Assignment	Senior Capstone Bridge Design

Section Name	Preliminary Gider Calcs

Section Dimensions (in)		
Component	Thickness	Width
Top Flange	0.75	16.00
Web	55.00	0.50
Bottom Flange	1.25	16.00

Concrete Properties	
Unit Weight (ksi)	0.49
Comprehensive Strength (ksi)	4

Modulus Ratios	
n (short term)	8
3n (long term)	24

Effective Flange Widths (in)	
Interior	114

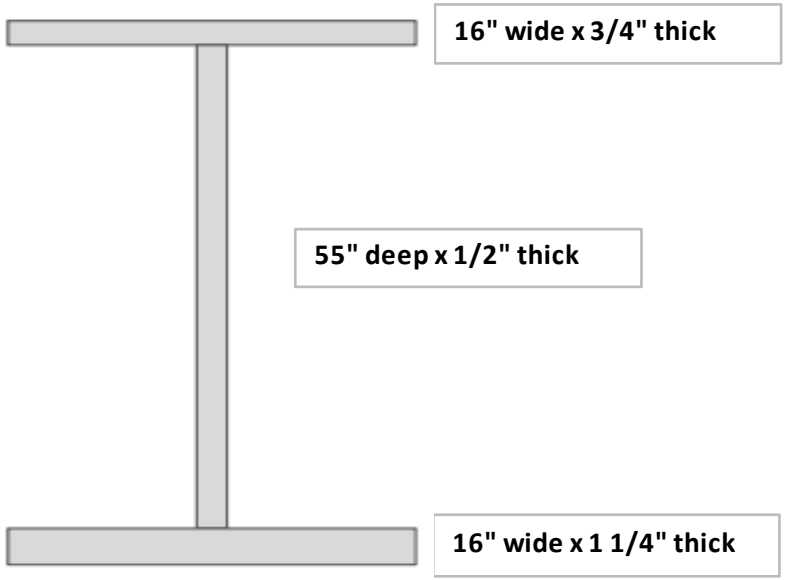
Structural Slab Thickness (in)	
Interior	8

Bridge Parameters	
Girder Spacing (ft)	9
Deck Overhang (ft)	5.67
Number of Girders	4
Total Deck Width (ft)	34

Deck Dimenions (in)	
Total Thickness	9.00
Integral Wearing Surface	1.00
Haunch	2.00

Length	125	1500	in
Steel	50		
F_{yc}	65		

		Preliminary Sizing	Normal Range	Optimized Values	Units
1	D design	54.55		**55.00**	in
2	t_w Design	0.45	0.36	**1/2**	in
3	b_{fc} Design	13.64	9.09	**16.00**	in
4	t_{fc} Design	0.75	0.85	**3/4**	in
5	t_{ft} Design	1.12		**1.25**	in



Element Quantities - Steel Plate Girder Alternative

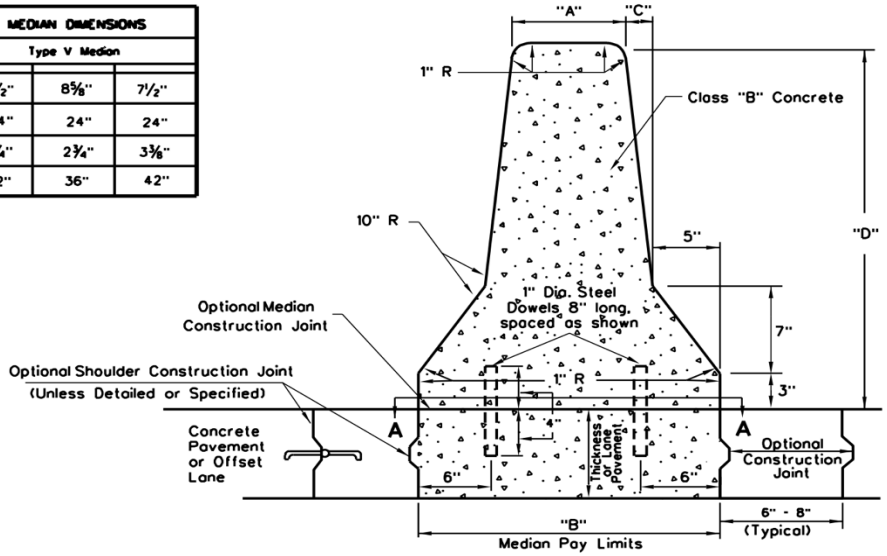
Unit Wt. of Steel	**490**	**lb/ft3**
Unit Wt. of Rein. Concrete	**145**	**lb/ft3**

Part	Length (ft)	Width (ft)	Thickness (ft)	Volume (ft^3)	# Required	Weight/Part	Total Wt. (lbs)	LF of Steel - Girders
Top Flange	125	1.333	0.063	10.417	4	5104.167	20417	500
Web	125	4.583	0.042	23.872	4	11697.049	46788	500
Bottom Flange	125	1.333	0.104	17.361	4	8506.944	34028	500
							101233	**1500**

Part	Length (in)	Width (in)	Thickness (in)	# Required/ Beam	Total # Required
Elastomeric Bearing Pads	20	18	5.875	2	8
AASHTO M 164 Bolts	-	-	-	328	1312

Part	Length (ft)	Width (ft)	Thickness (ft)	Volume (ft^3)	# Required	Weight/Part	Total Wt. (lbs)	LF of Concrete
Concrete Deck	125	30	0.75	2812.5	1	407812.5	407812.5	125
Type V Median Parapet	125	0.79167	2.667	263.9219	2	38268.67188	76537.34375	250
Class B Concrete							**484350**	**375**
(assuming rectangular shape)								

