



Ministry of Surface Transport
(Roads Wing)

STANDARD PLANS FOR HIGHWAY BRIDGES R.C.C. SLAB SUPERSTRUCTURE

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The Indian Roads Congress
on behalf of the Govt. of India,
Ministry of Surface Transport (Roads Wing)

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New Delhi- 110011

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FOREWORD

I have great pleasure in placing before the community of Bridge Engineers, this Volume of Standard Plans for Highway Bridges covering RCC right slab type superstructure. This publication is the first in the series of new Standard Plans for Highway Bridge Superstructure being brought out keeping in view the recent changes in specifications and provisions in the Bridge Codes. I am sure this publication will prove extremely useful in proper planning, estimation and execution of highway bridges in the country.

The publication has been made possible by the sustained efforts of the personnel of the Bridges Standards and Research zone of the Bridges Directorate of this Ministry and the Consultant associated with the work, who deserve commendation for the work done by them. The keen interest of the Addl. Director General (Bridges), in taking up this work and bringing out this publication in a short time is worthy of special mention.



(K.K. SARIN)
Director General (Road Development) &
Addl. Secretary to the Govt. of India

New Delhi, June 1, 1991

PREFACE

The Standard Plans for Highway Bridges with RCC Slab Type Superstructure (Volume II) were first issued by the Ministry of Surface Transport (Roads Wing) in the year 1977. Since then there have been several revisions in the specifications and provisions of the Bridge Codes. The preparation of revised Standard Drawings was, therefore, taken up towards the end of 1989 and completed on top priority.

This Volume, the first in the series of new Standard Drawings for Superstructure, contains Standard Plans for RCC Slab type highway bridge superstructure for 3.0 to 10.0 metre effective spans. It also contains drawings for wearing coat, railings and miscellaneous items. A separate volume containing bill of quantities for various items of superstructures will also be issued shortly.

The design caters for one lane of IRC Class 70-R wheeled/tracked loading or 2-lanes of IRC Class A loading whichever produces more severe effect. Footpaths have been designed for a crowd load of 5 kN/m². Keeping in view the current practice of providing a deck of the same width as the adjoining road for NH bridges having total length less than 30 m, the overall width between the outer faces of the railing kerb has been kept as 12 m. The wearing coat will be of mastic and asphaltic concrete type, except in remote areas where average 75 mm thick cement concrete wearing coat may also be adopted. The designs are based on Standard Specifications and Codes of Practice for Highway Bridges issued by the Indian Roads Congress. For construction purposes, Specifications for Road and Bridge works issued by the Govt. of India, Ministry of Surface Transport (Roads Wing), as amended from time to time, will apply.

The plans have been made complete in all respects so that they could be readily adopted for preparation of estimates and also serve as construction drawings in the field. The entire design philosophy adopted lays great emphasis on constructability i.e. convenient and full translation of the design on to the ground. A great deal of attention has, therefore, been paid to dimensioning and detailing. I have no doubt that the wide spread adoption of these Standard Plans will lead to reduction in time of construction and enhancement of the quality and durability of our road bridges.

Every possible care has been taken to eliminate errors in the Drawings but users are requested to bring to our notice errors or omissions, if any, which may come to light while using these Drawings in their bridge works.

The work of preparing the Designs and Drawings was carried out by the Consultant, M/s. Consulting Engineering Services (India) Pvt. Ltd., New Delhi. Equally important contributions in the finalisation of the designs and details were made by officers of the Ministry whose names appear in the title blocks of various drawings. The enthusiasm and dedication which they brought to bear on the task are to be highly appreciated.



(NINAN KOSHI)
Addl. Director General (Bridges),
Ministry of Surface Transport (Roads Wing)

New Delhi, June 1, 1991

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(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 : 6-1986 (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) Weaving 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 any 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:

- (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°C 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).

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- In case of isolated bridge construction or bridges located in remote areas where provision of mastic and asphalt 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 di-

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/portion 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 8m 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 IS8112 or ordinary portland cement conforming to IS 285 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 21-1987.

(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/fallouts 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 chains 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 screw vibrators for concrete in deck slab.
10. Properly braced steel plates shall be used as shuttering. Sharp edges of concrete shall be chamfered.

