

# Earthwork

**EW**

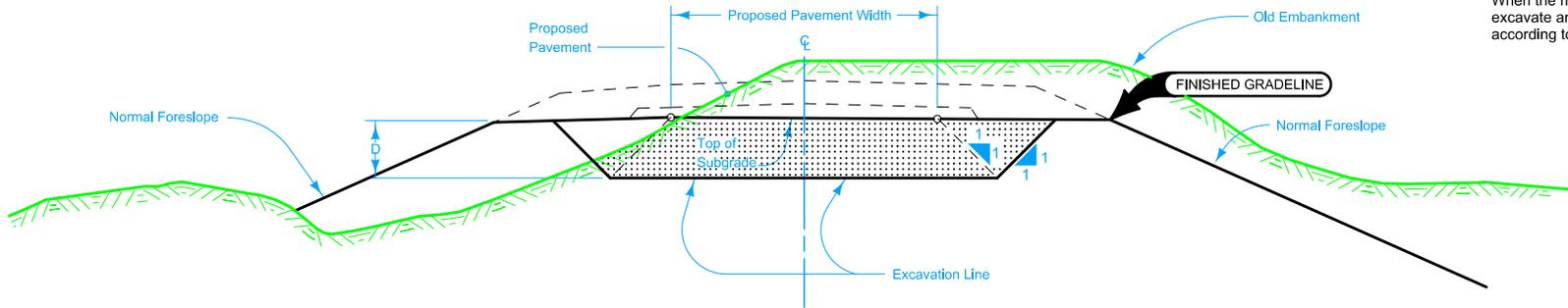
# Earthwork

SECTION  
**EW**

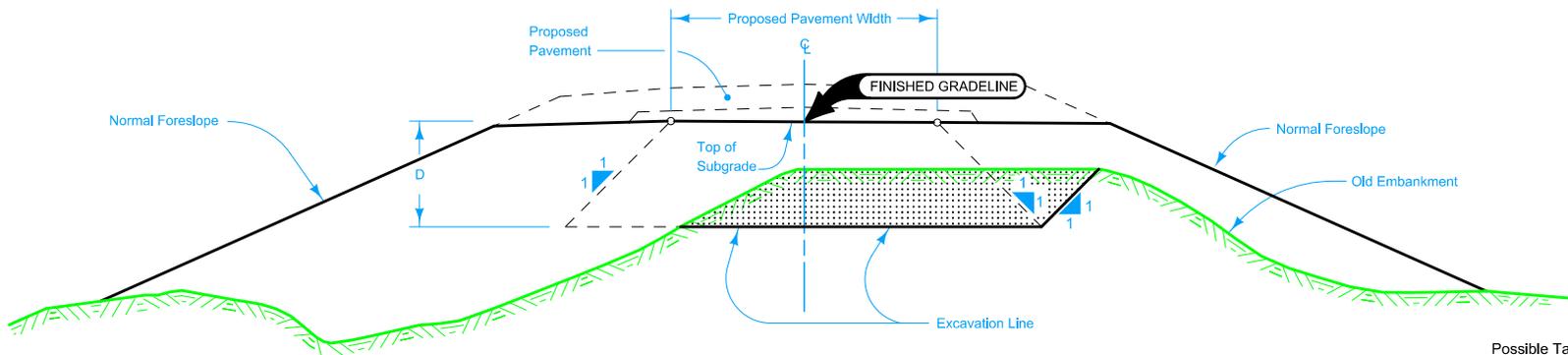
NO.	DATE	TITLE
<b>Embankments</b>		
EW-101	04-18-17	Embankment and Rebuilding Embankments
EW-102	10-20-15	Allowable Placement of Unsuitable Soil in Embankments
EW-103	10-20-15	Embankment Subgrade Treatment, Moisture Density Control and Special Compaction
EW-105	04-21-15	Reshaping Slopes and Ditches
EW-110	10-20-15	Ditch Blocks and Dikes
<b>Grading at Bridges</b>		
EW-201	04-19-16	Bridge Berm Grading without Recoverable Slope (Barnroof Section)
EW-202	04-19-16	Bridge Berm Grading without Recoverable Slope (Non-Barnroof Section)
EW-203	04-21-15	Bridge Berm Grading with Recoverable Slope (Non-Barnroof Section)
EW-204	04-21-15	Bridge Berm Grading with Recoverable Slope (Barnroof Section)
EW-210	10-20-15	Standard Wing Dikes
EW-211	04-21-15	Special Grading at Side Piers
EW-212	10-20-15	Settlement Plate
<b>Grading for Guardrail</b>		
EW-301	10-20-15	Guardrail Grading
EW-302	10-20-15	Special Shaping for High Tension Cable Guardrail at Median Obstacles
<b>Erosion Control</b>		
EW-401	10-20-15	Temporary Stream Crossing, Causeway, or Equipment Pad
EW-402	04-18-17	Temporary Stream Diversion
EW-403	04-18-17	Temporary Erosion Control Measures
<b>Entrances, Sideroads, and Safety Ramps</b>		
EW-501	10-20-15	Rural Entrance
EW-502	04-18-17	Safety Ramp
EW-503	10-20-15	Side Road Grading

Refer to contract documents for removal limits and allowable placement areas for excavated material.

When the material is to be deposited in the same area, excavate area shown, then spread and recompact material according to specifications.



TYPICAL CROSS SECTION REBUILDING EMBANKMENT  
OLD EMBANKMENT HIGHER THAN NEW EMBANKMENT  
(Plowing and Shaping)

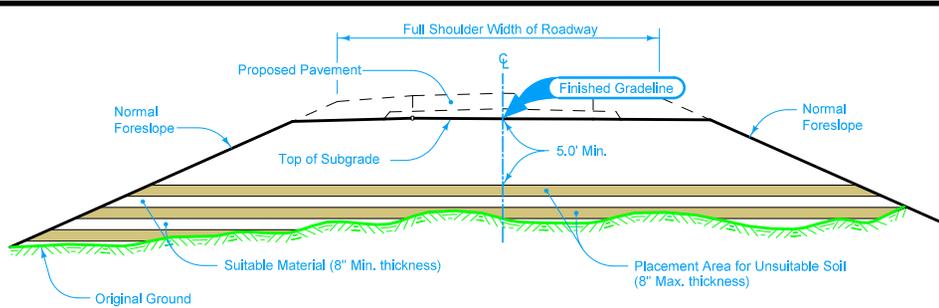


TYPICAL CROSS SECTION REBUILDING EMBANKMENT  
OLD EMBANKMENT LOWER THAN NEW EMBANKMENT  
(Plowing and Shaping)

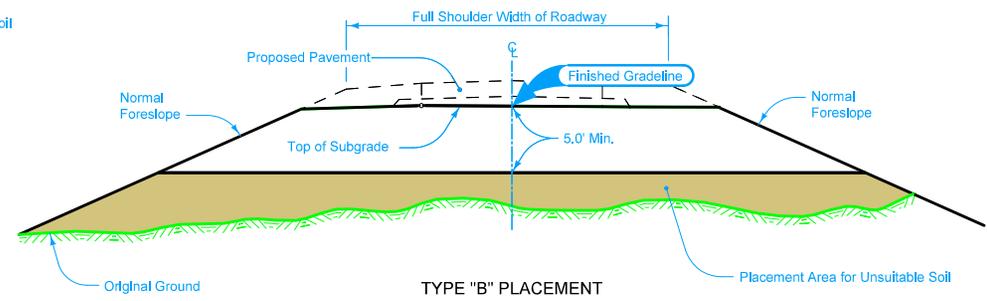
Possible Tabulation:  
107-31

LEGEND	
	Area of Excavation

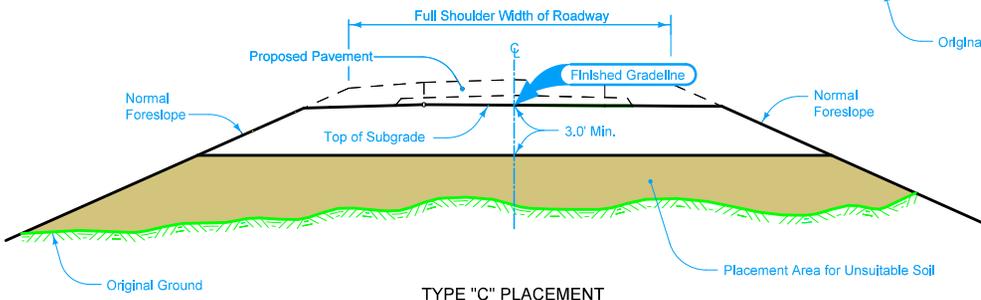
 <b>STANDARD ROAD PLAN</b>	REVISION
	2   04-18-17
EW-101	SHEET 1 of 1
REVISIONS: Added detail for old embankment higher than new embankment.	
APPROVED BY DESIGN METHODS ENGINEER 	
<b>EMBANKMENT AND REBUILDING EMBANKMENTS</b>	



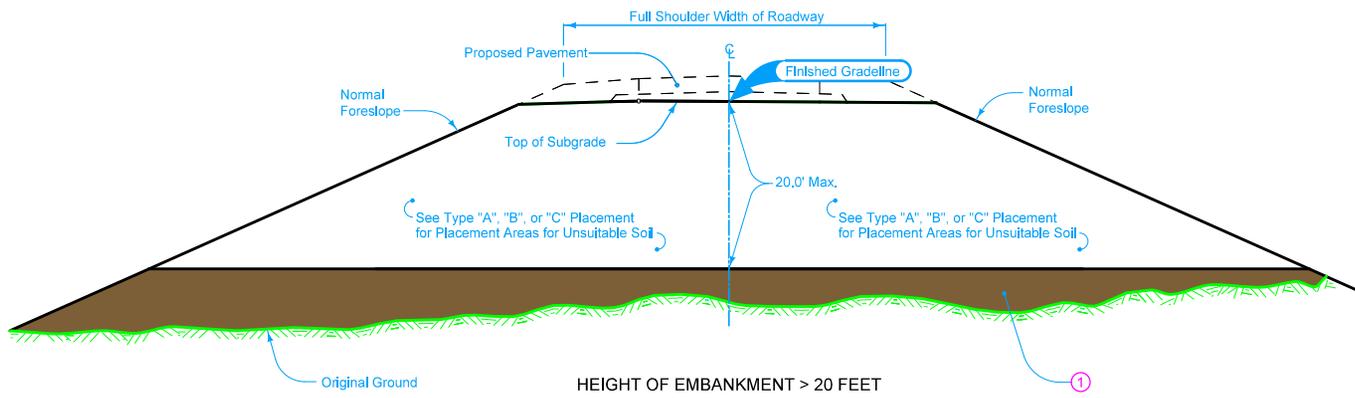
TYPE "A" PLACEMENT



TYPE "B" PLACEMENT



TYPE "C" PLACEMENT



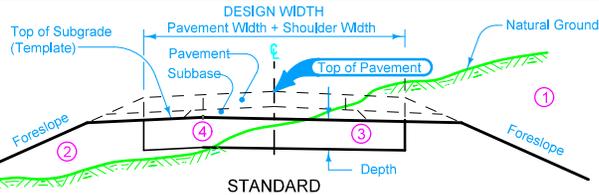
HEIGHT OF EMBANKMENT > 20 FEET

Place unsuitable soil as detailed for the particular type of soil described in Section 2102 of the Standard Specifications. Project plan details or specific directions of the Engineer may require placement of topsoil or other unsuitable soil by methods other than those shown. Refer also to plan cross sections and soil survey sheets for additional information.

① In new embankments greater than 20 feet in height, only Select, Suitable Class 10, or Type 'C' Unsuitable material will be allowed below that 20 foot depth.

 <b>STANDARD ROAD PLAN</b>	REVISION 2   10-20-15
	<b>EW-102</b>
	SHEET 1 of 1
REVISIONS: Replaced the DOT logo in the title block with the new version.	
APPROVED BY DESIGN METHODS ENGINEER <i>Brian Smith</i>	
<b>ALLOWABLE PLACEMENT OF UNSUITABLE SOIL IN EMBANKMENTS</b>	

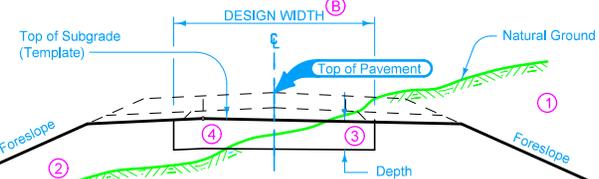
TYPE OF WORK	AREA NO.
Excavation	(1)
Embankment	(2)
Subgrade Treatment	(3)(4)



STANDARD  
SUBGRADE TREATMENT

AREA NO.	TYPE OF ADJUSTMENTS TO TEMPLATE QUANTITY
(1)	None
(2)	None
(3)	+ Cut
(4)	- Fill

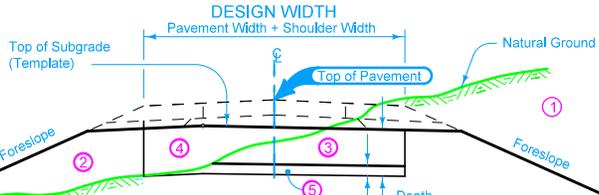
TYPE OF WORK	AREA NO.
Excavation	(1)
Embankment	(2)
Subgrade Treatment	(3)(4)



TRENCH  
SUBGRADE TREATMENT

AREA NO.	TYPE OF ADJUSTMENTS TO TEMPLATE QUANTITY
(1)	None
(2)	None
(3)	+ Cut
(4)	- Fill

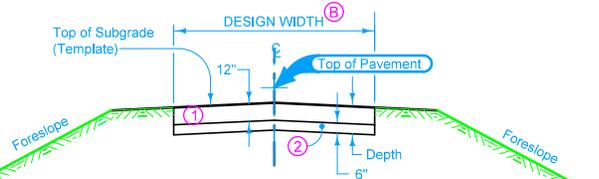
TYPE OF WORK	AREA NO.
Excavation	(1)(3)
Embankment	(2)(4)
M & D Embankment	(3)(4)
Scarify with M & D Embank.	(5)



MOISTURE CONTROL OR  
MOISTURE AND DENSITY CONTROL

AREA NO.	TYPE OF ADJUSTMENTS TO TEMPLATE QUANTITY
(1)	None
(2)	None
(3)	+ Cut + Fill
(4)	None
(5)	None

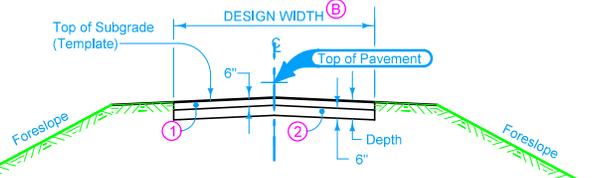
TYPE OF WORK	AREA NO.
Excavation	(1)
Scarify	(2)



TRENCH BOTTOM COMPACTION  
(Existing Roadways)

AREA NO.	TYPE OF ADJUSTMENTS TO TEMPLATE QUANTITY
(1)	+ Cut + Fill
(2)	None

TYPE OF WORK	AREA NO.
Excavation	(1)
Scarify	(2)



SPECIAL COMPACTION  
(Existing Roadway)

AREA NO.	TYPE OF ADJUSTMENTS TO TEMPLATE QUANTITY
(1)	None
(2)	None

The pay quantity for Subgrade Treatment will be in either tons or cubic yards. The volume will be based on specified depth, the treatment type, and includes the quantity for shrinkage.

The pay quantity for "Compaction with Moisture and Density Control" or "Compaction with Moisture Control" will be the absolute volume for the specified depth and subgrade width.

(B) Design width equals pavement width plus 3.0 feet on each side.

- Possible Contract Items:
- Compaction with Moisture and Density Control
  - Compaction with Moisture Control
  - Compacting Trench Bottom
  - Special Compaction of Subgrade

- Possible Tabulations:
- 103-1
  - 103-3
  - 103-6

	REVISION
	1 10-20-15
	<b>EW-103</b>
STANDARD ROAD PLAN	
SHEET 1 of 1	
REVISIONS: Replaced the DOT logo in the title block with the new version.	
 APPROVED BY DESIGN METHODS ENGINEER	
<b>EMBANKMENT SUBGRADE TREATMENT, MOISTURE DENSITY CONTROL AND SPECIAL COMPACTION</b>	

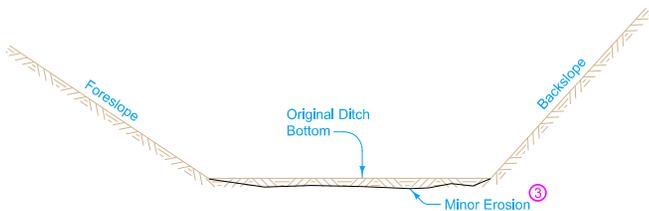


SLOPE RESHAPING

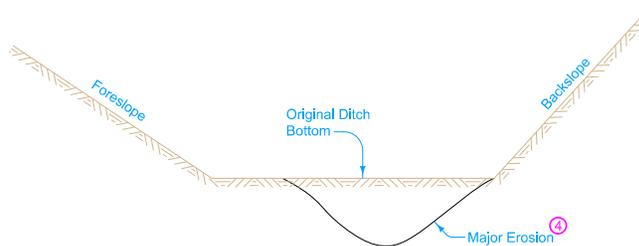


CLASS 10

RESHAPING SLOPES

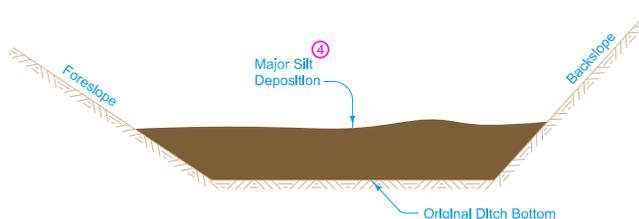
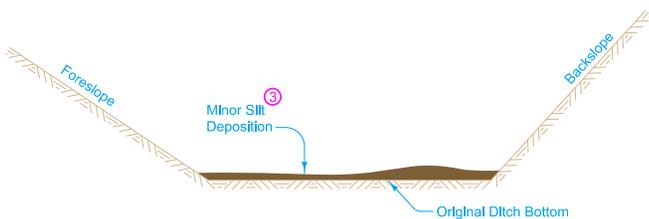


RESHAPING DITCHES



CLASS 10

DITCH RESHAPING



Minor slope and ditch reshaping resulting from normal seedbed preparation will not be paid for separately.

