# Earthwork

EW

SECTION

# EW

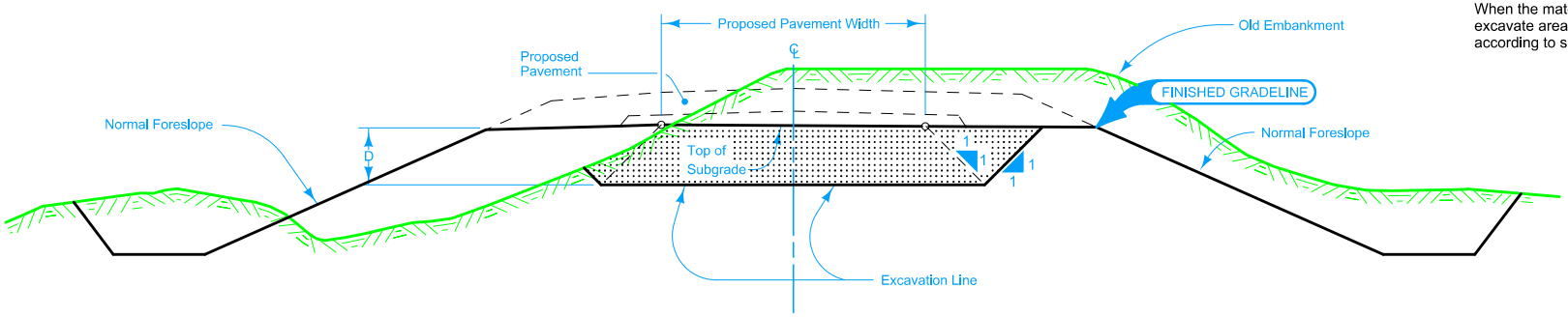
# Earthwork

| NO. | DATE | TITLE |
|---|---|---|
| | | **Embankments** |
| EW-101 | 10-17-17 | 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 |
| | | **Grading at Bridges** |
| 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 | 10-20-20 | Bridge Berm Grading with Recoverable Slope (Non-Barnroof Section) |
| EW-204 | 10-20-20 | Bridge Berm Grading with Recoverable Slope (Barnroof Section) |
| EW-210 | 10-20-15 | Standard Wing Dikes |
| EW-211 | 10-17-17 | Special Grading at Side Piers |
| EW-212 | 10-20-15 | Settlement Plate |
| | | **Grading for Guardrail** |
| EW-301 | 10-20-15 | Guardrail Grading |
| EW-302 | 10-20-15 | Special Shaping for High Tension Cable Guardrail at Median Obstacles |
| | | **Erosion Control** |
| 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 |
| | | **Entrances, Sideroads, and Safety Ramps** |
| EW-501 | 10-20-15 | Rural Entrance |
| EW-502 | 04-18-17 | Safety Ramp |
| EW-503 | 10-20-15 | Side Road Grading |

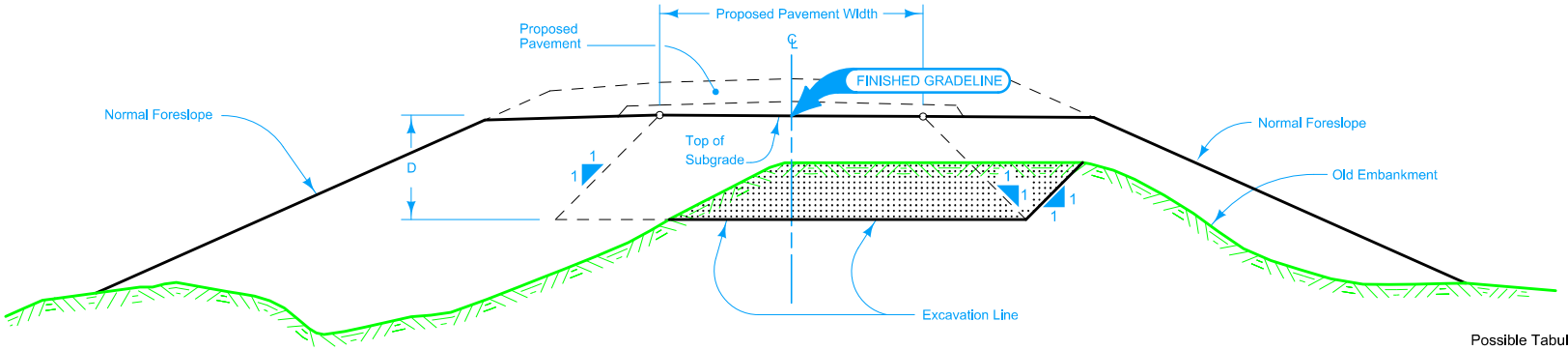
DESIGNER INFO

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 Plowing and Shaping

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 3 | 10-17-17 |

EW-101

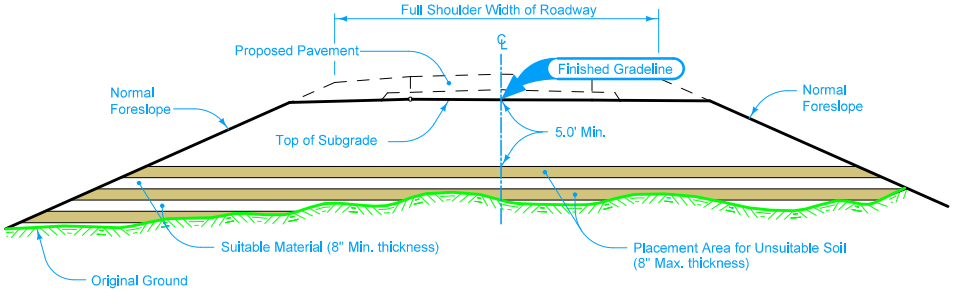
SHEET 1 of 1

REVISIONS: Added Designer Info button. Modified legend and top drawing.

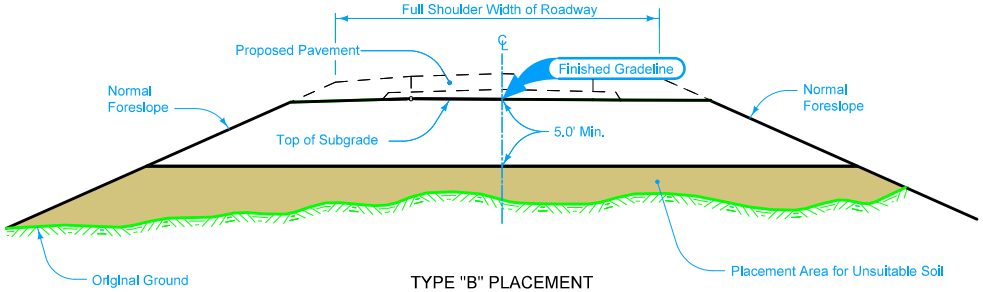
Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

**EMBANKMENT AND REBUILDING EMBANKMENTS**

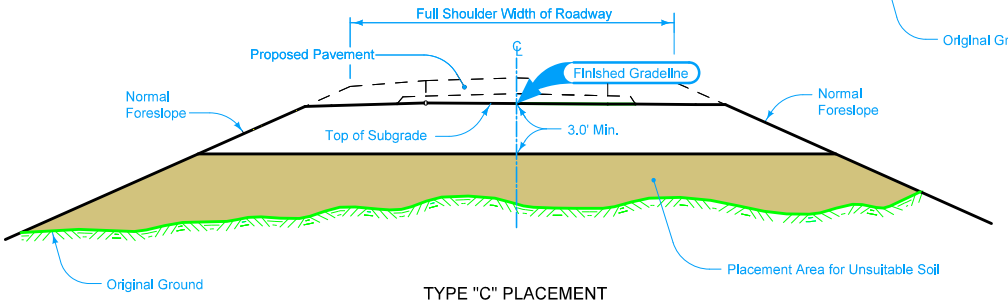
Place unsuitable soil as detailed for the particular type of soil described in Section 2102 of the Standard Specifications. Project plan details or specific directions of the Engineer may require placement of topsoil or other unsuitable soil by methods other than those shown. Refer also to plan cross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



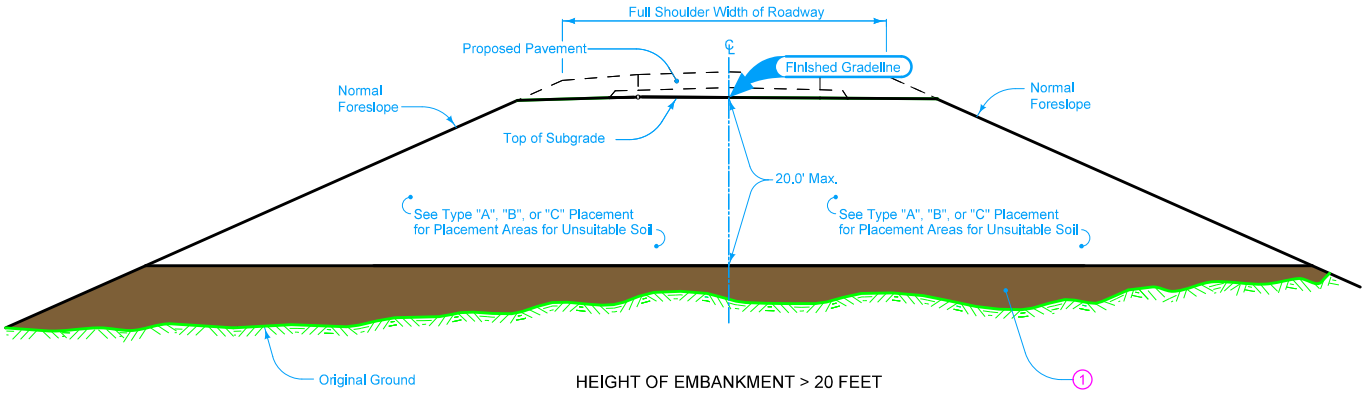

TYPE "A" PLACEMENT




TYPE "B" PLACEMENT




TYPE "C" PLACEMENT




HEIGHT OF EMBANKMENT > 20 FEET

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.

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 2 | 10-20-15 |

EW-102

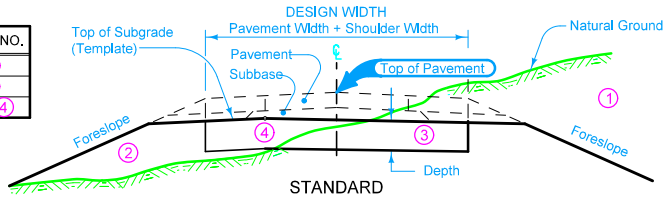
SHEET 1 of 1

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

Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

**ALLOWABLE PLACEMENT OF UNSUITABLE SOIL IN EMBANKMENTS**

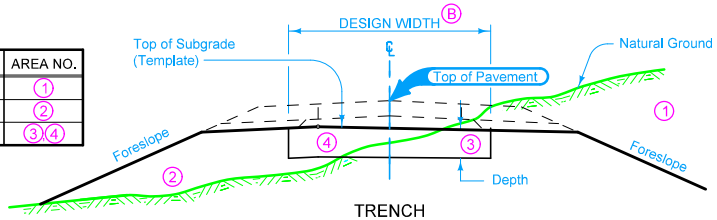
| TYPE OF WORK | AREA NO. |
|---|---|
| Excavation | 1 |
| Embankment | 2 |
| Subgrade Treatment | 3, 4 |




STANDARD
SUBGRADE TREATMENT

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

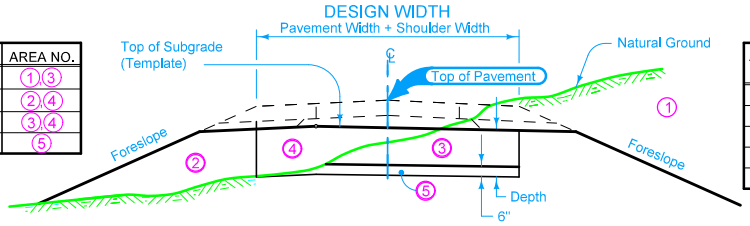
| TYPE OF WORK | AREA NO. |
|---|---|
| Excavation | 1 |
| Embankment | 2 |
| Subgrade Treatment | 3, 4 |




TRENCH
SUBGRADE TREATMENT

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

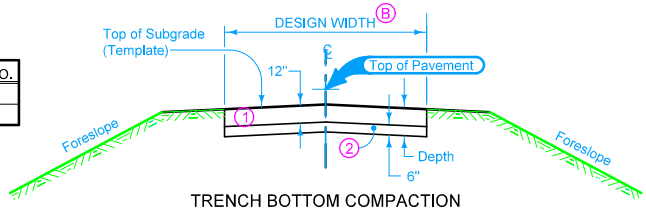
| TYPE OF WORK | AREA NO. |
|---|---|
| Excavation | 1, 3 |
| Embankment | 2, 4 |
| M & D Embankment | 3, 4 |
| Scarify with M & D Embank. | 5 |




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 |

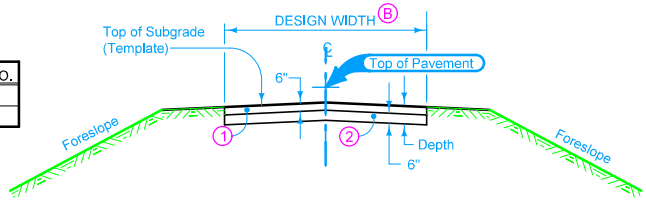
| TYPE OF WORK | AREA NO. |
|---|---|
| Excavation | 1 |
| Scarify | 2 |




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

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 1 | 10-20-15 |

EW-103

SHEET 1 of 1

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

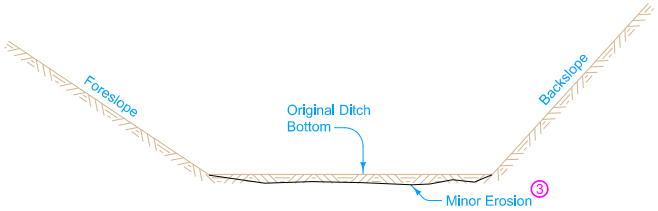
Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

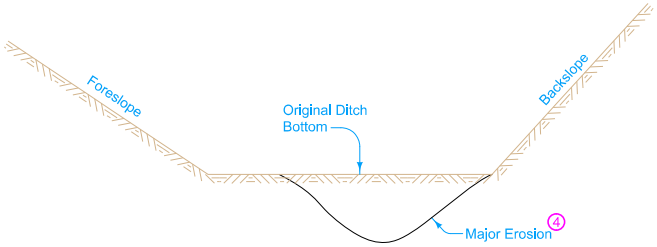
**EMBANKMENT SUBGRADE TREATMENT, MOISTURE DENSITY CONTROL AND SPECIAL COMPACTION**

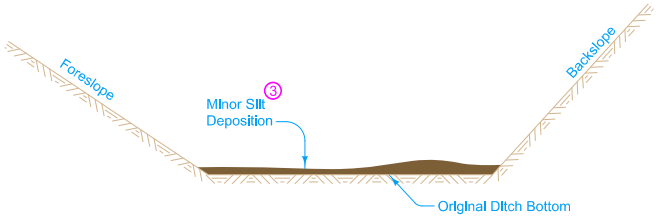
SLOPE RESHAPING

CLASS 10

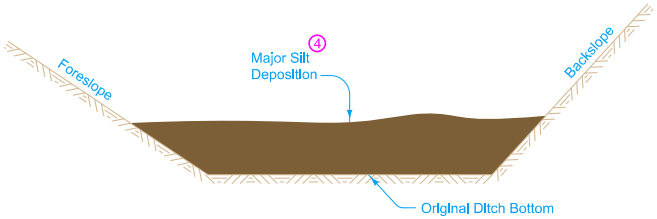
RESHAPING SLOPES




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 topsoill 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 topsoill 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

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| New | 04-21-15 |

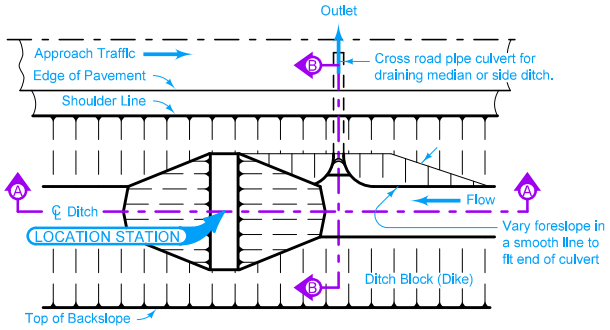
EW-105

SHEET 1 of 1

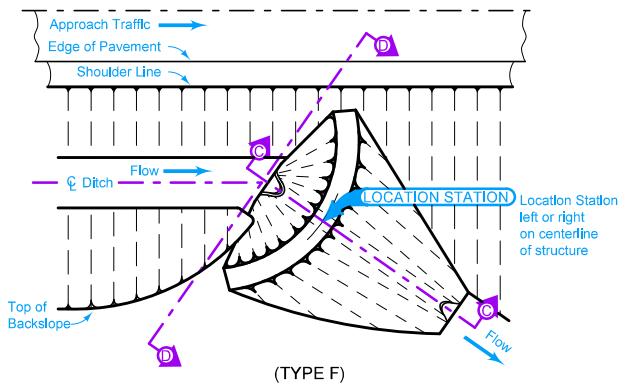
REVISIONS: New.

Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

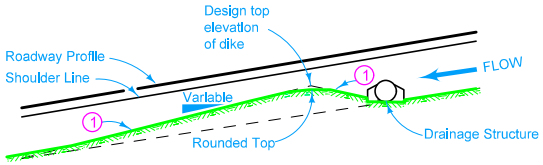
**RESHAPING SLOPES AND DITCHES**



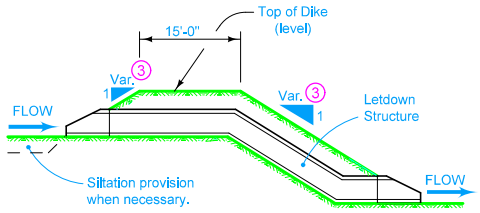

(TYPE M AND G)
TYPICAL PLAN FOR DITCH BLOCK (DIKE)



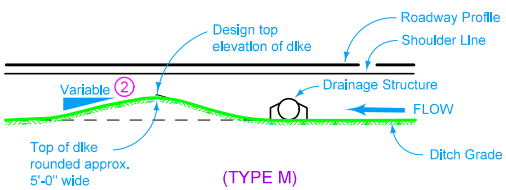

(TYPE F)
TYPICAL PLAN FOR DIKE AT LETDOWN STRUCTURES



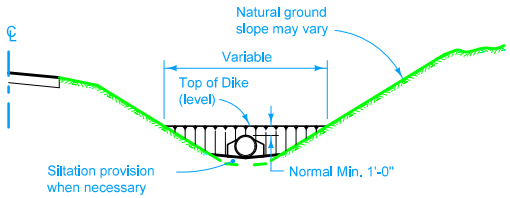

(TYPE G)
TYPICAL SECTION A-A



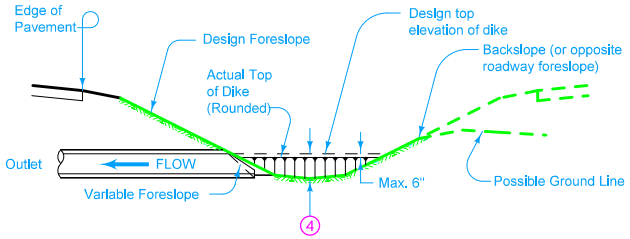

(TYPE F)
TYPICAL SECTION C-C




(TYPE M)
TYPICAL SECTION A-A




(TYPE F)
TYPICAL SECTION D-D




(TYPE M AND G)
TYPICAL SECTION B-B

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.

Paymant 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.

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 1 | 10-20-15 |

EW-110

SHEET 1 of 1

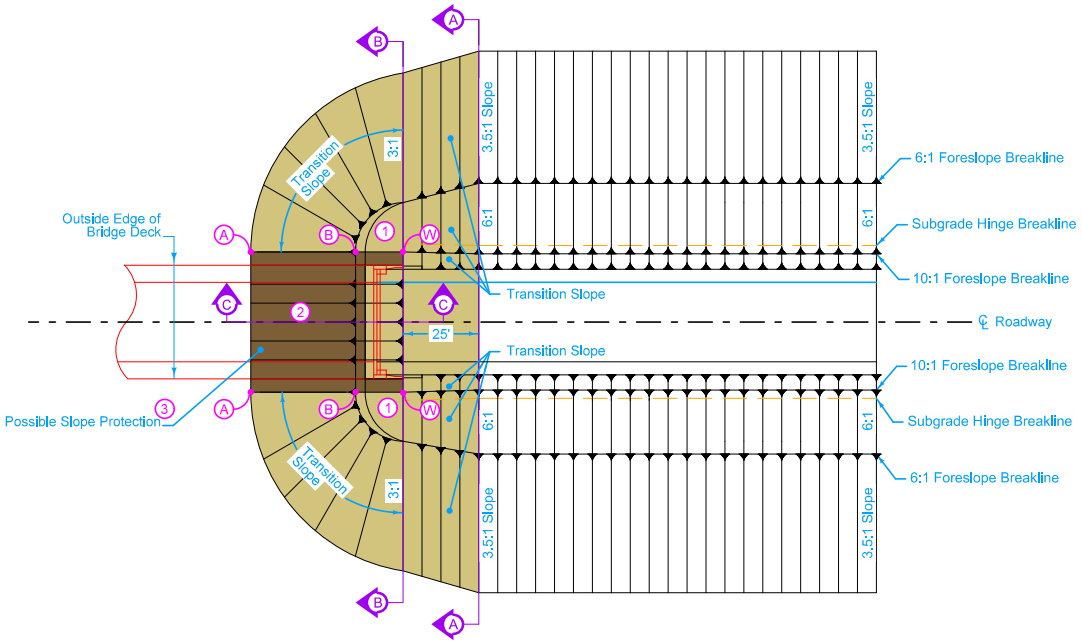
REVISIONS: Replaced the DOT logo in the title block with the new version.

Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

**DITCH BLOCKS AND DIKES**

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.




**PLAN VIEW OF BRIDGE BERM**
**(BARNROOF FORESLOPE)**

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 4 | 04-19-16 |

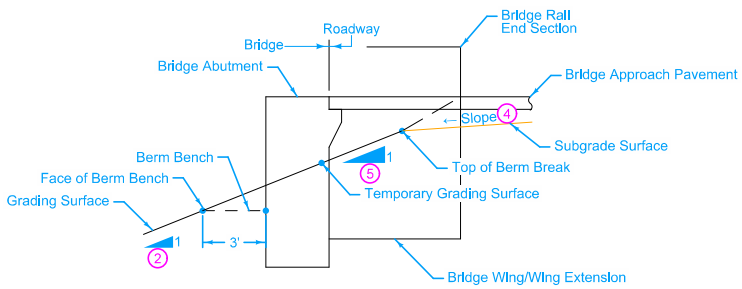
EW-201

SHEET 1 of 3

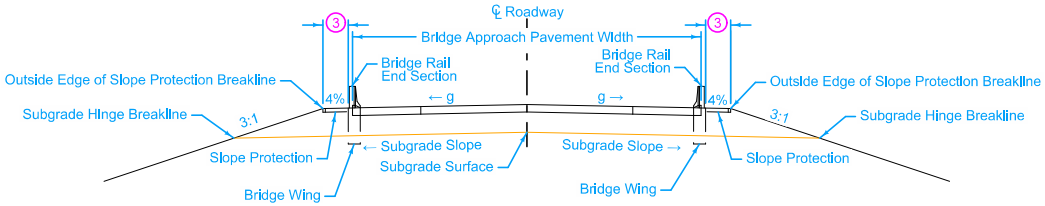
REVISIONS: Changed reference from RK series to BR series in circle note 4.

Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

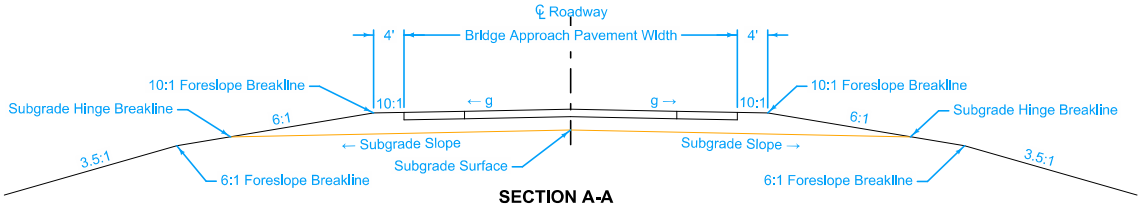
**BRIDGE BERM GRADING**
**WITHOUT RECOVERABLE SLOPE**
**(BARNROOF SECTION)**




**SECTION C-C**




**SECTION B-B**




**SECTION A-A**

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.

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 4 | 04-19-16 |

EW-201

SHEET 2 of 3

REVISIONS: Changed reference from RK series to BR series in circle note 4.

Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

**BRIDGE BERM GRADING WITHOUT RECOVERABLE SLOPE (BARNROOF SECTION)**

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

IOWADOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 4 | 04-19-16 |

EW-201

SHEET 3 of 3

REVISIONS: Changed reference from RK series to BR series in circle note 4.

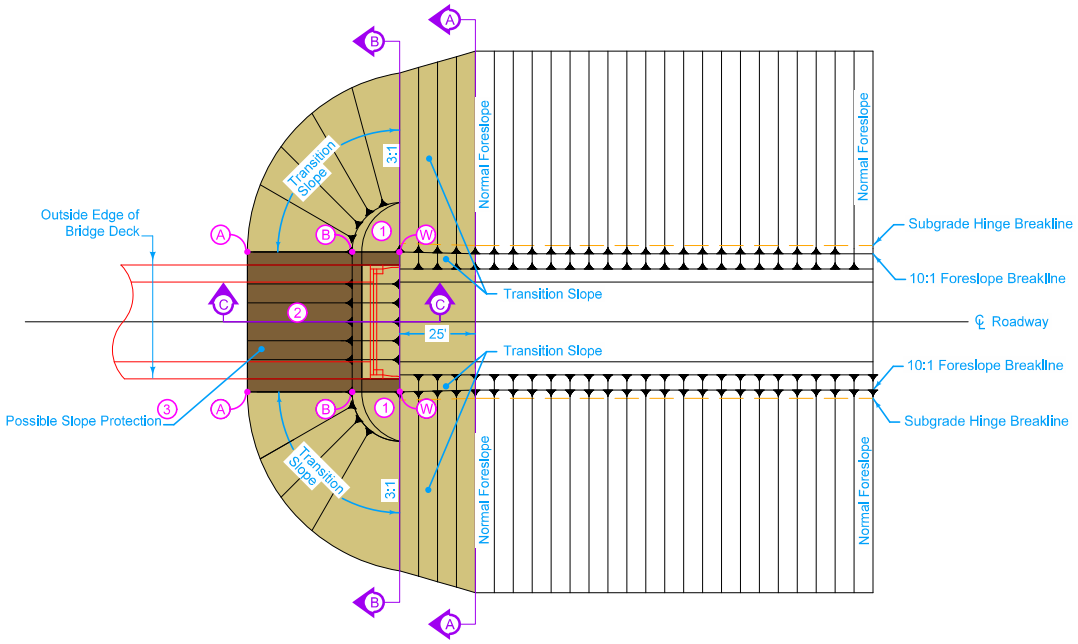
Brian Smith

APPROVED BY DESIGN METHODS ENGINEER

**BRIDGE BERM GRADING**
**WITHOUT RECOVERABLE SLOPE**
**(BARNROOF SECTION)**

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.




**PLAN VIEW OF BRIDGE BERM**
**(NON-BARNROOF FORESLOPE)**

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 4 | 04-19-16 |

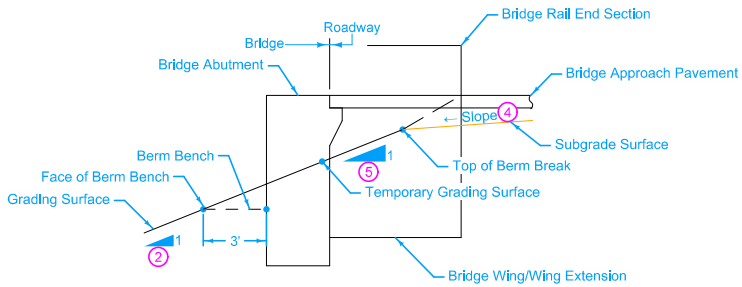
EW-202

SHEET 1 of 3

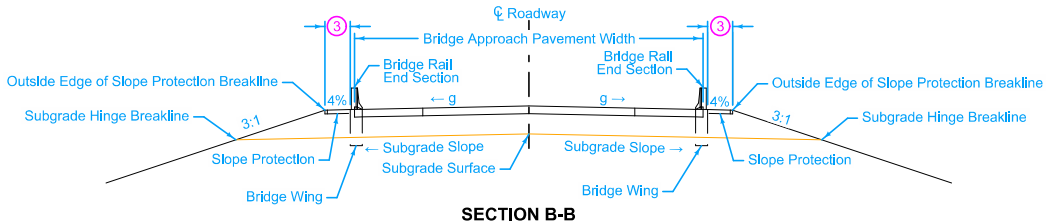
REVISIONS: Changed reference from RK series to BR series in circle note 4.

Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

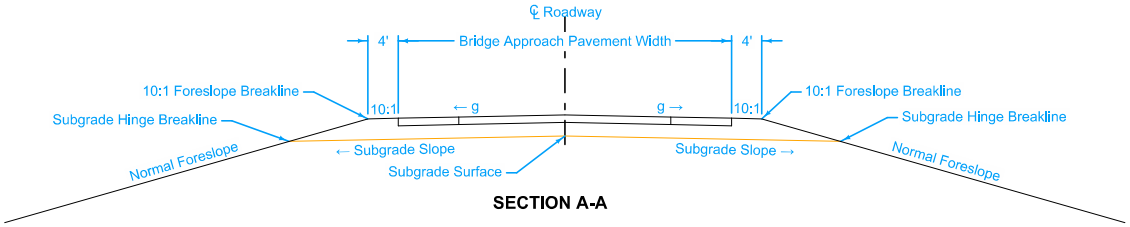
**BRIDGE BERM GRADING**
**WITHOUT RECOVERABLE SLOPE**
**(NON-BARNROOF SECTION)**




**SECTION C-C**




**SECTION B-B**




**SECTION A-A**

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.

