

# **Design Detail Sheets**

**500**

SECTION  
**500**

**Drainage**

NO.	DATE	TITLE
500-5	10-20-15	Precast Concrete Drain Extension
500-6	10-20-15	Median Culvert Extensions with Beveled Pipe and Guard
500-19	04-21-15	Diagonal Placed Drain for Median Crossovers
500-20	10-15-13	Continuous Trench Drain

SECTION  
**510**

**Fencing**

NO.	DATE	TITLE
510-1	04-20-10	Chain Link Fence on Concrete Retaining Wall
510-2	03-28-95	Temporary Slope Drain
510-3	04-20-10	Supplemental Details of Field Fence (Small Animal Barrier)
510-4	04-21-15	Precast Stock Pass Extension
510-5	10-19-10	Small Animal Barrier for Gated Entrance

**Traffic Control - Two Lane - Stationary**

NO.	DATE	TITLE
520-54	10-17-06	Traffic Control Layout for Unpaved On-Site Detour w/ One-Lane Traffic
520-55	10-17-06	Traffic Control Layout for Unpaved On-Site Detour w/ Two-Way Traffic

# ROADWAY PAVEMENT

SECTION  
**531**

NO.	DATE	TITLE
531-2	04-17-12	Median Crossover at Interchange (50' Median)

SECTION

**535**

**ROADWAY SHOULDERS**

NO.	DATE	TITLE
535-3	04-16-13	Paved Shoulder Hot Mix Asphalt with 6" Sloped Curb and Gutter Unit

SECTION

**540**

**TRAFFIC BARRIERS AND APPURTENANCES**

NO.	DATE	TITLE
540-13	10-19-10	Barricade at Crossover

SECTION

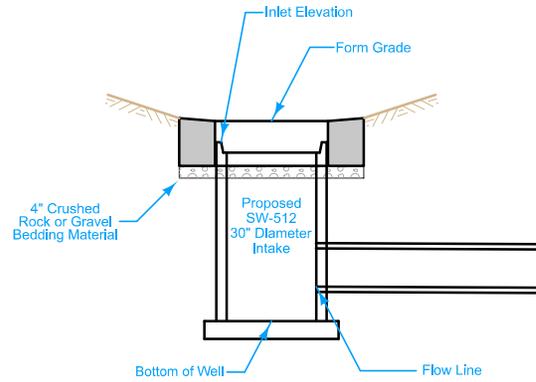
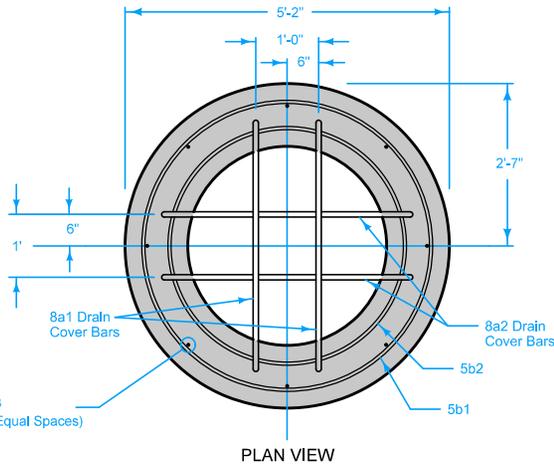
**560****MISCELLANEOUS**

NO.	DATE	TITLE
560-2	03-28-95	Mailbox Turnouts (Granular Surfaced)
560-3	10-16-12	Grading Blister at Light Pole Footing
560-4	10-21-14	HMA Wedge for Superelevation
560-5	04-21-15	Painted Islands
560-6	10-18-16	Shared-use Trail or Sidewalk Behind Steel Beam Guardrail at Bridge Approach

SECTION

**570****EROSION CONTROL**

NO.	DATE	TITLE
570-1	10-18-16	Slash Mulch Berm
570-2	04-19-16	Rock Check Dam
570-3	10-18-16	Temporary Sediment Control Basin
570-4	10-18-16	Silt Fence Installation for Shallow or No Ditch
570-5	04-18-17	Erosion Control for Intake or Manhole Well
570-6	04-18-17	Open-Throat Curb Intake Sediment Filter
570-7	04-18-17	Grate Intake Sediment Filter Bag
570-9	04-18-17	Erosion Control for Trenchless Construction
570-10	04-18-17	Stabilized Construction Entrance



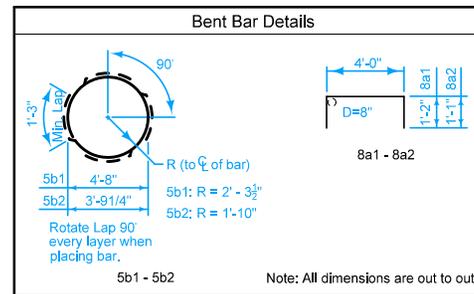
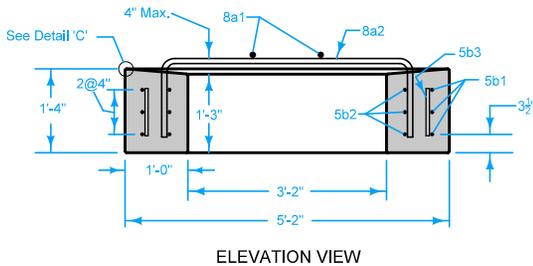
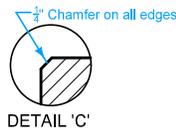
Minimum clear distance of 3 inches from the face of concrete to near reinforcing bar unless noted otherwise.

All reinforcing steel Grade 60.

Concrete  $f_c = 4.0$  ksi

- ① Galvanize 8a1 and 8a2 bars after bending. Ensure the 8a1 and 8a2 bars bear against each other during placement.

Estimated Quantities		
Item	Unit	Total
Structural Concrete ( Miscellaneous )	cu. yds.	0.64
Reinforcing Steel, Epoxy Coated	lbs.	101
Reinforcing Steel, Galvanized ①	lbs.	67

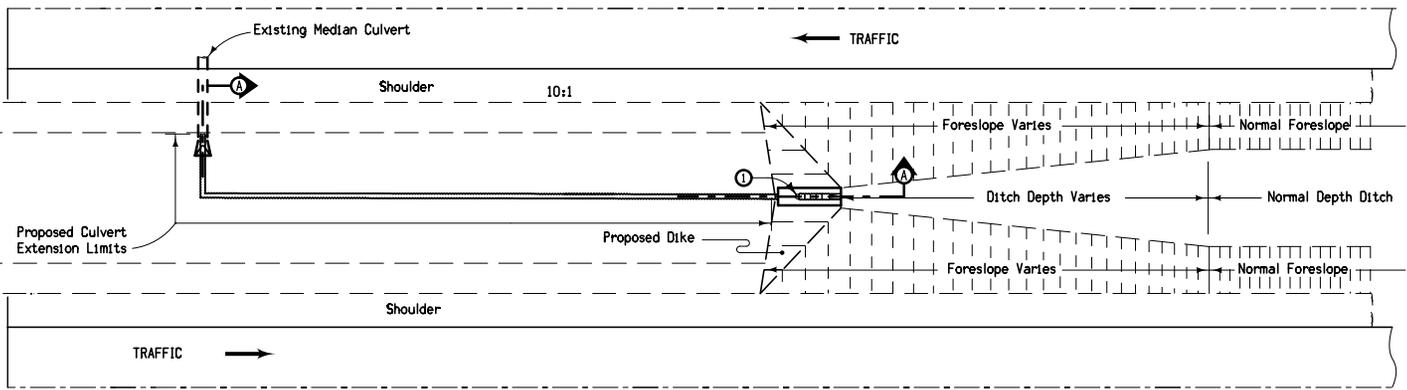


INTAKE ADJUSTMENT RING							
For bedding and backfill purposes, use crushed rock or crushed gravel material complying with Article 4120.04 of the Standard Specifications for all bedding and backfill. Place and compact the material according to Article 2435.03, A. Use 100% crushed gravel produced by crushing material retained on a 1.5 inch or larger screen.							
No.	Location		Proposed Intake Inlet Elev.	Form Grade Intake Adjustment Ring Elev.	Flow Line Elevation	Bottom of Well Elevation	Remarks
	Station	Offset					

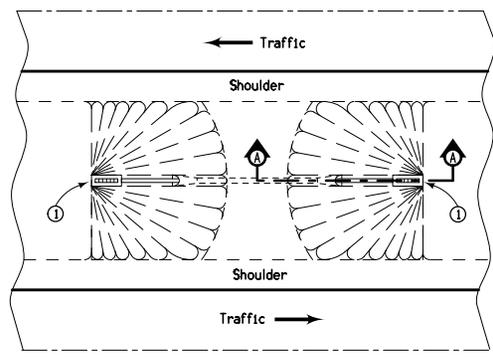
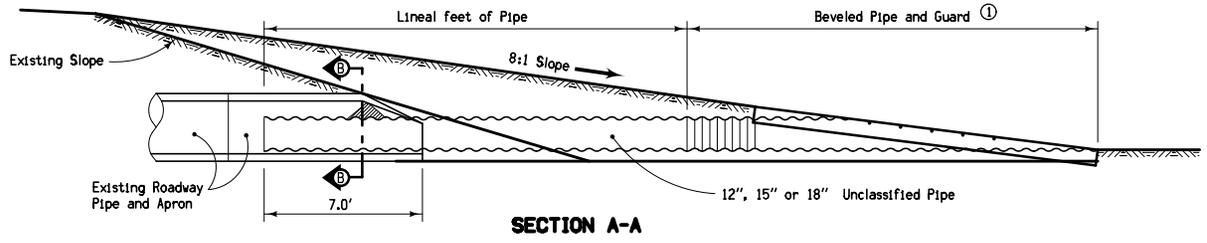
Reinforcing Bar List						
Bar	Location	Shape	No.	Length	Weight	
Galvanized	8a1	Drain Cover Bars - Top Layer	2	6'-4"	34	
	8a2	Drain Cover Bars - Bottom Layer	2	6'-2"	33	
	Reinforcing Steel, Galvanized - Total (lbs.)					67
Epoxy Coated	5b1	Circular Tie Bars - Outside Face	3	16'-0"	50	
	5b2	Circular Tie Bars - Inside Face	3	13'-2"	42	
	5b3	Tie Bars - Vertical	8	0'-9"	6	
	Reinforcing Steel, Epoxy Coated - Total (lbs.)					98

<b>IOWA DOT</b>	REVISION
	NEW 10-20-15
ROAD DESIGN DETAIL	500-05
REVISIONS: New	SHEET 1 of 1

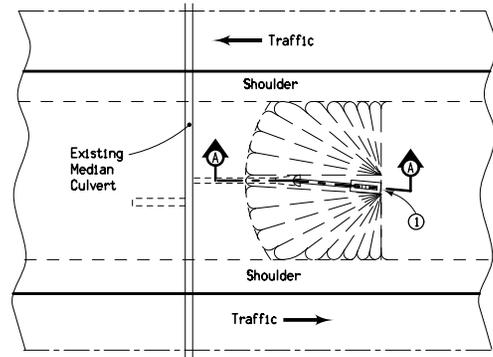
**PRECAST CONCRETE  
DRAIN EXTENSION**



**CASE 'A'**  
Guardrail Installation between Dual Bridges



**CASE 'B'**  
Maintenance Turnaround



**CASE 'C'**  
Median Culvert

Construct the extension by placing the appropriate size of Unclassified Pipe into the existing culvert and apron. After the Unclassified pipe has been assembled at the proper angle and placed into the culvert, some adjusting may be required by rotating the Unclassified Pipe to fit the new flow line. Seal the area between the existing apron and Unclassified Pipe with concrete.

Construct the extension using Class 'C' concrete.

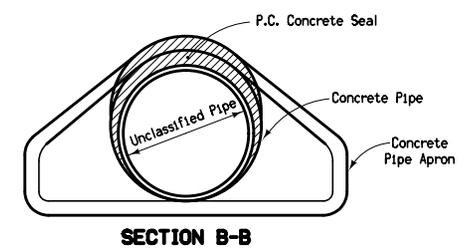
Excavating silt for pipe placement is incidental to pipe items.

Place a silt fence ditch check immediately upstream from the inlet of the culvert. See EC-201 for construction details.

① For details of Beveled Pipe and Guard, see DR-212.

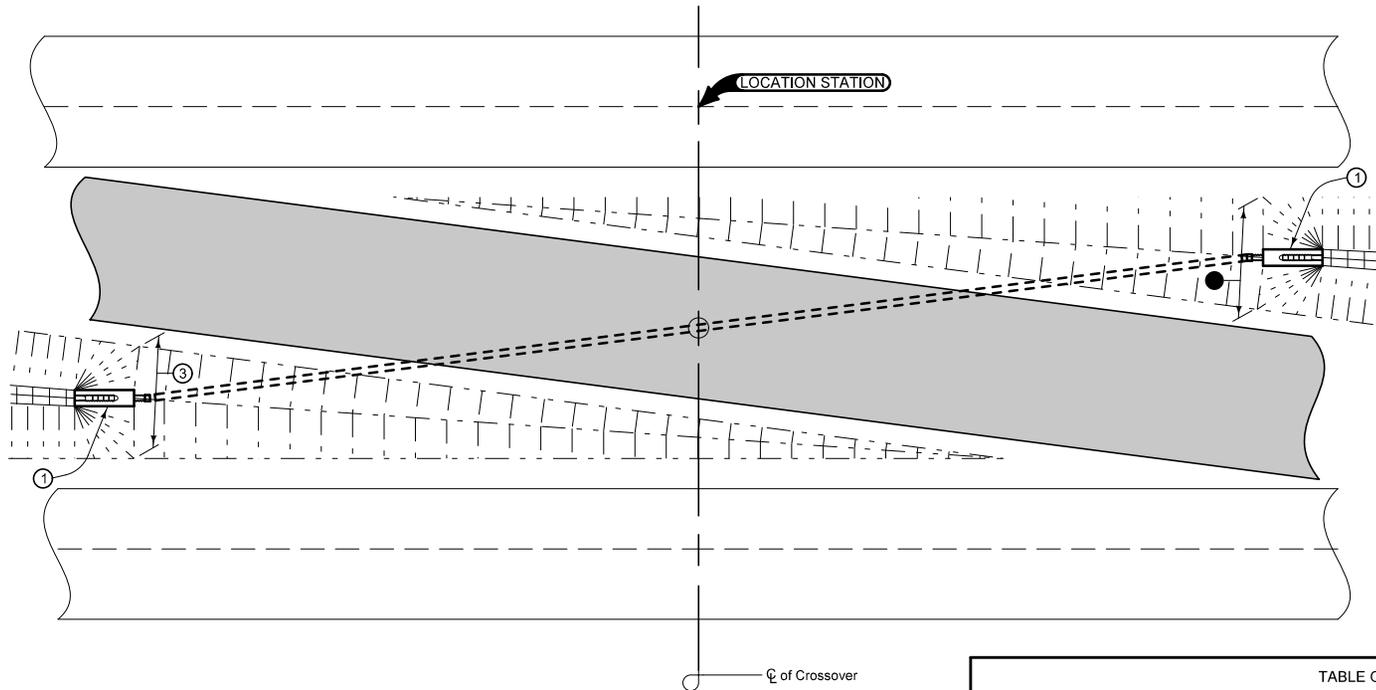
Contract Items:

- Unclassified Roadway Pipe
- Beveled Pipe and Guard



<b>IOWA DOT</b>	REVISION	
	6	10-20-15
<b>ROAD DESIGN DETAIL</b>		<b>500-6</b>
		SHEET 1 of 1
REVISIONS: Changed the reference from RF-27 to DR-212. Updated DOT logo. Revised general notes.		

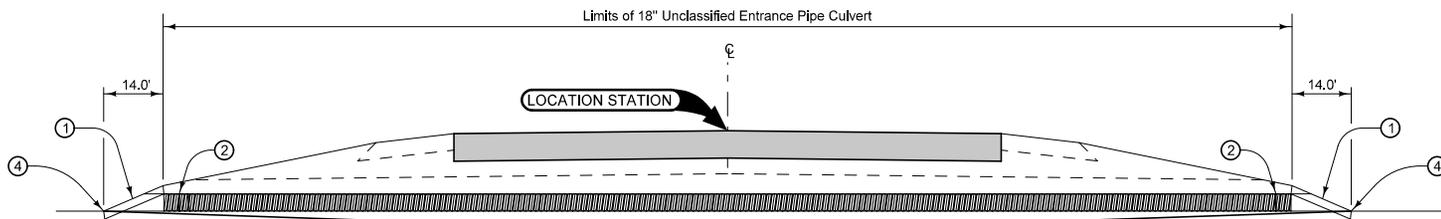
**MEDIAN CULVERT EXTENSIONS  
WITH BEVELED PIPE AND GUARD**



PLAN VIEW

- ① Beveled pipe and guard. See Standard Road Plan DR-212.
- ② Requires approximately 7 degree elbow.
- ③ Place the top edge of beveled pipe and guard at a point where the distance between the edges of the shoulders are approximately 22 feet apart.
- ④ Median ditch flow line.

