(A) GENERAL

1. These notes are applicable for the Standard Drawings for R.C.C. solid slab superstructure with and without footpaths.
2. These drawings are applicable only for right bridges with overall width of 12 m.
3. No raised footpaths shall be provided on the bridges having length less than 30m unless the same are otherwise existing on the approaches.
4. All dimensions are in millimetres unless otherwise mentioned. Only written dimensions are to be followed. No drawing shall be scaled.
5. Design criteria:
   - I. The design is according to the following codes:
     - (a) IRC : 5-1985
     - (b) IRC : 6-1966 (1985 reprint)
     - (c) IRC : 21-1987.
   - II. The following loads have been considered in the design:
     - (a) One lane of IRC class 70R or two lanes of IRC class A on carriage way, whichever governs.
     - (b) Footpath load of 5 kN/sq.m for superstructure having footpaths.
     - (c) Wearing coat load of 2 kN/sq.m.
   - III. The designs are applicable for 'MODERATE' AND 'SEVERE' conditions of exposure.
6. Public utility services (except water supply and sewerage), if required, shall be carried over the bridge through 150mm diameter ducts provided in the footpaths. Total load of such services shall not be more than 1.0 kN per metre on each footpath. Water/sewerage pipeline shall not be carried over any part of the superstructure. Inspection chambers in footpaths may be provided as shown in the drawing. The location and spacing of chambers along the footpath will be decided by the Engineer-in-charge in consultation with the users.
7. Wearing coat shall consist of the following:
   - I.(a) A coat of mastic asphalt 6mm thick with a prime coat over the top of the deck before the wearing coat is laid. The prime coat of mastic asphalt shall be 30% straight run 30/40 penetration grade bitumen and 50% light solvent (Benzol) to be laid over the deck slab. The insulating layer of 6mm thick mastic asphalt with 75% lime stone dust filler and 25% of 30/40 penetration grade bitumen shall be laid at 375°F with broom over prime coat.
   - (b) 50mm thick asphaltic concrete wearing coat in two layers of 25mm each as per Clause 512 of MOST's Specifications for Road and Bridge Works (Second Revision-1988)
   - II. In case of isolated bridge construction or bridges located in remote areas where provision of mastic and asphaltic concrete wearing coat is not practicable, the Engineer-in-charge may permit provision of 75mm thick cement concrete wearing coat in M30 grade concrete with maximum water cement ratio as 0.40. The reinforcement shall consist of 8mm High Yield Strength Deformed bars @ 200mm centres reducing to 100 centres in both the directions over a strip of 300mm near the expansion joint. Reinforcement shall be placed at the centre of the wearing coat. Wearing coat shall be discontinued at expansion joint locations. Joint fillers shall extend upto the top of wearing coat.
8. 20mm expansion joint does not cater for any allowance for possible tilting of abutment.
9. Support for the deck slab shall provide a bearing width of 400mm.
10. In urban areas, chequered tiles may be provided in the footpath portion by suitably adjusting the thickness of the footpath slab.
11. Type/position of return walls, railings, guard posts, ramp etc. in approach portion shall be decided by the Engineer-in-charge.

(B) MATERIALS SPECIFICATIONS

Concrete

1. Concrete shall be of design mix and shall have minimum 28 days characteristic strength on 150mm cubes for all elements of superstructure as indicated below:

Conditions of exposure	Concrete grade	Characteristic Strength
'MODERATE'	M 25	25 MPa (for 3m to 9m span)
'MODERATE'	M 30	30 MPa (for 10m span)
'SEVERE'	M 30	30 MPa (for 3m to 10m span)

2. High strength ordinary portland cement conforming to IS:8112 or ordinary portland cement conforming to IS 269 capable of achieving the required design concrete strength shall only be used.
3. The minimum cement content and maximum water cement ratio in the concrete design mix shall be 310 kg/cu.m and 0.45 respectively for 'MODERATE' conditions of exposure. The minimum cement content and maximum water cement ratio in the concrete design mix shall be 400 kg/cu.m and 0.40 respectively for 'SEVERE' conditions of exposure.

Reinforcement

All reinforcing bars shall be High Yield Strength Deformed bars (Grade designation S 415) conforming to IS 1786.

Water

Water to be used in concreting and curing shall conform to Clause 302.4 of IRC 21-1967.