(D) GENERAL SPECIFICATIONS

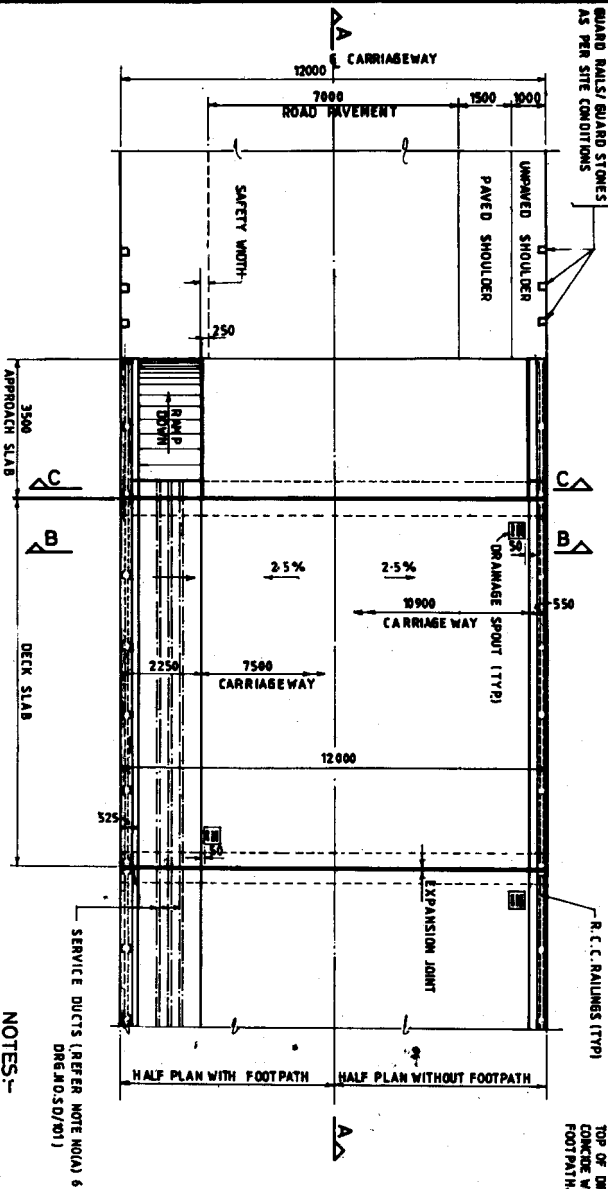
The work shall be executed in accordance with MOST's Specification for Road and Bridge Works (Second Revision, 1988) except wherever otherwise mentioned.

(E) REFERENCE TO DRAWINGS

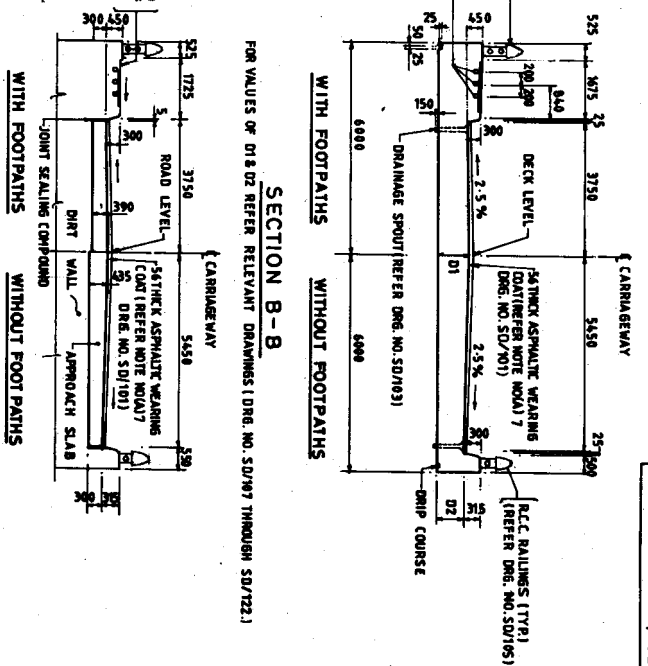
| Drawing No. | Title. |
|--------------------------|--|
| SD/101 | GENERAL NOTES |
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[illegible]

Figure 1 is a schematic diagram of a guard rail system. It shows a cross-section of a road with a guard rail. The rail is labeled "R. C. C. RAILINGS (TTP)" and is supported by "GUARD RAILS/GUARD STONES AS PER SITE CONDITIONS". The diagram also shows a "C" and "B" section line, and a "50" dimension.



TOP OF DIRT WALL TO
COINCIDE WITH TOP OF
FOOTPATH.



| | <u>WITH FOOTPATHS</u> | <u>WITHOUT FOOTPATHS</u> |
|--|-----------------------|--------------------------|
| 1. <u>Distance</u> | 1.00 | 1.00 |
| 2. <u>Time</u> | 1.00 | 1.00 |
| 3. <u>Cost</u> | 1.00 | 1.00 |
| 4. <u>Convenience</u> | 1.00 | 1.00 |
| 5. <u>Reliability</u> | 1.00 | 1.00 |
| 6. <u>Flexibility</u> | 1.00 | 1.00 |
| 7. <u>Accessibility</u> | 1.00 | 1.00 |
| 8. <u>Comfort</u> | 1.00 | 1.00 |
| 9. <u>Security</u> | 1.00 | 1.00 |
| 10. <u>Environmental Impact</u> | 1.00 | 1.00 |
| 11. <u>Maintenance</u> | 1.00 | 1.00 |
| 12. <u>Integration with Public Transport</u> | 1.00 | 1.00 |
| 13. <u>Emergency Services Access</u> | 1.00 | 1.00 |
| 14. <u>Future Expansion Potential</u> | 1.00 | 1.00 |
| 15. <u>Community Engagement</u> | 1.00 | 1.00 |
| 16. <u>Health and Safety</u> | 1.00 | 1.00 |
| 17. <u>Local Business Impact</u> | 1.00 | 1.00 |
| 18. <u>Historical and Cultural Value</u> | 1.00 | 1.00 |
| 19. <u>Visual Aesthetics</u> | 1.00 | 1.00 |
| 20. <u>Overall Satisfaction</u> | 1.00 | 1.00 |

| UNCLASSIFIED NO. | TITLE |
|------------------|---|
| SD/001 | GENERAL NOTES |
| SD/003 & SD/004 | MISCELLANEOUS DETAILS |
| SD/005 | DETAILS OF R.C. BALUNES (WITHOUT FOOTPRINTS) |
| SD/006 | DETAILS OF R.C. BALUNES (WITH FOOTPRINTS) |
| SD/007 | DETAILS OF R.C. BALUNES (WITHOUT FOOTPRINTS) |
| SD/008 | DETAILS OF R.C. BALUNES (WITH FOOTPRINTS) |
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| SD/010 | SUPERSTRUCTURE DETAILS (WITHOUT FOOTPRINTS) |
| SD/011 | R.C. C. SOLID SLAB |
| SD/012 | SUPERSTRUCTURE DETAILS (SPANS 30' to 100') |
| SD/013 | (WITH FOOTPRINTS) |

