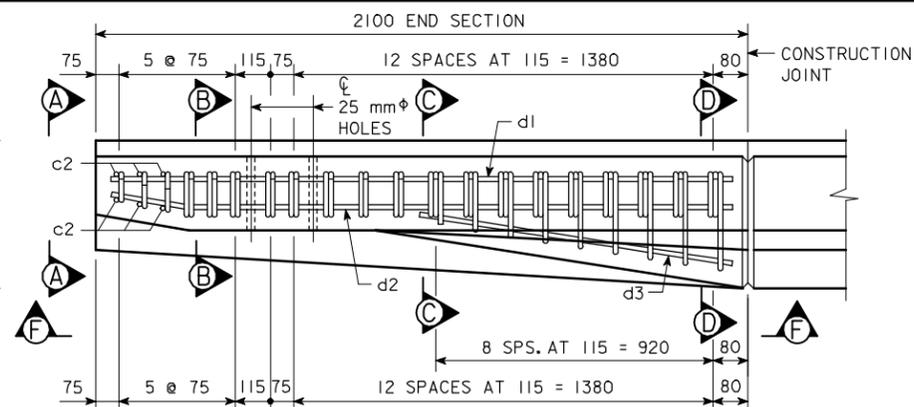
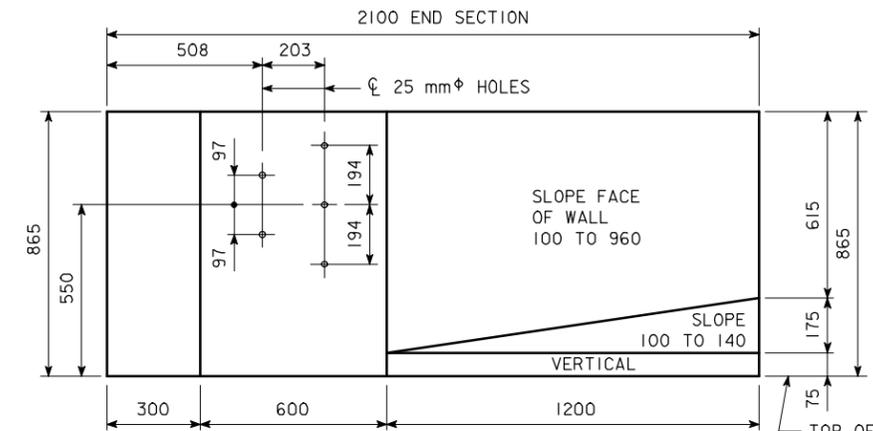


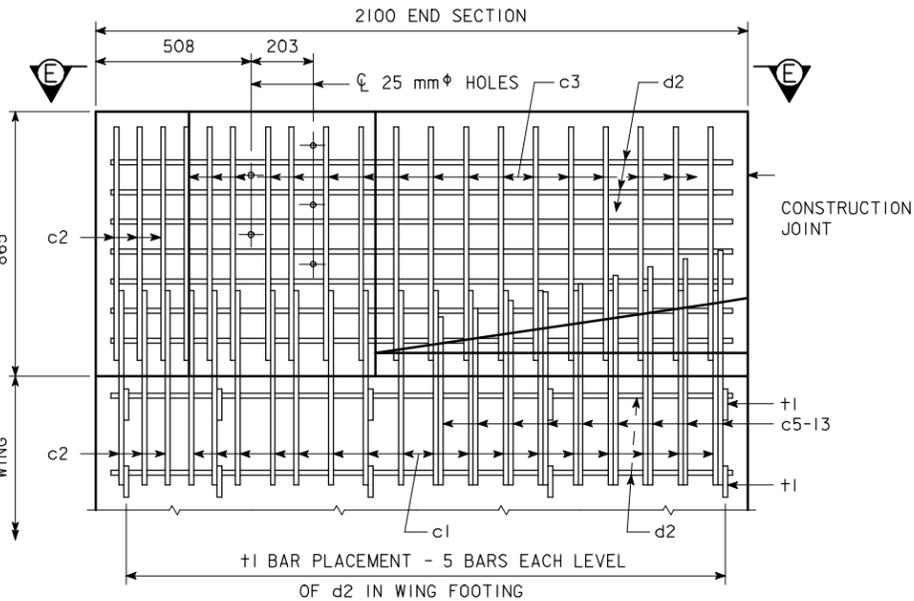
PART PLAN VIEW



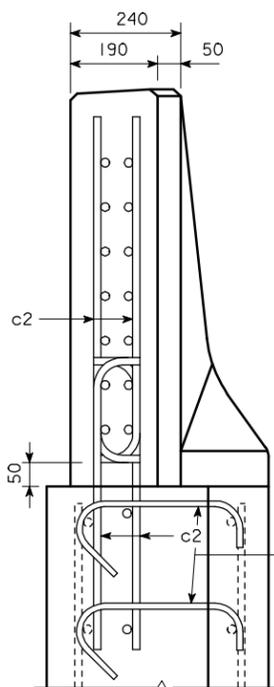
PART VIEW E-E



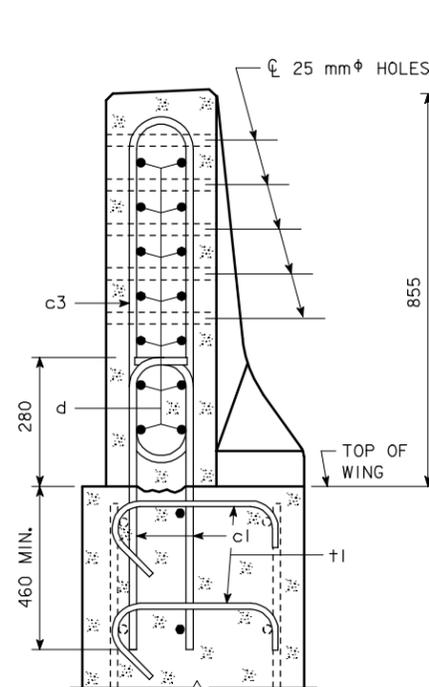
PART ELEVATION VIEW



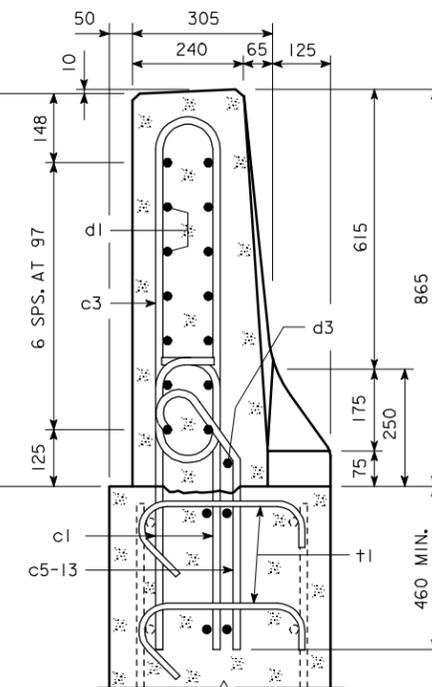
PART VIEW F-F



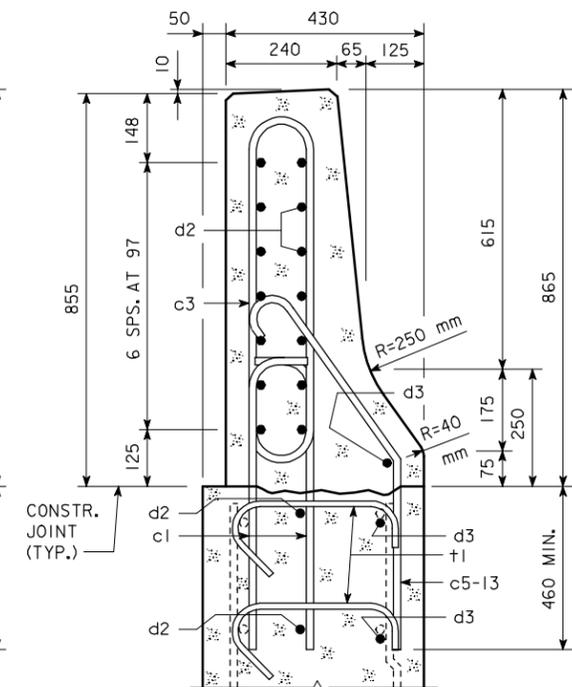
VIEW A-A



SECTION B-B



SECTION C-C



SECTION D-D

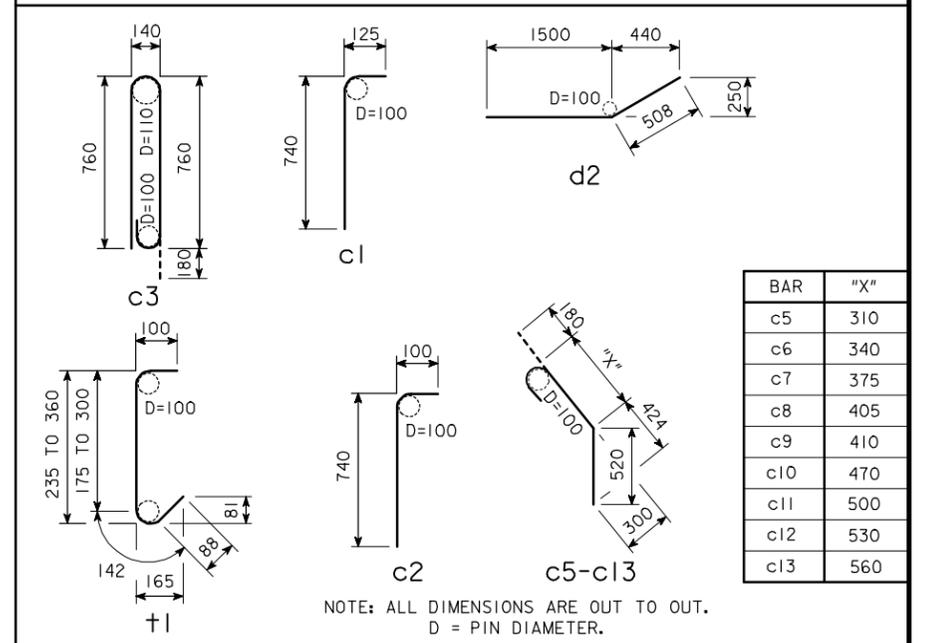
EPOXY REINFORCING STEEL - ONE END SECTION

MARK	SIZE	LOCATION	SHAPE	NO.	LENGTH	MASS	
c1	15	VERTICAL, RAIL TO WING FOOTING	┌	34	865	46	
c2	15	VERTICAL AT NOSE, RAIL TO WING FOOTING	┌	12	840	16	
c3	15	VERTICAL	┌	17	1840	49	
c5-13	15	VERTICAL	┌	9	VARIABLE	16	
d1	15	LONGITUDINAL	—	7	2000	22	
d2	15	LONGITUDINAL	—	9	2000	28	
d3	15	LONGITUDINAL	—	3	1045	5	
+1	10	WING FOOTING TIE BARS	┌	10	VARIABLE	5	
					(INCLUDE WITH BARRIER RAIL REINFORCING)	TOTAL (kg.)	187

CONCRETE PLACEMENT SUMMARY

SECTION	TOTAL
BARRIER RAIL ONE END SECTION	0.47 m <sup>3</sup>

BENT BAR DETAILS



NOTE: CONSTRUCTION JOINT BETWEEN TOP OF WING AND BARRIER RAIL ROUGHENED CONCRETE.

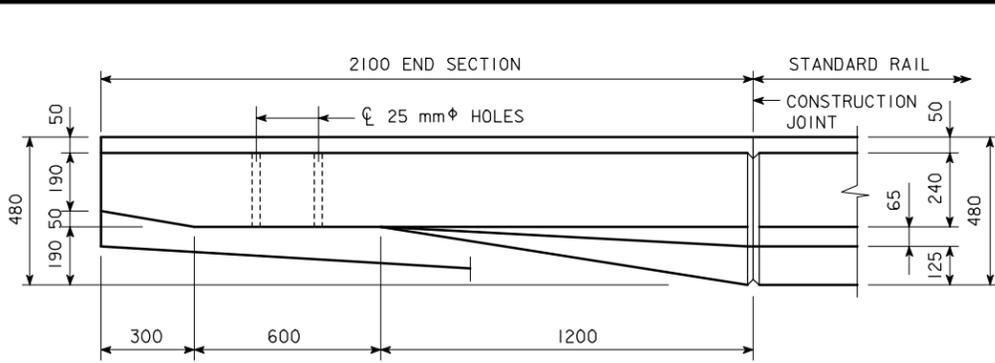
NOTE: THE 250 mm RADIUS AND 40 mm RADIUS ARE TYPICAL AND SHALL BE USED WHEN CONSTRUCTING THE CORNERS FOR VIEW A-A, SECTION B-B, SECTION C-C AND SECTION D-D.

NOTE: THE c1, c2, c5-13, d2, +1 AND d3 BARS ARE TO BE PLACED WITH THE ABUTMENT WING FOOTING. THE DETAILS FOR PLACEMENT ARE SHOWN ON THE SUPERSTRUCTURE DETAIL SHEET.

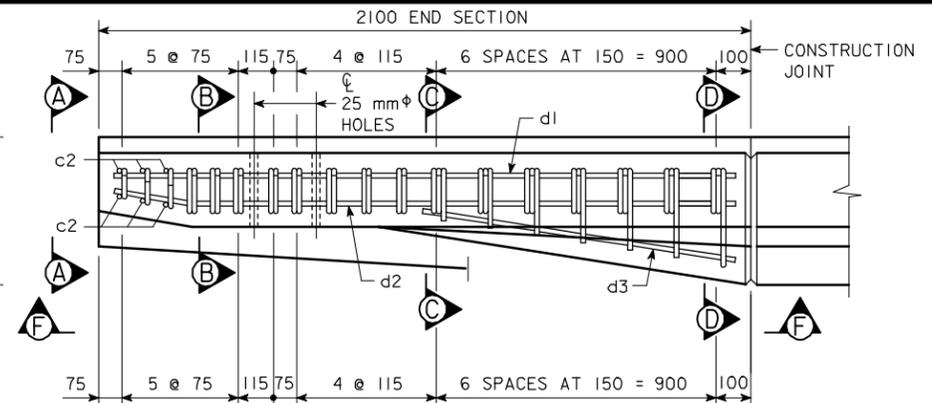
NOTE: DASHED LINES BELOW THE TOP OF WING ARE THE ABUTMENT WING REINFORCING STEEL. SEE SUPERSTRUCTURE DETAIL SHEET FOR PLACEMENT.

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
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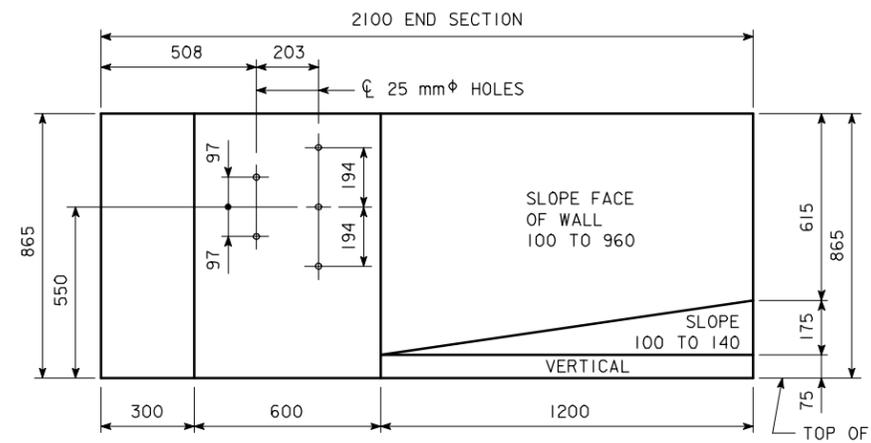
CORRECTION 07-04 - MINOR CHANGES TO NOTES. HM1017.SOI - 09-01 THIS SHEET ISSUED.



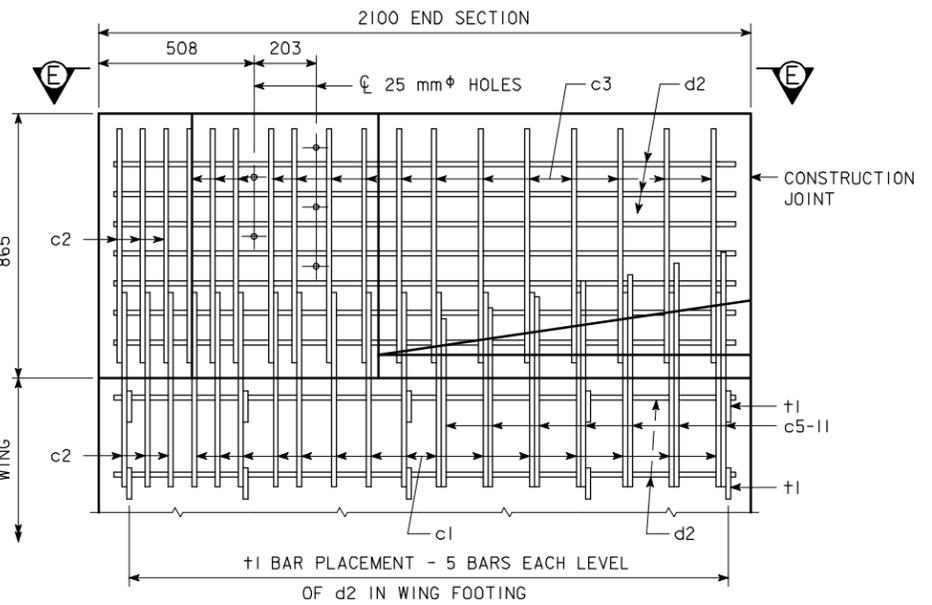
PART PLAN VIEW



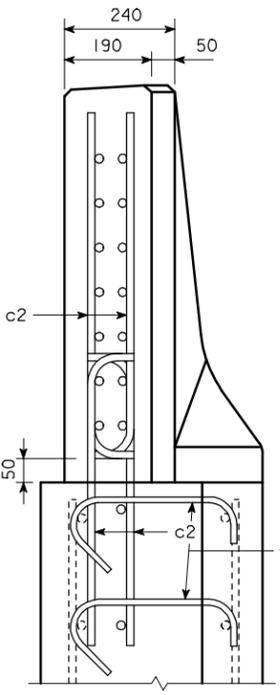
PART VIEW E-E



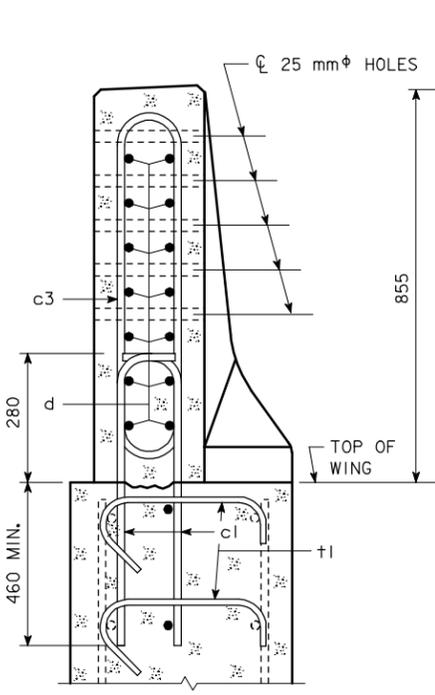
PART ELEVATION VIEW



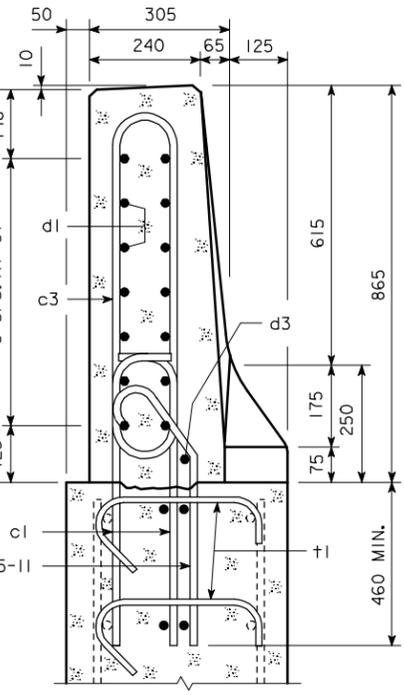
PART VIEW F-F



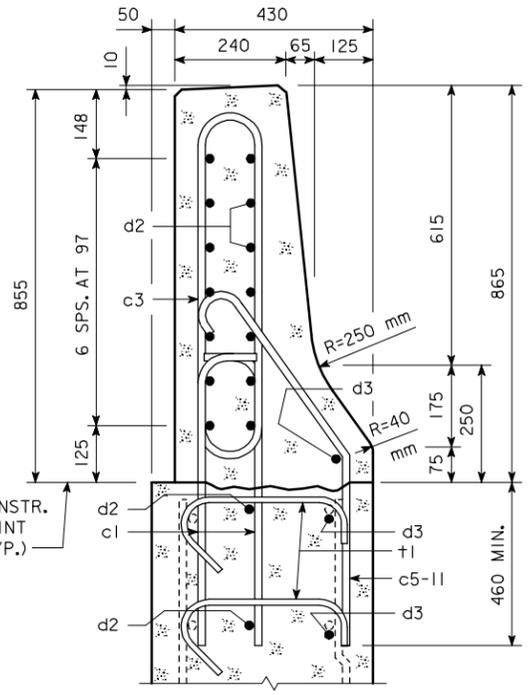
VIEW A-A



SECTION B-B



SECTION C-C



SECTION D-D

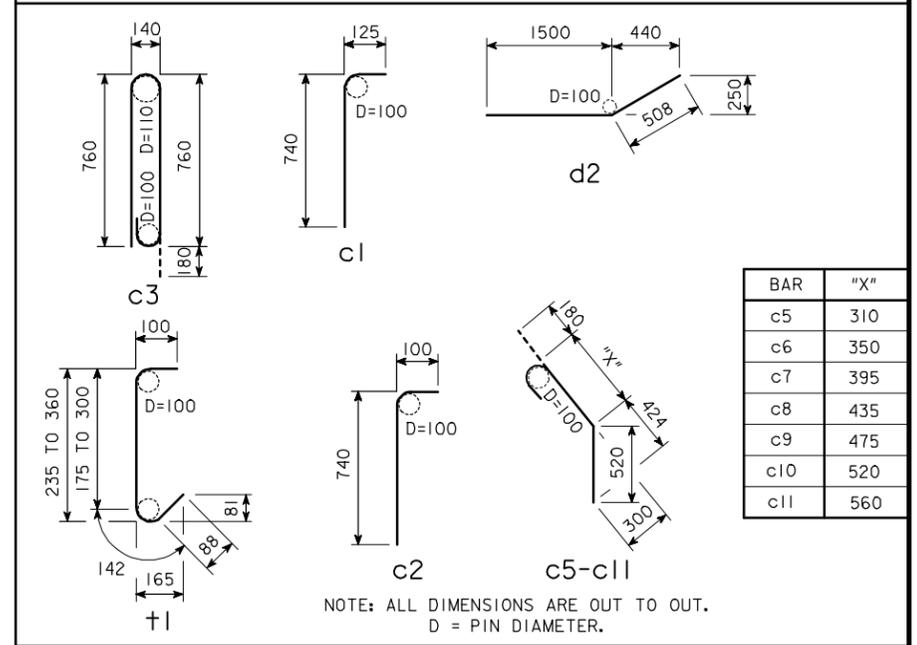
EPOXY REINFORCING STEEL - ONE END SECTION

MARK	SIZE	LOCATION	SHAPE	NO.	LENGTH	MASS	
c1	15	VERTICAL, RAIL TO WING FOOTING	┌	30	865	41	
c2	15	VERTICAL AT NOSE, RAIL TO WING FOOTING	┌	12	840	16	
c3	15	VERTICAL	┌	15	1840	43	
c5-11	15	VERTICAL	┌	7	VARIABLES	12	
d1	15	LONGITUDINAL	—	7	2000	22	
d2	15	LONGITUDINAL	—	9	2000	28	
d3	15	LONGITUDINAL	—	3	1045	5	
t1	10	WING FOOTING TIE BARS	┌	10	VARIABLES	5	
(INCLUDE WITH BARRIER RAIL REINFORCING)						TOTAL (kg.)	172

CONCRETE PLACEMENT SUMMARY

SECTION	TOTAL
BARRIER RAIL ONE END SECTION	0.47 m <sup>3</sup>

BENT BAR DETAILS



BAR	"X"
c5	310
c6	350
c7	395
c8	435
c9	475
c10	520
c11	560

NOTE:  
CONSTRUCTION JOINT BETWEEN TOP OF WING AND BARRIER RAIL ROUGHENED CONCRETE.

