C3.2.7 Substructures

C3.2.7.1 Skew

C3.2.7.2 Abutments

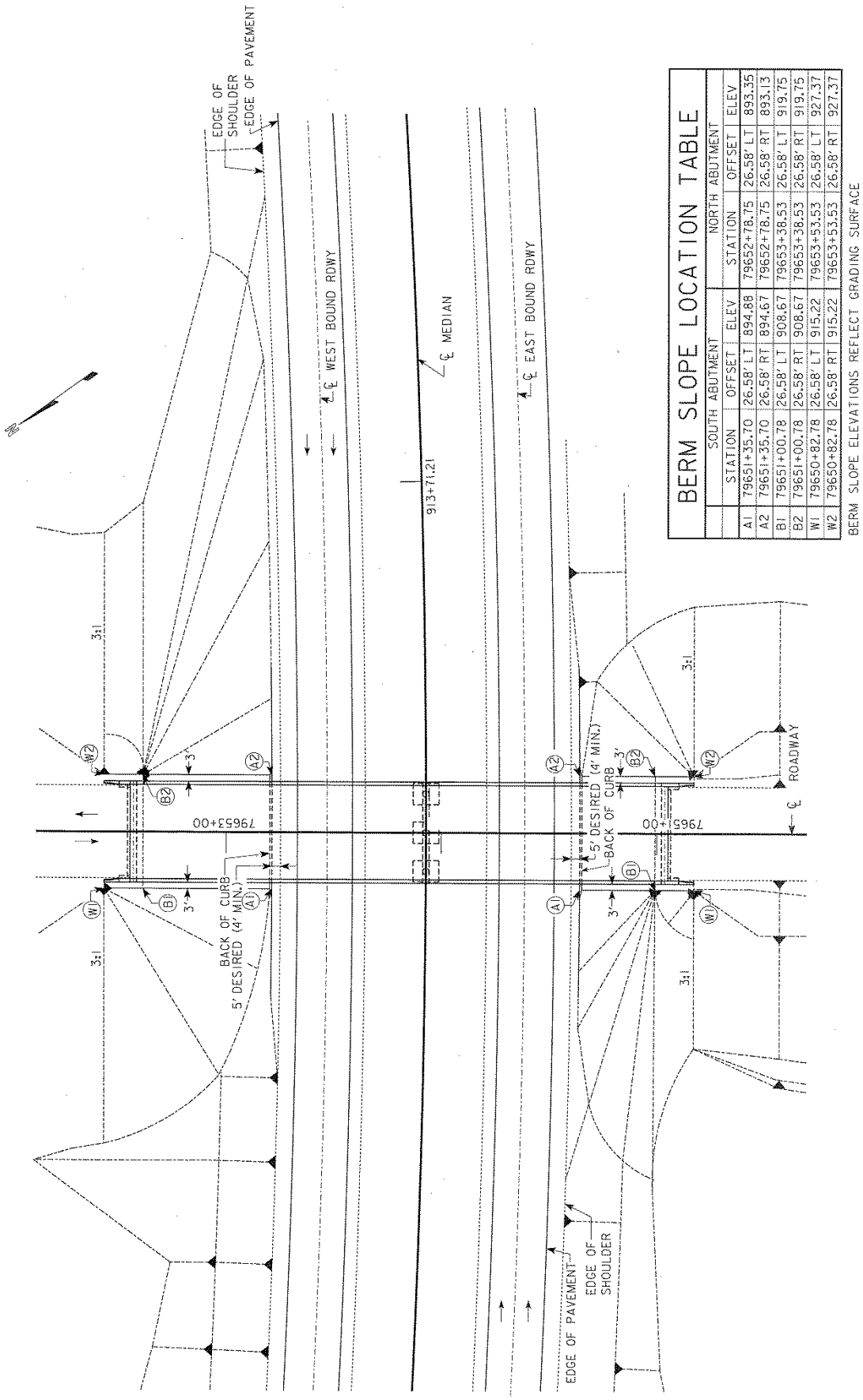
C3.2.7.3 Berms

C3.2.7.3.1 Slope

C3.2.7.3.2 Toe offset

C3.2.7.3.3 Berm slope location table

See also the RBLT example C3.2.7.3.4.