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 4 | 04-19-16 |

EW-202

SHEET 2 of 3

REVISIONS: Changed reference from RK series to BR series in circle note 4.

Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

**BRIDGE BERM GRADING WITHOUT RECOVERABLE SLOPE (NON-BARNROOF SECTION)**

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

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 4 | 04-19-16 |

EW-202

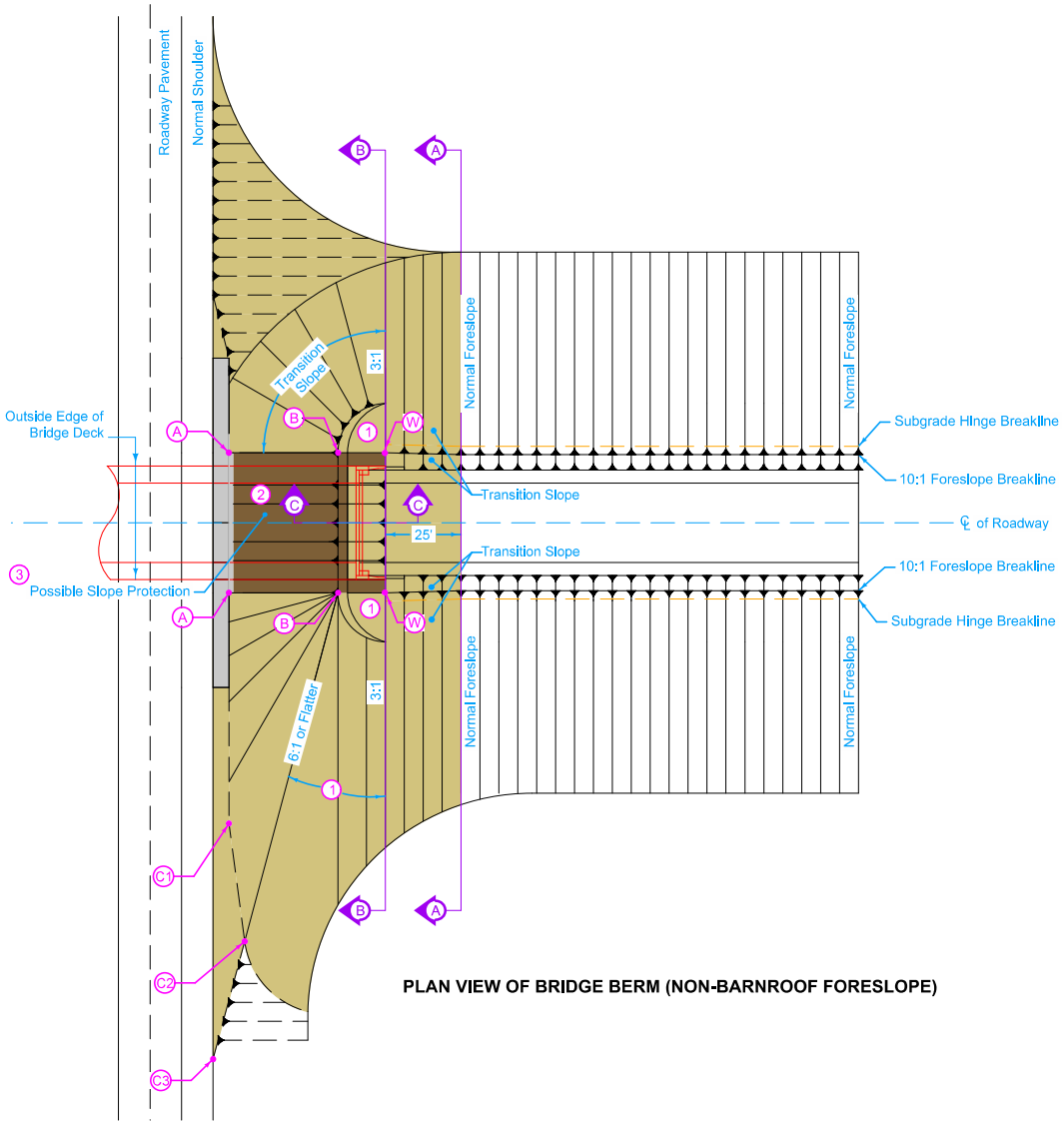
SHEET 3 of 3

REVISIONS: Changed reference from RK series to BR series in circle note 4.

Brian Smith

APPROVED BY DESIGN METHODS ENGINEER

**BRIDGE BERM GRADING**
**WITHOUT RECOVERABLE SLOPE**
**(NON-BARNROOF SECTION)**




PLAN VIEW OF BRIDGE BERM (NON-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. 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

IOWA DOT

| REVISION | |
|---|---|
| 6 | 10-20-20 |

STANDARD ROAD PLAN

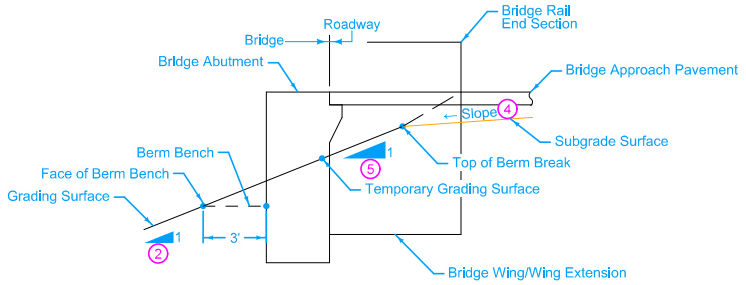
EW-203

SHEET 1 of 5

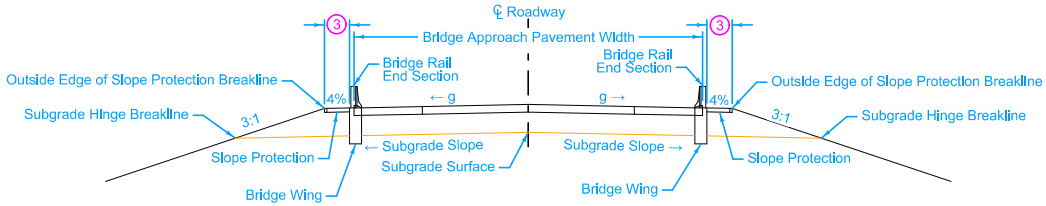
REVISIONS: Modified dimension line "A" on page 1.

APPROVED BY DESIGN METHODS ENGINEER

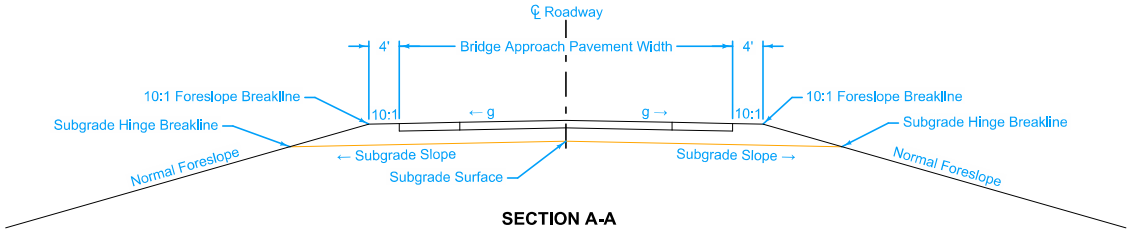
**BRIDGE BERM GRADING WITH RECOVERABLE SLOPE (NON-BARNROOF SECTION)**




**SECTION C-C**




**SECTION B-B**




**SECTION A-A**

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.

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 6 | 10-20-20 |

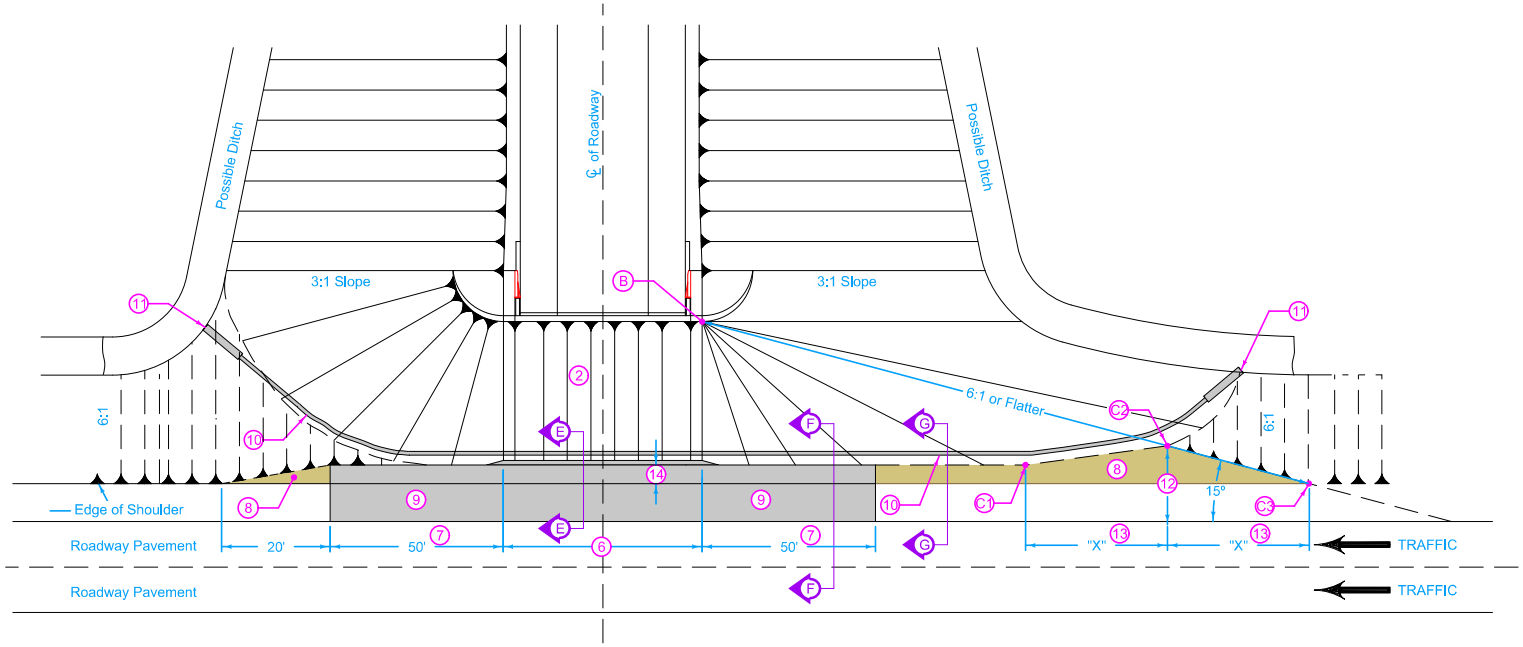
EW-203

SHEET 2 of 5

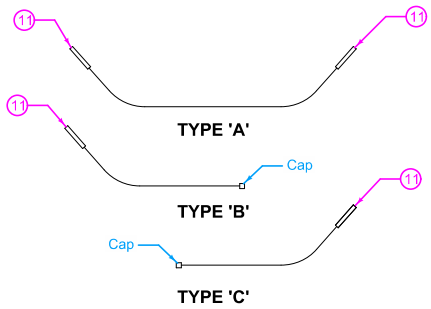
REVISIONS: Modified dimension line "A" on page 1.

APPROVED BY DESIGN METHODS ENGINEER

**BRIDGE BERM GRADING WITH RECOVERABLE SLOPE (NON-BARNROOF SECTION)**




**PLAN VIEW OF BRIDGE BERM AREA**




**TYPE 'A'**

**TYPE 'B'**

**TYPE 'C'**

**SUBDRAIN LAYOUT TYPES**

(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-306 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.

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 6 | 10-20-20 |

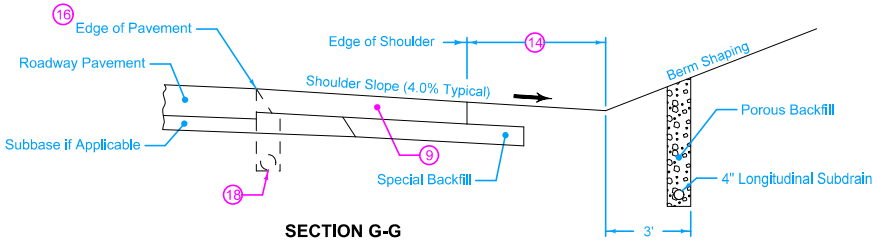
EW-203

SHEET 3 of 5

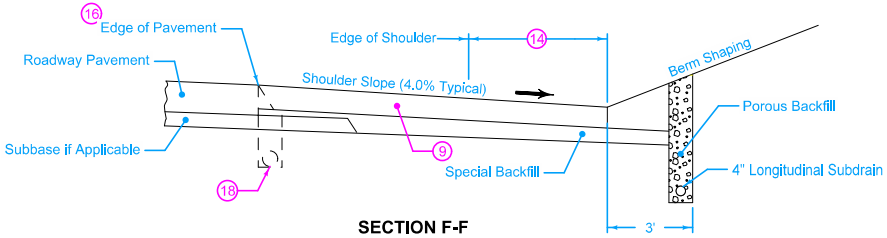
REVISIONS: Modified dimension line "A" on page 1.

APPROVED BY DESIGN METHODS ENGINEER

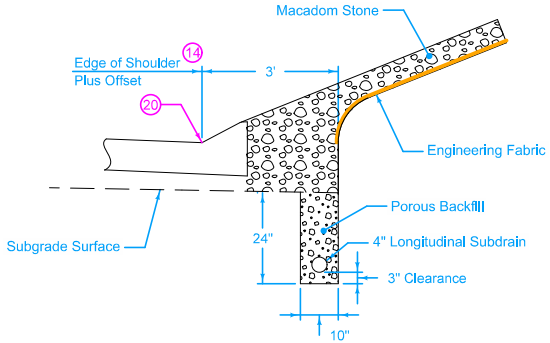
**BRIDGE BERM GRADING WITH RECOVERABLE SLOPE (NON-BARNROOF SECTION)**



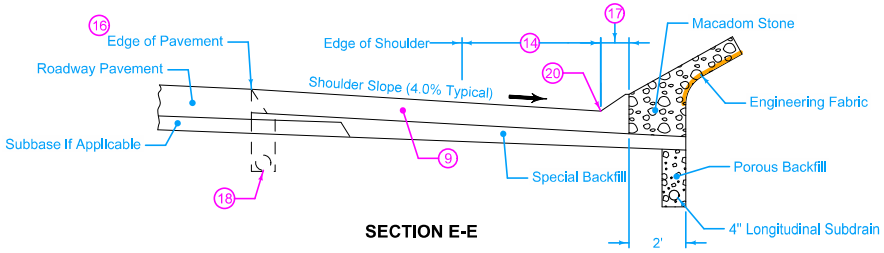

**SECTION G-G**



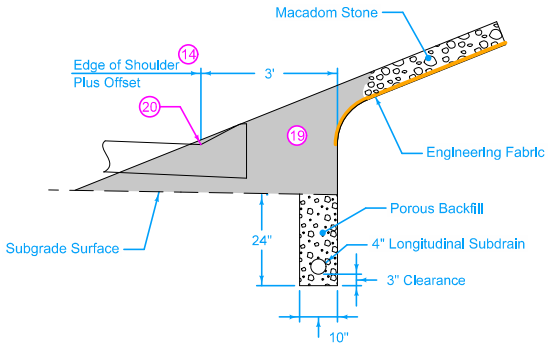

**SECTION F-F**




**PARTIAL SECTION E-E**
As constructed by others




**SECTION E-E**




**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.

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 6 | 10-20-20 |

EW-203

SHEET 4 of 5

REVISIONS: Modified dimension line "A" on page 1.