TABLE OF QUANTITIES										
Standard Road Plan No.	PV-501	PV-502	PV-504	PV-505	PV-507	PV-508	PV-510	PV-511	PV-513	PV-514
Median Width	50.0'	50.0'	64.0'	64.0'	68.24'	68.24'	82.0'	82.0'	100.0'	100.0'
Crossover Pavement Width	16.0'	28.0'	16.0'	28.0'	16.0'	28.0'	16.0'	28.0'	16.0'	28.0'
Bid Item										
18" dia. Unclassified Entrance Pipe Culvert	250'	344'	112'	196'	82'	162'	56'	74'	148'	88'



LONGITUDINAL SECTION AT PIPE CENTERLINE

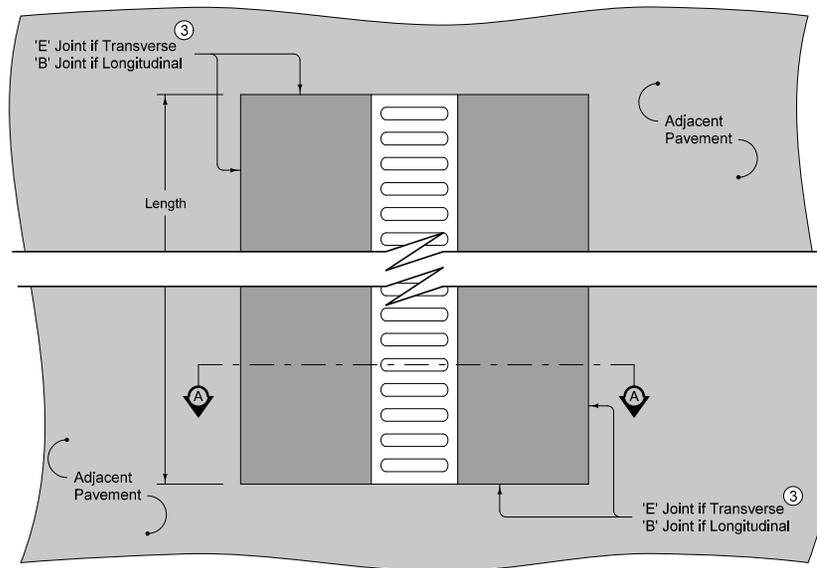
Possible Contract Items:  
 Beveled Pipe and Guard.  
 Culvert, Unclassified Entrance Pipe, 18" Dia.  
 Embankment-In-Place  
 Excavation, Class 10, Roadway and Borrow  
 Special Backfill

Possible Tabulation:  
 112-8

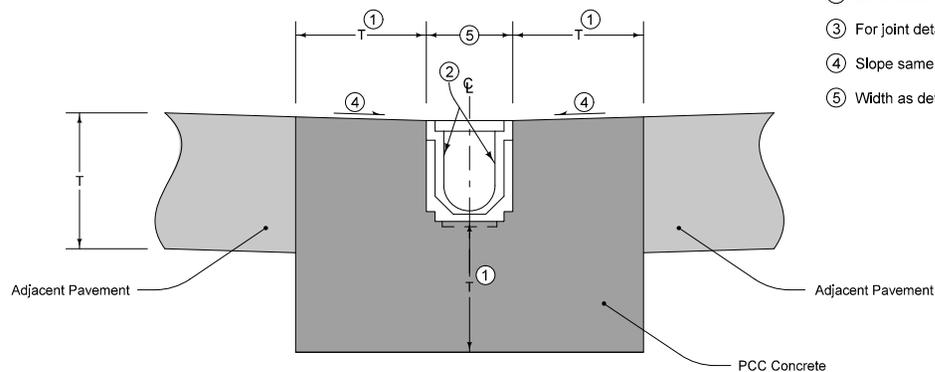
<b>IOWA DOT</b> <b>ROAD DESIGN DETAIL</b>	REVISION	
	6	04-21-15
	<b>500-19</b>	
		SHEET 1 of 1

REVISIONS: Changed reference from RF-27 to DR-212 in circle note 1.

**DIAGONAL PLACED DRAIN FOR  
MEDIAN CROSSOVERS**



PLAN



SECTION A-A

- ① Same as thickness of adjacent pavement.
- ② Continuous Trench Drain.
- ③ For joint details, see PV-101.
- ④ Slope same as adjacent pavement.
- ⑤ Width as determined by manufacturer.

**DESCRIPTION.**  
Construct a continuous trench drain designed, manufactured, and supplied by one of the following:

- Zurn Industries, Inc. or a designated distributor;
- ABT, Inc. or a designated distributor;
- Hubbell Power Systems, Inc. or a designated distributor.

**MATERIALS.**

- A. Meet the specifications set forth by the manufacturer.
- B. PCC concrete complying with Section 2301 of the Standard Specifications.

**CONSTRUCTION.**

- A. Install continuous trench drain according to the manufacturer's recommendation and the contract documents.
- B. Install casting certified for 40,000 pound proof-load according to AASHTO M 306.
- C. Use duct tape or wood block to cover drain during paving operations.

**METHOD OF MEASUREMENT.**

Measurement for Continuous Trench Drain will be in linear feet.

**BASIS OF PAYMENT.**

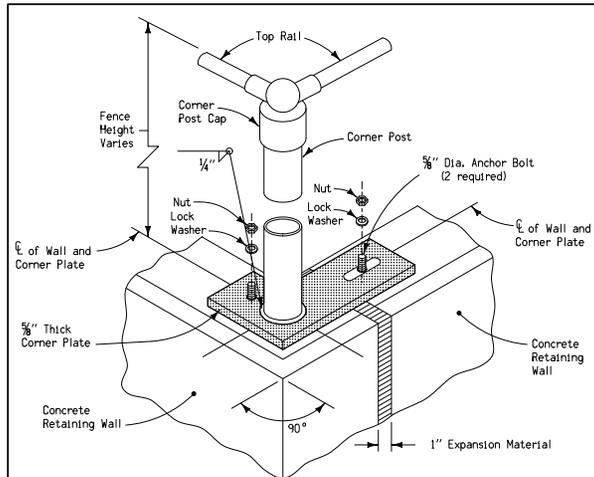
- A. Payment for Continuous Trench Drain will be the contract unit price per linear foot.
- B. Payment is full compensation for:
  - Purchasing the manufactured continuous trench drain materials.
  - PCC concrete to construct the continuous trench drain.
  - Furnishing all equipment, tools, and labor to construct the continuous trench drain.
- C. Connection to manhole, pipe, or apron is incidental to Continuous Trench Drain.

Possible Contract Item:  
Continuous Trench Drain

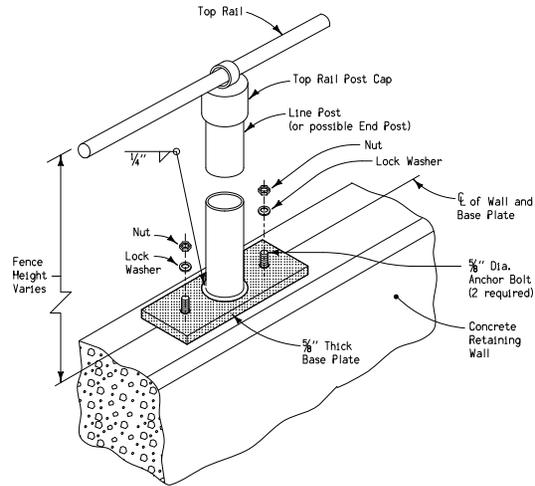
Possible Tabulation:  
104-14

 <b>Iowa Department of Transportation Highway Division</b>		
<b>DETAIL SHEET</b>		<b>500-20</b>
REVISION:	Changed detail title & removed supply reference numbers. Added Length and T dimensions. Added Possible Tabulation and Possible Contract Item.	REVISION NO. 4 REVISION DATE 10-15-13

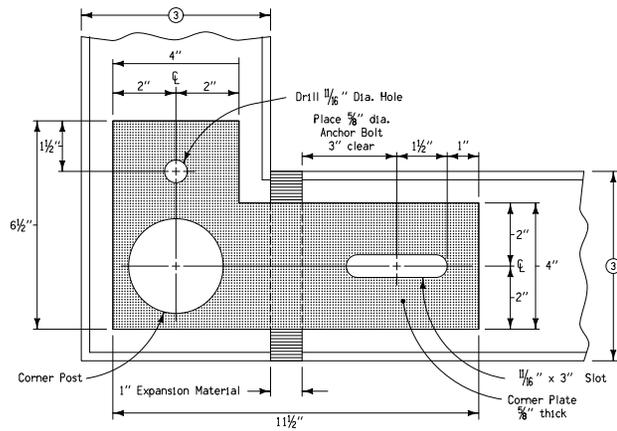
CONTINUOUS TRENCH DRAIN



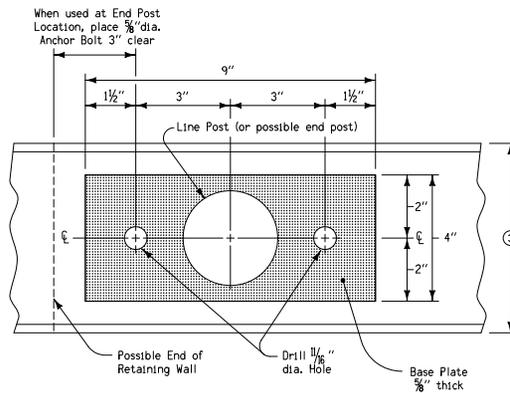
TYPICAL INSTALLATION CORNER PLATE



TYPICAL INSTALLATION BASE PLATE ②



PLAN OF CORNER PLATE ①



PLAN OF BASE PLATE

Construction of Chain Link Fence on Concrete Retaining Wall shall be in conformance with current Standard and Supplemental Specifications. Details shown on this sheet are typical. Alternate details may be submitted to the Engineer for approval prior to construction. Refer to project plans for details of particular fencing installations.

Anchor bolts (5/8" diameter) shall have a minimum pull out strength of 9000 pounds based on 3500 psi concrete, shall meet the requirements of I.D.O.T. Materials I.M. 453.09, and shall be galvanized and installed according to recommendations of the manufacturer.

Base Plates and Corner Plates shall be galvanized after welding and prior to installation.

Post size and spacing shall be as shown on MI-102.

Bottom tension wire, placement of stretcher bar clamps, fastening of chain link fabric to posts, top rail sleeve, etc., shall be as indicated on MI-102.

Brace rails and truss rods are not required where height of fabric is specified as 42 inches or less.

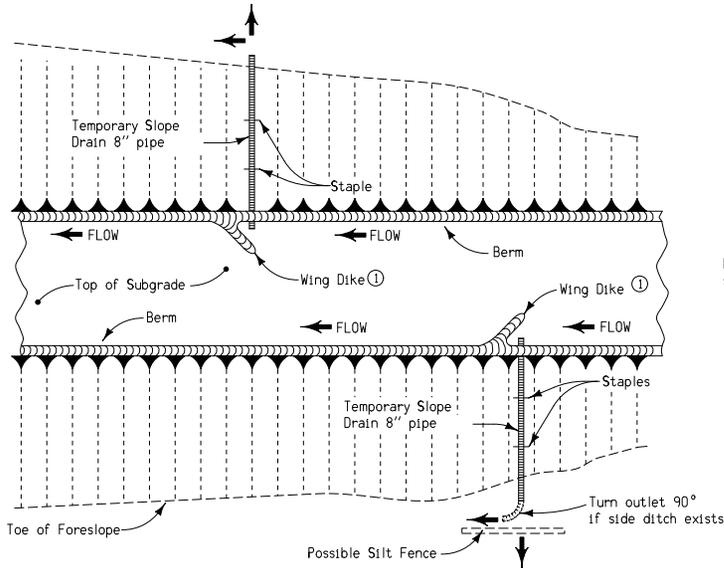
Grounding requirements shall be as determined by Section 2519 of the Standard Specifications.

Chain link fabric shall be knuckled selvage at top and bottom of fence.

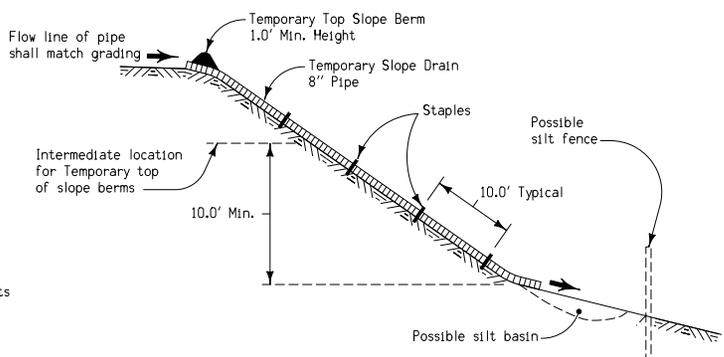
Price bid for "Chain Link Fence" shall be considered full compensation for fabrication and construction of fencing as detailed hereon, as required by project plans, and as per Section 2519 of the Standard Specifications.

- ① The 11.5 inches length dimension for the Corner Plate is based on a wall width of 6 inches. In cases where wider wall widths are shown on project plans, the length dimension shall be increased to ensure 3 inches clearance for the anchor bolt.
- ② The Base Plate is shown mounted on a narrow width wall. Where a wider wall is shown on project plans, the base plate may be rotated 90 degrees when there is sufficient concrete to ensure a minimum of 3 inches clearance for anchor bolts.
- ③ Width of concrete retaining wall

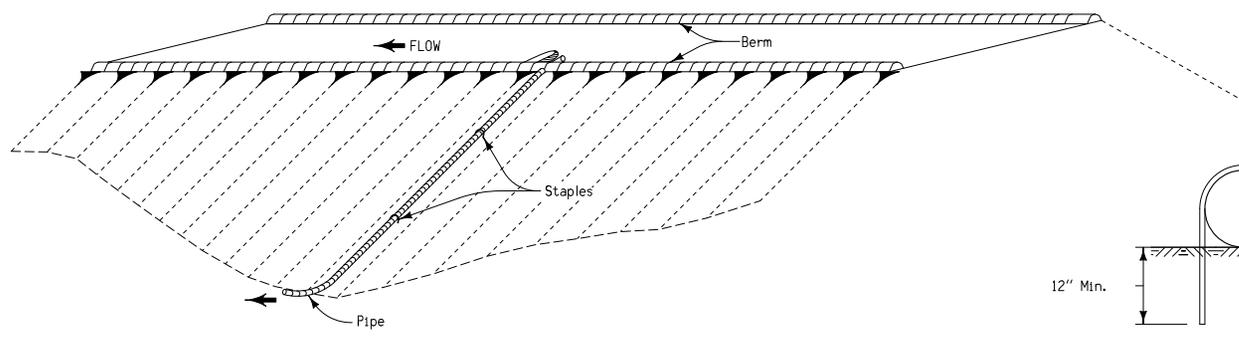
 Iowa Department of Transportation Highway Division		
<b>DETAIL SHEET 510-1</b>		
REVISION: Updated references to renamed standards.	REVISION NO. 2	REVISION DATE 04-20-10
CHAIN LINK FENCE ON CONCRETE RETAINING WALL		



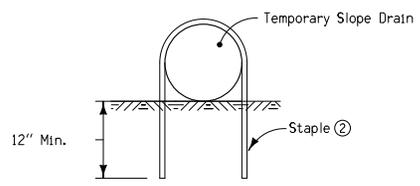
PLAN



TYPICAL SECTION



PERSPECTIVE



STAPLE DETAIL

**GENERAL NOTES:**

Details indicated hereon are for the installation of a temporary slope drain on the foreslope of the roadway fill. The intent of the temporary slope drain is to prevent foreslope erosion during construction and to minimize the water pollution which might be caused by soil erosion from the project.

At the completion of each day's grading, a temporary berm will be constructed on both sides of the subgrade. At points a maximum of 500' apart, at low points of vertical curves, and as determined by the Engineer, temporary intercepting wing dikes shall be graded and slope drains installed. All special grading work shall be considered incidental to other grading work on the project.

Foreslopes with a vertical height of ten feet or less shall not have temporary slope drains installed.

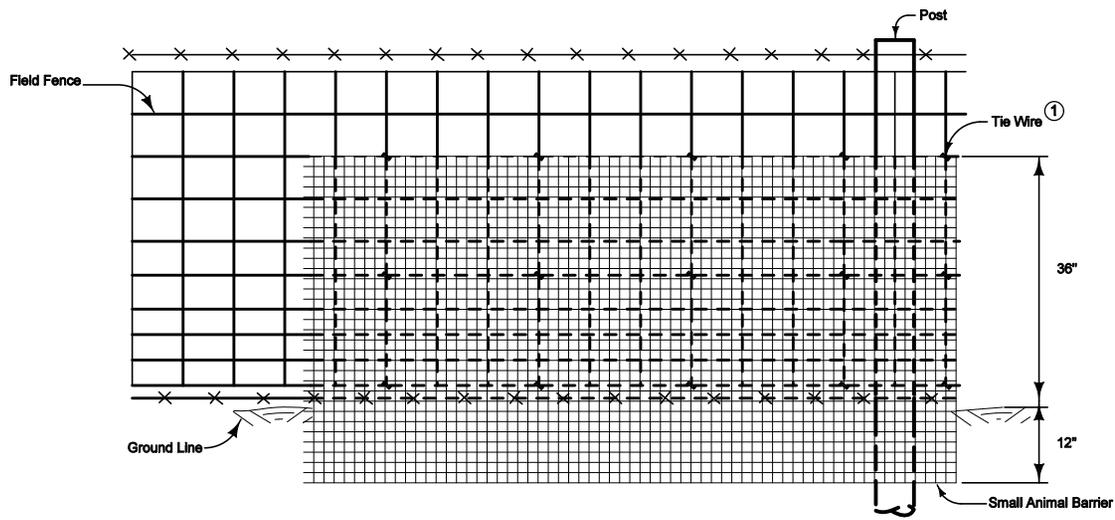
The temporary slope drain shall consist of a length of pipe capable of extending to the top of foreslope when all grading has been completed. The pipe shall be moved up the foreslope to the new temporary top of slope berm at the completion of each day's work. The pipe shall be Solid Tubing complying with all requirements of ASTM F 405, Standard Duty Tubing.

Method of measurement shall be along the centerline of pipe in its final position.

