Tabulating Guardrail

Design Manual
Chapter 8
Safety Design
Originally Issued: 02-26-99
Revised: 04-29-11

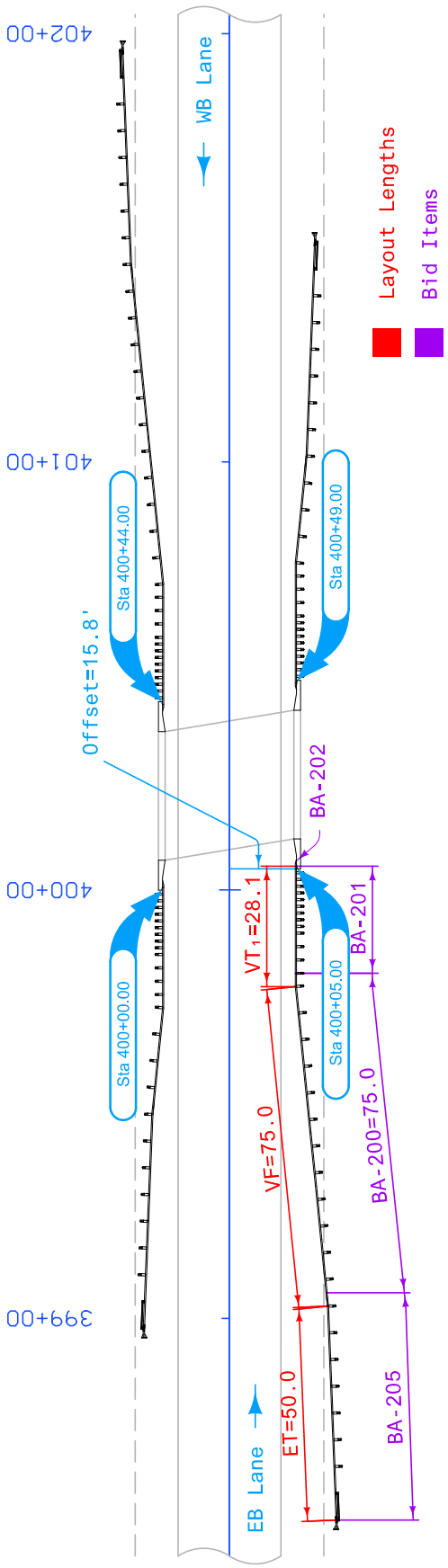
Tabulating guardrail can be confusing because the tabulations are set up to handle many different situations. Because of this, some columns are used in some situations but not used in other situations. Tabulating guardrail consistently makes it easier for contractors and inspectors to understand the designer's intent and helps ensure that the guardrail is installed correctly.

The examples on the following pages illustrate how to tabulate guardrail for some common situations.

- Example 1: Steel Beam Guardrail at a Two-lane, Two-way Bridge (BA-250)
- Example 2: Steel Beam Guardrail at a One-way Bridge (BA-250)
- Example 3: Steel Beam Guardrail over a Low-fill Culvert (BA-250)
- Example 4: Side Obstacle Shielded with Steel Beam Guardrail (Two-way Protection) (BA-251)
- Example 5: Side Obstacle Shielded with Steel Beam Guardrail (One-way Protection) (BA-252)
- Example 6: Median Obstacle Shielded with High-tension Cable Guardrail (BA-351)
- Example 7: High-tension Cable Guardrail Attached to Steel Beam Guardrail (Case 1) (BA-250 and BA-351)
- Example 8: High-tension Cable Guardrail Attached to Steel Beam Guardrail (Case 2) (BA-250 and BA-351)

The column labeled *Direction of Traffic* in the tabulations simply indicates on which side of the highway the installation is located. The column labeled *Side* is used only with multilane divided highways to further clarify where the installation is located. Either *M* for 'median' or *O* for 'outside' is entered in this column.