APPROVED BY DESIGN METHODS ENGINEER

**BRIDGE BERM GRADING WITH RECOVERABLE SLOPE (NON-BARNROOF SECTION)**

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

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 6 | 10-20-20 |

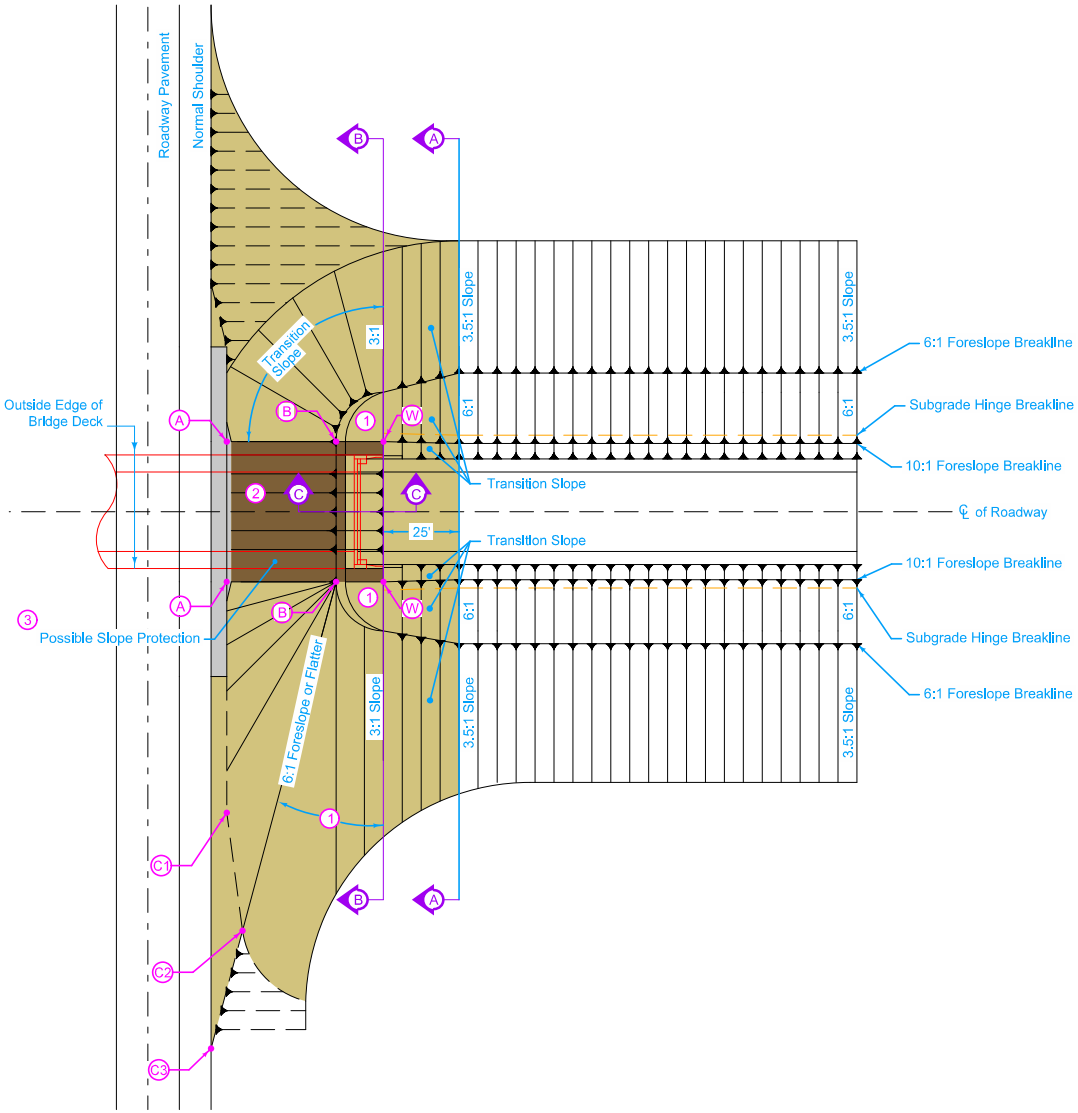
EW-203

SHEET 5 of 5

REVISIONS: Modified dimension line "A" on page 1.

APPROVED BY DESIGN METHODS ENGINEER

**BRIDGE BERM GRADING WITH RECOVERABLE SLOPE (NON-BARNROOF SECTION)**




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

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 6 | 10-20-20 |

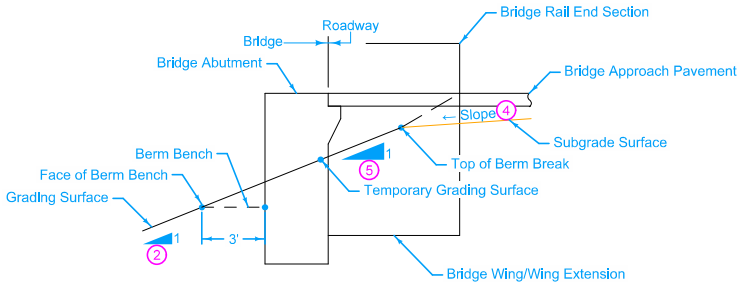
EW-204

SHEET 1 of 5

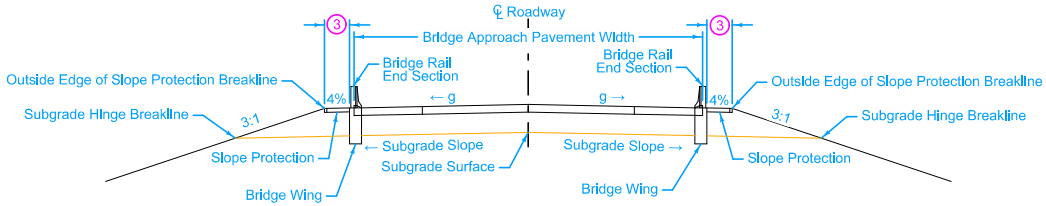
REVISIONS: Modified dimension line "A" on page 1.

APPROVED BY DESIGN METHODS ENGINEER

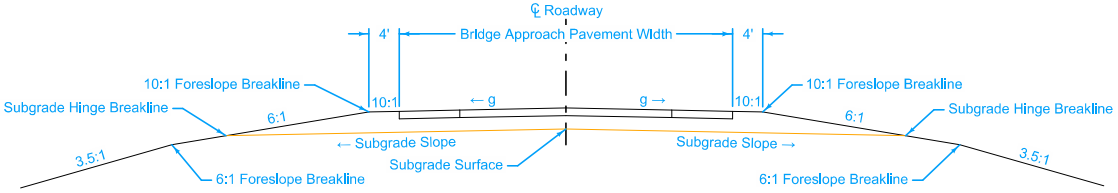
**BRIDGE BERM GRADING WITH RECOVERABLE SLOPE (BARNROOF SECTION)**




**SECTION C-C**




**SECTION B-B**




**SECTION A-A**

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.

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 6 | 10-20-20 |

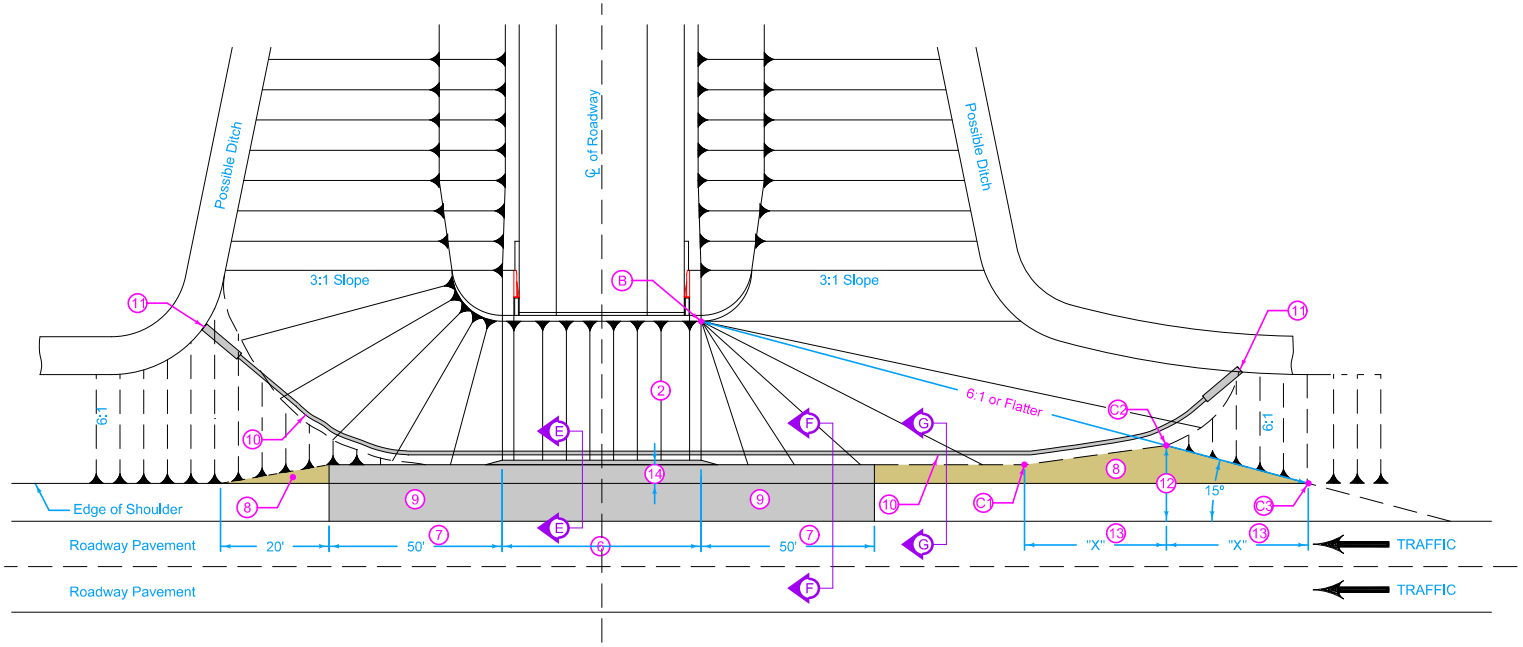
EW-204

SHEET 2 of 5

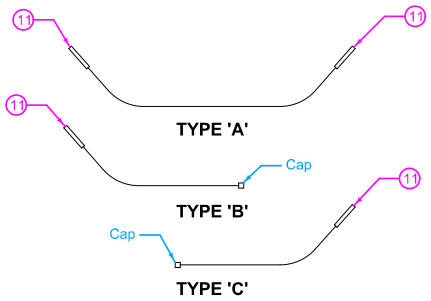
REVISIONS: Modified dimension line "A" on page 1.

APPROVED BY DESIGN METHODS ENGINEER

**BRIDGE BERM GRADING WITH RECOVERABLE SLOPE (BARNROOF SECTION)**




PLAN VIEW OF BRIDGE BERM AREA




TYPE 'A'

TYPE 'B'

TYPE 'C'

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-306 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.

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 6 | 10-20-20 |

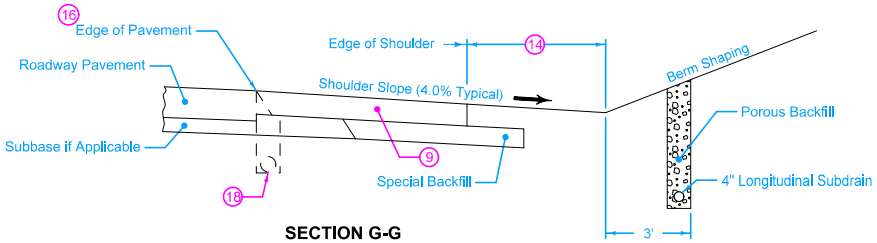
EW-204

SHEET 3 of 5

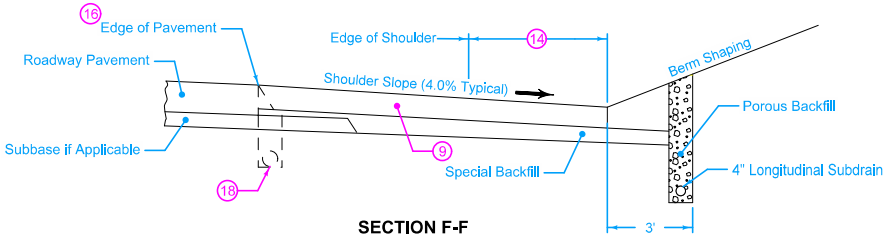
REVISIONS: Modified dimension line "A" on page 1.

APPROVED BY DESIGN METHODS ENGINEER

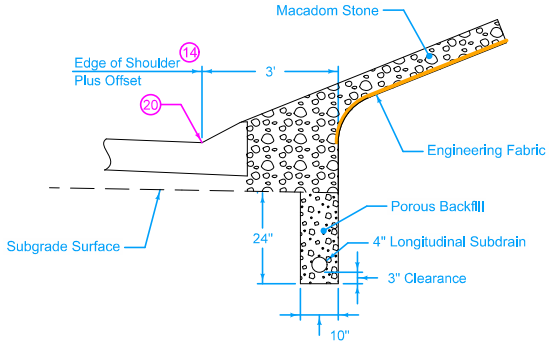
**BRIDGE BERM GRADING WITH RECOVERABLE SLOPE (BARNROOF SECTION)**



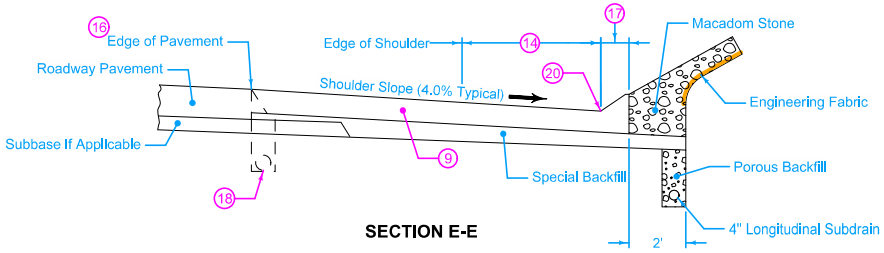

**SECTION G-G**



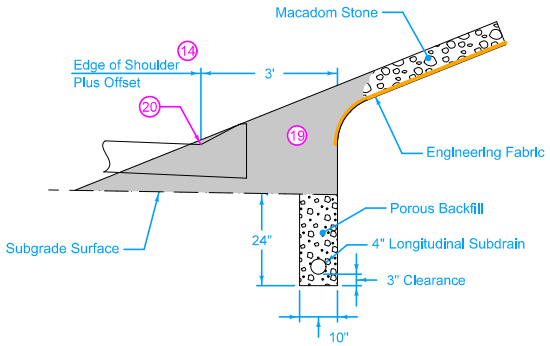

**SECTION F-F**




**PARTIAL SECTION E-E**
**As constructed by others**




**SECTION E-E**




**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.

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 6 | 10-20-20 |

EW-204

SHEET 4 of 5

REVISIONS: Modified dimension line "A" on page 1.