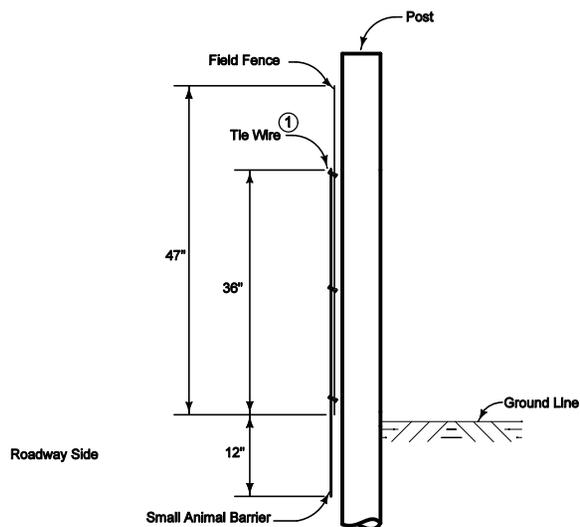
The price bid for "Temporary Slope Drain, As Per Plan", measured in lineal feet, shall be considered full compensation for the construction of all required temporary top of slope berms and for installing and maintaining the slope drain for the duration of the contract.

- ① Typical length of 10.0', 1.0' minimum height
- ② Staple may be bent reinforcing bar No. 4 minimum, or alternate approved by the Engineer.

 <b>Iowa Department of Transportation</b> Project Development Division		
<b>DETAIL SHEET</b>		<b>510-2</b>
REVISION: Place in CAD	REVISION NO.	REVISION DATE
	1	03-28-95
DETAILS OF TEMPORARY SLOPE DRAIN		



FRONT VIEW



SIDE VIEW

Small Animal Barrier is used for preventing small mammals, reptiles and amphibians from migrating on to the highway right of way.

Contract item "Small Animal Barrier" includes chain link fence fabric, galvanized tie wires, 12 inch trench excavation, backfill and compaction around fence fabric, all materials, tools and labor required to construct barrier as detailed.

Construct Small Animal Barrier using 14 gage Chain Link Fence Fabric with a 1/2 inch grid Mesh spacing and a 48 inch total height. Use Chain Link Fabric per Standard Specification Section 4154 and install fencing per the Contract Documents.

Stretch Small Animal Barrier and mount on Field Fence using Galvanized Wire Ties and as described in Standard Specification Section 4154. Bury the bottom 12 inches of the Barrier below the finished grade to restrict burrowing under the barrier. Do not damage or deform the barrier fabric when backfilling and compacting trench material around the fabric. Overlap the ends of the barrier fabric roll a minimum of 6 inches and tie both ends to the Field Fence, leaving no gap between the fabric ends.

Measurement will be in linear feet of installed Small Animal Barrier and paid for at the contract unit price per linear feet.

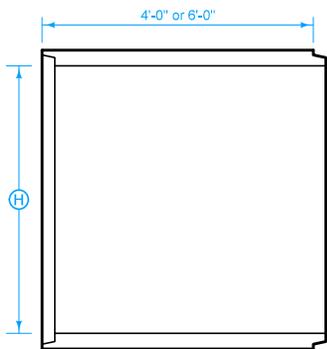
- ① Place galvanized Tie Wires at the following three vertical locations: top of chain link fence fabric, bottom of field fence, approximate mid point between the top and bottom ties. Repeat attachment locations at 1'-6" intervals along the length of the barrier.

Possible Contract Items:  
 Field Fence  
 Field Fence Brace Panel  
 Small Animal Barrier

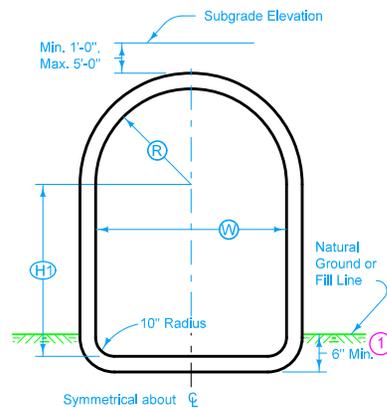
Possible Tabulation:  
 100-7

 <b>Iowa Department of Transportation Highway Division</b>		
<b>DETAIL SHEET</b>		<b>510-3</b>
REVISION: Changed woven wire fabric to chain link.	REVISION NO. 1	REVISION DATE 04-20-10

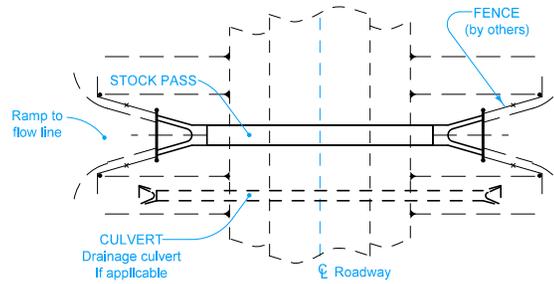
SUPPLEMENTAL DETAILS  
 OF FIELD FENCE  
 (SMALL ANIMAL BARRIER)



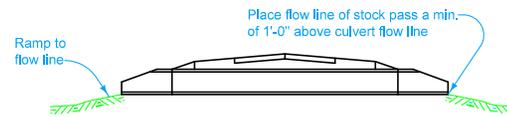
DETAIL OF INTERMEDIATE UNIT



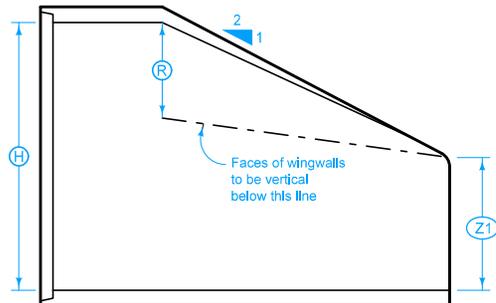
END VIEW OF INTERMEDIATE UNIT



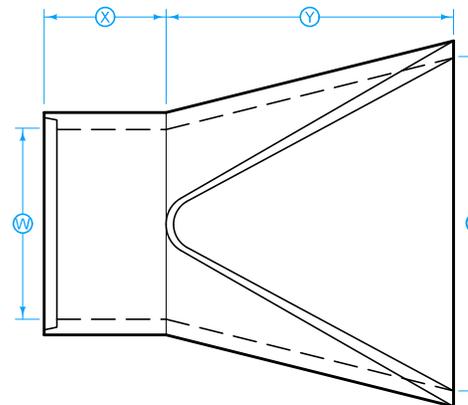
PLAN



LONGITUDINAL SECTION



APRON LONGITUDINAL SECTION



PLAN OF APRON

Furnish Precast Stock Pass complying with Section 2415 of the Standard Specifications. Install according to Section 2416 of the Standard Specifications.

Seal joints and install joint ties according to the manufacturer's recommendations.

Details indicated are typical. Alternate designs or methods may be submitted to the Engineer for approval.

Payment is full compensation for furnishing and installing stock pass and apron.

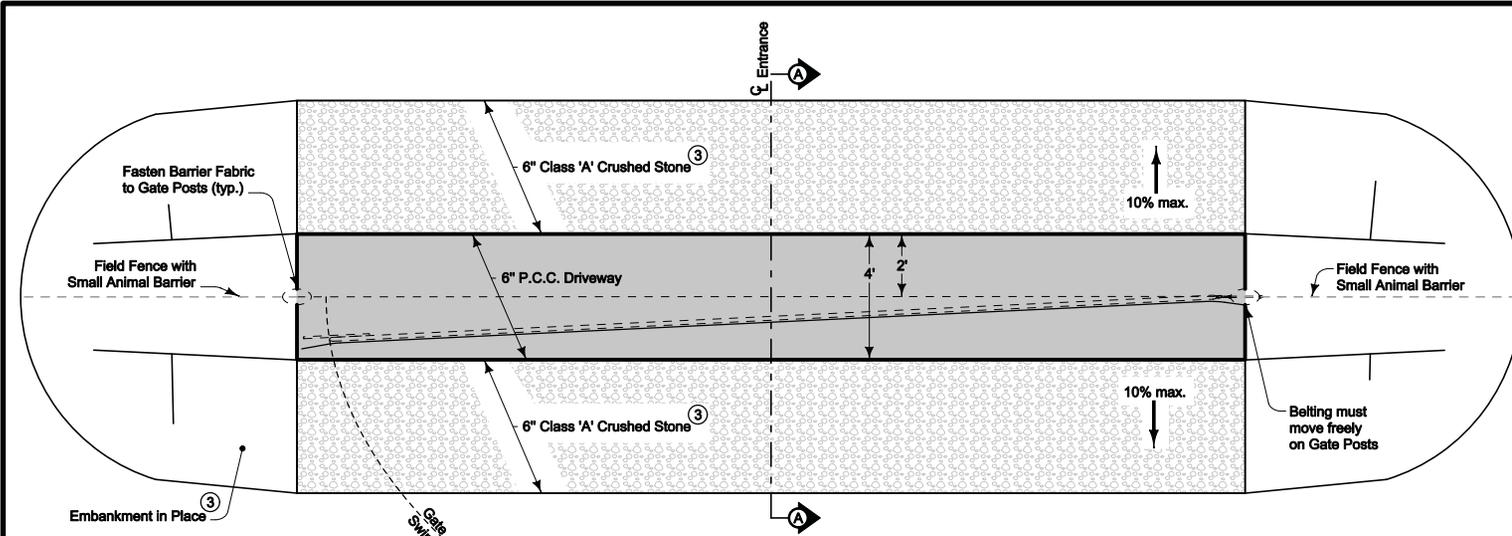
- ① Perform excavation below ground line using a template conforming to the shape of the stock pass.

Structure	DIMENSIONS FOR APRON						
	W	H	R	X	Y	Z	Z1
4' x 6'	4'	6'	2'	3'-2"	7'	7'	2'-11"
5' x 7'	5'	7'	2'-6"	1'-9"	7'-5 1/2"	7'	3'-6"

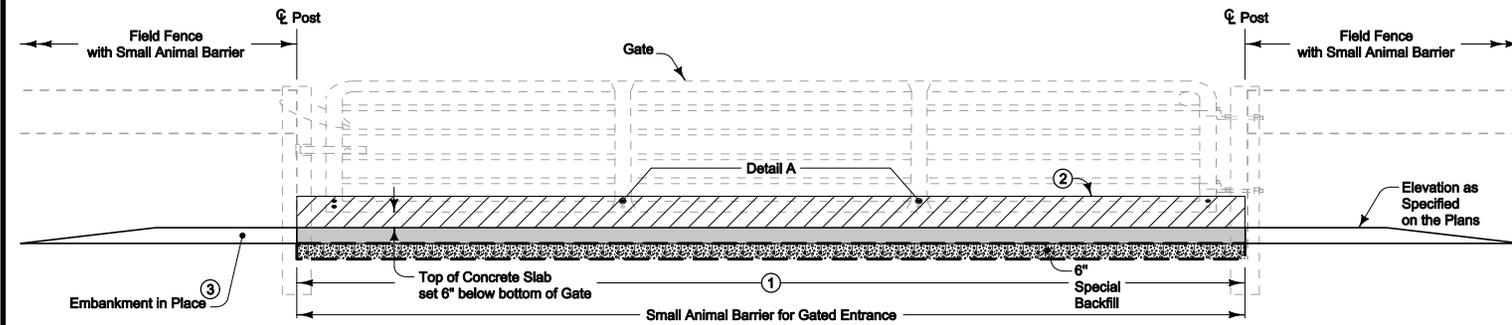
Structure	DIMENSIONS FOR INTERMEDIATE UNIT			
	W	H	R	H1
4' x 6'	4'	6'	2'	4'
5' x 7'	5'	7'	2'-6"	4'-6"

- Possible Contract Items:
- Stock Pass Apron, 4' x 6' Precast Concrete
  - Stock Pass Apron, 5' x 7' Precast Concrete
  - Stock Pass, 4' x 6' Precast Concrete
  - Stock Pass, 5' x 7' Precast Concrete

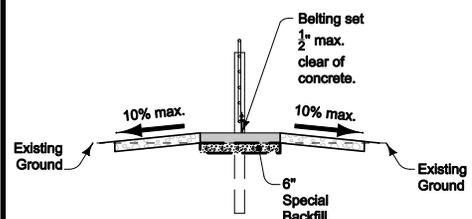
	REVISION	
	NEW	04-21-15
	<b>510-4</b>	
ROAD DESIGN DETAIL		SHEET 1 of 1
REVISIONS: New. Replaces RF-8.		



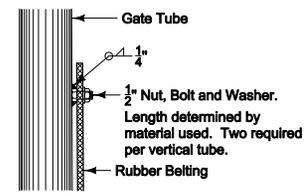
PLAN



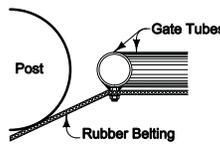
ELEVATION



SECTION A-A



DETAIL 'A'



BRACE POST



BELTING OVERLAP

Construct "Small Animal Barrier for Gated Entrance" at specified locations to provide access through the "Small Animal Barrier".

Place "Portland Cement Concrete Driveway" to elevation specified on the plans.

Each "Small Animal Barrier for Gated Entrance" correctly installed will be counted for payment.

Payment will be the contract unit price for each "Small Animal Barrier for Gated Entrance" installed correctly.

Payment includes all materials, tools and labor required to construct "Small Animal Barrier for Gated Entrance" as detailed.

- ① P.C. Concrete Driveway: Gate Width + 12 inches by 4'-0" along centerline of entrance by 6 inches thick.
- ② Rubber Belting: 12 Inches wide by 1/4 inch thick (min.) Fabric Reinforced Rubber Belting bolted to Gate as shown in Detail A. Length is Gate Width + 12 inches.
- ③ Transition into natural ground.

Possible Contract Item:  
Small Animal Barrier for Gated Entrance

Incidental to Small Animal Barrier for Gated Entrance:  
Driveway Surfacing, Class 'A' Crushed Stone  
Embankment In Place  
Portland Cement Concrete Driveway, 6 inch  
Rubber Belting  
Special Backfill

Possible Tabulation:  
100-7

<b>DETAIL SHEET</b>		<b>510-5</b>
REVISION: Nev.	REVISION NO.	REVISION DATE
	Nev	10-19-10
<b>SMALL ANIMAL BARRIER FOR GATED ENTRANCE</b>		

**TWO-LANE ROADWAY**

SPEED LIMIT (mph)	Approximate Sign Spacing
	'A'
35	250'
45	350'
55	500'

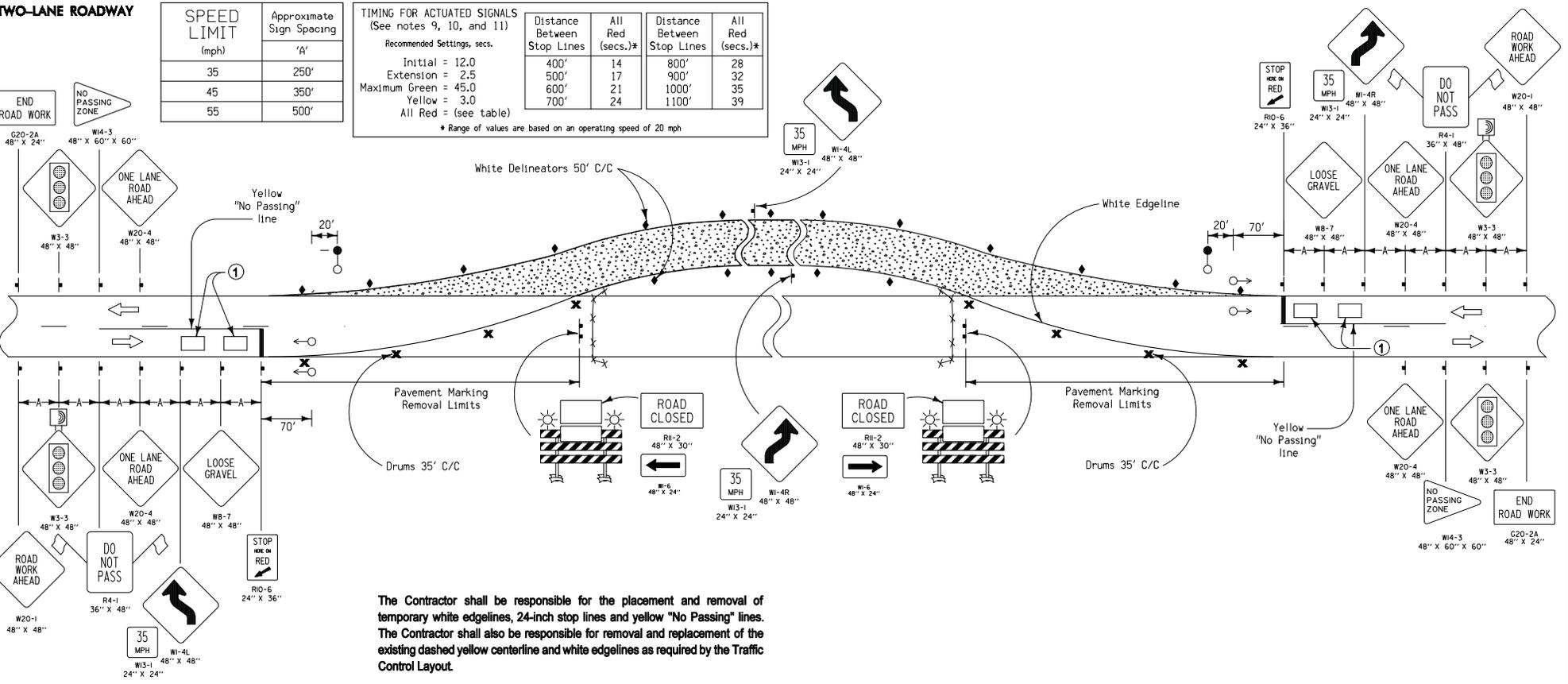
**TIMING FOR ACTUATED SIGNALS**  
(See notes 9, 10, and 11)

Recommended Settings, secs.

Initial = 12.0  
Extension = 2.5  
Maximum Green = 45.0  
Yellow = 3.0  
All Red = (see table)

Distance Between Stop Lines	All Red (secs.)*	Distance Between Stop Lines	All Red (secs.)*
400'	14	800'	28
500'	17	900'	32
600'	21	1000'	35
700'	24	1100'	39

\* Range of values are based on an operating speed of 20 mph



The Contractor shall be responsible for the placement and removal of temporary white edgelines, 24-inch stop lines and yellow "No Passing" lines. The Contractor shall also be responsible for removal and replacement of the existing dashed yellow centerline and white edgelines as required by the Traffic Control Layout.