Example 1—Steel Beam Guardrail at a Two-lane, Two-way Bridge



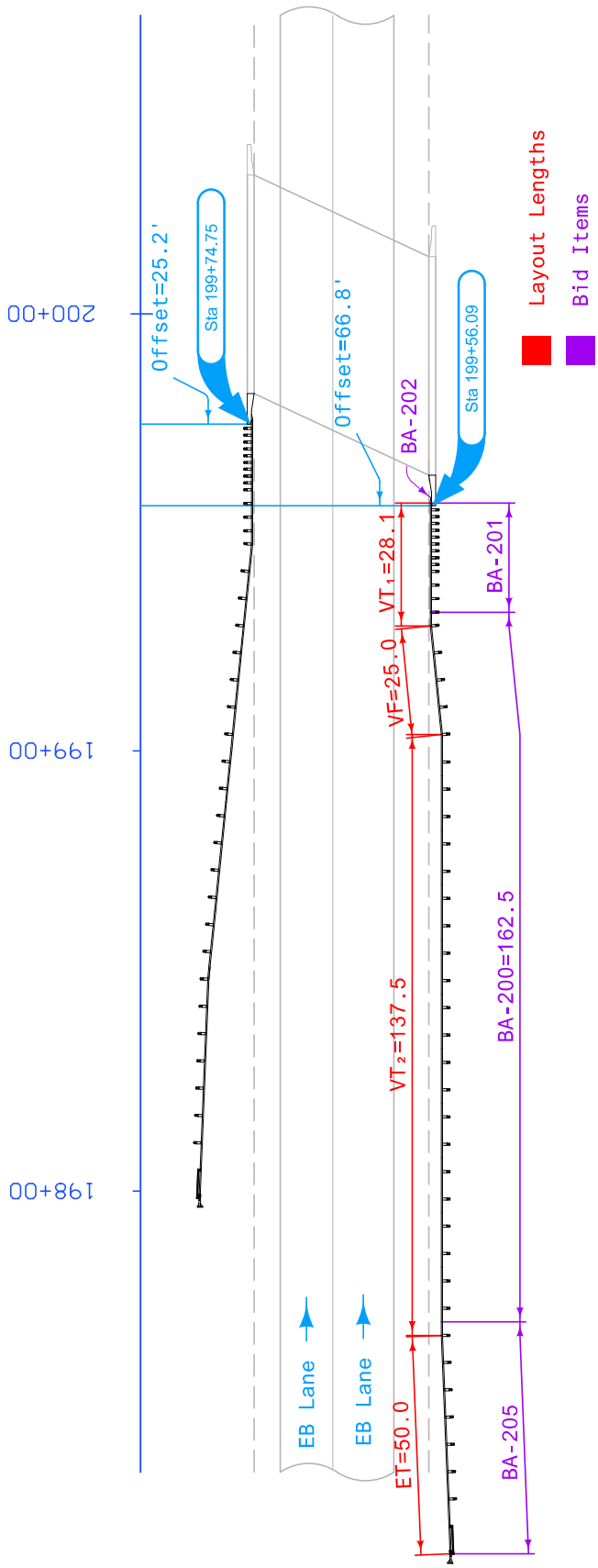
108-8A
10-19-10

STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE END POST

Refer to BA-200, BA-201, BA-202, BA-205, BA-250, SI-172, SI-173 and SI-211. (1) See Standards for list of materials.

Location Station			Layout Lengths				Delineators and Object Markers						Bid Items (1)						Remarks
			VT1	VF	VT2	ET	Type	Delineator		Object Marker			End Anchor Bolted	Barrier Transition Section	Steel Beam Guardrail	End Terminal			
						Terminal		Type 1	Type 2	Type 3						Standard	Flared for Cable Connection	Adapter	
No.	Station	Offset	LF	LF	LF	LF		White No.	No.	OM-3L No.	OM-3R No.		BA-202 Type	BA-201 No.	BA-200 LF	BA-205 No.	BA-206 No.	BA-210 No.	
1	400+00.00	15.8' LT	28.1	25.0	--	50.0	2	--	4	1	--		1	1	25.0	1	--	--	
2	400+05.00	15.8' RT	28.1	75.0	--	50.0	2	--	5	--	1		1	1	75.0	1	--	--	
3	400+44.00	15.8' LT	28.1	75.0	--	50.0	2	--	5	--	1		1	1	75.0	1	--	--	
4	400+49.00	15.8' RT	28.1	25.0	--	50.0	2	--	4	1	--		1	1	25.0	1	--	--	

