

- NOTES:
- Design Specifications - CAN/CSA-S6-06
  - Design Loading - Live Load CL-750  
Load Factors 1.2D + 1.5D (surfacing) + 1.7L  
Dead Load includes 80 mm of asphalt
  - Concrete for stringers shall be standard weight containing Type GU General Use Portland cement with silica fume and 6% ± 1% entrained air. Maximum aggregate size shall be 20 mm.
  - Concrete shall attain a minimum 28 day compressive strength of 35 Mpa.
  - The compressive strength of job cured standard cylinders shall be 27 MPa before the prestressing force is transferred.
  - Prestressing strands shall conform to the requirements of CSA Standard G279-M, Grade 1860 with a low relaxation property.
  - Initial tensioning force shall be 185 kN per 15 # strand.
  - Stringer length shown is the dimension to be achieved after transfer of the prestressing force.
  - Reinforcing steel shall be fabricated from deformed bars conforming to the requirements of CAN/CSA-G30.18-M, Grade 400.
  - Diameters of all hooks and bends unless otherwise noted, shall conform to the recommended sizes in CAN/CSA-S6-06.
  - Structural steel shall conform to the requirements of CAN/CSA-G40.21, Grade 300W.
  - Welding of reinforcing steel will not be permitted without the written approval of the Engineer.
  - All welding shall conform to the requirements of CSA Standard W59.
  - Galvanizing shall conform to the requirements of CSA Standard G164.
  - Construction procedures shall conform to Specification 7800 For The Fabrication Of Precast Concrete Bridge Units And Barriers.
  - All exposed corners shall have a 20 mm chamfer.
  - Exterior face of exterior stringers shall be finished to a smooth uniform colour and texture. Other surfaces shall have all pockets filled and oil fins removed.
  - Bridgerail and connector bolts are not a part of this contract. All other hardware shown shall be supplied by the fabricator.
  - The bridgerail post spacing shown is for a single span bridge with a Type 4 steel bridgerail. For multiple span bridges using a Type 4 steel bridgerail, a revised spacing will be provided with the order. The anchor details shown will not be used with a concrete curb or concrete traffic barrier.
  - The 3/4" # heavy nuts for the bridgerail anchor shall be heavy hex nuts conforming to the requirements of ASTM specification A563, Grade DH. Nuts shall be galvanized and tapped oversized in accordance with ASTM Specification A563.
  - Galvanized spacers shall be attached by welding or other approved procedure.
  - All dimensions are in millimetres unless noted otherwise.

QUANTITIES	
ITEM	TOTAL QUANTITY
CONCRETE (STANDARD WEIGHT)	2.5 m <sup>3</sup>
PRESTRESSING STRANDS (Grade 1860 MPa)	53 kg
REINFORCING STEEL (Grade 400 MPa)	167 kg

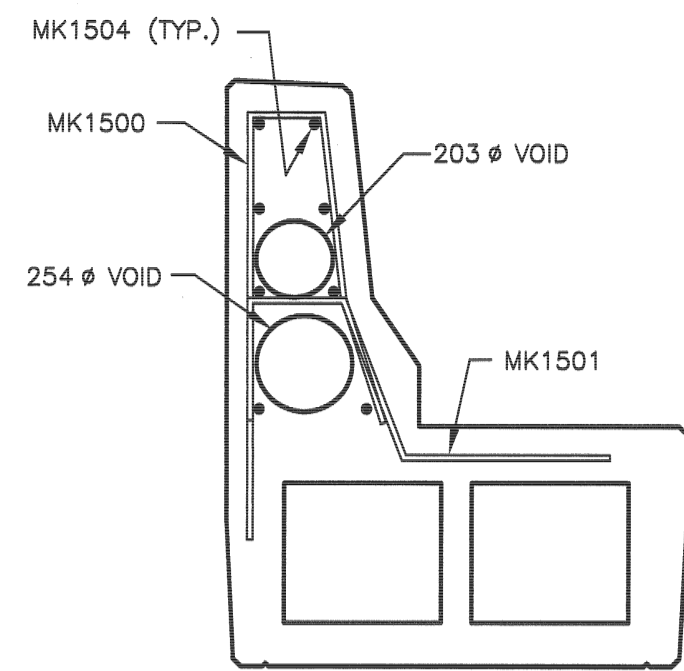
  

Government of Saskatchewan Ministry of Highways & Infrastructure		<b>BRIDGE STANDARDS</b>	
<b>STANDARD PRECAST PRESTRESSED CONCRETE STRINGER</b>			
<b>6 METRE BOX</b>			
RECOMMENDED BY:	15-JUL-2013 DATE		
APPROVED BY:	01-06-2013 DATE		
DESIGN	S.A.	DRAWN	S.A.
DATE	13-Dec.-2012	CHECKED	G.L.
	22-Jan.-2013	FILE	
	24-Jan.-2013		

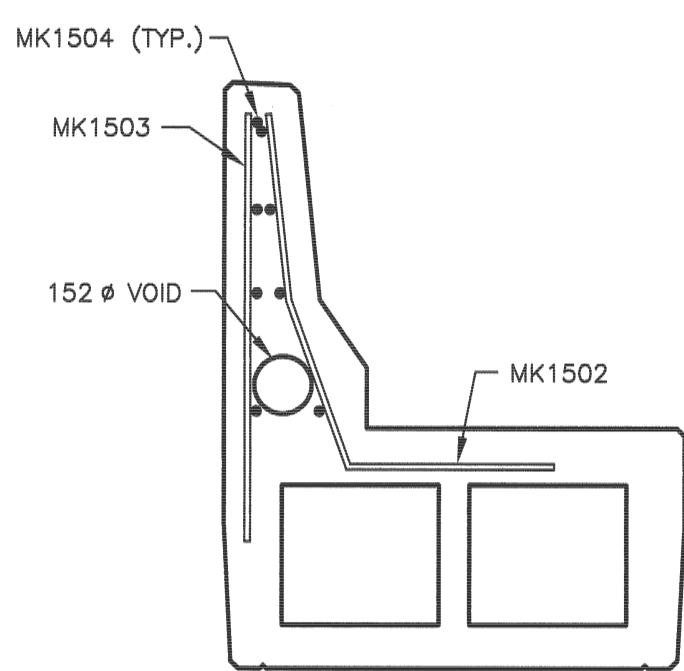
  

REVISIONS	
NO.	DESCRIPTION
1	08-JULY-2013 CORRECT DOWEL HOLE SIZE
2	08-JULY-2013 CORRECT DOWEL HOLE SIZE

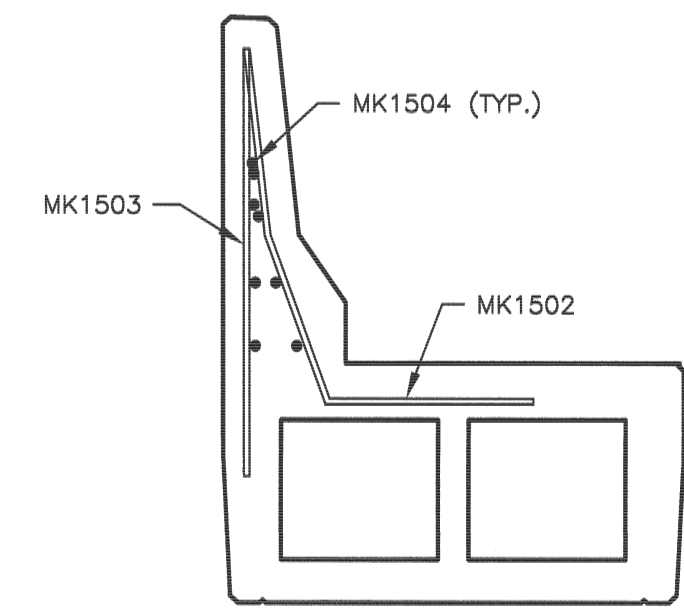
LAST REVISED DATE: 12-JULY-2013 9:20 AM



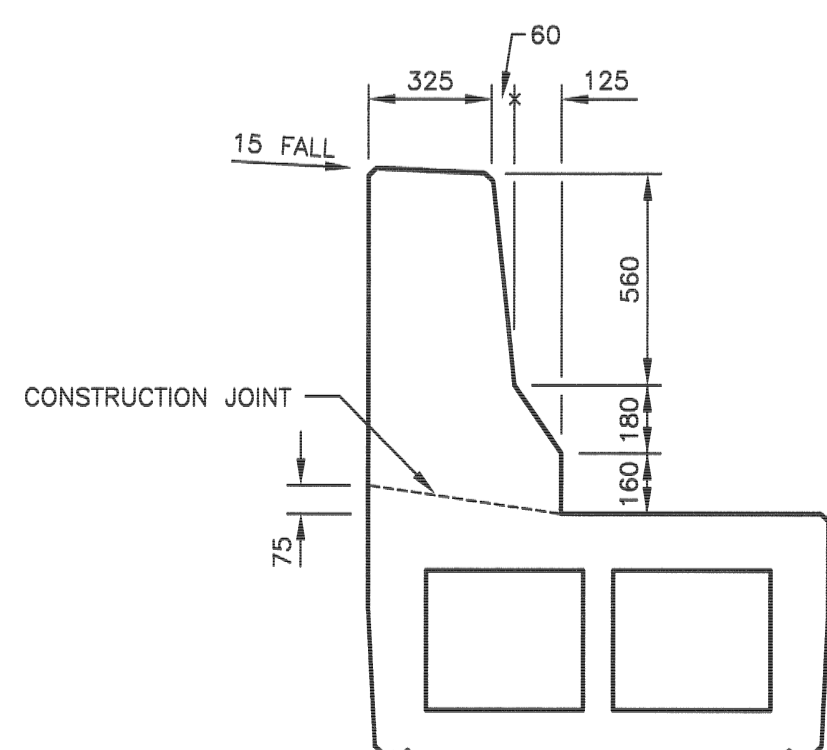
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SCALE 1:20