- ① Move material to or from areas immediately adjacent to slope to re-establish original slope template. Prepare slope according to Article 2601.03, B, 4, a of the Standard Specifications.
- ② Remove or place Class 10 material to re-establish original slope template. In areas of Class 10 placement, furnish topsoil and place according to Section 2105 of the Standard Specifications. Prepare slope according to Article 2601.03, B, 4, a of the Standard Specifications.
- ③ Move material to or from areas immediately adjacent in order to re-establish original ditch template. Prepare ditch according to Articles 2601.03, H, 1, a, b, and c of the Standard Specifications. Reshape ditch according to Section 2125 of the Standard Specifications
- ④ Remove or place Class 10 material to re-establish original ditch template. In areas of Class 10 placement, furnish topsoil and place according to Section 2105 of the Standard Specifications. Prepare ditch according to Articles 2601.03, H, 1, a, b, and c of the Standard Specifications.

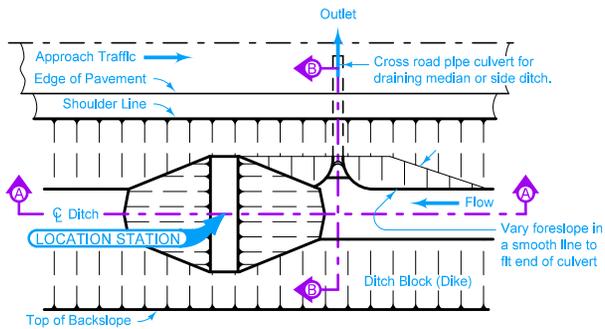
Possible Contract Items:  
 Slope Reshaping  
 Reshaping Ditches  
 Class 10 Excavation  
 Topsoil, Furnish and Spread

<b>IOWA DOT</b>	REVISION	
	New	04-21-15
<b>STANDARD ROAD PLAN</b>		<b>EW-105</b>
		SHEET 1 of 1

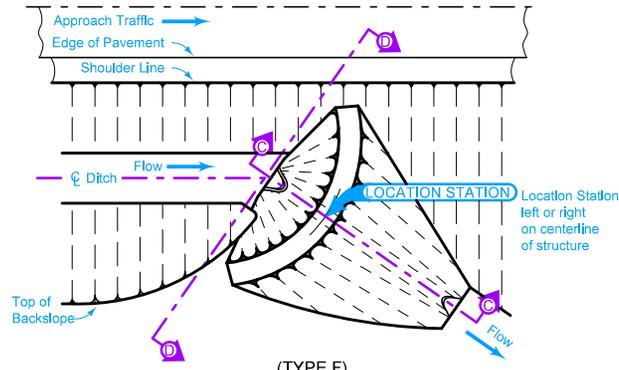
REVISIONS: New.

*Brian Smith*  
 APPROVED BY DESIGN METHODS ENGINEER

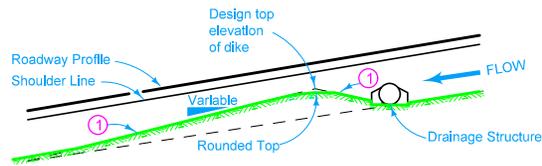
**RESHAPING SLOPES AND DITCHES**



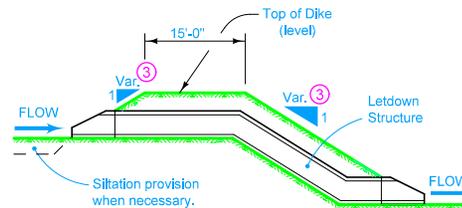
(TYPE M AND G)  
TYPICAL PLAN FOR DITCH BLOCK (DIKE)



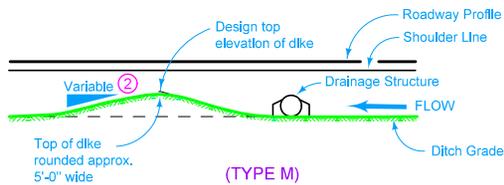
(TYPE F)  
TYPICAL PLAN FOR DIKE AT LETDOWN STRUCTURES



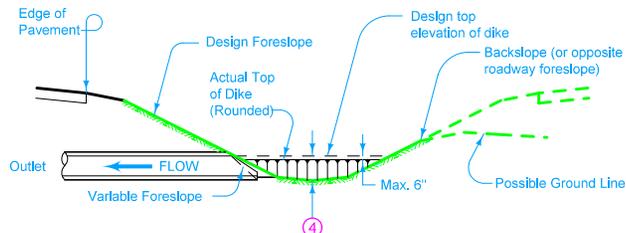
(TYPE G)  
TYPICAL SECTION A-A



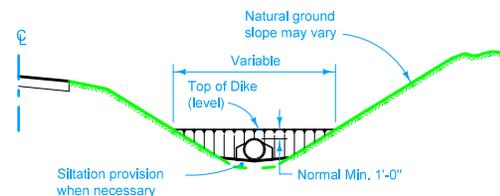
(TYPE F)  
TYPICAL SECTION C-C



(TYPE M)  
TYPICAL SECTION A-A



(TYPE M AND G)  
TYPICAL SECTION B-B



(TYPE F)  
TYPICAL SECTION D-D

Variation in dike construction will be allowed to adapt to local conditions when necessary.

Type F dike for letdown structures may vary in length and plan in different locations. Tie ends of dike into natural ground at the elevation of top of dike unless specified otherwise.

Refer to detail road plans and tabulation of drainage structures for exact information on location, top elevation, shape, or any variation from this plan for dikes.

Coordinate dike construction with project provisions for erosion control as directed by the Engineer.

Necessary material for construction of dikes is included in "Estimate of Quantities" for excavation.

Payment for "Excavation of the class specified" is full compensation for construction of dikes as indicated hereon according to the Standard Specifications.

**DESCRIPTION OF DIKES**

Type M - Normal ditch block for medians or roadway side ditches

Type G - Ditch block using established ditch grades. For median or side ditches.

Type F - Dike for letdowns or other structures away from roadway area. Refer to project plans for details.

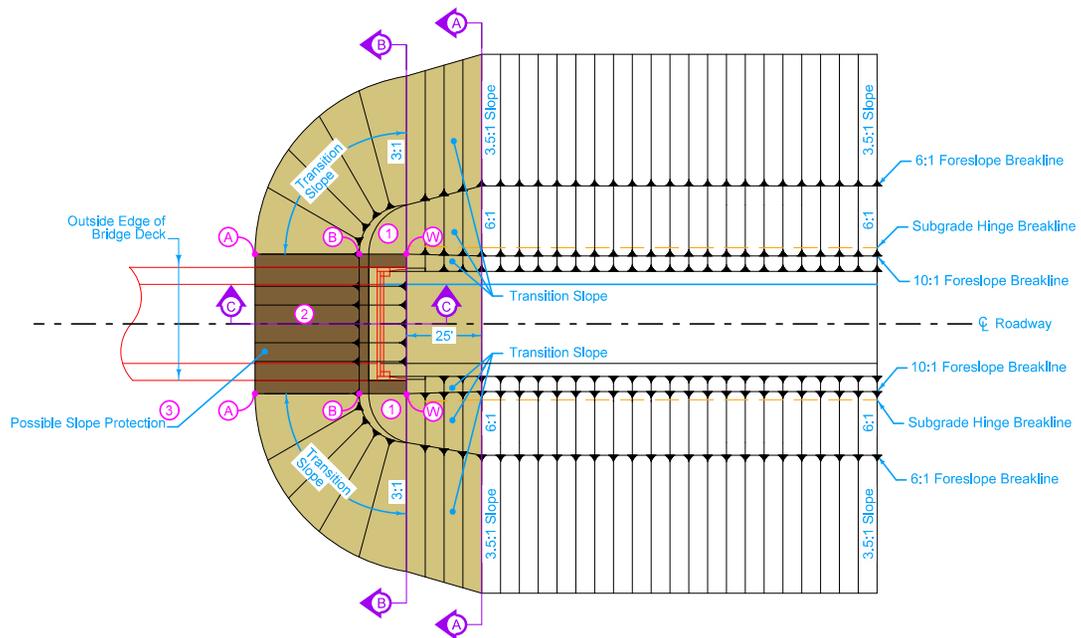
- ① Design Ditch Grade to accomplish purpose of Ditch Block. Maximum slope approximately 10:1 relative to roadway grade.
- ② No greater than 10:1.
- ③ 8:1 slope relative to approach roadway for any portion of dike constructed within 50' of edge of roadway with approaching traffic. Any portion of dike beyond 50' from edge of roadway may vary from 8:1 to a maximum of 2.5:1 at 100' from roadway.
- ④ 18" unless specified otherwise.

 <b>STANDARD ROAD PLAN</b>	REVISION
	1   10-20-15
	<b>EW-110</b>
SHEET 1 of 1	

REVISIONS: Replaced the DOT logo in the title block with the new version.

*Brian Smith*  
APPROVED BY DESIGN METHODS ENGINEER

**DITCH BLOCKS AND DIKES**

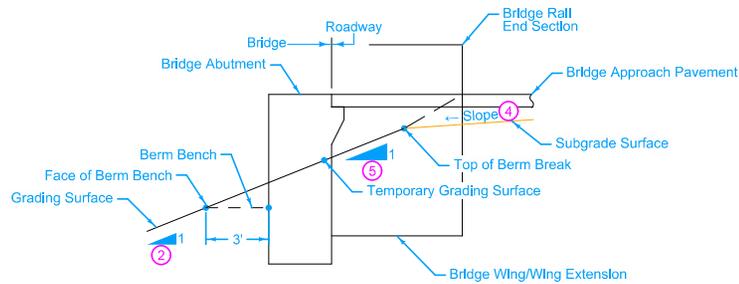


PLAN VIEW OF BRIDGE BERM  
(BARNROOF FORESLOPE)

Grading surface:  
Refer to berm slope location table in project plans  
for locations of A, B, W and possible other points.

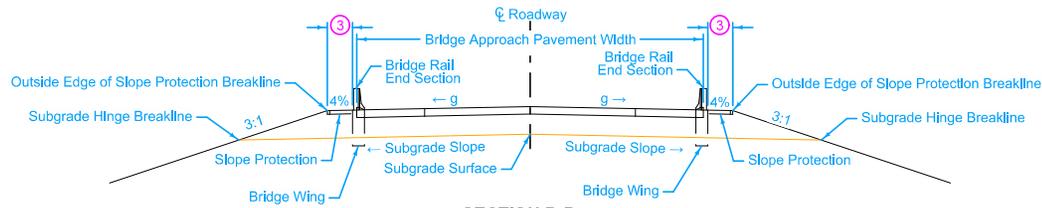
- ① Variable slope.
- ② Bridge Berm slope may vary and is determined by the A and B points. Slope is normally 2.5:1 or flatter.
- ③ Refer to contract documents for limits of the slope protection.

<b>IOWA DOT</b>	REVISION	
	4	04-19-16
<b>STANDARD ROAD PLAN</b>		<b>EW-201</b>
		SHEET 1 of 3
REVISIONS: Changed reference from RK series to BR series in circle note 4.		
 APPROVED BY DESIGN METHODS ENGINEER		
<b>BRIDGE BERM GRADING WITHOUT RECOVERABLE SLOPE (BARNROOF SECTION)</b>		

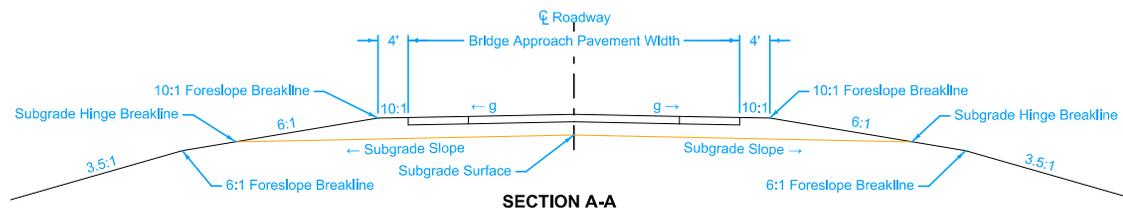


SECTION C-C

- ② Bridge Berm slope may vary and is determined by the A and B points.
  - ③ Refer to contract documents for limits of the slope protection.
  - ④ Refer to **BR series** for longitudinal subgrade slope.
  - ⑤ Temporary grading slope.
- g* = Pavement cross slope.



SECTION B-B



SECTION A-A

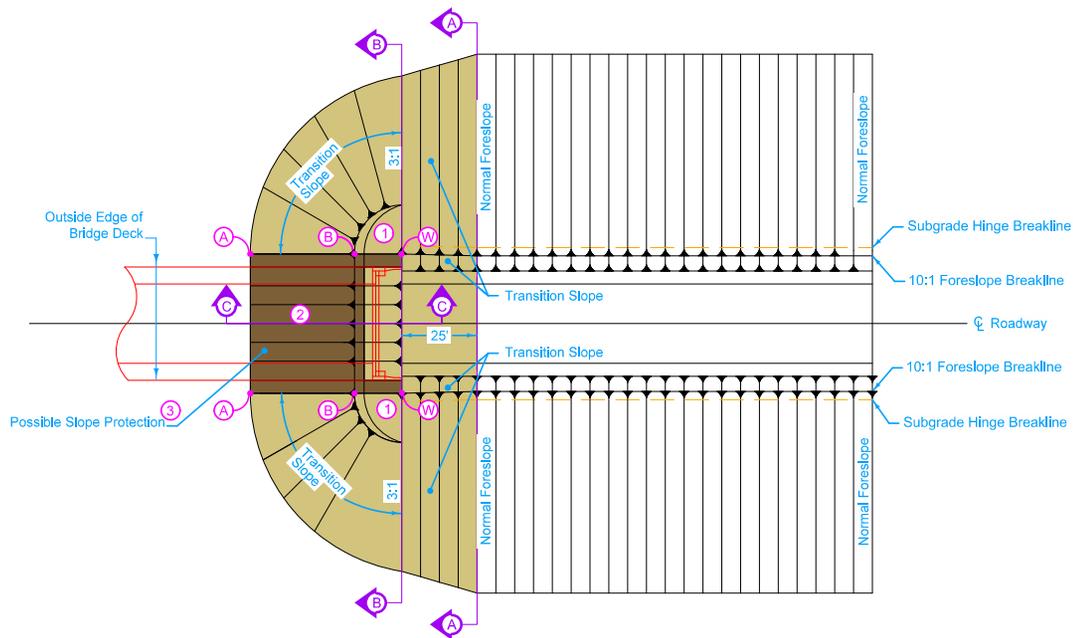
	REVISION	
	4	04-19-16
<b>STANDARD ROAD PLAN</b>		<b>EW-201</b>
		SHEET 2 of 3
REVISIONS: Changed reference from RK series to BR series in circle note 4.		
 APPROVED BY DESIGN METHODS ENGINEER		
<b>BRIDGE BERM GRADING WITHOUT RECOVERABLE SLOPE (BARNROOF SECTION)</b>		

This image can be viewed in 3D on the the ERL or at our website <http://www.iowadot.gov/design/stdrdpln.htm>



This image can be viewed in 3D on the the ERL or at our website <http://www.iowadot.gov/design/stdrdpln.htm>

	REVISION	
	4	04-19-16
<b>STANDARD ROAD PLAN</b>	<b>EW-201</b>	
	SHEET 3 of 3	
REVISIONS: Changed reference from RK series to BR series in circle note 4.		
<i>Brian Smith</i> APPROVED BY DESIGN METHODS ENGINEER		
<b>BRIDGE BERM GRADING WITHOUT RECOVERABLE SLOPE (BARNROOF SECTION)</b>		

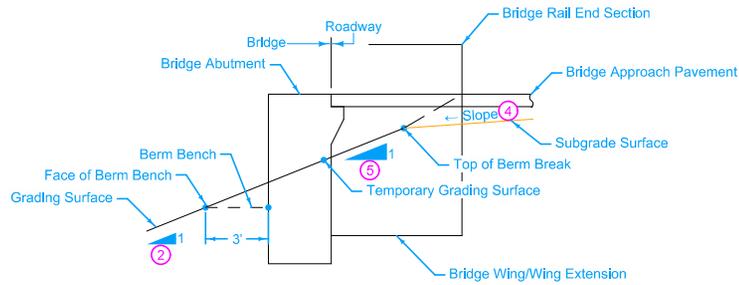


PLAN VIEW OF BRIDGE BERM  
(NON-BARNROOF FORESLOPE)

Grading Surface:  
Refer to berm slope location table in project plans  
for locations of A, B, W and possible other points.

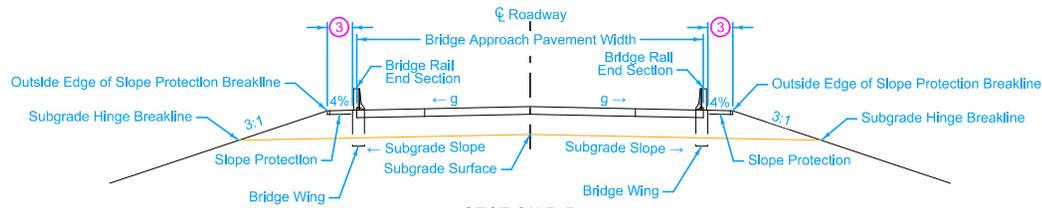
- ① Variable slope.
- ② Bridge Berm slope may vary and is determined by the A and B points. Slope is normally 2.5:1 or flatter.
- ③ Refer to contract documents for limits of the slope protection.