APPROVED BY DESIGN METHODS ENGINEER

**BRIDGE BERM GRADING WITH RECOVERABLE SLOPE (BARNROOF SECTION)**

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

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 6 | 10-20-20 |

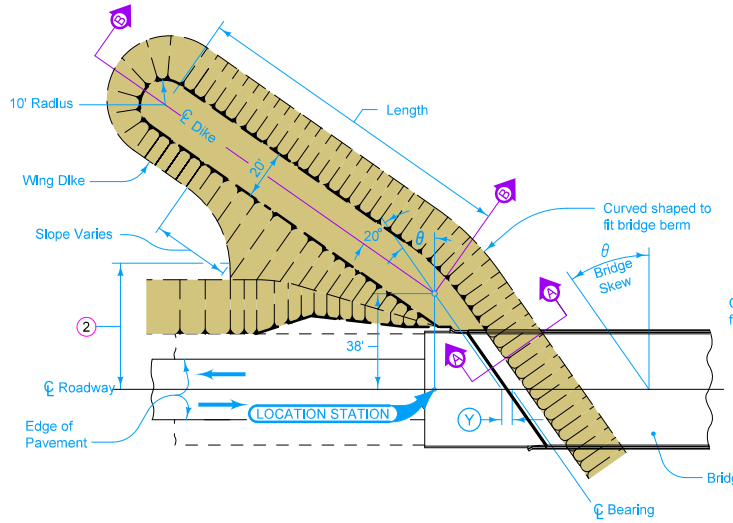
EW-204

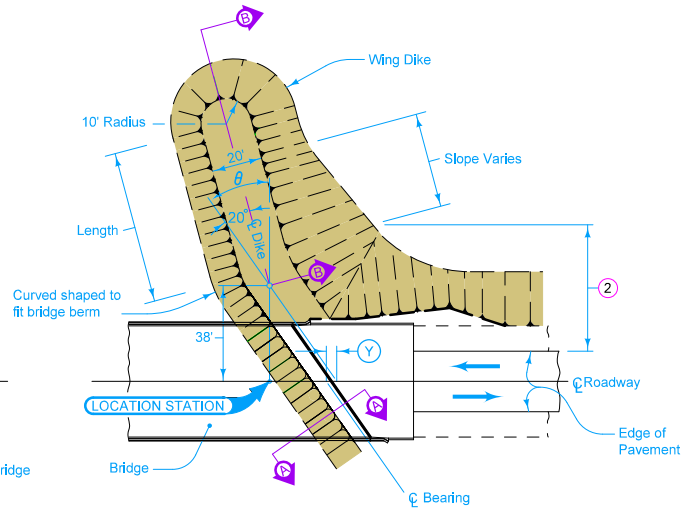
SHEET 5 of 5

REVISIONS: Modified dimension line "A" on page 1.

APPROVED BY DESIGN METHODS ENGINEER

**BRIDGE BERM GRADING WITH RECOVERABLE SLOPE (BARNROOF SECTION)**




TYPICAL PLAN VIEW OF DIKE CONSTRUCTION AT SKEWED BRIDGE

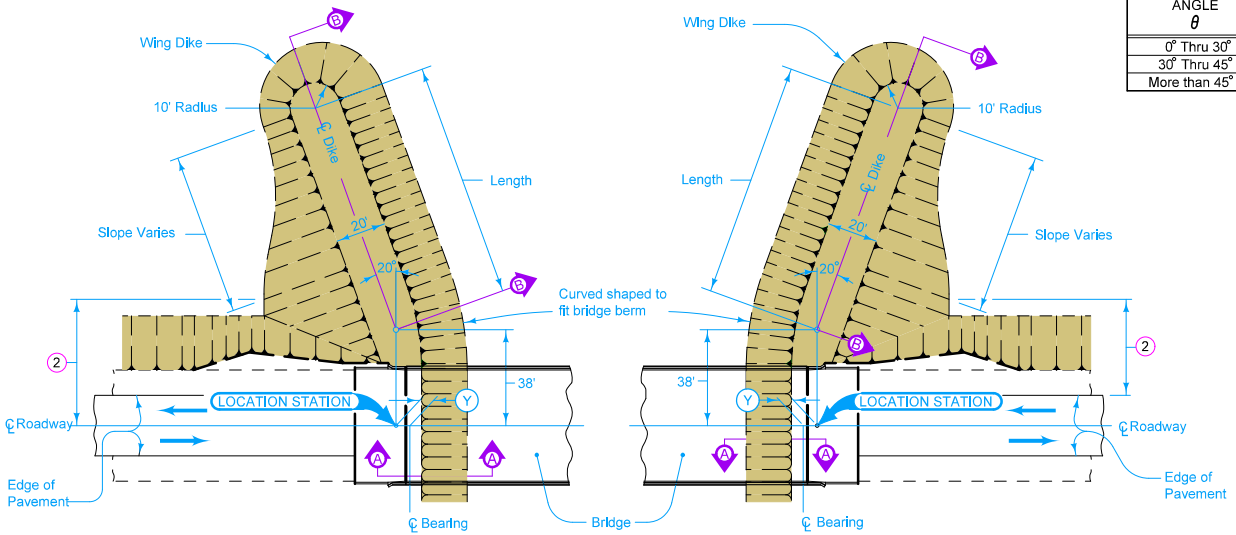
For guidelines to determine wing dike lengths or when to use wing dikes, see the Office of Bridges and Structures' Preliminary Design Bridge Manual.

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.

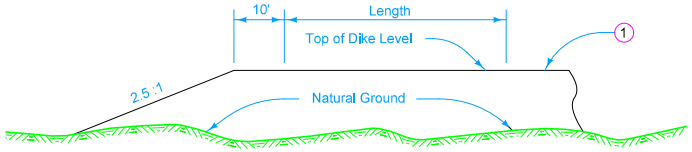
Necessary materials for construction of the dikes are included on the tabulation of "Estimate of Quantities" for excavation. Price bid for "Excavation of the class specified" is full compension for construction of dikes as indicated hereon.

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.

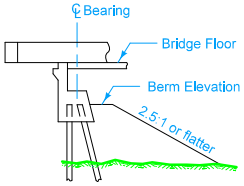
| SKEW ANGLE θ | DIMENSION Y |
|---|---|
| 0° Thru 30° | 5.5' / Cos θ |
| 30° Thru 45° | 4.5' / Cos θ |
| More than 45° | 3.5' / Cos θ |




TYPICAL PLAN VIEW OF DIKE CONSTRUCTION AT NON-SKEWED BRIDGE




SECTION B-B




SECTION A-A

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 1 | 10-20-15 |

EW-210

SHEET 1 of 1

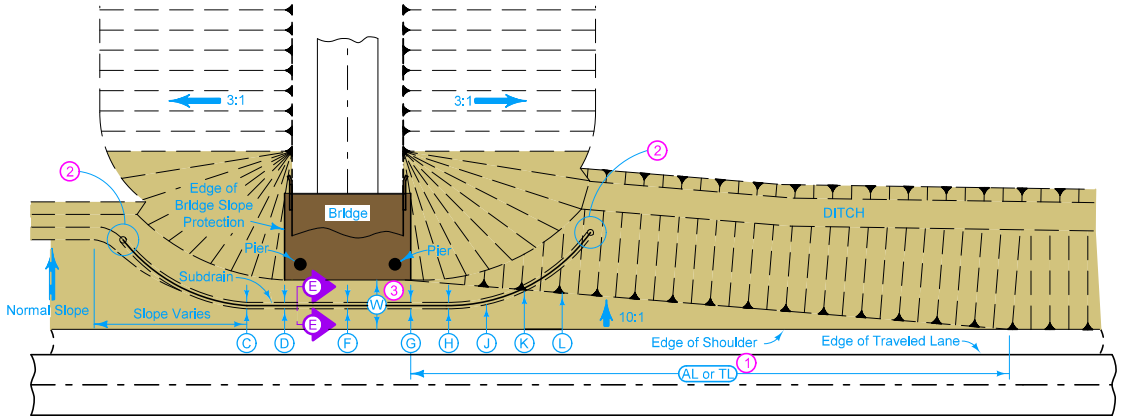
REVISIONS: Modified note 2 and Section A-A.

Brian Smith

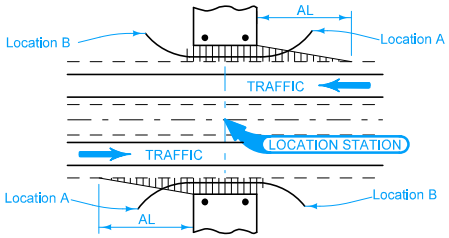
APPROVED BY DESIGN METHODS ENGINEER

**STANDARD WING DIKES**

DESIGNER INFO

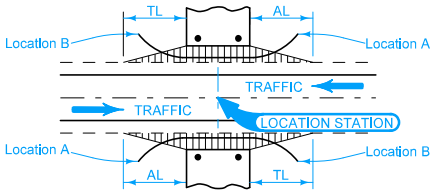



SITUATION PLAN



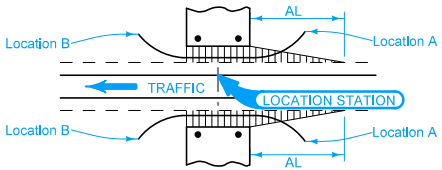

TYPE 6

(Interstate, Freeway and Expressway)



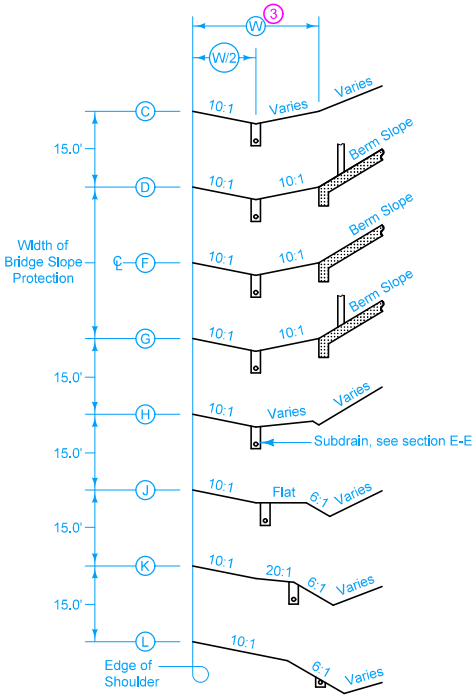

TYPE 7

(Two-Way)

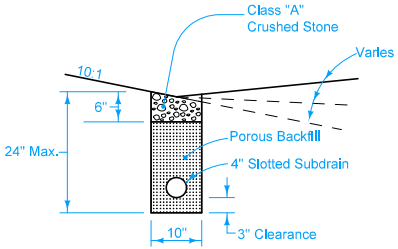



TYPE 8

(Ramp)




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.

1. AL or 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-306.
3. 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-306)

Possible Tabulation:

104-12

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 2 | 10-17-17 |

EW-211

SHEET 1 of 1

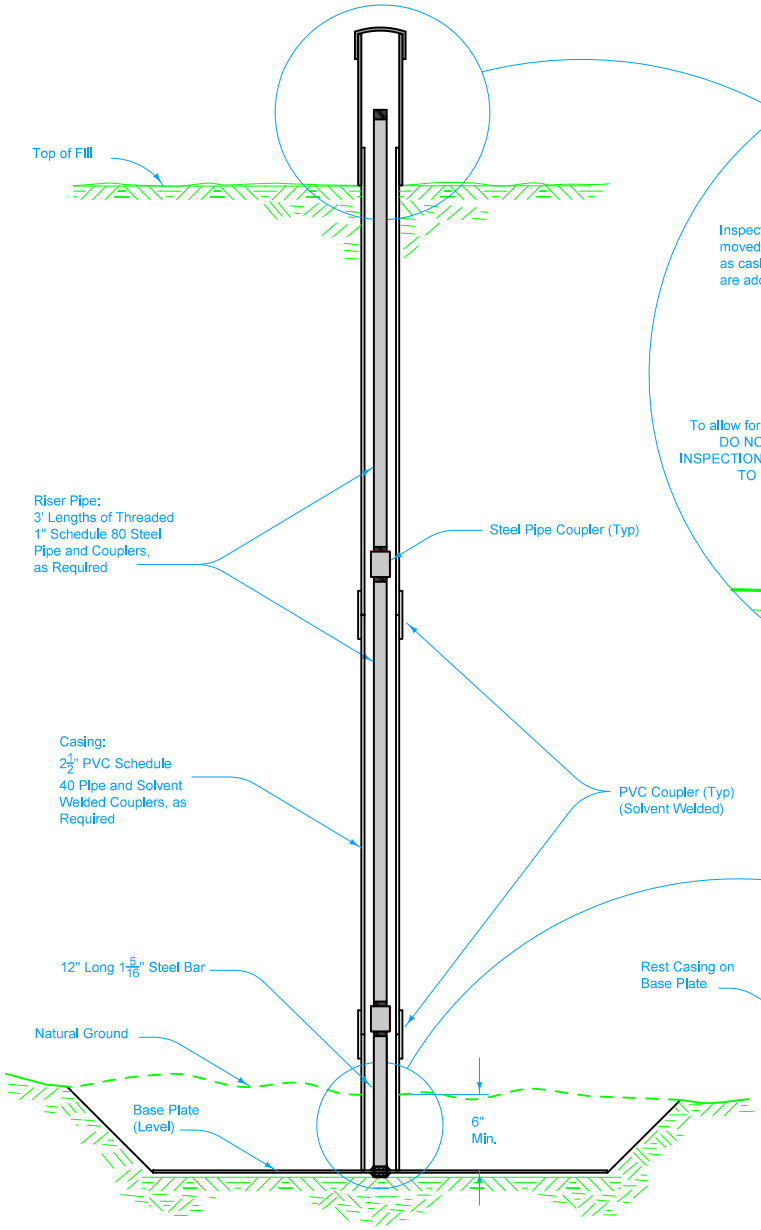
REVISIONS: Clarified dimensions of Class "A" Crushed Stone and Porous Backfill in Section E-E. Modified general notes and Possible Contract Items.