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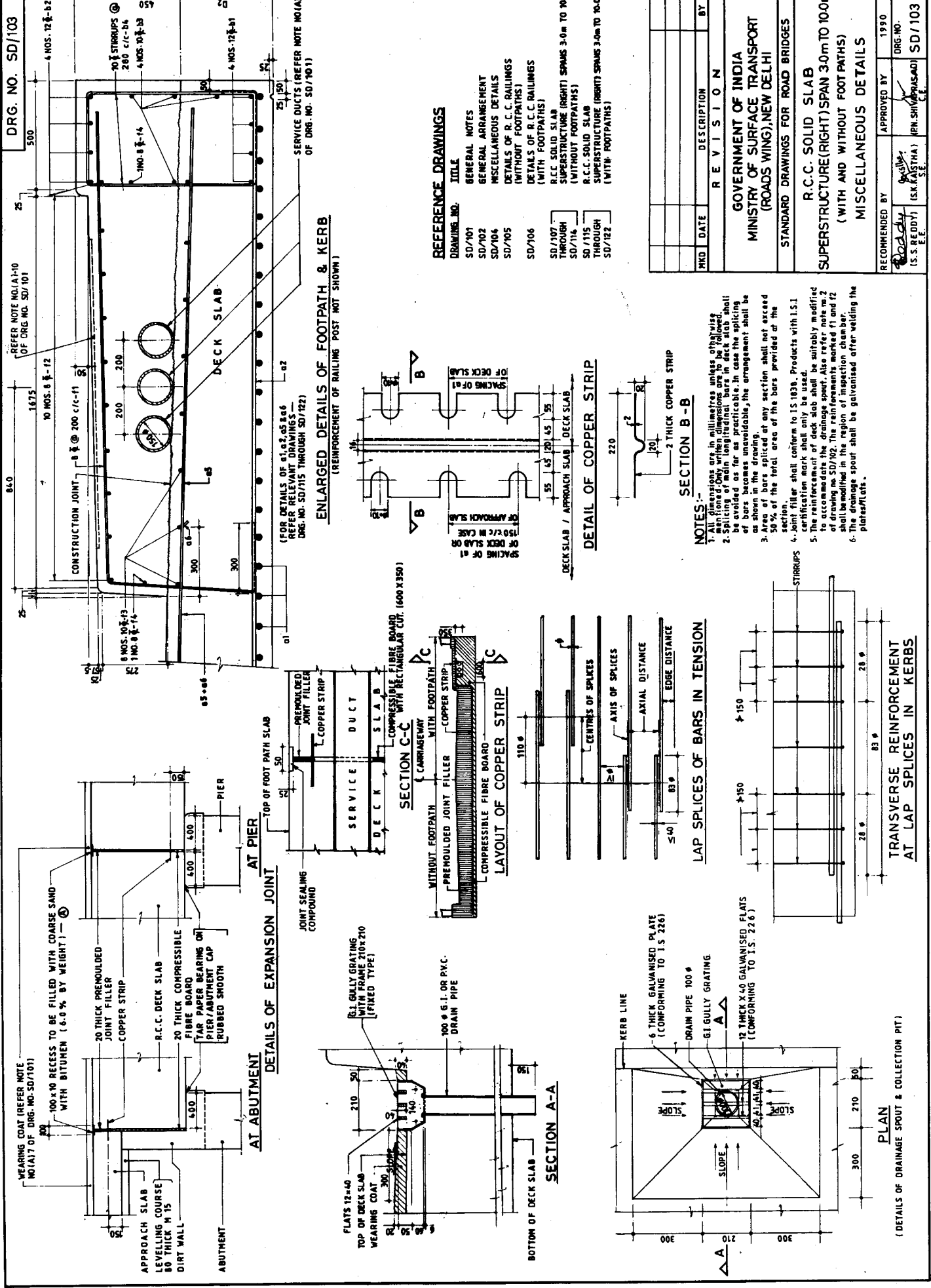
1. All dimensions are in millimetres unless otherwise mentioned. Only written dimensions are to be followed.
2. Typical arrangement of drainage spoils has been shown in plan. Suitable modifications may be made by the Engineer-in-charge as per site conditions and intensity of rainfall.

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.