BERM SLOPE LOCATION TABLE

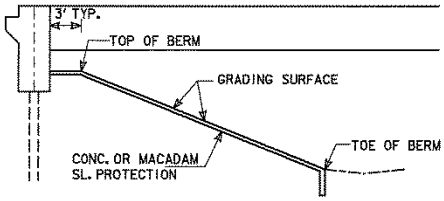
	SOUTH ABUTMENT			NORTH ABUTMENT		
	STATION	OFFSET	ELEV	STATION	OFFSET	ELEV
A1	79651+35.70	26.58' LT	894.88	79652+78.75	26.58' LT	893.35
A2	79651+35.70	26.58' RT	894.67	79652+78.75	26.58' RT	893.13
B1	79651+00.78	26.58' LT	908.67	79653+38.53	26.58' LT	919.75
B2	79651+00.78	26.58' RT	908.67	79653+38.53	26.58' RT	919.75
W1	79650+82.78	26.58' LT	915.22	79653+53.53	26.58' LT	927.37
W2	79650+82.78	26.58' RT	915.22	79653+53.53	26.58' RT	927.37

BERM SLOPE ELEVATIONS REFLECT GRADING SURFACE

REVISED JULY 2013

EXAMPLE BERM SLOPE LOCATION TABLE (BSLT)

SLOPE PROTECTION LOCATION FOR BSLT GRADING SURFACES



NOTES:

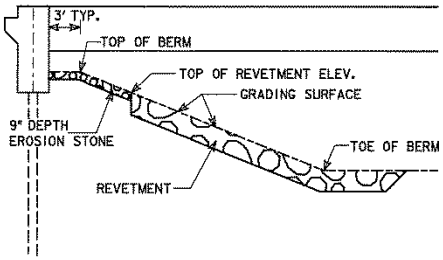
1. BSLT POINTS GIVEN AT THE GRADING SURFACE = TOP OF SLOPE PROTECTION.

2. THE GRADING SURFACE IS DEFINED BY THE BRIDGE OFFICE SLOPE PROTECTION STANDARD.

3. WING ARMORING DETAILS ARE DEFINED BY THE BRIDGE OFFICE WING ARMORING STANDARDS.

4. SLOPE PROTECTION AND WING ARMORING QUANITIES WILL BE CALCULATED IN FINAL DESIGN.

CONCETE OR MACADAM SLOPE PROTECTION



NOTES:

1. BSLT POINTS GIVEN AT GRADING SURFACE = TOP OF EROSION STONE AND TOP OF EMBEDDED REVETMENT.

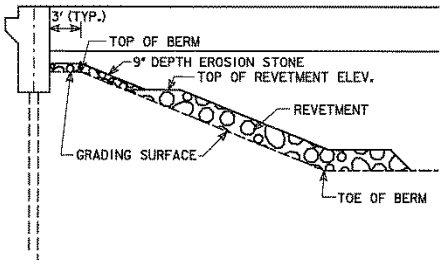
2. THE GRADING SURFACE SHALL BE LABELED ON THE TSL REVETMENT TYPICAL SECTION. TOP OF REVETMENT ELEVATION SHALL BE DEFINED.

3. ADDITIONAL EROSION STONE DETAILS ARE COVERED BY THE BRIDGE OFFICE SLOPE PROTECTION STANDARD.

4. REVETMENT AND EROSION STONE BERM ARMORING ARE PLACED BELOW THE GRADING SURFACE AND WILL REQUIRE "CORE OUT". DEFINE LIMITS OF THE CORE OUT IN THE PLANS. THE BERM ARMORING QUANTITIES TABLE SHALL INCLUDE (AS APPLICABLE) CLASS 10 EXCAVATION, ENGINEERING FABRIC, EROSION STONE AND REVETMENT. BERM ARMORING GENERALLY INCLUDES QUANTITIES TO THE FACE OF THE ABUTMENT.

5. WING ARMORING DETAILS ARE DEFINED BY THE BRIDGE OFFICE WING ARMORING STANDARD. FINAL DESIGN WILL CALCULATE QUANTITIES RELATED TO THE WING ARMORING.

EMBEDDED REVETMENT



NOTES:

1. BSLT POINTS GIVEN AT GRADING SURFACE = BASE OF EROSION STONE AND BASE OF NON-EMBEDDED REVETMENT.

2. THE GRADING SURFACE SHALL BE LABELED ON THE TSL REVETMENT TYPICAL SECTION. TOP OF REVETMENT ELEVATION SHALL BE DEFINED.