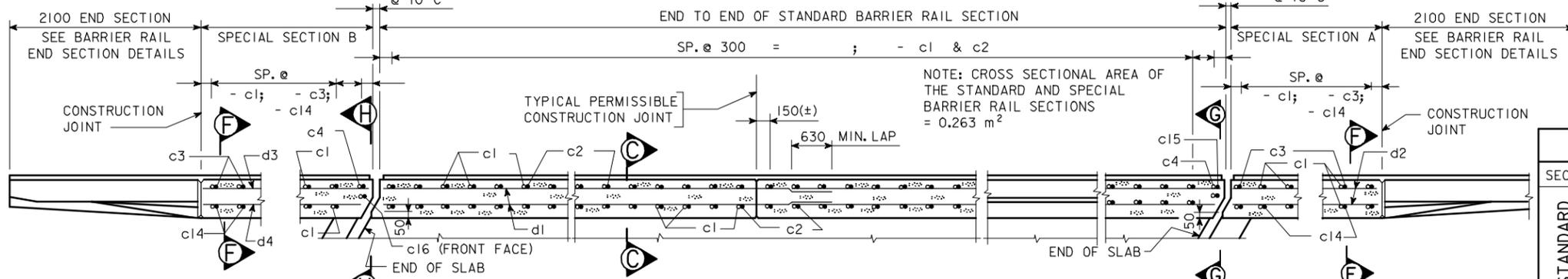
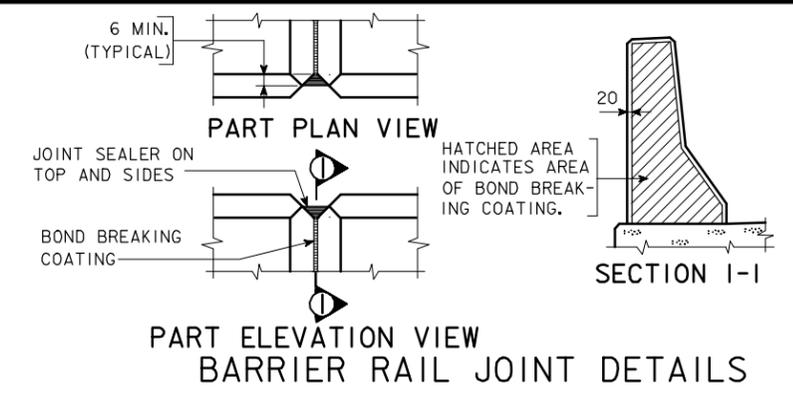
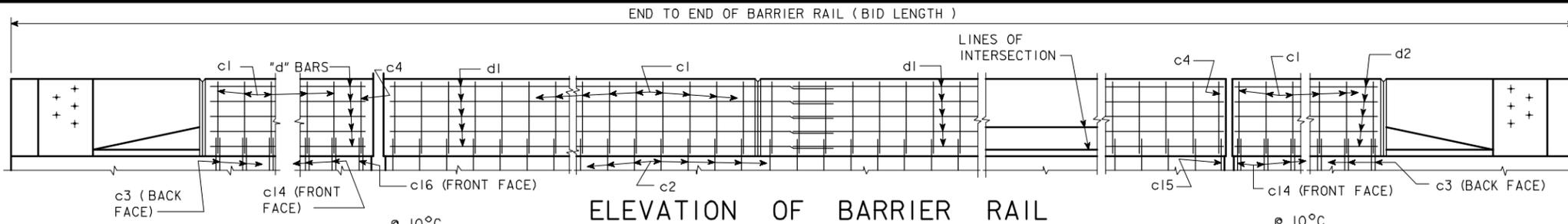
NOTE:  
THE 250 mm RADIUS AND 40 mm RADIUS ARE TYPICAL AND SHALL BE USED WHEN CONSTRUCTING THE CORNERS FOR VIEW A-A, SECTION B-B, SECTION C-C AND SECTION D-D.

NOTE:  
THE c1, c2, c5-13, d2, t1 AND d3 BARS ARE TO BE PLACED WITH THE ABUTMENT WING FOOTING. THE DETAILS FOR PLACEMENT ARE SHOWN ON THE SUPERSTRUCTURE DETAIL SHEET.

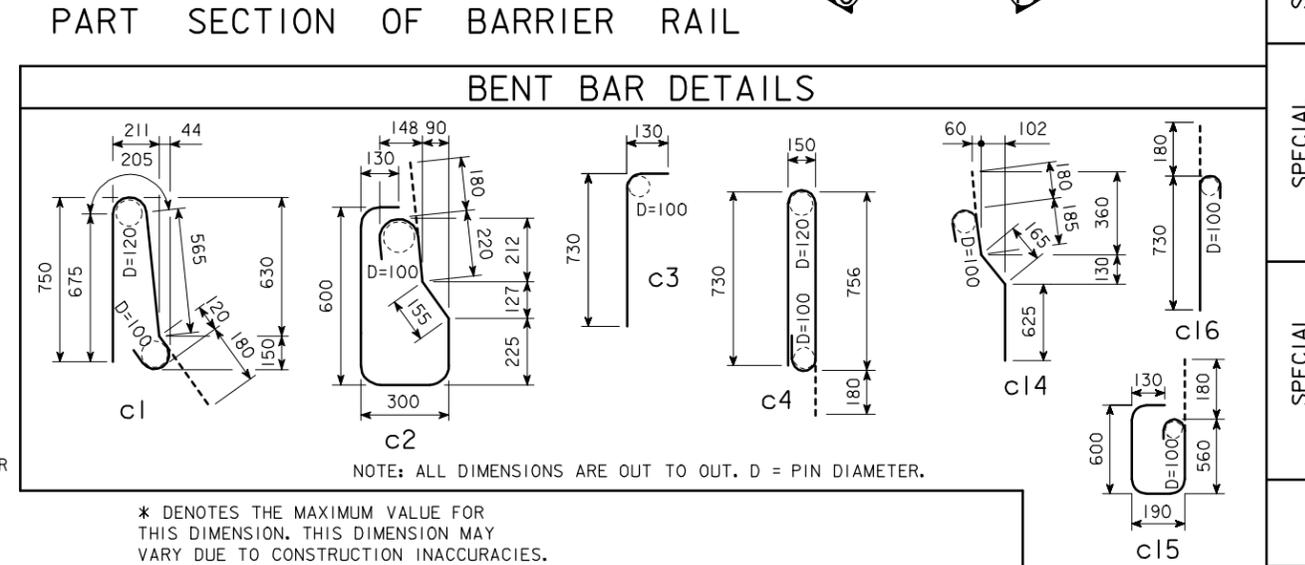
NOTE:  
DASHED LINES BELOW THE TOP OF WING ARE THE ABUTMENT WING REINFORCING STEEL. SEE SUPERSTRUCTURE DETAIL SHEET FOR PLACEMENT.

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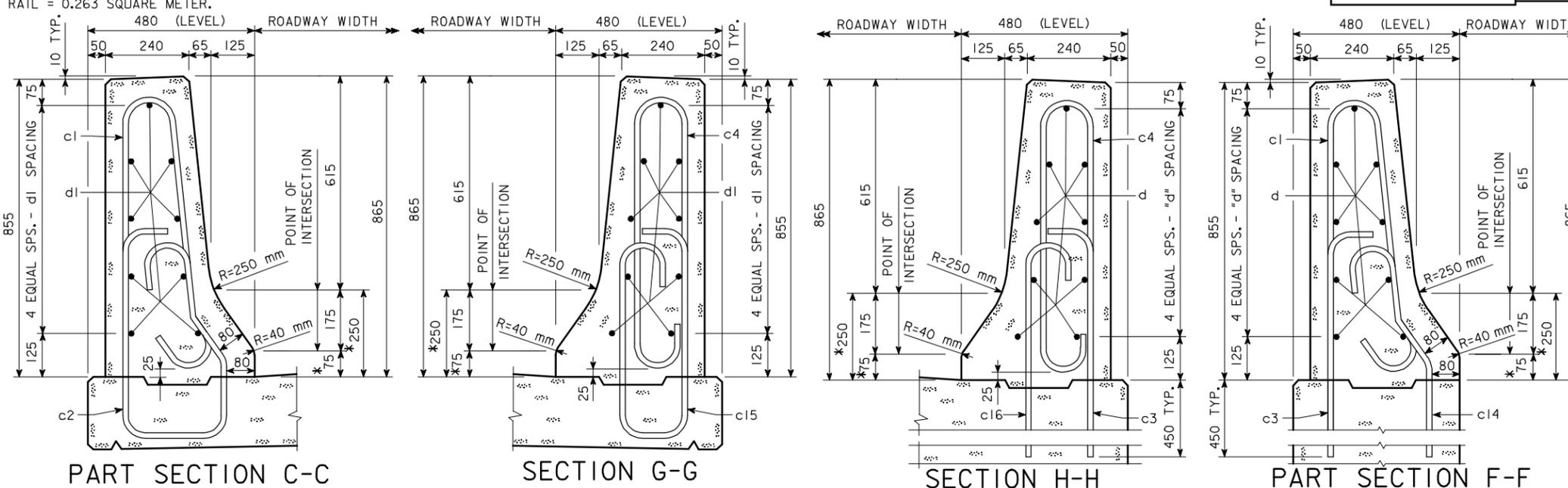
CORRECTION 07-04 - MINOR CHANGES TO NOTES. FM1017A.501 - 09-01 THIS SHEET ISSUED.



**BARRIER RAIL NOTES:**  
 MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 50 mm UNLESS OTHERWISE NOTED OR SHOWN.  
 THE PERMISSIBLE CONSTRUCTION JOINTS ARE TO BE PLACED BETWEEN VERTICAL BARS AT A MINIMUM SPACING OF 6000 mm. CONSTRUCTION JOINT CONTACT SURFACES ARE TO BE COATED WITH AN APPROVED BOND BREAKER. COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.  
 ALL BARRIER RAIL REINFORCING STEEL IS TO BE EPOXY COATED.  
 THE CONCRETE BARRIER RAIL IS TO BE BID ON A METRIC BASIS. THE NUMBER OF METERS OF BARRIER RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER METER BASED ON PLAN QUANTITIES. PRICE BID FOR CONCRETE BARRIER RAILING SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EXCLUDING REINFORCING STEEL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS. IF CONDUIT IS REQUIRED IN THIS PLAN THE RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS INCLUDING LABOR AND ANY ADDITIONAL WORK TO DO THE INSTALLATION IS CONSIDERED INCIDENTAL TO THE COST OF THE RAILING.  
 ALL BARRIER RAIL REINFORCING STEEL IS TO BE INCLUDED WITH THE SUPERSTRUCTURE REINFORCING STEEL.  
 THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETED FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.  
 TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL  $\nabla$  GRADE.  
 CROSS SECTIONAL AREA OF THE STANDARD SECTION OF THE BARRIER RAIL = 0.263 SQUARE METER.



EPOXY REINFORCING STEEL - TWO RAILS							
SECTION	MARK	SIZE	LOCATION	SHAPE	NO.	LENGTH	MASS
STANDARD SECTION	c1	15	VERTICAL	⌒		1750	
	c2	15	VERTICAL	⌒		1810	
	c4	15	VERTICAL	⌒	2	1820	6
	c15	15	VERTICAL	⌒	2	1660	5
	d1	15	LONGITUDINAL	—			
SPECIAL SECTION A	c1	15	VERTICAL	⌒		1750	
	c3	15	VERTICAL	⌒		860	
	c14	15	VERTICAL	⌒		1155	
	d2	15	LONGITUDINAL	—	18		
SPECIAL SECTION B	c1	15	VERTICAL	⌒		1750	
	c3	15	VERTICAL	⌒		860	
	c4	15	VERTICAL	⌒	2	1820	6
	c14	15	VERTICAL	⌒		1155	
	c16	15	VERTICAL	⌒	2	910	3
	d4	15	LONGITUDINAL	—	2		
BARRIER RAIL END SECTION						4 AT 187 kg.	748
(INCLUDED WITH SUPERSTRUCTURE REINFORCING)						TOTAL (kg.)	

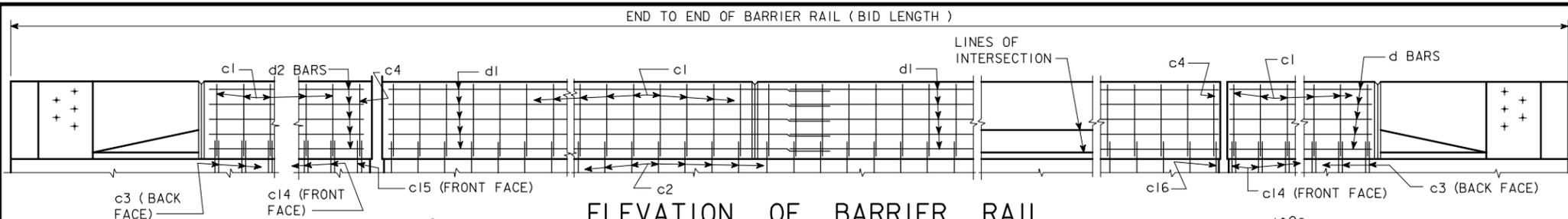


CONCRETE PLACEMENT SUMMARY		
SECTION		TOTAL
STANDARD SECTION	m AT 0.263 m³ PER m	
SPECIAL SECTION A		
SPECIAL SECTION B		
BARRIER RAIL END SECTION	4 AT 0.47 m³	1.9
TOTAL (m³)		

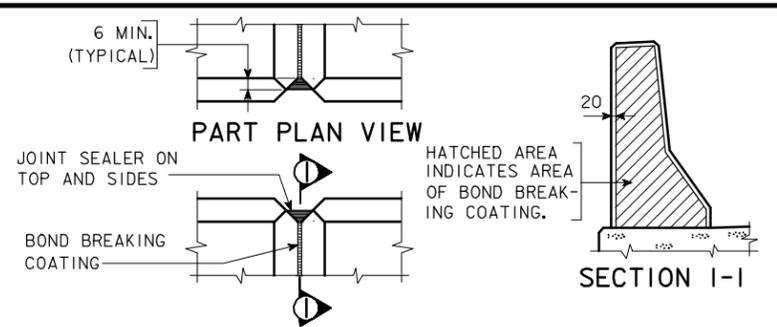
CONCRETE BARRIER RAIL QUANTITIES		
ITEM	UNIT	QUANTITY
CONCRETE BARRIER RAILING	m	

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
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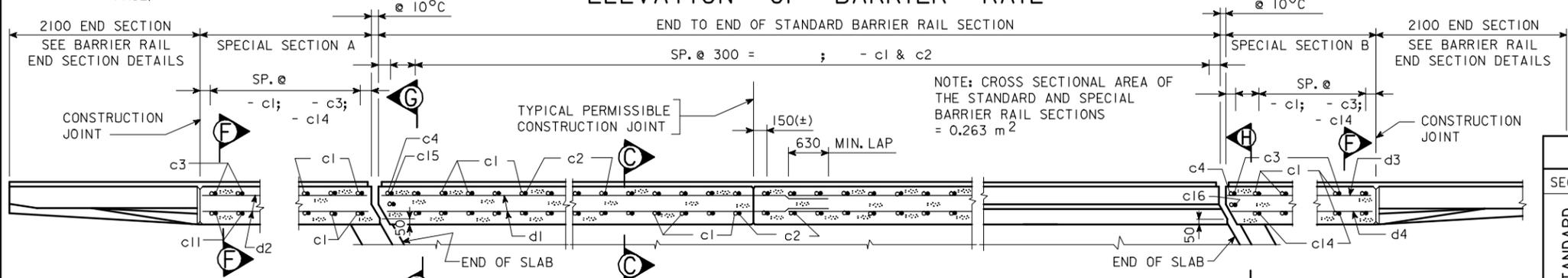
CORRECTION 12-01 - 5c16 BAR RELABELLED TO 5c14 IN SECTION F-F. HM1018.S01 - THIS SHEET ISSUED, 9-1-95.



ELEVATION OF BARRIER RAIL



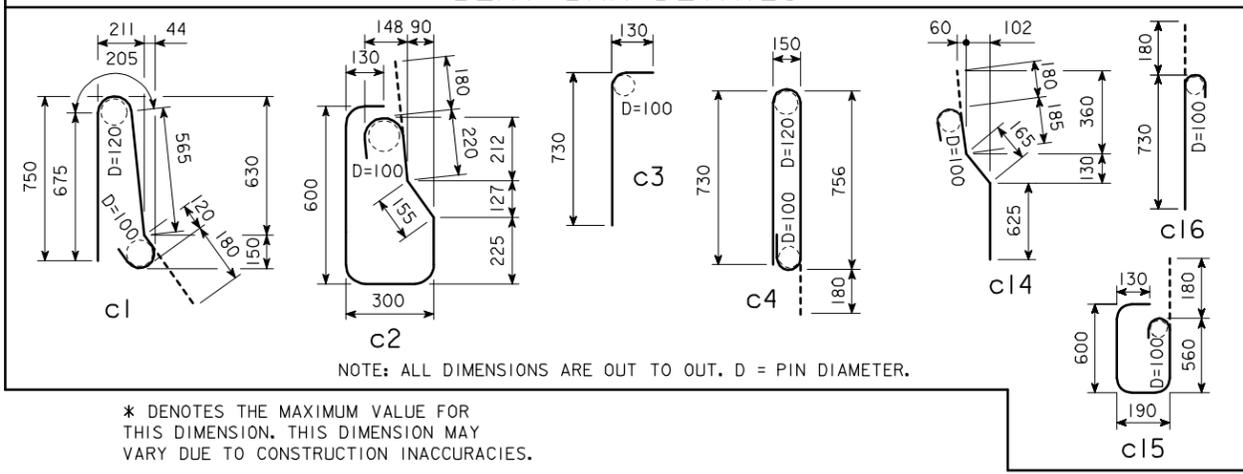
PART ELEVATION VIEW BARRIER RAIL JOINT DETAILS



PART SECTION OF BARRIER RAIL

**BARRIER RAIL NOTES:**  
 MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 50 mm UNLESS OTHERWISE NOTED OR SHOWN.  
 THE PERMISSIBLE CONSTRUCTION JOINTS ARE TO BE PLACED BETWEEN VERTICAL BARS AT A MINIMUM SPACING OF 6000 mm. CONSTRUCTION JOINT CONTACT SURFACES ARE TO BE COATED WITH AN APPROVED BOND BREAKER. COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.  
 ALL BARRIER RAIL REINFORCING STEEL IS TO BE EPOXY COATED.  
 THE CONCRETE BARRIER RAIL IS TO BE BID ON A METRIC BASIS. THE NUMBER OF METERS OF BARRIER RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER METER BASED ON PLAN QUANTITIES. PRICE BID FOR CONCRETE BARRIER RAILING SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EXCLUDING REINFORCING STEEL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS. IF CONDUIT IS REQUIRED IN THIS PLAN THE RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS INCLUDING LABOR AND ANY ADDITIONAL WORK TO DO THE INSTALLATION IS CONSIDERED INCIDENTAL TO THE COST OF THE RAILING.  
 ALL BARRIER RAIL REINFORCING STEEL IS TO BE INCLUDED WITH THE SUPERSTRUCTURE REINFORCING STEEL.  
 THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETED FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.  
 TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL  $\pm$  GRADE.  
 CROSS SECTIONAL AREA OF THE STANDARD SECTION OF THE BARRIER RAIL = 0.263 SQUARE METER.

BENT BAR DETAILS



\* DENOTES THE MAXIMUM VALUE FOR THIS DIMENSION. THIS DIMENSION MAY VARY DUE TO CONSTRUCTION INACCURACIES.