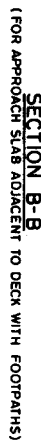
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|--|
| MINISTRY OF SURFACE TRANSPORT (ROADS WING),NEW DELHI |
| STANDARD DRAWINGS FOR ROAD BRIDGES |
| R.C.C. SOLID SLAB SUPERSTRUCTURE(RIGHT)SPAN 3.0m TO 10.0m (WITH AND WITHOUT FOOTPATHS) GENERAL ARRANGEMENT |

| | | |
|----------------|-------------|------|
| RECOMMENDED BY | APPROVED BY | 1990 |
|----------------|-------------|------|

| | | |
|----------|--------|--|
| DRG. NO. | SD/102 | 44 (U. JAYAKODI) (S.K. KASTHA) (M.K. MUKHERJEE) |
|----------|--------|--|



DRG. NO. SD/104



NOACH SLAD



SECTION 11



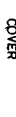
DEFINITION



CLAIM



PART I PLAN OF BRIDGE DECK



SECTION D-D



CONCRETE COVER FOR



1000

SECRET

100

INTERNAL DRAWINGS

— 771106 —

NOTES:

- railings.**

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SCHEDULE OF REINFORCEMENT FOR RAILING ON ONE SIDE

| SL. NO. | LOCATION | BAR MKD. | SHAPE | DIA (mm) | SPACING (mm) | LENGTH (mm) | NOS | TOTAL LENGTH (m) | WEIGHT (kg) |
|---------|----------|----------|-------|----------|--------------|-------------|-----|------------------|-------------|
| 1 | RAILINGS | a1 | △ | 8 | 100 | 940 | 100 | 94.0 | L1 = 0.395 |
| 2 | RAILINGS | a2 | — | 8 | — | (A-50) | 5-N | 5-N | L2 = 0.395 |
| 3 | RAILINGS | a3 | — | 10 | — | (A-50) | 3-N | 3-N | L3 = 0.417 |
| 4 | POST | a4 | □ | 12 | — | 680 | 4-N | 4-N | L4 = 0.880 |
| 5 | POST | a5 | □ | 8 | — | 680 | 8-N | 8-N | L5 = 0.935 |

* FOR END POST INNER TWO BARS THE SHAPE IS

QUANTITIES (PER SPAN)

| EFFECTIVE NUMBER OF DIVISIONS 'N' | A (mm) | h (mm) | STEEL (KG) | RAILINGS (RAIL POSTS) | QUANTITY |
|-----------------------------------|--------|--------|------------|-----------------------|----------|
| 3 | 2 | 1700 | 915 | 95 | 0.65 |
| 4 | 3 | 1467 | 945 | 127 | 0.86 |
| 5 | 3 | 1800 | 1015 | 143 | 1.03 |
| 6 | 4 | 1600 | 1065 | 176 | 1.22 |
| 7 | 4 | 1950 | 1115 | 195 | 1.41 |
| 8 | 5 | 1680 | 1215 | 230 | 1.60 |
| 9 | 5 | 1880 | 1285 | 249 | 1.79 |
| 10 | 6 | 1734 | 1365 | 288 | 1.98 |

● STEEL QUANTITIES INCLUDE 5% EXTRA FOR WASTES AND 5% EXTRA FOR RAILINGS ON BOTH SIDES OF THE SLABS.

REFERENCE DRAWINGS

| DRW. NO. | TITLE |
|-----------------|---|
| SD/101 | GENERAL NOTES |
| SD/102 | GENERAL ARRANGEMENT |
| SD/103 & SD/104 | MISCELLANEOUS DETAILS |
| SD/105 | STRUCTURE (RIGHT) SPANS 3-10 TO 10.0m (WITHOUT FOOTPATHS) |

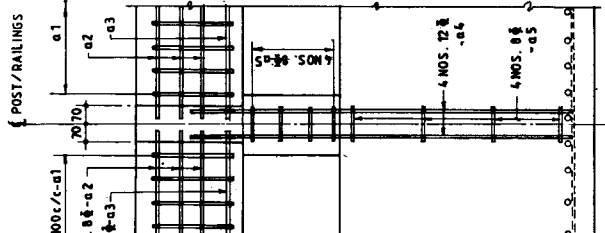
| REV. | DATE | DESCRIPTION | BY |
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| | | | |

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

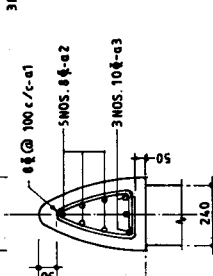
STANDARD DRAWINGS FOR ROAD BRIDGES
R.C.C. SOLID SLAB
SUPERSTRUCTURE (RIGHT) SPAN 3-10 TO 10.0m (WITHOUT FOOTPATHS)

DETAILS OF R.C.C. RAILINGS

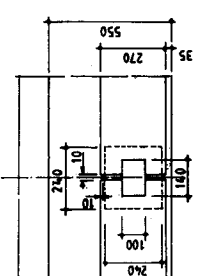
| RECOMMENDED BY | APPROVED BY | DRG. NO. |
|---------------------|--------------------|----------|
| (U. JAYAKUMAR) S.E. | (S.K. KASTHA) S.E. | SD/105 |