<b>IOWA DOT</b>	REVISION	
	4	04-19-16
<b>STANDARD ROAD PLAN</b>		<b>EW-202</b>
		SHEET 1 of 3
REVISIONS: Changed reference from RK series to BR series in circle note 4.		
 APPROVED BY DESIGN METHODS ENGINEER		
<b>BRIDGE BERM GRADING WITHOUT RECOVERABLE SLOPE (NON-BARNROOF SECTION)</b>		

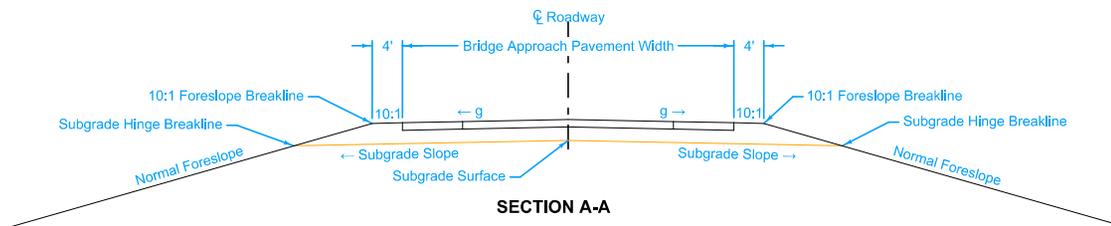


**SECTION C-C**

- ② Bridge Berm slope may vary and is determined by the A and B points.
- ③ Refer to contract documents for limits of the slopeprotection.
- ④ Refer to **BR series** for longitudinal subgrade slope.
- ⑤ Temporary grading slope.
- g* = Pavement cross slope.



**SECTION B-B**



**SECTION A-A**

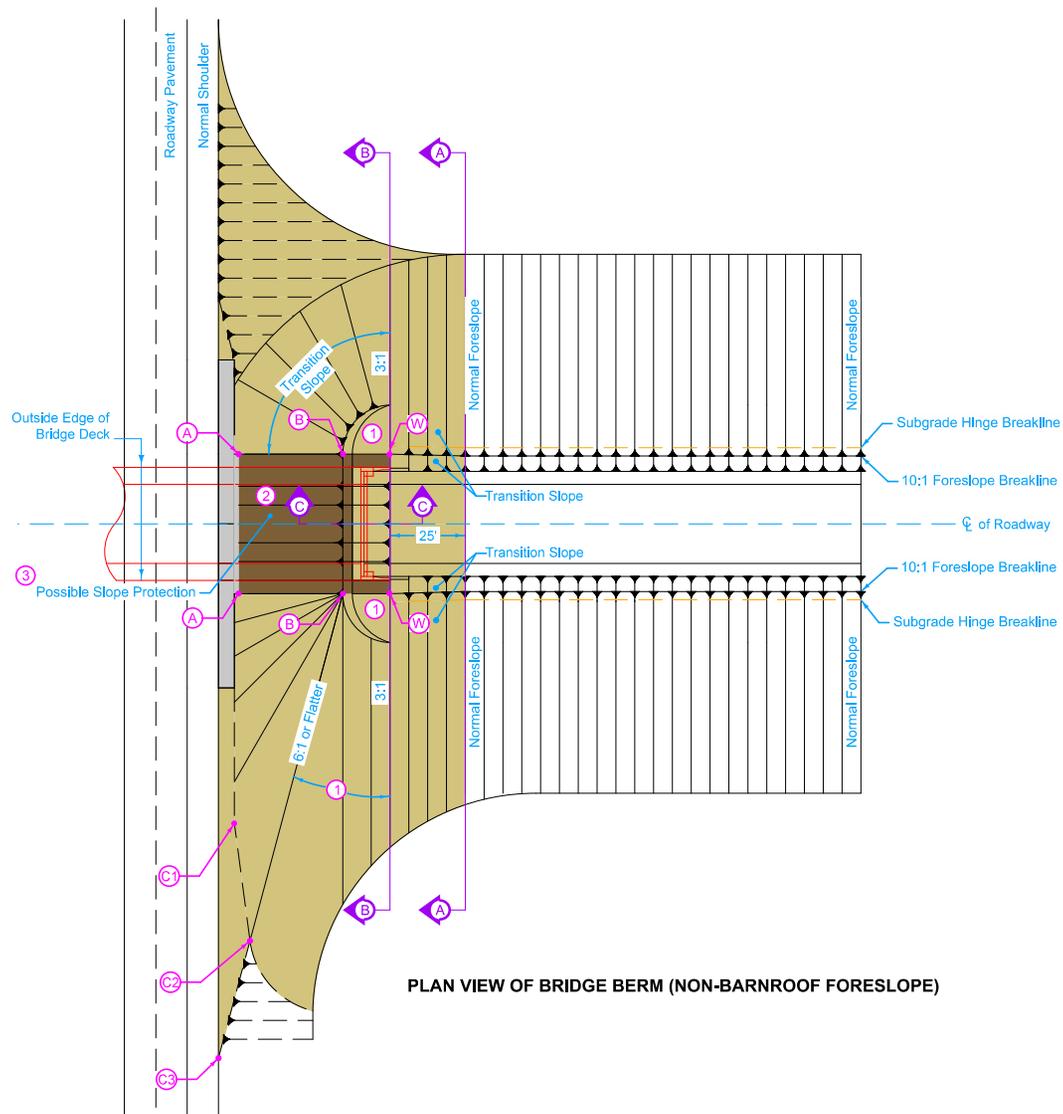
 <b>STANDARD ROAD PLAN</b>	REVISION 4   04-19-16
	<b>EW-202</b> SHEET 2 of 3
<small>REVISIONS: Changed reference from RK series to BR series in circle note 4.</small>	
 <small>APPROVED BY DESIGN METHODS ENGINEER</small>	
<b>BRIDGE BERM GRADING          WITHOUT RECOVERABLE SLOPE          (NON-BARNROOF SECTION)</b>	

This image can be viewed in 3D on the the ERL or at our website <http://www.iowadot.gov/design/stdrdpln.htm>



This image can be viewed in 3D on the the ERL or at our website <http://www.iowadot.gov/design/stdrdpln.htm>

	REVISION	
	4	04-19-16
<b>STANDARD ROAD PLAN</b>	<b>EW-202</b>	
	SHEET 3 of 3	
REVISIONS: Changed reference from RK series to BR series in circle note 4.		
		
APPROVED BY DESIGN METHODS ENGINEER		
<b>BRIDGE BERM GRADING WITHOUT RECOVERABLE SLOPE (NON-BARNROOF SECTION)</b>		



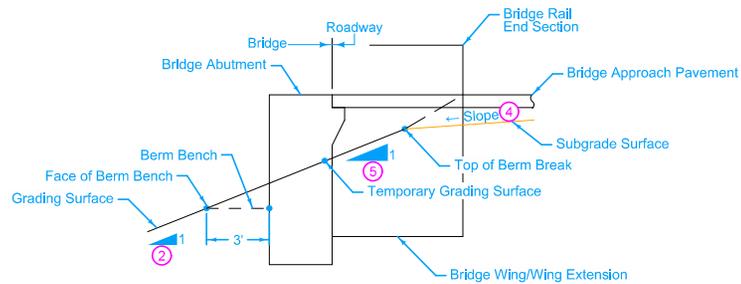
Grading Surface:  
Refer to berm slope location table in project plans  
for locations of A, B, C, W and possible other points.

The cost of removal, stockpiling and placement of  
macadam stone shall be considered incidental to  
"Paved Shoulder, P.C. Concrete".

- ① Special shaping.
- ② Bridge Berm slope may vary and is determined by  
the A and B points. Slope is normally 2.5:1 or flatter.
- ③ Refer to contract documents for limits of the slope protection.

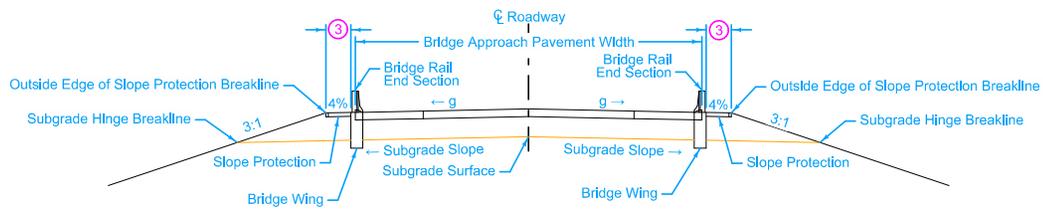
Possible Tabulation: 104-9

<b>IOWA DOT</b>	REVISION	
	4	04-21-15
<b>STANDARD ROAD PLAN</b>	<b>EW-203</b>	
	SHEET 1 of 5	
REVISIONS: Changed references to renamed standards.		
<i>Brian Smith</i> APPROVED BY DESIGN METHODS ENGINEER		
<b>BRIDGE BERM GRADING WITH RECOVERABLE SLOPE (NON-BARNROOF SECTION)</b>		

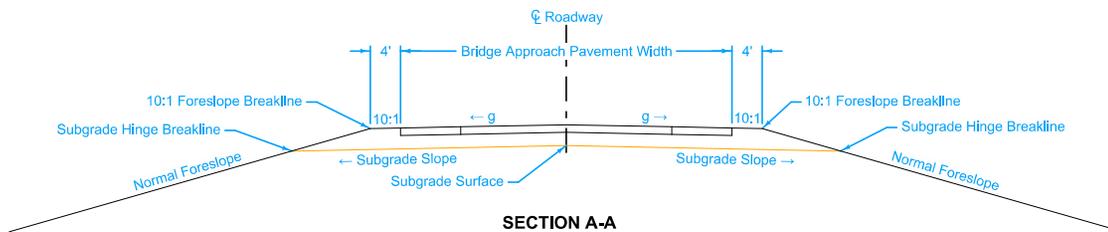


SECTION C-C

- ② Bridge Berm slope may vary and is determined by the A and B points. Slope is normally 2.5:1 or flatter.
- ③ Refer to contract documents for limits of the slope protection.
- ④ Refer to **BR series** for longitudinal subgrade slope.
- ⑤ Temporary grading slope.
- g = pavement cross slope.

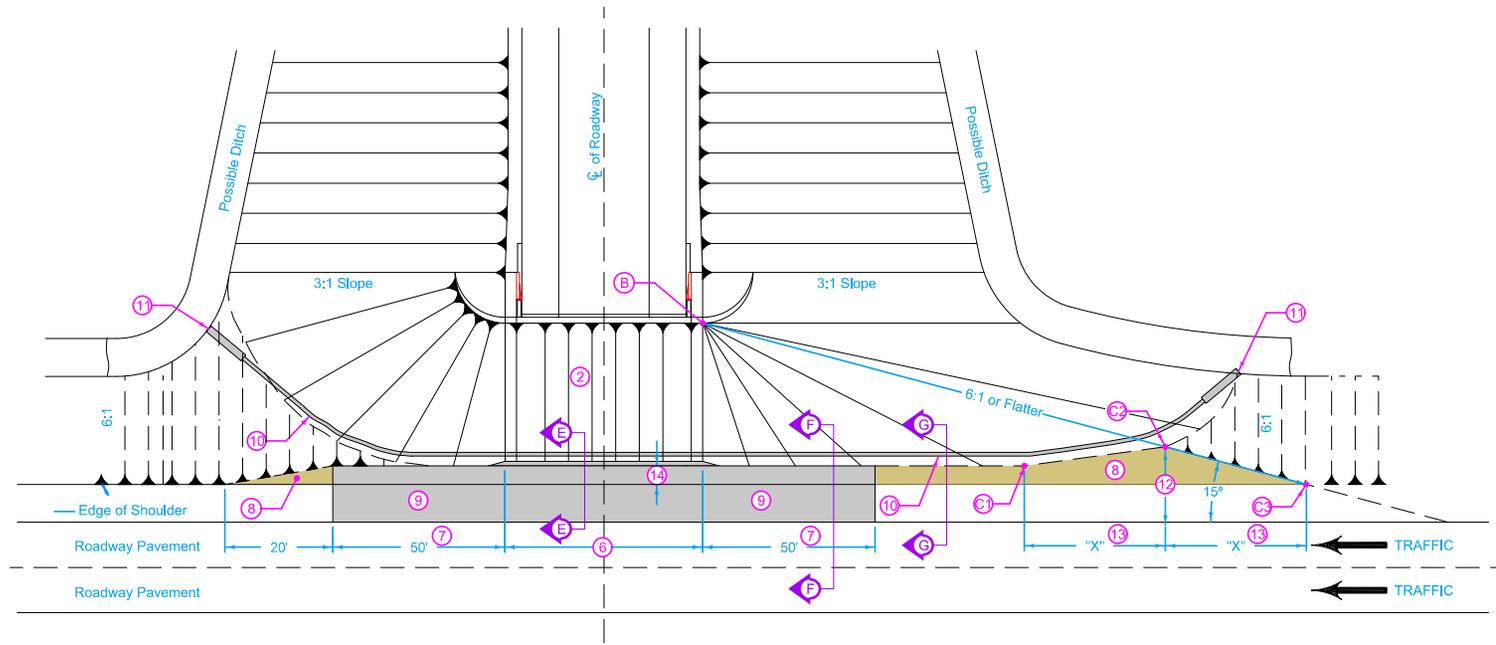


SECTION B-B



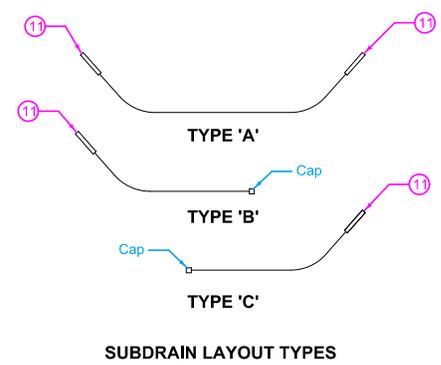
SECTION A-A

	REVISION
	4   04-21-15
<b>STANDARD ROAD PLAN</b>	<b>EW-203</b>
REVISIONS: Changed references to renamed standards.	SHEET 2 of 5
 APPROVED BY DESIGN METHODS ENGINEER	
<b>BRIDGE BERM GRADING WITH RECOVERABLE SLOPE (NON-BARNROOF SECTION)</b>	



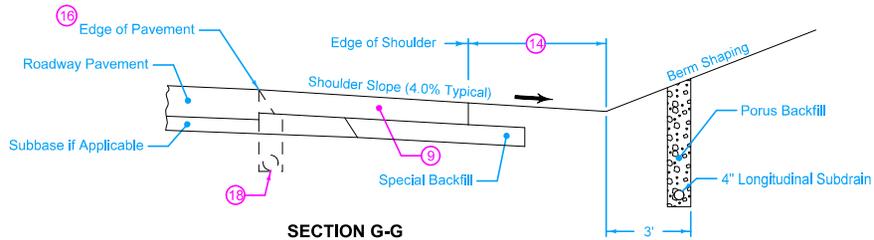
- ② Bridge Berm slope may vary and is determined by the A and B points. Slope is normally 2.5:1 or flatter.
- ⑥ Width of bridge slab + 3' on each side. Build 6" sloped curb to this width. Refer to PV-102 for curb details.
- ⑦ Includes curb runout length. Refer to PV-102 for curb runout details.
- ⑧ Match typical shoulder slope.
- ⑨ See typical cross-sections for details of paved shoulder.
- ⑩ Approximate location of bridge subdrain.
- ⑪ Refer to DR-304 subdrain outlet. When flow of subdrain does not require an outlet at both ends, cap the end without an outlet in a method approved by the Engineer.
- ⑫ 2 times typical shoulder width.
- ⑬ "X" distance based on station difference between points C2 and C3.
- ⑭ 5' offset unless otherwise noted on the Bridge Situation Plan. 4' offset minimum.

PLAN VIEW OF BRIDGE BERM AREA

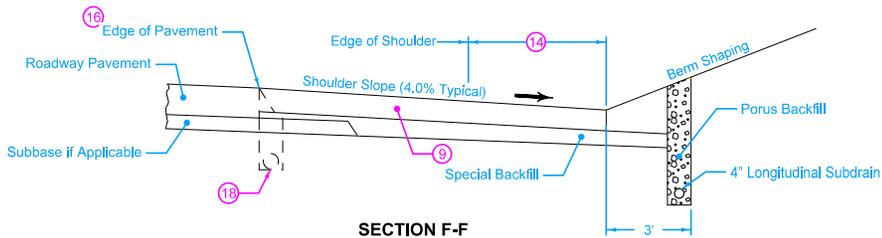


SUBDRAIN LAYOUT TYPES

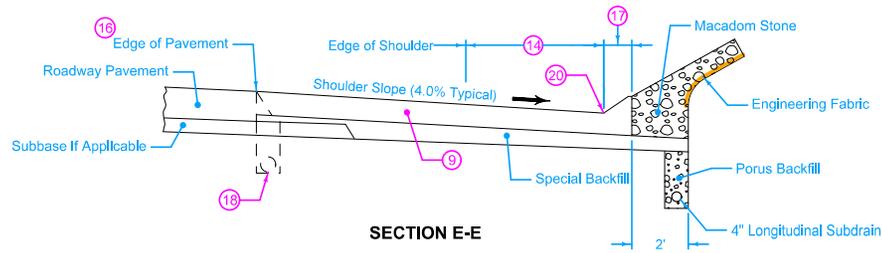
 <b>STANDARD ROAD PLAN</b>	REVISION 4   04-21-15
	<b>EW-203</b> SHEET 3 of 5
REVISIONS: Changed references to renamed standards.	
 APPROVED BY DESIGN METHODS ENGINEER	
<b>BRIDGE BERM GRADING          WITH RECOVERABLE SLOPE          (NON-BARNROOF SECTION)</b>	



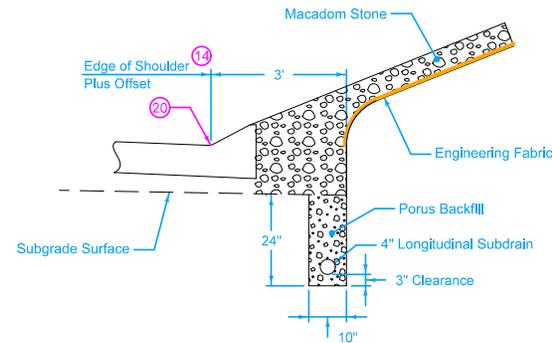
SECTION G-G



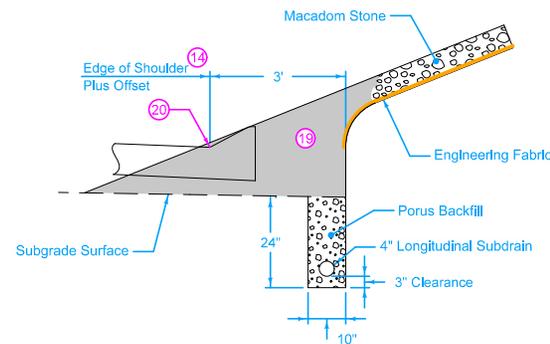
SECTION F-F



SECTION E-E



PARTIAL SECTION E-E  
As constructed by others



PARTIAL SECTION E-E  
Proposed construction

- 9 See typical cross-sections for details of paved shoulder.
- 14 5' offset unless otherwise noted on the Bridge Situation Plan, 4' offset minimum.
- 16 If roadway pavement is newly-constructed PCC, use BT-1 or BT-2 joint. If roadway pavement is existing PCC, use BT-3, BT-4, or BT-5 joint. Refer to PV-101 joint details.
- 17 6" sloped curb. Refer to PV-102 curb details.
- 18 Roadway subdrain location. Use caution when excavating. Maintain porous material in trench to bottom of roadway pavement.
- 19 Remove and stockpile macadam stone. Carefully separate the macadam stone from the surrounding soil. Preserve the integrity of the engineering fabric.
- 20 Toe of the berm. Refer to A points on the berm slope location table.