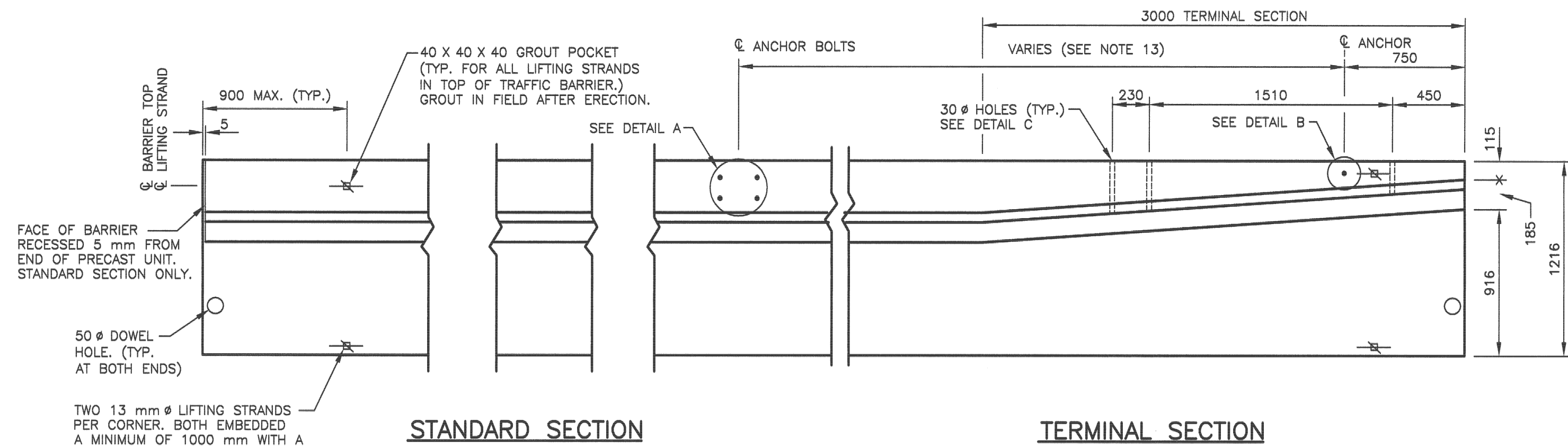
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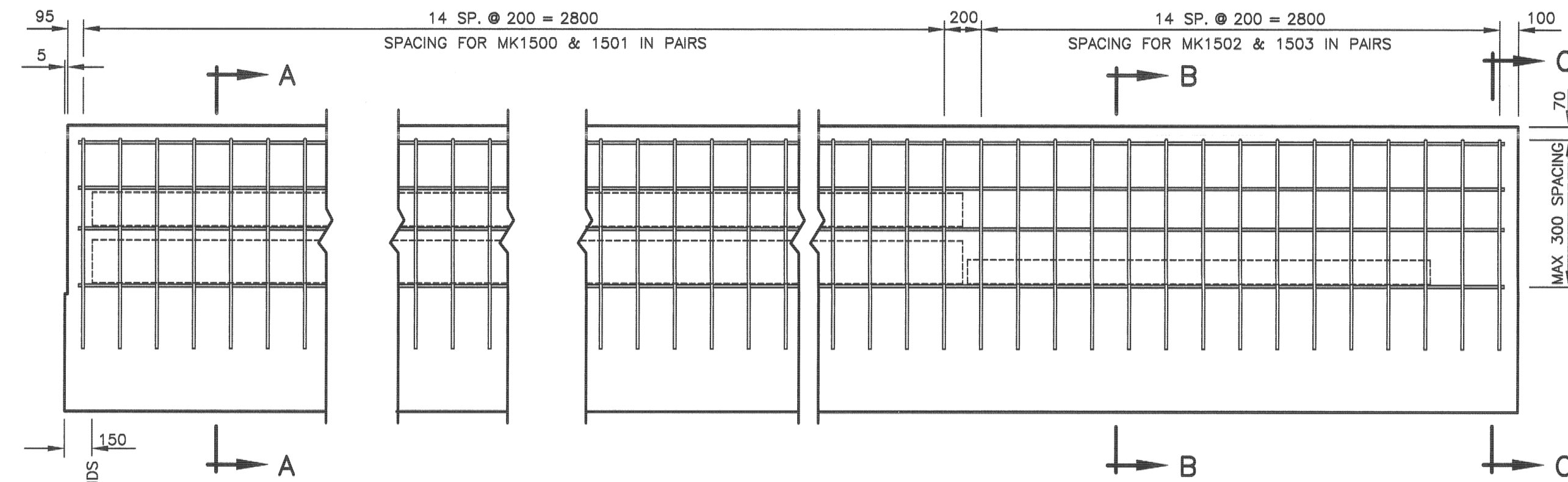
SECTION C-C  
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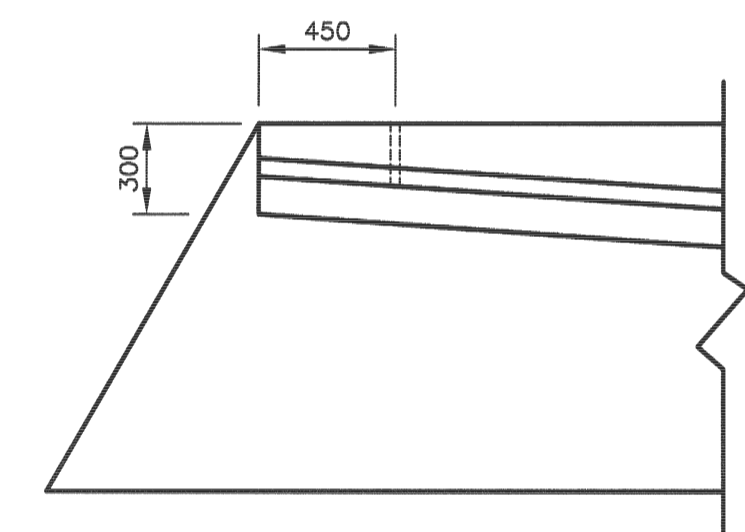
STANDARD CROSS SECTION  
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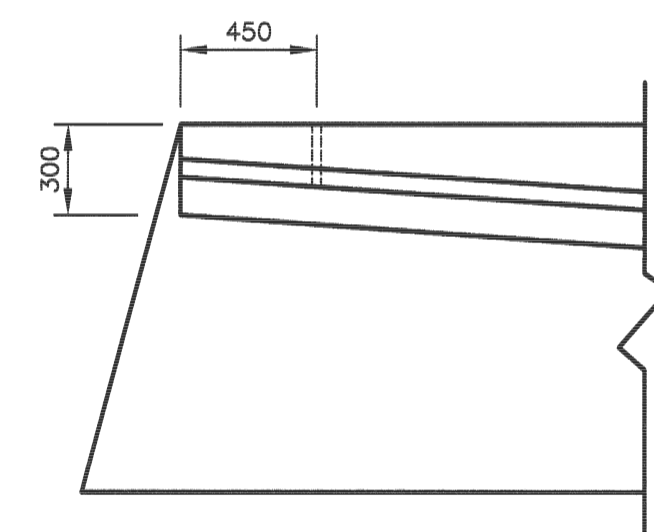
PLAN  
SCALE 1:25