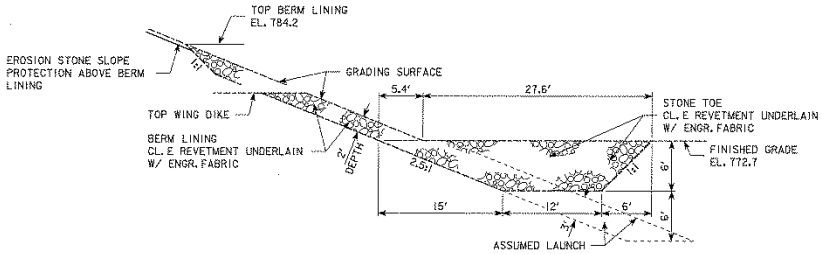
3. ADDITIONAL EROSION STONE DETAILS ARE COVERED BY THE BRIDGE OFFICE SLOPE PROTECTION STANDARD.

4. THE BERM ARMORING QUANTITIES TABLE SHALL INCLUDE ENGINEERING FABRIC, EROSION STONE AND REVETMENT. BERM ARMORING QUANTITIES GENERALLY WILL INCLUDE ARMORING WORK UP TO THE FACE OF ABUTMENT.

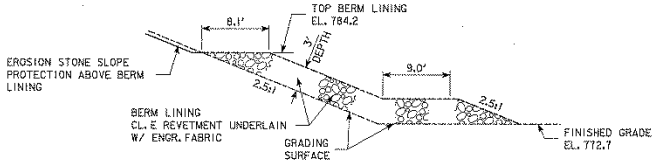
5. WING ARMORING DETAILS ARE DEFINED BY THE BRIDGE OFFICE WING ARMORING STANDARD. FINAL DESIGN WILL CALCULATE QUANTITIES RELATED TO THE WING ARMORING.

REVETMENT (NOT EMBEDDED)

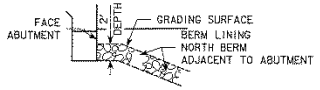
4-24-12



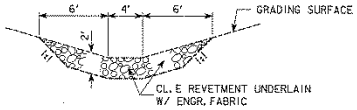
SECTION THROUGH STONE TOE AND BERM LINING



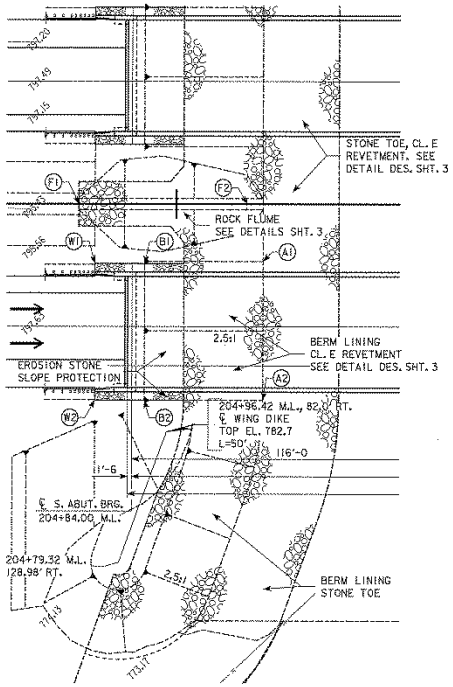
SECTION THROUGH STONE TOE AND BERM LINING



SECTION THROUGH BERM LINING AT ABUTMENT



SECTION THROUGH ROCK FLUME



EXAMPLE SITUATION PLAN

REVETMENT QUANTITIES

REVETMENT TYPE - LOCATION	REVETMENT CL. E (TON)	EROSION STONE (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
STONE TOE - SOUTH	3,944	-	2,010	2,465
STONE TOE - NORTH	3,856	-	1,965	2,410
BERM LINING - SOUTH (INCLUDES ROCK FLUME)	1,341	-	1,263	838
BERM LINING - NORTH	1,157	-	1,089	723
SLOPE PROTECTION - SOUTH	-	76	189	48
SLOPE PROTECTION - NORTH	-	9	22	6
TOTALS	10,298	85	6,538	6,490

REVETMENT EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE.