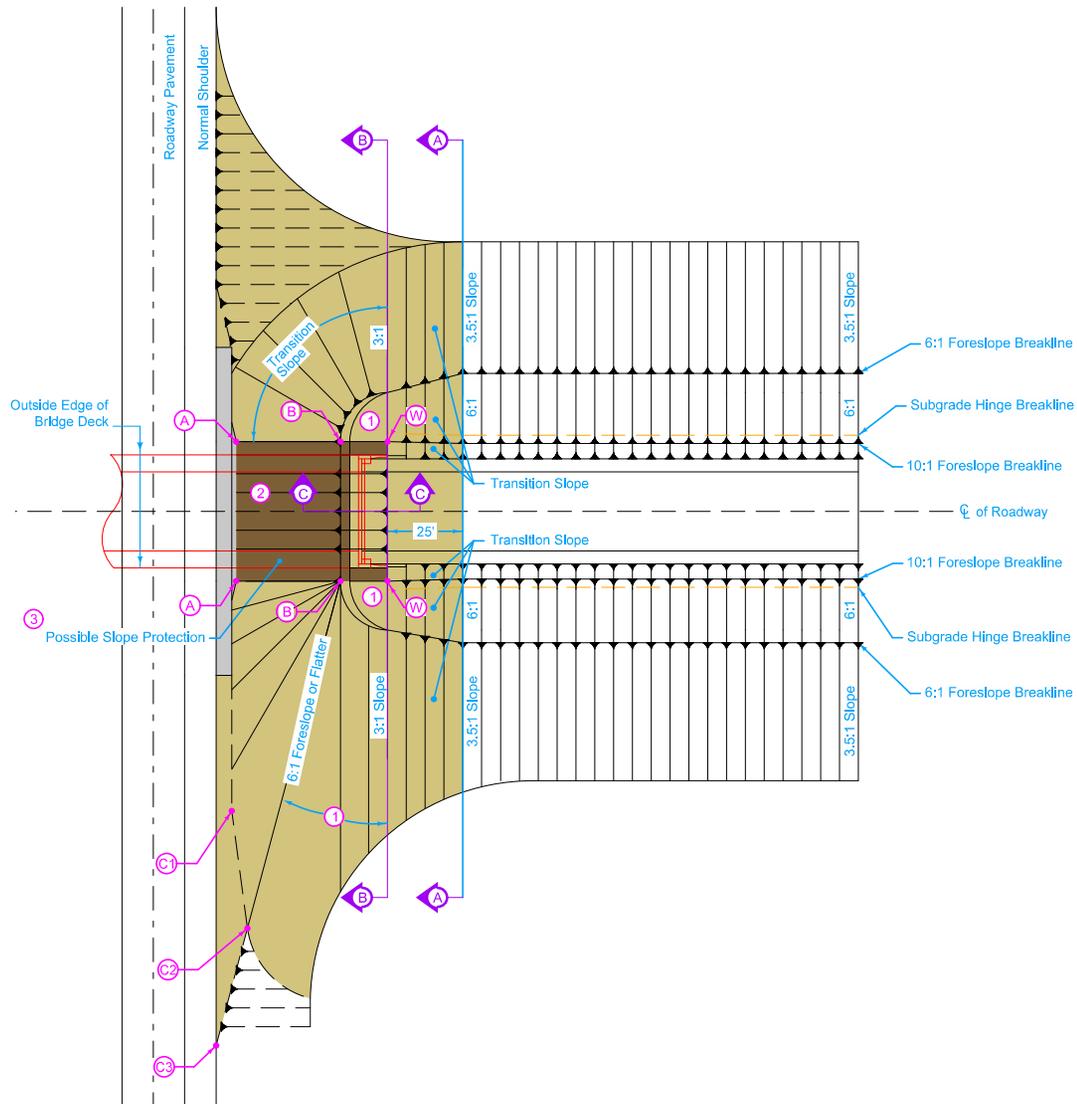
 <b>STANDARD ROAD PLAN</b>	REVISION 4   04-21-15
	<b>EW-203</b> SHEET 4 of 5
	<small>REVISIONS: Changed references to renamed standards.</small>
 <small>APPROVED BY DESIGN METHODS ENGINEER</small>	
<b>BRIDGE BERM GRADING          WITH RECOVERABLE SLOPE          (NON-BARNROOF SECTION)</b>	

This image can be viewed in 3D on the the ERL or at our website <http://www.iowadot.gov/design/stdrdpln.htm>



This image can be viewed in 3D on the the ERL or at our website <http://www.iowadot.gov/design/stdrdpln.htm>

 <b>STANDARD ROAD PLAN</b>	REVISION	
	4	04-21-15
<b>EW-203</b>		
SHEET 5 of 5		
REVISIONS: Changed references to renamed standards.		
<i>Brian Smith</i> APPROVED BY DESIGN METHODS ENGINEER		
<b>BRIDGE BERM GRADING WITH RECOVERABLE SLOPE (NON-BARNROOF SECTION)</b>		



PLAN VIEW OF BRIDGE BERM (BARNROOF FORESLOPE)

Grading Surface:  
Refer to berm slope location table in project plans for locations of A, B, C, W and possible other points.

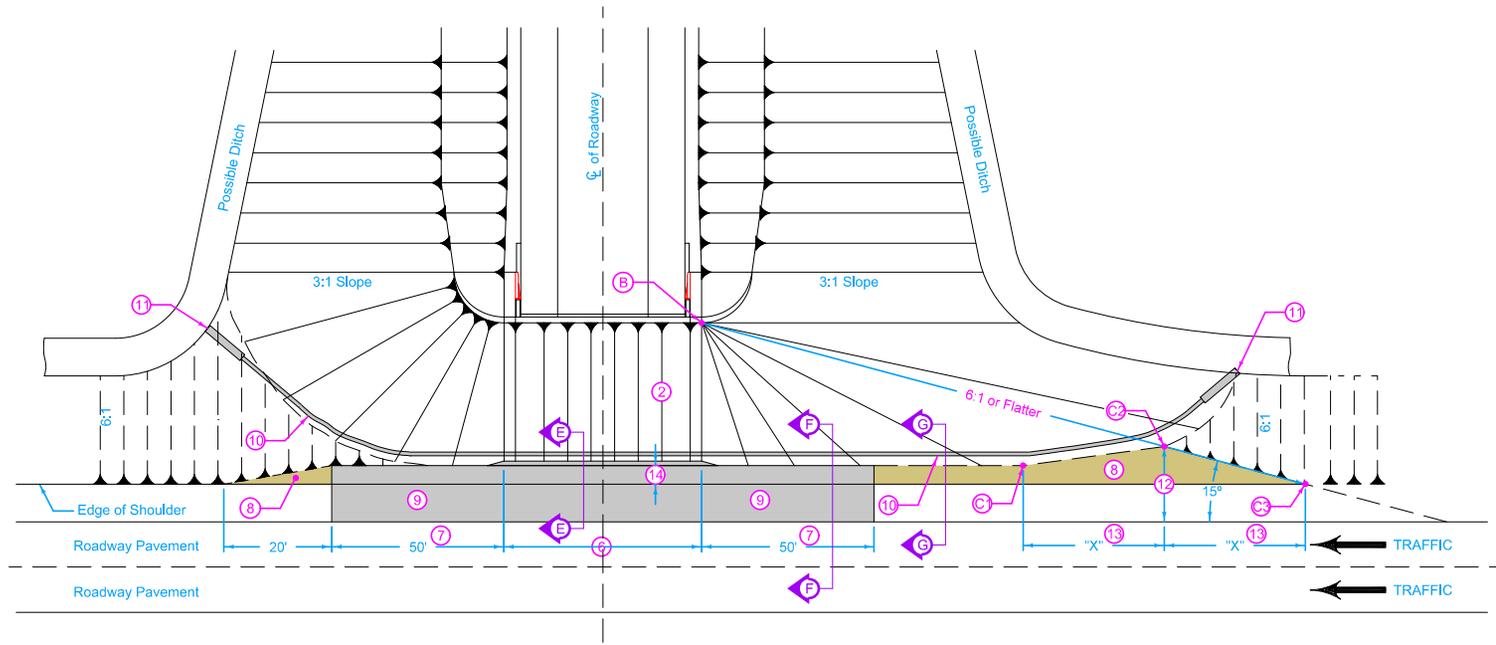
The cost of removal, stockpiling and placement of macadam stone shall be considered incidental to "Paved Shoulder, P.C. Concrete".

- ① Special shaping.
- ② Face of Bridge Berm slope may vary and is determined by the A and B points. Slope is normally 2.5:1 or flatter.
- ③ Refer to contract documents for limits of the slope protection.

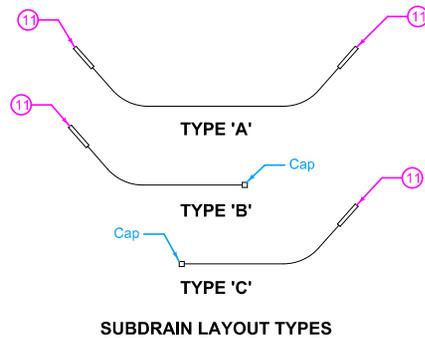
Possible Tabulation: 104-9

 <b>STANDARD ROAD PLAN</b>	REVISION 4   04-21-15
	<b>EW-204</b> SHEET 1 of 5
REVISIONS: Changed references to renamed standards.	
 APPROVED BY DESIGN METHODS ENGINEER	
<b>BRIDGE BERM GRADING          WITH RECOVERABLE SLOPE          (BARNROOF SECTION)</b>	





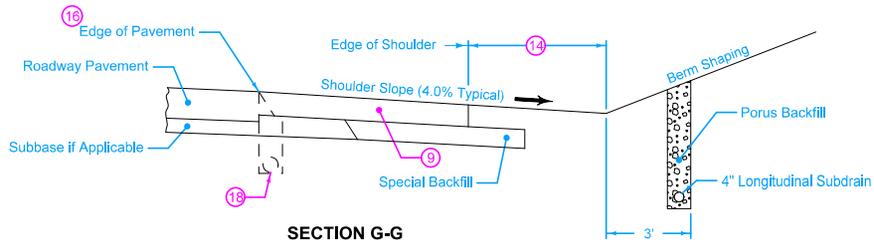
PLAN VIEW OF BRIDGE BERM AREA



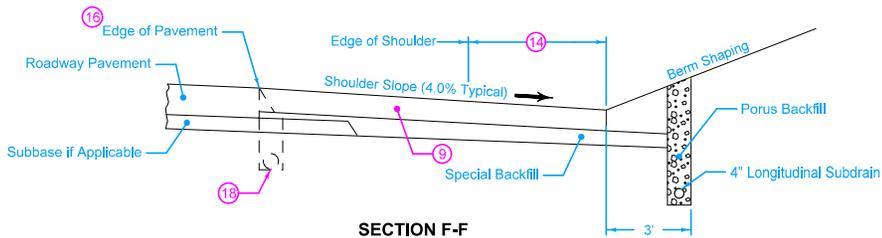
SUBDRAIN LAYOUT TYPES

- ② Bridge Beam slope may vary and is determined by the A and B points. Slope is normally 2.5:1 or flatter.
- ⑥ Width of bridge slab + 3' on each side. Build 6" sloped curb to this width. Refer to PV-102 for curb details.
- ⑦ Includes curb runout length. Refer to PV-102 for curb runout details.
- ⑧ Match typical shoulder slope.
- ⑨ See typical cross-sections for details of paved shoulder.
- ⑩ Approximate location of bridge subdrain.
- ⑪ Refer to DR-304 subdrain outlet. When flow of subdrain does not require an outlet at both ends, cap the end without an outlet in a method approved by the Engineer.
- ⑫ 2 times typical shoulder width.
- ⑬ "X" distance based on station difference between points C2 and C3.
- ⑭ 5' offset unless otherwise noted on the Bridge Situation Plan. 4' offset minimum.

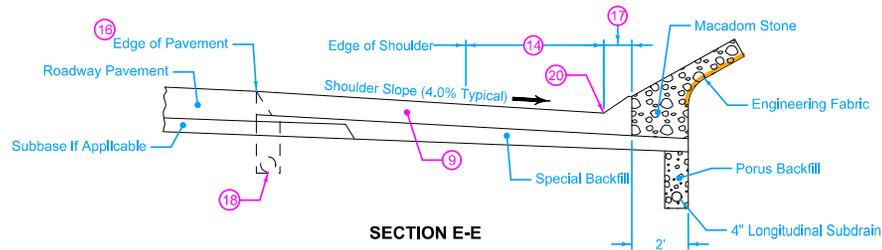
	REVISION
	4   04-21-15
<b>STANDARD ROAD PLAN</b>	<b>EW-204</b>
SHEET 3 of 5	
<small>REVISIONS: Changed references to renamed standards.</small>	
 <small>APPROVED BY DESIGN METHODS ENGINEER</small>	
<b>BRIDGE BERM GRADING WITH RECOVERABLE SLOPE (BARNROOF SECTION)</b>	



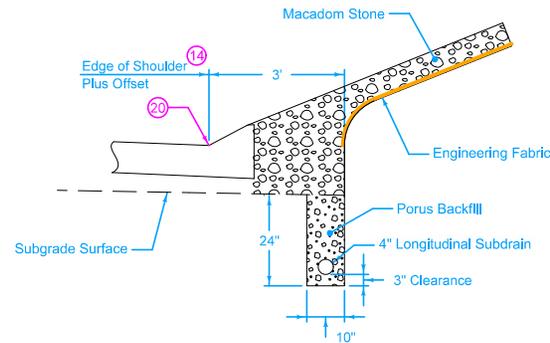
SECTION G-G



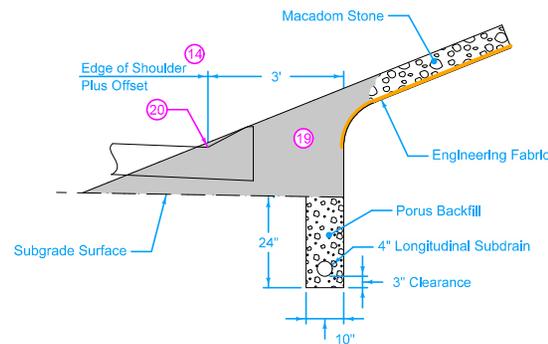
SECTION F-F



SECTION E-E



PARTIAL SECTION E-E  
As constructed by others

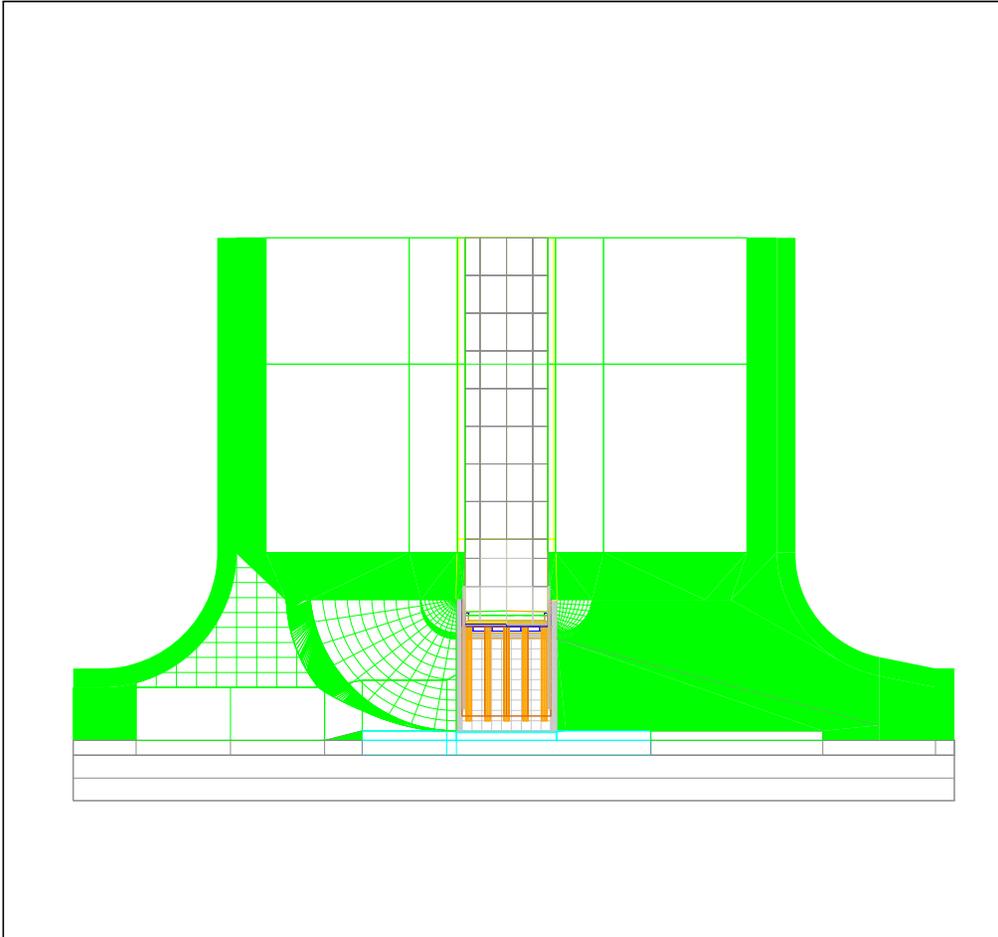


PARTIAL SECTION E-E  
Proposed construction

- 9 See typical cross-sections for details of paved shoulder.
- 14 5' offset unless otherwise noted on the Bridge Situation Plan, 4' offset minimum.
- 16 If roadway pavement is newly-constructed PCC, use BT-1 or BT-2 joint. If roadway pavement is existing PCC, use BT-3, BT-4, or BT-5 joint. Refer to PV-101 joint details.
- 17 6" sloped curb. Refer to PV-102 curb details.
- 18 Roadway subdrain location. Use caution when excavating. Maintain porous material in trench to bottom of roadway pavement.
- 19 Remove and stockpile macadam stone. Carefully separate the macadam stone from the surrounding soil. Preserve the integrity of the engineering fabric.
- 20 Toe of the berm. Refer to A Points on the berm slope location table.