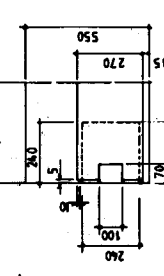
SECTION B-B



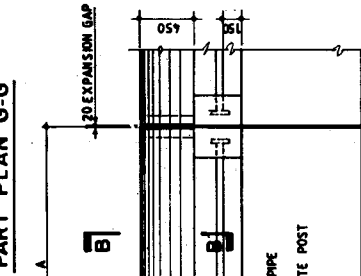
PART PLAN C-C



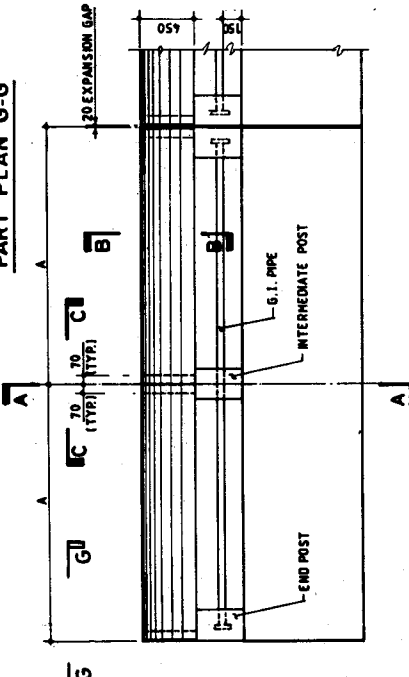
SECTION D-D



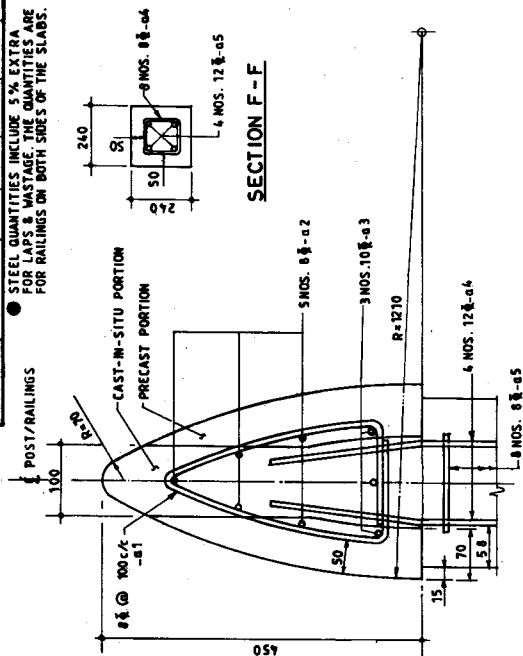
PART PLAN G-G



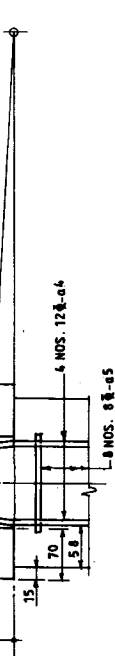
GENERAL ELEVATION



SECTION F-F



DETAIL - E



NOTES:-

- All dimensions are in millimetres unless otherwise mentioned. Only written dimensions are to be followed.
- The maximum size of the aggregate to be used for precast concrete work shall be limited to 12mm.
- The centre to centre spacing 'A' between successive vertical posts shown in the elevation shall be adjusted to suit the length of the bridge span for which the railing is used but in no case shall its value exceed 2000.
- The details of reinforcement in herb and deck slab have not been shown in the drawings.
- Railings to be built after the structural concrete of the superstructure has hardened and the shoring for the railings has been removed.
- Rollings shall be carefully inspected true to line and grade.
- Post and rail shall be checked for level and square.
- Special care shall be taken to match the surface of the cast-in-situ portion.

SCHEDULE OF REINFORCEMENT FOR RAILING ON ONE SIDE

| SL. NO. | LOCATION | BAR MKD | SHAPE | DIA (mm) | SPACING (mm) | LENGTH (m) | NOS | TOTAL LENGTH (m) | WEIGHT (kg) |
|---------|----------|---------|-------|----------|--------------|------------|-----|------------------|-------------|
| 1 | RAILINGS | a1 | | 8 | 100 | 9.60 | 1 | 9.60 | 0.395 |
| 2 | RAILINGS | a2 | — | 8 | — | (A-50) | 1 | 1.00 | 0.395 |
| 3 | RAILINGS | a3 | — | 10 | — | (A-50) | 1 | 1.00 | 0.395 |
| 4 | POST | a4 | | 12 | — | h + 449 | 1 | h + 449 | 0.888 |
| 5 | POST | a5 | | 8 | — | 688 | 1 | 688 | 0.395 |

* FOR END POST INNER TWO BARS, THE SHAPE IS

QUANTITIES (PER SPAN)

| EFFECTIVE SPAN (m) | NUMBER OF DIVISIONS 'N' | A (mm) | h (mm) | STEEL (CONCRETE) (kg) | RAILINGS (kg) | RAIL POSTS (kg) |
|--------------------|-------------------------|--------|--------|-----------------------|---------------|-----------------|
| 3 | 2 | 1700 | 1300 | 107 | 0.45 | 0.22 |
| 4 | 3 | 1647 | 1350 | 143 | 0.54 | 0.29 |
| 5 | 3 | 1600 | 1400 | 159 | 1.03 | 0.29 |
| 6 | 4 | 1600 | 1450 | 196 | 1.22 | 0.36 |
| 7 | 4 | 1650 | 1500 | 215 | 1.41 | 0.36 |
| 8 | 5 | 1600 | 1600 | 254 | 1.60 | 0.44 |
| 9 | 5 | 1680 | 1670 | 273 | 1.79 | 0.44 |
| 10 | 6 | 1734 | 1750 | 316 | 1.98 | 0.51 |