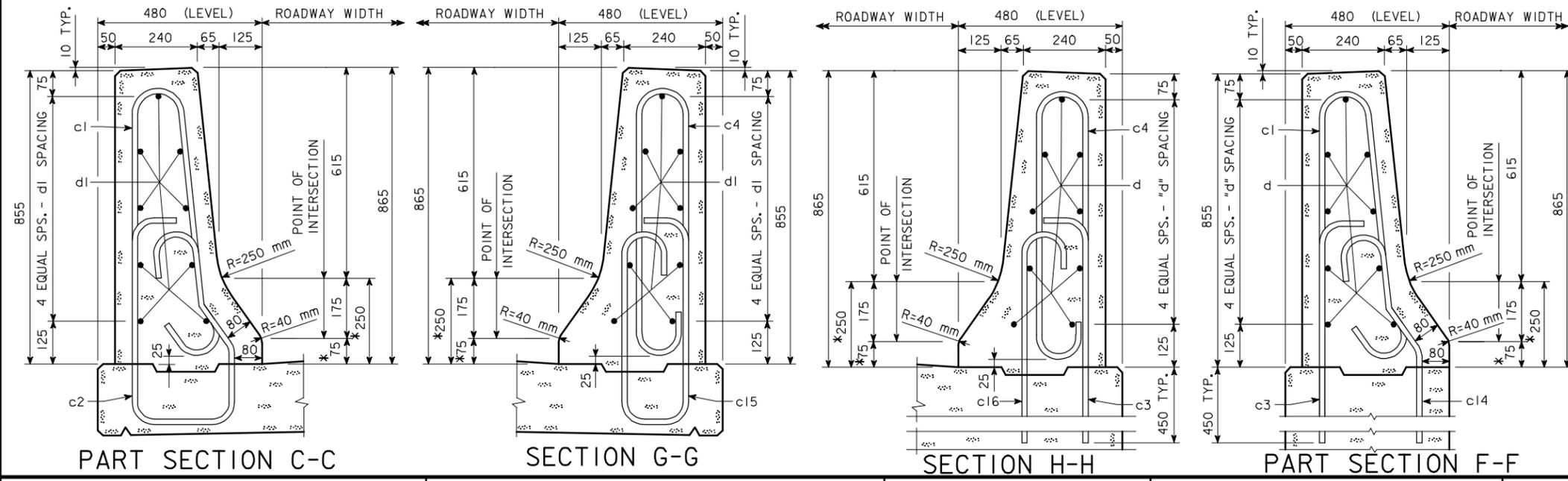
EPOXY REINFORCING STEEL - TWO RAILS							
SECTION	MARK	SIZE	LOCATION	SHAPE	NO.	LENGTH	MASS
STANDARD SECTION	c1	15	VERTICAL	⌒		1750	
	c2	15	VERTICAL	⌒		1810	
	c4	15	VERTICAL	⌒	2	1820	6
	c15	15	VERTICAL	⌒	2	1660	5
	d1	15	LONGITUDINAL	—			
SPECIAL SECTION A	c1	15	VERTICAL	⌒		1750	
	c3	15	VERTICAL	⌒		860	
	c14	15	VERTICAL	⌒		1155	
	d2	15	LONGITUDINAL	—	18		
SPECIAL SECTION B	c1	15	VERTICAL	⌒		1750	
	c3	15	VERTICAL	⌒		860	
	c4	15	VERTICAL	⌒	2	1820	6
	c14	15	VERTICAL	⌒		1155	
	c16	15	VERTICAL	⌒	2	910	3
	d3	15	LONGITUDINAL	—	16		
BARRIER RAIL END SECTION					4 AT 187 kg.		748
(INCLUDED WITH SUPERSTRUCTURE REINFORCING)					TOTAL (kg.)		

CONCRETE PLACEMENT SUMMARY

SECTION	TOTAL
STANDARD SECTION	m AT 0.263 m <sup>3</sup> PER m
SPECIAL SECTION A	
SPECIAL SECTION B	
BARRIER RAIL END SECTION	4 AT 0.47 m <sup>3</sup>
	TOTAL (m <sup>3</sup> )
	1.9

CONCRETE BARRIER RAIL QUANTITIES

ITEM	UNIT	QUANTITY
CONCRETE BARRIER RAILING	m	



PART SECTION C-C

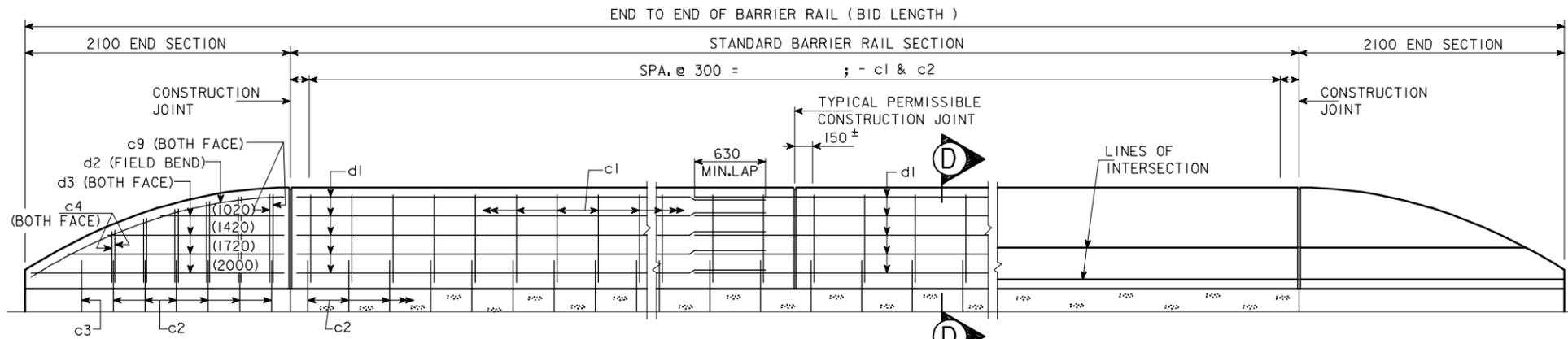
SECTION G-G

SECTION H-H

PART SECTION F-F

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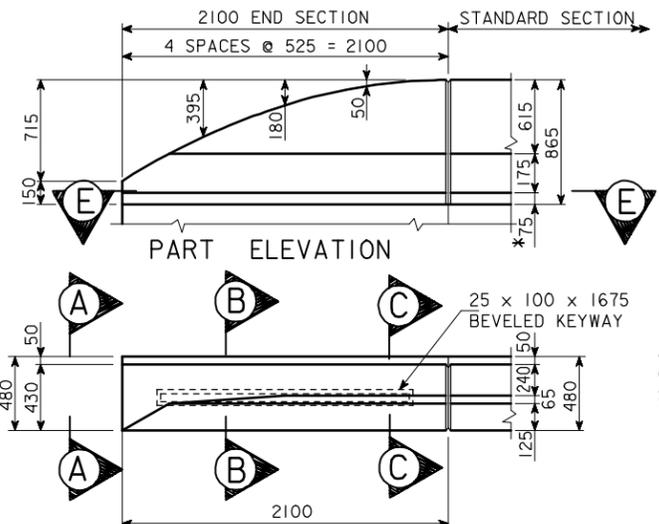
CORRECTION 05-03 - BAR DESIGNATION CHANGE FOR d2 BARS. HM1018A.S01 - THIS SHEET ISSUED 9-1-95.



### EPOXY REINFORCING STEEL - TWO RAILS

SECTION	MARK	SIZE	LOCATION	SHAPE	NO.	LENGTH	MASS
STANDARD SECTIONS	c1	15	RAIL, VERTICAL	⌈		1750	
	c2	15	RAIL TO SLAB	⌈		1810	
	d1	15	RAIL, LONGITUDINAL	—			
4 END SECTIONS	c2	15	RAIL TO ABUTMENT	⌈	24	1810	68
	c3	15	RAIL TO ABUTMENT	⌈	4	1700	11
	c4-9	15	RAIL, VERTICAL	⌈	48	VARIES	80
	d2	15	RAIL, LONGITUDINAL	—	4	2150	14
	d3	15	RAIL, LONGITUDINAL	—	32	VARIES	77
( INCLUDE WITH SUPERSTRUCTURE REINFORCING )						TOTAL ( kg )	

### ELEVATION OF BARRIER RAIL



### BARRIER RAIL NOTES :

TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL  $\bar{C}$  GRADE. MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 50 mm UNLESS OTHERWISE NOTED OR SHOWN. ALL EXPOSED CORNERS 90° OR SHARPER ARE TO BE FILLETED WITH A 20 mm DRESSED AND BEVELED STRIP.

ALL BARRIER RAIL CONCRETE IS TO BE CLASS D.

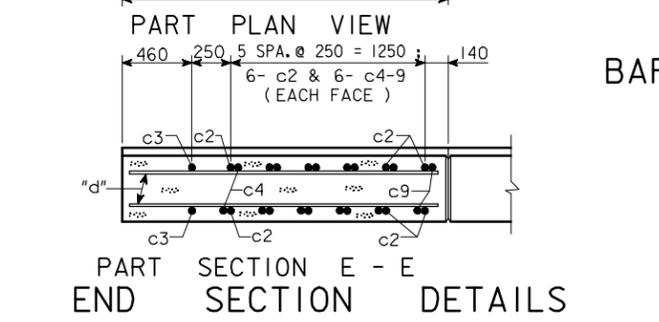
ALL BARRIER RAIL REINFORCING IS TO BE EPOXY COATED.

THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETED FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED. COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.

THE PERMISSIBLE CONSTRUCTION JOINTS ARE TO BE PLACED BETWEEN VERTICAL BARS AT A MINIMUM SPACING OF 6000 mm. CONSTRUCTION JOINT SURFACES ARE TO BE COATED WITH AN APPROVED BOND BREAKER.

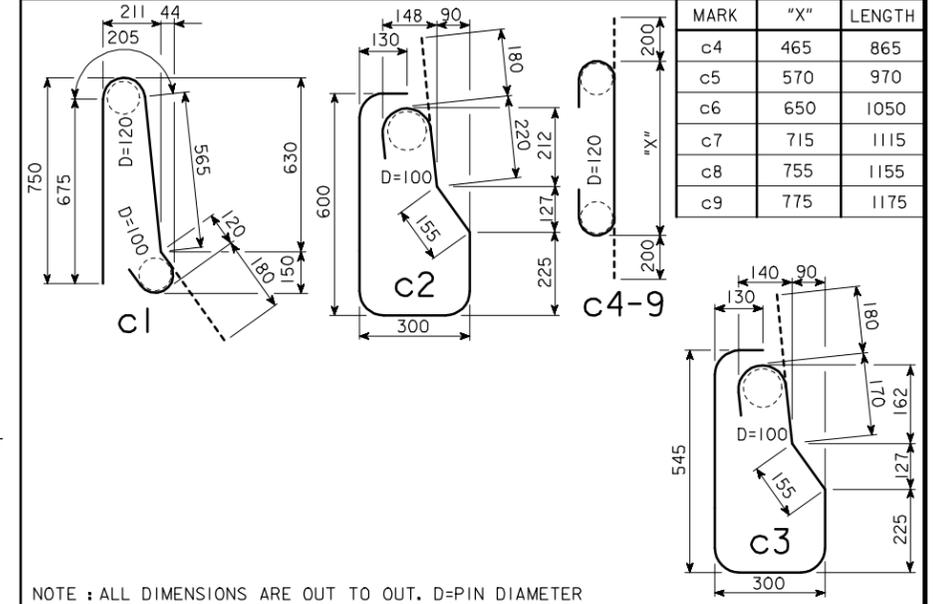
THE CONCRETE BARRIER RAIL IS TO BE BID ON A METRIC BASIS MEASURED FROM END TO END OF RAIL. THE NUMBER OF METERS OF BARRIER RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER METER BASED ON PLAN QUANTITIES. THE PRICE BID FOR "CONCRETE BARRIER RAILING" SHALL BE FULL COMPENSATION FOR FURNISHING ALL EQUIPMENT, LABOR AND MATERIAL, EXCEPT REINFORCING STEEL, REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT METRIC STANDARD SPECIFICATIONS. ALL BARRIER RAIL REINFORCING STEEL IS TO BE INCLUDED WITH THE SUPERSTRUCTURE REINFORCING STEEL.

### BARRIER RAIL JOINT DETAILS



CROSS SECTIONAL AREA OF THE STANDARD SECTION OF THE BARRIER RAIL = 0.263 m<sup>2</sup>

### BENT BAR DETAILS



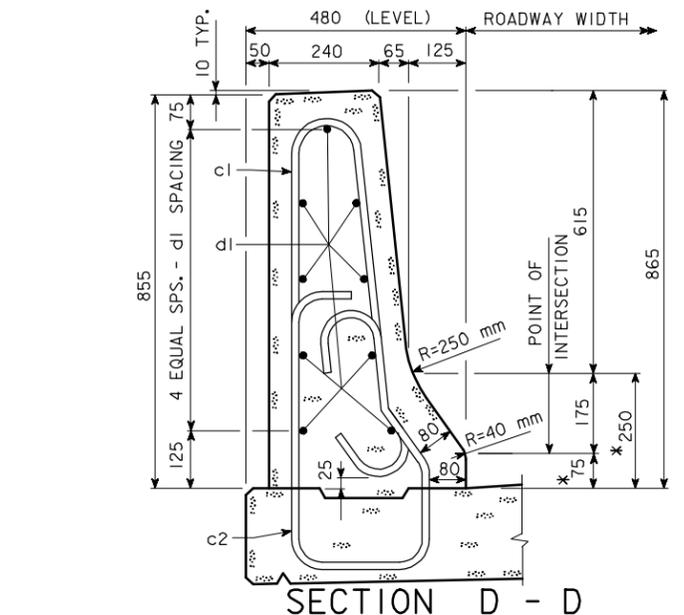
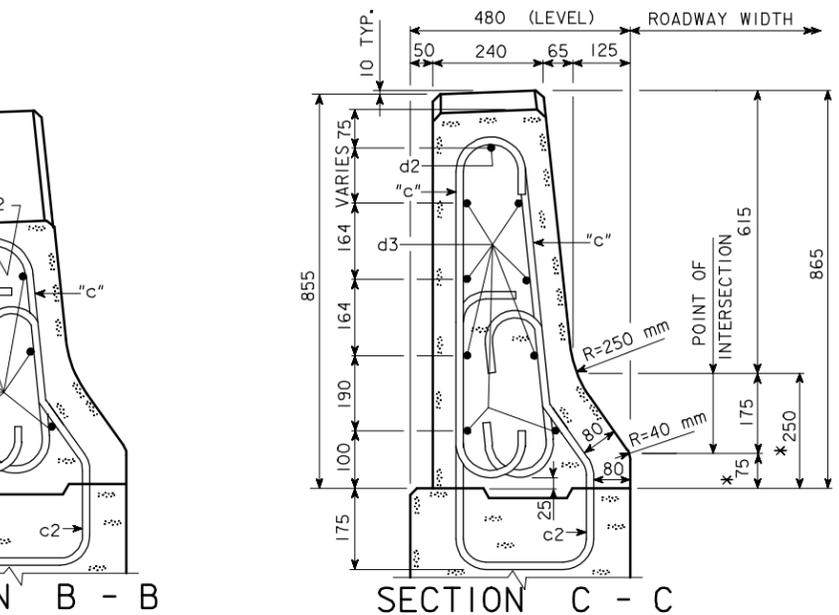
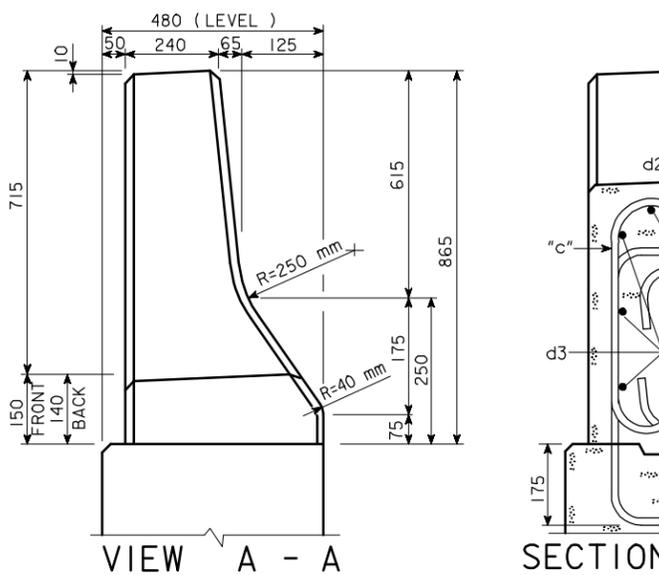
### CONCRETE PLACEMENT SUMMARY

SECTION	TOTAL
STANDARD SECTION	m AT 0.263 m <sup>3</sup> /m
END SECTIONS	4 AT 0.450 m <sup>3</sup>
TOTAL (m <sup>3</sup> )	1.8

### CONCRETE BARRIER RAIL QUANTITIES

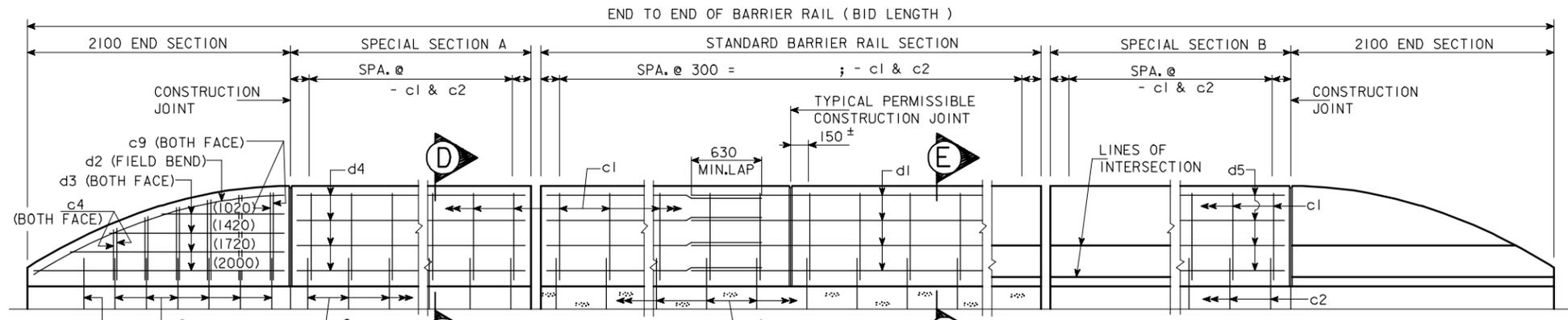
ITEM	UNITS	QUANTITY
CONCRETE BARRIER RAILING	m	

\* DENOTES THE MAXIMUM VALUE FOR THIS DIMENSION. THIS DIMENSION MAY VARY DUE TO CONSTRUCTION INACCURACIES.

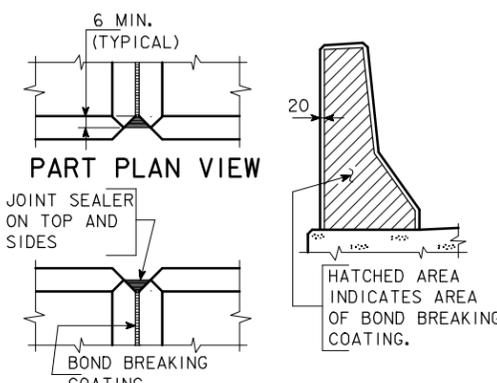
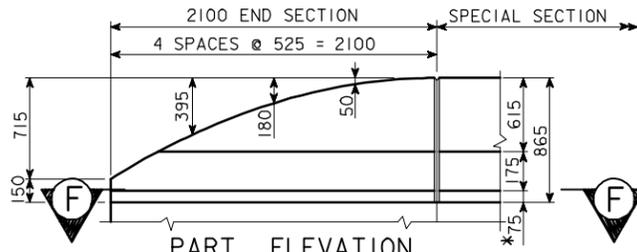


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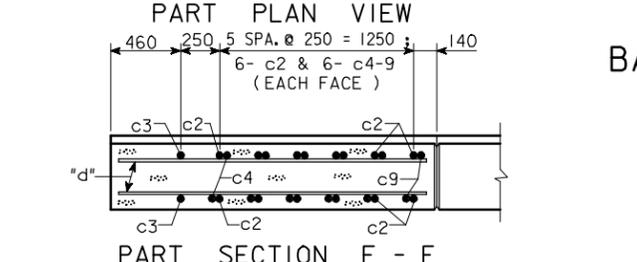
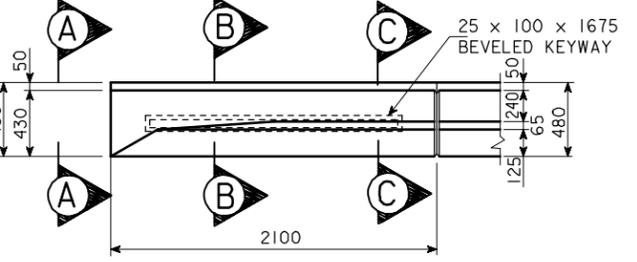
REVISED: 8-4-97: JOINT SEALER NOTE CHANGED. HM1019A.S01: THIS SHEET ISSUED: 9-1-95.