(C) WORKMANSHIP/DETAILING

1. Minimum clear cover to any reinforcement including stirrups shall be 50mm unless shown otherwise in the drawings.
2. For ensuring proper cover of concrete to reinforcement bars specially made polymer cover blocks shall only be used.
3. **Construction Joints**
   - I. The location and provision of construction joints shall be approved by Engineer-in-charge. The concreting operation shall be carried out continuously upto the construction joint.
   - II. The concrete surface at the joint shall be brushed with a stiff brush after casting while the concrete is still fresh and it has only slightly hardened.
   - III. Before new concrete is poured the surface of old concrete shall be prepared as under:
     - a) For hardened concrete, the surface shall be thoroughly cleaned to remove debris/laitance and made rough so that 1/4 of the size of the aggregate or structurally damaging the concrete.
     - b) For partially hardened concrete, the surface shall be treated by wire brush followed by an air jet.
     - c) The old surface shall be soaked with water without leaving puddles immediately before starting concreting to prevent the absorption of water from new concrete.
   - IV. New concrete shall be thoroughly compacted in the region of the joint.
4. Welding of reinforcement bars shall not be permitted.
5. Laps in reinforcement:
   - I. Minimum lap length of reinforcement shall be kept as 83 d where 'd' is the diameter of bar.
   - II. Not more than 50% of reinforcement shall be lapped at any one location.
6. Bending of reinforcement bars shall be as per IS : 2502.
7. Supporting chairs of 12mm diameter shall be provided at suitable intervals as per IS : 2502.
8. Concrete shall be produced in a mechanical mixer of capacity not less than 200 litres having integral weigh-batching facility and automatic water measuring and dispensing device.
9. Proper compaction of concrete shall be ensured by use of full width screed vibrators for concrete in deck slab.
10. Properly braced steel plates shall be used as shuttering.
11. Sharp edges of concrete shall be chamfered.

(D) GENERAL SPECIFICATIONS

The work shall be executed in accordance with MOST's Specification for Road and Bridge Works (Second Revision, 1988) except wherever otherwise mentioned.

(E) REFERENCE TO DRAWINGS

Drawing No.	Title.
SD/101	GENERAL NOTES
SD/102	GENERAL ARRANGEMENT
SD/103 & SD/104	MISCELLANEOUS DETAILS
SD//105	DETAILS OF R.C.C. RAILINGS (WITHOUT FOOTPATHS)
SD/106	DETAILS OF R.C.C. RAILINGS (WITH FOOTPATHS)
SD/107 THROUGH SD/114	R.C.C. SOLID SLAB SUPERSTRUCTURE (RIGHT) SPANS 3m To 10m (WITHOUT FOOTPATHS)
SD/115 THROUGH SD/122	R.C.C. SOLID SLAB SUPERSTRUCTURE (RIGHT) SPANS 3m To 10m (WITH FOOTPATHS)

MKD	DATE	DESCRIPTION	BY

REVISION

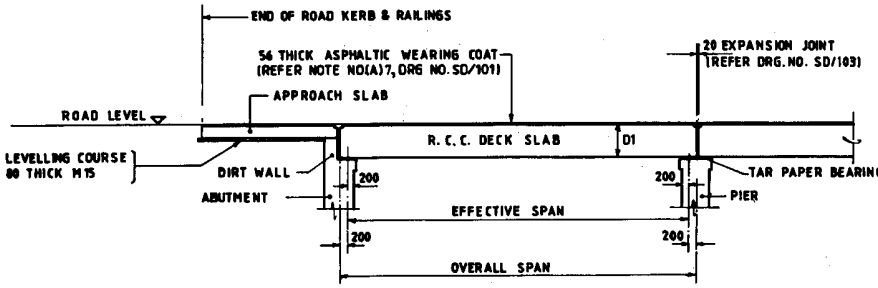
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

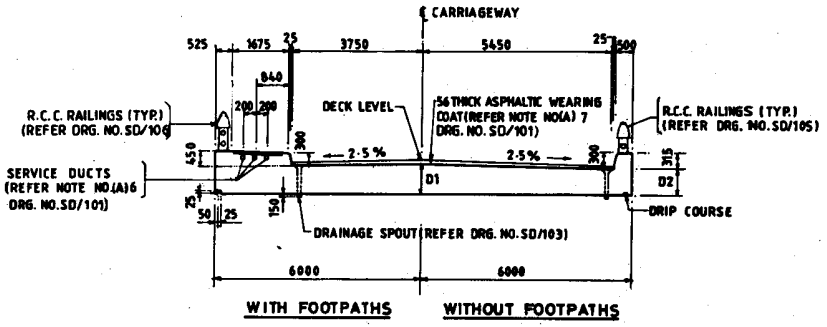
R.C.C. SOLID SLAB
SUPERSTUCTURE (RIGHT) SPAN 3.0m To 10.0 m
(WITH AND WITHOUT FOOTPATHS)
GENERAL NOTES