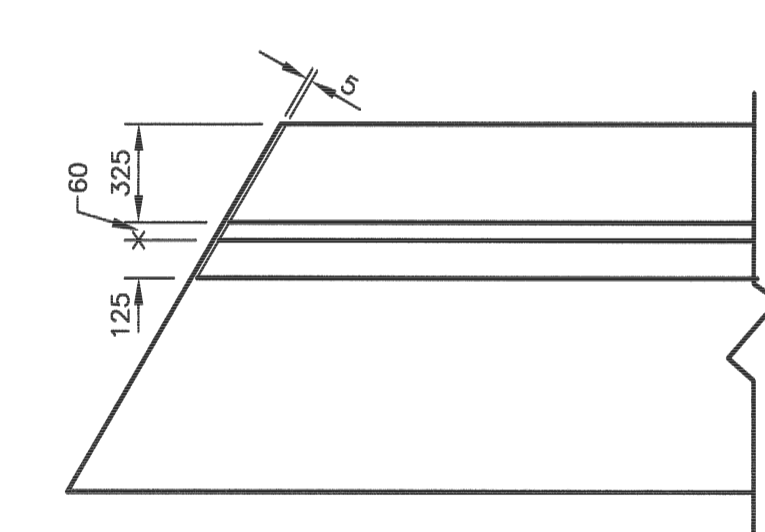
ELEVATION REINFORCEMENT  
SCALE 1:25



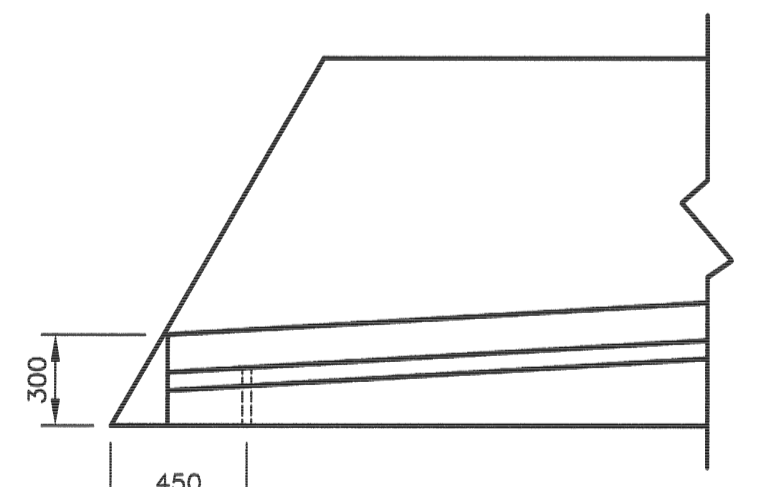
30° SKEW - TERMINAL SECTION



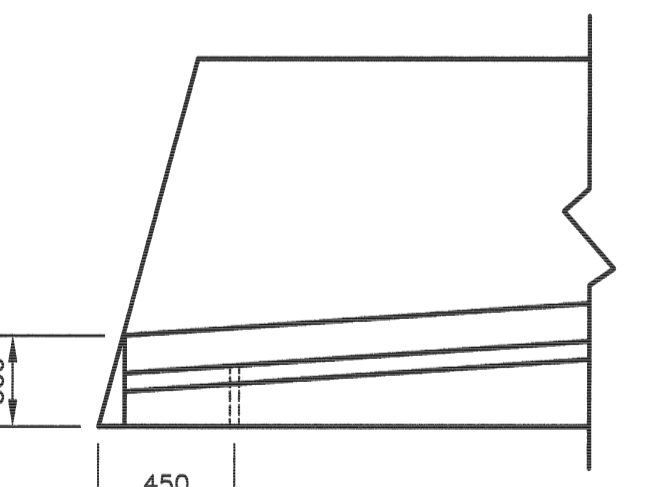
15° SKEW - TERMINAL SECTION



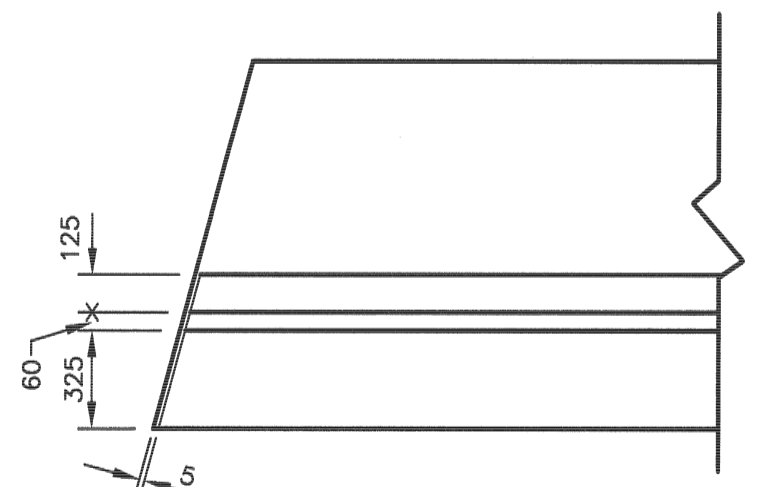
30° SKEW - STANDARD SECTION



30° SKEW - TERMINAL SECTION



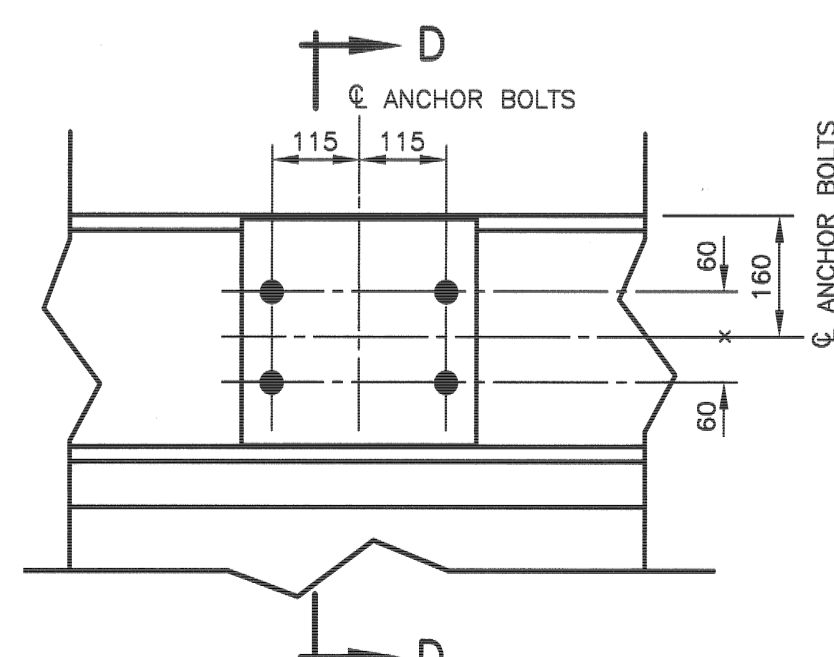
15° SKEW - TERMINAL SECTION



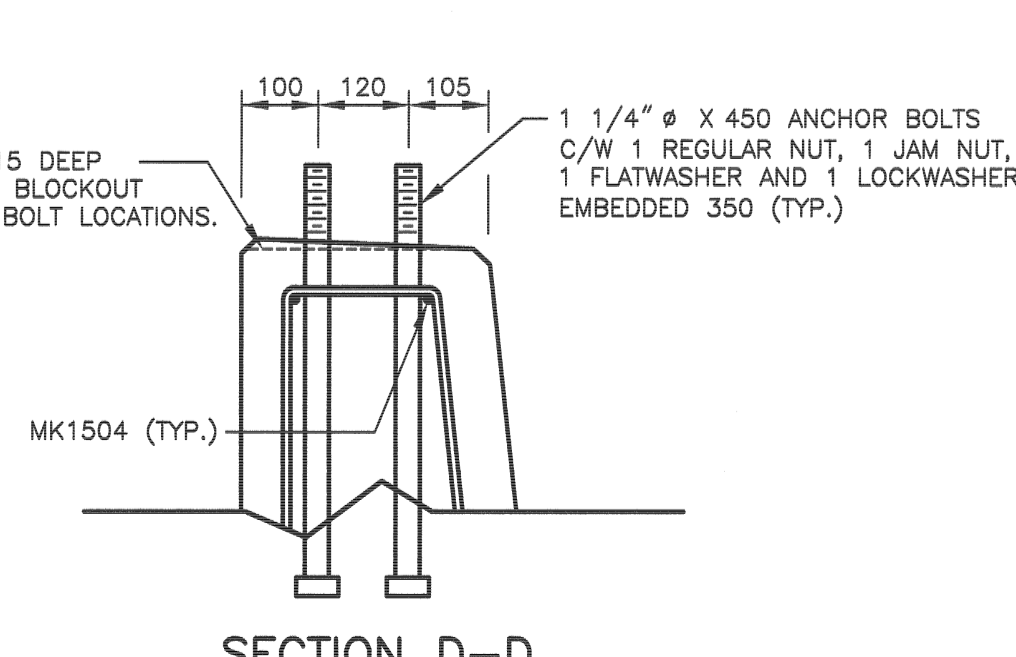
15° SKEW - STANDARD SECTION

**SKEWED END TREATMENT**

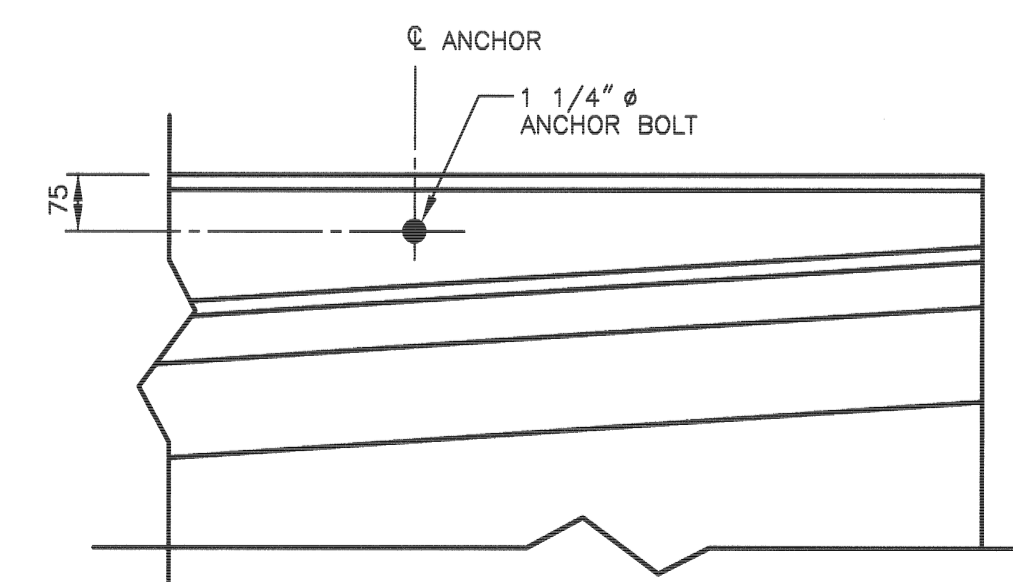
SCALE 1:25



DETAIL A  
SCALE 1:10



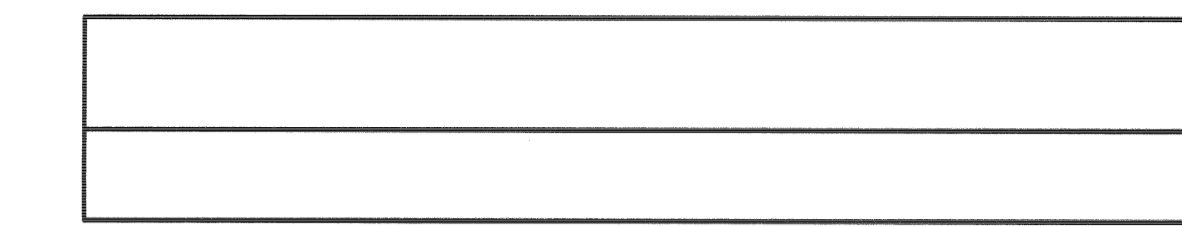
SECTION D-D



DETAIL B  
SCALE 1:10

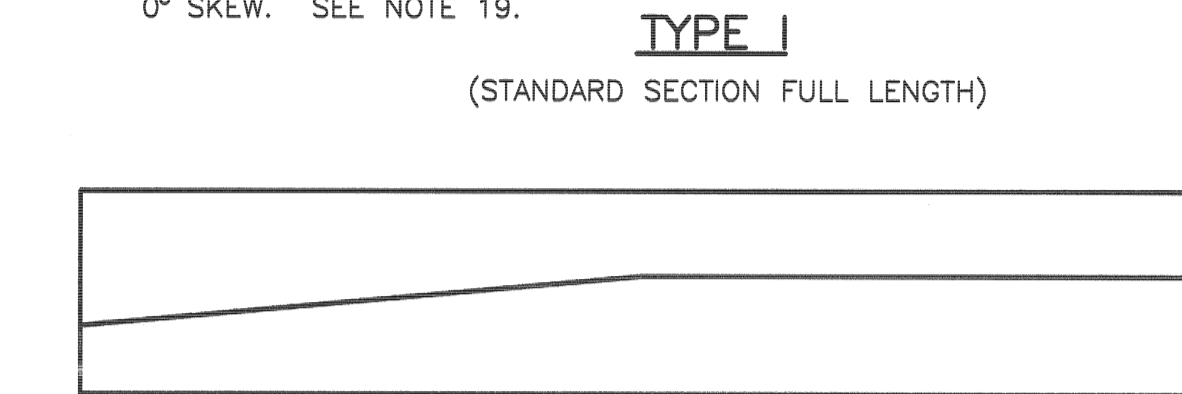
**REINFORCING SCHEDULES**

NOTE: ALL DIMENSIONS ARE OUT TO OUT



MARK	TYPE	NO.	TYPE	LENGTH	TOTAL LENGTH	GRADE	MASS (kg)
1500	15 M	30	A	1860	55 800	400	88
1501	15 M	30	B	1910	57 300	400	90