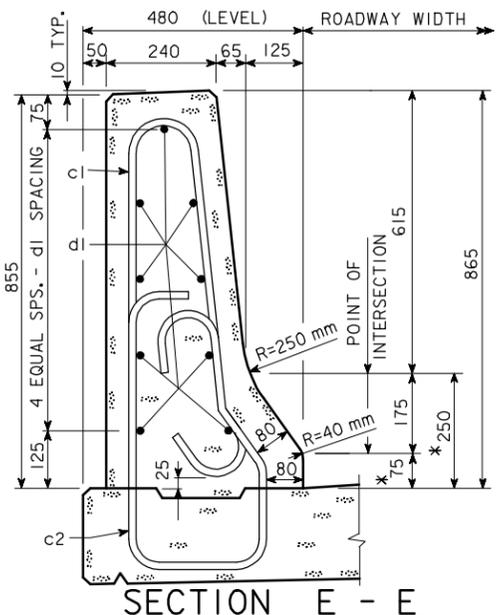
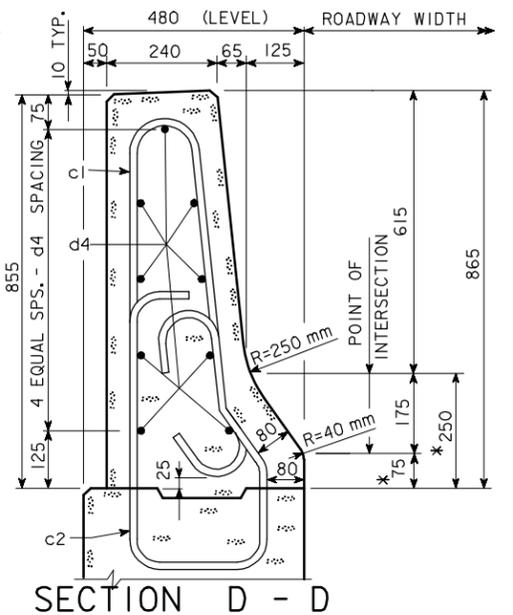
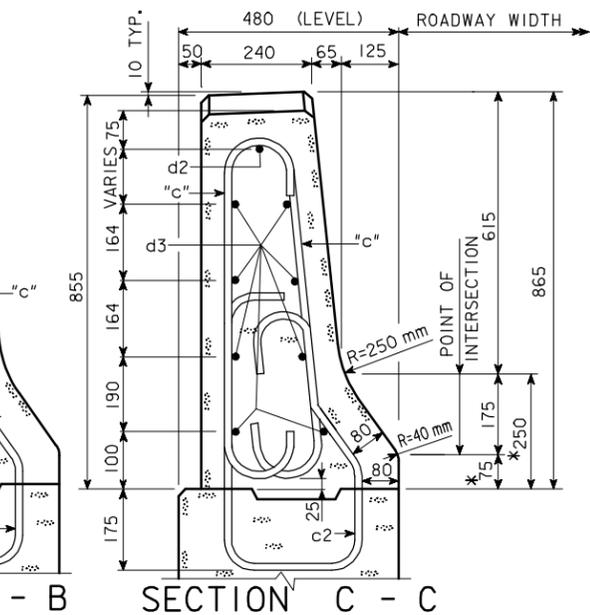
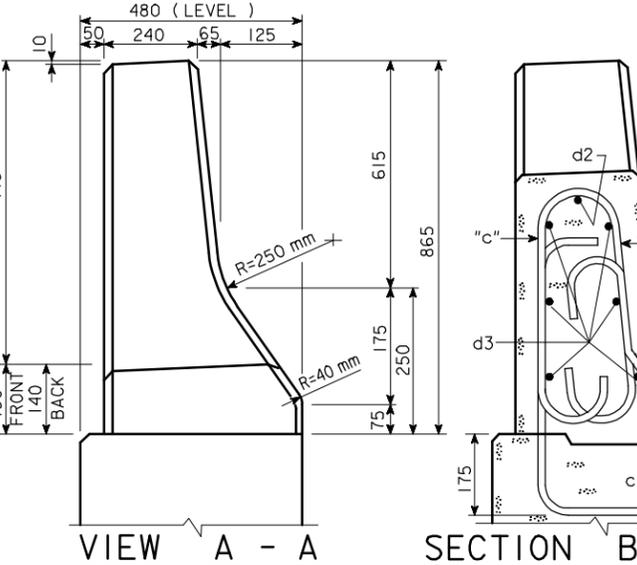
ELEVATION OF BARRIER RAIL



BARRIER RAIL JOINT DETAILS



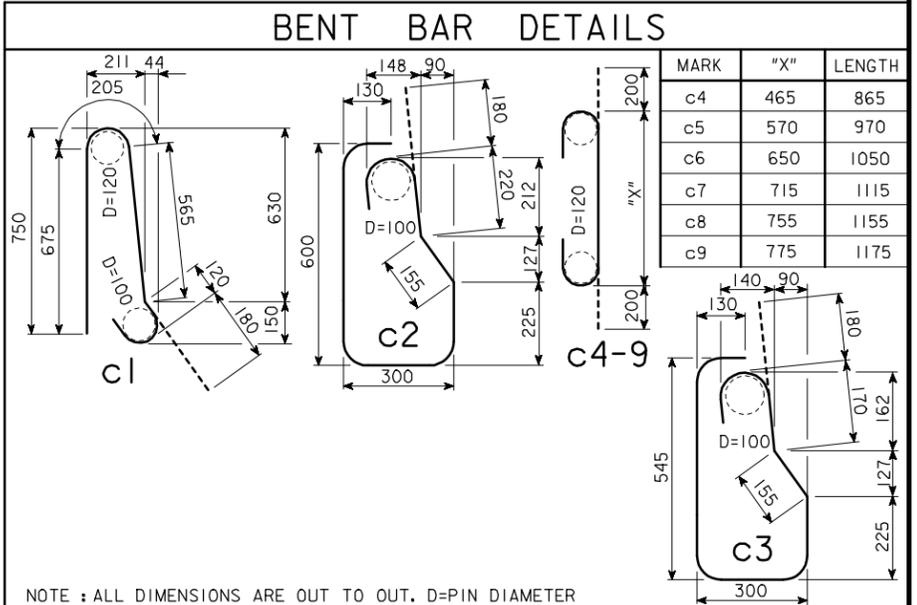
END SECTION DETAILS



**BARRIER RAIL NOTES :**  
 TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL  $\phi$  GRADE. MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 50 mm UNLESS OTHERWISE NOTED OR SHOWN.  
 ALL EXPOSED CORNERS 90° OR SHARPER ARE TO BE FILLETED WITH A 20 mm DRESSED AND BEVELED STRIP.  
 ALL BARRIER RAIL CONCRETE IS TO BE CLASS D.  
 ALL BARRIER RAIL REINFORCING IS TO BE EPOXY COATED.  
 THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETED FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.  
 COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.  
 THE PERMISSIBLE CONSTRUCTION JOINTS ARE TO BE PLACED BETWEEN VERTICAL BARS AT A MINIMUM SPACING OF 6000 mm. CONSTRUCTION JOINT SURFACES ARE TO BE COATED WITH AN APPROVED BOND BREAKER.  
 THE CONCRETE BARRIER RAIL IS TO BE BID ON A METRIC BASIS MEASURED FROM END TO END OF RAIL. THE NUMBER OF METERS OF BARRIER RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER METER BASED ON PLAN QUANTITIES. THE PRICE BID FOR "CONCRETE BARRIER RAILING" SHALL BE FULL COMPENSATION FOR FURNISHING ALL EQUIPMENT, LABOR AND MATERIAL, EXCEPT REINFORCING STEEL, REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT METRIC STANDARD SPECIFICATIONS. ALL BARRIER RAIL REINFORCING STEEL IS TO BE INCLUDED WITH THE SUPERSTRUCTURE REINFORCING STEEL.

CROSS SECTIONAL AREA OF THE SPECIAL SECTIONS AND STANDARD SECTION OF BARRIER RAIL = 0.263 m<sup>2</sup>

EPOXY REINFORCING STEEL - TWO RAILS							
SECTION	MARK	SIZE	LOCATION	SHAPE	NO.	LENGTH	MASS
STANDARD SECTIONS	c1	15	RAIL, VERTICAL	⌒		1750	
	c2	15	RAIL TO SLAB	⌒		1810	
	d1	15	RAIL, LONGITUDINAL	—			
4 END SECTIONS	c2	15	RAIL TO ABUTMENT	⌒	24	1810	68
	c3	15	RAIL TO ABUTMENT	⌒	4	1700	11
	c4-9	15	RAIL, VERTICAL	⌒	48	VARIES	80
	d2	15	RAIL, LONGITUDINAL	—	4	2150	14
	d3	15	RAIL, LONGITUDINAL	—	32	VARIES	77
SPECIAL SECTIONS	c1	15	RAIL, VERTICAL	⌒		1750	
	c2	15	RAIL TO ABUTMENT	⌒		1810	
	d4	15	RAIL, LONGIT. - SPECIAL SECTION A	—		18	
	d5	15	RAIL, LONGIT. - SPECIAL SECTION B	—		18	
	( INCLUDE WITH SUPERSTRUCTURE REINFORCING )						TOTAL ( kg )



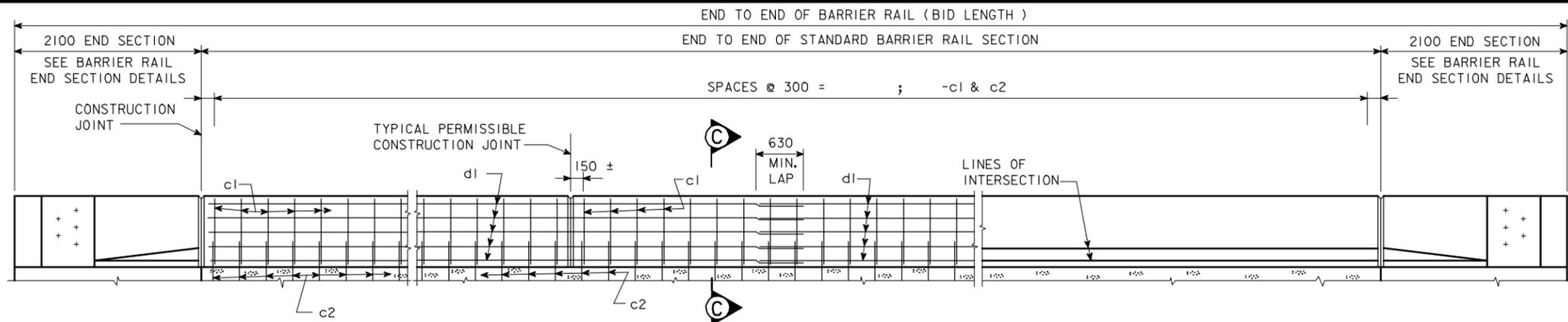
CONCRETE PLACEMENT SUMMARY		
SECTION		TOTAL
STANDARD SECTION	m AT 0.263 m <sup>3</sup> /m	
END SECTIONS	4 AT 0.450 m <sup>3</sup>	1.8
SPECIAL SECTION A	m AT 0.263 m <sup>3</sup> /m	
SPECIAL SECTION B	m AT 0.263 m <sup>3</sup> /m	
TOTAL ( m <sup>3</sup> )		

CONCRETE BARRIER RAIL QUANTITIES		
ITEM	UNITS	QUANTITY
CONCRETE BARRIER RAILING	m	

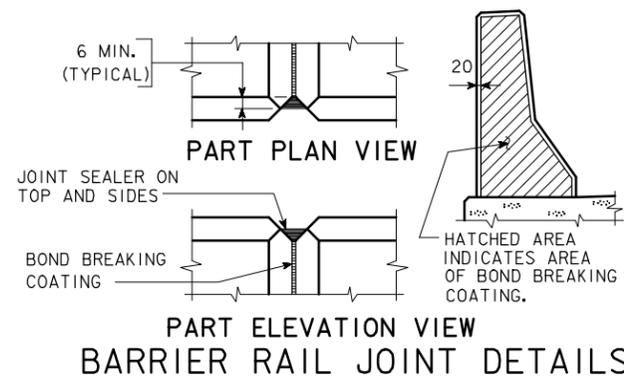
\* DENOTES THE MAXIMUM VALUE FOR THIS DIMENSION. THIS DIMENSION MAY VARY DUE TO CONSTRUCTION INACCURACIES.

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. \_\_\_ OF \_\_\_ FILE NO. \_\_\_ DESIGN NO. \_\_\_

REVISED: 8-4-97 - JOINT SEALER NOTE CHANGED.  
 HM1019B.S01 - THIS SHEET ISSUED, 9-1-95.

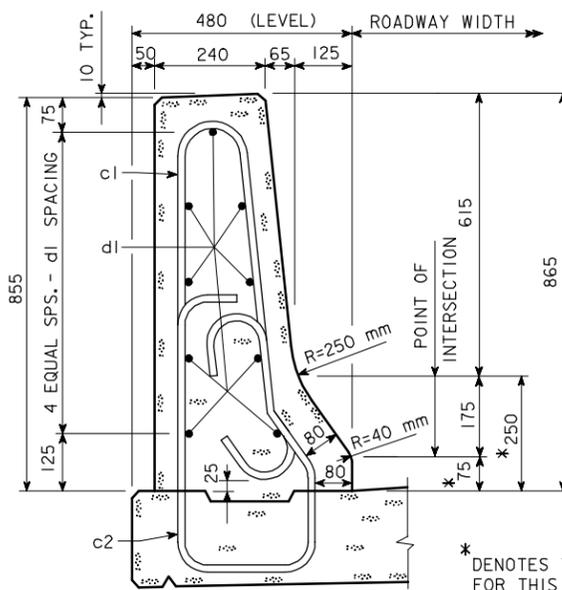


ELEVATION OF BARRIER RAIL LAYOUT



**BARRIER RAIL NOTES:**

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 50 mm UNLESS OTHERWISE NOTED OR SHOWN.  
 THE PERMISSIBLE CONSTRUCTION JOINTS ARE TO BE PLACED BETWEEN VERTICAL BARS AT A MINIMUM SPACING OF 6000 mm. CONSTRUCTION JOINT CONTACT SURFACES ARE TO BE COATED WITH AN APPROVED BOND BREAKER. COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.  
 ALL BARRIER RAIL REINFORCING STEEL IS TO BE EPOXY COATED.  
 THE CONCRETE BARRIER RAIL IS TO BE BID ON A METRIC BASIS.  
 THE NUMBER OF METERS OF BARRIER RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER METER BASED ON PLAN QUANTITIES. PRICE BID FOR CONCRETE BARRIER RAILING SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EXCLUDING REINFORCING STEEL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS. IF CONDUIT IS REQUIRED IN THIS PLAN THE RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS INCLUDING LABOR AND ANY ADDITIONAL WORK TO DO THE INSTALLATION IS CONSIDERED INCIDENTAL TO THE COST OF THE RAILING.  
 ALL BARRIER RAIL REINFORCING STEEL IS TO BE INCLUDED WITH THE SUPERSTRUCTURE REINFORCING STEEL.  
 THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETED FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.  
 TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL  $\pm$  GRADE.  
 CROSS SECTIONAL AREA OF THE STANDARD SECTION OF THE BARRIER RAIL = 0.263 SQUARE METER.



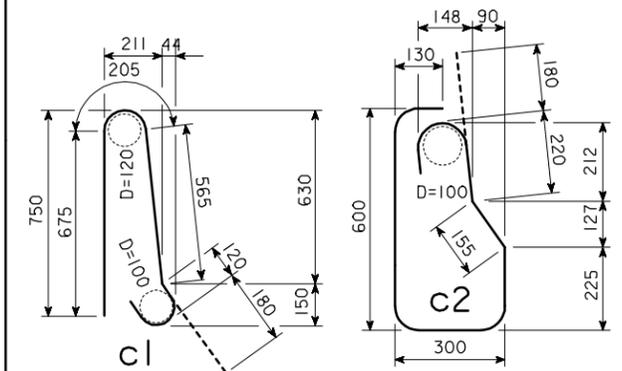
PART SECTION C-C

\* DENOTES THE MAXIMUM VALUE FOR THIS DIMENSION. THIS DIMENSION MAY VARY DUE TO CONSTRUCTION INACCURACIES.

**EPOXY REINF. STEEL-TWO BARRIER RAILS**

SECTION	MARK	SIZE	LOCATION	SHAPE	NO.	LENGTH	MASS
STANDARD SECTION	c1	15	VERTICAL			1750	
	c2	15	VERTICAL			1810	
	d1	15	LONGITUDINAL				
BARRIER RAIL END SECTION					4 AT 187 kg.		748
(INCLUDE WITH SUPERSTRUCTURE REINFORCING)					TOTAL (kg)		

**BENT BAR DETAILS**



NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

**CONCRETE PLACEMENT SUMMARY**

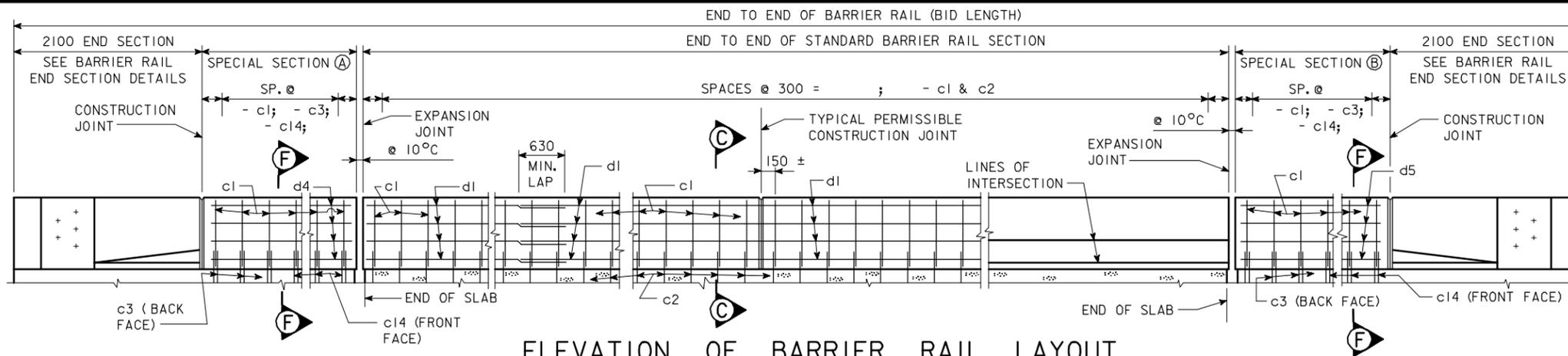
SECTION	TOTAL
STANDARD SECTION	m @ 0.263 m <sup>3</sup> PER m
BARRIER RAIL END SECTIONS	4 @ 0.47 m <sup>3</sup>
	1.9
TOTAL (m <sup>3</sup> )	

**CONCRETE BARRIER RAIL QUANTITIES**

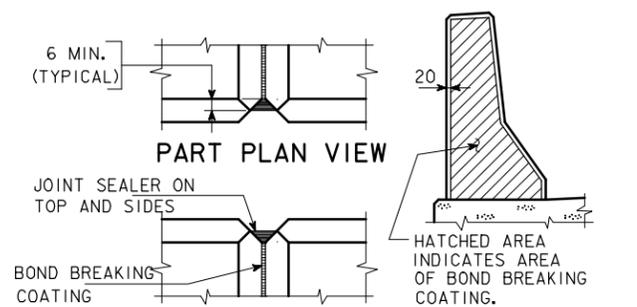
ITEM	UNIT	QUANTITY
CONCRETE BARRIER RAILING	m	

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. \_\_\_ OF \_\_\_ FILE NO. \_\_\_ DESIGN NO. \_\_\_

REVISED 09-01 - BARRIER RAIL END SECTION DETAILS MOVED TO STD. SHEET 1017.  
 HM1020A.S01 THIS SHEET ISSUED 9-1-95.



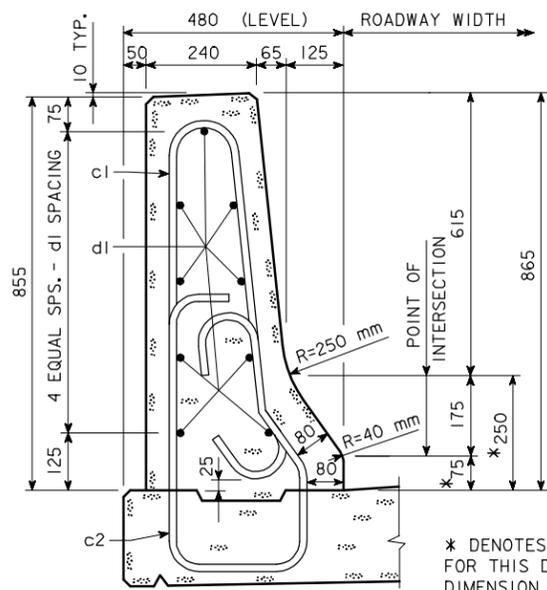
ELEVATION OF BARRIER RAIL LAYOUT



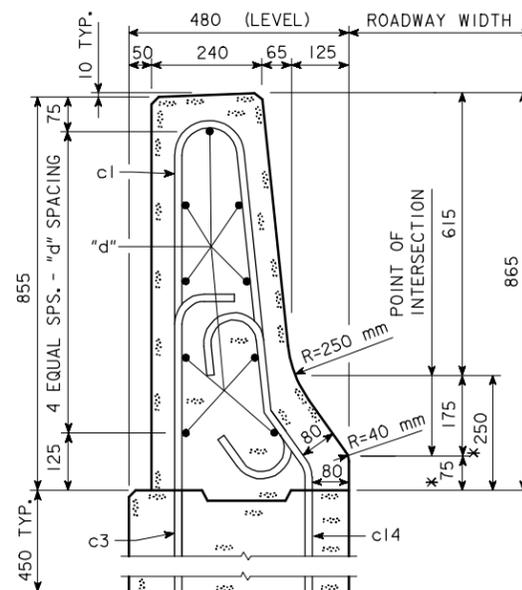
BARRIER RAIL JOINT DETAILS

**BARRIER RAIL NOTES:**

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 50 mm UNLESS OTHERWISE NOTED OR SHOWN.  
 THE PERMISSIBLE CONSTRUCTION JOINTS ARE TO BE PLACED BETWEEN VERTICAL BARS AT A MINIMUM SPACING OF 6000 mm. CONSTRUCTION JOINT CONTACT SURFACES ARE TO BE COATED WITH AN APPROVED BOND BREAKER. COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.  
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 ALL BARRIER RAIL REINFORCING STEEL IS TO BE INCLUDED WITH THE SUPERSTRUCTURE REINFORCING STEEL.  
 THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETED FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED. TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL CL GRADE.  
 CROSS SECTIONAL AREA OF THE STANDARD SECTION OF THE BARRIER RAIL = 0.263 SQUARE METER.



PART SECTION C-C



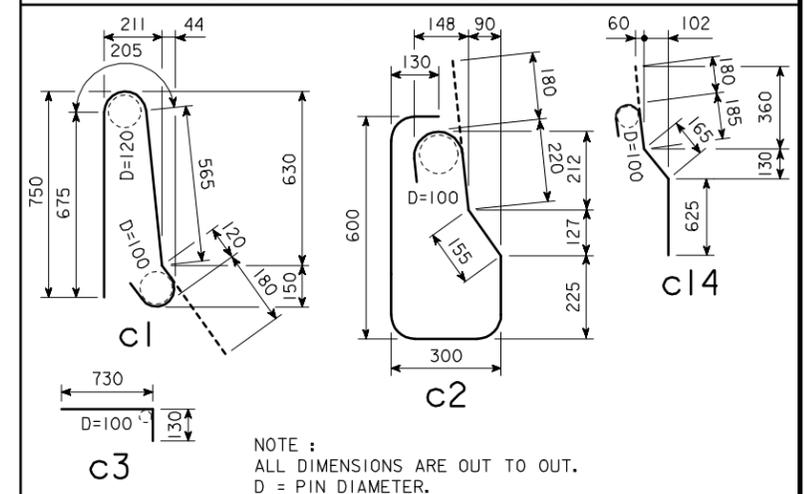
PART SECTION F-F

\* DENOTES THE MAXIMUM VALUE FOR THIS DIMENSION. THIS DIMENSION MAY VARY DUE TO CONSTRUCTION INACCURACIES.