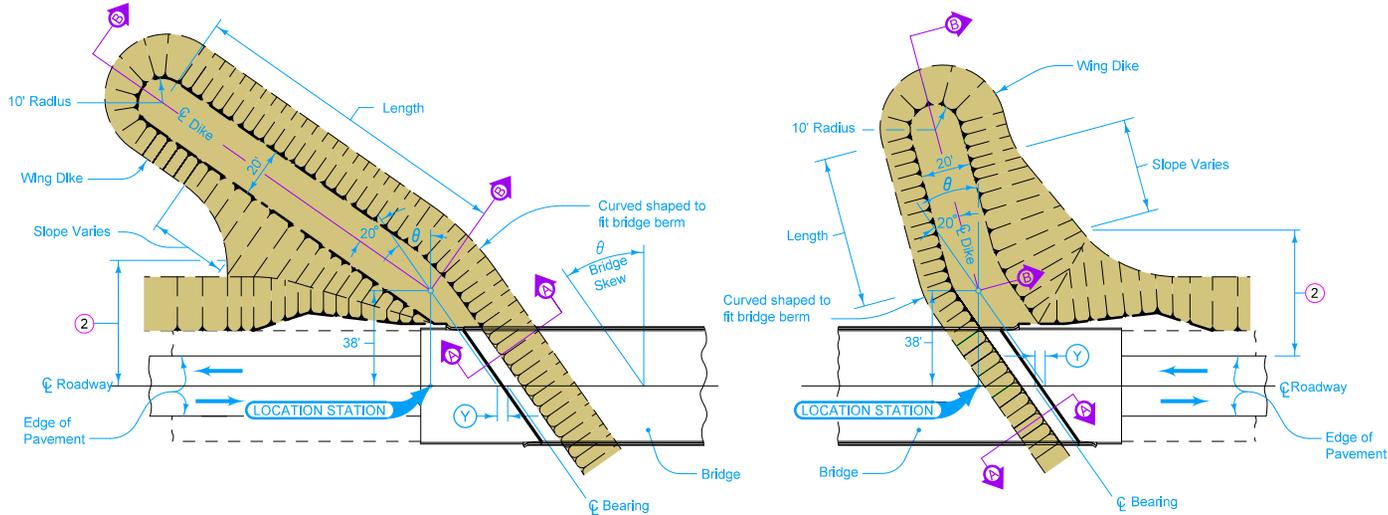
 <b>STANDARD ROAD PLAN</b>	REVISION 4   04-21-15
	<b>EW-204</b> SHEET 4 of 5
	<small>REVISIONS: Changed references to renamed standards.</small>
 <small>APPROVED BY DESIGN METHODS ENGINEER</small>	
<b>BRIDGE BERM GRADING          WITH RECOVERABLE SLOPE          (BARNROOF SECTION)</b>	

This image can be viewed in 3D on the the ERL or at our website <http://www.iowadot.gov/design/stdrdpln.htm>



This image can be viewed in 3D on the the ERL or at our website <http://www.iowadot.gov/design/stdrdpln.htm>

	REVISION	
	4	04-21-15
<b>STANDARD ROAD PLAN</b>	<b>EW-204</b>	
	SHEET 5 of 5	
REVISIONS: Changed references to renamed standards.		
<i>Brian Smith</i> APPROVED BY DESIGN METHODS ENGINEER		
<b>BRIDGE BERM GRADING WITH RECOVERABLE SLOPE (BARNROOF SECTION)</b>		



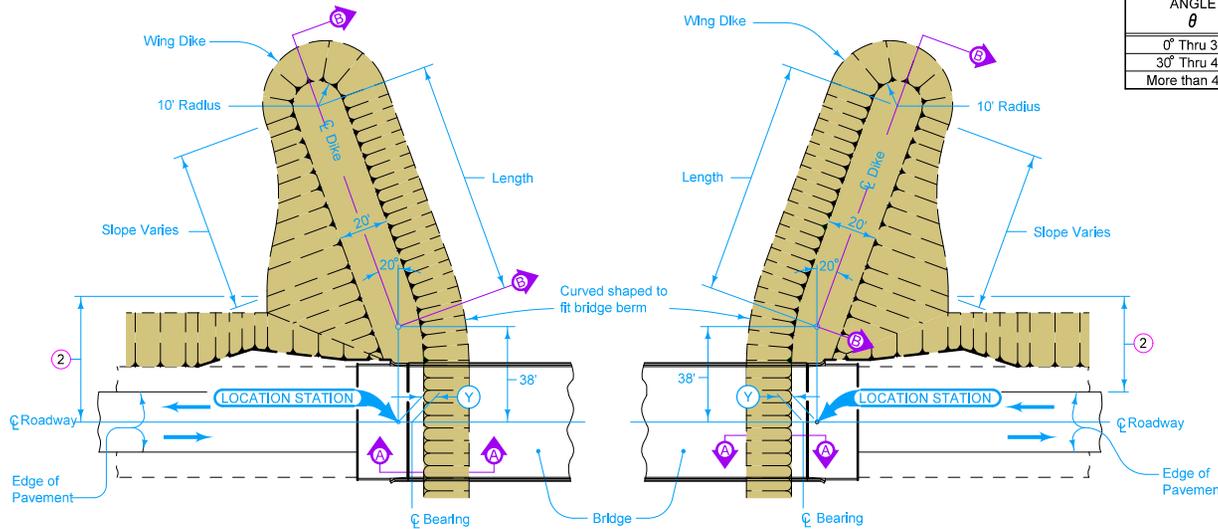
TYPICAL PLAN VIEW OF DIKE CONSTRUCTION AT SKEWED BRIDGE

For guidelines to determine wing dike lengths or when to use wing dikes, see the Office of Bridges and Structures' Preliminary Design Bridge Manual.

Build wing dikes with an additional skew angle of 20 degrees to the skew angle of the bridge. The location method will be similar when the direction of flow or skew is opposite that indicated.

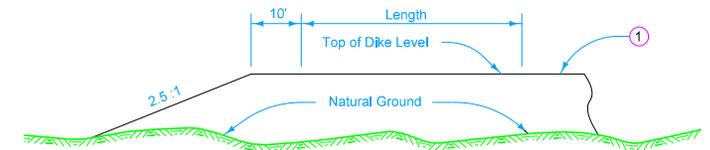
Necessary materials for construction of the dikes are included on the tabulation of "Estimate of Quantities" for excavation. Price bid for "Excavation of the class specified" is full compensation for construction of dikes as indicated hereon.

- ① Match the bridge top of berm elevation unless noted otherwise.
- ② Construct portions of wing dikes within 50 feet of the edge of the traffic lane for the approach traffic with a slope of 8:1 parallel to traffic. Construct the stream side slope of the wing dike to 2.5:1 or flatter as shown.

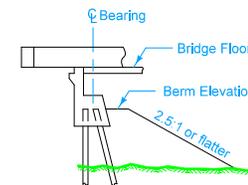


TYPICAL PLAN VIEW OF DIKE CONSTRUCTION AT NON-SKEWED BRIDGE

SKEW ANGLE $\theta$	DIMENSION (Y)
0° Thru 30°	$5.5' / \cos \theta$
30° Thru 45°	$4.5' / \cos \theta$
More than 45°	$3.5' / \cos \theta$



SECTION B-B



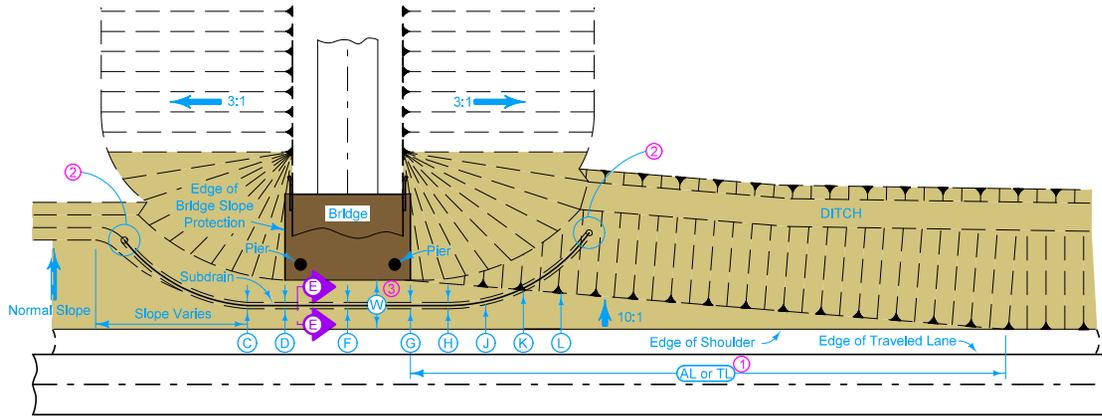
SECTION A-A

 <b>STANDARD ROAD PLAN</b>	REVISION
	1   10-20-15
	<b>EW-210</b>
SHEET 1 of 1	

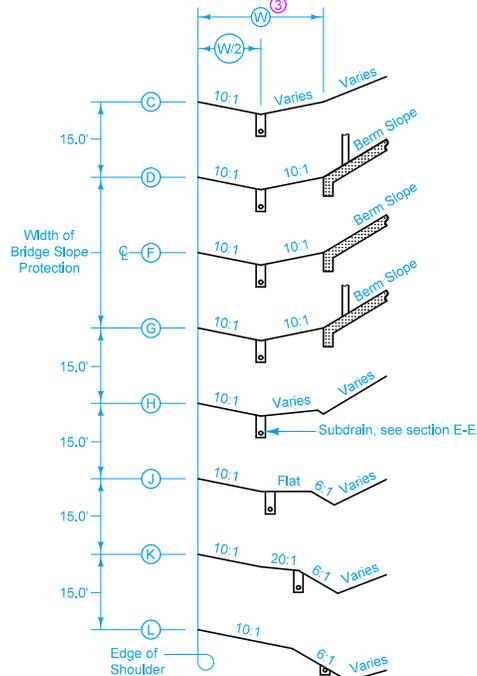
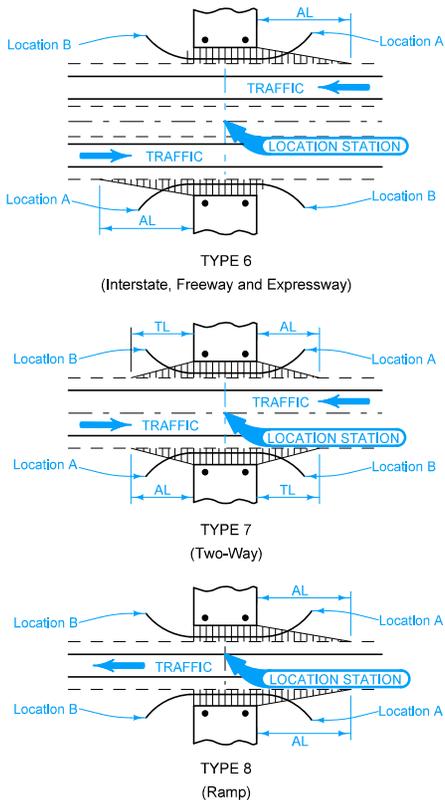
REVISIONS: Modified note 2 and Section A-A.

*Brian Smith*  
APPROVED BY DESIGN METHODS ENGINEER

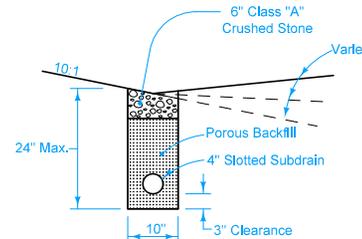
**STANDARD WING DIKES**



**SITUATION PLAN**



**TYPICAL SECTIONS**



**SECTION E-E**

Earthwork for construction of the grading at side piers has been included in the tabulation of earthwork quantities. Drainage structure requirements in conjunction with the grading at side piers have also tabulated elsewhere in the plans.

When a subdrain installation does not have a subdrain outlet on the end, cap that end with methods approved by the Engineer. Outlet Location A and B are indicated on the Tabulation of Subdrain and Grading at Side Piers.

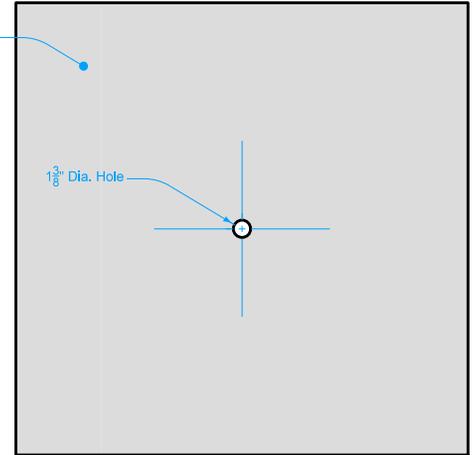
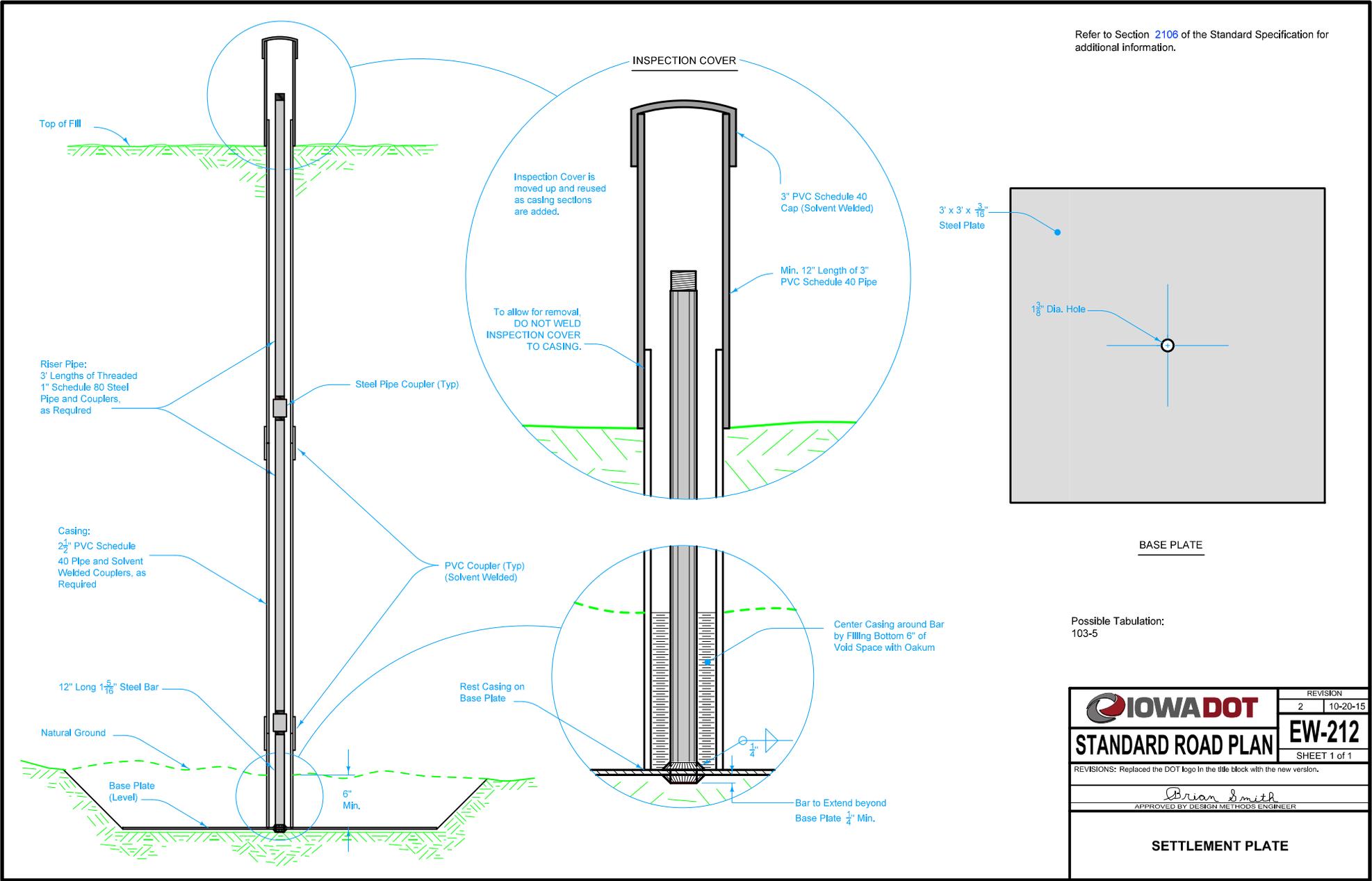
- ①  $\text{AL}$  or  $\text{TL}$  is the length measured from the edge of the bridge slope protection to a point on the shoulder edge.
- ② See typical section on Standard Road Plan DR-304.
- ③  $\text{W}$  is the length measured from the shoulder edge to the toe of the berm in the area of bridge slope protection.