Example 2—Steel Beam Guardrail at a One-way Bridge



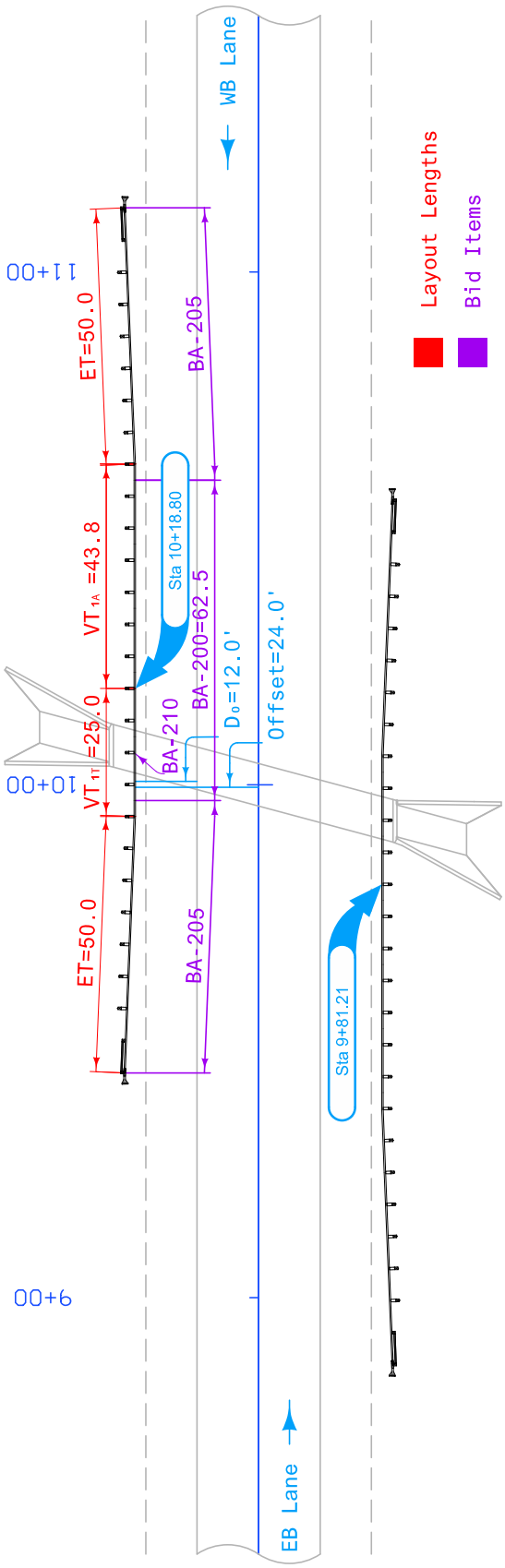
108-8A
10-19-10

STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE END POST

Refer to BA-200, BA-201, BA-202, BA-205, BA-250, SI-172, SI-173 and SI-211. ① See Standards for list of materials.

Location Station			Layout Lengths					Delineators and Object Markers								Bid Items ①								Remarks
								Delineator			Object Marker								End Terminal					
			VT1	VF	VT2	ET	Type	Type 1		Type 2	Type 3		End Anchor Bolted	Barrier Transition Section	Steel Beam Guardrail	Standard	Flared for Cable Connection	Adapter	
						Terminal		White			OM-3L	OM-3R							
No.	Station	Offset	LF	LF	LF	LF		No.		No.	No.	No.	Type	No.	LF	No.	No.	No.	
1	199+56.09	66.8' RT	28.1	25.0	137.5	50.0	--	--		--	--	1	1	1	162.5	1	--	--	
2	199+74.75	25.2' RT	28.1	100.0	--	50.0	--	--		--	1	--	1	1	100.0	1	--	--	