RECOMMENDED BY		APPROVED BY	1990
(U. JAYAKODI) E.E.	(S.K. KAISTHA) S.E.	(M.K MUKHERJEE) C.E.	DRG. NO. SD/101

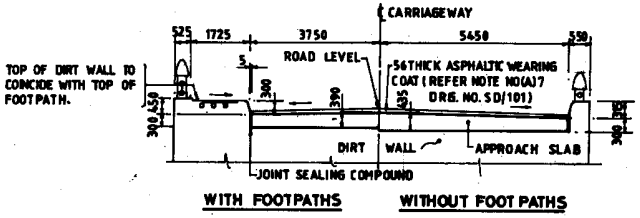
DRG. NO. SD/102



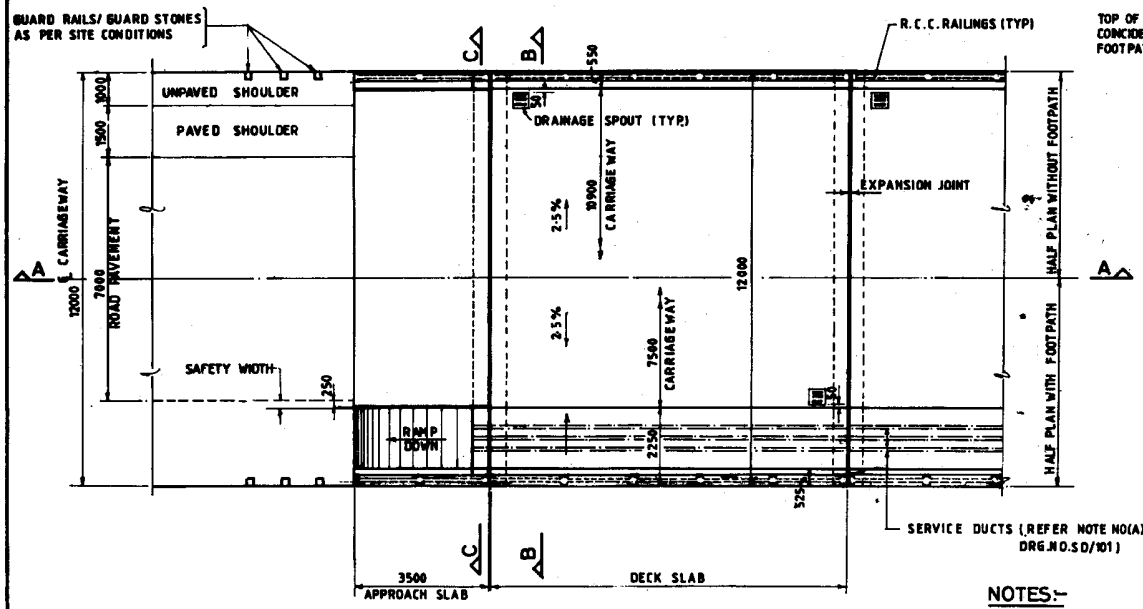
SECTION. A-A
(ROAD KERB & RAILINGS NOT SHOWN.)



SECTION B-B
FOR VALUES OF D1 & D2 REFER RELEVANT DRAWINGS (DRG. NO. SD/107 THROUGH SD/122.)



SECTION.C-C



PLAN.

REFERENCE DRAWINGS

DRAWING NO.	TITLE
SD/101	GENERAL NOTES
SD/103 & SD/104	MISCELLANEOUS DETAILS
SD/105	DETAILS OF R.C.C. RAILINGS (WITHOUT FOOTPATHS)
SD/106	DETAILS OF R.C.C. RAILINGS (WITH FOOTPATHS)
SD/107 THROUGH SD/114	R.C.C. SOLID SLAB SUPERSTRUCTURE (RIGHT) SPANS 3·0 m TO 10·0 m (WITHOUT FOOTPATHS)
SD/115 THROUGH SD/122	R.C.C. SOLID SLAB SUPERSTRUCTURE (RIGHT) SPANS 3·0 m TO 10·0 m (WITH FOOTPATHS)

NOTES:-

1. All dimensions are in millimetres unless otherwise mentioned. Only written dimensions are to be followed.
2. Typical arrangement of drainage spouts has been shown in plan. Suitable modifications may be made by the Engineer-in-charge as per site conditions and intensity of rainfall.

MKD	DATE	DESCRIPTION	BY

REVISION

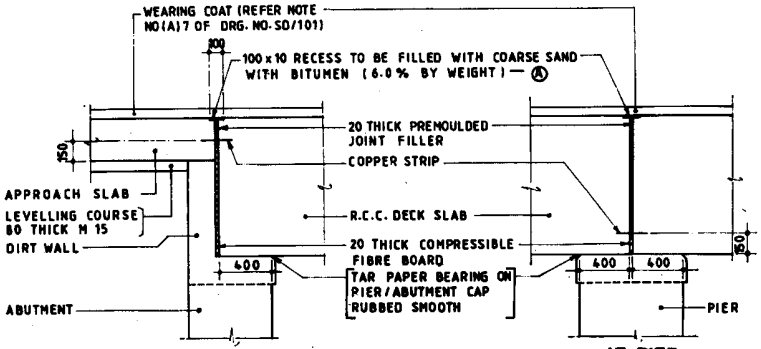
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