**EPOXY REINF. STEEL-TWO BARRIER RAILS**

SECTION	MARK	SIZE	LOCATION	SHAPE	NO.	LENGTH	MASS
STANDARD SECTION	c1	15	VERTICAL	⌒		1750	
	c2	15	VERTICAL	⌒		1810	
	d1	15	LONGITUDINAL	—			
SPECIAL SECTIONS (ALL REINFORCING REQUIRED)	c1	15	VERTICAL	⌒		1750	
	c3	15	VERTICAL	⌒		860	
	c14	15	VERTICAL	⌒		1155	
	d4	15	LONGIT.- SPECIAL SECTIONS (A)	—			
	d5	15	LONGIT.- SPECIAL SECTIONS (B)	—			
BARRIER RAIL END SECTION						4 AT 187 kg.	748
(INCLUDE WITH SUPERSTRUCTURE REINFORCING)						TOTAL (kg)	

**BENT BAR DETAILS**



NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

**CONCRETE PLACEMENT SUMMARY**

SECTION	TOTAL
STANDARD SECTION	m @ 0.263 m <sup>3</sup> PER m
SPECIAL SECTION (A)	m @ 0.263 m <sup>3</sup> PER m
SPECIAL SECTION (B)	m @ 0.263 m <sup>3</sup> PER m
BARRIER RAIL END SECTIONS	4 @ 0.47 m <sup>3</sup>
TOTAL (m <sup>3</sup> )	
1.9	

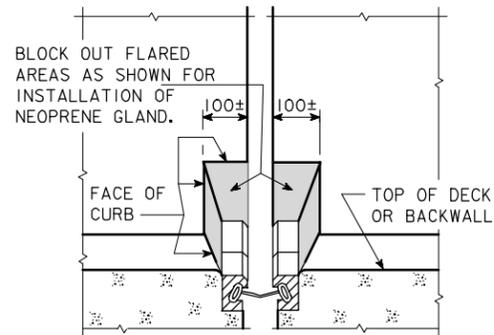
**CONCRETE BARRIER RAIL QUANTITIES**

ITEM	UNIT	QUANTITY
CONCRETE BARRIER RAILING	m	

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. \_\_\_ OF \_\_\_ FILE NO. \_\_\_ DESIGN NO. \_\_\_

CORRECTION 12-01 - 5c16 BAR RELABELED TO 5c14 IN SECTION F-F. HMI020B.S01 - THIS SHEET ISSUED 9-1-95.





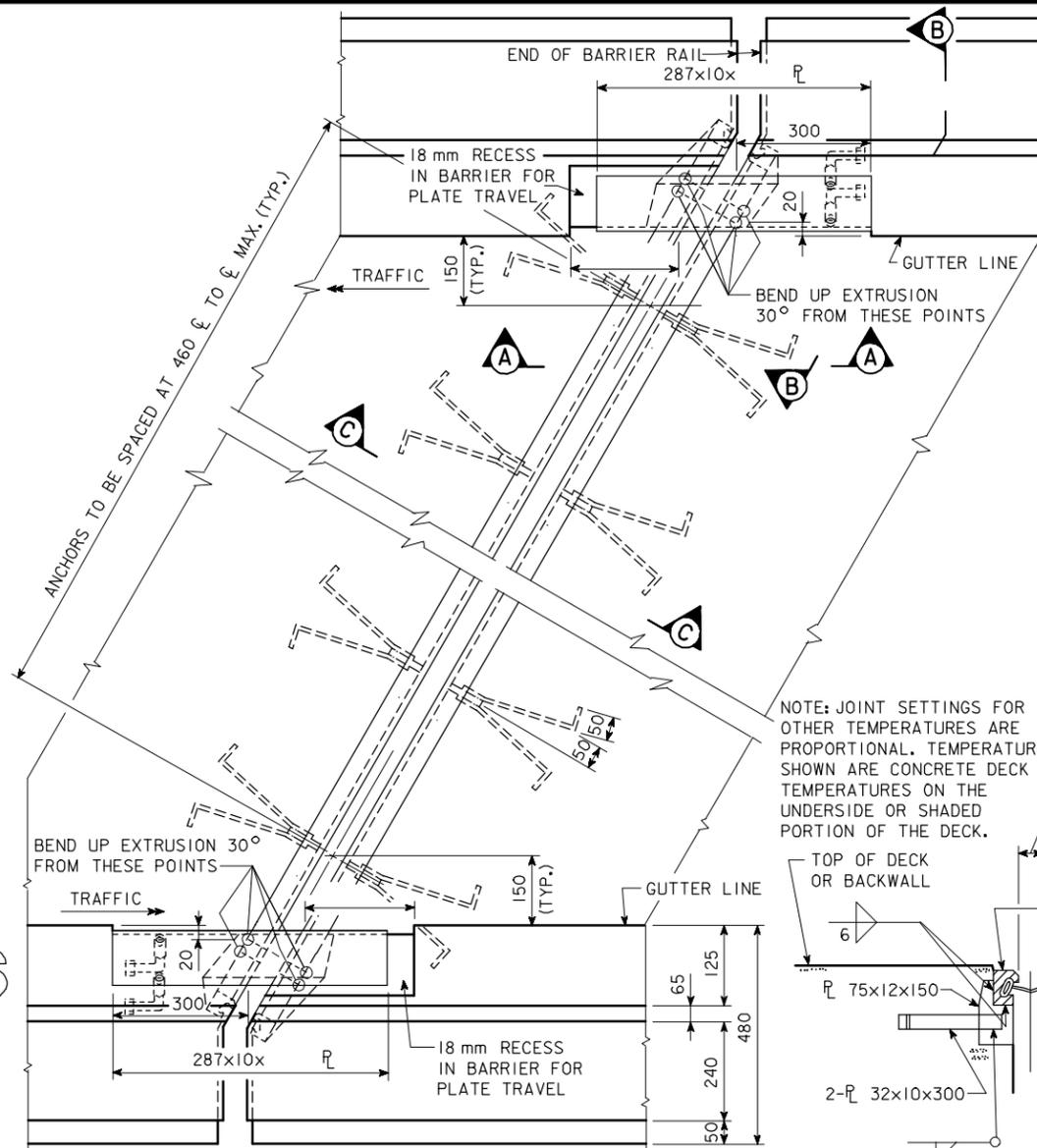
**BLOCKOUT DETAIL**

(DRAWN FOR 0° SKEW FOR ILLUSTRATIVE PURPOSES)

CONTRACTOR TO NOTE THAT THE CAP SCREW ANCHORAGE SYSTEM FOR THE 10 mm BARRIER PLATES ARE ALWAYS TO BE PLACED ON THE ONCOMING TRAFFIC SIDE.

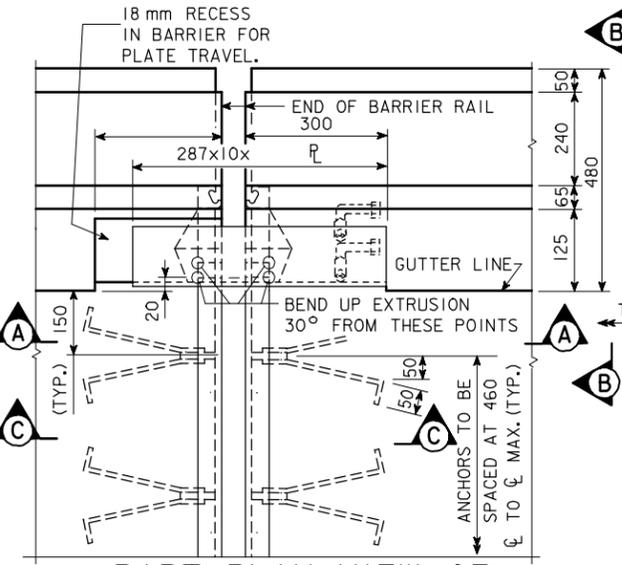


**SOCKET FLAT COUNTERSUNK HEAD CAP SCREW DETAIL**



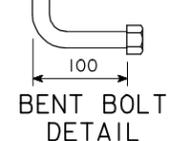
**PART PLAN VIEW OF EXPANSION DEVICE L.A. SKEW**

NOTE: IT IS INTENDED THAT THE 18 mm RECESSED AREA BE FORMED SO THAT WHEN THE 10 mm BENT PLATE IS INSTALLED THE PLATE WILL BE ABLE TO MOVE FREELY IN THIS RECESSED AREA.

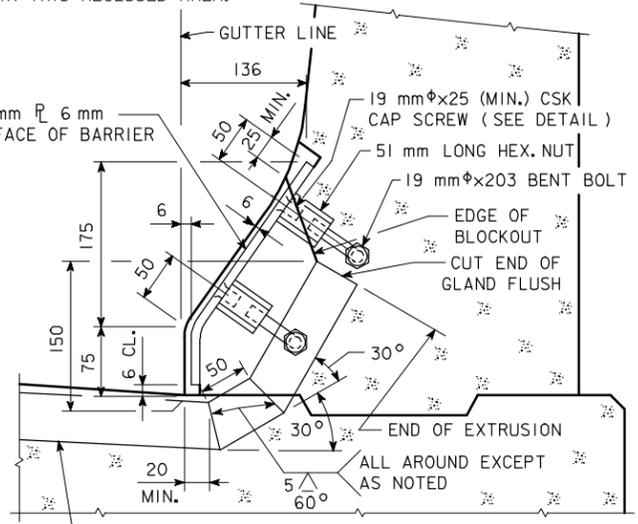


**PART PLAN VIEW OF EXPANSION DEVICE 0° SKEW**

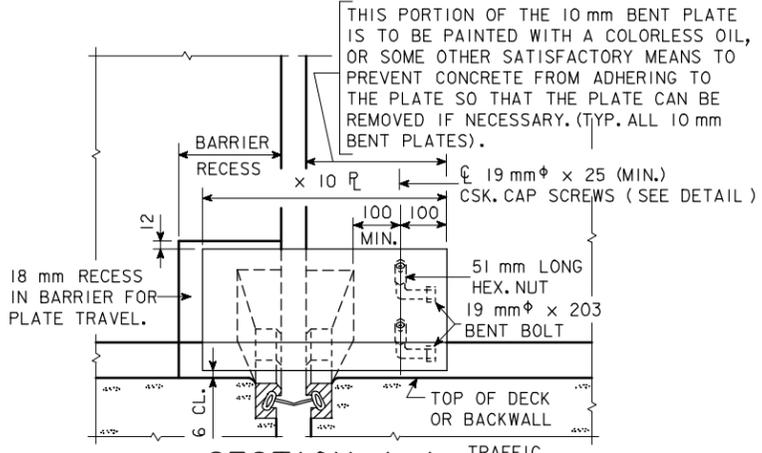
CONTRACTOR TO NOTE THAT THE CAP SCREW ANCHORAGE SYSTEM FOR THE 10 mm BARRIER PLATES ARE ALWAYS TO BE PLACED ON THE ONCOMING TRAFFIC SIDE.



**BENT BOLT DETAIL**



**SECTION B-B**



**SECTION A-A**

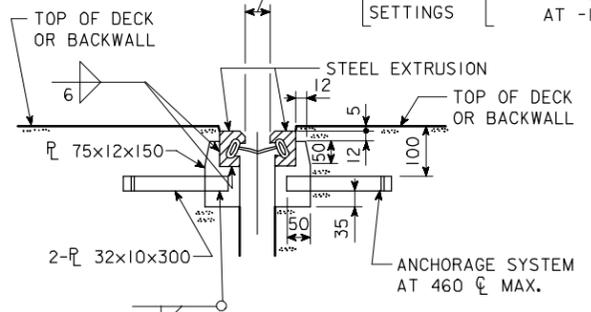
**BARRIER PLATE NOTE:**  
THE MATERIAL USED FOR THE BARRIER PLATES IS TO BE ASTM A-36M STEEL. THE BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A-307. THE PLATES, BOLTS, NUTS AND CAP SCREWS ARE TO BE GALVANIZED IN ACCORDANCE WITH ARTICLE 4100.07 OF THE STANDARD SPECIFICATIONS. 51 mm φ STAINLESS STEEL SOCKET FLAT COUNTERSUNK HEAD CAP SCREW SHALL MEET THE REQUIREMENTS OF ASTM F879-91.

THIS PORTION OF THE 10 mm BENT PLATE IS TO BE PAINTED WITH A COLORLESS OIL, OR SOME OTHER SATISFACTORY MEANS TO PREVENT CONCRETE FROM ADHERING TO THE PLATE SO THAT THE PLATE CAN BE REMOVED IF NECESSARY. (TYP. ALL 10 mm BENT PLATES).

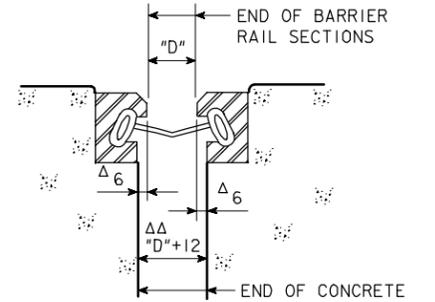
**EXPANSION DEVICE NOTES:**

THE CONTRACTOR SHALL SUBMIT FOR APPROVAL SHOP DRAWINGS OF THE EXPANSION DEVICES SHOWING LAYOUT, MATERIAL TO BE USED, AND PROVISIONS FOR HOLDING DEVICES DURING PLACEMENT OF CONCRETE.  
 THE EXPANSION DEVICE SHALL BE GALVANIZED AFTER WELDING.  
 THE EXPANSION DEVICE IS TO BE PARALLEL TO GRADE.  
 CAP SCREWS SHALL BE COUNTERSUNK 2 mm BELOW TOP OF PLATE.  
 THE NEOPRENE GLAND IS TO BE PLACED AS ONE CONTINUOUS PIECE FROM END TO END OF THE STEEL EXTRUSIONS.  
 THE MINIMUM GRADE OF STRUCTURAL STEEL FOR THE EXPANSION DEVICE SHALL BE ASTM A-36M.  
 THE NEOPRENE GLAND SHALL CONFORM TO ASTM D-2628 MODIFIED TO EXCLUDE RECOVERY TESTS AND COMPRESSION SET.  
 BLOCKOUT DETAILS MAY BE ALTERED FROM THOSE SHOWN PROVIDED THE GLAND MAY BE INSTALLED AND REMOVED IF NECESSARY.  
 THE CONTRACT UNIT PRICE BID FOR "STEEL EXTRUSION JOINT WITH NEOPRENE" SHALL BE FULL COMPENSATION FOR FURNISHING AND INSTALLING THE EXPANSION JOINTS. THIS WORK WILL CONSIST OF FURNISHING ALL REQUIRED MATERIALS, (INCLUDING THE 10 mm PLATES AT THE BARRIERS AND THEIR ANCHORAGE SYSTEMS), AND THE INSTALLATION AND ADJUSTMENT OF THE EXPANSION JOINTS IN ACCORDANCE WITH THE DETAILS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER. THE FURNISHING AND INSTALLATION OF ALL NECESSARY HARDWARE AND ACCESSORIES AS SUPPLIED BY THE EXPANSION JOINT MANUFACTURER ARE TO BE INCLUDED IN THIS WORK, INCLUDING THE ANCHORAGE SYSTEM AND ANY TEMPORARY ERECTION MATERIAL. ALL WORK AND MATERIALS FOR THE INSTALLATION OF THE EXPANSION JOINTS ARE TO COMPLY WITH THE WRITTEN RECOMMENDATIONS OF THE EXPANSION JOINT MANUFACTURER.  
 SHOP AND OR FIELD SPLICES OF THE STEEL EXTRUSION WILL BE PERMITTED. PIECES OF STEEL EXTRUSION IN THE 4600 mm TO 6700 mm RANGE SHALL BE USED TO FORM THE REQUIRED GUTTER TO GUTTER LENGTH. THE INDIVIDUAL LENGTH OF PIECES SHALL BE CHOSEN SO THAT A MINIMUM NUMBER OF SPLICES IS REQUIRED. ALL PIECES SHALL BE JOINED WITH A PREQUALIFIED PARTIAL PENETRATION SINGLE GROOVE WELD, AND ALL SURFACES NOT IN CONTACT WITH CONCRETE ARE TO BE GROUND FLUSH. NO WELD SHALL BE PERMITTED IN THE INTERNAL SECTION OF THE EXTRUSION WHERE THE NEOPRENE GLAND IS TO BE LOCATED.

NOTE: JOINT SETTINGS FOR OTHER TEMPERATURES ARE PROPORTIONAL. TEMPERATURES SHOWN ARE CONCRETE DECK TEMPERATURES ON THE UNDERSIDE OR SHADED PORTION OF THE DECK.



**SECTION C-C**



**EXPANSION OPENING DETAIL**

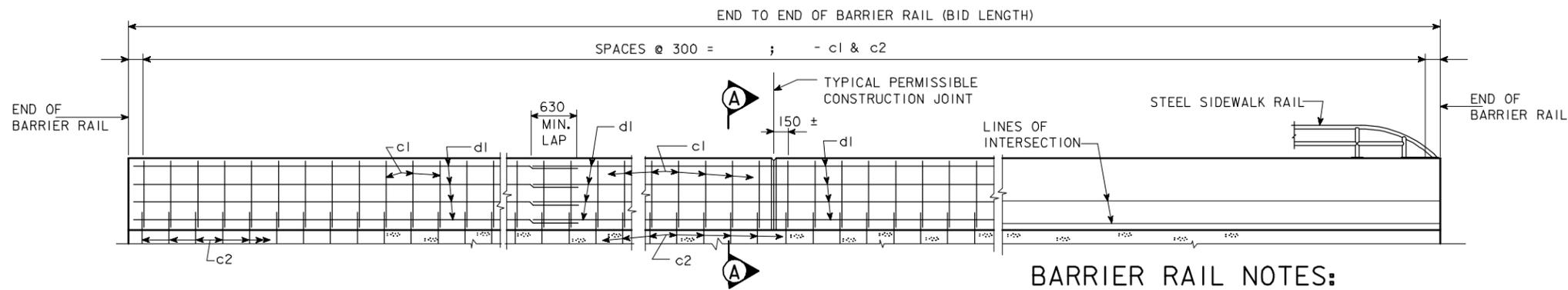
<sup>Δ</sup> THIS DIMENSION MAY VARY SLIGHTLY DEPENDING ON MANUFACTURER FURNISHING THE JOINT.  
<sup>ΔΔ</sup> USED FOR ALL OUT TO OUT DIMENSIONS OF SLAB. THE DIMENSION MAY VARY SLIGHTLY DEPENDING ON MANUFACTURER FURNISHING THE JOINT.

**TABLE OF APPROVED EXPANSION DEVICES**

MANUFACTURER	TYPE OF STEEL EXTRUSION	NEOPRENE GLAND
WATSON-BOWMAN & ACME CORP.	A	SE-
D.S. BROWN CO.	SSA2	A2R-400
APPROVED EQUAL		

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. \_\_\_ OF \_\_\_ FILE NO. \_\_\_ DESIGN NO. \_\_\_

CORRECTION 07-04 - ADDED HEX HEAD CAP SKREW DETAIL AND ASTM NOTATION. MOVED PART PLAN R.A. OFF BORDER AND ADDED BLOCKOUT DETAIL INSIDE BORDER. HMI026.SOL; THIS SHEET ISSUED, 9-1-95.



ELEVATION OF BARRIER RAIL LAYOUT

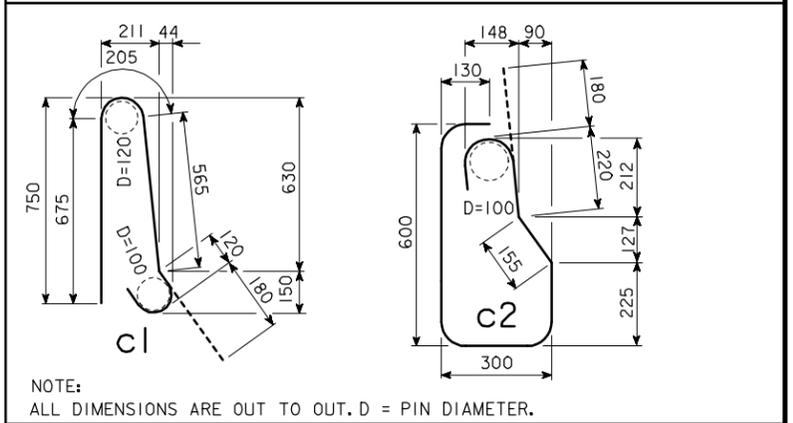
**BARRIER RAIL NOTES:**

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 50 mm UNLESS OTHERWISE NOTED OR SHOWN.  
 ALL EXPOSED CORNERS 90° OR SHARPER ARE TO BE FILLETED WITH A 20 mm DRESSED AND BEVELED STRIP.  
 THE PERMISSIBLE CONSTRUCTION JOINTS ARE TO BE PLACED BETWEEN VERTICAL BARS AT A MINIMUM SPACING OF 6000 mm. CONSTRUCTION JOINT CONTACT SURFACES ARE TO BE COATED WITH AN APPROVED BOND BREAKER. COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.  
 ALL BARRIER RAIL CONCRETE IS TO BE CLASS D.  
 ALL BARRIER RAIL REINFORCING STEEL IS TO BE EPOXY COATED.  
 THE CONCRETE BARRIER RAIL IS TO BE BID ON A METRIC BASIS MEASURED FROM END TO END OF RAIL. THE NUMBER OF METERS OF BARRIER RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER METER BASED ON PLAN QUANTITIES. PRICE BID FOR "CONCRETE BARRIER RAILING" SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EXCLUDING REINFORCING STEEL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT METRIC STANDARD SPECIFICATIONS. ALL BARRIER RAIL REINFORCING STEEL IS TO BE INCLUDED WITH THE SUPERSTRUCTURE REINFORCING STEEL.  
 THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETED FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.  
 TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL  $\phi$  GRADE.  
 CROSS SECTIONAL AREA OF THE SPECIAL SECTIONS AND STANDARD SECTION OF THE BARRIER RAIL = 0.263 m<sup>2</sup>

**EPOXY REINF. STEEL-TWO BARRIER RAILS**

MARK	SIZE	LOCATION	SHAPE	NO.	LENGTH	MASS
c1	15	VERTICAL			1750	
c2	15	VERTICAL			1810	
d1	15	LONGITUDINAL				
(INCLUDE WITH SUPERSTRUCTURE REINFORCING) TOTAL (kg)						

**BENT BAR DETAILS**

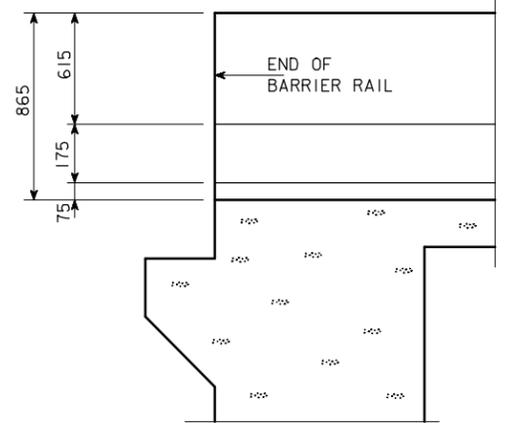


**CONCRETE PLACEMENT SUMMARY**

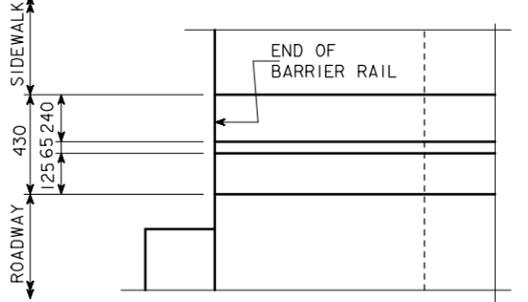
CONCRETE	TOTAL
@ 0.263 m <sup>3</sup> PER m	
TOTAL (m <sup>3</sup> )	