Example 3—Steel Beam Guardrail over a Low-fill Culvert



108-8B
10-18-11

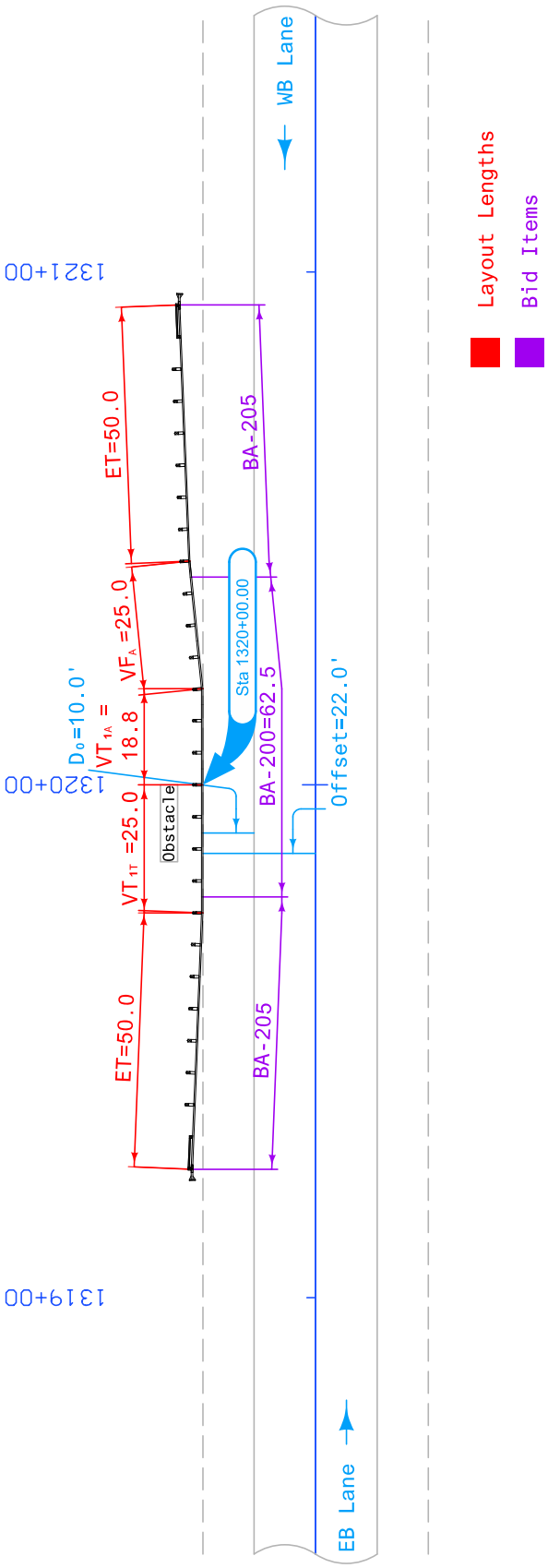
STEEL BEAM GUARDRAIL FOR SIDE OBSTACLE (TWO-WAY PROTECTION)

Refer to BA-200, BA-201, BA-205, BA-206, BA-251, SI-172, SI-173, and SI-211

No.	Location: Direction of Traffic (1)	Location: Side (1) O= Outside M= Median	Location: Station	Location: Offset	O_L FT	D_0 FT	Approach Side (A): ET Terminal LF	Approach Side (A): $VT2_A$ LF	Approach Side (A): VF_A LF	Approach Side (A): $VT1_A$ LF	Trailing Side (T): $VT1_T$ LF	Trailing Side (T): VF_T LF	Trailing Side (T): $VT2_T$ LF	Trailing Side (T): ET Terminal LF	Culvert Spanning	Delineators and Object Markers: Type	Delineator: Type 1 White No.	Delineator: Type 2 No.	Object Marker: Type 3 OM-3L No.	Object Marker: Type 3 OM-3R No.	Steel Beam Guardrail BA-200 LF	End Terminal (2): Standard BA-205 No.	End Terminal (2): Flared for Cable Connection BA-206 No.	Adapter BA-210 No.	Remarks
1	EB	--	9+81.21	24.0' RT	9.0	12.0	50.0	--	--	43.8	25.0	--	--	50.0	--	--	--	--	--	--	62.5	2	--	1	
2	WB	--	10+18.80	24.0' LT	9.0	12.0	50.0	--	--	43.8	25.0	--	--	50.0	--	--	--	--	--	--	62.5	2	--	1	

(1) Lane(s) to which the obstacle is adjacent.
(2) See Standards for list of materials.

Example 4—Side Obstacle Shielded with Steel Beam Guardrail (Two-way Protection)