1504	15 M	8	STR.	5860	46 880	400	74

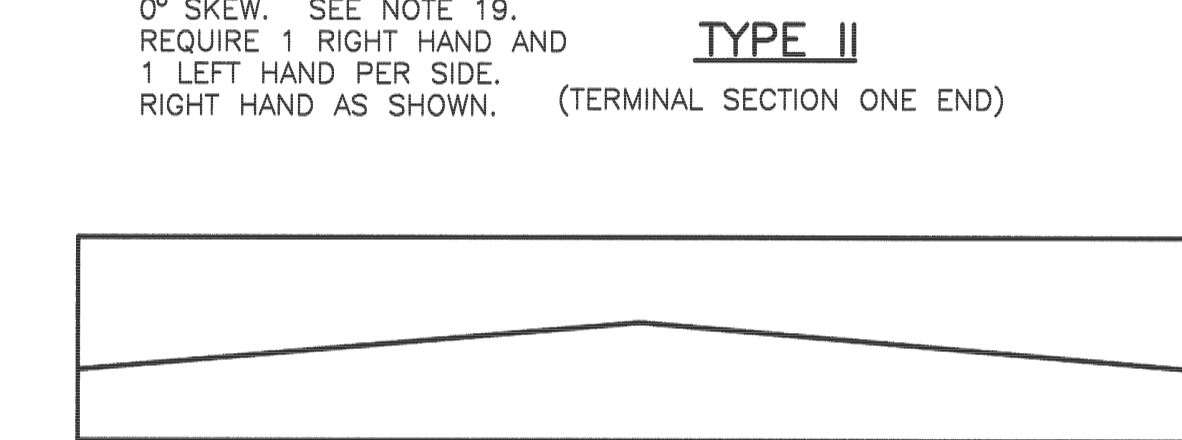
NOTE: USE FOR INTERIOR SPANS ONLY. OF SKEW. SEE NOTE 19.



TYPE I  
(STANDARD SECTION FULL LENGTH)

MARK	TYPE	NO.	TYPE	LENGTH	TOTAL LENGTH	GRADE	MASS (kg)
1500	15 M	15	A	1860	27 900	400	44
1501	15 M	15	B	1910	28 650	400	45
1502	15 M	15	C	1505	22 575	400	35
1503	15 M	15	STR.	1130	16 950	400	27
1504	15 M	8	STR.	5860	46 880	400	74

NOTE: USE FOR END SPANS ONLY. OF SKEW. SEE NOTE 19. REQUIRE 1 RIGHT HAND AND 1 LEFT HAND PER SIDE. RIGHT HAND AS SHOWN.

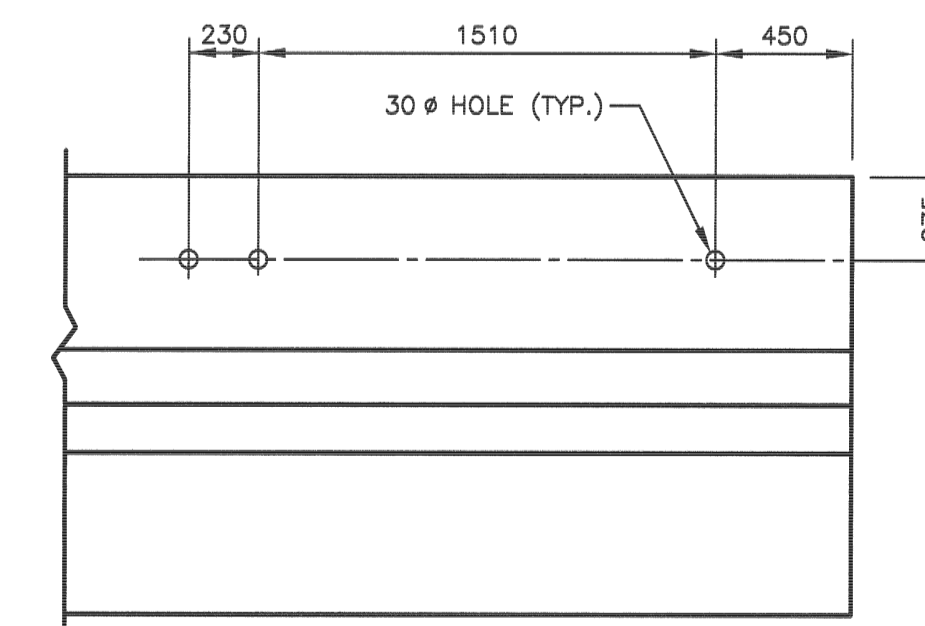


TYPE II  
(TERMINAL SECTION ONE END)

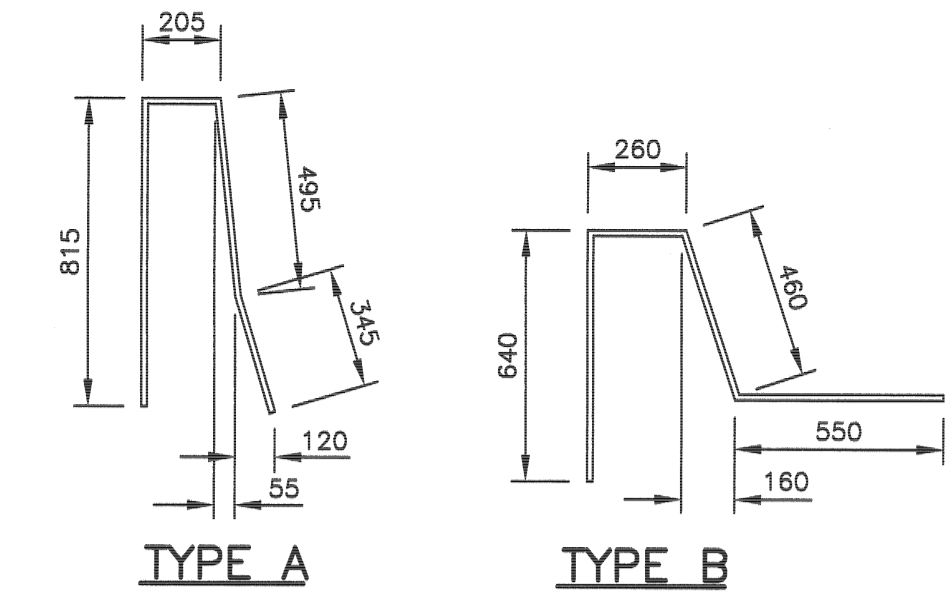
MARK	TYPE	NO.	TYPE	LENGTH	TOTAL LENGTH	GRADE	MASS (kg)
1502	15 M	30	C	1505	45 150	400	71
1503	15 M	30	STR.	1130	33 900	400	53
1504	15 M	8	STR.	5860	46 880	400	74

NOTE: USE FOR SINGLE SPAN BRIDGES ONLY. OF SKEW. SEE NOTE 19.

