

SCHEDULE OF REINFORCEMENT (PER SPAN)

SLNO	LOCATION	BAR MKD	SHAPE	DIA (mm)	SPACING (mm)	LENGTH (mm)	NOS.	TOTAL LENGTH (m)	WEIGHT (kg)
1	SLAB BOTTOM ALONG X	01	81-A-100	25	125	11150	96	1070.40	421
2	SLAB BOTTOM ALONG Y	02	81-B-150	12	115	12430	91	1321.13	1004
3	SLAB SIDE ALONG Y	03	11800	10	-	11900	2	23.80	15
4	SLAB TOP ALONG X	04	81-A-100	10	125	11240	61	685.64	423
5	SLAB TOP ALONG Y	05	81-B-150	10	250	11600	42	447.20	301
6	SLAB TOP ALONG Y	06	81-B-150	10	250	8100	42	340.20	210
7	KEEB BOTTOM	07	81-B-150	12	-	11500	8	92.00	82
8	KEEB TOP	08	81-B-150	12	-	11530	8	92.24	82
9	KEEB SIDES	09	81-B-150	10	-	10840	8	86.72	54
10	KEEB STIRRUPS	10	81-B-150	10	280	3110	76	226.36	146
11	FOOTPATH TOP ALONG Y	11	81-B-150	8	200	2275	106	347.15	137
12	FOOTPATH TOP ALONG X	12	81-B-150	8	-	11450	20	229.00	90
13	FOOTPATH TOP ALONG X	13	81-B-150	10	-	10250	16	164.00	101
14	FOOTPATH TOP ALONG X	14	81-B-150	8	-	11200	4	44.80	18

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. rollings @ 3 km/m and wearing coat @ 2 km/m = 3004 kN.

QUANTITIES (PER SPAN)

EFFECTIVE SPAN (m)	10.0
CONCRETE (cu m)	118.70
STEEL INCLUDING 5% EXTRA FOR LAPS AND WASTAGE (kg)	7124
ASPHALTIC WEARING COAT (sq.m)	78.00

NOTES:-

1. All dimensions are in millimetres unless otherwise mentioned.
2. Only written dimensions are to be followed.
3. Special attention is invited to note no. B/H of drawing no SD/101 regarding the design mix to be adopted.
4. The reinforcement of rolling posts shall be incorporated before casting of the deck slab. The rollings shall conform to drawing no SD/106 or any other approved type.
5. Dimensions in schedule of reinforcement are given as per IS 2502
6. Reinforcement of adjacent span superstructure, approach slab not shown.
7. Service ducts and reinforcement of footpath not shown in plan.

REFERENCE DRAWINGS
DRAWING NO. SD/101
GENERAL NOTES
SD/102
SD/103 & SD/104
SD/106
TITLE
GENERAL NOTES
MISCELLANEOUS DETAILS
DETAILS OF R.C.C. ROLLINGS
(WITH FOOTPATHS)

RECOMMENDED BY		APPROVED BY	
SD/101		SD/122	
E.E.		C.E.	
<p align="center">GOVERNMENT OF INDIA MINISTRY OF SURFACE TRANSPORT (ROADS WING), NEW DELHI</p> <p align="center">STANDARD DRAWINGS FOR ROAD BRIDGES</p> <p align="center">R.C.C. SOLID SLAB SUPERSTRUCTURE (RIGHT) SPAN 10.0m (WITH FOOTPATHS)</p>			
DATE	DESCRIPTION	BY	



Ministry of Surface Transport
(Roads Wing)

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

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

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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/m^2 . 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. 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 bridge having length less than 30m unless the same are otherwise stipulating in 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 : 8-1986 (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 carriageway, whichever governs.

(b) Footpath load of 5 kN/m² for superstructure having

- 2 (c) Wearing coat load of 2 kN/eq.m.

6. Public utility services (except water supply and sewerage), if

- required, shall be carried over the bridge through 150-mm 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:

- (a) A coat of mastic asphalt 6mm thick with a prime coat at 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 asphalt. 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% with broom over prime coat.
- (b) 20mm thick asphaltic concrete wearing coat in two layers of 50mm each as per Clause 512 of MGS's Specifications for Road and Bridge Works (Second Edition-1988).

■

- concrete wearing coat is not predictable, the Engineer-in-charge may permit provision of 75mm thick cement concrete wearing coat in M30 grade concrete with maximum reinforcement ratio as 0.40. The reinforcement shall consist of 8mm High Yield Strength Deformed bars @ 200mm centres reducing to 100 centres in the distal 200mm.

(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 IS3112 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/cum 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/cum 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**
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 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 weight-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.