F-SHAPE MEDIAN DIMENSIONS			
Designation	Type V Median		
"A"	9½"	8⅝"	7½"
"B"	24"	24"	24"
"C"	2¼"	2¾"	3⅜"
"D"	32"	36"	42"



(Adjocent to Concrete Paving)

F-SHAPE

Element Quantities - Steel Rolled Beam Alternative

Unit Wt. of Steel	**490**	**lb/ft3**
Unit Wt. of Rein. Concrete	**145**	**lb/ft3**

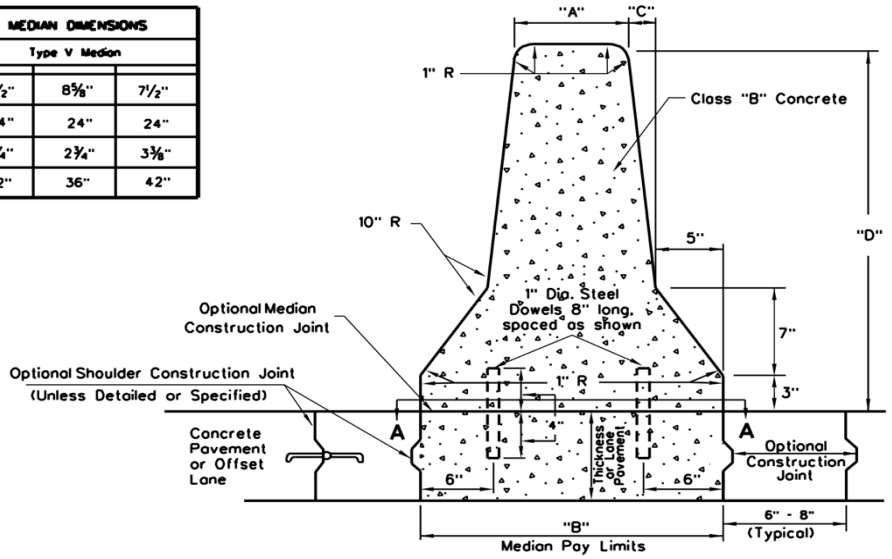
Part	Length (ft)	Area (ft2)	Volume (ft^3)	# Required	Weight/ Part	Total Wt. (lbs)	LF of Steel - Girders
Rolled Beam	125		0.000	4	0.000	0	500
						0	**500**

Part	Length (in)	Width (in)	Thickness (in)	# Required/ Beam	Total # Required
Elastomeric Bearing Pads	20	18	5.875	2	8
AASHTO M 164 Bolts	-	-	-	328	1312

Part	Length (ft)	Width (ft)	Thickness (ft)	Volume (ft^3)	# Required	Weight/ Part	Total Wt. (lbs)	LF of Concrete
Concrete Deck	125	30	0.75	2812.5	1	407813	407812.5	125
Type V Median Parapet	125	0.79167	2.667	263.9219	2	38268.7	76537.344	250
Class B Concrete							**484350**	**375**

(assuming rectangular shape)

F-SHAPE MEDIAN DIMENSIONS			
Designation	Type V Median		
"A"	9½"	8⅝"	7½"
"B"	24"	24"	24"
"C"	2¼"	2¾"	3⅜"
"D"	32"	36"	42"



(Adjacent to Concrete Paving)

F-SHAPE

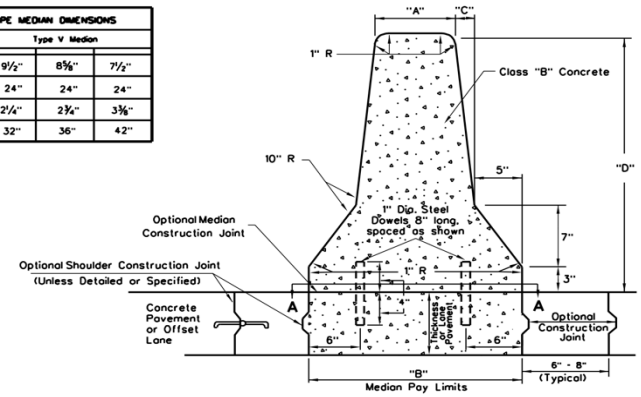
Element Quantities - Concrete Type V I-Beam Alternative

Unit Wt. of Steel	**490**	**lb/ft3**
Unit Wt. of Rein. Concrete	**145**	**lb/ft3**

Part	Length (ft)	Width (ft)	Thickness (ft)	Area (in2)	Area (ft2)	Volume (ft3)	# Required	Weight (lbs)	Weight/Part	Total Wt. (lbs)	LF of Concrete
AASHTO I Beam - Type V	125.00	-	-	1013.00	7.03	-	4.00	1055.00	4220.00	16880.00	500.00
Concrete Deck	125.00	30.00	0.75	-	22.50	2812.50	1.00	-	407812.50	407812.50	125.00
Type V Median Parapet (Class B Concrete)	125.00	0.79	2.67	-	2.11	263.92	2.00	-	38268.67	76537.34	250.00
										501229.84	**875.00**

Part	Length (in)	Width (in)	Thickness (in)	# Required
Elastomeric Bearing Pads	20	18	5.875	8

F-SHAPE MEDIAN DIMENSIONS			
Designation	Type V Median		
"A"	9½"	8⅝"	7½"
"B"	24"	24"	24"
"C"	2¼"	2¾"	3⅜"
"D"	32"	36"	42"



(Adjacent to Concrete Paving)

F-SHAPE