TYPE III  
(TERMINAL SECTION BOTH ENDS)

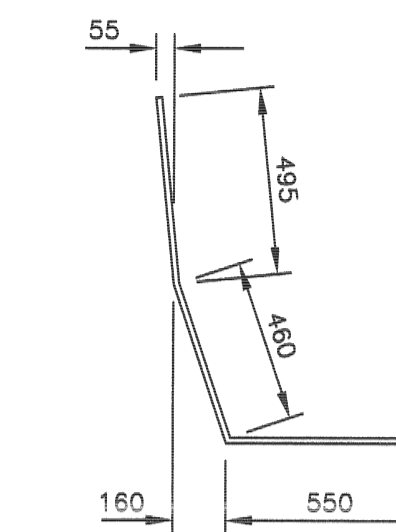


DETAIL C  
SCALE 1:25



TYPE A

TYPE B



TYPE C

**NOTES:**

- Design Specifications - CAN/CSA-S6-06.
- Performance Level PL-2.
- Concrete for barriers shall be standard weight containing Type GU, General Use Portland cement with silica fume and 6% ± 1% entrained air. Maximum aggregate size shall be 20 mm.
- Concrete shall attain a minimum 28 day compressive strength of 35 MPa.
- Reinforcing steel shall be fabricated from deformed bars conforming to the requirements of CAN/CSA-G30.18-M, Grade 400.
- Diameters of hooks and bends, unless otherwise noted, shall conform to the recommended sizes in CAN/CSA-S6-06.
- Girder units shall be exterior units as per Standard Plan BS101 modified to include a traffic barrier as noted on this plan.
- A midspan camber of 5 mm shall be cast into the top of the traffic barrier.
- Barrier reinforcement shall be free of concrete mortar before barrier forms are set in place.
- Prior to casting the barrier, the top surface of the precast unit shall be horizontal in a transverse direction with both ends of the unit at the same elevation. The unit shall be continuously supported throughout its length until the concrete in the barrier has attained a compressive strength of 15 MPa.
- All surfaces of traffic barrier shall be finished to a smooth uniform colour and texture.
- Barrier units shall have provision for only one dowel hole at each end.
- Bridgerail anchor details on Standard Plan BS101 do not apply to barrier units. Bridgerail anchor details shall be as shown on this sheet. Anchor spacing shall be as specified in the order.
- The 1 1/4" φ headed anchor bolts shall conform to the requirements of CAN/CSA-G40.21-M, Grade 300, and shall be galvanized. All galvanizing shall conform to the requirements of CSA Standard G164. Quantities shown are for the traffic barrier. These quantities are additional to those shown on Standard Plan BS101.
- All voids shall be formed with Norlux Fibre-Forms or equivalent. Ends of the voids shall be capped.
- Minimum clear cover for the reinforcing steel in the traffic face and top surface of the barrier shall be 70 mm. Minimum clear cover for the reinforcing steel in the rear face of the barrier shall be 55 mm.
- All exposed corners shall have a 20 mm chamfer.
- For skewed units, Type A, Type B and Type C bars shall be detailed and spaced as required.
- All dimensions are in millimetres unless noted otherwise.

**QUANTITIES**

ITEM	QUANTITY		
	TYPE I	TYPE II	TYPE III
REINFORCING STEEL	252 kg	225 kg	198
CONCRETE	1.7 m <sup>3</sup>	1.6 m <sup>3</sup>	1.4 m <sup>3</sup>
VOIDS	254 #	5700	2850
	203 #	5700	2850
	152 #	--	2450



**BRIDGE STANDARDS**

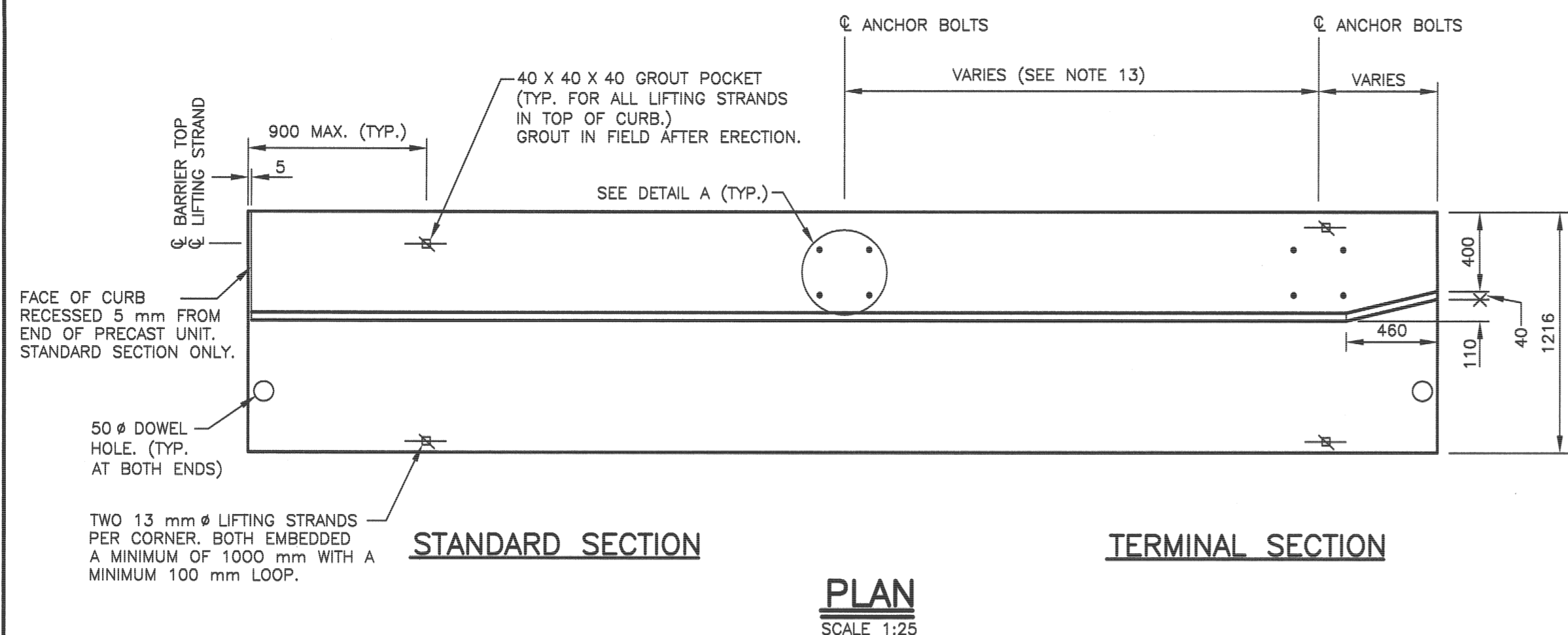
**6 METRE BOX GIRDER  
STANDARD BARRIER UNITS**

RECOMMENDED BY: [Signature] SENIOR BRIDGE DESIGN ENGINEER DATE: 29-May-2013

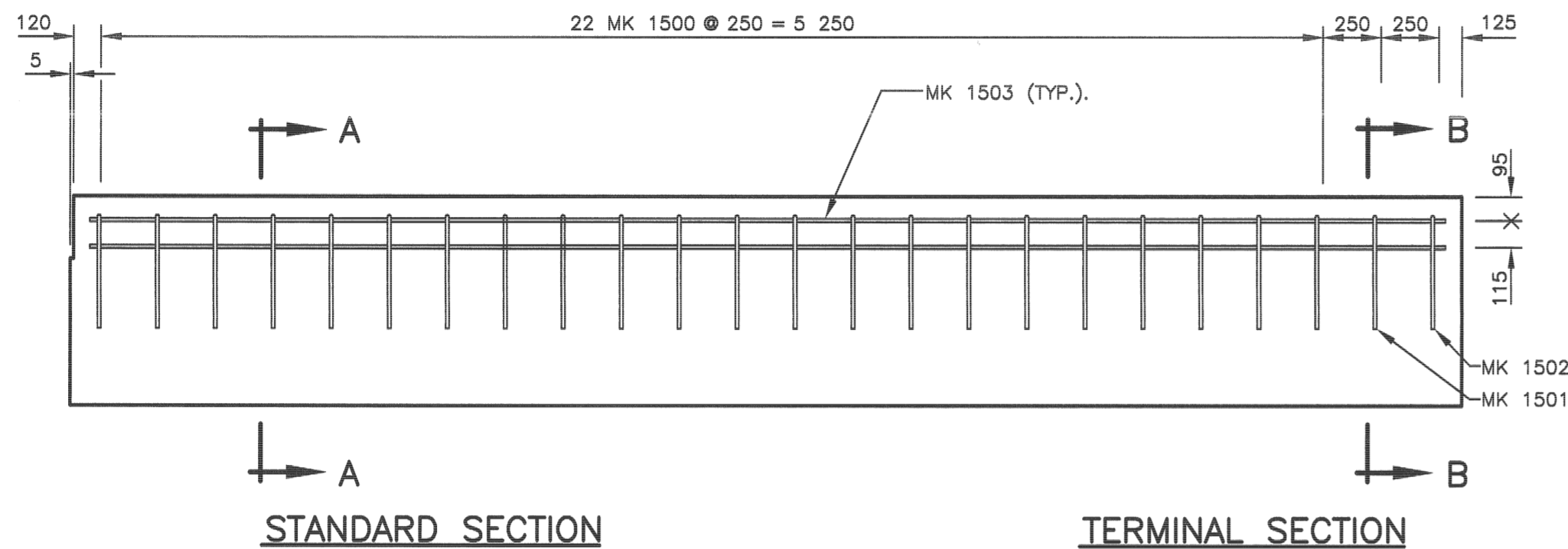
APPROVED BY: [Signature] DIRECTOR, BRIDGE STANDARDS DATE: 29-May-2013