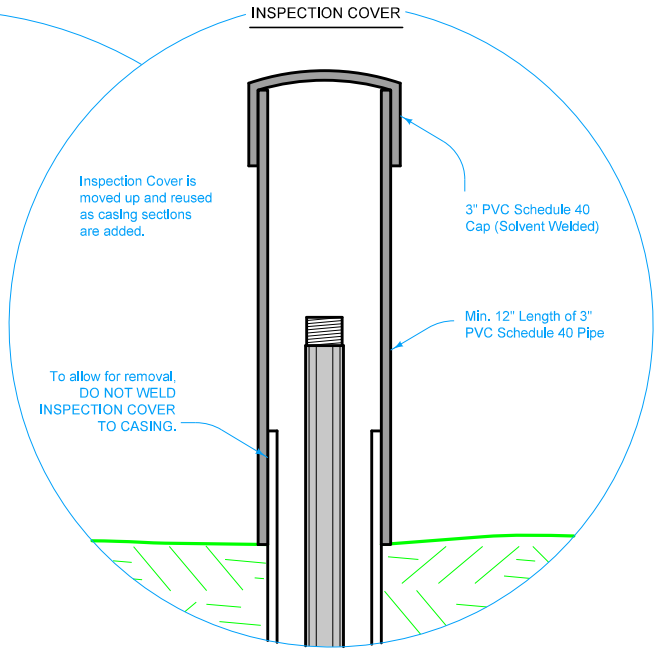
Brian Smith

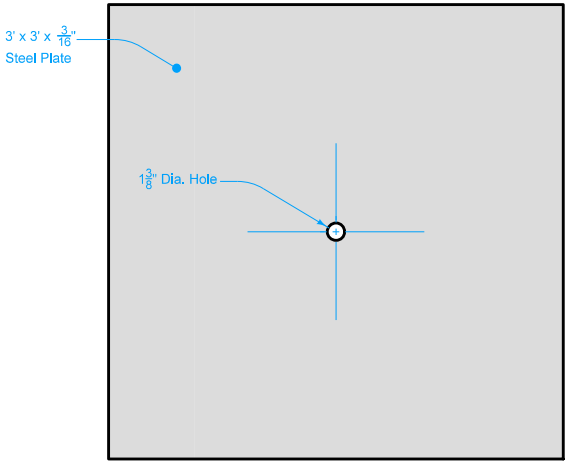
APPROVED BY DESIGN METHODS ENGINEER

**SPECIAL GRADING AT SIDE PIERS**

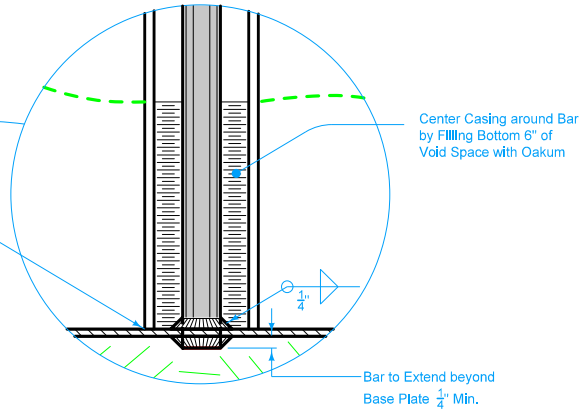
Refer to Section 2106 of the Standard Specification for additional information.




BASE PLATE




Possible Tabulation:
103-5

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 2 | 10-20-15 |

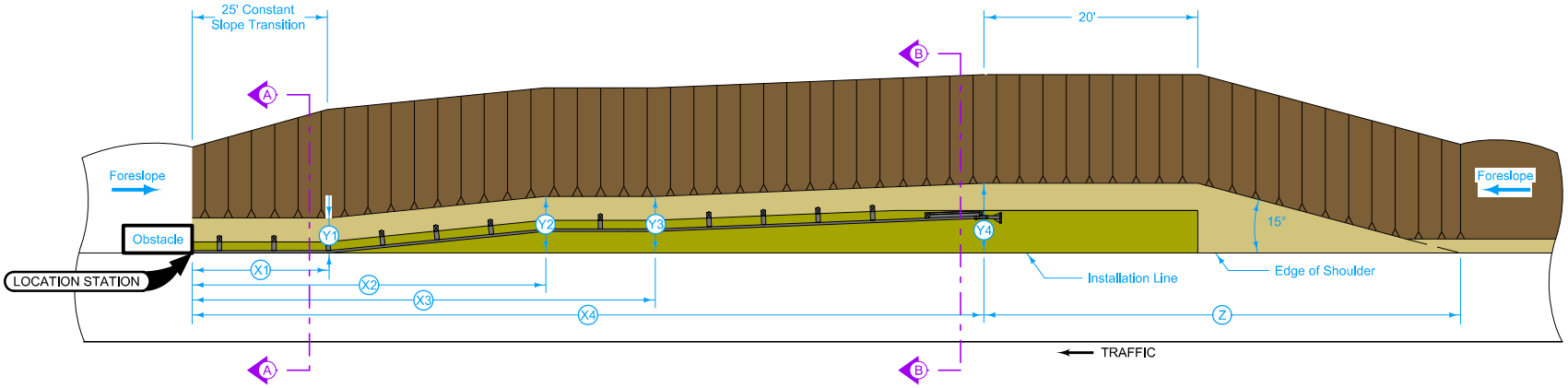
EW-212

SHEET 1 of 1

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

Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

**SETTLEMENT PLATE**




**PLAN**

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

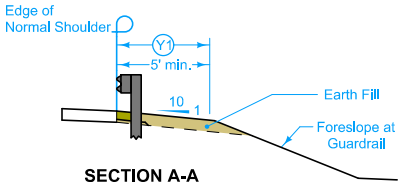
Construct paved shoulder in front of guardrail as shown on Typical 7156.

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

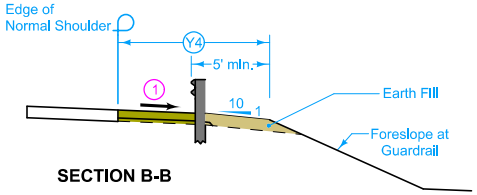
(1) Match slope of adjacent shoulder.

(X) Measured from Location Station.

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




**SECTION A-A**




**SECTION B-B**

| (Y4) feet | (Z) 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

**LEGEND**

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

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

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 1 | 10-20-15 |

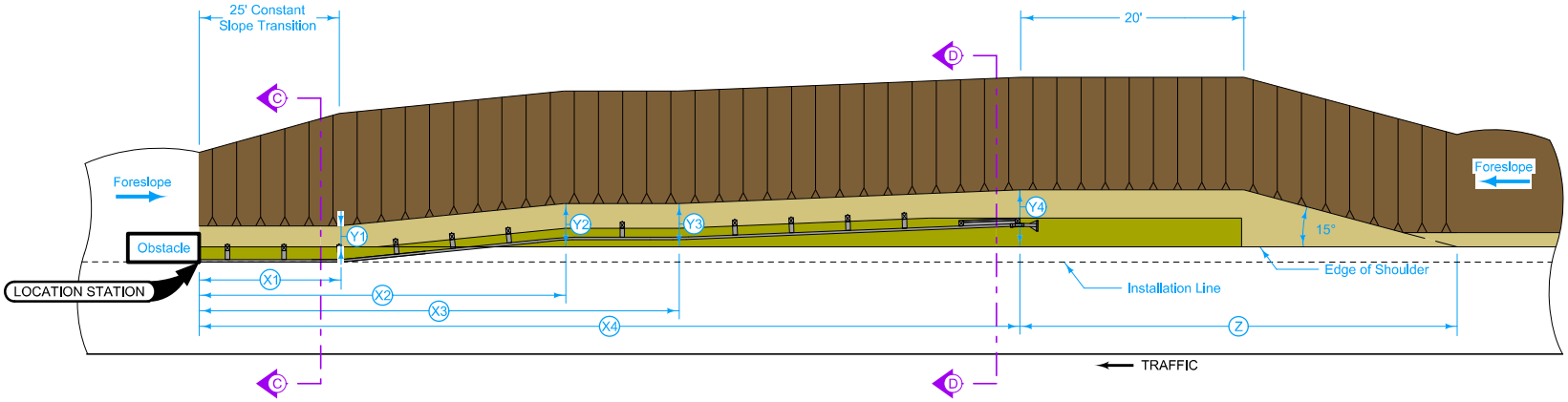
EW-301

SHEET 1 of 5

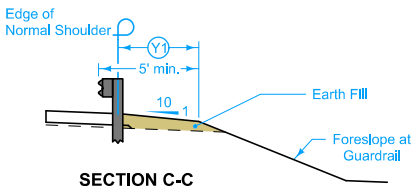
REVISIONS: Changed slope in front of guardrail from a 10 to 1 to match the slope of the adjacent shoulder. Added note 3 on Sheet 4.

Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

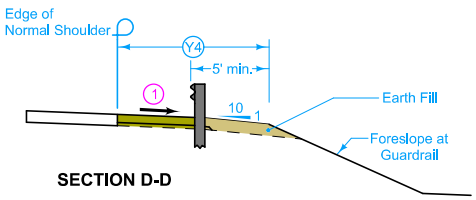
**GUARDRAIL GRADING**




**PLAN**




**SECTION C-C**




**SECTION D-D**

(1) Match slope of adjacent shoulder.

(X) Measured from Location Station.

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

| (Y4) feet | (Z) 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 |

**LEGEND**

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

**GUARDRAIL INSTALLATION LINE WITHIN SHOULDER**

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 1 | 10-20-15 |

EW-301

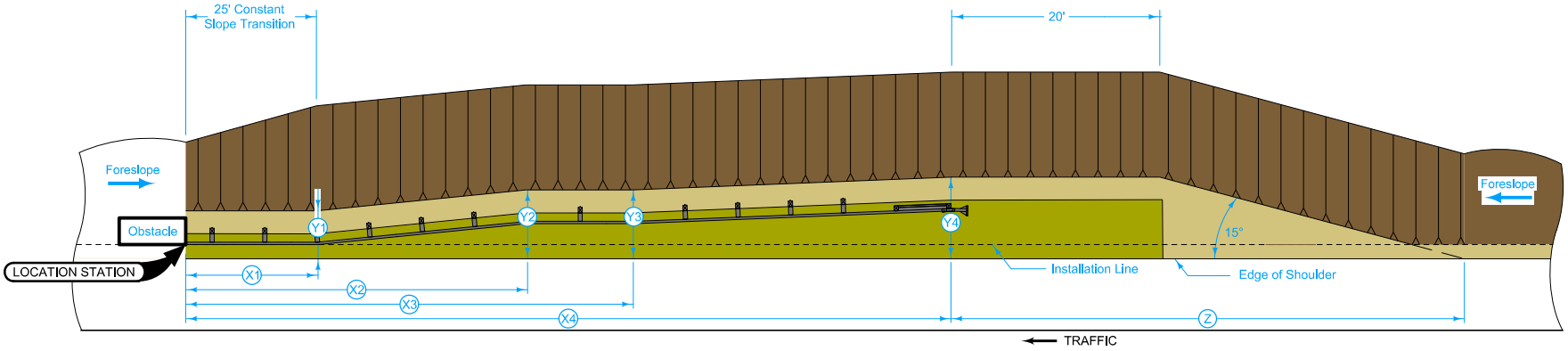
SHEET 2 of 5

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.

Brian Smith

APPROVED BY DESIGN METHODS ENGINEER

**GUARDRAIL GRADING**

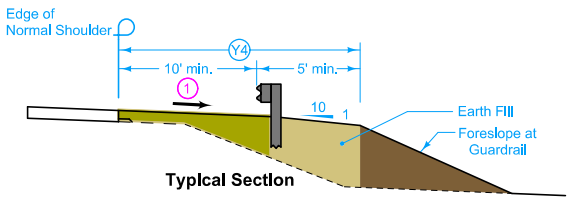



**PLAN**

1 Match slope of adjacent shoulder.

X Measured from Location Station.

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




**Typical Section**

| Y4 feet | Z 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 |

**LEGEND**

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

**GUARDRAIL INSTALLATION LINE BEYOND 10 FEET FROM SHOULDER**

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 1 | 10-20-15 |

EW-301

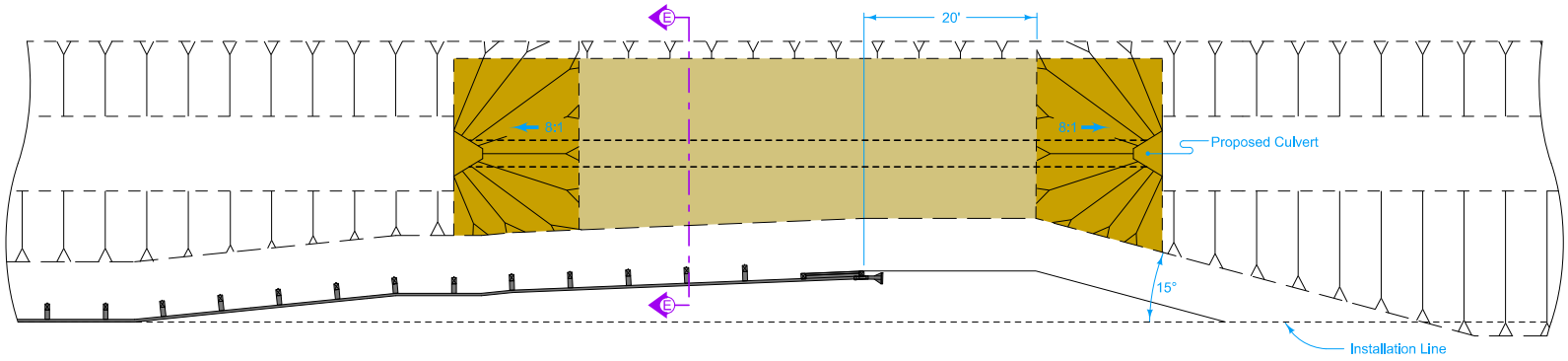
SHEET 3 of 5

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.

Brian Smith

APPROVED BY DESIGN METHODS ENGINEER

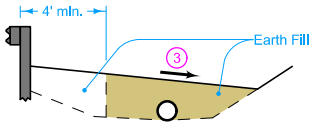
**GUARDRAIL GRADING**




**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

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 1 | 10-20-15 |

EW-301

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.

Brian Smith

APPROVED BY DESIGN METHODS ENGINEER

**GUARDRAIL GRADING**

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

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 1 | 10-20-15 |

EW-301

SHEET 5 of 5

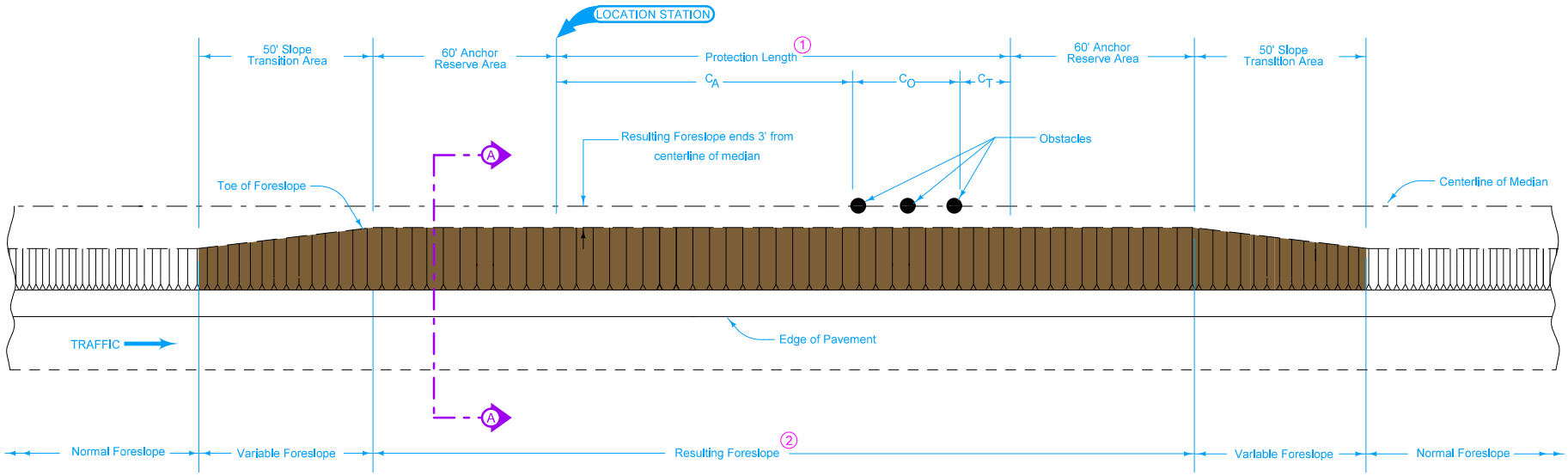
REVISIONS: Changed slope in front of guardrail from a 10 to 1 to match the slope of the adjacent shoulder. Added note 3 on Sheet 4.