The Engineer may change the advisory speed if deemed appropriate. If reduced below 35 mph, the Reverse Curve signs shall be changed to Reverse Turn signs (W1-3LA or W1-3RA).

This layout is not appropriate when ADT (Average Daily Traffic) exceeds 3,000 vehicles or when the distance between stop lines exceeds 1,100 feet.

① A detection area shall be located near the stop line with the downstream edge positioned 6' from the stop line. A second detection area shall be located 100 to 150 feet in advance of the stop line. The size of the detection areas shall be approximately 6' x 10'. A single above-ground detector may be used to provide detection for both areas.

- LEGEND**
- † Traffic Sign
  - ✖ Drum
  - † Type III Barricade
  - Orange Plastic Safety Fence
  - ←○ Traffic Signal
  - ◆ Single White Delineators (mount back to back)
  - Temporary Floodlighting
  - ☀ Type 'A' Low-Intensity Flashing Warning Light
  - ☾ Type 'B' High-Intensity Flashing Warning Light

**Iowa Department of Transportation**  
**Highway Division**

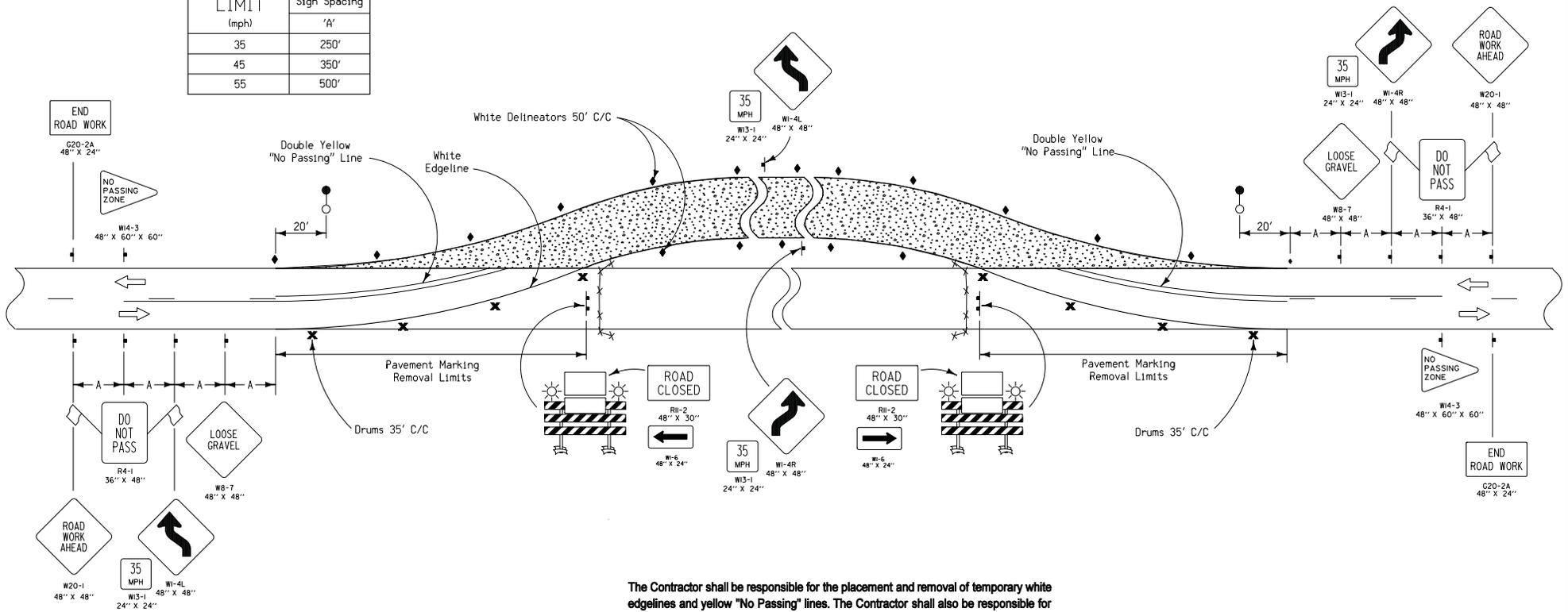
**DETAIL SHEET 520-54**

REVISION: Replaced RS-11, as it is rarely used.	REVISION NO.	REVISION DATE
	NEW	10-17-06

**TRAFFIC CONTROL LAYOUT  
FOR UNPAVED ON SITE DETOUR  
WITH ONE-LANE TRAFFIC**

**TWO-LANE ROADWAY**

SPEED LIMIT (mph)	Approximate Sign Spacing
	'A'
35	250'
45	350'
55	500'



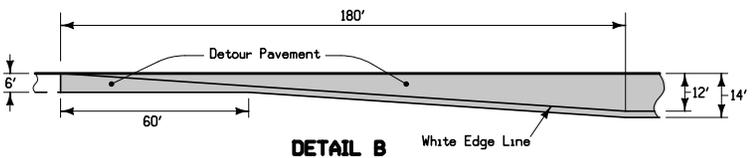
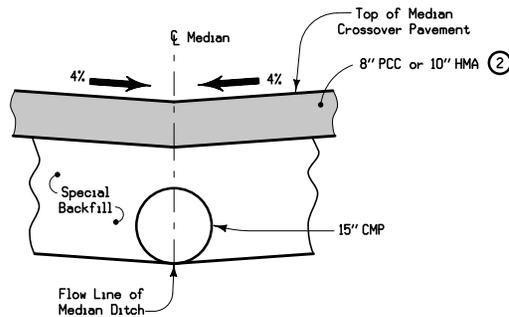
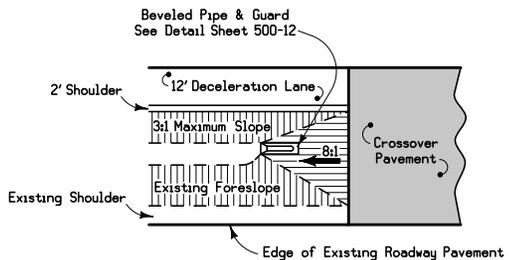
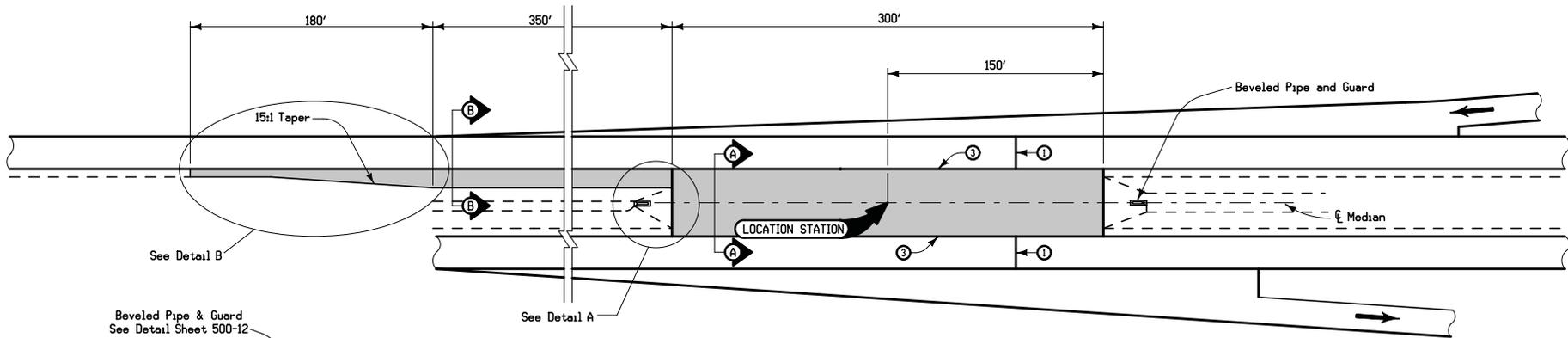
The Contractor shall be responsible for the placement and removal of temporary white edgelines and yellow "No Passing" lines. The Contractor shall also be responsible for the removal and replacement of the existing dashed yellow centerline and white edgelines as required by the Traffic Control Layout.

The Engineer may change the advisory speed if deemed appropriate. If reduced below 35 mph, the Reverse Curve signs shall be changed to Reverse Turn signs (W1-3LA or W1-3RA).

**LEGEND**

- ┆ Traffic Sign
- ✕ Drum
- ┆ Type III Barricade
- Orange Plastic Safety Fence
- ←○ Traffic Signal
- ◆ Single White Delineators (mount back to back)
- Temporary Floodlighting
- ☀ Type 'A' Low-Intensity Flashing Warning Light
- ☀ Type 'B' High-Intensity Flashing Warning Light

 <b>Iowa Department of Transportation</b> Highway Division		
<h1>DETAIL SHEET 520-55</h1>		
REVISION: Replaced RS-9, as it is rarely used.	REVISION NO.	REVISION DATE
	NEW	10-17-06
<p>TRAFFIC CONTROL LAYOUT FOR UNPAVED ON SITE DETOUR WITH TWO-WAY TRAFFIC</p>		



The intent of this plan is to show the construction requirements for a median crossover where the median width is 50' and located adjacent to ramp tapers.

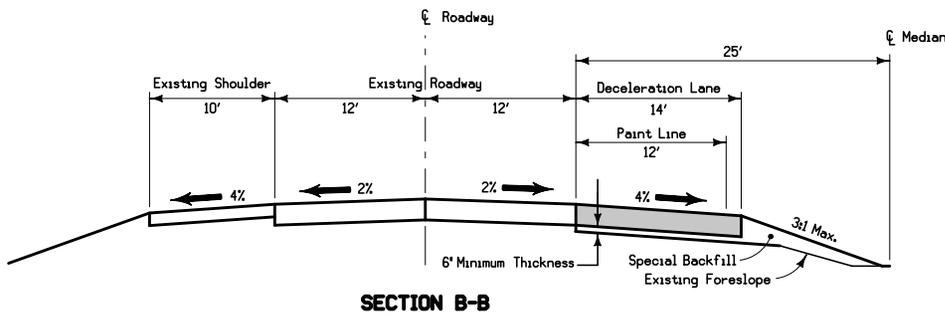
The Engineer will determine the header location to accommodate the required staging activities.

Price bid for contract items shall be considered full compensation for furnishing all necessary materials and labor to construct the median crossover as detailed hereon.

Contract bid items are:	Unit	Amount
Removal of pavement *	Sq. Yds.	753
Special Backfill	Tons	1660 **
Detour Pavement	Sq. Yds.	2384
15" Unclassified Roadway Pipe	Lin. Ft.	334

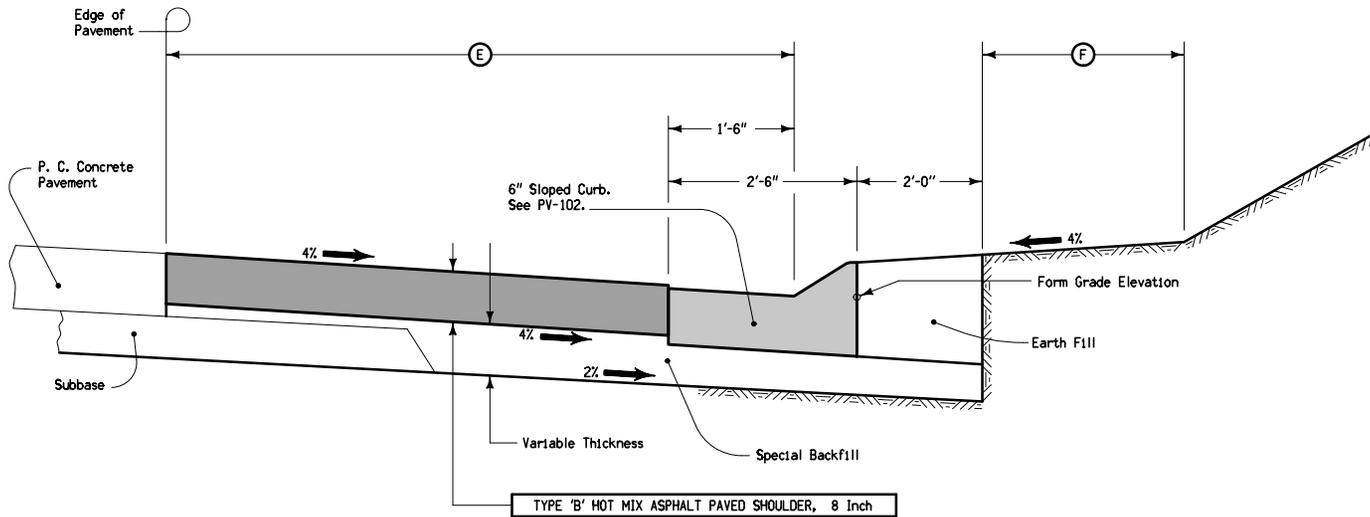
\* The removal of subbase material is considered incidental to the removal of pavement.

\*\* Quantities are based on the assumption that the existing median ditch is 4' deep and foreslopes are 4:1.



- ① Possible location of staging header
- ② 8" PCC Pavement, Class 'C', with required joints, or 10" HMA Pavement, HMA mixture (10,000,000 ESAL) Intermediate Course 3/4" mix, with PG64-22 binder and Class 1B compaction. The surface lift requires L-4 friction.
- ③ 'B' Joint required

<b>DETAIL SHEET 531-2</b>	
REVISION: Renamed pipe contract bid items. Added shading to match similar details.	REVISION NO. 10 REVISION DATE 04-17-12
<b>DETAILS OF MEDIAN CROSSOVER AT INTERCHANGE (50' MEDIAN)</b>	



**TYPICAL SECTION  
HOT MIX ASPHALT PAVED SHOULDER  
WITH 6" SLOPED CURB AND GUTTER UNIT**

E Feet	Hot Mix Asphalt				P. C. Concrete Curb And Gutter Unit Cu. Yds.
	Surface Area Sq. Yds.	Hot Mix Asphalt Tons ②	Tack Coat Gallons ③	Asphalt Binder Tons	
6	44.44	19.33	3.19	1.160	9.38
8	66.67	29.00	4.31	1.740	9.38
10	88.89	38.67	5.42	2.320	9.38

Slopes, dimensions, and quantities indicated hereon are for a normal section as shown and are for design purposes. Shoulder construction details may be modified through superelevated curves or other areas specifically designated by the Engineer. Refer to Typical Cross Sections and Standard Road Plans for superelevation.

Accomplish any special shaping of subgrade necessary, prior to construction of paved shoulders, as directed by the Engineer. Dispose of material removed due to this special shaping as directed by the Engineer.

Payment for special backfill will be based on a nominal 6 inch thickness. The thickness may be exceeded at the Contractor's option. However, the Contractor will not be compensated for any additional amount.

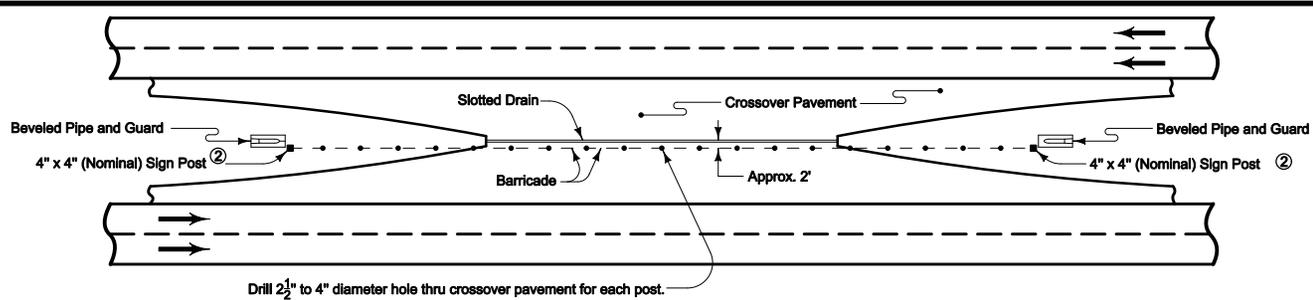
- ① Quantities shown are for one shoulder per station. Rates of application may be adjusted at the time of construction if so directed by the Engineer.
- ② Quantities shown are based on a design weight of 145 lbs / cu. ft. for Hot Mix Asphalt Mixture (1,000,000 ESAL), Base Course, 3/4" mix, with an asphalt content of 6 percent.
- ③ Includes quantities for tack coating vertical face of adjacent pavement prior to placement of any base material. Tack coat estimated at one (1) application at 0.05 gal. per sq. yd.