DESIGN	DRAWN	CHECKED	FILE
G.L.	S.A.	A.H.	
DATE	DATE	DATE	PLAN
27-Feb-2013	27-Feb-2013	14-Mar-2013	BS201

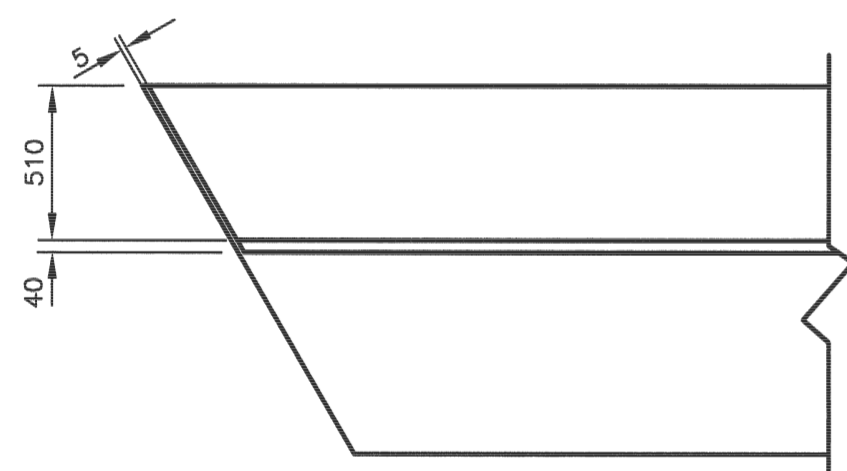
NO.	DATE	DESCRIPTION
REVISIONS		



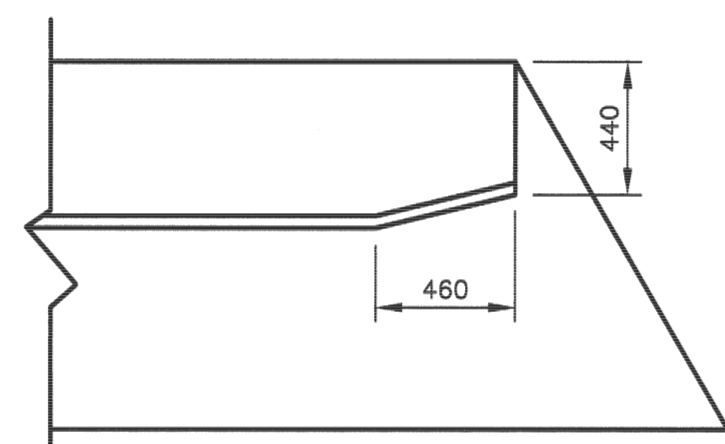
**PLAN**  
SCALE 1:25



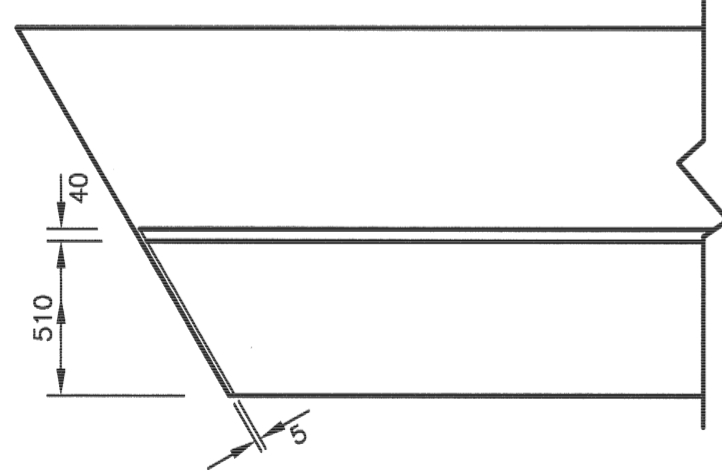
**ELEVATION REINFORCEMENT**  
SCALE 1:25