Brian Smith

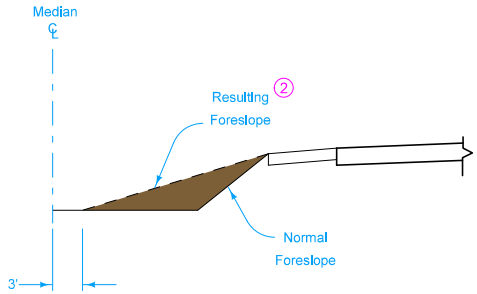
APPROVED BY DESIGN METHODS ENGINEER

GUARDRAIL GRADING

DESIGNER INFO




PLAN




SECTION A-A

Possible Contract Items:

Topsoil
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.

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 1 | 10-20-15 |

EW-302

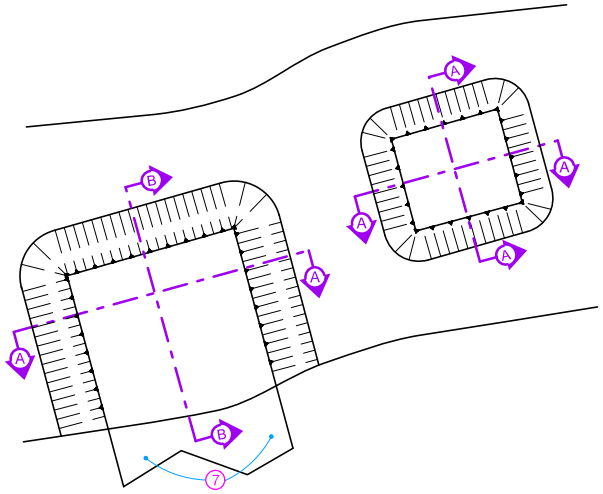
SHEET 1 of 1

REVISIONS: Modified note 2. Added Designer Info button.

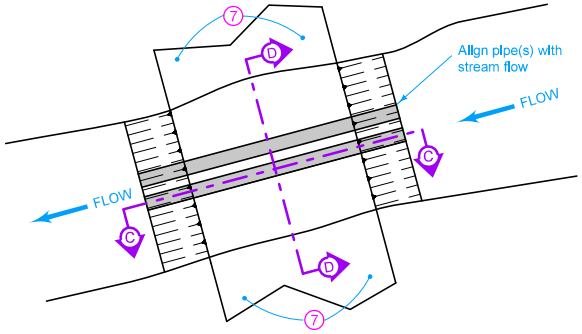
Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

SPECIAL SHAPING FOR HIGH TENSION CABLE GUARDRAIL AT MEDIAN OBSTACLES

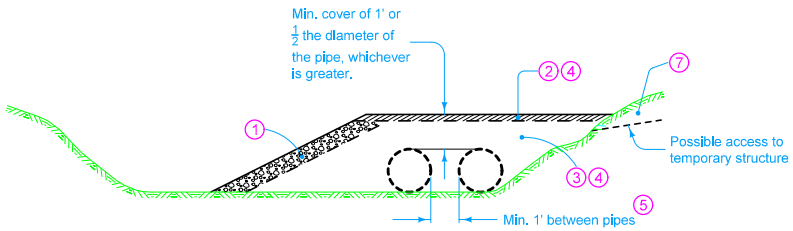
DESIGNER INFO



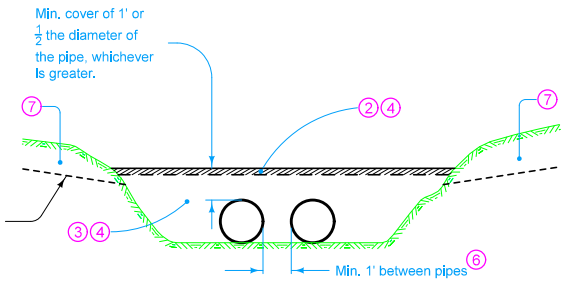

TYPICAL PLAN (CAUSEWAY OR EQUIPMENT PAD) 5



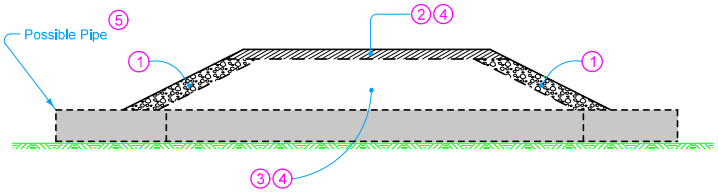

TYPICAL PLAN (STREAM CROSSING) 6



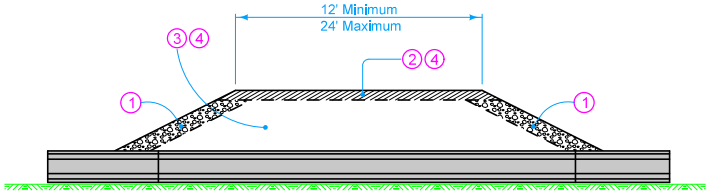

SECTION B-B (CAUSEWAY) 5




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.

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 2 | 10-20-15 |

EW-401

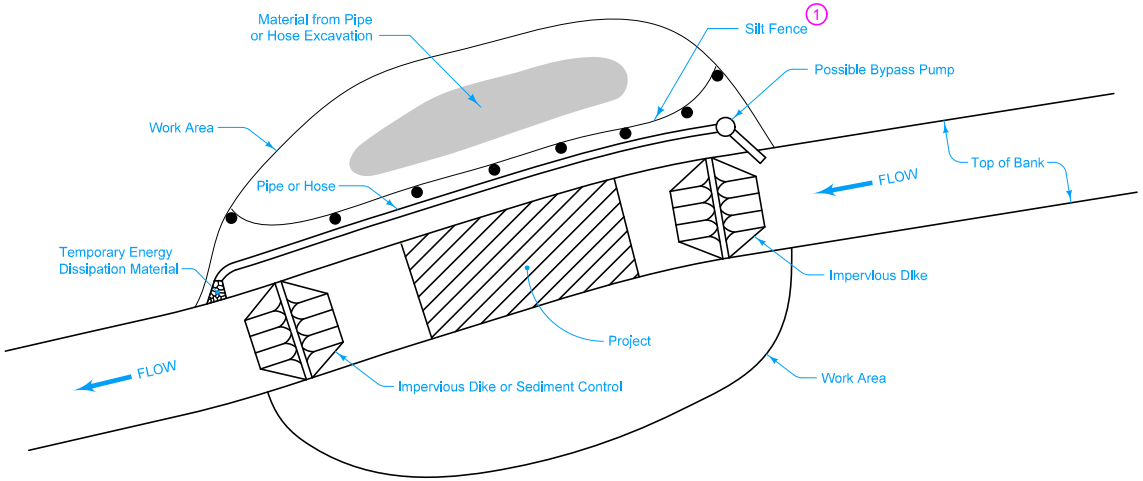
SHEET 1 of 1

REVISIONS: Corrected typo in note 4. Updated the DOT logo.

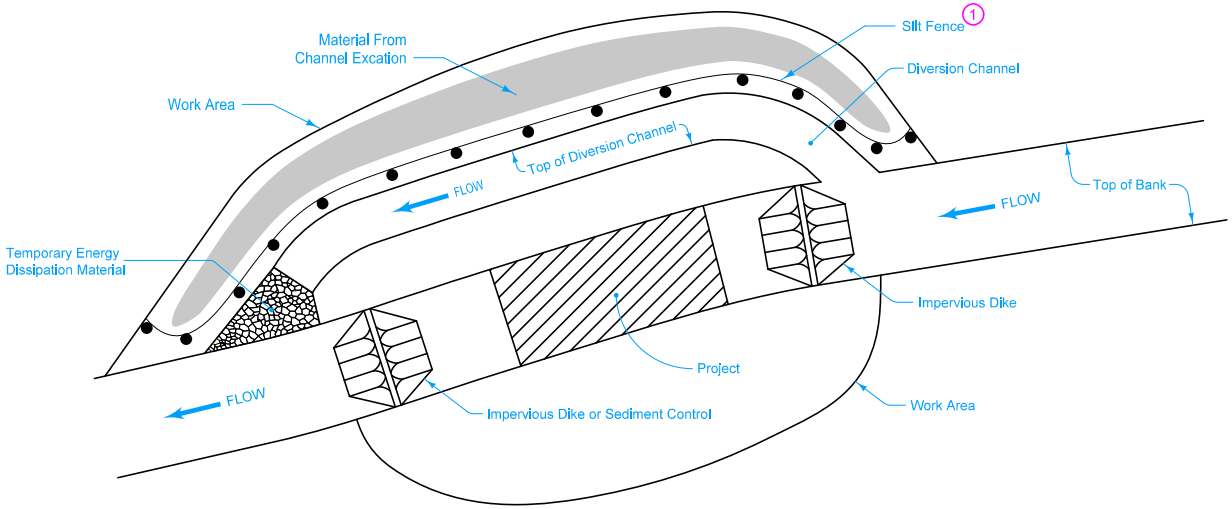
Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

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

DESIGNER INFO




PIPE OR HOSE




DIVERSION CHANNEL

(1) Extend ends of silt fence to work area boundry.

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

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 2 | 04-18-17 |

EW-402

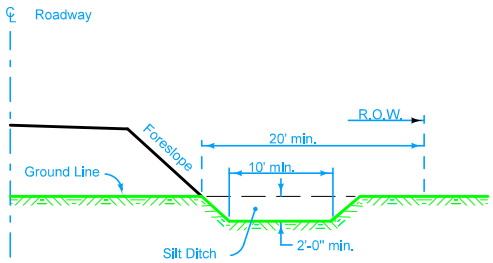
SHEET 1 of 1

REVISIONS: Added silt fence in DIVERSION CHANNEL and PIPE OR HOSE views.

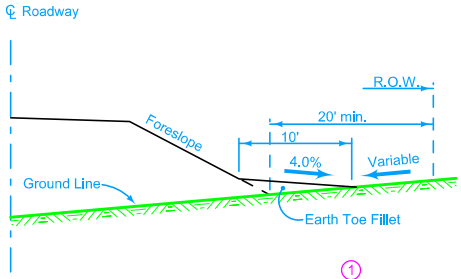
Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

**TEMPORARY STREAM DIVERSION**

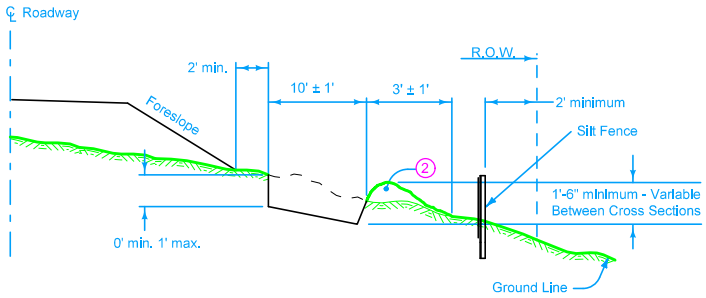
DESIGNER INFO



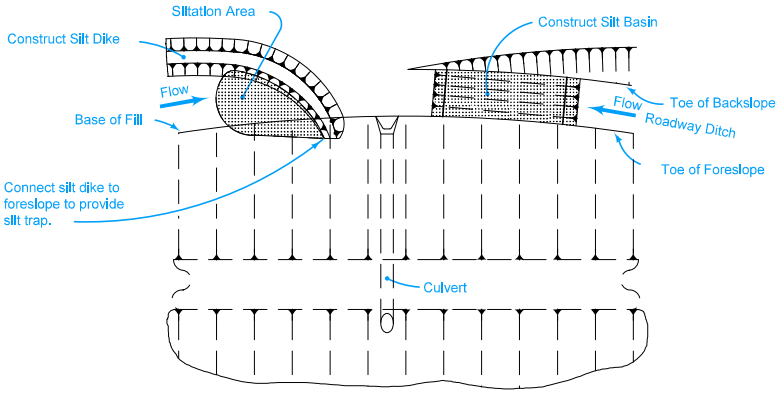

SILT DITCH



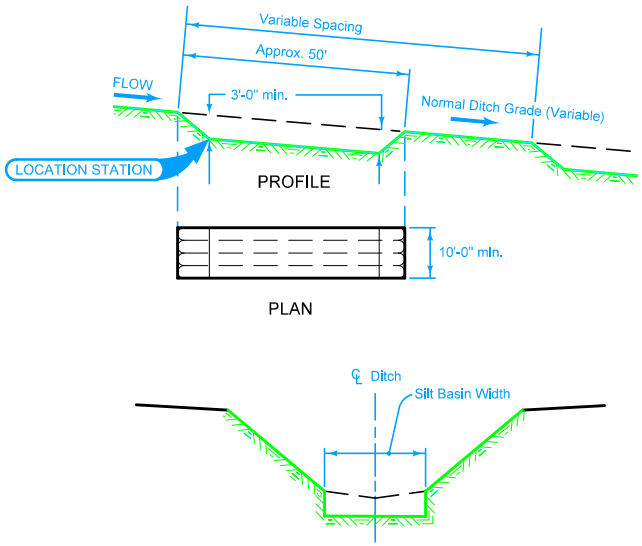

TOE FILLET (1)




SILT DIKE




TYPICAL PLAN WITH
PERMANENT CULVERT INSTALLATION




SILT BASIN

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

IOWA DOT

| REVISION | |
|---|---|
| 3 | 04-18-17 |

STANDARD ROAD PLAN

EW-403

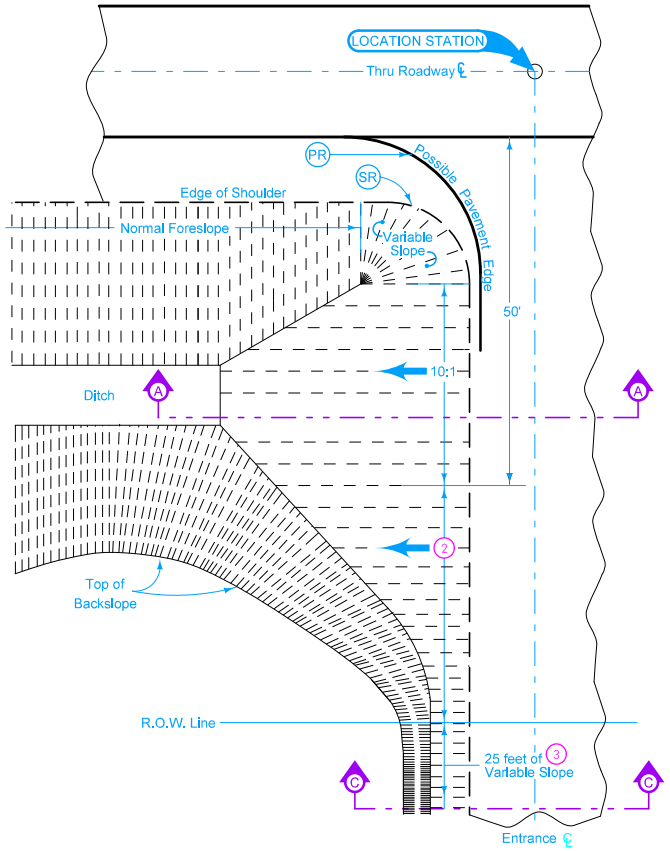
SHEET 1 of 1

REVISIONS: Added Location Station to Silt Basin view. Added Designer Info button.