Possible Contract items:  
Longitudinal Subdrain (Shoulder), 4-inch Subdrain Outlet (DR-304)

Possible Tabulation:  
104-12

 <b>STANDARD ROAD PLAN</b>	REVISION
	1 04-21-15
	<b>EW-211</b> SHEET 1 of 1
REVISIONS: Replaced the DOT logo in the title block with the new version and changed references to renamed standards.	
 APPROVED BY DESIGN METHODS ENGINEER	
<b>SPECIAL GRADING AT SIDE PIERS</b>	

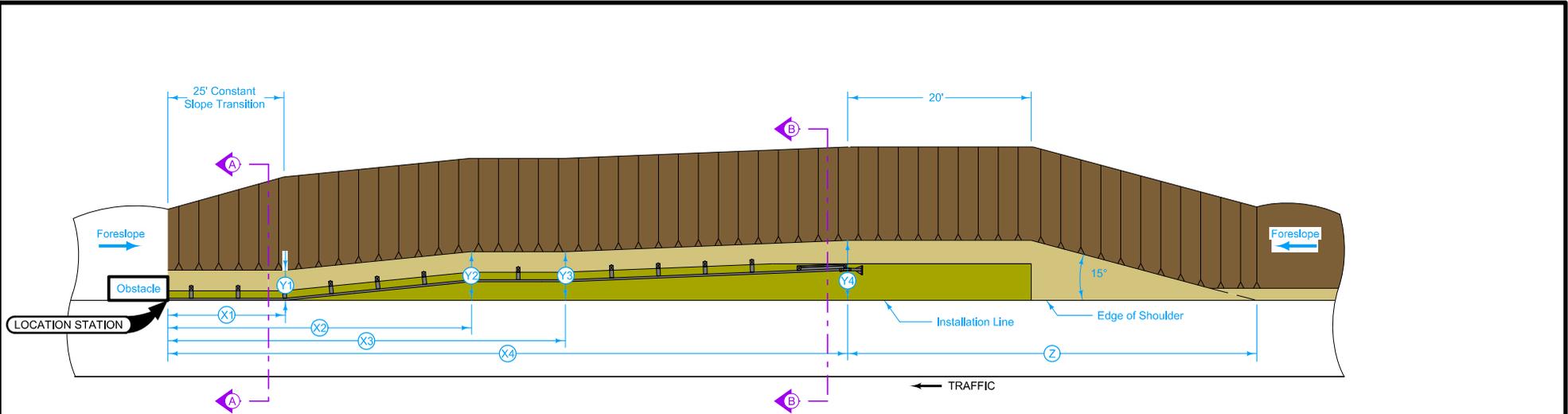
Refer to Section 2106 of the Standard Specification for additional information.



BASE PLATE

Possible Tabulation:  
103-5

	REVISION
	2   10-20-15
<b>STANDARD ROAD PLAN</b>	<b>EW-212</b>
SHEET 1 of 1	
<small>REVISIONS: Replaced the DOT logo in the title block with the new version.</small>	
 <small>APPROVED BY DESIGN METHODS ENGINEER</small>	
<b>SETTLEMENT PLATE</b>	



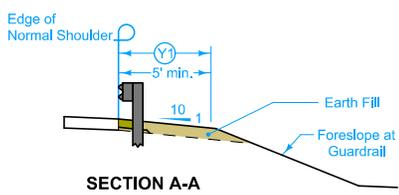
PLAN

Construct earth fill in conformance with requirements for construction of embankments.

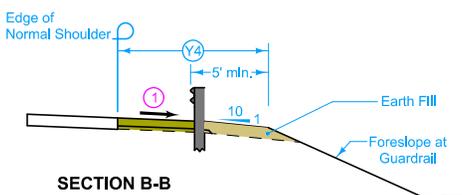
Construct paved shoulder in front of guardrail as shown on Typical 7156.

Guardrail may or may not be attached to face of obstacle.

- ① Match slope of adjacent shoulder.
- ⊗ Measured from Location Station.
- Ⓨ Distance from edge of normal shoulder to toe of 10:1 slope



SECTION A-A



SECTION B-B

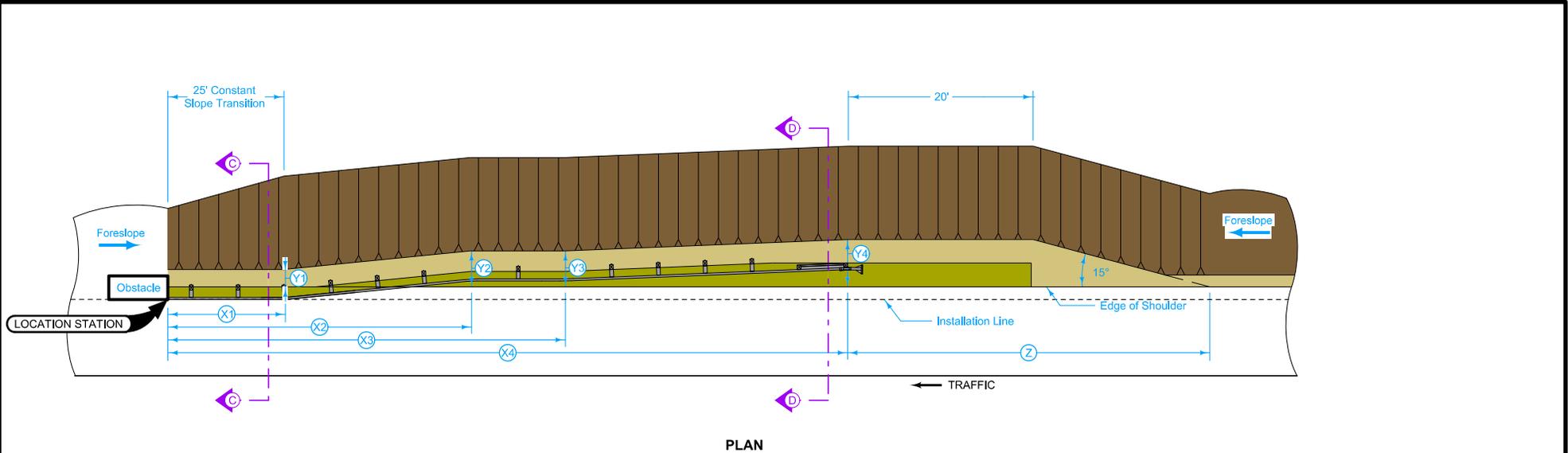
LEGEND	
	Foreslope at Guardrail
	Slope - 10:1
	Match adjacent shoulder.

**GUARDRAIL INSTALLATION LINE AT OR WITHIN 10 FEET OF SHOULDER**

Ⓨ4 feet	Ⓩ feet
5	39
6	43
7	47
8	50
9	54
10	57
11	61
12	65
13	69
14	72
15	76
16	80
17	83
18	87
19	91
20	95

Possible Tabulation:  
107-23

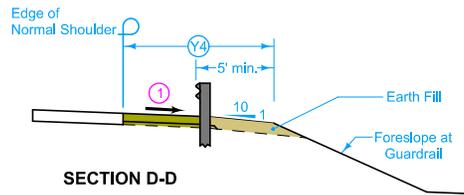
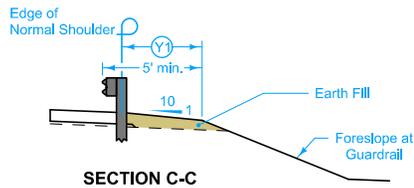
 <b>STANDARD ROAD PLAN</b>	REVISION 1 10-20-15
	<b>EW-301</b> SHEET 1 of 5
	REVISIONS: Changed slope in front of guardrail from a 10 to 1 to match the slope of the adjacent shoulder. Added note 3 on Sheet 4. <i>Brian Smith</i> APPROVED BY DESIGN METHODS ENGINEER
<b>GUARDRAIL GRADING</b>	



① Match slope of adjacent shoulder.

⊗ Measured from Location Station.

Ⓨ Distance from edge of normal shoulder to toe of 10:1 slope

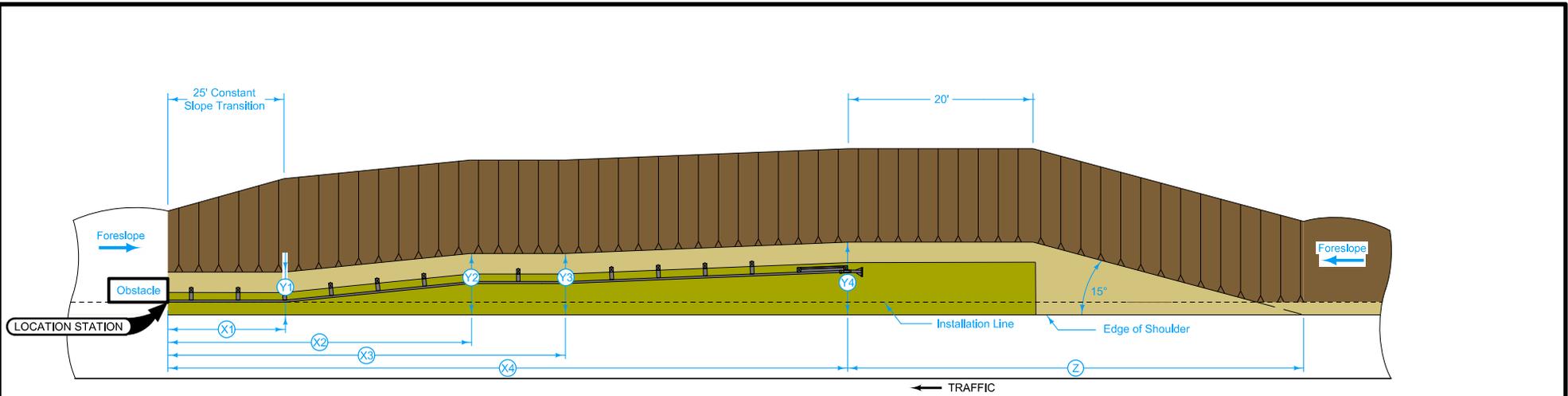


LEGEND	
	Foreslope at Guardrail
	Slope - 10:1
	Match adjacent shoulder.

Ⓨ4 feet	Ⓩ feet
5	39
6	43
7	47
8	50
9	54
10	57
11	61
12	65
13	69
14	72
15	76
16	80
17	83
18	87
19	91
20	95

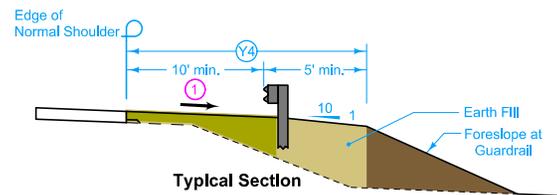
**GUARDRAIL INSTALLATION LINE WITHIN SHOULDER**

 <b>STANDARD ROAD PLAN</b>	REVISION 1    10-20-15
	<b>EW-301</b>
	SHEET 2 of 5
REVISIONS: Changed slope in front of guardrail from a 10 to 1 to match the slope of the adjacent shoulder. Added note 3 on Sheet 4.	
 APPROVED BY DESIGN METHODS ENGINEER	
GUARDRAIL GRADING	



PLAN

- ① Match slope of adjacent shoulder.
- ⓧ Measured from Location Station.
- Ⓨ Distance from edge of normal shoulder to toe of 10:1 slope



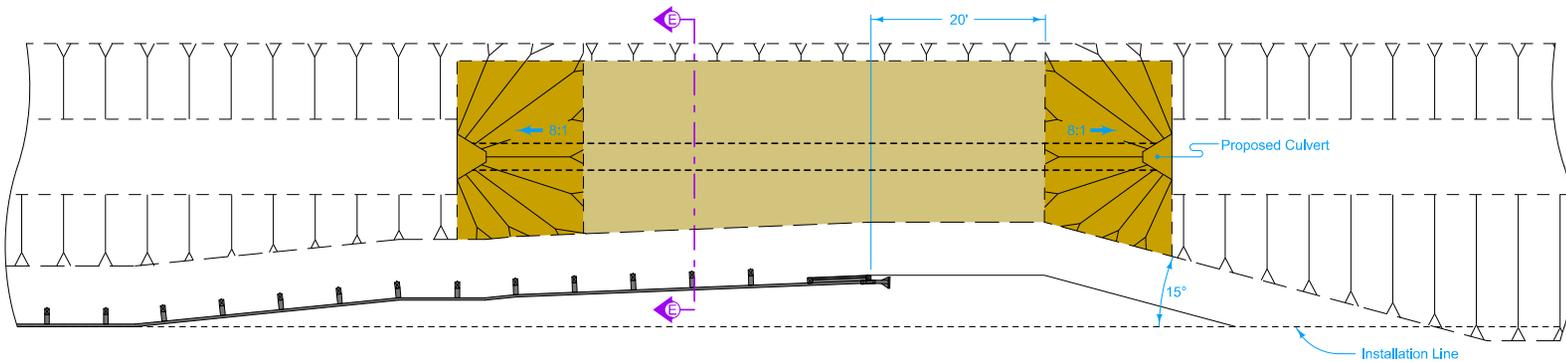
Typical Section

LEGEND	
	Foreslope at Guardrail
	Slope - 10:1
	Match adjacent shoulder.

Ⓨ4 feet	Ⓩ feet
5	39
6	43
7	47
8	50
9	54
10	57
11	61
12	65
13	69
14	72
15	76
16	80
17	83
18	87
19	91
20	95

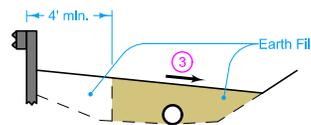
GUARDRAIL INSTALLATION LINE BEYOND 10 FEET FROM SHOULDER

 <b>STANDARD ROAD PLAN</b>	REVISION
	1   10-20-15
	<b>EW-301</b>
SHEET 3 of 5	
REVISIONS: Changed slope in front of guardrail from a 10 to 1 to match the slope of the adjacent shoulder. Added note 3 on Sheet 4.	
 APPROVED BY DESIGN METHODS ENGINEER	
<b>GUARDRAIL GRADING</b>	



PLAN

- ② See sheets 1, 2, or 3 for unshaded areas.
- ③ 10:1 preferred; no steeper than 6:1.



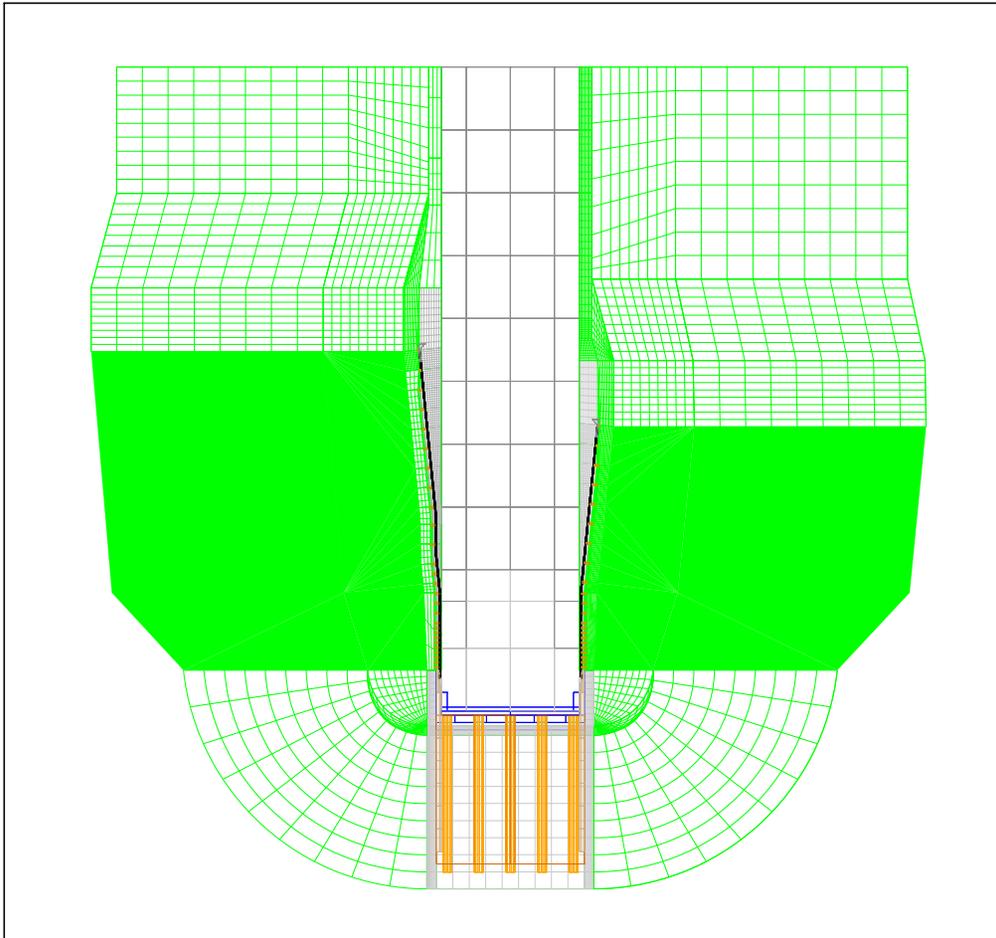
SECTION E-E

LEGEND	
	Slope - 10:1
	Slope - 8:1

FILL OVER PIPE CULVERT ②

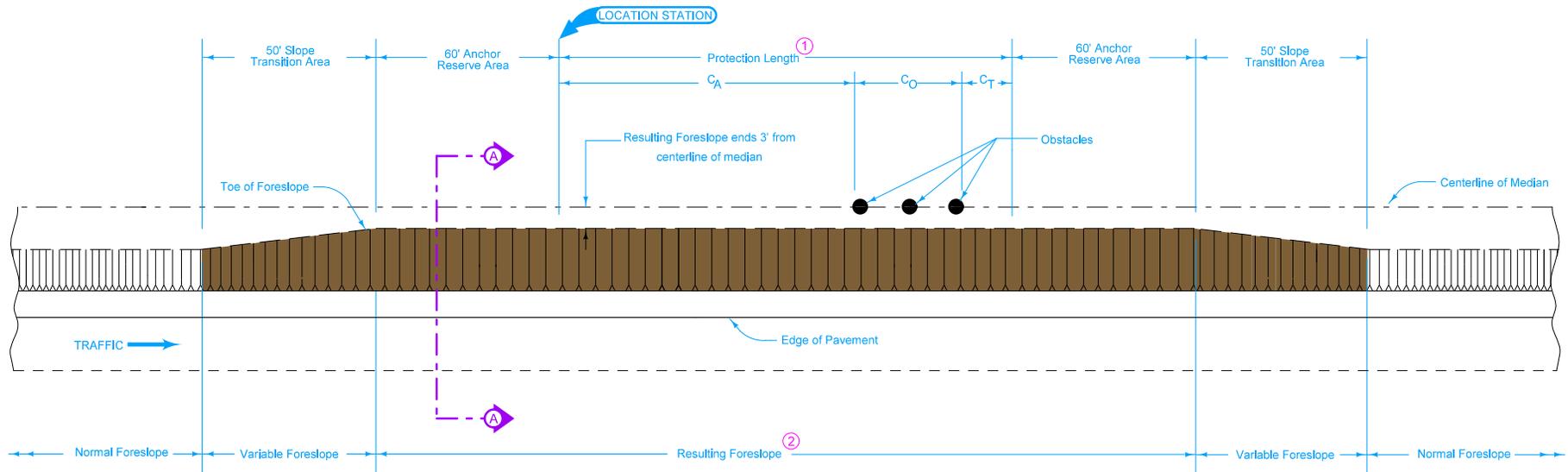
 <b>STANDARD ROAD PLAN</b>	REVISION
	1   10-20-15
	<b>EW-301</b>
SHEET 4 of 5	
REVISIONS: Changed slope in front of guardrail from a 10 to 1 to match the slope of the adjacent shoulder. Added note 3 on Sheet 4.	
 APPROVED BY DESIGN METHODS ENGINEER	
<b>GUARDRAIL GRADING</b>	