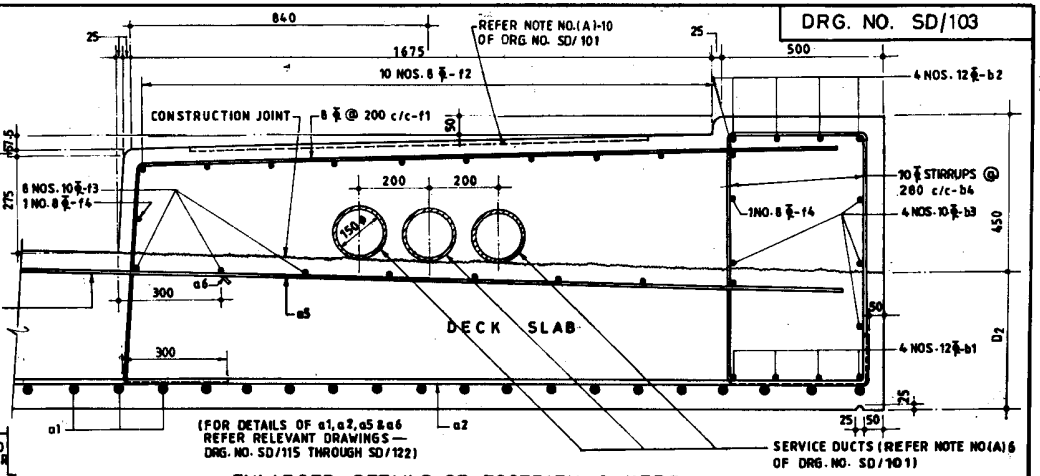
R.C.C. SOLID SLAB SUPERSTRUCTURE (RIGHT) SPAN 3·0m TO 10·0m
(WITH AND WITHOUT FOOTPATHS)
GENERAL ARRANGEMENT

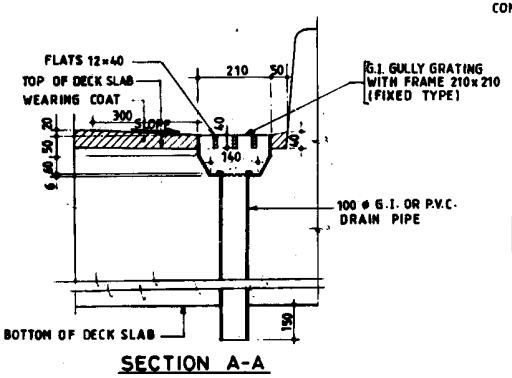
RECOMMENDED BY		APPROVED BY	1990
(U. JAYAKODI) E.E.	(S.K. KAISTHA) S.E.	(M.K. MUKHERJEE) C.E.	DRG. NO. SD/102