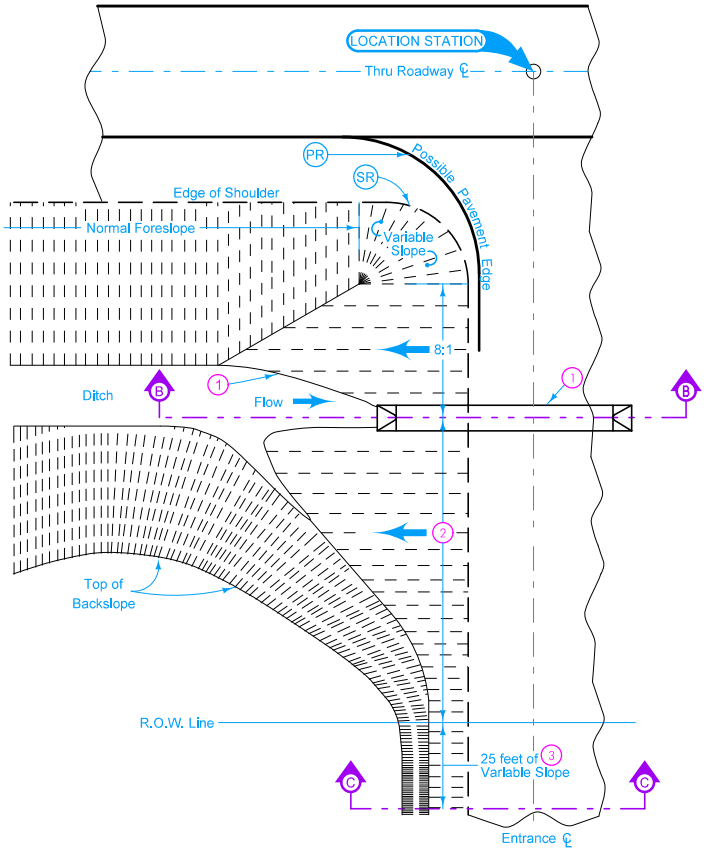
Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

**TEMPORARY EROSION CONTROL MEASURES**

DESIGNER INFO




TYPE B OR C ENTRANCE
WITHOUT PIPE




TYPE B OR C ENTRANCE
WITH PIPE

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

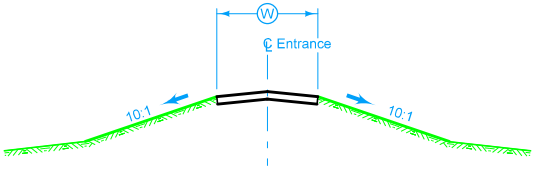
Earthwork and material used for construction of entrances are included in estimate of quantities.

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.

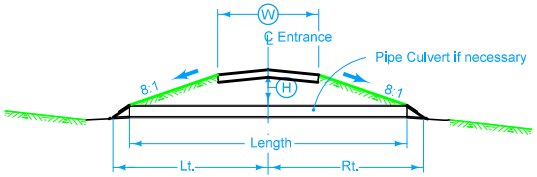
Possible Contract Items:
Aprons, Unclassified
Culvert, Unclassified Entrance Pipe
Excavation, Class 10

Possible Tabulation:

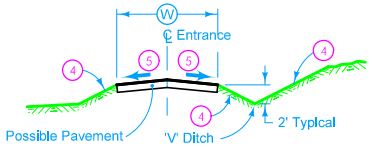
102-3




SECTION A-A




SECTION B-B




SECTION C-C
(TYPICAL ENTRANCE)

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 1 | 10-20-15 |

EW-501

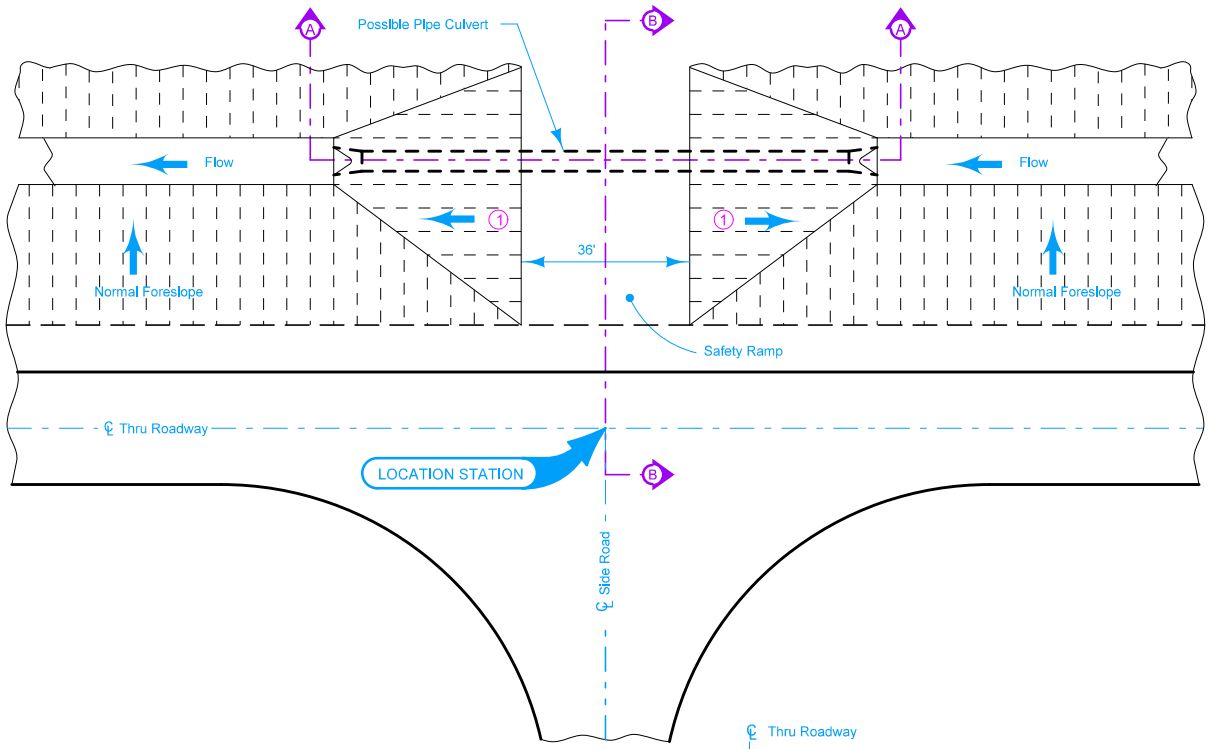
SHEET 1 of 1

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

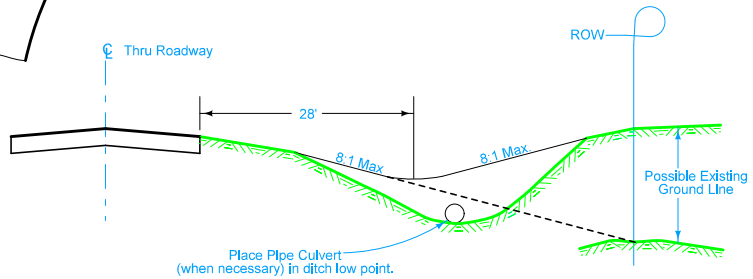
Brian Smith
APPROVED BY DESIGN METHODS ENGINEER

RURAL ENTRANCE

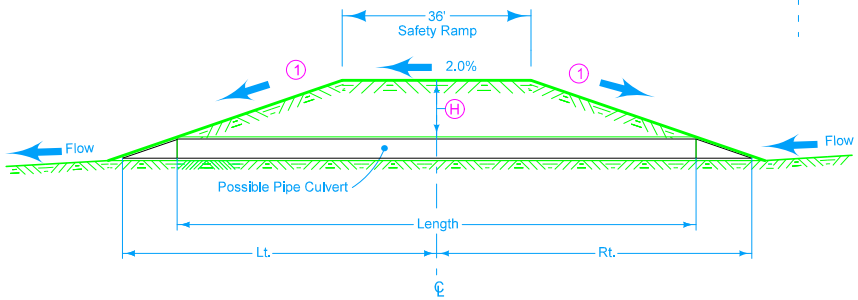
DESIGNER INFO




PLAN




SECTION B-B




SECTION A-A

1 Slope 10:1 or flatter without pipe, 8:1 or flatter with pipe.

Possible Contract Items:

Aprons, Unclassified
Culvert, Unclassified Entrance Pipe
Excavation, Class 10

Possible Tabulation:

102-3

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 2 | 04-18-17 |

EW-502

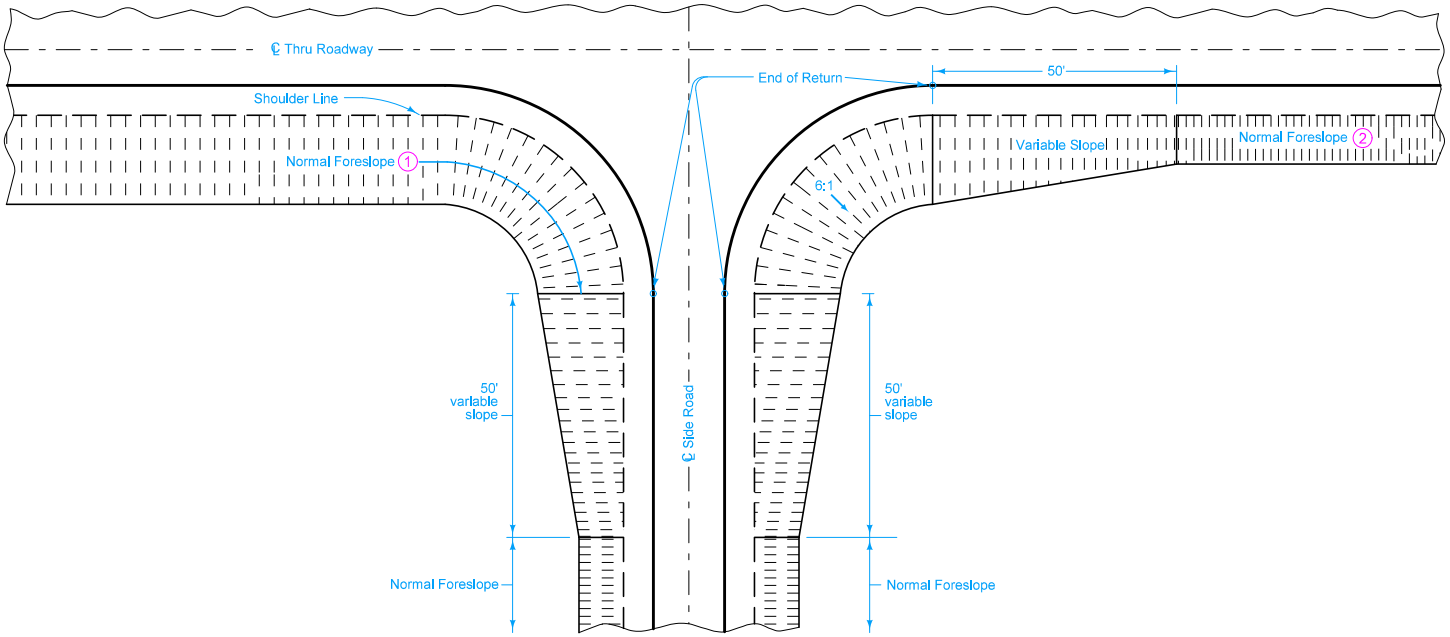
SHEET 1 of 1

REVISIONS: Added Designer Info button.

Brian Smith
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

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 1 | 10-20-15 |

EW-503

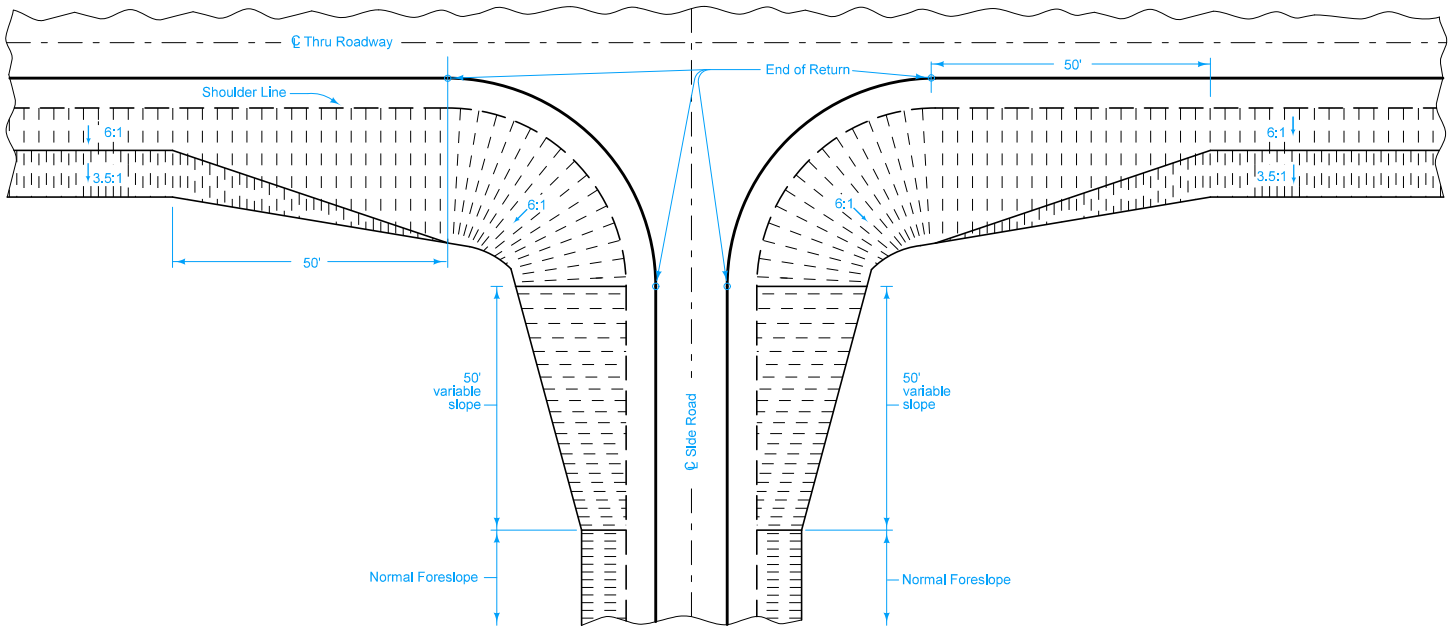
SHEET 1 of 2

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

Brian Smith

APPROVED BY DESIGN METHODS ENGINEER

SIDE ROAD GRADING




BARNROOF

IOWA DOT

STANDARD ROAD PLAN

| REVISION | |
|---|---|
| 1 | 10-20-15 |

EW-503

SHEET 2 of 2

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

Brian Smith

APPROVED BY DESIGN METHODS ENGINEER

SIDE ROAD GRADING