REVETMENT ESTIMATED AT 1.6 TON/CY

ROCK FLUME LAYOUT:

(F1) ℄ U/S END ROCK FLUME
204+64.5 M.L., 0.0' RT.
F.L. EL. 793.2

(F2) ℄ D/S END ROCK FLUME
205+25.5 M.L., 0.0' RT.
F.L. EL. 772.7

BERM SLOPE LOCATION TABLE - N.B. BRIDGE

	S. ABUTMENT			N. ABUTMENT		
	STATION	OFFSET	ELEV	STATION	OFFSET	ELEV
A1	205+31.50	21.42' RT	772.70	209+23.23	21.42' RT	772.70
A2	205+31.50	70.58' RT	772.70	209+23.23	70.58' RT	772.70
B1	204+88.50	21.42' RT	789.90	209+45.50	21.42' RT	781.61
B2	204+88.50	70.58' RT	789.90	209+45.50	70.58' RT	781.61
W1	204+70.50	21.42' RT	796.50	209+63.50	21.42' RT	787.73
W2	204+70.50	70.58' RT	796.42	209+63.50	70.58' RT	787.65

W - END WING / EDGE EROSION STONE
BERM SLOPE/FLUME ELEVATIONS REFLECT GRADING SURFACE

EXAMPLE BSLT PLACED ON SITUATION PLAN

DESIGN FOR 0° SKEW

DUAL 466'-0 X 40'-0 PRETENSIONED PRESTRESSED CONC. BEAM BRIDGES

118'-0 END SPANS 117'-0 INTERIOR SPANS

REVETMENT DETAILS

STATION 207+17.00 M.L. MAR. 2012

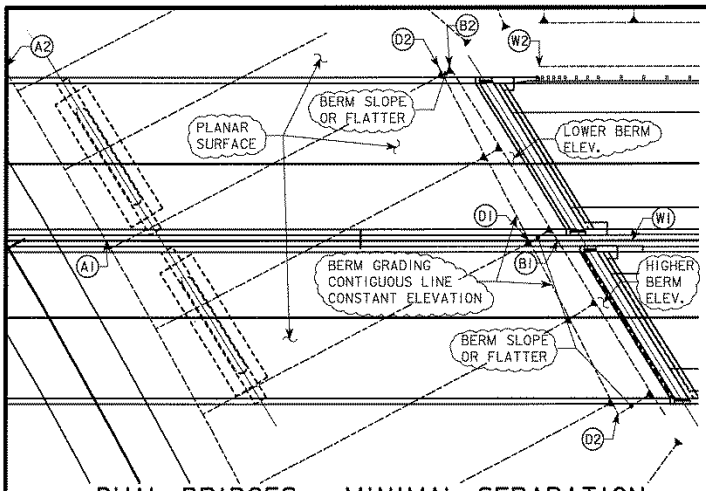
POLK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

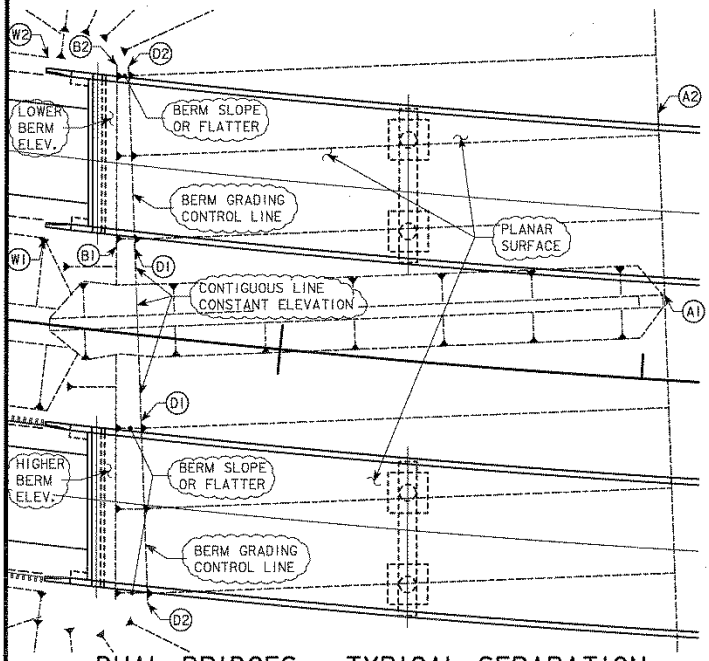
DESIGN SHEET NO. 3 OF 5 FILE NO. 30582 DESIGN NO. 512