 Iowa Department of Transportation  
Highway Division

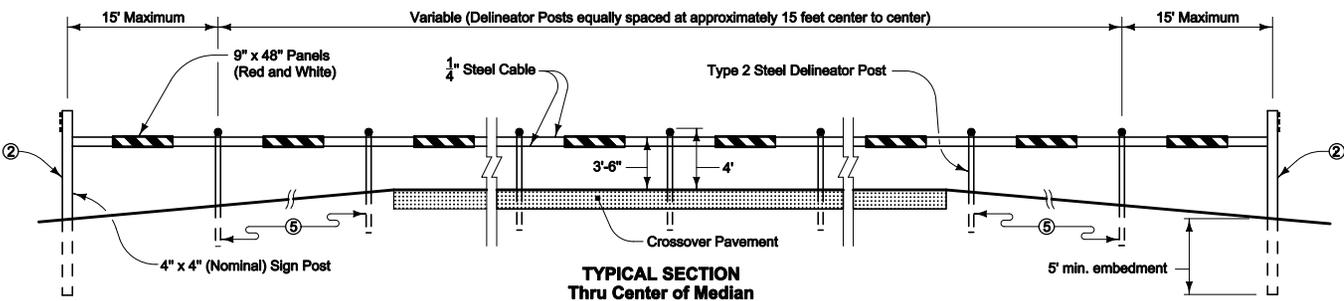
**DETAIL SHEET 535-3**

REVISION: Modified notes. Updated reference to sloped curb. Changed dimensions regarding curb. REVISION NO. 13 REVISION DATE 04-16-13

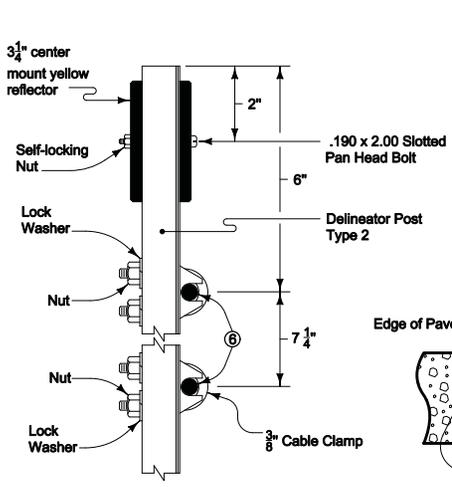
**PAVED SHOULDER  
HOT MIX ASPHALT WITH  
6" SLOPED CURB AND GUTTER UNIT**



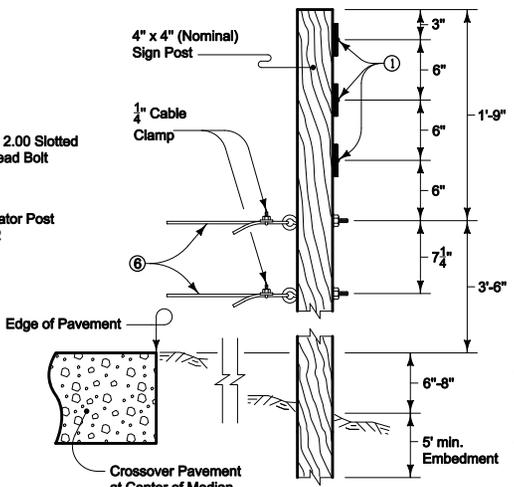
**PLAN VIEW**



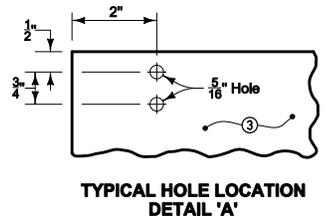
**TYPICAL SECTION THRU CENTER OF MEDIAN**



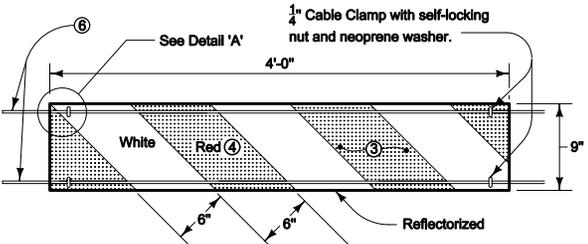
**DELINEATOR POST ATTACHMENT DETAILS**



**SIGN POST ATTACHMENT DETAILS**



**TYPICAL HOLE LOCATION DETAIL 'A'**



**PANEL ATTACHMENT DETAILS**

The price bid for "Crossover Barricade", each, is considered full compensation for furnishing all materials and work necessary to construct the barricade as detailed hereon.

- ① 3 1/4" center mount yellow reflector, attached to sign post with 0.190 x 1.25 slotted pan head screws.
- ② Extend the barricade to within 2 feet from the top end of the concrete collar.
- ③ 0.125 inch aluminum panel with Type III or IV retroreflective sheeting on both sides.
- ④ Reflectorized red stripes on both sides shall slope from upper left to lower right of panel.
- ⑤ Embed all delineator posts a minimum of 2'-6".
- ⑥ 1/4" inch diameter steel cable.

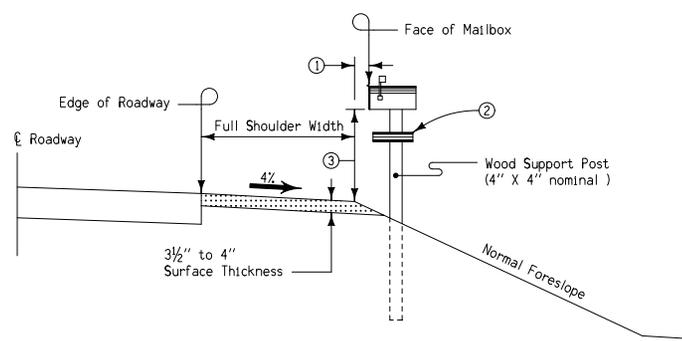
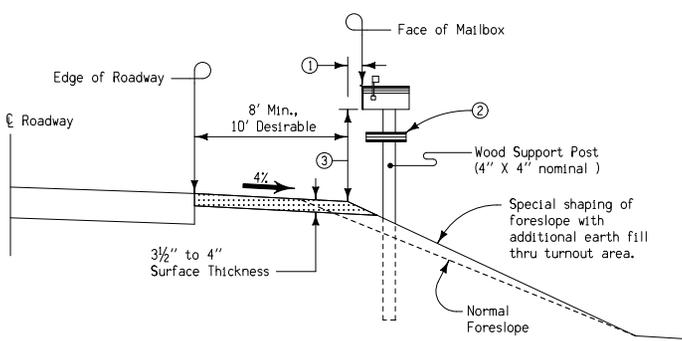
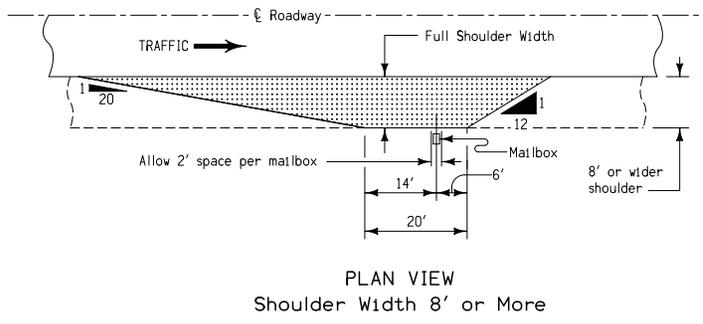
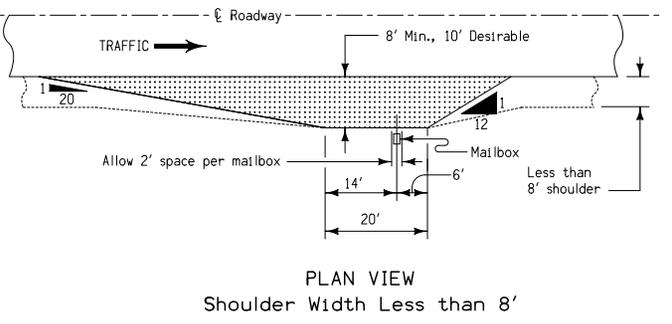
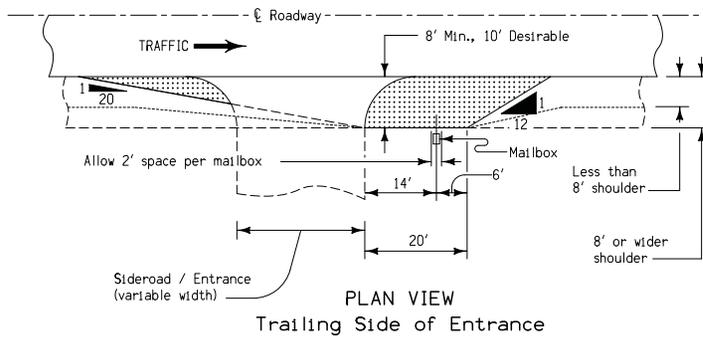
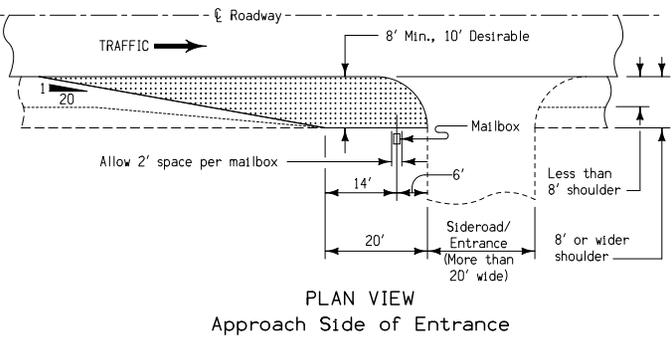
Quantities for Standard Road Plans				Items
PV-500	PV-503	PV-506		
25	19	18		Type 2 Steel Delineator Posts
2	2	2		4" x 4" (Nominal) Sign Post
56	44	42		3 1/4" Yellow Reflectors, center mounted
25	19	18		0.190 x 2.00 slotted pan head bolts and self-locking nuts
6	6	6		0.190 x 1.25 slotted pan head screws
26	20	19		9" x 48" Aluminum panels (red on white)
50	38	36		3/8" Cable clamps, lock washers and nuts
104	80	76		1/4" Cable clamps, neoprene washers and self-locking nuts
4	4	4		3/8" x 6" Eye bolts, washers and nuts
4	4	4		1/4" Cable clamps
820'	640'	610'		Approximate length of 1/4" diameter Steel Cable
405'	315'	300'		Distance from Sign Post to Sign Post based on Note ②

**Iowa Department of Transportation**  
 Highway Division

DETAIL SHEET 540-13

REVISION: Changed RV designations to PV. REVISION NO. 9 REVISION DATE 10-19-10

DETAILS OF BARRICADE AT CROSSOVER



**GENERAL NOTES:**

Refer to "Policies and Procedures Manual", Policy 610.09, Mailboxes and Newspaper Receptacles on Primary Roads.

Mailbox turnouts shall be full shoulder width with a minimum width of 8 feet. On shoulders less than 8 feet, build fillet to obtain a minimum width of 8 feet.

For multiple mailbox installations in one turnout, the taper dimensions will remain the same. The dimensions from centerline of mailbox located at either end will remain the same and 2 feet will be allowed for each mailbox in the installation.

When the mailbox owner's driveway is on the right hand side of the road, as the mail carrier travels, the box would preferably be placed near the driveway as shown on this sheet. With these types of placement, the driveway will serve as part of the mailbox turnout.

Requests, by the property owner, for the location of mailbox turnouts other than at driveways shall be approved by the Engineer in charge of construction and the U.S. Postal Authorities.

Mailbox(s) shall be installed with the face (door) no closer to the roadway than the shoulder line. Support post shall be in the foreslope with the inside edge at least one (1) foot outward from the shoulder line.

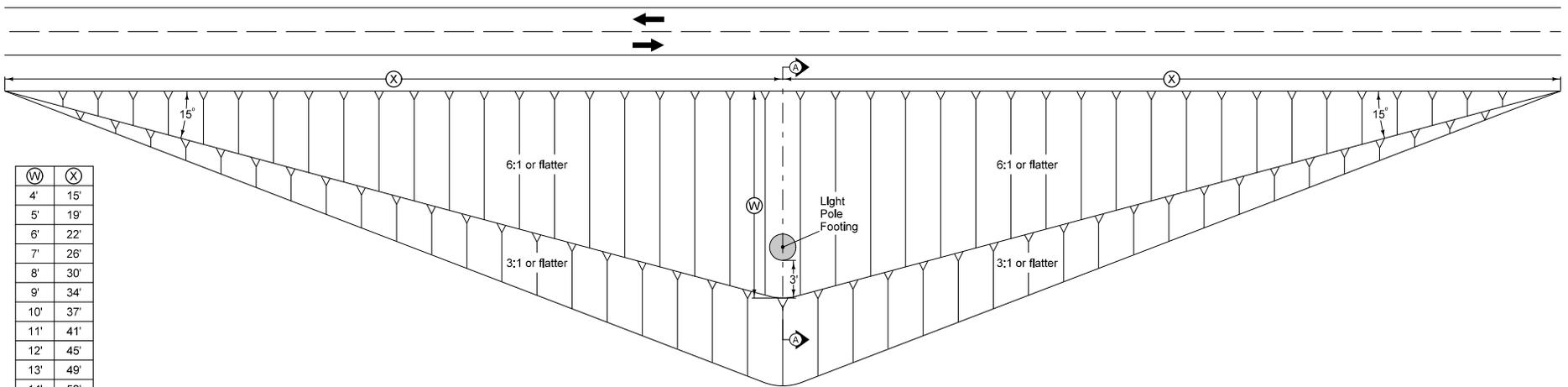
**SURFACING QUANTITY**

Surfacing of mailbox turnouts is based on a 5 inch design depth (loose volume) which will, under normal conditions, compact to 3.5" to 4" actual depth. A width of 8 feet will require approximately 18.3 cubic yards and 10 foot width will require approximately 27.8 cubic yards of surfacing. Quantities are given for a single mailbox installation 276 to 340 feet in length. Where multiple installations or installations at driveways are encountered, quantities will vary as directed by the Engineer.

Payment for construction of mailbox turnouts will be as specified elsewhere in the contract documents.

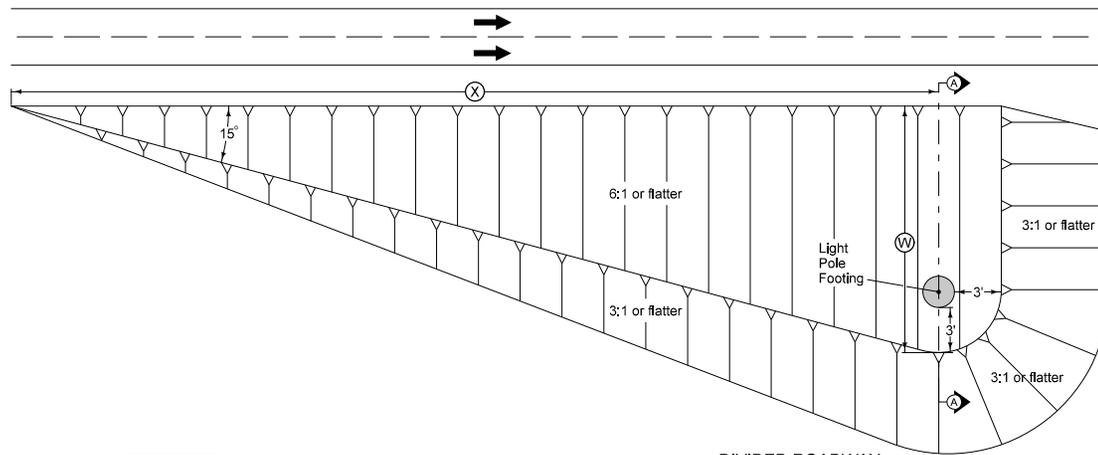
- ① 8" to 12" preferred, 0" minimum.
- ② Metal tube / box for delivery of local advertisements, newspapers etc.
- ③ Mounting height per U.S. Postal Regulations (42" to 48" above mail stop surface).

<b>Project Development Division</b>		
<b>DETAIL SHEET</b>		<b>560-2</b>
REVISION: Place in CADD	REVISION NO.	REVISION DATE
	1	03-28-95
DETAILS OF MAILBOX TURNOUTS (GRANULAR SURFACED)		

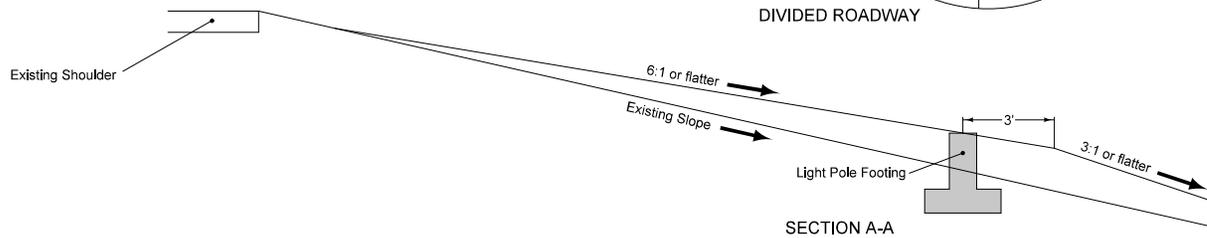


W	X
4'	15'
5'	19'
6'	22'
7'	26'
8'	30'
9'	34'
10'	37'
11'	41'
12'	45'
13'	49'
14'	52'
15'	56'

UNDIVIDED ROADWAY

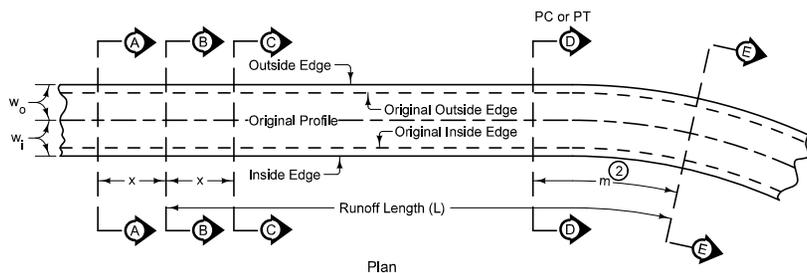


DIVIDED ROADWAY

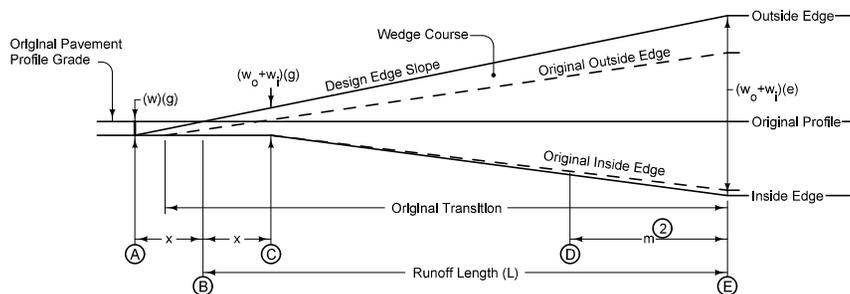


SECTION A-A

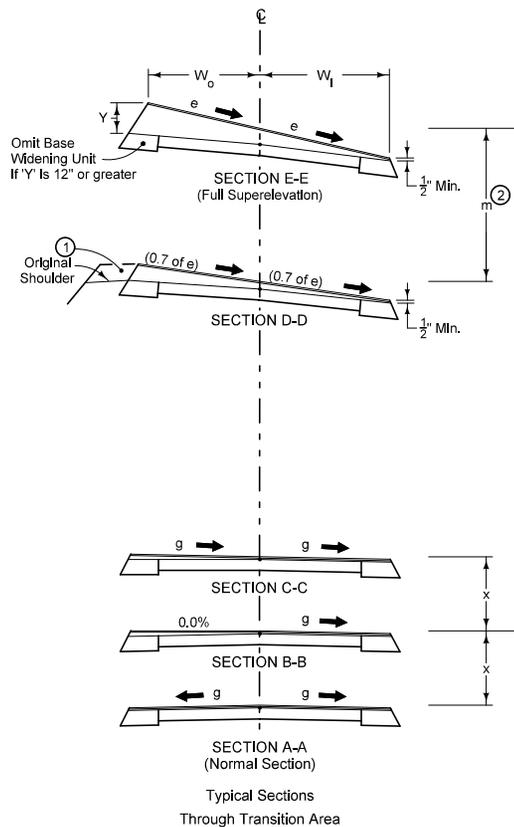
<b>DETAIL SHEET</b>		<b>560-3</b>
REVISION: New	REVISION NO: New	REVISION DATE: 10-16-12
GRADING BLISTER AT LIGHT POLE FOOTING		



Plan



Profile



Typical Sections Through Transition Area

Refer to curve data contained in the project plans for tangent runoff length (x), runoff length (L), transition applied within curve length (m), rotation width (w), total thickness of wedge and surface mat (Y), normal cross-slope (g), existing cross slope at PC/PT (E), and full superelevation (e).