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10-18-11

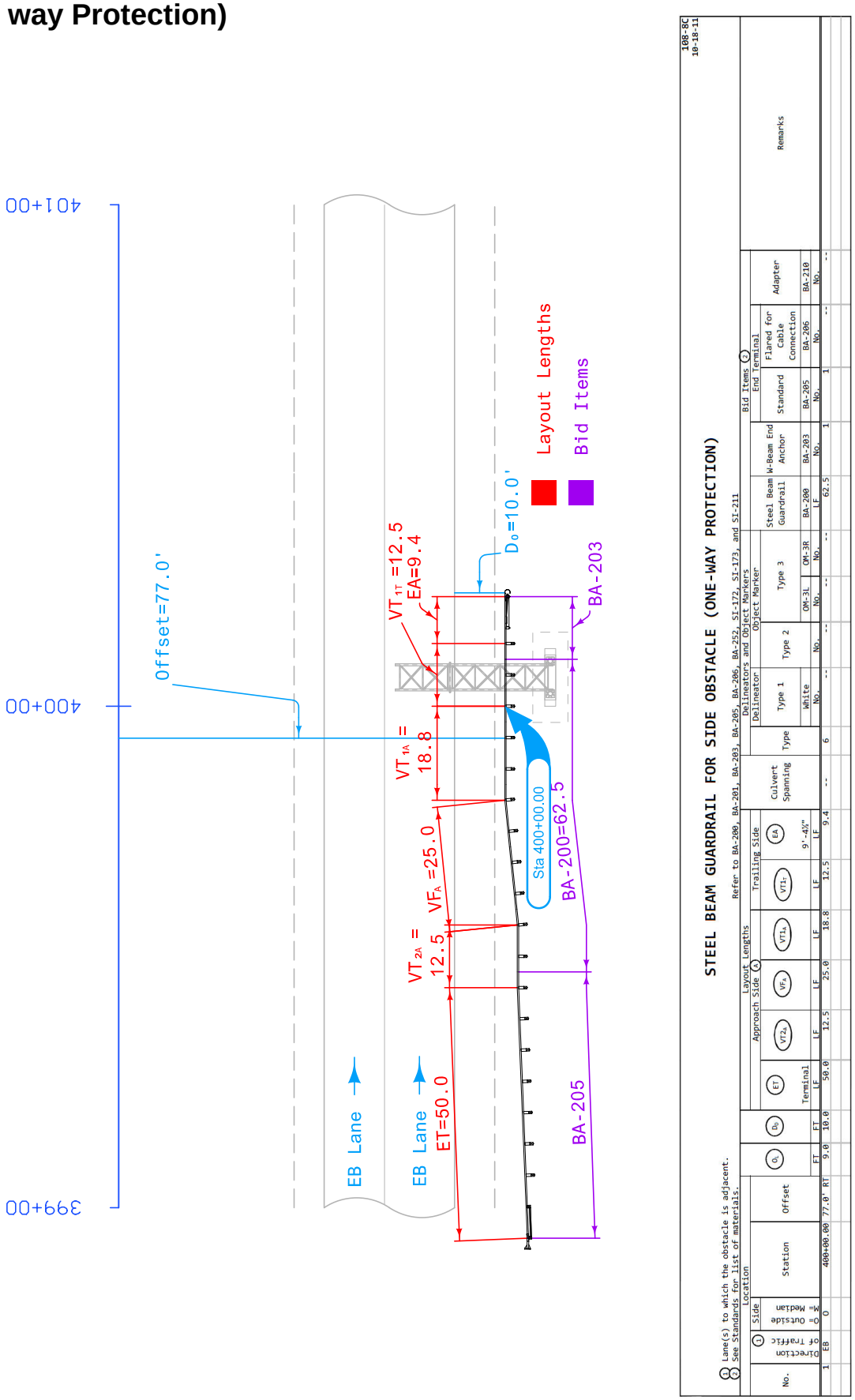
STEEL BEAM GUARDRAIL FOR SIDE OBSTACLE (TWO-WAY PROTECTION)