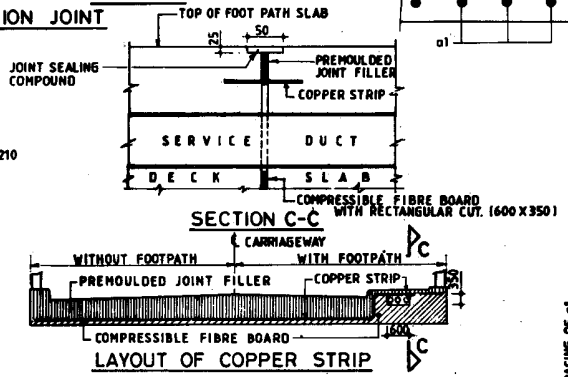
DRG. NO. SD/103



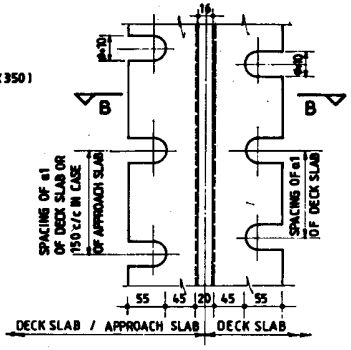
DETAILS OF EXPANSION JOINT

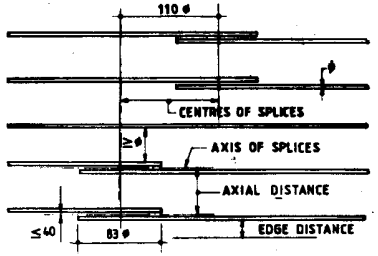


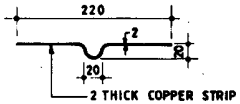


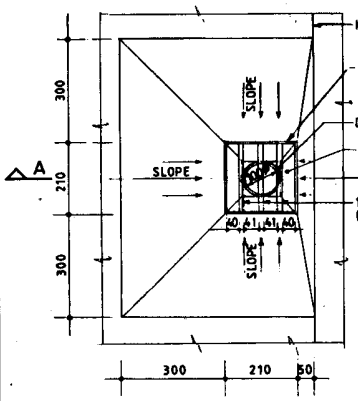


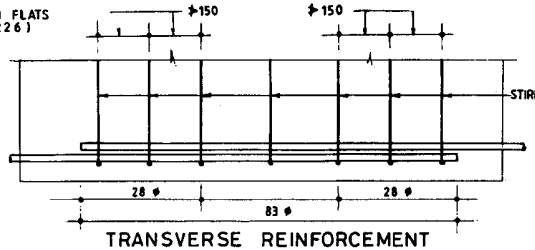
ENLARGED DETAILS OF FOOTPATH & KERB
(REINFORCEMENT OF RAILING POST NOT SHOWN)











REFERENCE DRAWINGS

DRAWING NO.	TITLE
SD/101	GENERAL NOTES
SD/102	GENERAL ARRANGEMENT
SD/104	MISCELLANEOUS DETAILS
SD/105	DETAILS OF R.C.C. RAILINGS (WITHOUT FOOTPATHS)
SD/106	DETAILS OF R.C.C. RAILINGS (WITH FOOTPATHS)
SD/107 THROUGH SD/114	R.C.C SOLID SLAB SUPERSTRUCTURE (RIGHT) SPANS 3.0m TO 10.0m (WITHOUT FOOTPATHS)
SD/115 THROUGH SD/122	R.C.C. SOLID SLAB SUPERSTRUCTURE (RIGHT) SPANS 3.0m TO 10.0m (WITH FOOTPATHS)

NOTES:-

1. All dimensions are in millimetres unless otherwise mentioned. Only written dimensions are to be followed.
2. Splicing of main longitudinal bars in deck slab shall be avoided as far as practicable. In case the splicing of bars becomes unavoidable, the arrangement shall be as shown in the drawing.
3. Area of bars spliced at any section shall not exceed 50% of the total area of the bars provided at the section.
4. Joint filler shall conform to IS 1838. Products with I.S.I certification mark shall only be used.
5. The reinforcement of deck slab shall be suitably modified to accommodate the drainage spout. Also refer note no. 2 of drawing no. SD/102. The reinforements marked f1 and f2 shall be modified in the region of inspection chamber.
6. The drainage spout shall be galvanised after welding the plates/flats.

MKD	DATE	DESCRIPTION	BY

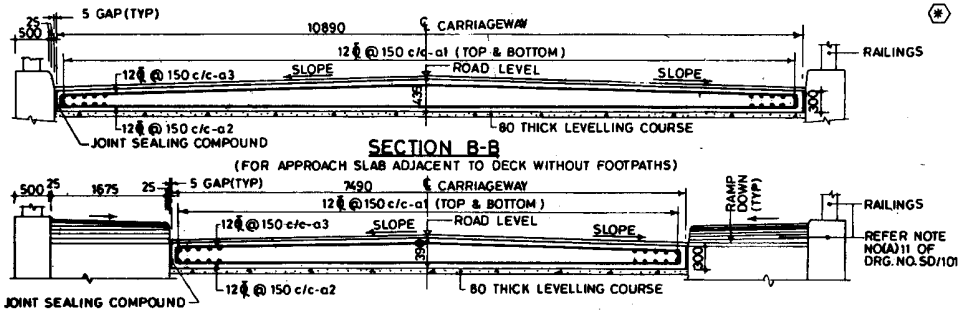
REVISION

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

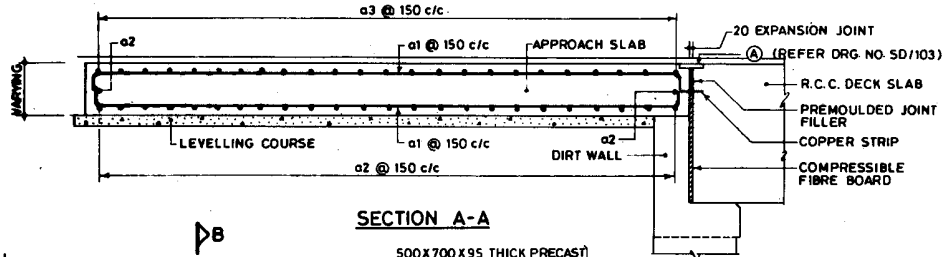
R.C.C. SOLID SLAB SUPERSTRUCTURE (RIGHT) SPAN 3.0m TO 10.0m
(WITH AND WITHOUT FOOT PATHS)
MISCELLANEOUS DETAILS