- ① See other drawings for shoulder details.
- ②  $m = 30\%$  of Runoff Length (L). If the existing cross slope at the PC/PT exceeds 70% of the proposed 'e', determine the value of 'm' using the following formula:

$$m = L \cdot \left[ \frac{(L)(E)}{(e)} \right]$$

Possible Contract Items:  
 Base Widening, various  
 HMA Mixture, Wedge, Leveling or Strengthening Course  
 Possible Tabulation:  
 101-8

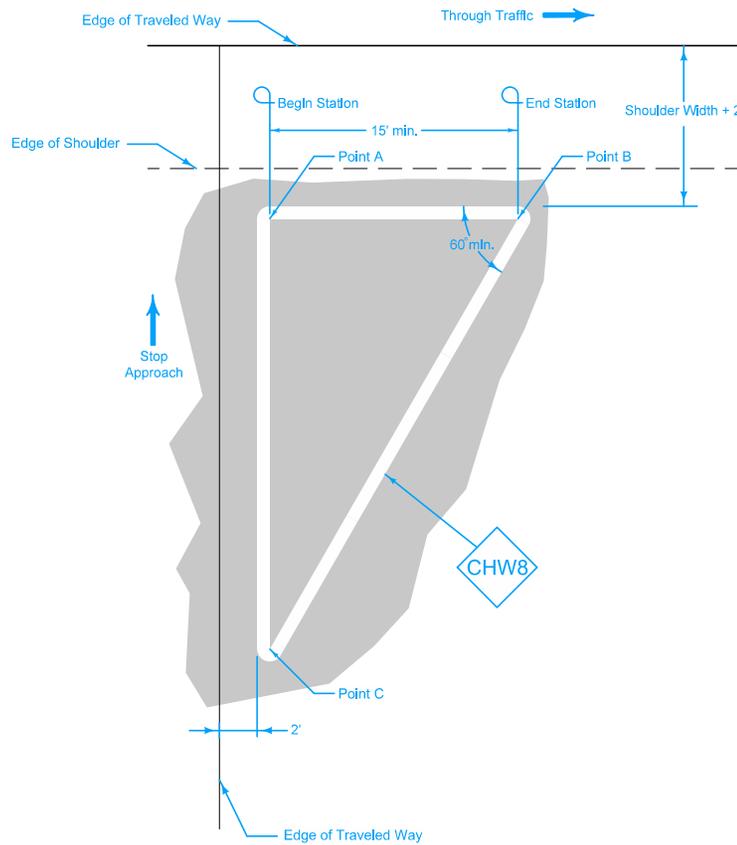
<b>IOWA DOT</b>	REVISION	
	NEW	10-21-14
<b>ROAD DESIGN DETAIL</b>		<b>560-4</b>
		SHEET 1 of 1

REVISIONS: New. Replaces RR-25.

HMA WEDGE FOR SUPERELEVATION

For pavement marking line types, see [PM-110](#).

For stop line information, see [PM-120](#).



Possible Contract Item:  
Pavement Marking Line Items

Possible Tabulations:  
101-10  
108-22

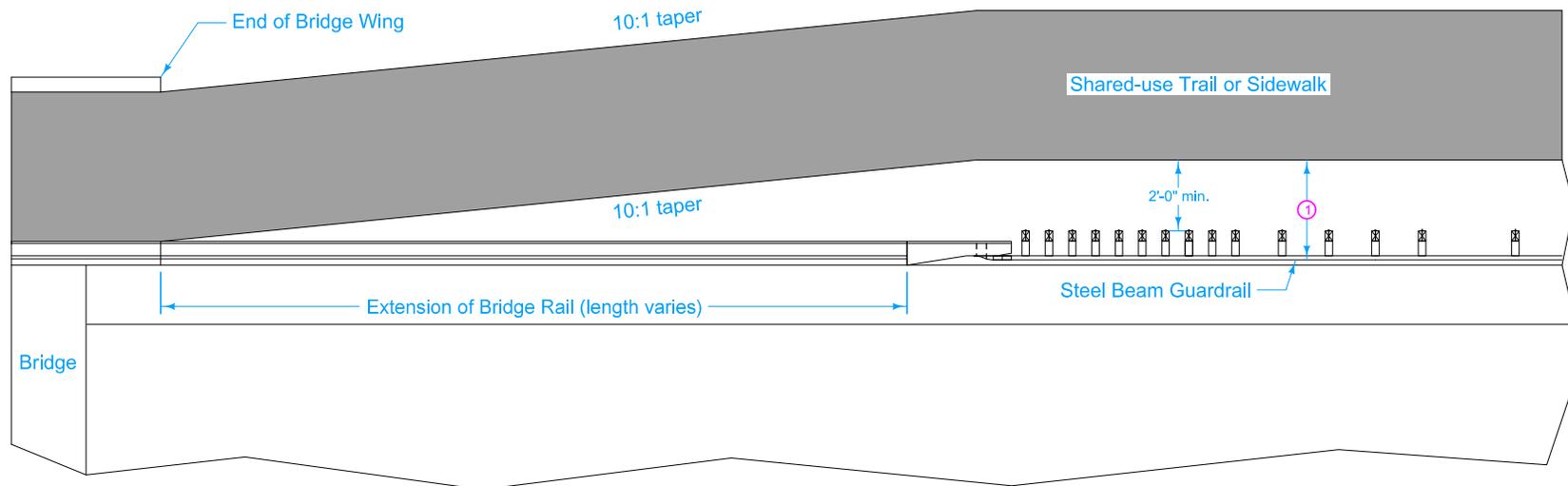
<b>IOWA DOT</b>	REVISION	
	NEW	04-21-15
<b>ROAD DESIGN DETAIL</b>	<b>560-5</b>	
	SHEET 1 of 1	

REVISIONS: New.

**PAINTED ISLANDS**

1 Refer to table below for minimum distance between face of guardrail and edge of Shared-use Trail or Sidewalk.

Posted Speed Limit (mph)	Minimum Distance (feet)
<45	4
45 or greater	5

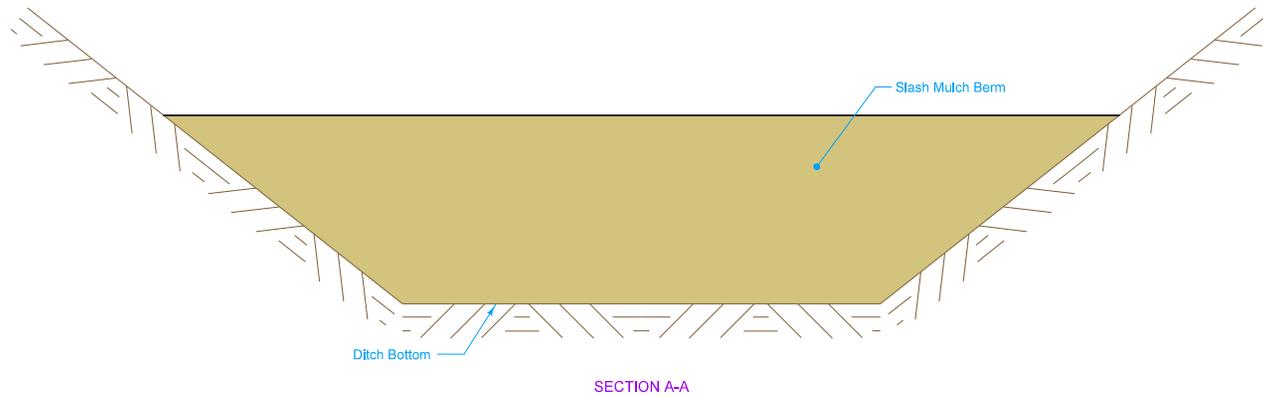
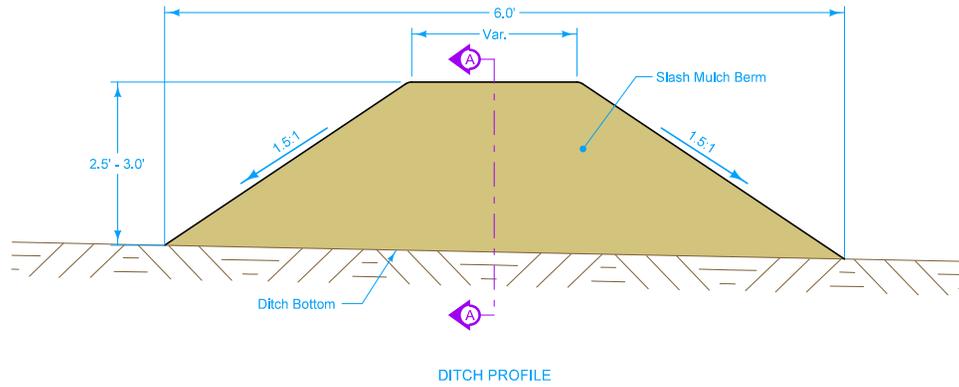


<b>IOWA DOT</b>	REVISION	
	NEW	10-18-16
<b>ROAD DESIGN DETAIL</b>		<b>560-6</b>
REVISIONS: New.		SHEET 1 of 1

**SHARED-USE TRAIL OR SIDEWALK  
BEHIND STEEL BEAM GUARDRAIL  
AT BRIDGE APPROACH**

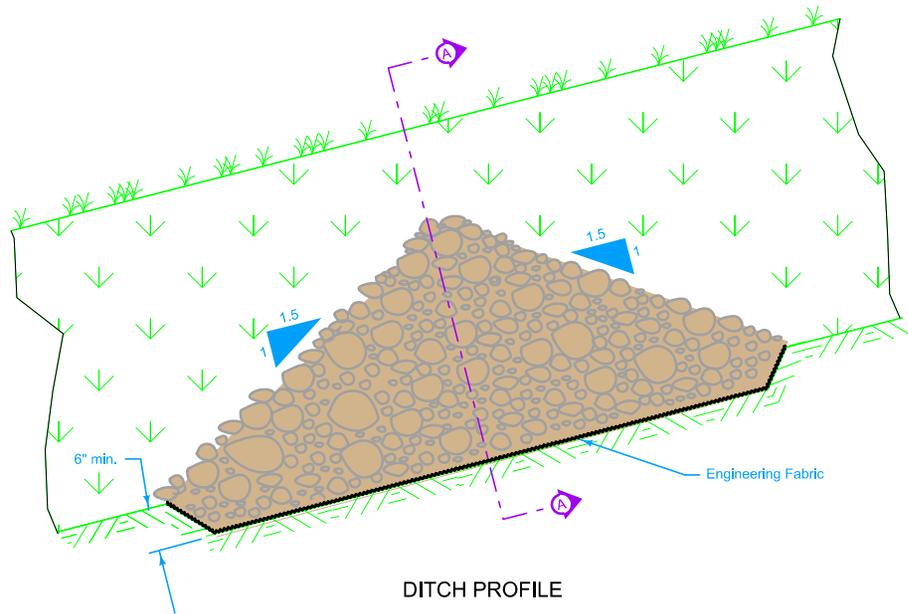
Slash mulch consists of waste material from clearing and grubbing. Use material with a maximum length of 20 inches and maximum width of 2 inches for individual pieces. Material will be accepted based on visual inspection.

Dispose of the slash mulch berm material off the project unless the Engineer approves a suitable site within the project limits.

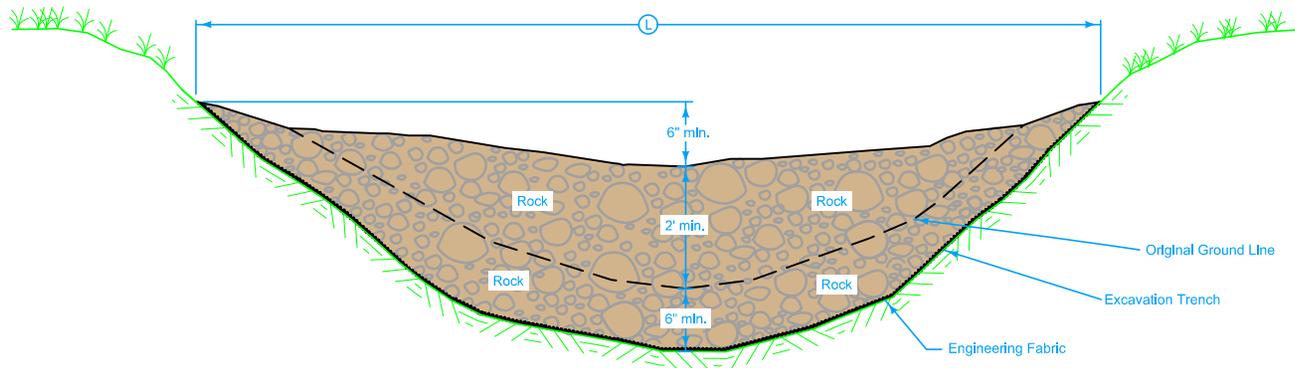


	REVISION	
	1	10-18-16
	<b>570-1</b>	
<b>ROAD DESIGN DETAIL</b>		SHEET 1 of 1
<small>REVISIONS: Corrected typo from 'much' to 'mulch' in general notes.</small>		

**SLASH MULCH BERM**



DITCH PROFILE



SECTION A-A

Use Class D Revetment to construct Rock Check Dam.

Method of Measurement for Rock Check Dam will be in linear feet to the nearest 0.1 feet.

Basis of Payment for Rock Check Dam will be the contract unit price per linear foot. Payment is full compensation for all materials, labor, and equipment required to construct the Rock Check Dam as shown. Class 10 excavation required to cut trench and engineering fabric installed prior to placing revetment are incidental and will not be paid for separately.

Method of Measurement for Maintenance of Rock Check Dam will be by count.

Basis of Payment for Maintenance of Rock Check Dam will be at the contract unit price for each occurrence. Payment is full compensation for clean out and disposal of material when capacity reaches 50%, and for any repair that is needed during the project.

Method of Measurement for Removal of Rock Check Dam will be by count.

Basis of Payment for Removal of Rock Check Dam will be at the contract unit price for each Rock Check Dam removed. Payment is full compensation for all labor and equipment required to remove all rock and material above original ditch grade. Rock, silt, and engineering fabric that is flush with and/or below final ditch grade will be allowed to remain in the excavation trench.