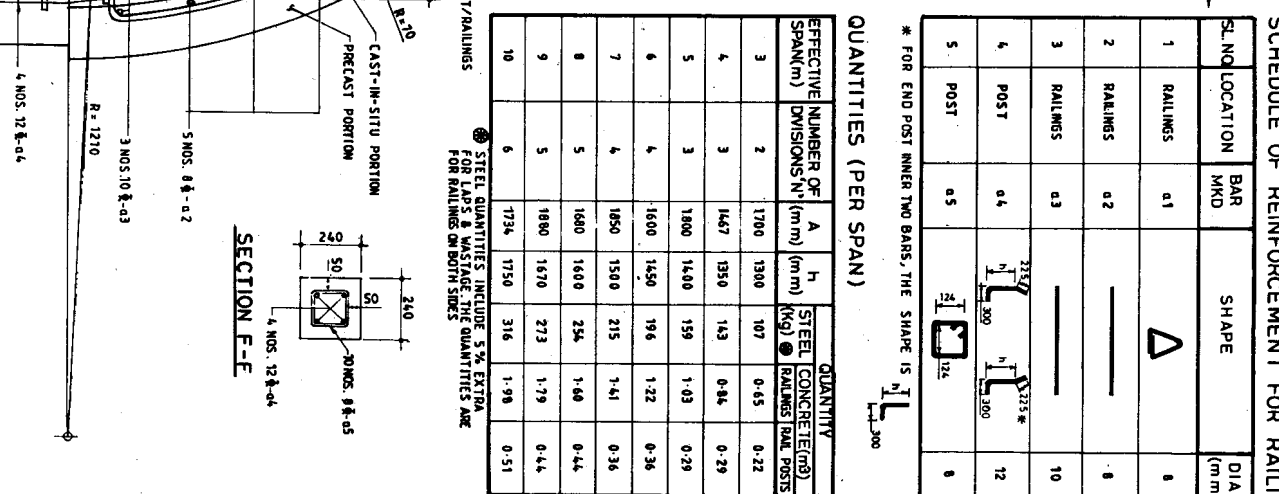
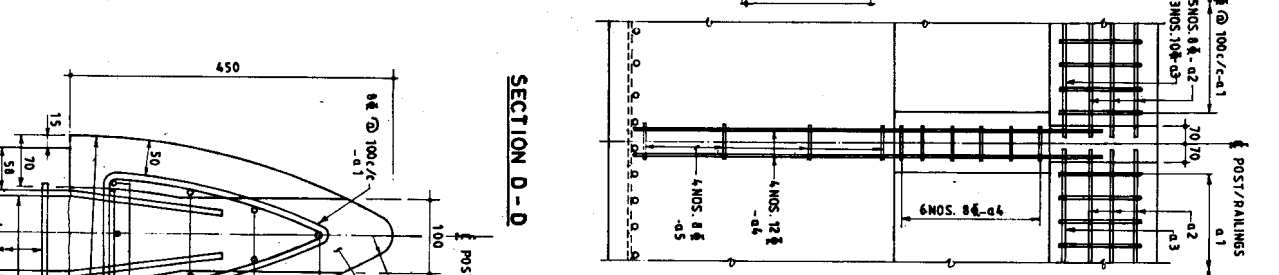
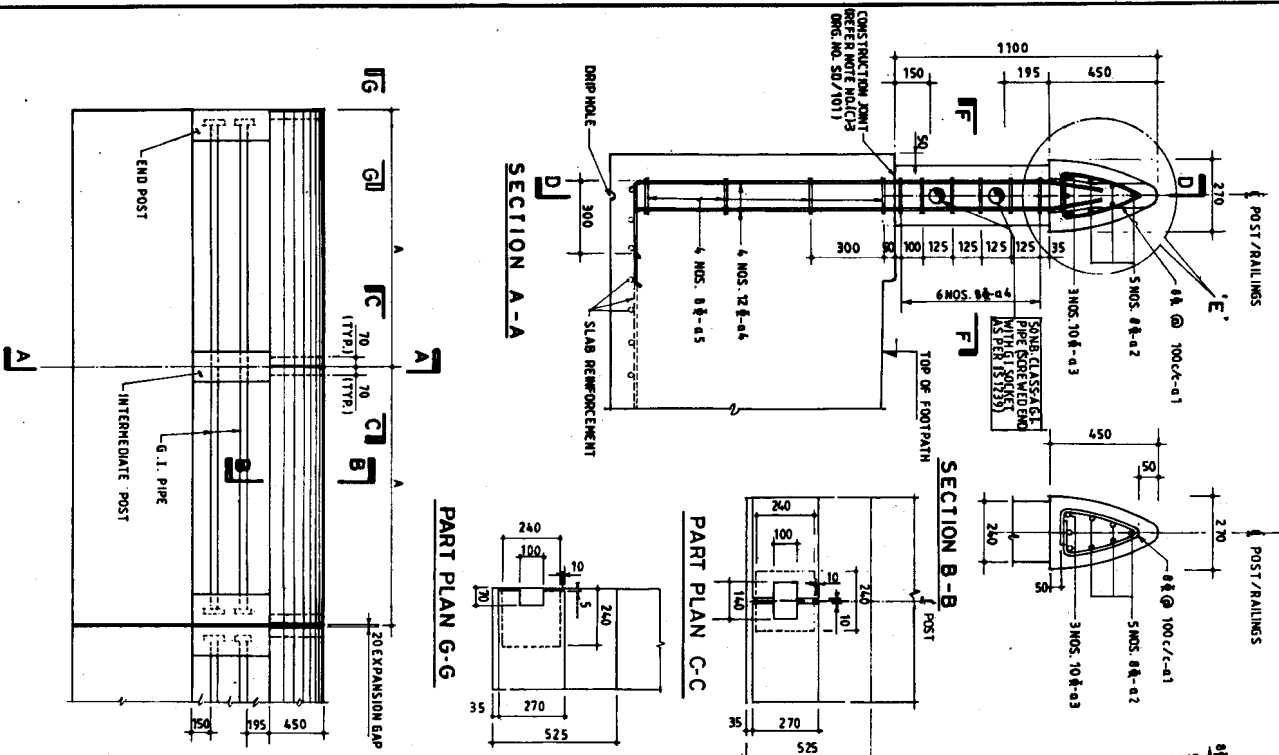
STEEL QUANTITIES INCLUDE 5% EXTRA FOR LAPS & WASTAGE. THE QUANTITIES ARE FOR RAILINGS ON BOTH SIDES.