**CONCRETE BARRIER RAIL QUANTITIES**

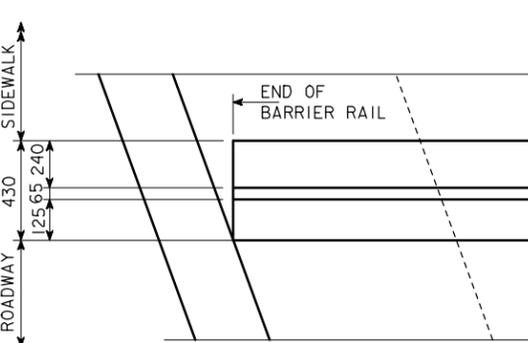
ITEM	UNIT	QUANTITY
CONCRETE BARRIER RAILING	m	



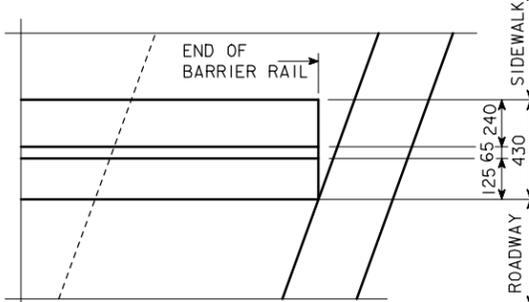
PART ELEVATION VIEW



PART PLAN VIEW



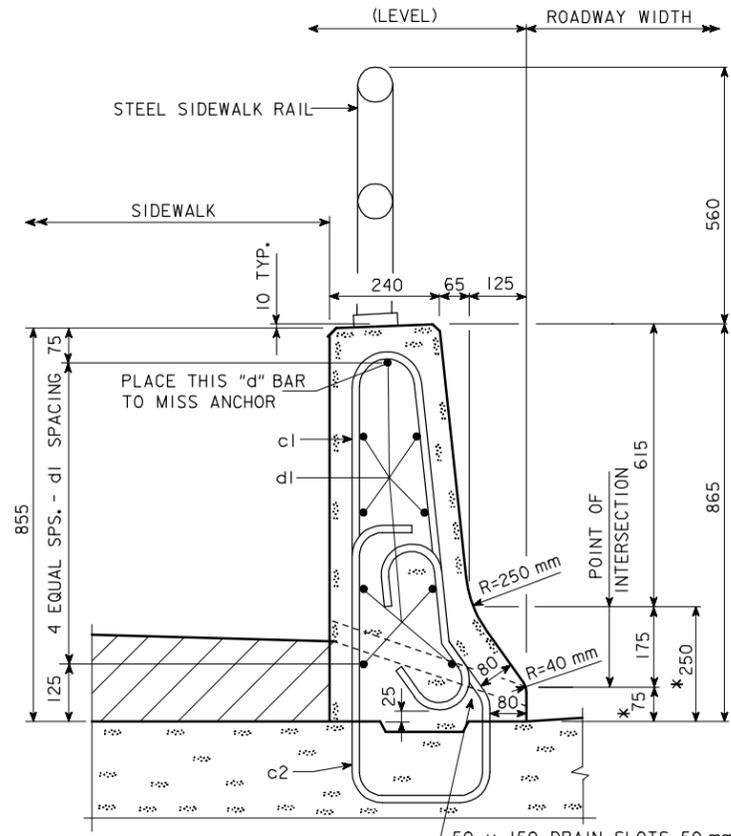
PART PLAN VIEW



PART PLAN VIEW

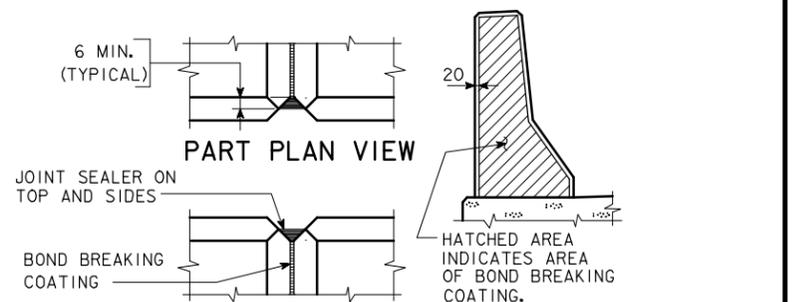
NOTE TO DETAILER USE THESE VIEWS ONLY IF SKEWED

NOTE TO DETAILER, TAKE OFF SIDEWALK OVERLAY AND DRAIN SLOTS IN PART SECTION A-A IF THEY ARE NOT APPLICABLE.



PART SECTION A-A

\* DENOTES THE MAXIMUM VALUE FOR THIS DIMENSION. THIS DIMENSION MAY VARY DUE TO CONSTRUCTION INACCURACIES.



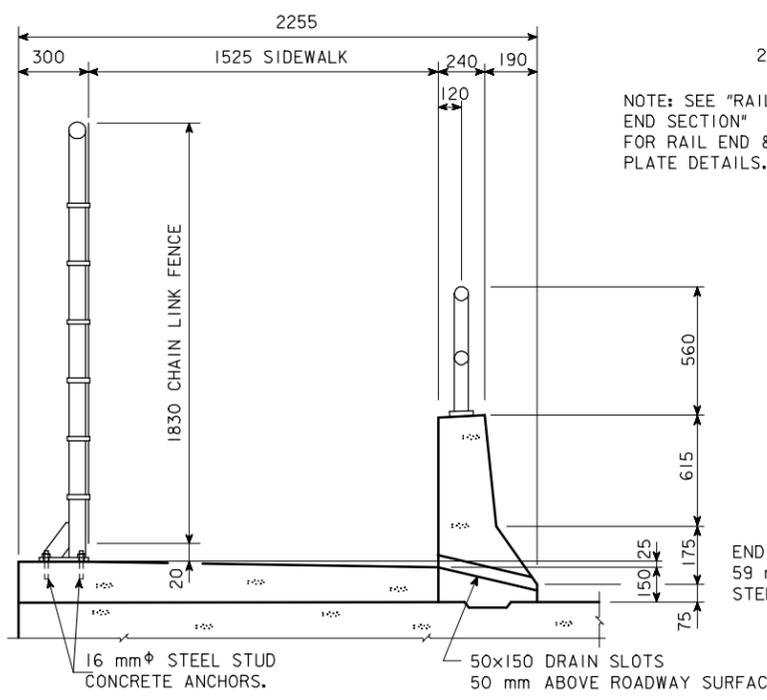
PART ELEVATION VIEW BARRIER RAIL JOINT DETAILS

SEE STANDARD SHEET M1029? FOR STEEL PIPE SIDEWALK RAILING.

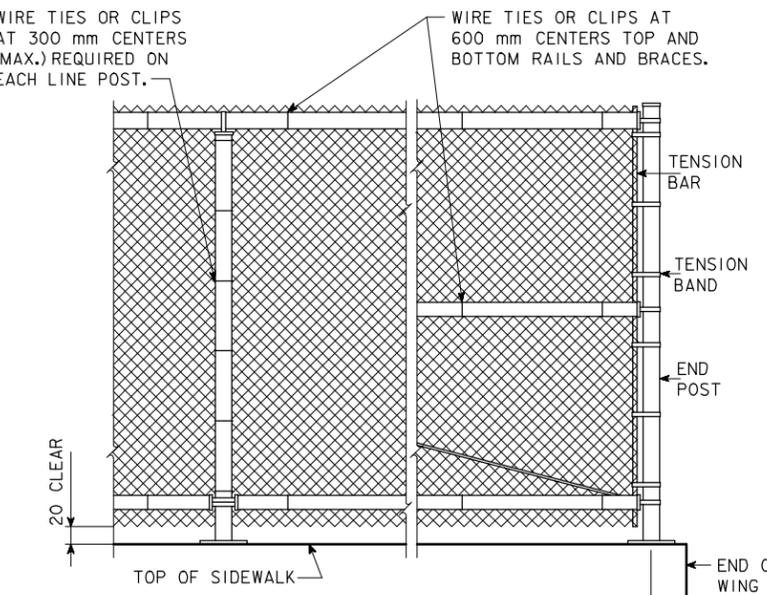
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. \_\_\_ OF \_\_\_ FILE NO. \_\_\_ DESIGN NO. \_\_\_

REVISED 07-04 - DRAIN SLOTS MOVED IN PART SECTION A-A. REFERRAL NOTE ADDED FOR STEEL SIDEWALK RAIL. HMI028A.S01 : THIS SHEET ISSUED, 9-1-95.

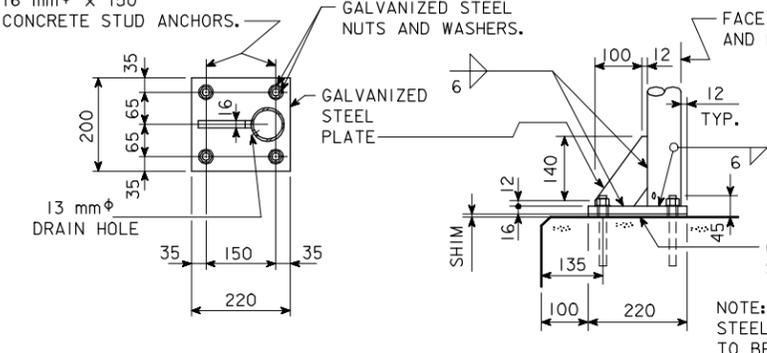




TYPICAL SECTION

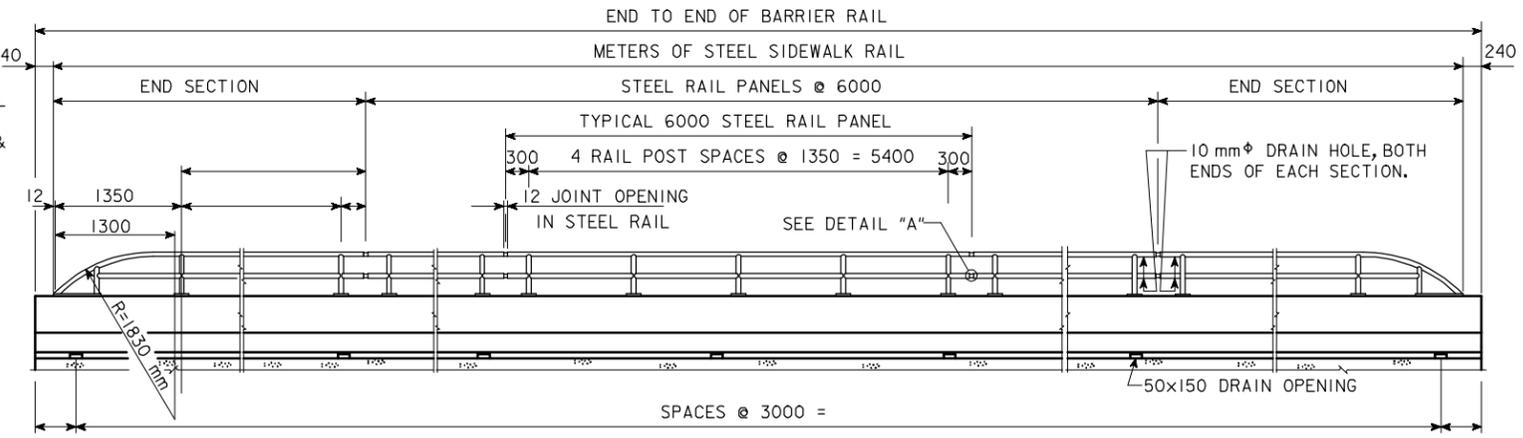


FENCE DETAILS

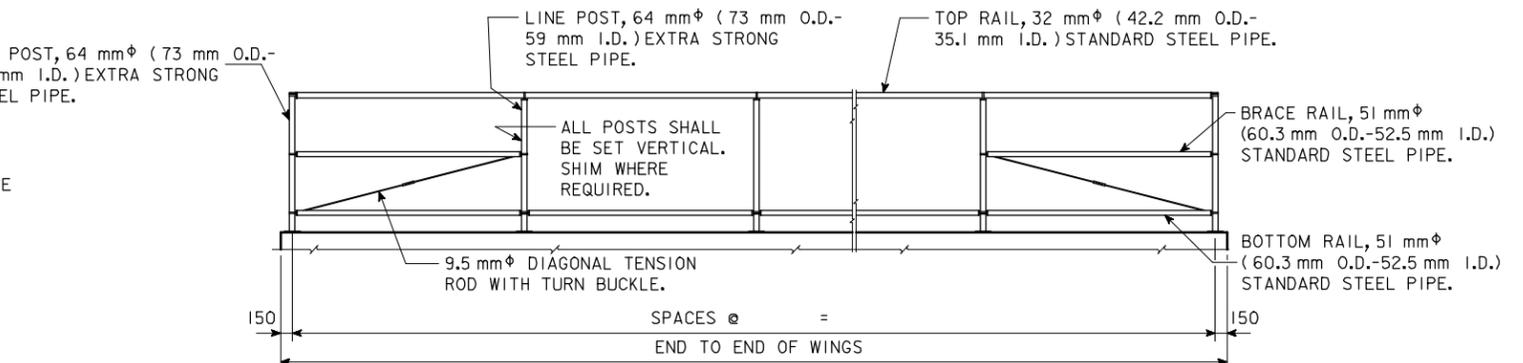


BASE PLATE DETAILS FOR END POST AND LINE POSTS

NOTE: POSTS AND BASE PLATES SHALL BE GALVANIZED, AFTER FABRICATION, IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A-123.

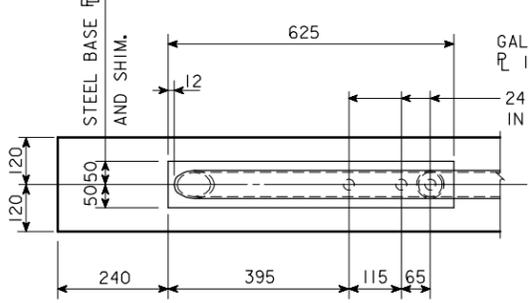


ELEVATION OF SIDEWALK BARRIER RAIL AND STEEL PIPE RAILING

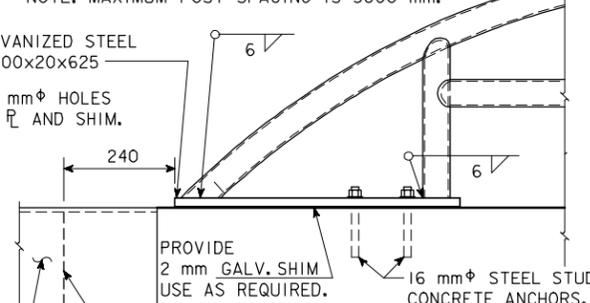


ELEVATION OF FENCE

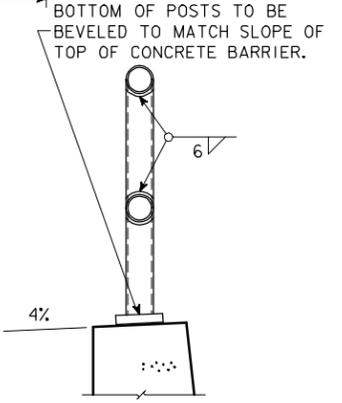
NOTE: MAXIMUM POST SPACING IS 3000 mm.



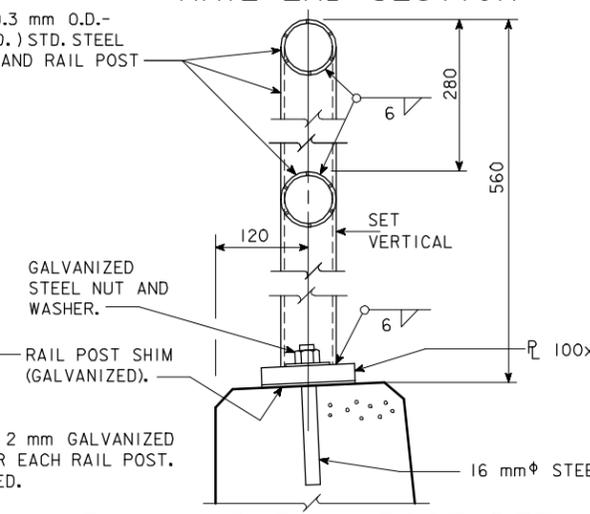
PLAN



ELEVATION RAIL END SECTION



PART SECTION

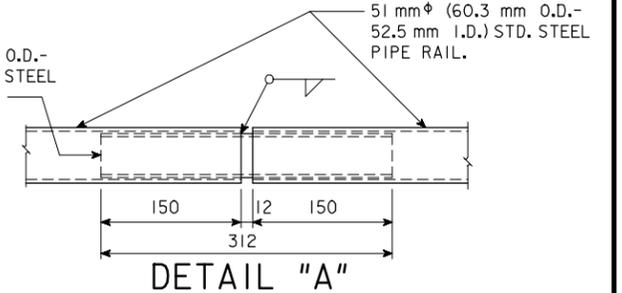


RAIL AND RAIL POST DETAILS

QUANTITIES		
ITEM	UNITS	AMOUNT
STEEL PIPE PEDESTRIAN HAND RAILING	m	
CHAIN LINK FENCE, AS PER PLAN	m	

**STEEL CHAIN LINK FENCE NOTES:**  
THE CHAIN LINK FENCE IS TO BE BID ON A METRIC BASIS MEASURED FROM  $\phi$  TO  $\phi$  OF END POSTS. THE PRICE BID, PER METER, FOR "CHAIN LINK FENCE, AS PER PLAN" SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, INCLUDING CONCRETE ANCHORS AND SHIMS, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE FENCE IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS.  
THE CHAIN LINK FENCE SHALL BE EITHER ZINC (ASTM A392) OR ALUMINUM (ASTM A491) COATED FABRIC, 50 mm MESH, 3.76 mm WIRES, 1830 mm HEIGHT WITH KNUCKLED SELVAGES TOP AND BOTTOM.  
THE STUD CONCRETE ANCHORS SHALL BE GALVANIZED AND HAVE A MINIMUM PULLOUT STRENGTH OF 35.6 KN BASED ON 28 MPa CONCRETE.  
THE MATERIAL FOR POSTS, BRACES AND RAILS SHALL BE STEEL PIPE MEETING THE REQUIREMENTS OF ASTM A-53, TYPE E OR S, GRADE B. BASE PLATES AND SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A-36M. POSTS AND BASE PLATES SHALL BE GALVANIZED, AFTER FABRICATION, IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A-123. SPECIAL FITTINGS SHALL BE AS SPECIFIED IN ARTICLE 4154.11, OF THE STANDARD SPECIFICATIONS, UNLESS OTHERWISE NOTED.  
THE FENCE SHALL BE TRUE TO LINE, TAUT, AND COMPLY WITH THE BEST PRACTICE FOR FENCE CONSTRUCTION OF THIS TYPE. ALL ENDS OF WIRES SHALL BE TURNED SO THAT THEY EXTEND AWAY FROM THE SIDEWALK SIDE OF THE FENCE.

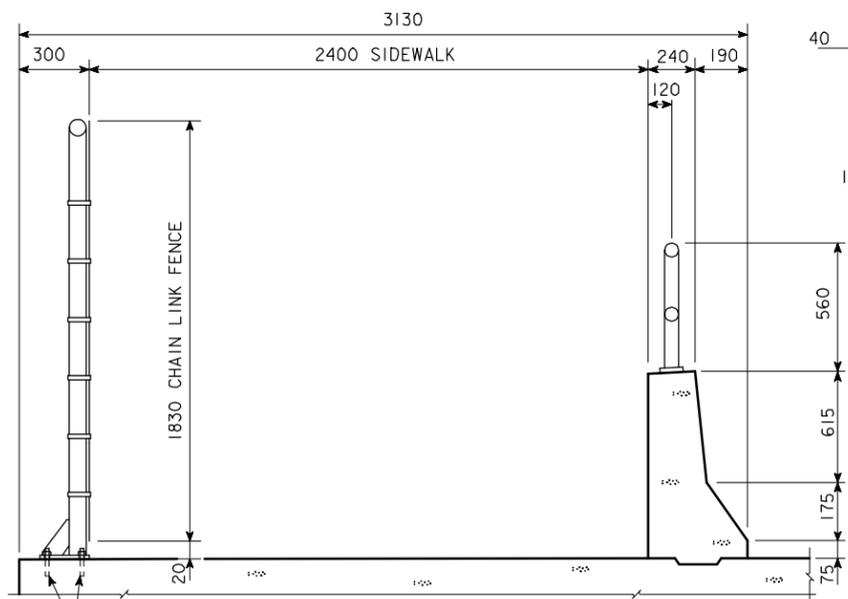
**STEEL PIPE RAILING NOTES:**  
THE STEEL SIDEWALK RAIL IS TO BE BID ON A METRIC BASIS MEASURED END TO END OF RAIL. THE PRICE BID, PER METER, FOR "STEEL PIPE PEDESTRIAN HAND RAILING" SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, INCLUDING ANCHOR BOLTS AND SHIMS, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS.  
THE MATERIAL FOR TUBE RAILS, POSTS AND SPLICE TUBES SHALL BE STANDARD STEEL PIPE MEETING THE REQUIREMENTS OF ASTM A-53, TYPE E OR S, GRADE B. BASE PLATES AND SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A-36M. PANELS AND END SECTIONS SHALL BE GALVANIZED, AFTER FABRICATION, IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A-123.  
ENDS OF RAIL SECTIONS ARE TO BE SAWED OR MILLED. ALL CUT ENDS ARE TO BE TRUE, SMOOTH, AND FREE OF BURRS OR RAGGED EDGES.  
NO PAINTING WILL BE REQUIRED.  
THE STUD CONCRETE ANCHORS SHALL BE GALVANIZED AND HAVE A MINIMUM PULL OUT STRENGTH OF 35.6 KN BASED ON 28 MPa CONCRETE.  
FOR DETAILS OF CONCRETE BARRIER RAIL SEE DESIGN SHEET OF THESE PLANS.