DESIGN TEAM | POLK COUNTY | PROJECT NUMBER NHSX-065-4(127)--3H-77 | SHEET NUMBER

13-JAN-2011 17:55 wkaufma W:\Highway\Bridge\PreItmSection\Concepts\BermGrading\Berm_Grading.str TSL_XX_XXXX_XX \\ntpprtsvr2\BrgPDF



DUAL BRIDGES - MINIMAL SEPARATION



DUAL BRIDGES - TYPICAL SEPARATION

NOTES:

FOR DUAL BRIDGES A BERM GRADING CONTROL LINE WILL BE PROVIDED.

THE BERM GRADING CONTROL LINE IS A CONTIGUOUS LINE FROM 3 FT. BEYOND THE OUTSIDE BRIDGE FASCIA'S SET AT A CONSTANT ELEVATION. THE GRADING CONTROL LINE WILL RESULT IN A PLANAR BERM SURFACE BETWEEN AND UNDER THE BRIDGES.

FOR DUAL BRIDGES WHERE BOTH BERMS HAVE THE SAME ELEVATION AND THE EDGE OF THE 3 FT. BRIDGE BERM FORMS A CONTIGUOUS LINE OUT-OUT THE 'B' POINTS DEFINE THE BERM GRADING CONTROL LINE. FOR MOST DUAL BRIDGE SITES THIS CAN BE ACCOMPLISHED BY ADJUSTMENT OF THE LOW BRIDGE BERM AND/OR ELIMINATION OF A SLOPING BERM.

TO ATTAIN LEVEL/EQUAL BERM ELEVATIONS THE BERM CAN BE ELEVATED UP TO THE FOLLOWING LIMITS (ELEVATED FROM THE 2 FT. TYPICAL FROM BTM. FTG.):

INTEGRAL - 0.5 FT.
STUB - 0.75 FT.

THE PROVISIONS OF ARTICLE 3.2.7.2 (SLOPING OF ABUT. FOOTING/BERM) SHOULD BE REVIEWED FOR APPLICABILITY. THE PROVISIONS OF THE ABOVE ARTICLE SHALL GOVERN.

FOR SITES WHERE THE 'B' POINTS CANNOT BE ADJUSTED TO FORM A CONTIGUOUS LINE AT A CONSTANT ELEVATION, 'D' POINTS WILL BE UTILIZED TO DEFINE THE BERM GRADING CONTROL LINE.

THE CONTROL LINE WILL BE SET AT AN ELEVATION 1 FT. BELOW THE LOW BERM ELEVATION. THE ALIGNMENT WILL BE SET SUCH THAT THE SLOPE BETWEEN ADJACENT 'B' AND 'D' POINTS MATCHES OR IS FLATTER THAN THE BERM SLOPE BELOW THE GRADING CONTROL LINE.

BERM SLOPE LOCATION TABLE

POINTS	WEST ABUTMENT			EAST ABUTMENT		
	STATION	OFFSET	ELEV.	STATION	OFFSET	ELEV.
A1	891+04.80	23.40' LT	1200.80	895+34.10	23.40' LT	1200.80
A2	890+99.60	72.50' LT	1200.80	895+39.50	72.50' LT	1200.80
D1	889+57.40	23.40' LT	1249.28	896+70.50	23.40' LT	1245.70
D2	889+50.00	72.50' LT	1249.28	896+78.00	72.50' LT	1245.70
B1	889+52.25	23.40' LT	1250.28	896+76.00	23.40' LT	1246.70
B2	889+46.67	72.50' LT	1250.28	896+81.58	72.50' LT	1246.70
W1	889+32.20	23.40' LT	1257.74	896+96.05	23.40' LT	1254.17
W2	889+27.25	72.50' LT	1257.84	897+01.00	72.50' LT	1254.27