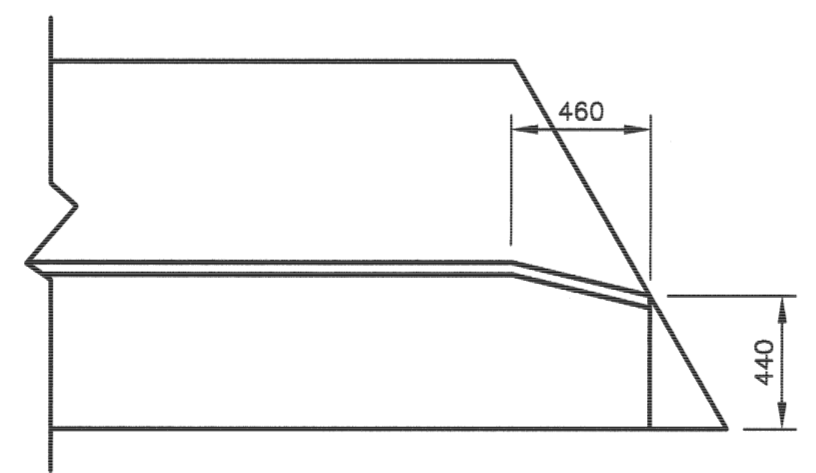
**SKewed END - STANDARD SECTION**



**SKewed END - TERMINAL SECTION**

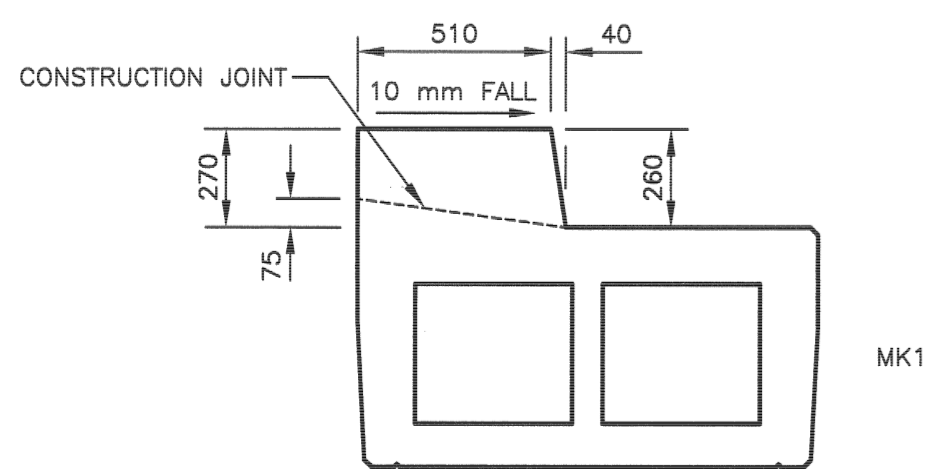


**SKewed END - STANDARD SECTION**

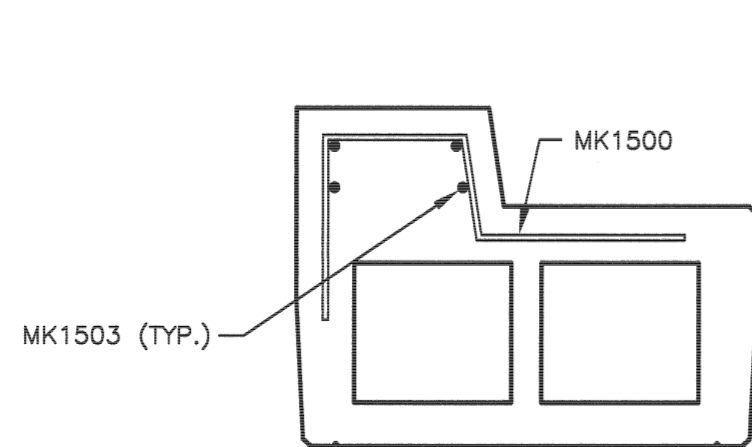


**SKewed END - TERMINAL SECTION**

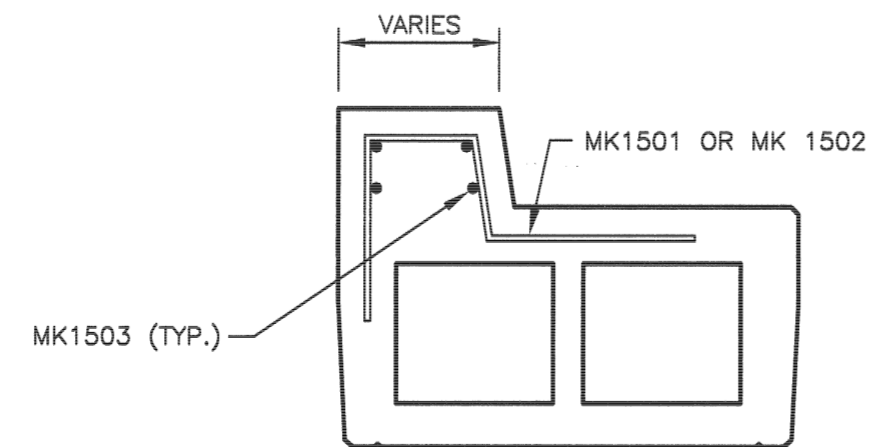
**SKewed END TREATMENT**  
SCALE 1:25



**STANDARD CROSS SECTION**  
SCALE 1:20

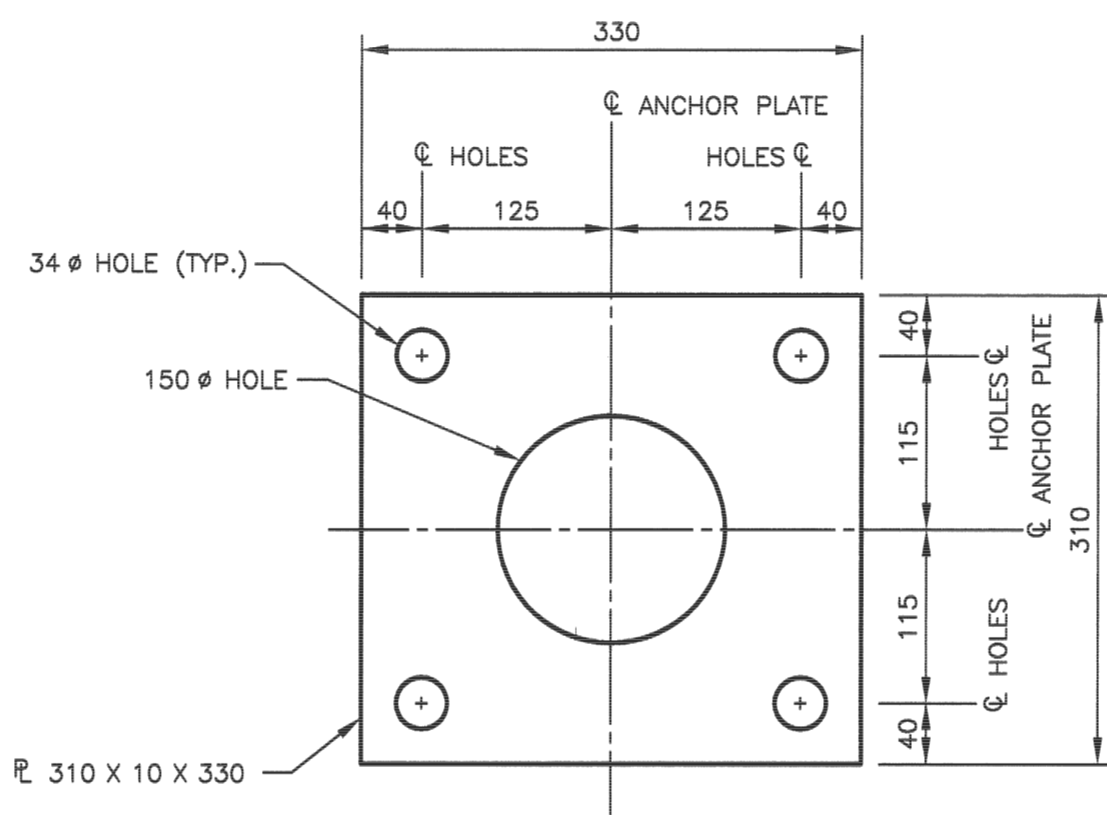


**SECTION A-A**  
SCALE 1:20

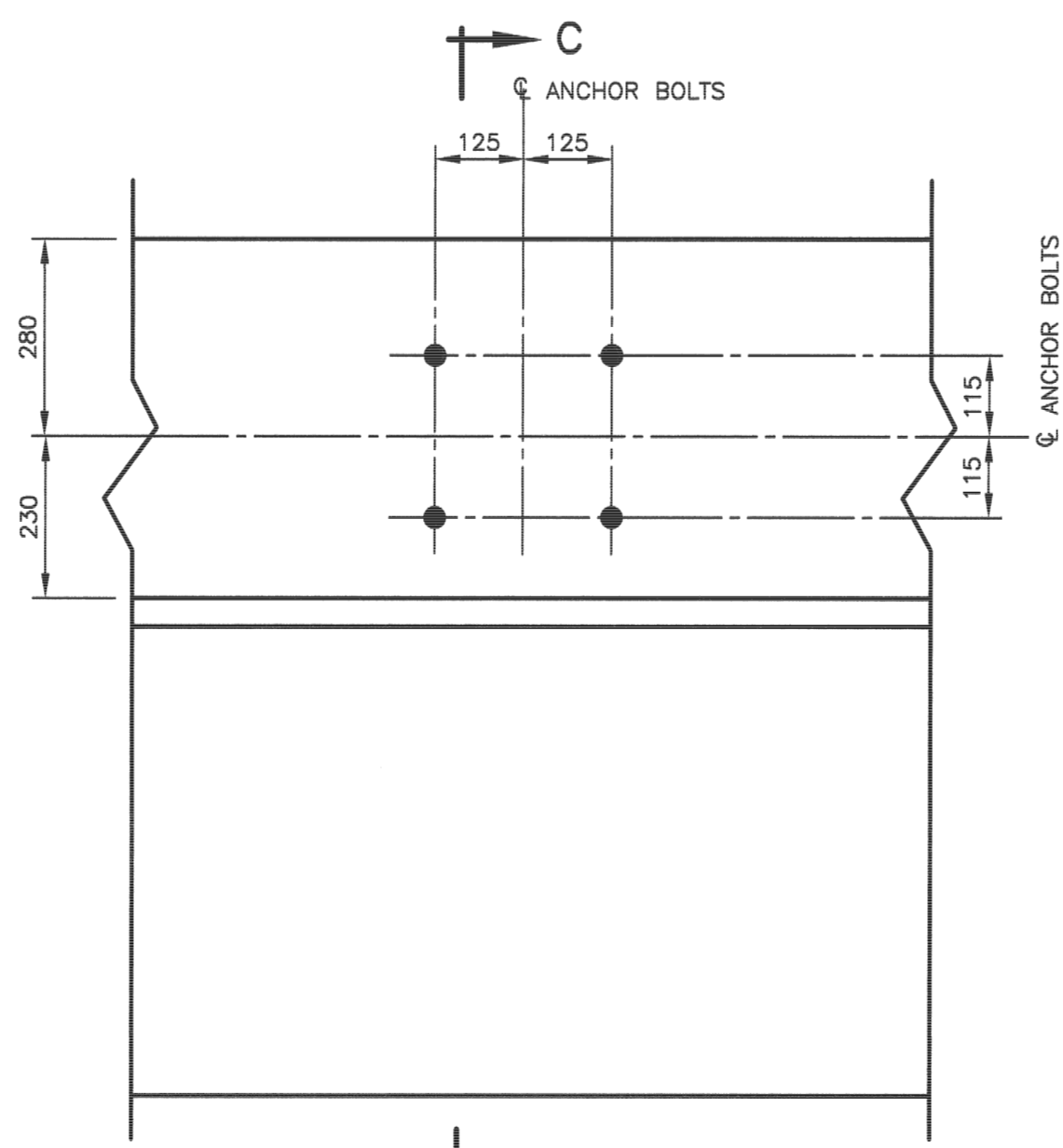


**SECTION B-B**  
SCALE 1:20

NOTE: HORIZONTAL LEG OF MK1500 SHALL BE UNDERNEATH LONGITUDINAL STEEL IN PRECAST UNIT.



**ANCHOR PLATE DETAILS**  
SCALE 1:5

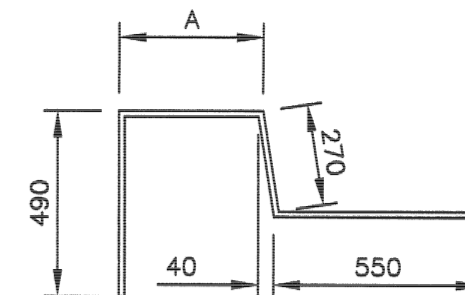
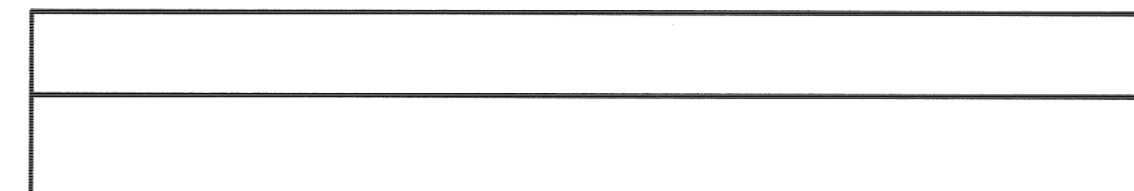


**DETAIL A**  
SCALE 1:10

NOTE: ANCHORS SHALL BE INSTALLED VERTICALLY

**REINFORCING SCHEDULES**

NOTE: ALL DIMENSIONS ARE OUT TO OUT



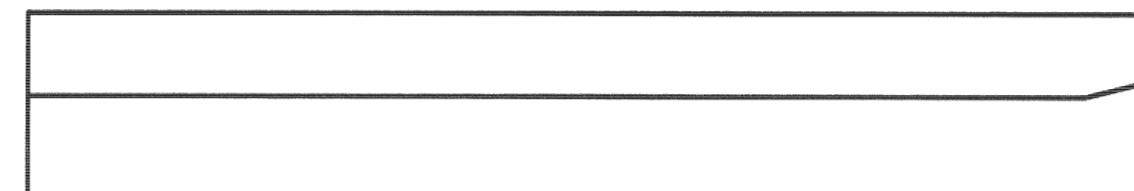
**TYPE A**

MARK	TYPE	NO.	TYPE	A	LENGTH	TOTAL LENGTH	GRADE	MASS (kg)
1500	15 M	24	A	380	1 690	40 560	400	64
1503	15 M	4	STR.	-	5 850	23 400	400	37

NOTE: USE FOR INTERIOR SPANS ONLY. 0° SKEW. SEE NOTE 19.