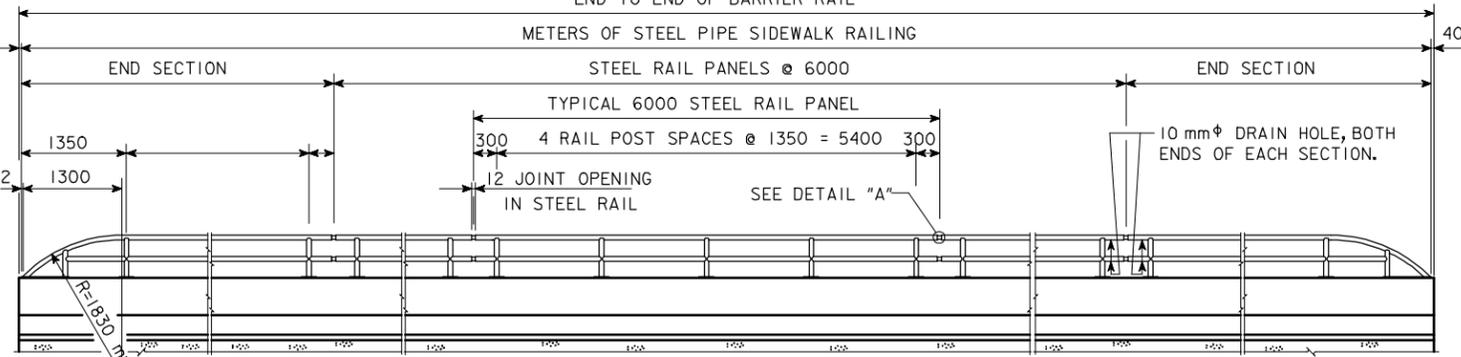
DETAIL "A"

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. \_\_\_ OF \_\_\_ FILE NO. \_\_\_ DESIGN NO. \_\_\_

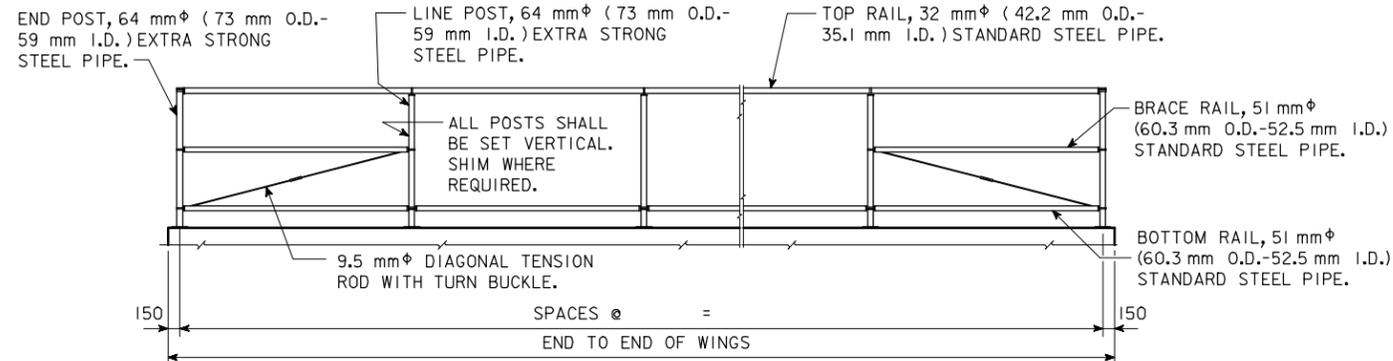
REVISED 07-04 - DRAIN SLOTS MOVED IN TYPICAL SECTION. QUANTITY ITEM CHANGE FOR STEEL PIPE. HMI029B.SOI; THIS SHEET ISSUED, 9-1-95.



TYPICAL SECTION

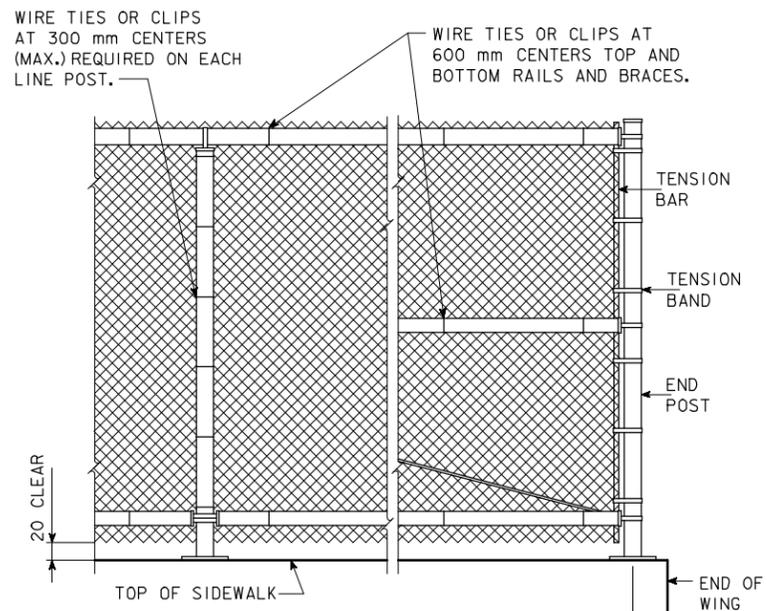


ELEVATION OF SIDEWALK BARRIER RAIL AND STEEL PIPE RAILING

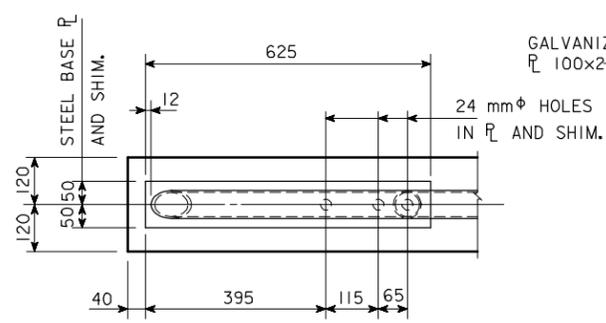


ELEVATION OF FENCE

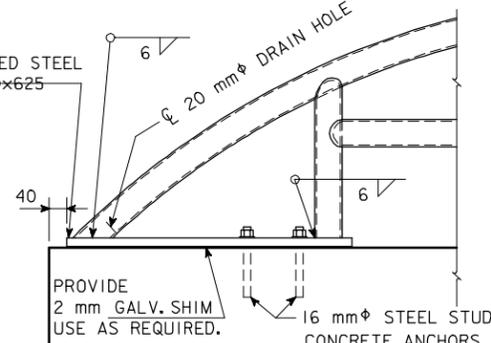
NOTE: MAXIMUM POST SPACING IS 3000 mm.



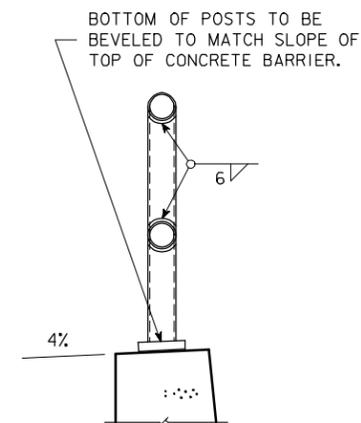
FENCE DETAILS



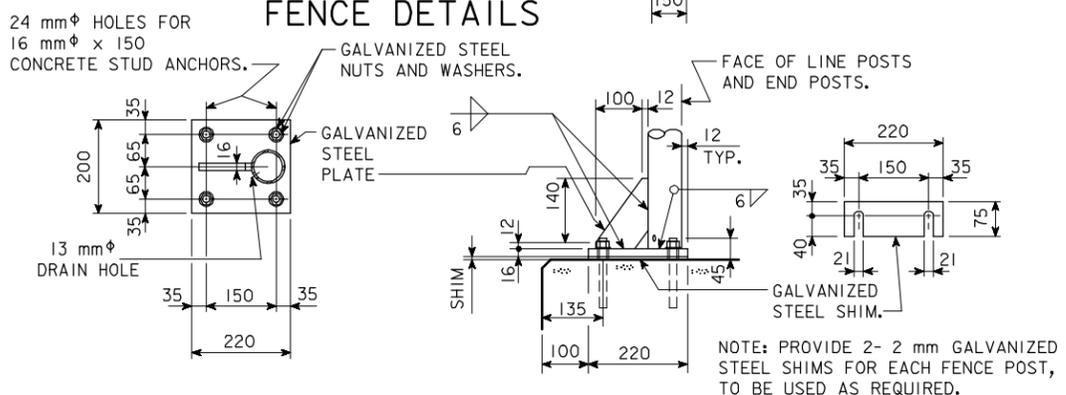
PLAN



ELEVATION

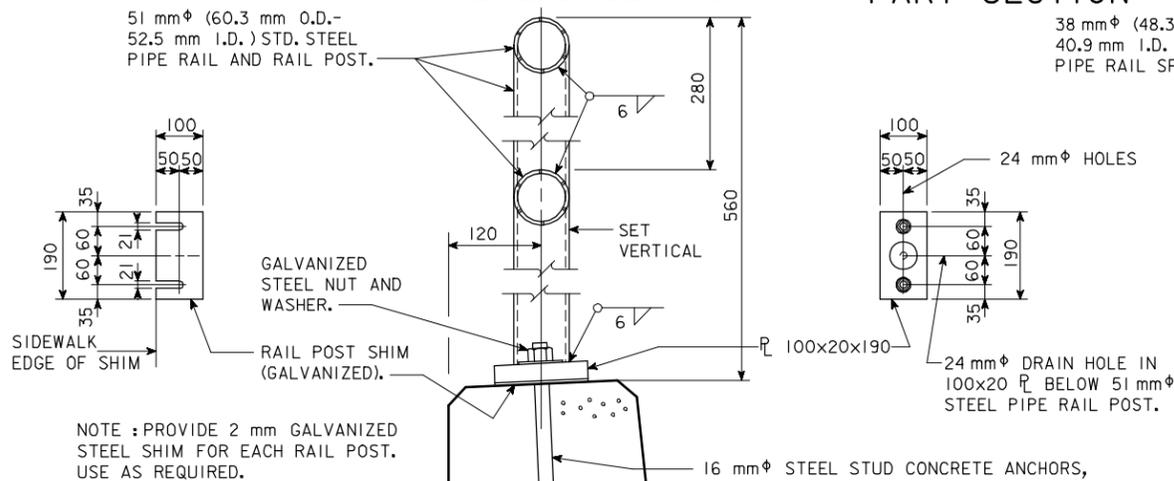


PART SECTION



BASE PLATE DETAILS FOR END POST AND LINE POSTS

NOTE: POSTS AND BASE PLATES SHALL BE GALVANIZED, AFTER FABRICATION, IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A-123.



RAIL AND RAIL POST DETAILS

QUANTITIES		
ITEM	UNITS	AMOUNT
STEEL PIPE PEDESTRIAN HAND RAILING	m	
CHAIN LINK FENCE, AS PER PLAN	m	

**STEEL CHAIN LINK FENCE NOTES:**  
 THE CHAIN LINK FENCE IS TO BE BID ON A METRIC BASIS MEASURED FROM C/C TO C/C OF END POSTS. THE PRICE BID, PER METER, FOR "CHAIN LINK FENCE, AS PER PLAN" SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, INCLUDING CONCRETE ANCHORS AND SHIMS, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE FENCE IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS.

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THE FENCE SHALL BE TRUE TO LINE, TAUT, AND COMPLY WITH THE BEST PRACTICE FOR FENCE CONSTRUCTION OF THIS TYPE. ALL ENDS OF WIRES SHALL BE TURNED SO THAT THEY EXTEND AWAY FROM THE SIDEWALK SIDE OF THE FENCE.

**STEEL PIPE RAILING NOTES:**

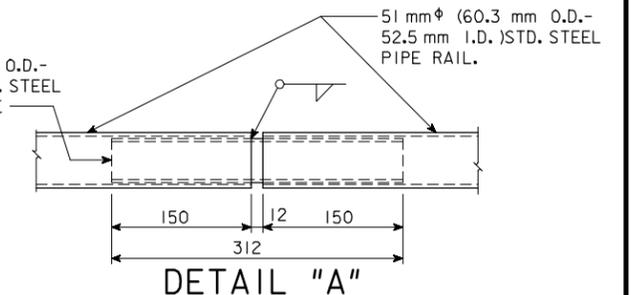
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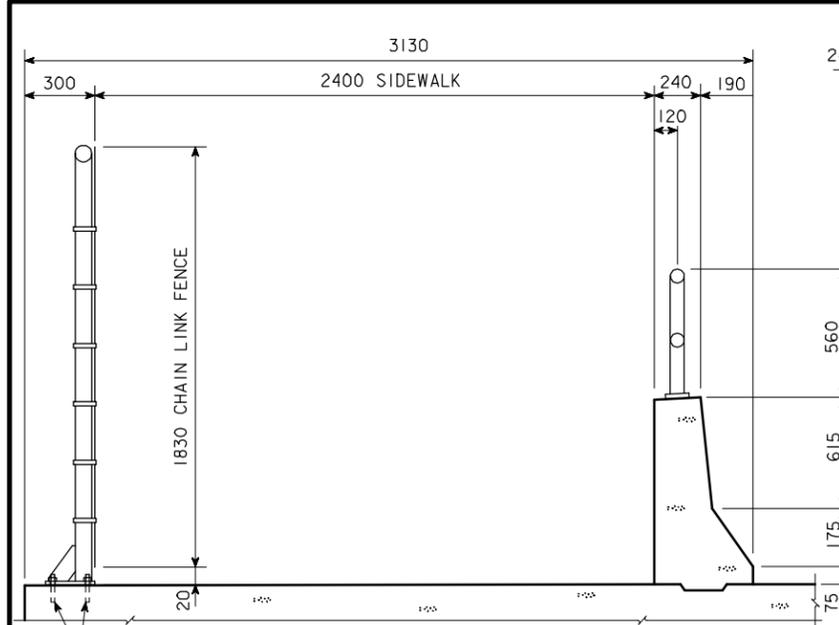
NO PAINTING WILL BE REQUIRED. THE STUD CONCRETE ANCHORS SHALL BE GALVANIZED AND HAVE A MINIMUM PULL OUT STRENGTH OF 35.6 KN BASED ON 28 MPa CONCRETE.

FOR DETAILS OF CONCRETE BARRIER RAIL SEE DESIGN SHEET OF THESE PLANS.

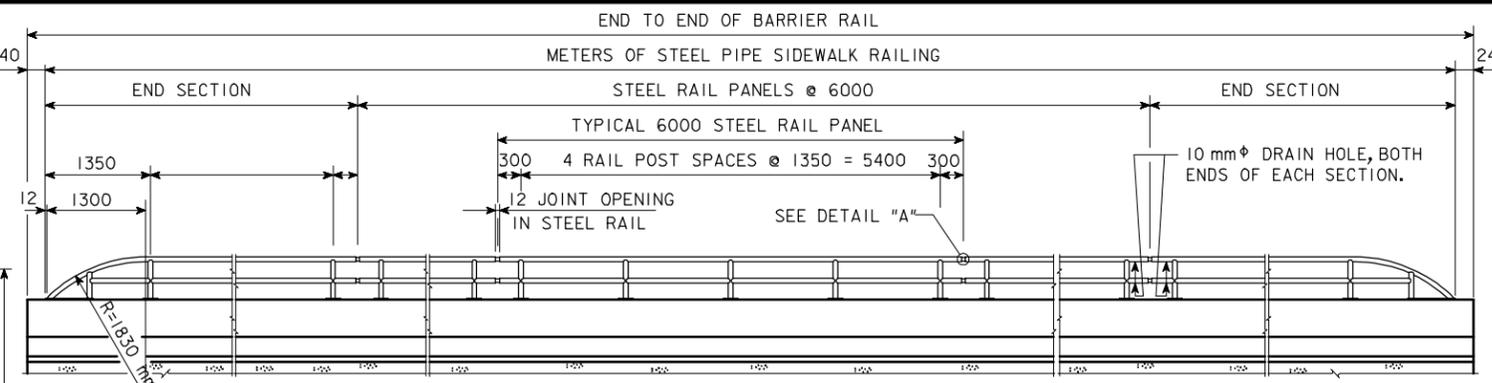


DETAIL "A"

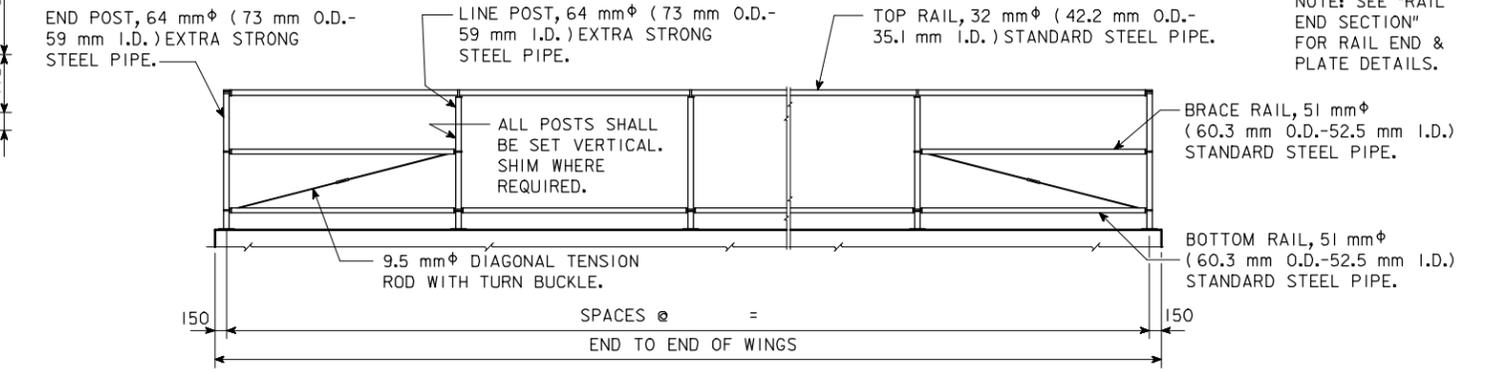
REVISED 07-04 - QUANTITY ITEM NAME CHANGED FOR STEEL PIPE. HMI029C.SOI - THIS SHEET ISSUED, 9-1-95.



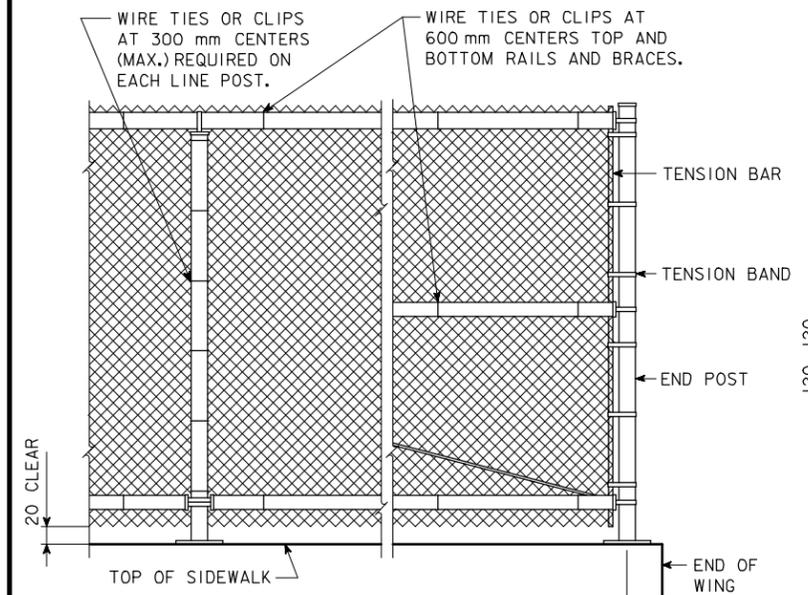
TYPICAL SECTION



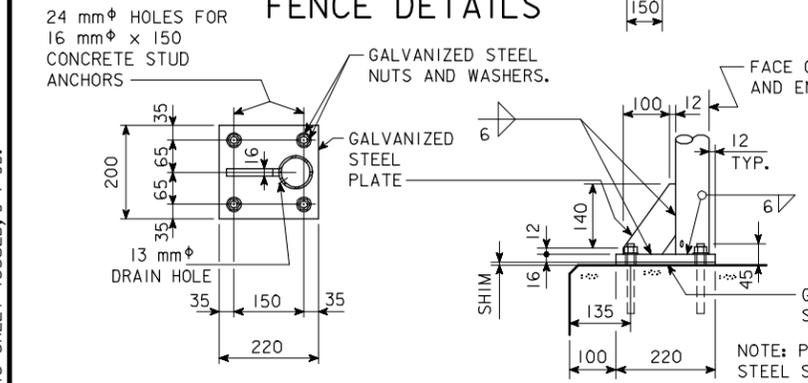
ELEVATION OF SIDEWALK BARRIER RAIL AND STEEL PIPE RAILING



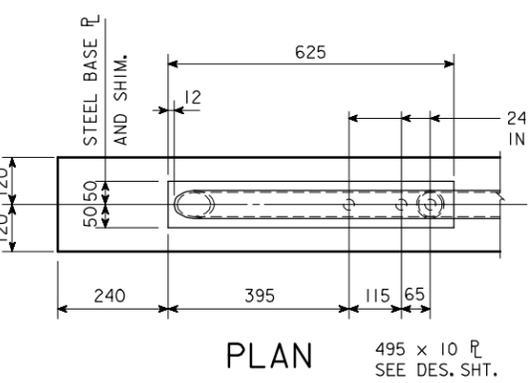
ELEVATION OF FENCE



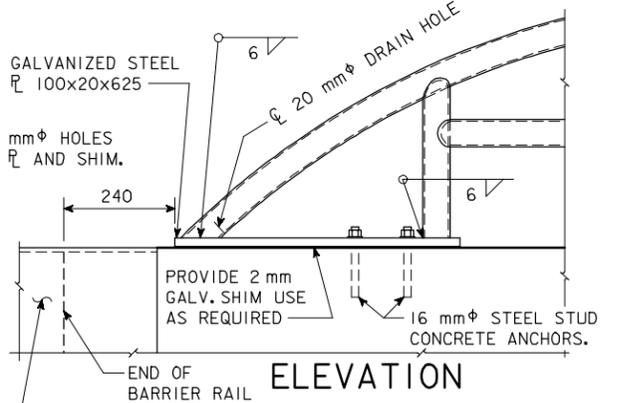
FENCE DETAILS



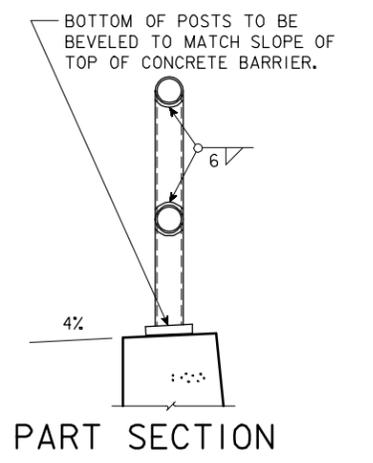
BASE PLATE DETAILS FOR END POST AND LINE POSTS



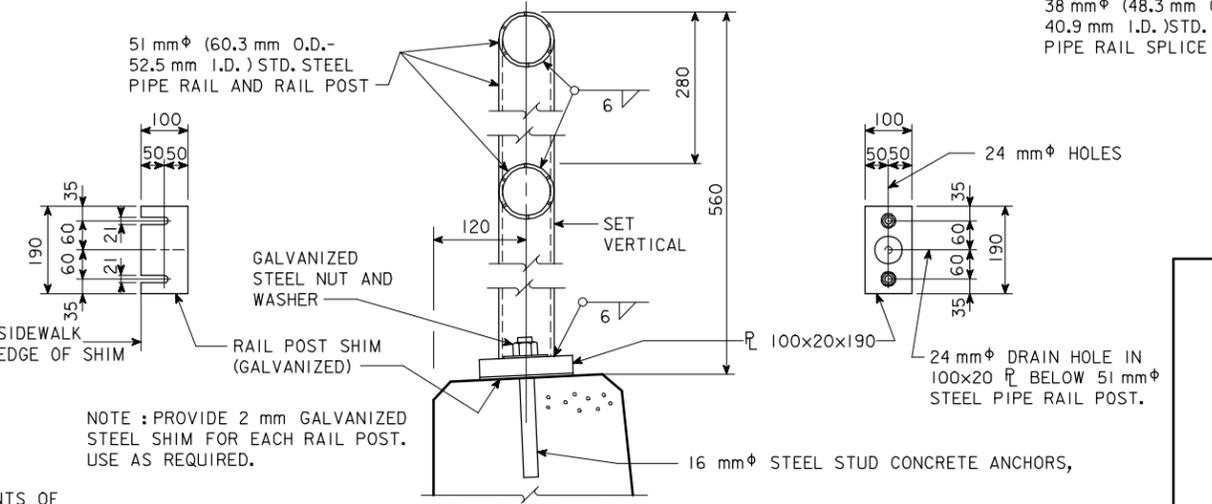
PLAN



RAIL END SECTION



PART SECTION



RAIL AND RAIL POST DETAILS

QUANTITIES		
ITEM	UNITS	AMOUNT
STEEL PIPE PEDESTRIAN HAND RAILING	m	
CHAIN LINK FENCE, AS PER PLAN	m	

**STEEL CHAIN LINK FENCE NOTES:**  
 THE CHAIN LINK FENCE IS TO BE BID ON A METRIC BASIS MEASURED FROM C/C TO C/C OF END POSTS. THE PRICE BID, PER METER, FOR "CHAIN LINK FENCE, AS PER PLAN" SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, INCLUDING CONCRETE ANCHORS AND SHIMS, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE FENCE IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS.