Refer to BA-200, BA-201, BA-205, BA-206, BA-251, SI-172, SI-173, and SI-211

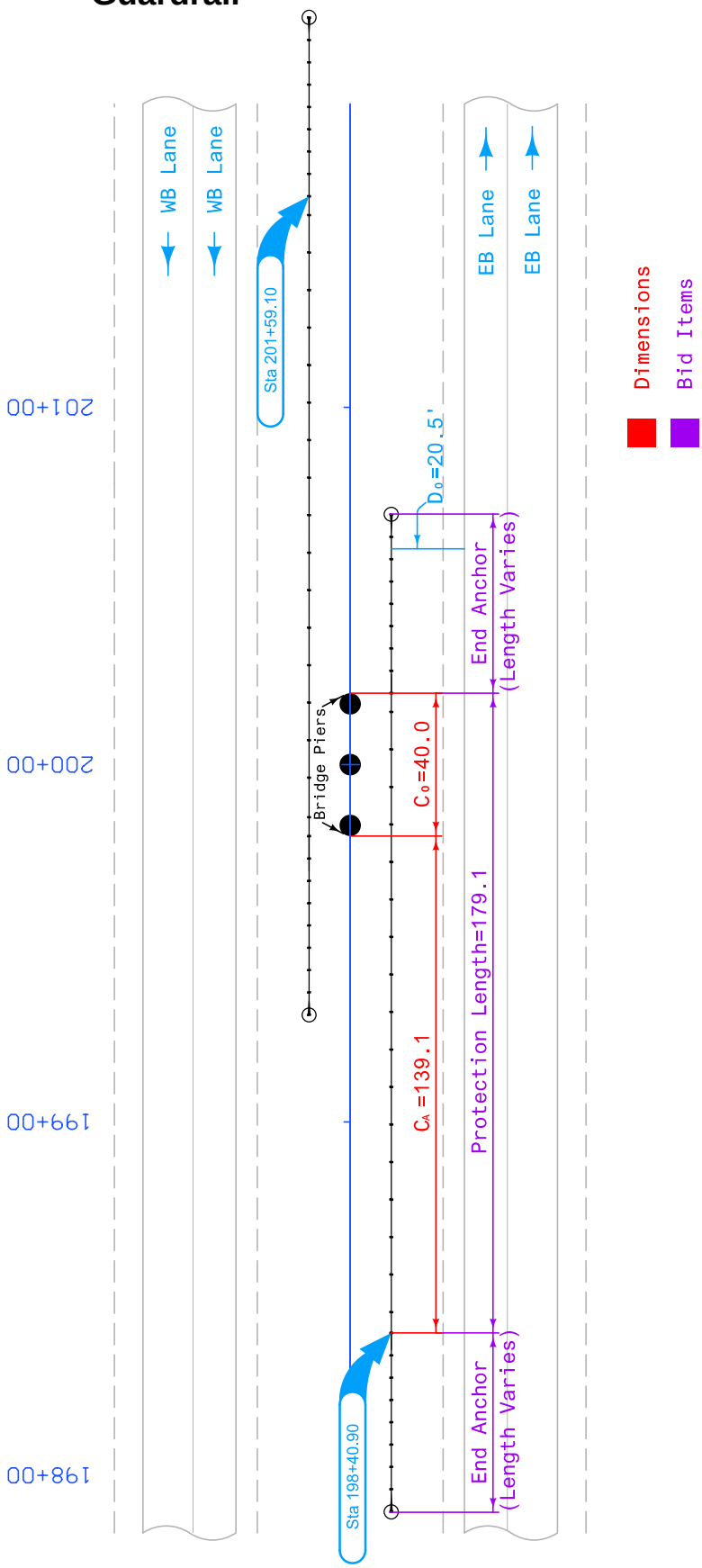
1 Lane(s) to which the obstacle is adjacent.
2 See Standards for list of materials.

No.	Location: Direction of Traffic	Location: Side O= Outside M= Median	Location: Station	Location: Offset	O_L	D_o	Layout Lengths: Approach Side (A) ET Terminal	Approach Side (A) $VT2_A$	Approach Side (A) VF_A	Approach Side (A) $VT1_A$	Trailing Side (T) $VT1_T$	Trailing Side (T) VF_T	Trailing Side (T) $VT2_T$	Trailing Side (T) ET Terminal	Culvert Spanning	Delineators and Object Markers: Type	Delineator: Type 1 White	Delineator: Type 2	Object Marker: Type 3 OM-3L	Object Marker: Type 3 OM-3R	Bid Items (2): Steel Beam Guardrail	End Terminal: Standard	End Terminal: Flared for Cable Connection	Adapter	Remarks
					FT	FT	LF	LF	LF	LF	LF	LF	LF	LF			No.	No.	No.	No.	LF	No.	No.	No.	
1	WB	--	1320+00.00	22.0' LT	15.0	10.0	50.0	--	25.0	18.8	25.0	--	--	50.0	--	5	--	--	1	1	62.5	2	--	--	

Example 5—Side Obstacle Shielded with Steel Beam Guardrail (One-way Protection)