RECOMMENDED BY		APPROVED BY	1990
(S.S. REDDY) E.E.	(S.K. KAISTHA) S.E.	(P.N. SHIVAPRASAD) C.E.	DRG. NO. SD/103

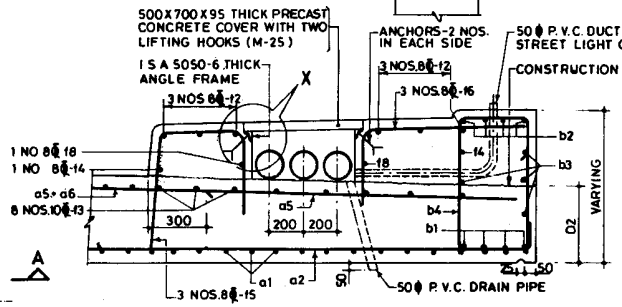


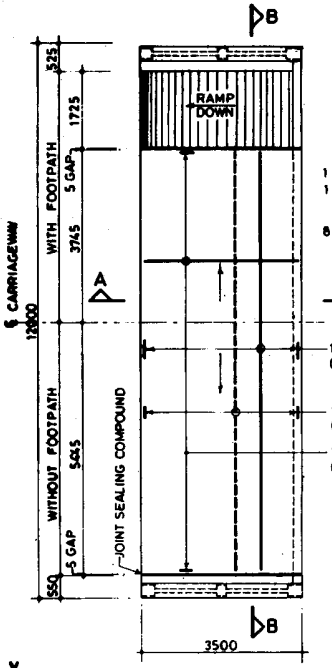
SECTION B-B
(FOR APPROACH SLAB ADJACENT TO DECK WITHOUT FOOTPATHS)

SECTION B-B
(FOR APPROACH SLAB ADJACENT TO DECK WITH FOOTPATHS)



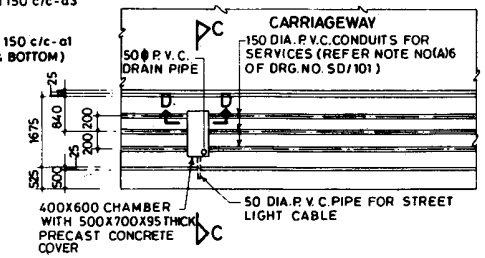
SECTION A-A



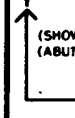


PLAN
(SHOWING REINFORCEMENT DETAILS OF APPROACH SLAB)
(ABUTMENT, DIRTWALL & LEVELLING COURSE NOT SHOWN)

SECTION C-C
(REINFORCEMENT OF RAILING POST NOT SHOWN FOR VALUES OF D2 & DETAILS OF a1, a2, a5, a6, b1, b2, b3 & b4 REFER RELEVANT DRAWINGS :
– DRG. NOS. SD/115 THROUGH SD/122)



PART PLAN OF BRIDGE DECK
(SHOWING DETAILS OF INSPECTION CHAMBER IN FOOTPATH THE LOCATION AND SPACINGS ALONG THE FOOTPATHS TO BE DECIDED BY ENGINEER-IN-CHARGE AS PER SITE CONDITIONS AND IN CONSULTATION WITH THE CONCERNED AUTHORITIES)



⊛ SCHEDULE OF REINFORCEMENT (PER APPROACH SLAB)

DRG. NO. SD/104

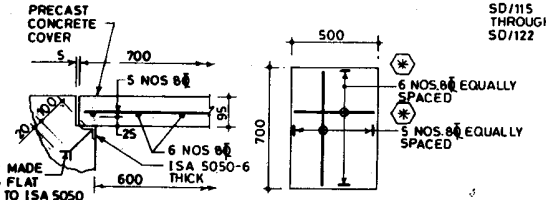
SL.NO.	LOCATION	BAR MKD.	SHAPE	DIA. (m.m.)	SPACING (m.m.)	LENGTH (m.m.)	NOS.	TOTAL LENGTH (m)	WEIGHT (kg)
APPROACH SLAB ADJACENT TO DECK WITHOUT FOOTPATHS									
1	SLAB TOP & BOTTOM ALONG-X	a1	3400, 200, R=50, 200	12	150	3730	146	544·58	484
2	SLAB BOTTOM ALONG-Y	a2	150, R=50, 150, 10790	12	150	11020	26	286·52	254
3	SLAB TOP ALONG-Y	a3	5395, 5395, 150, R=50, 150, 135	12	150	11020	24	264·48	235
APPROACH SLAB ADJACENT TO DECK WITH FOOTPATHS									
4	SLAB TOP & BOTTOM ALONG-X	a1	3400, 200, R=50, 200	12	150	3730	100	373·00	331
5	SLAB BOTTOM ALONG-Y	a2	150, R=50, 150, 7390	12	150	7620	26	198·12	176
6	SLAB TOP ALONG-Y	a3	3695, 3695, 150, R=50, 90, 150	12	150	7620	24	182·88	162