Possible Contract Items:

- Rock Check Dam
- Maintenance of Rock Check Dam
- Removal of Rock Check Dam

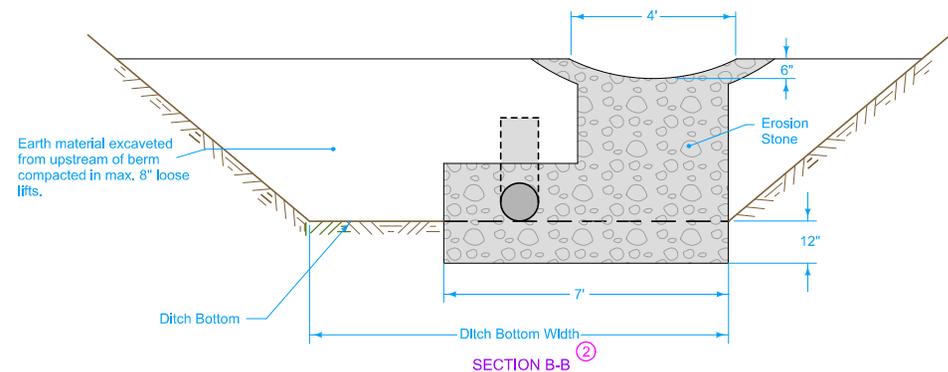
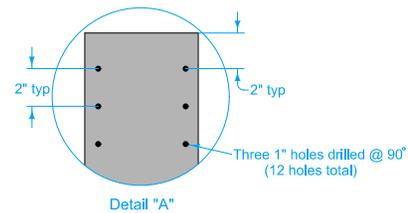
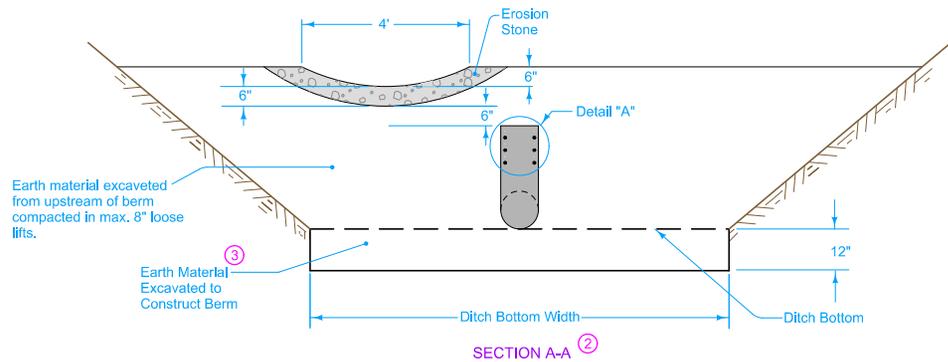
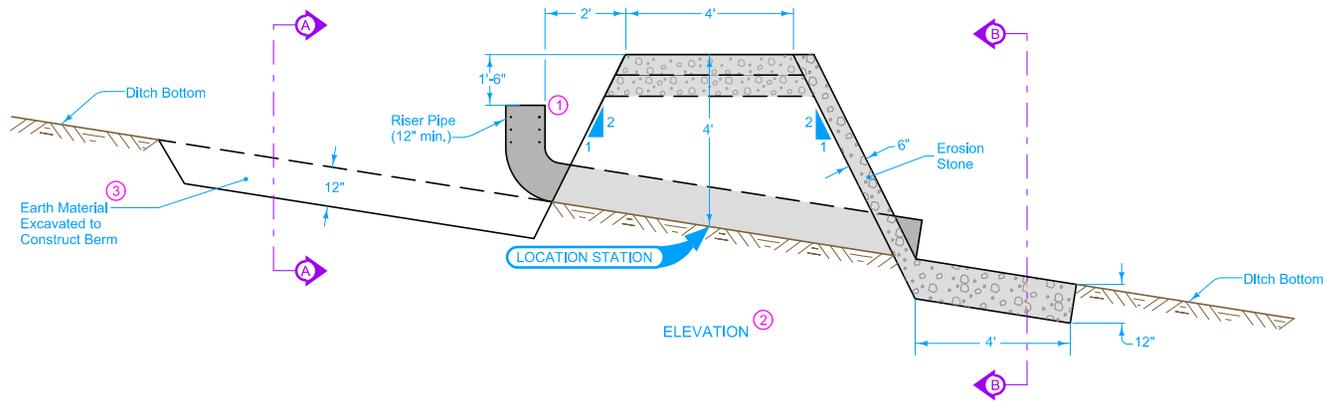
Possible Tabulation:

100-32

<b>IOWA DOT</b>	REVISION	
	NEW	04-19-16
<b>ROAD DESIGN DETAIL</b>		570-2
		SHEET 1 of 1

REVISIONS: New

ROCK CHECK DAM



Measurement for Temporary Sediment Control Basin will be by count.

Basis of Payment for Temporary Sediment Control Basin will be at the contract unit price for each device installed. Payment is full compensation for furnishing all equipment, labor, and materials required to construct the Temporary Sediment Control Basin as shown.

Method of Measurement for Maintenance of Temporary Sediment Control Basin will be by count.

Basis of Payment for Maintenance of Temporary Sediment Control Basin will be at the contract unit price for each occurrence. Payment is full compensation for clean out and disposal of material when capacity reaches 50%, and for any other repair needed during the project.

Measurement for Removal of Temporary Sediment Control Basin will be by count.

Basis of Payment for Removal of Temporary Sediment Control Basin will be at the contract unit price for each device removed. Payment is full compensation for all labor and equipment required to remove all rock and material above designed ditch grade and to place topsoil per note 3 below. Rock and engineering fabric that is flush with and/or below designed ditch grade will be allowed to remain in place.

- ① Ensure Riser Pipe remains vertical.
- ② Dimensions shown are minimums.
- ③ When Temporary Sediment Control Basin is removed, if basin has not silted in to designed ditch grade, use topsoil to bring up to designed ditch grade .

**Possible Contract Items:**

- Temporary Sediment Control Basin
- Maintenance of Temporary Sediment Control Basin
- Removal of Temporary Sediment Control Basin

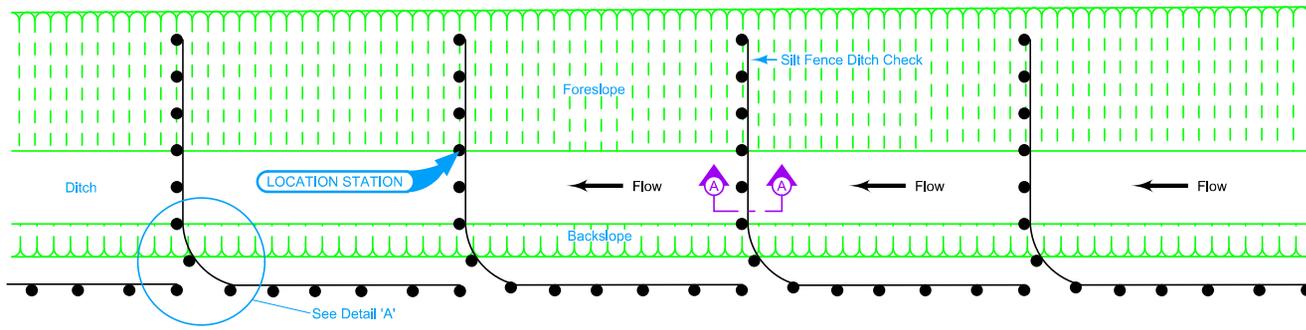
**Incidental to Temporary Sediment Control Basin:**

- Erosion Stone
- Pipe
- Excavated Earth Material

Possible Tabulation:  
100-33

<b>IOWA DOT</b>	REVISION
	1   10-18-16
<b>ROAD DESIGN DETAIL</b>	570-3
SHEET 1 of 1	
REVISIONS: Changed Possible Tabulation from 100-30 to 100-33.	

**TEMPORARY SEDIMENT  
CONTROL BASIN**



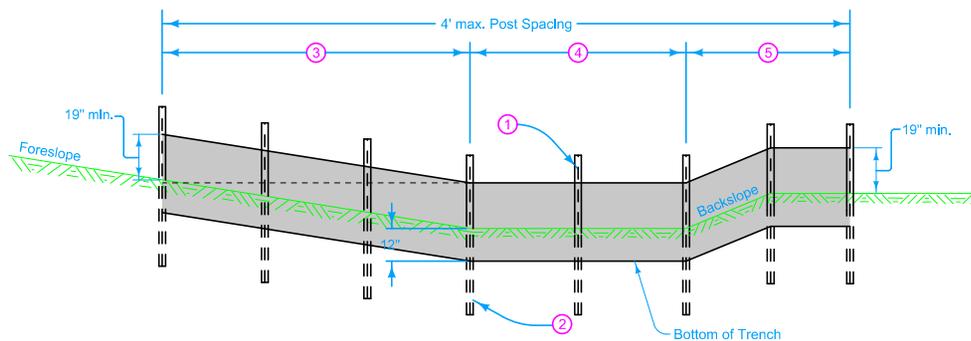
PLAN FOR SILT DITCH (SHALLOW DITCH SECTION-TYPE 4) ⑥

Install all silt fence using a silt fence machine. Use manual (trench) installation if physical conditions prohibit machine installation.

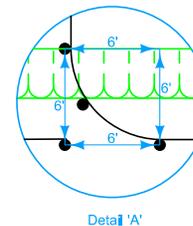
For machine installation, compact by driving over each side of silt fence at least two times with device exerting 60 p.s.i. or greater.

For manual installation, compact with a mechanical or pneumatic tamper.

- ① Secure top of engineering fabric to steel posts using cable ties (50 lb.) or wire. See attachment to post.
- ② Embed all posts 28 inches below the ground line.
- ③ The minimum end span (in feet) = 2 X Foreslope (H:V).
- ④ Locate posts at toe of foreslope and toe of backslope and space remaining posts equally.
- ⑤ Place posts as shown in Detail 'A' to transition from transverse to parallel installation. Place one post at the backslope intercept and the other beyond the intercept.
- ⑥ Refer to Tab. 100-18.



FRONT VIEW



Detail 'A'

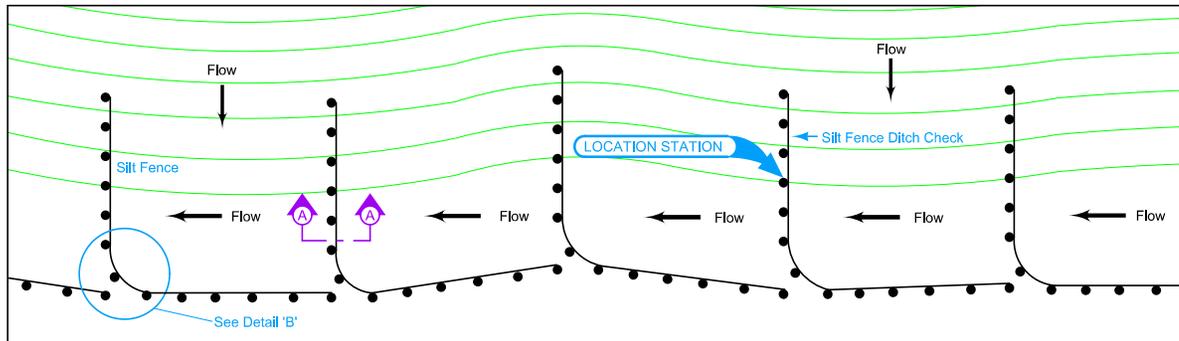
Possible Contract Items:  
Silt Fence for Ditch Checks

Possible Tabulations:  
100-18

<b>IOWA DOT</b>	REVISION	
	NEW	10-18-16
<b>ROAD DESIGN DETAIL</b>		<b>570-4</b>
		SHEET 1 of 3

REVISIONS: NEW

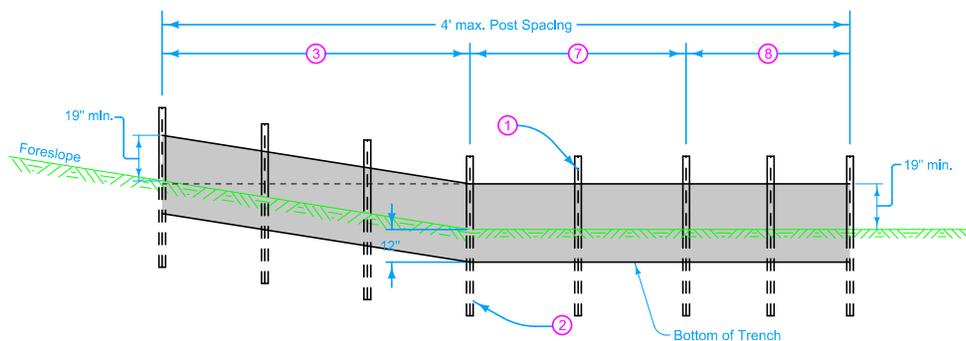
**SILT FENCE INSTALLATION  
FOR SHALLOW OR NO DITCH**



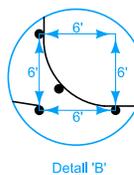
PLAN FOR SILT FENCE (NO DITCH SECTION-TYPE 5) <sup>(6)</sup>

- ① Secure top of engineering fabric to steel posts using cable ties (50 lb.) or wire. See attachment to post.
- ② Embed all posts 28 inches below the ground line.
- ③ The minimum end span (in feet) = 2 X Foreslope (H:V).
- ④ Refer to tabulation 100-18.
- ⑤ Locate post at toe of foreslope. Locate 2 additional posts at 4 foot spacing.
- ⑥ Place posts as shown in Detail 'B' to transition from transverse to parallel installation. The parallel portion of the installation should approximately parallel the intercept of the foreslope.

 Contour Lines

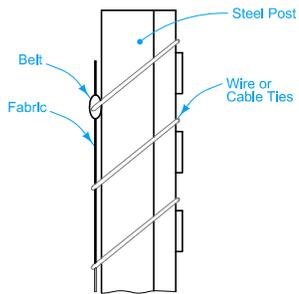


FRONT VIEW

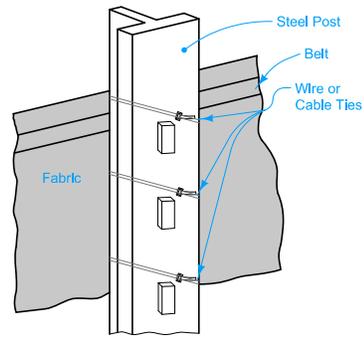


<b>IOWA DOT</b>	REVISION	
	NEW	10-18-16
<b>ROAD DESIGN DETAIL</b>		<b>570-4</b>
REVISIONS: NEW		SHEET 2 of 3

**SILT FENCE INSTALLATION  
FOR SHALLOW OR NO DITCH**



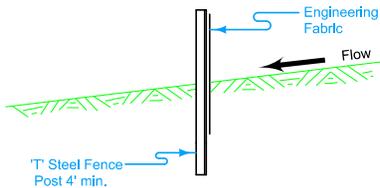
**PROFILE VIEW  
ATTACHMENT TO POST**



**BACK VIEW  
ATTACHMENT TO POST**

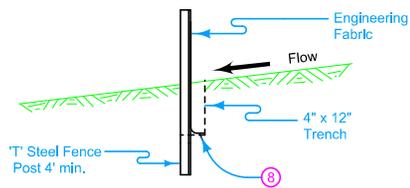
⑧ For manual installation only, fold engineering fabric along bottom of trench.

**DITCH CHECK - MACHINE INSTALLATION**



**SECTION A-A**

**DITCH CHECK - MANUAL INSTALLATION**

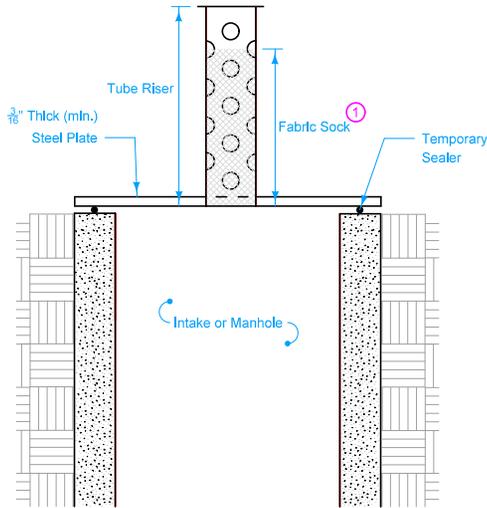


**SECTION A-A**

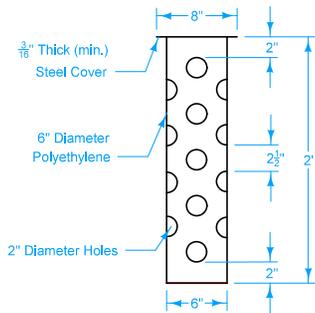
<b>IOWA DOT</b>	REVISION	
	NEW	10-18-16
<b>ROAD DESIGN DETAIL</b>		<b>570-4</b>
		SHEET 3 of 3

REVISIONS: NEW

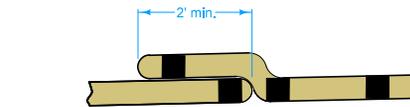
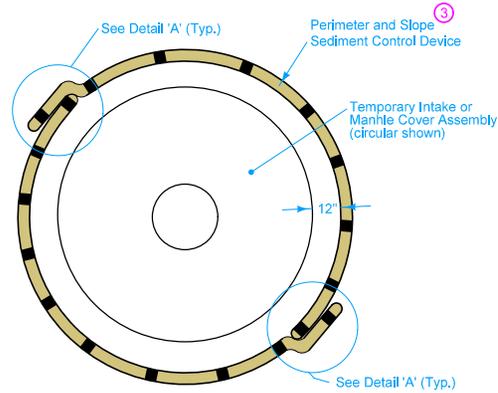
**SILT FENCE INSTALLATION  
FOR SHALLOW OR NO DITCH**



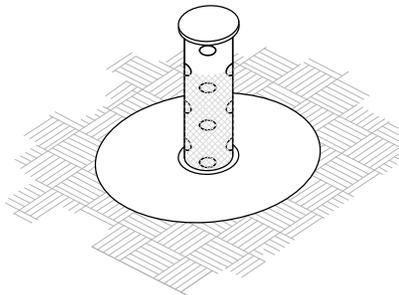
SECTION VIEW



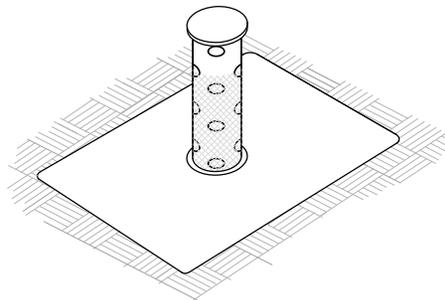
TUBE RISER (2)



DETAIL 'A' (4)  
(Overlap Joint)



ISOMETRIC VIEW  
(Circular)



ISOMETRIC VIEW  
(Rectangular)

TEMPORARY INTAKE OR MANHOLE COVER ASSEMBLY

PERIMETER AND SLOPE SEDIMENT CONTROL

Method of Measurement for Temporary Intake or Manhole Cover Assembly will be by count.

Basis of Payment for Temporary Intake or Manhole Cover Assembly will be at the contract unit price for each device installed.

Method of Measurement for Maintenance of Temporary Intake or Manhole Cover Assembly will be by count.

Basis of Payment for Maintenance of Temporary Intake or Manhole Cover Assembly will be at the contract unit price for each occurrence. Payment is full compensation for inspecting fabric sock and replacing when flow capacity has been reduced to 50%.

Method of Measurement for Removal of Temporary Intake or Manhole Cover Assembly will be by count.

Basis of Payment for Removal of Temporary Intake or Manhole Cover Assembly will be at the contract unit price for each device removed.

- (1) Wrap fabric sock around tube riser. Use fabric complying with Article 4196.01, B, 1 with a minimum flow rate of 90 gallons per minute per square foot. Ensure top of sock is below form grade elevation.
- (2) Tube riser may be such that it can be pushed down and pulled up.
- (3) Place Perimeter and Slope Sediment Control Devices around all intake or manhole wells. Use 20 inch diameter device.
- (4) Extra material required to install overlaps will not be included in the installation length.