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THE FENCE SHALL BE TRUE TO LINE, TAUT, AND COMPLY WITH THE BEST PRACTICE FOR FENCE CONSTRUCTION OF THIS TYPE. ALL ENDS OF WIRES SHALL BE TURNED SO THAT THEY EXTEND AWAY FROM THE SIDEWALK SIDE OF THE FENCE.

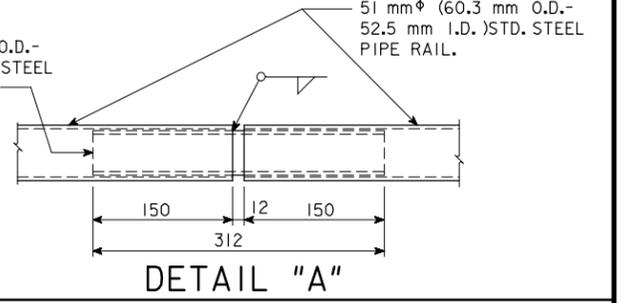
**STEEL PIPE RAILING NOTES:**  
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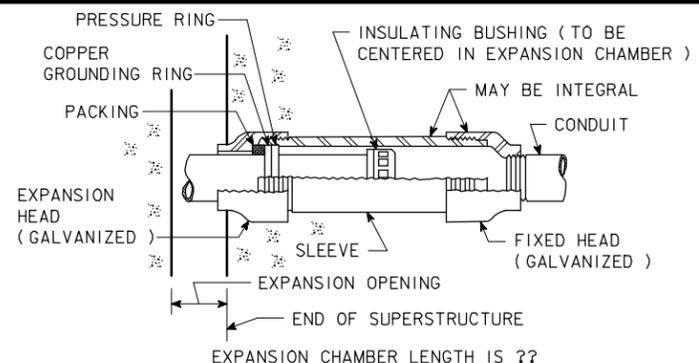
NO PAINTING WILL BE REQUIRED. THE STUD CONCRETE ANCHORS SHALL BE GALVANIZED AND HAVE A MINIMUM PULL OUT STRENGTH OF 35.6 KN BASED ON 28 MPa CONCRETE.

FOR DETAILS OF CONCRETE BARRIER RAIL SEE DESIGN SHEET OF THESE PLANS.



DETAIL "A"

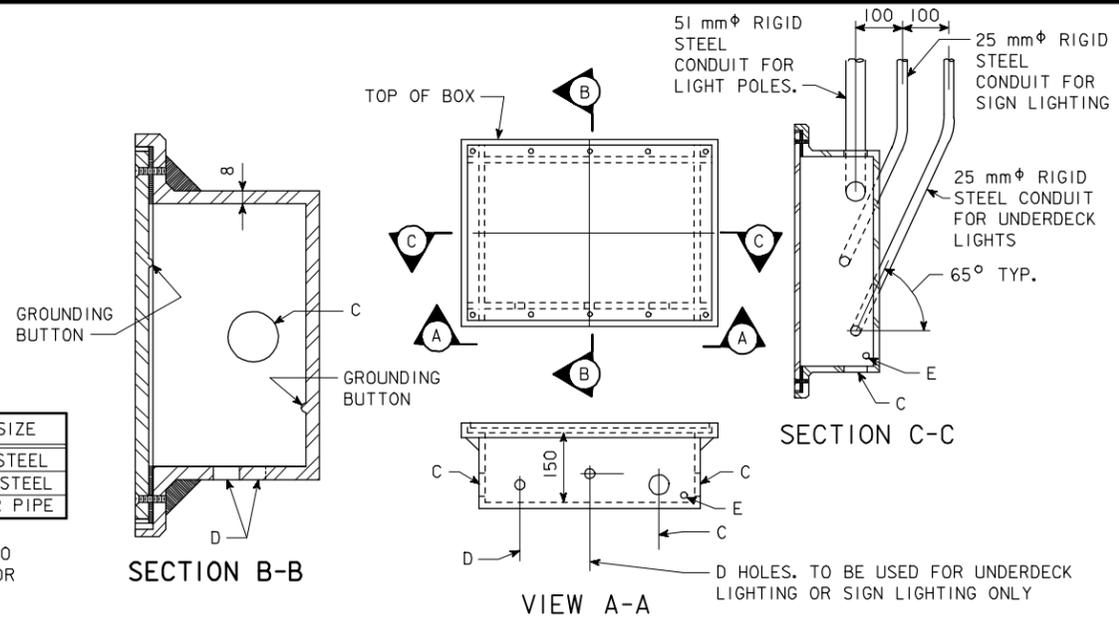
REVISED 07-04 - QUANTITY ITEM NAME CHANGED FOR STEEL PIPE. HMI029d.s01; THIS SHEET ISSUED, 9-1-95.



EXPANSION CHAMBER LENGTH IS ??  
EXPANSION FITTING DETAIL  
(?? REQUIRED)

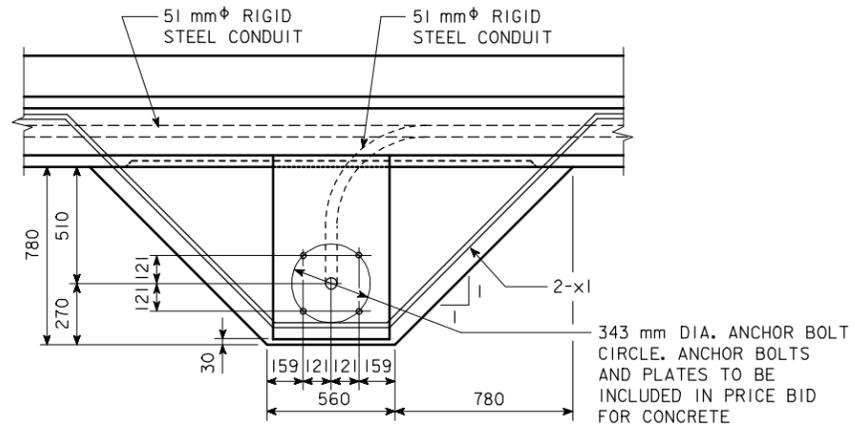
BOSSED FOR	HOLE	FOR CONDUIT SIZE
5 THREADS	C	51 mm $\phi$ RIGID STEEL
NONE	D	25 mm $\phi$ RIGID STEEL
NONE	E	13 mm $\phi$ COPPER PIPE

NOTE:  
THE GROUNDING BUTTONS ARE TO BE BLIND DRILLED AND TAPPED FOR 9.5 mm  $\phi$  x 20 mm BOLTS.

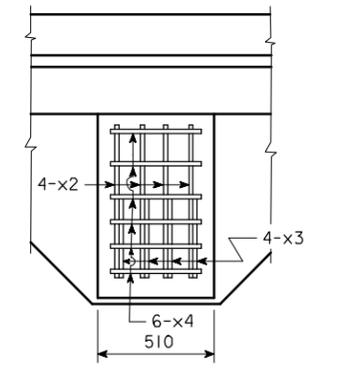


RM-37, TYPE I JUNCTION BOX  
WATERTIGHT, CAST IRON - FLUSH MOUNT

**LIGHTING NOTES:**  
SEE RM-37 STANDARD ROAD PLAN FOR ADDITIONAL INFORMATION ON JUNCTION BOXES.  
CONSTRUCTION SHALL CONFORM TO THE CURRENT IOWA D.O.T. STANDARD AND SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.  
CONDUIT INSTALLATION SHALL COMPLY WITH THE ARTICLE "ELECTRICAL DUCTS", SECTION 2523.  
ALL "C" ENTRANCE HOLES IN JUNCTION BOXES SHALL BE DRILLED AND TAPPED FOR THE SPECIFIED CONDUIT SIZE. ALL OTHER HOLES SHALL HAVE A CONCRETE - TIGHT SLIP FIT. CONDUIT ENDS SHALL NOT PROTRUDE INTO JUNCTION BOX MORE THAN 6 mm. DRAIN PIPE END SHALL BE FLUSH WITH INSIDE SURFACE OF BOX. GROUNDING BUTTONS SHALL BE LOCATED APPROXIMATELY 75 mm FROM THE INSIDE SURFACE OF THE BOX WALL, AND NOT CLOSER THAN 75 mm TO THE EDGE OF ANY HOLE IN THE BOX FLOOR. HOLES FOR DRAIN PIPE SHALL BE PLACED IN THE LOW CORNER OF THE BOX, WITH A MINIMUM CLEARANCE OF 25 mm BETWEEN THE EDGE OF THE HOLE AND THE INSIDE SURFACE OF THE BOX WALL. TYPICAL DETAILS ARE SHOWN ON THIS SHEET.  
THE RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS INCLUDING LABOR AND ANY ADDITIONAL WORK TO DO THE INSTALLATION IS CONSIDERED INCIDENTAL TO THE COST OF THE RAILING.  
THE CONCRETE AND MASS OF REINFORCING STEEL IS INCLUDED IN THE SUPERSTRUCTURE ESTIMATED QUANTITIES.  
COST OF FURNISHING AND INSTALLING POLES, LIGHTS AND LIGHTING CONDUCTOR IS NOT A PART OF THIS ESTIMATE.  
EXPANSION FITTING SHALL BE AS SPECIFIED OR AS APPROVED BY THE ENGINEER. TYPICAL DETAILS ARE SHOWN ON THIS SHEET.  
ALL ANCHOR BOLT MATERIAL SHALL COMPLY WITH THE REQUIREMENTS OF IOWA DOT MATERIALS I.M. 453.08.  
ALL REINFORCING STEEL IS TO BE EPOXY COATED AND GRADE 400.

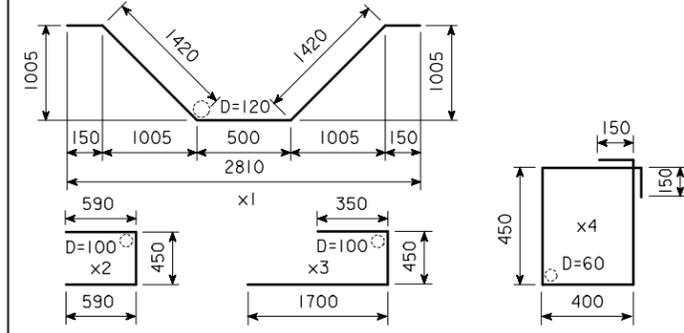


PLAN OF POLE BASE  
BASE REINFORCING BARS NOT SHOWN



PLAN OF POLE BASE REINFORCING

EPOXY REINFORCING STEEL-ONE BASE						
MARK	SIZE	LOCATION	SHAPE	NO.	LENGTH	MASS
x1	20	SLAB ANCHORS	~	2	3640	17
x2	15	POLE BASE TO SLAB	□	4	1630	10
x3	15	POLE BASE TO SLAB	□	4	2500	16
x4	15	POLE BASE HOOP	□	6	2000	19
x5	25	SLAB TRANSVERSE	—	4	1800	28
					TOTAL (kg.)	90

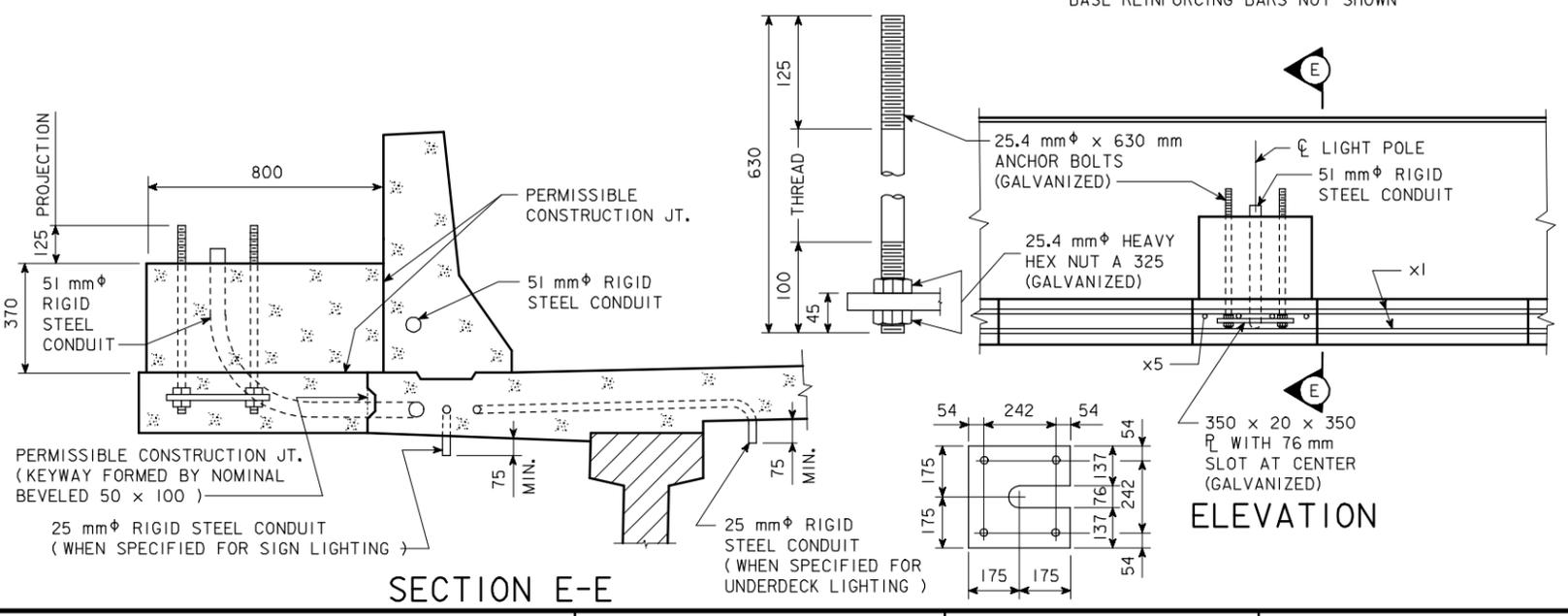


NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

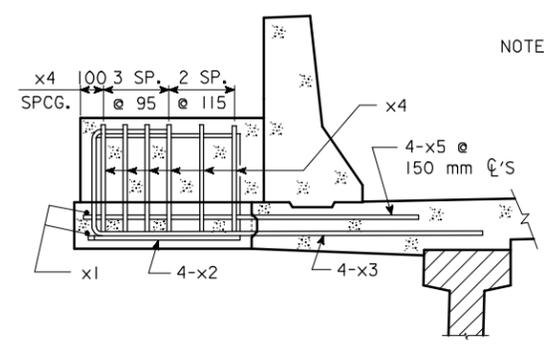
LIGHTING QUANTITIES	
ITEM	AMOUNT
STRUCTURAL CONCRETE ( BRIDGE )	m <sup>3</sup>
REINFORCING STEEL - EPOXY COATED	kg

NOTE: FOR LOCATION AND LENGTHS OF CONDUITS NEEDED SEE DES. SH. ?? TOTAL QUANTITIES FOR CONCRETE AND REINFORCING STEEL FOR POLE BASES ARE INCLUDED IN THE SUPERSTRUCTURE QUANTITIES ON ANOTHER SHEET.

SEE STANDARD SHEET M1030A LIGHTING DETAILS ( 2 OF 2 ) FOR DETAILS NOT SHOWN.



SECTION E-E

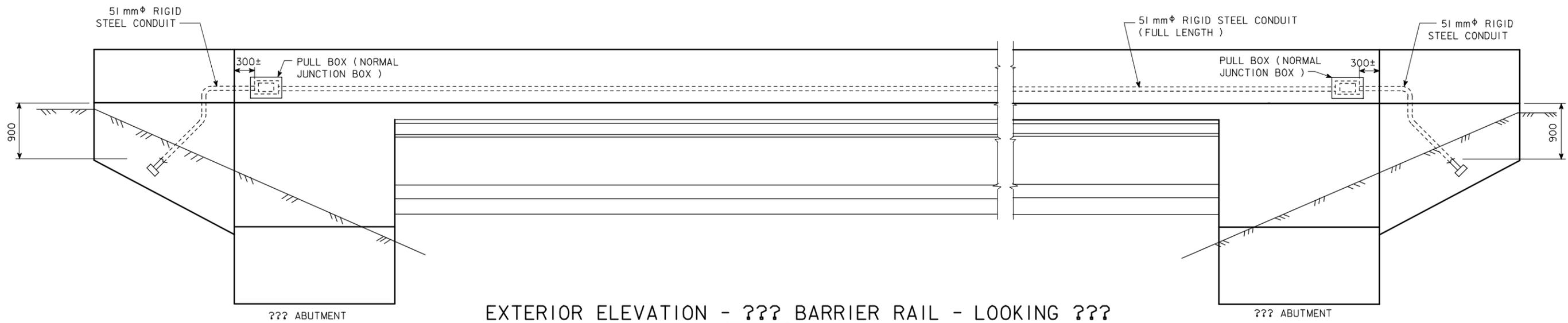


SECTION THROUGH BASE SHOWING REINFORCING

LIGHTING DETAILS

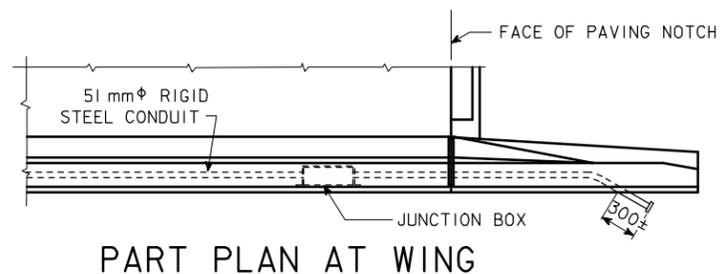
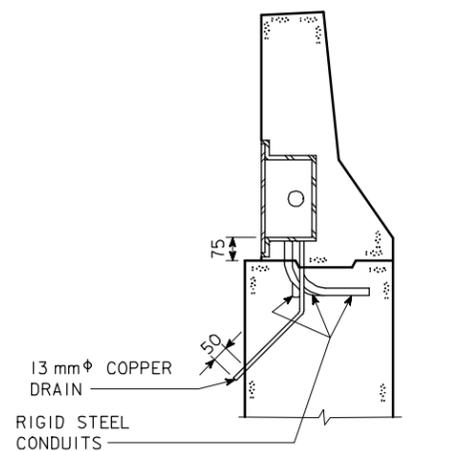
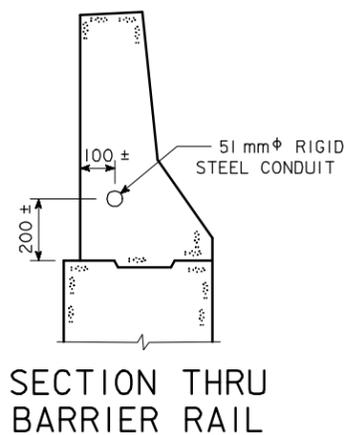
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. \_\_\_ OF \_\_\_ FILE NO. \_\_\_ DESIGN NO. \_\_\_

REVISED 07-04 - CONDUIT USED FOR LIGHT POLE CHANGED FROM 25 mm TO 51 mm. ANCHOR PLATE CHANGED TO 75 mm SLOT. HM1030A.S01 - THIS SHEET ISSUED 9-1-95.



CONDUIT ONLY, PRESTRESSED W\INTERGRAL ABUT.

EXAMPLE SHOWN - SEE OTHER EXAMPLES OUTSIDE OF BORDER SHEET FOR SPECIFIC BRIDGE TYPE



SEE STANDARD SHEET M1030A LIGHTING DETAILS (1 OF 2) FOR DETAILS NOT SHOWN.

**LIGHTING DETAILS**

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HM1030A.S02 - THIS SHEET ISSUED 07-04.