This image can be viewed in 3D on the the ERL or at our website <http://www.iowadot.gov/design/stdrdpIn.htm>

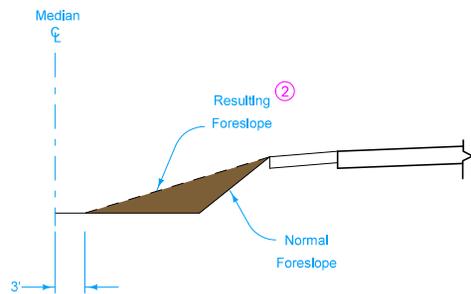


This image can be viewed in 3D on the the ERL or at our website <http://www.iowadot.gov/design/stdrdpIn.htm>

 <b>STANDARD ROAD PLAN</b>	REVISION	1	10-20-15
	<b>EW-301</b>		
	SHEET 5 of 5		
REVISIONS: Changed slope in front of guardrail from a 10 to 1 to match the slope of the adjacent shoulder. Added note 3 on Sheet 4.			
<i>Brian Smith</i> APPROVED BY DESIGN METHODS ENGINEER			
<b>GUARDRAIL GRADING</b>			



PLAN



SECTION A-A

Possible Contract Items:

- Topsail
- Embankment in Place
- Excavation, Class 10

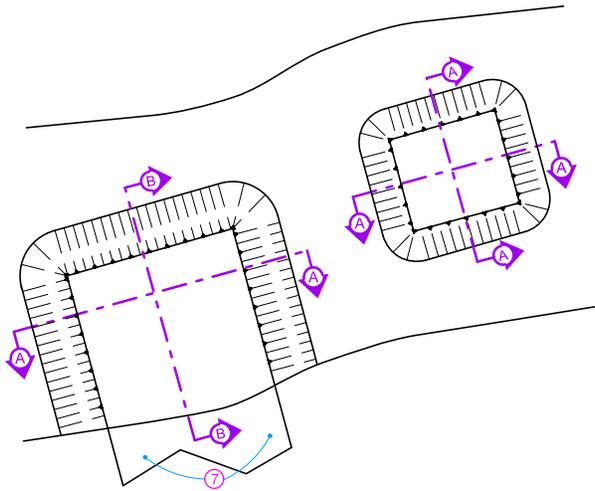
Possible Tabulations:

- 107-24
- 108-9A

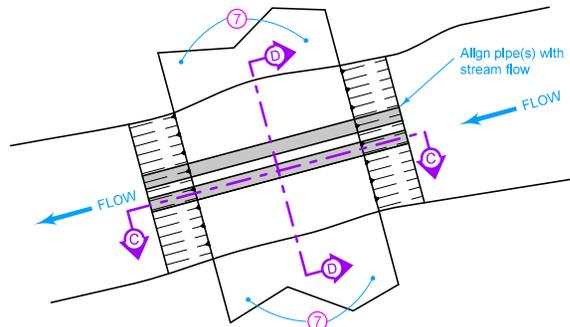
Provide positive drainage through the median obstacle area.

- ① Refer to Tabulation 108-9A and BA-351.
- ② No steeper than 6:1. See plans for detailed drawings.

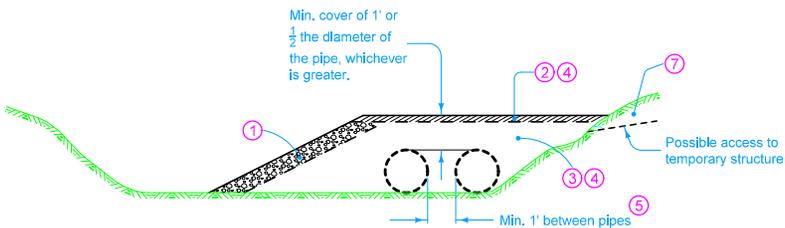
 <b>STANDARD ROAD PLAN</b>	<small>REVISION</small> 1   10-20-15
	<b>EW-302</b>
	<small>SHEET 1 of 1</small>
<small>REVISIONS: Modified note 2, Added Designer Info button.</small>	
 <small>APPROVED BY DESIGN METHODS ENGINEER</small>	
<b>SPECIAL SHAPING FOR HIGH TENSION CABLE GUARDRAIL AT MEDIAN OBSTACLES</b>	



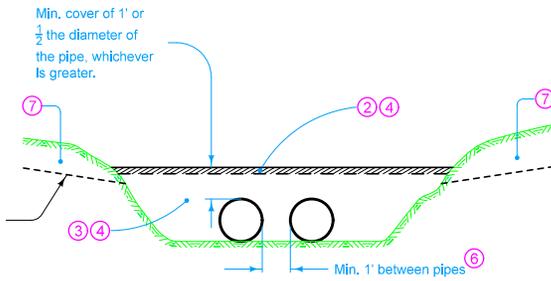
TYPICAL PLAN (CAUSEWAY OR EQUIPMENT PAD) 5



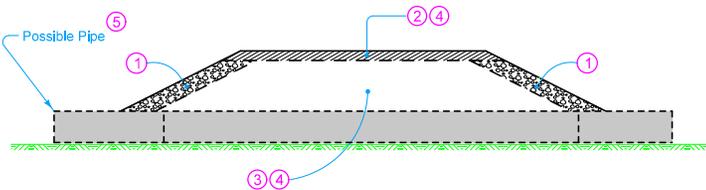
TYPICAL PLAN (STREAM CROSSING) 6



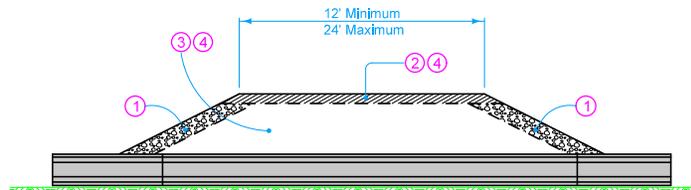
SECTION B-B (CAUSEWAY) 5



SECTION D-D (STREAM CROSSING) 6



SECTION A-A 5



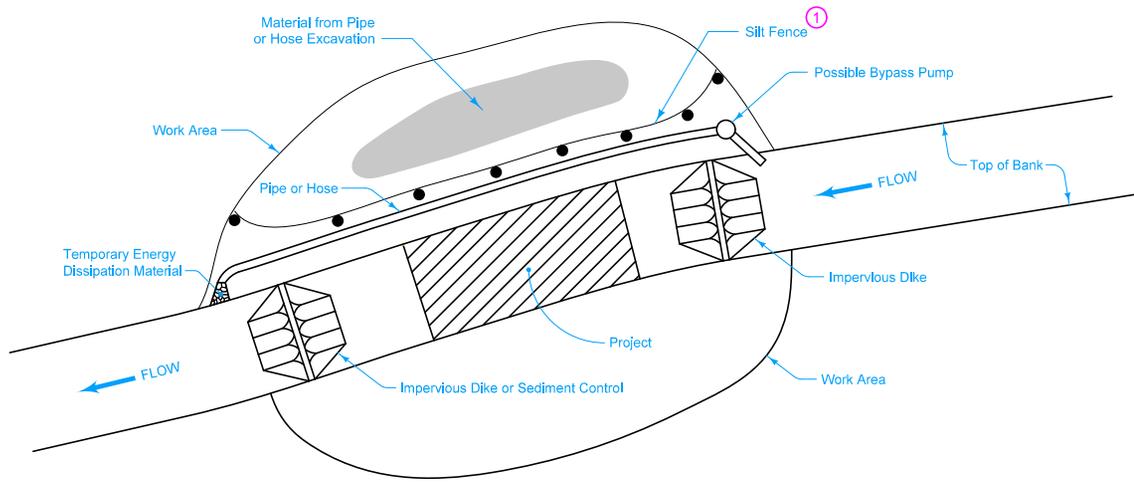
SECTION C-C 6

- 1 Minimum 1 foot of Class D revetment, Class E revetment, or broken concrete meeting the requirements of Section 4130 of the Standard Specifications.
- 2 Possible choke layer for construction traffic. Use any combination of erosion stone, granular backfill, special backfill (except with reclaimed HMA), granular surfacing material, or granular soils of AASHTO classification A-1 or A-2 with less than 5% fines passing the #200 sieve.
- 3 Use clean material with less than 5% fines passing the #200 sieve. Acceptable materials include revetment and granular materials.
- 4 When dredging is allowed by a permit, use dredged material containing 10% or less passing the #200 sieve. Prior to beginning construction according to EW-401, install erosion control measures according to EC-202. Leave these measures in place and maintain until temporary EW-401 materials have been completely removed. Installation, maintenance, and removal of these erosion control measures is incidental and will not be paid for separately.
- 5 Pipe required if structure spans more than half the distance between banks. Contractor determines size and number of pipe(s) unless specified otherwise in the contract documents.
- 6 Pipe required. Contractor determines size and number of pipe(s) unless specified otherwise in the contract documents.
- 7 When material needs to be cut from the bank to provide for access to construct and use a temporary stream structure, move this material to an upland location.

<b>IOWA DOT</b> <b>STANDARD ROAD PLAN</b>	REVISION	
	2	10-20-15
	<b>EW-401</b>	
SHEET 1 of 1		
REVISIONS: Corrected typo in note 4. Updated the DOT logo.		

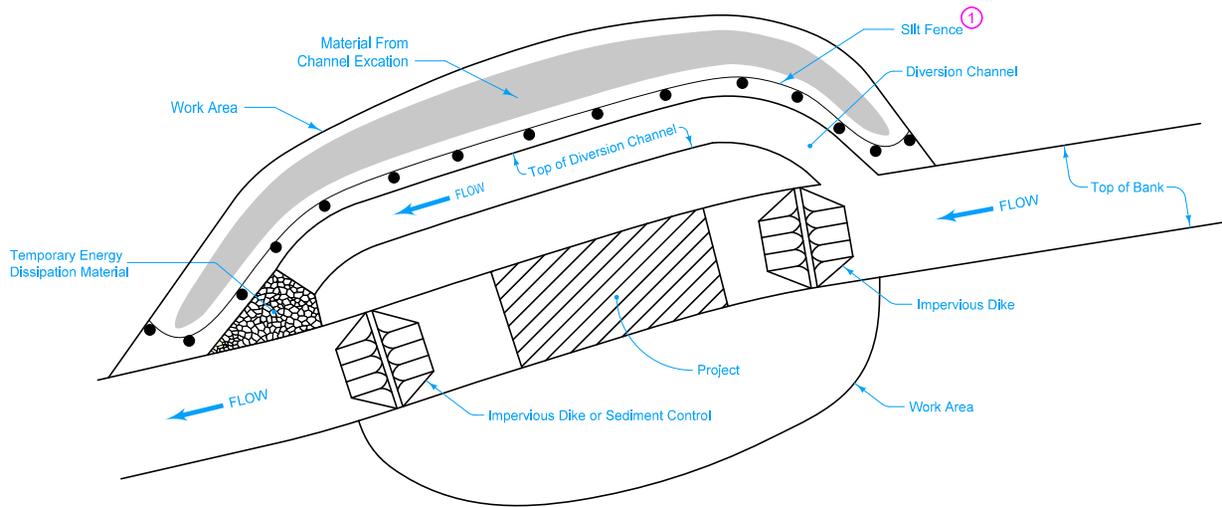
*Brian Smith*  
APPROVED BY DESIGN METHODS ENGINEER

**TEMPORARY STREAM CROSSING,  
CAUSEWAY, OR EQUIPMENT PAD**



PIPE OR HOSE

① Extend ends of silt fence to work area boundry.

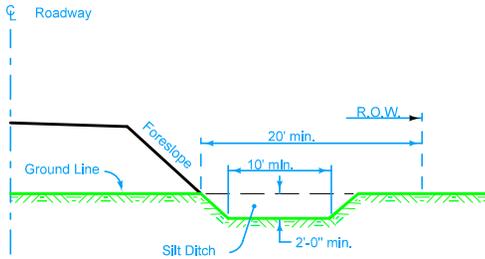


DIVERSION CHANNEL

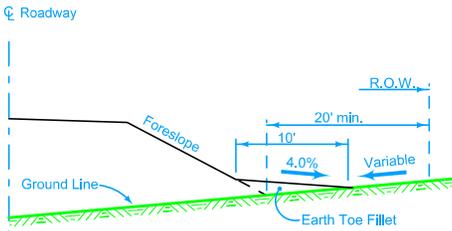
- Possible Contract Items:
- Temporary Stream Diversion
  - Silt Fence
  - Removal of Silt Fence or Silt Fence for Ditch Check Perimeter and Slope Sediment Control Device

- Possible Tabulations:
- 100-26
  - 100-17

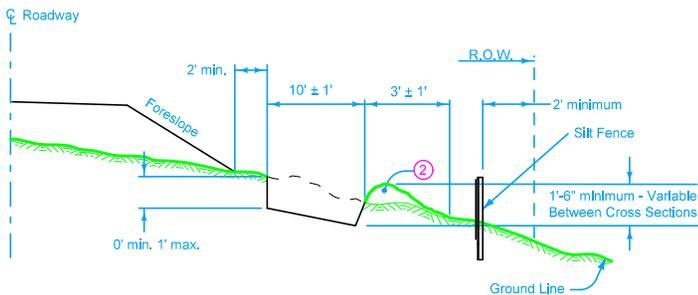
	REVISION
	2   04-18-17
STANDARD ROAD PLAN	EW-402
SHEET 1 of 1	
REVISIONS: Added silt fence in DIVERSION CHANNEL and PIPE OR HOSE views.	
 APPROVED BY DESIGN METHODS ENGINEER	
<b>TEMPORARY STREAM DIVERSION</b>	



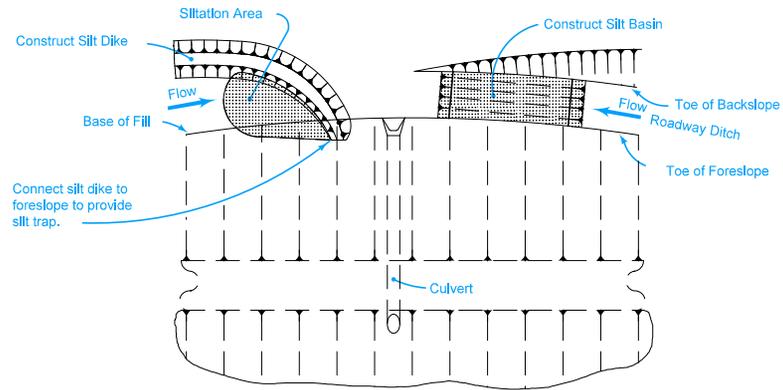
**SILT DITCH**



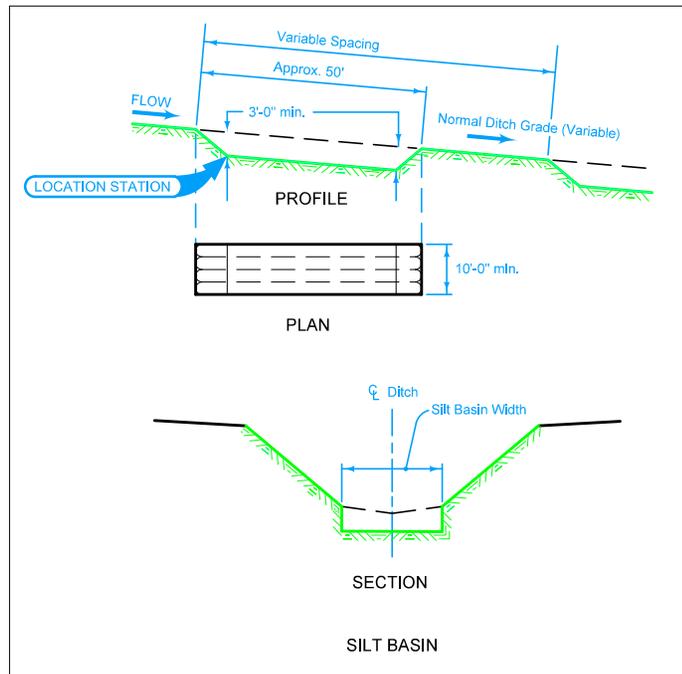
**TOE FILLET** ①



**SILT DIKE**



**TYPICAL PLAN WITH  
PERMANENT CULVERT INSTALLATION**



Obtain the Engineer's approval for installation locations.