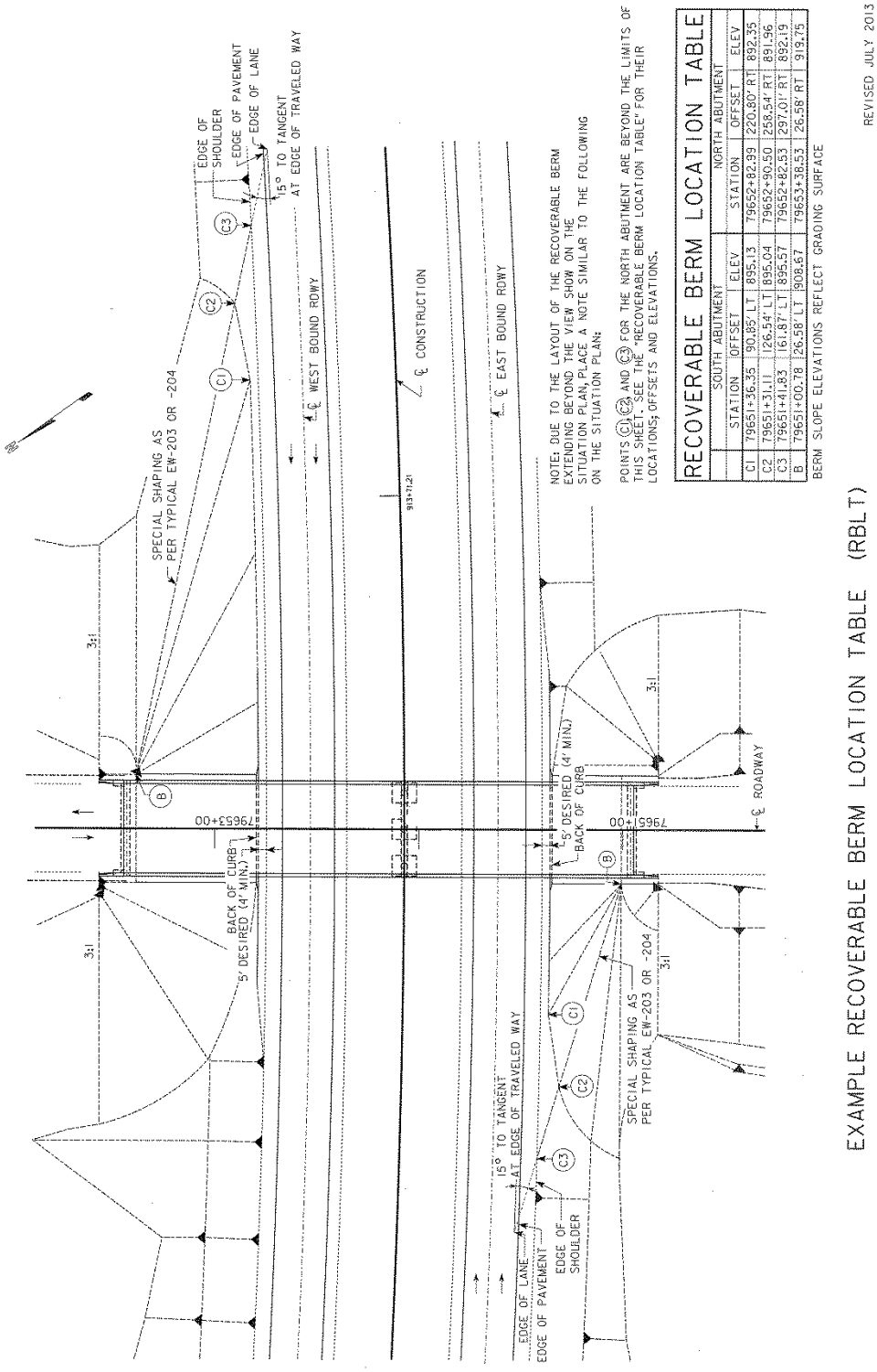
BERM SLOPE ELEVATIONS REFLECT THE GRADING SURFACE. BERM GRADING BELOW BERM GRADING CONTROL LINE DEFINED BY CONTROL LINE.
BERM GRADING CONTROL LINE IS DEFINED BY 'D' POINTS IN ABOVE TABLE.
[ALTERNATE NOTE FOR ABOVE WHEN 'D' POINTS NOT REQUIRED - SEE NOTES]
BERM GRADING CONTROL LINE IS DEFINED BY 'B' POINTS IN ABOVE TABLE.

DUAL BRIDGES
BERM SLOPE DEFINITION

REV. DATE: 5-01-13

C3.2.7.3.4 Recoverable berm location table

See also the BSLT example in C3.2.7.3.3.



C3.2.7.3.5 Slope protection

C3.2.7.4 Piers and pier footings

C3.2.7.5 Wing Walls