**TYPE I**

(STANDARD SECTION FULL LENGTH)



MARK	TYPE	NO.	TYPE	A	LENGTH	TOTAL LENGTH	GRADE	MASS (kg)
1500	15 M	22	A	380	1 690	37 180	400	59
1501	15 M	1	A	360	1 670	1 670	400	3
1502	15 M	1	A	295	1 605	1 605	400	3
1503	15 M	4	STR.	-	5 850	23 400	400	37

NOTE: USE FOR END SPANS ONLY. 0° SKEW. SEE NOTE 19.

**TYPE II**

(TERMINAL SECTION ONE END)

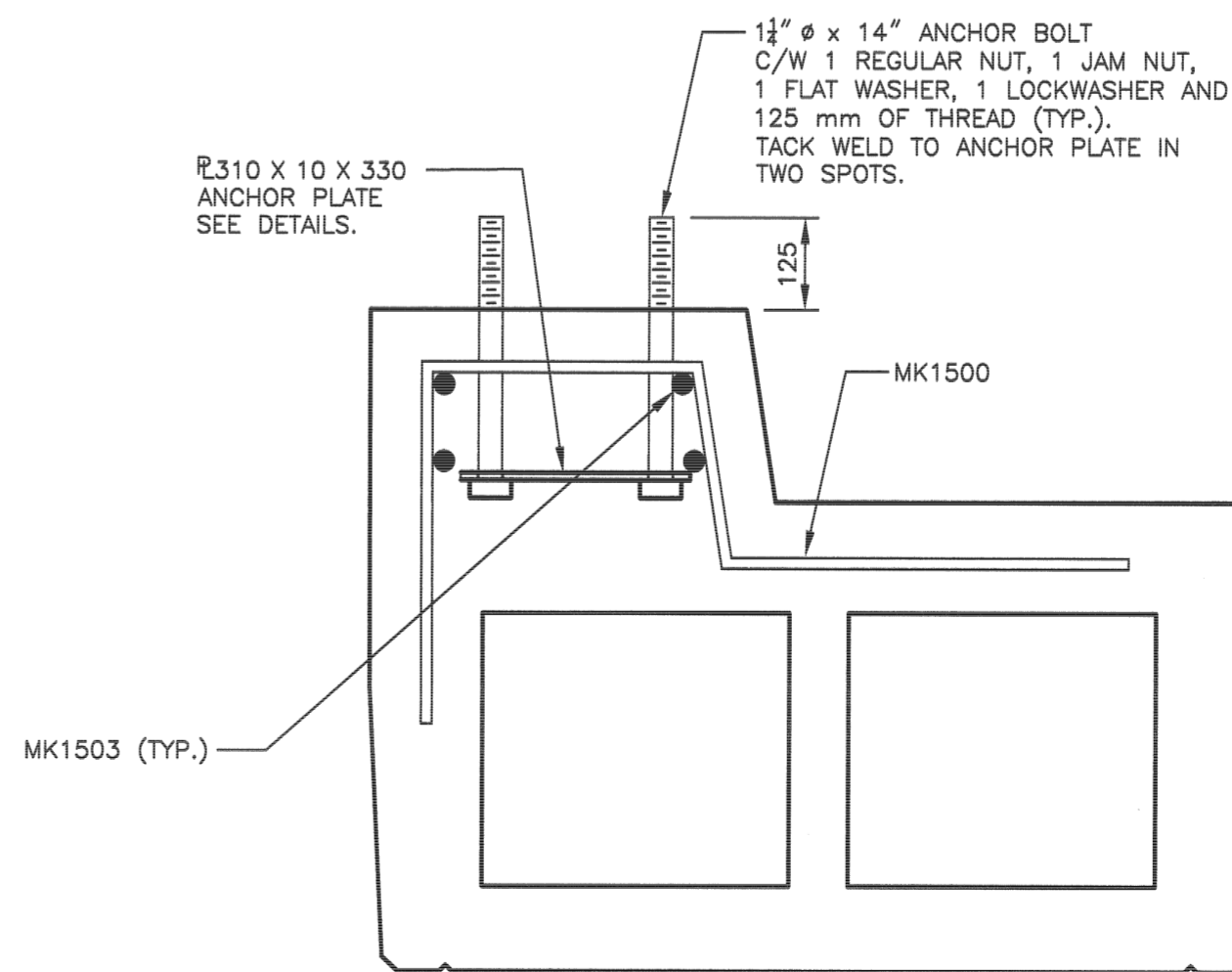


MARK	TYPE	NO.	TYPE	A	LENGTH	TOTAL LENGTH	GRADE	MASS (kg)
1500	15 M	20	A	380	1 690	33 800	400	54
1501	15 M	2	A	360	1 670	3 340	400	5
1502	15 M	2	A	295	1 605	3 210	400	5
1503	15 M	4	STR.	-	5 850	23 400	400	37

NOTE: USE FOR SINGLE SPAN BRIDGES ONLY. 0° SKEW. SEE NOTE 19.

**TYPE III**

(TERMINAL SECTION BOTH ENDS)



**SECTION C-C**

**NOTES:**

1. Design Specifications - CAN/CSA-S6-06.
2. Performance Level PL-2 when used in conjunction with a Standard Type 5 steel bridgerail.
3. Concrete for curbs shall be standard weight containing Type GU, General Use Portland cement with silica fume and 6% ± 1% entrained air. Maximum aggregate size shall be 20 mm.
4. Concrete shall attain a minimum 28 day compressive strength of 35 MPa.
5. Reinforcing steel shall be fabricated from deformed bars conforming to the requirements of CAN/CSA-G30.18-M, Grade 400.
6. Diameters of bends in reinforcing shall conform to the recommended sizes in CAN/CSA-S6-06.
7. Girder units shall be exterior units as per Standard Plan BS101 modified to include a traffic curb as noted on this plan.
8. A midspan camber of 5 mm shall be cast into the top of the traffic curb.
9. Curb reinforcement shall be free of concrete mortar before curb forms are set in place.
10. Prior to casting the curb, the top surface of the precast unit shall be horizontal in the transverse direction with both ends of the unit at the same elevation. The unit shall be continuously supported throughout its length until the concrete in the curb has attained a compressive strength of 15 MPa.
11. All surfaces of the traffic curb shall be finished to a smooth uniform colour and texture.
12. Curb units shall have provision for only one dowel hole at each end.
13. Bridgerail anchor details on Standard Plan BS101 do not apply to curb units. Bridgerail anchor details shall be as shown on this plan. Anchor spacing shall be as specified in the order.
14. The 1 1/4 inch diameter headed anchor bolts shall conform to the requirements of ASTM Specification A307 and shall be galvanized. All galvanizing shall conform to the requirements of CSA Standard G164.
15. Anchor plates shall be fabricated from structural steel conforming to the requirements of CAN/CSA-G40.21, Grade 300W.
16. Quantities shown are for the traffic curb. These quantities are in addition to those shown on Standard Plan BS101.
17. Minimum clear cover for the reinforcing steel in the traffic face, top surface and rear face of the traffic curb shall be 70 mm.
18. All exposed corners shall have a 20 mm chamfer.
19. For skewed units, Type A bars shall be detailed and spaced as required.
20. All dimensions are in millimeter unless noted otherwise.

**QUANTITIES**

ITEM	QUANTITY		
	TYPE I	TYPE II	TYPE III
REINFORCING STEEL	101 kg	102 kg	101 kg
CONCRETE	0.9 m <sup>3</sup>	0.9 m <sup>3</sup>	0.9 m <sup>3</sup>

Government of Saskatchewan  
Ministry of Highways & Infrastructure  
**BRIDGE STANDARDS**

**6 METRE BOX GIRDER  
STANDARD CURB UNITS**

RECOMMENDED BY: [Signature] 29-Mar-2013  
DATE  
APPROVED BY: [Signature] 29-Mar-2013  
DATE

DESIGN	DRAWN	CHECKED	FILE
G.L.	S.A.	A.H.	
DATE	DATE	DATE	PLAN
27-Feb-2013	27-Feb-2013	14-Mar-2013	<b>BS301</b>
NO.	DATE	DESCRIPTION	