QUANTITIES

CONCRETE IN APPROACH SLAB (cu.m.)	WITH FOOTPATHS	9·04
	WITHOUT FOOTPATHS	14·01
STEEL INCLUDING 5% EXTRA FOR LAPS AND WASTAGE (kg)	WITH FOOTPATHS	702
	WITHOUT FOOTPATHS	1022
ASPHALTIC WEARING COAT (sq.m.)	WITH FOOTPATHS	26·22
	WITHOUT FOOTPATHS	38·12

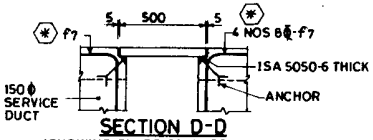
REFERENCE DRAWINGS

DRAWING NO.	TITLE
SD/101	GENERAL NOTES
SD/102	GENERAL ARRANGEMENT
SD/103	MISCELLANEOUS DETAILS
SD/105	DETAILS OF R.C.C. RAILINGS (WITHOUT FOOTPATHS)
SD/106	DETAILS OF R.C.C. RAILINGS (WITH FOOTPATHS)
SD/107 THROUGH SD/114	R.C.C. SOLID SLAB SUPERSTRUCTURE (RIGHT) SPANS 3·0m TO 10·0 m (WITHOUT FOOTPATHS)
SD/115 THROUGH SD/122	R.C.C. SOLID SLAB SUPERSTRUCTURE (RIGHT) SPANS 3·0m TO 10·0 m (WITH FOOTPATHS)



DETAIL-X

DETAILS OF PRECAST CONCRETE COVER FOR INSPECTION CHAMBER



SECTION D-D
(SHOWING SHAPE OF BARS IN THE REGION OF INSPECTION CHAMBER OTHER REINFORCEMENTS ARE NOT SHOWN)

NOTES:-
1. All dimensions are in millimetres unless otherwise mentioned. Only written dimensions are to be followed.
2. The reinforcement of railing posts shall be incorporated before casting of deck slab. The railings shall conform to drawing no. SD/105 or SD/106 or any other approved type.
3. Dimensions in schedule of reinforcement are given as per I.S. 2502
4. ⊛ Schedule of reinforcement does not include change in reinforcement around inspection chamber, precast cover to chamber and railings.

MKD	DATE	DESCRIPTION	BY

REVISION

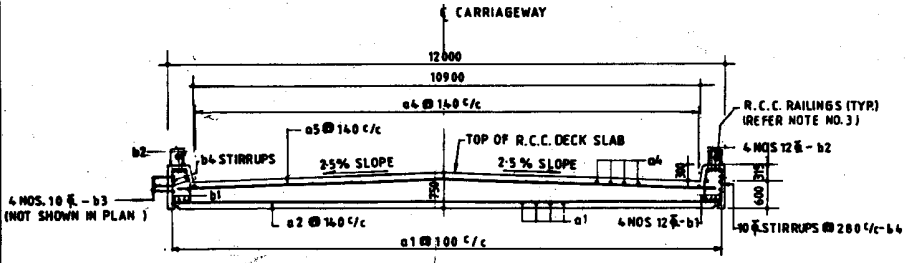
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

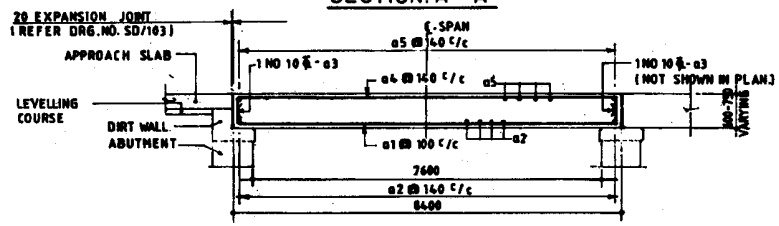
R.C.C. SOLID SLAB
SUPERSTRUCTURE (RIGHT) SPAN 3·0m TO 10·0m
(WITH AND WITHOUT FOOTPATHS)
MISCELLANEOUS DETAILS