NOTES:-

- All dimensions are in millimetres unless otherwise mentioned. Only written dimensions are to be followed.
- The maximum size of the aggregate to be used for precast concrete work shall be limited to 12mm.
- The reinforcement shall be provided to extend the length of the bridge span for which the railing is used but in no case shall its value exceed 2000.
- The details of reinforcement in kerb and deck slab have not been shown in the drawing.
- Rolling to be built after the structural concrete of the superstructure has hardened and the shoring for the railing shall be carefully constructed firm to line and grade.
- Post shall be vertical with a tolerance not to exceed 1 in 500.
- Special care shall be taken to match the surface of the cast-in-situ portion.

REFERENCE DRAWINGS

| DRAWING NO. | TITLE |
|---------------|------------------------------------|
| SD/01 | GENERAL NOTES |
| SD/02 | GENERAL ARRANGEMENT |
| SD/03 & SD/04 | MISCELLANEOUS DETAILS |
| SD/05 | R.C.C. SOLID SLAB |
| SD/06 | R.C.C. SOLID SLAB (WITH FOOTPATHS) |
| SD/07 | R.C.C. SOLID SLAB (WITH FOOTPATHS) |
| SD/08 | R.C.C. SOLID SLAB (WITH FOOTPATHS) |
| SD/09 | R.C.C. SOLID SLAB (WITH FOOTPATHS) |
| SD/10 | R.C.C. SOLID SLAB (WITH FOOTPATHS) |
| SD/11 | R.C.C. SOLID SLAB (WITH FOOTPATHS) |
| SD/12 | R.C.C. SOLID SLAB (WITH FOOTPATHS) |



GENERAL ELEVATION

| RECOMMENDED BY | APPROVED BY | DRG. NO. |
|---------------------|--------------|----------|
| A.A. (U. JAYAKUMAR) | (S. KRISHNA) | SD/106 |
| E.E. | S.E. | C.E. |

R.C.C. SOLID SLAB
SUPERSTRUCTURE (RIGHT) SPAN 3.0m TO 10.0m
(WITH FOOTPATHS)

DETAILS OF R.C.C. RAILINGS

STANDARD DRAWINGS FOR ROAD BRIDGES

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

SCHEDULE OF REINFORCEMENT (PER SPAN)

| S.NO | LOCATION | BAR MND | SHAPE | DIA (mm) | SPACING (mm) | LENGTH (mm) | NOS. | TOTAL LENGTH (m) | WEIGHT (kg) |
|------|---------------------|---------|-------|----------|--------------|-------------|------|------------------|-------------|
| 1 | SLAB-BOTTOM ALONG X | a1 | | 25 | 125 | 1150 | 96 | 1070.40 | 421 |
| 2 | SLAB-BOTTOM ALONG Y | a2 | | 12 | 115 | 1230 | 91 | 1131.13 | 1004 |
| 3 | SLAB-SIDE ALONG Y | a3 | | 10 | — | 11000 | 2 | 23.80 | 15 |
| 4 | SLAB-TOP ALONG X | a4 | | 10 | 125 | 11240 | 89 | 1000.36 | 617 |
| 5 | SLAB-TOP ALONG Y | a5 | | 10 | 125 | 11600 | 84 | 974.40 | 601 |
| 6 | KERB-BOTTOM | b1 | | 12 | — | 11500 | 8 | 92.80 | 82 |
| 7 | KERB-TOP | b2 | | 12 | — | 11530 | 8 | 92.24 | 82 |
| 8 | KERB-SIDES | b3 | | 10 | — | 10840 | 8 | 86.72 | 54 |
| 9 | KERB-STIRRUPS | b4 | | 10 | 280 | 2870 | 76 | 218.12 | 135 |

② DOES NOT INCLUDE THE ADDITIONAL STIRRUPS AT LAPS OR LONGITUDINAL BARS-REFER DRG. NO.SD/103

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) |

Dead load of the superstructure per span including R.C.C. railings = 28.63 KN.
 ③ 3kN / m. and wearing coat @ 2kN/sq.m

QUANTITIES (PER SPAN)