Possible Contract Items:

- Temporary Intake or Manhole Cover Assembly
- Maintenance of Temporary Intake or Manhole Cover Assembly
- Removal of Temporary Intake or Manhole Cover Assembly
- Perimeter and Slope Sediment Control Device

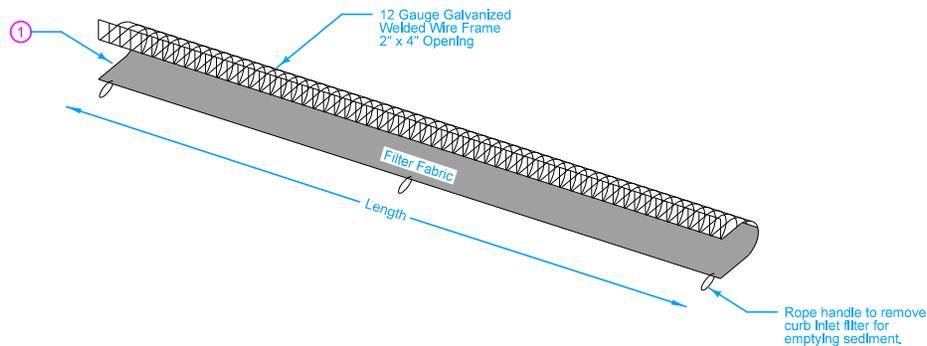
Possible Tabulations:

- 100-11
- 100-19

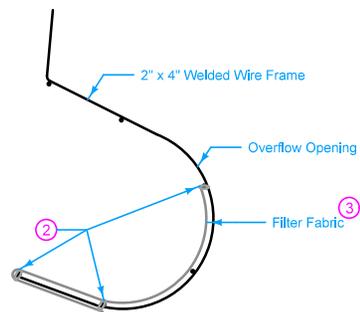
<b>IOWA DOT</b>	REVISION	
	1	04-18-17
	<b>570-5</b>	
<b>ROAD DESIGN DETAIL</b>		SHEET 1 of 1

REVISIONS: Add bid items for maintenance and removal. Added basis of payment and method of measurement.

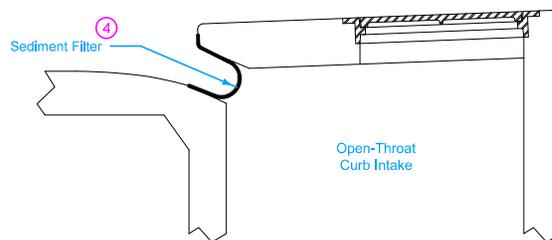
**EROSION CONTROL FOR INTAKE  
OR MANHOLE WELL**



OPEN-THROAT CURB INTAKE SEDIMENT FILTER



SEDIMENT FILTER CROSS SECTION



SEDIMENT FILTER PLACEMENT

Remove sediment filter upon stabilization of sediment sources.

Measurement for Open-throat Curb Intake Sediment Filter will be in feet to the nearest foot.

Basis of Payment for Open-throat Curb Intake Sediment Filter will be at the contract unit price per foot. Payment is full compensation for furnishing all equipment, labor, and materials required to install the Open-throat Curb Intake Sediment Filter as shown.

Method of Measurement for Maintenance of Open-throat Curb Intake Sediment Filter will be by count.

Basis of Payment for Maintenance of Open-throat Curb Intake Sediment Filter will be at the contract unit price for each occurrence. Payment is full compensation for clean out and disposal of material when sediment accumulation depth reaches 2 inches, and for any other repair needed during the project.

Measurement for Removal of Open-throat Curb Intake Sediment Filter will be by count.

Basis of Payment for Removal of Open-throat Curb Intake Sediment Filter will be at the contract unit price for each Open-throat Curb Intake Sediment Filter removed. Payment is full compensation for all labor and equipment required for removal.

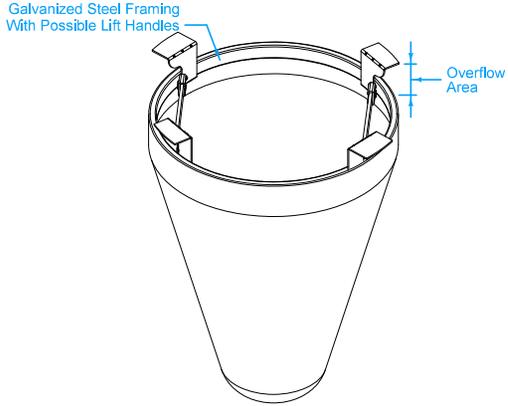
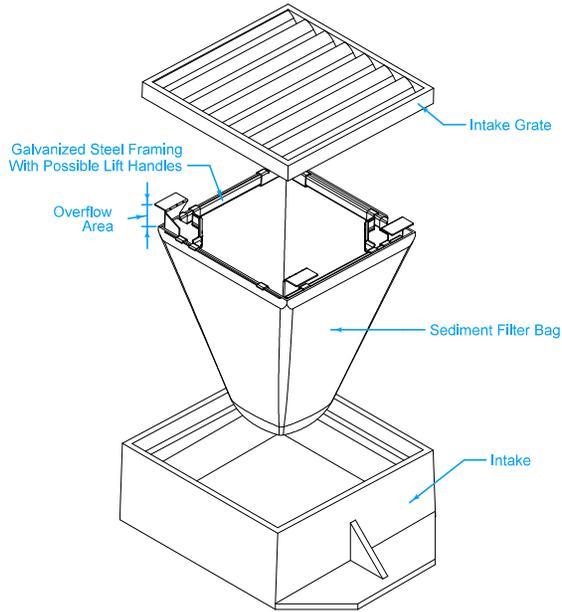
- ① Trim frame as needed to tightly fit in the intake throat. Overlap fabric a minimum of 3 inches and securely fasten.
- ② Securely attach filter fabric to the wire frame leaving an overflow opening above the filter fabric.
- ③ Woven material meeting the requirements of Table 4196.01-1 of the Standard Specifications, except a maximum apparent opening size US Sieve No. 10 and a minimum flow rate of 145 gallons per minute per square foot.
- ④ Insert sediment filter to create a compression fit in the intake throat.

Possible Contract Items:  
 Open-throat Curb Intake Sediment Filter  
 Maintenance of Open-throat Curb Intake Sediment Filter  
 Removal of Open-throat Curb Intake Sediment Filter

Possible Tabulation:  
 100-36

<b>IOWA DOT</b>	REVISION
	NEW 04-18-17
<b>ROAD DESIGN DETAIL</b>	<b>570-6</b>
REVISIONS: NEW	SHEET 1 of 1

**OPEN-THROAT CURB INTAKE  
SEDIMENT FILTER**



SEDIMENT FILTER BAG FOR CIRCULAR GRATE

Remove sediment filter bag upon stabilization of sediment sources.

Measurement for Grate Intake Sediment Filter Bag will be by count.

Basis of Payment for Grate Intake Sediment Filter Bag will be at the contract unit price for each device installed. Payment is full compensation for furnishing all equipment, labor, and materials required to install the Grate Intake Sediment Filter Bag as shown.

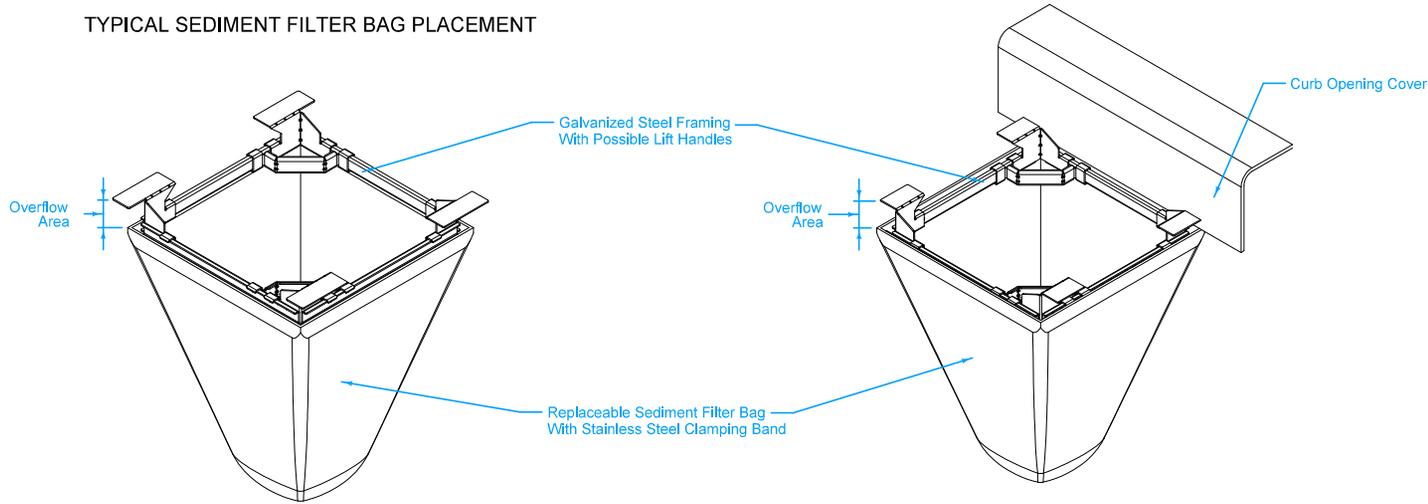
Method of Measurement for Maintenance of Grate Intake Sediment Filter Bag will be by count.

Basis of Payment for Maintenance of Grate Intake Sediment Filter Bag will be at the contract unit price for each occurrence. Payment is full compensation for clean out and disposal of material when capacity reaches 50%, and for any other repair needed during the project.

Measurement for Removal of Grate Intake Sediment Filter Bag will be by count.

Basis of Payment for Removal of Grate Intake Sediment Filter Bag will be at the contract unit price for each device removed. Payment is full compensation for all labor and equipment required for removal.

TYPICAL SEDIMENT FILTER BAG PLACEMENT



SEDIMENT FILTER BAG FOR SQUARE OR RECTANGULAR GRATE

SEDIMENT FILTER BAG FOR COMBINATION GRATE WITH CURB OPENING

① Woven material meeting the requirements of Table 4196.01-1 of the Standard Specifications, except a maximum apparent opening size US Sieve No. 10 and a minimum flow rate of 145 gallons per minute per square foot.

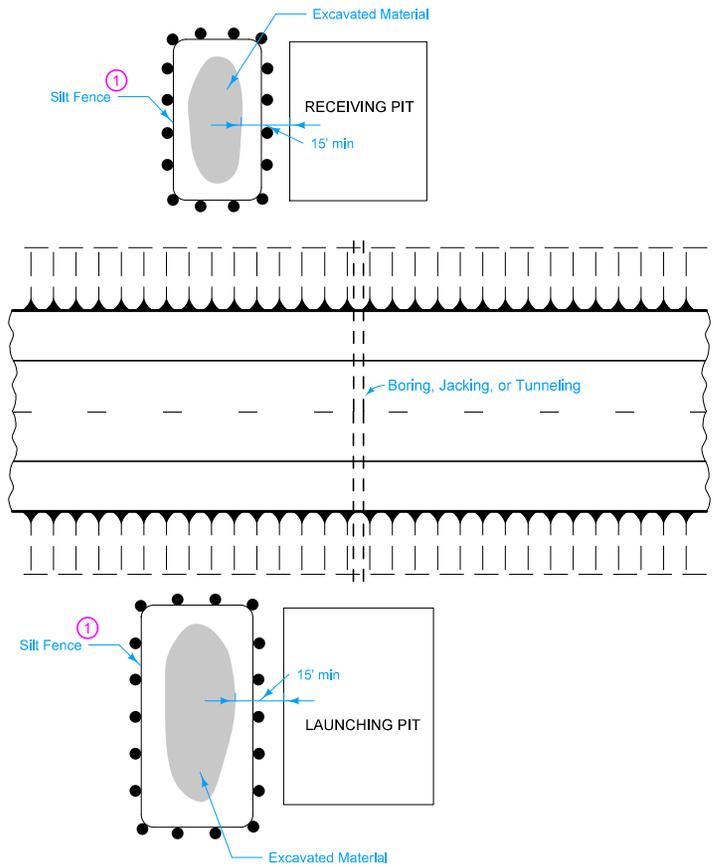
Possible Contract Items:  
 Grate Intake Sediment Filter Bag  
 Maintenance of Grate Intake Sediment Filter Bag  
 Removal of Grate Intake Sediment Filter Bag

Possible Tabulation:  
 100-37

<b>IOWA DOT</b>	REVISION
	NEW 04-18-17
ROAD DESIGN DETAIL	570-7
REVISIONS: NEW	SHEET 1 of 1

GRATE INTAKE  
SEDIMENT FILTER BAG

① Install silt fence to enclose excavated material.



Possible Contract Items:  
Silt Fence  
Removal of Silt Fence or Silt Fence for Silt Ditch Check

Possible Tabulations:  
100-17

	REVISION	
	NEW	04-18-17
<b>ROAD DESIGN DETAIL</b>	<b>570-09</b>	
	SHEET 1 of 1	

REVISIONS: NEW

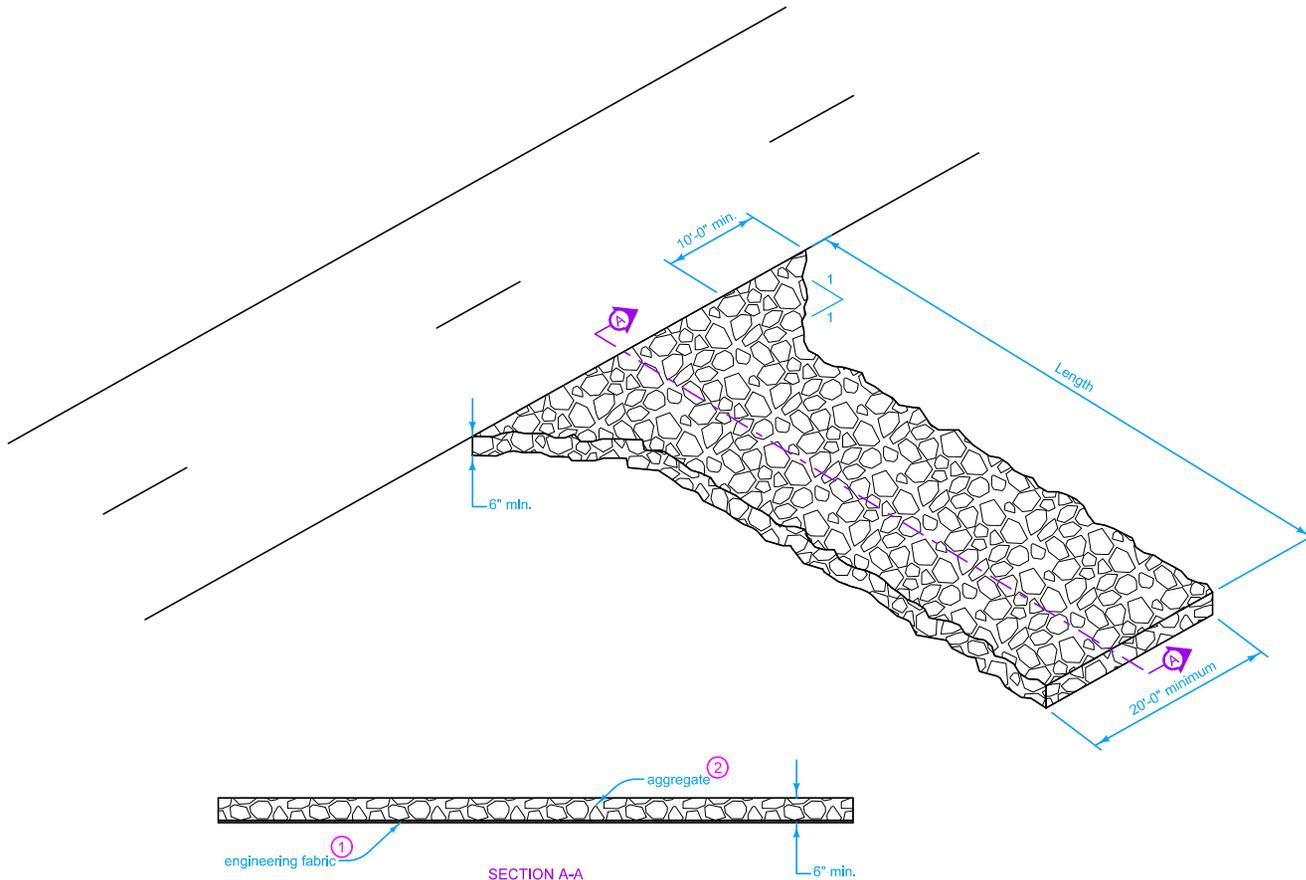
**EROSION CONTROL FOR  
TRENCHLESS CONSTRUCTION**

Obtain the Engineer's approval for location and length of stabilized entrances prior to constructing.

Method of Measurement for Stabilized Construction Entrance will be in linear feet measured along the length of the entrance at the entrance centerline.

Basis of Payment for Stabilized Construction Entrance will be at the contract unit price per linear foot. Payment is full compensation for furnishing all materials and work necessary for installation, maintenance, and removal of stabilized construction entrance. Maintenance includes installing additional material or cleaning required to maintain the entrance in a functional condition.

- ① Place engineering fabric prior to placing aggregate. Use fabric for Embankment Erosion Control complying with Section 4196 of the Standard Specifications.
- ② Use aggregate meeting Gradation No. 13 of Section 4109 of the Standard Specifications.



Possible Contract Item:  
Stabilized Construction Entrance

<b>IOWA DOT</b>	REVISION	
	NEW	04-18-17
<b>ROAD DESIGN DETAIL</b>	<b>570-10</b>	
REVISIONS: NEW	SHEET 1 of 1	

**STABILIZED CONSTRUCTION ENTRANCE**