- ① Construct an earth fillet at the toe of the roadway foreslope for areas where a roadway ditch, silt ditch, or silt dike is not provided. This Toe Fillet is incidental to "Roadway and Borrow Excavation".
- ② Windrow of excavated and compacted silt material or deposited and compacted earth.

Possible Contract Items:

- Silt Ditch
- Silt Dike
- Silt Basin

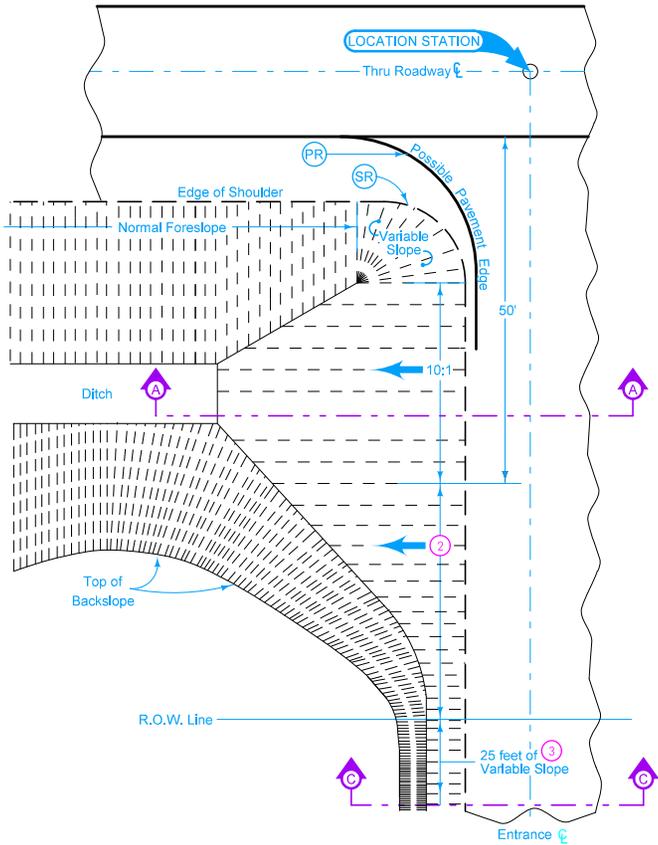
Possible Tabulations:

- 100-13
- 100-14
- 100-15

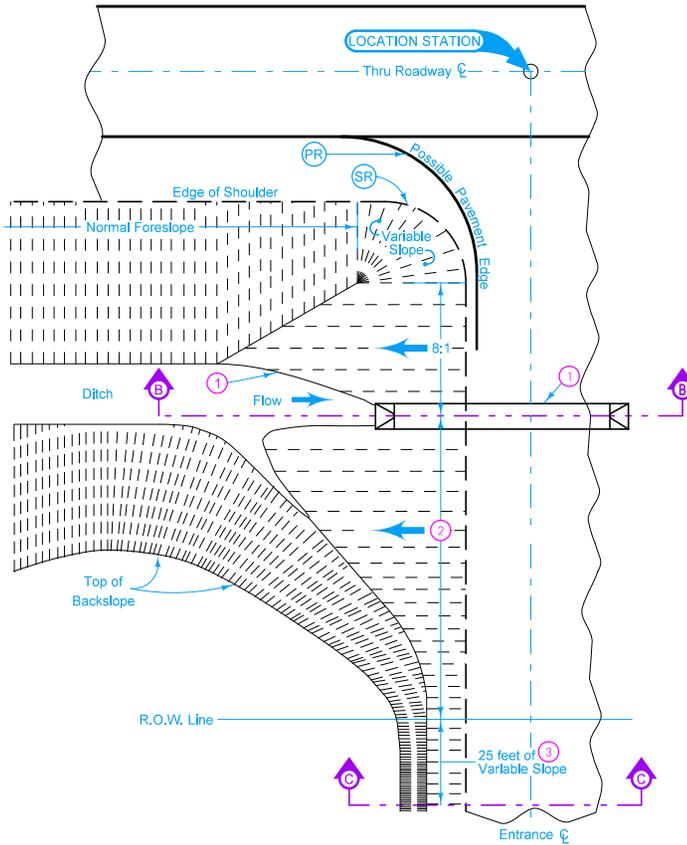
<b>IOWA DOT</b>	REVISION	
	3	04-18-17
	<b>EW-403</b>	
<b>STANDARD ROAD PLAN</b>		SHEET 1 of 1
REVISIONS: Added Location Station to Silt Basin View. Added Designer Info button.		

*Brian Smith*  
APPROVED BY DESIGN METHODS ENGINEER

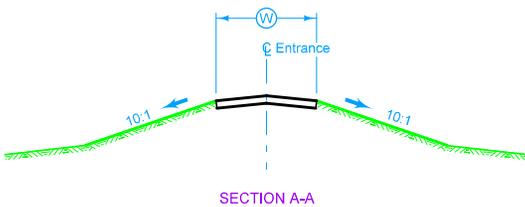
**TEMPORARY EROSION  
CONTROL MEASURES**



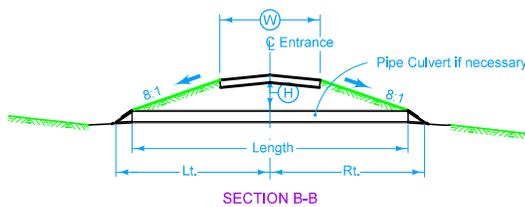
**TYPE B OR C ENTRANCE WITHOUT PIPE**



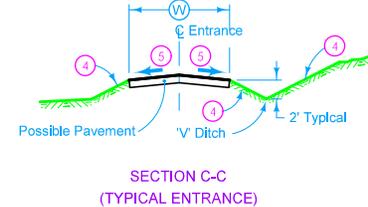
**TYPE B OR C ENTRANCE WITH PIPE**



**SECTION A-A**



**SECTION B-B**



**SECTION C-C (TYPICAL ENTRANCE)**

Smoothly shape and round surface and slopes of entrances where practical to provide minimal hazard to an out of control vehicle from through roadway.

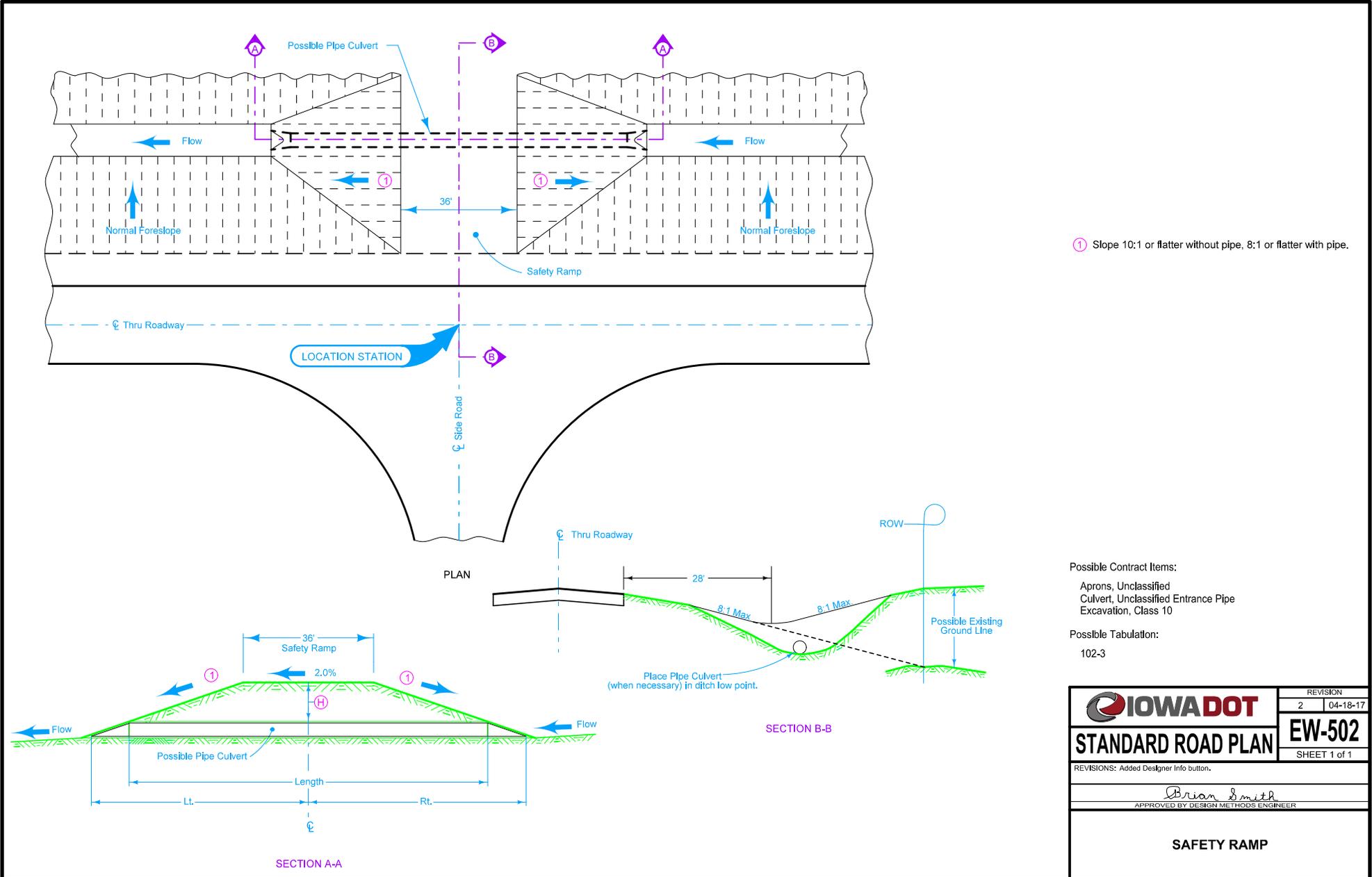
Earthwork and material used for construction of entrances are included in estimate of quantities.

- 1 Locate entrance pipe culverts to coincide with the line of the toe of backslopes as shown. Some special shaping of ditch may be required to fit culvert. Refer to tabulation of entrance pipe culverts and cross sections for details of installation.
- 2 Smooth transition to 6:1 at ROW line. If foreslopes of existing entrance are 6:1 or flatter, transition to existing entrance foreslopes.
- 3 Smooth transition from 6:1 to existing foreslope if existing foreslope steeper than 6:1.
- 4 3:1 for new entrance. Existing slope for existing entrance.
- 5 3% for new entrance. Existing slope for existing entrance.

Possible Contract Items:  
Aprons, Unclassified Culvert, Unclassified Entrance Pipe  
Excavation, Class 10

Possible Tabulation:  
102-3

<p><b>STANDARD ROAD PLAN</b></p>	REVISION
	1   10-20-15
	<b>EW-501</b>
SHEET 1 of 1	
REVISIONS: Replaced the DOT logo in the title block with the new version.	
<p>APPROVED BY DESIGN METHODS ENGINEER</p>	
<b>RURAL ENTRANCE</b>	

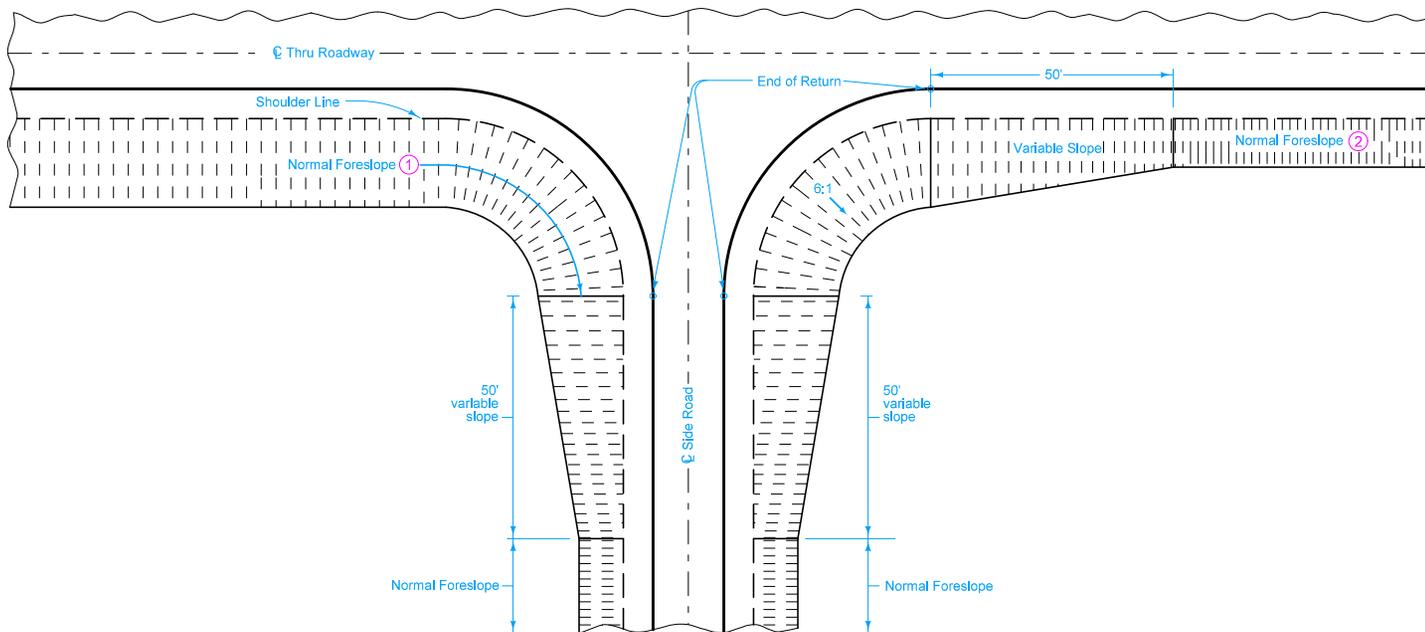


	REVISION	04-18-17
	2	
	<b>EW-502</b>	
<b>STANDARD ROAD PLAN</b>		SHEET 1 of 1
REVISIONS: Added Designer Info button.		

APPROVED BY DESIGN METHODS ENGINEER

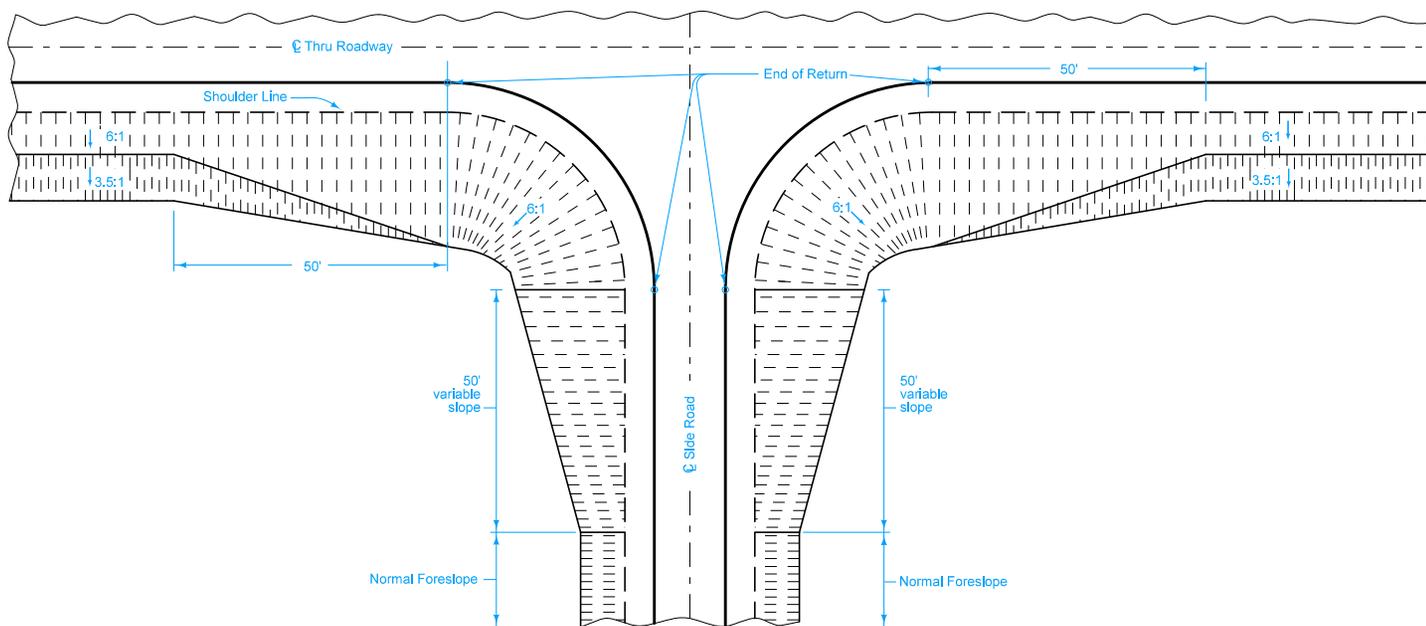
**SAFETY RAMP**

- ① For normal foreslopes 6:1 or flatter.
- ② For normal foreslopes steeper than 6:1.



NORMAL FORESLOPES

	REVISION	
	1	10-20-15
<b>STANDARD ROAD PLAN</b>	<b>EW-503</b>	
	SHEET 1 of 2	
REVISIONS: Replaced the DOT logo in the title block with the new version.		
<i>Brian Smith</i> APPROVED BY DESIGN METHODS ENGINEER		
<b>SIDE ROAD GRADING</b>		



BARNROOF

	REVISION	
	1	10-20-15
<b>STANDARD ROAD PLAN</b>	<b>EW-503</b>	
	SHEET 2 of 2	
REVISIONS: Replaced the DOT logo in the title block with the new version.		
		
APPROVED BY DESIGN METHODS ENGINEER		
<b>SIDE ROAD GRADING</b>		