RECOMMENDED BY		APPROVED BY	1990
(U. JAYAKODI) E.E.	(S. K. KAISTHA) S.E.	(P. N. SHIVAPRASAD) C.E.	DRG. NO. SD/104

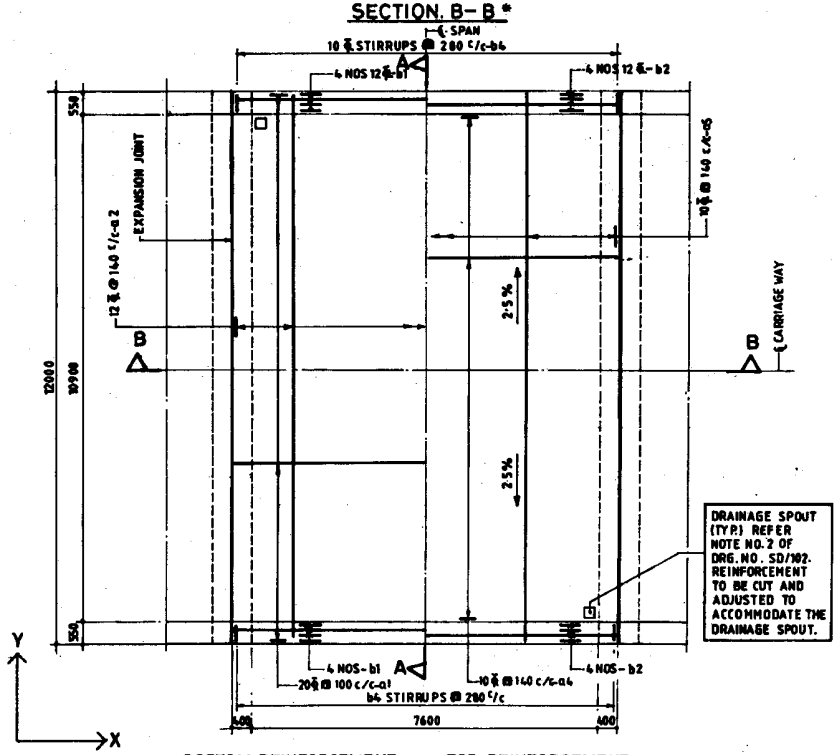
DRG. NO. SD/112



SECTION. A—A



SECTION. B—B *



BOTTOM REINFORCEMENT TOP REINFORCEMENT

PLAN SHOWING REINFORCEMENT DETAILS OF DECK SLAB *

SCHEDULE OF REINFORCEMENT (PER SPAN)

SL NO	LOCATION	BAR MKD	SHAPE	DIA (mm)	SPACING (mm)	LENGTH (mm)	NOS	TOTAL LENGTH (m)	WEIGHT (kg)
1	SLAB-BOTTOM ALONG-X	a1	500, R-80, 500, 8300	20	100	8980	120	1077.60	2662
2	SLAB-BOTTOM ALONG-Y	a2	300, R-50, 300, 11900	12	140	12430	61	758.23	673
3	SLAB-SIDE ALONG-Y	a3	11900	10	—	11900	2	23·80	15
4	SLAB-TOP ALONG-X	a4	9300, 400, R-40, 350	10	140	9040	79	714.16	441
5	SLAB-TOP ALONG-Y	a5	5800, 5800, 345	10	140	11600	61	707.60	437
6	KERB-BOTTOM	b1	500, R-50, 500, 8284	12	—	9210	8	73·68	65
7	KERB-TOP	b2	8300, 500, R-50, 500	12	—	9230	8	73·84	66
8	KERB-SIDE	b3	275, R-40, 275, 8260	10	—	8850	8	70·80	44
9	KERB-STIRRUPS	b4	400, 773, 400, 1600	10	280●	2580	62●	159·96	99

● DOES NOT INCLUDE THE ADDITIONAL STIRRUPS AT LAPS OF LONGITUDINAL BARS — REFER DRG. NO. SD/103

Dead load of the superstructure per span including R.C.C. railings @ 3KN/m and wearing coat @ 2kN/sq.m = 1933 kN

QUANTITIES (PER SPAN)

EFFECTIVE SPAN (m)	8·0
CONCRETE (cu.m.)	70·81
STEEL INCLUDING 5% EXTRA FOR LAPS AND WASTAGE (kg)	4727
ASPHALTIC WEARING COAT (sq.m)	91·56

NOTES:-

1. All dimensions are in millimetres unless otherwise mentioned. Only written dimensions are to be followed.
2. Special attention is invited to note no. (8)H of drawing no SD/101 regarding the design mix to be adopted.
3. The reinforcements of railing posts shall be incorporated before casting of the deck slab. The railings shall conform to drawing no SD/105 or any other approved type.
4. Dimensions in schedule of reinforcement are given as per IS.2502.
* 5. Reinforcement of adjacent span superstructure, approach slab not shown.

REFERENCE DRAWINGS

DRAWING NO.	TITLE
SD/101	GENERAL NOTES
SD/102	GENERAL ARRANGEMENT
SD/103 & SD/104	MISCELLANEOUS DETAILS
SD/105	DETAILS OF R.C.C. RAILINGS (WITHOUT FOOTPATHS)

MKD	DATE	DESCRIPTION	BY

REVISION

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. SOLID SLAB SUPERSTRUCTURE (RIGHT) SPAN 8·0m
(WITHOUT FOOTPATHS)

RECOMMENDED BY		APPROVED BY	1990
(U. JAYAKODI) E.E.	(S.K. KAISTHA) S.E.	(M.K. MUKHERJEE) C.E.	DRG NO. SD/112