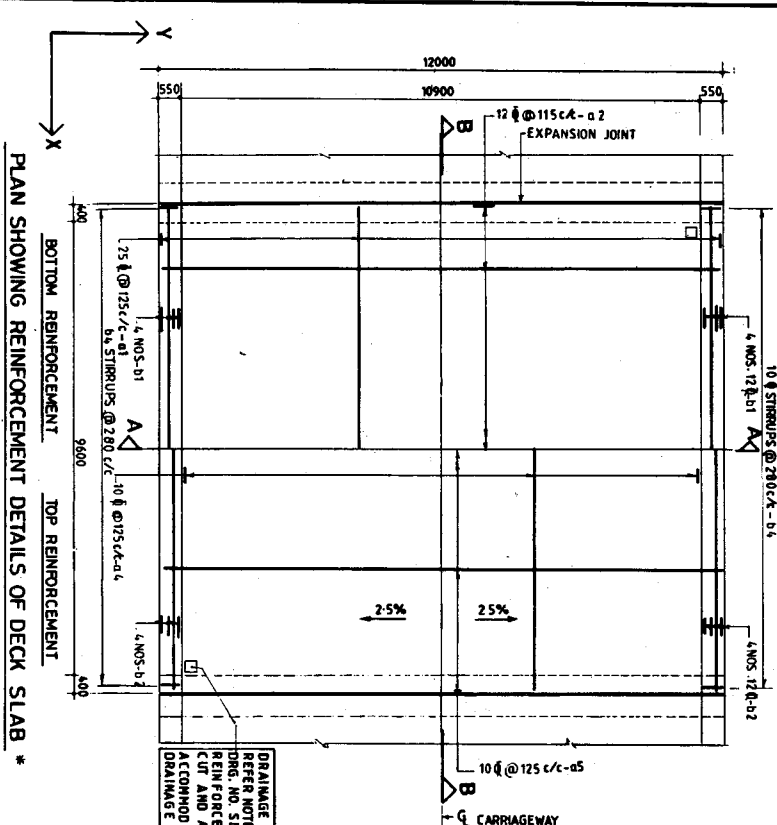
| EFFECTIVE SPAN (m) | 10.0 |
|--|--------|
| CONCRETE (cu. m.) | 136.40 |
| STEEL INCLUDING 5% EXTRA FOR LAPS AND WASTAGE (kg) | 7047 |
| ASPHALTIC WEARING COAT (sq. m.) | 113.36 |

NOTES:-

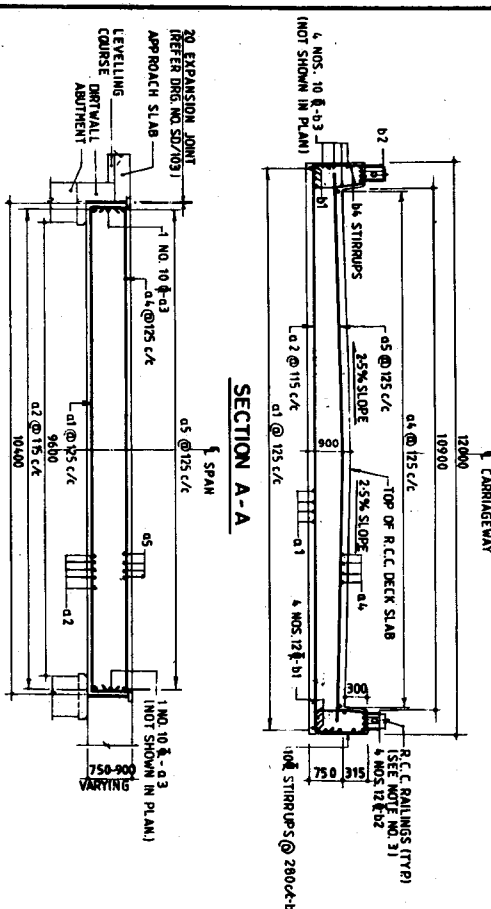
- All dimensions are in millimetres unless otherwise mentioned.
- Any reinforcement lap or joint shall be staggered.
- Special attention should be given to the design of the deck slab.
- The reinforcement of railing posts shall be incorporated before casting of the deck slab.
- The railings shall conform to drawing no. SD/105 or any other approved type.
- Dimensions in schedule of reinforcement are given as per IS: 202.
- Reinforcement of adjacent span superstructure, approach and not shown.

DRAINAGE SPOUTING/ R.C.C. DRAIN (TYPE) REFER DRG. NO. SD/103

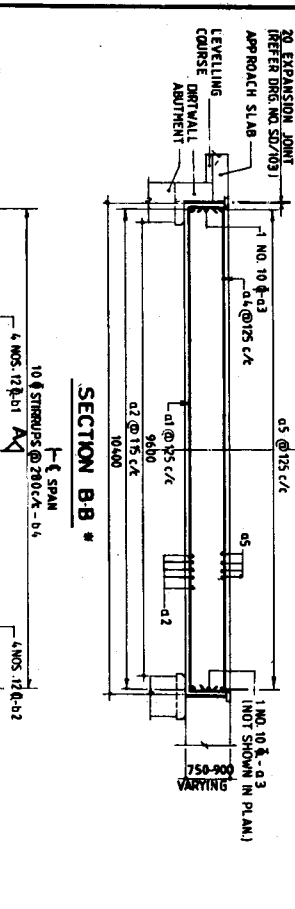
PLAN SHOWING REINFORCEMENT DETAILS OF DECK SLAB *



SECTION A-A



SECTION B-B



| | | | |
|------------------------------------|---------------|----------|------|
| GOVERNMENT OF INDIA | | | |
| MINISTRY OF SURFACE TRANSPORT | | | |
| (ROADS WING), NEW DELHI | | | |
| STANDARD DRAWINGS FOR ROAD BRIDGES | | | |
| R.C.C. SOLID SLAB | | | |
| SUPERSTRUCTURE (RIGHT) SPAN 10.0m | | | |
| (WITHOUT FOOTPATHS) | | | |
| RECOMMENDED BY | APPROVED BY | DRG. NO. | 1930 |
| (S.S. REDDY) | (S.K. KASTHA) | SD/114 | |
| E.E. | S.E. | C.E. | |