Example 6—Median Obstacle Shielded with High-tension Cable Guardrail



108-9A
04-20-10

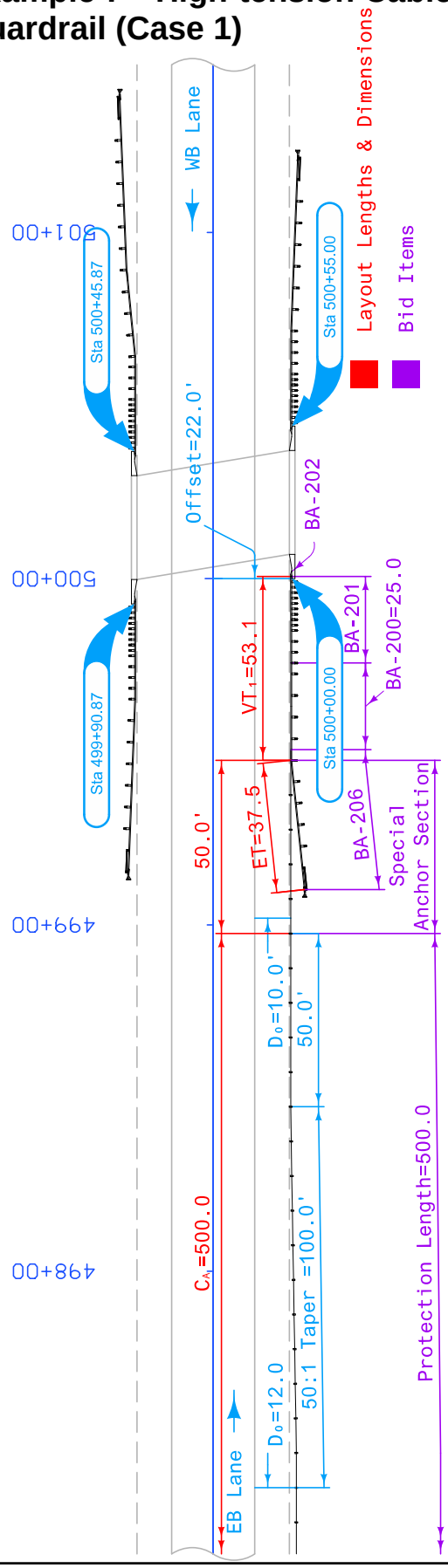
HIGH TENSION CABLE GUARDRAIL

Refer to BA-351.

(1) Lane(s) to which the installation is adjacent.

No.	Location: Direction of (1) Traffic	Location: Station to Station	Location: Side	Dimensions: Offset D_0	Dimensions: Approach C_A	Dimensions: Obstacle C_O	Dimensions: Trailing C_T	Bid Items: Protection Length (C_A+C_O+C_T)	Bid Items: End Anchor	Remarks
				FT	FT	FT	FT	FT	No.	
1	EB	198+40.90	M	20.5	139.1	40.0	--	179.1	2	
2	WB	199+80.00	M	20.5	139.1	40.0	--	179.1	2	

Example 7—High-tension Cable Guardrail Attached to Steel Beam Guardrail (Case 1)



108-8A
10-19-10

STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE END POST

Refer to BA-200, BA-201, BA-202, BA-205, BA-250, SI-172, SI-173 and SI-211. (1) See Standards for list of materials.

No.	Location Station: Station	Location Station: Offset	Layout Lengths: VT1 LF	Layout Lengths: VF LF	Layout Lengths: VT2 LF	Layout Lengths: ET Terminal LF	Bid Items: Delineators and Object Markers: Type	Delineator: Type 1 White No.	Delineator: Type 2 No.	Object Marker: Type 3 OM-3L No.	Object Marker: Type 3 OM-3R No.	End Anchor Bolted Type	Barrier Transition Section No.	Steel Beam Guardrail LF	End Terminal: Standard No.	End Terminal: Flared for Cable Connection No.	Adapter No.	Remarks
1	499+90.87	22.0' LT	28.1	--	--	50.0	3	--	--	--	1	--	1	--	1	--	--	
2	500+00.00	22.0' RT	53.1	--	--	37.5	3	--	--	--	1	1	1	25.0	--	1	--	Connect to 108-9A No.3
3	500+45.87	22.0' LT	28.1	25.0	--	50.0	3	--	--	--	1	1	1	25.0	1	--	--	
4	500+55.00	22.0' RT	28.1	--	--	50.0	3	--	--	1	--	1	1	--	1	--	--	

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04-20-10

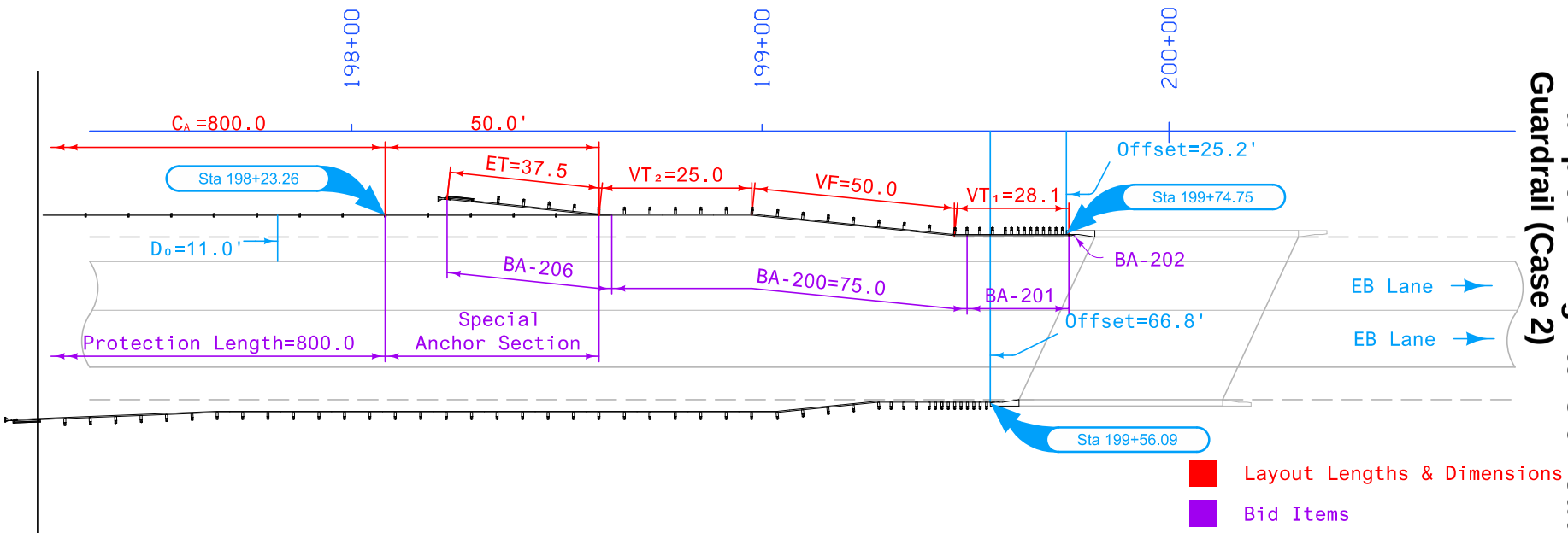
HIGH TENSION CABLE GUARDRAIL

(1) Lane(s) to which the installation is adjacent. Refer to BA-351.

No.	Location: Direction of Traffic (1)	Location: Station to Station	Location: Side	Dimensions: Offset D_0 FT	Dimensions: Approach C_A FT	Dimensions: Obstacle C_O FT	Dimensions: Trailing C_T FT	Bid Items: Protection Length (C_A+C_O+C_T) FT	Bid Items: End Anchor No.	Remarks
1	EB	494+03.58 497+53.58	--	12.0	350.0	--	--	350.0	1	
2	EB	497+53.58 498+53.58	--	12.0-10.0	100.0	--	--	100.0	--	
3	EB	498+53.58 499+03.58	--	10.0	50.0	--	--	50.0	1 (A)	Connect to 108-8A No.2

(A) Special Anchor Section

Example 8— High-tension Cable Guardrail Attached to Steel Beam Guardrail (Case 2)



108-8A
10-19-10

STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE END POST

Refer to BA-200, BA-201, BA-202, BA-205, BA-250, SI-172, SI-173 and SI-211.

(1) See Standards for list of materials.

Location Station			Layout Lengths				Delineators and Object Markers					Bid Items (1)						Remarks
			VT1	VF	VT2	ET	Type	Delineator Type 1	Object Marker Type 2	Object Marker Type 3		End Anchor Bolted	Barrier Transition Section	Steel Beam Guardrail	End Terminal Standard	End Terminal Flared for Cable Connection	Adapter	
						Terminal		White		OM-3L	OM-3R	BA-202	BA-201	BA-200	BA-205	BA-206	BA-210	
No.	Station	Offset	LF	LF	LF	LF		No.	No.	No.	No.	Type	No.	LF	No.	No.	No.	
1	199+56.09	66.8' RT	28.1	25.0	137.5	50.0	--	--	--	--	1	1	1	162.5	1	--	--	
2	199+74.75	25.2' RT	28.1	50.0	25.0	37.5	--	--	--	1	--	1	1	75.0	--	1	--	Connect to 108-9A No.1

108-9A
04-20-10

(1) Lane(s) to which the installation is adjacent.

HIGH TENSION CABLE GUARDRAIL

Refer to BA-351.

Location						Dimensions			Bid Items		Remarks
No.	Direction of Traffic (1)	Station to Station		Side	Offset D_0	Approach C_A	Obstacle C_O	Trailing C_T	Protection Length $(C_A+C_O+C_T)$	End Anchor	
					FT	FT	FT	FT	FT	No.	
1	EB	190+23.26	198+23.26	M	11.0	800.0	--	--	800.0	2 (A)	Connect to 108-8A No.2

(A) 1 Special Anchor Section

Chronology of Changes to Design Manual Section:

008B-010 Tabulating Guardrail

4/29/2011	Revised Updated examples for the BA series and added examples with high-tension cable guardrail.
6/18/2004	Previously Updated.