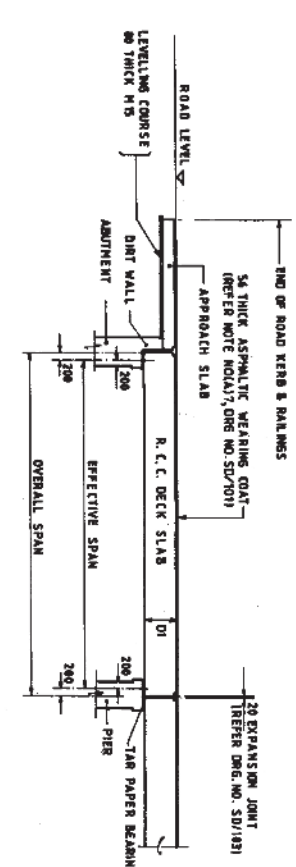
D) GENERAL SPECIFICATIONS

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

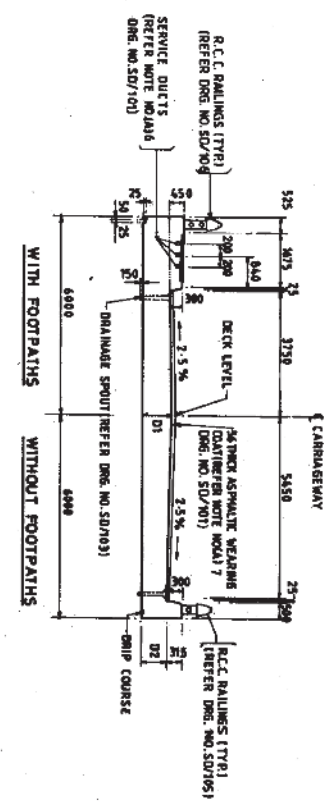
E) REFERENCE TO DRAWINGS

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SD/101	GENERAL NOTES
SD/102	GENERAL APPROPRIEMENT
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)

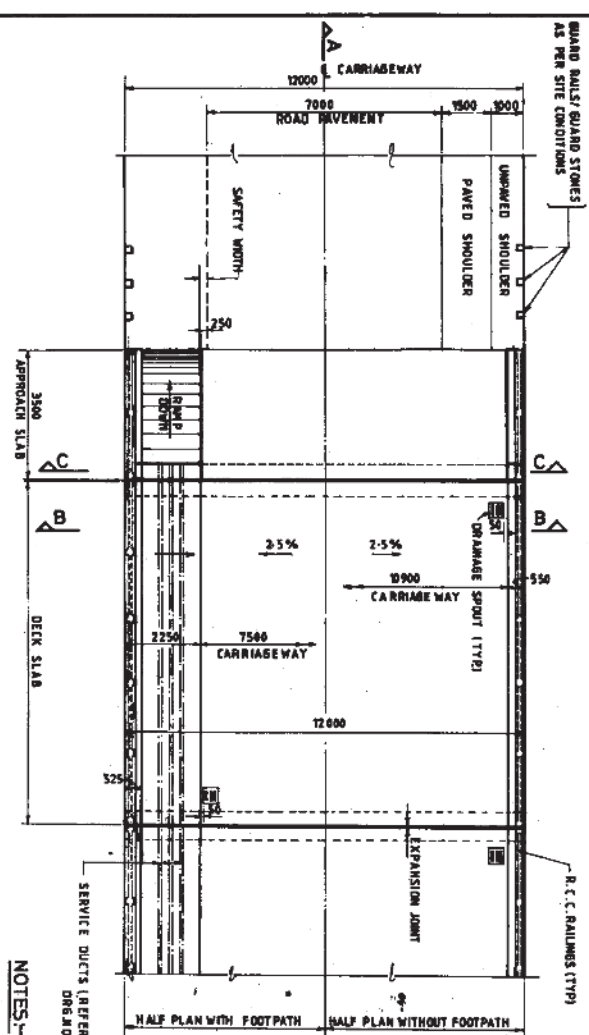
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SECTION A-A
(ROAD KERB & RAILINGS NOT SHOWN.)

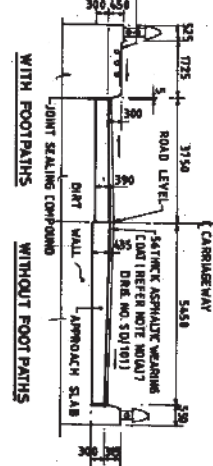


SECTION B-B
FOR VALUES OF DTS OR REFER. RELEVANT DRAWINGS (DNG. NO. SD/107 THROUGH SD/122.)



PLAN

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



SECTION C-C
WITH FOOTPATHS WITHOUT FOOTPATHS

REFERENCE DRAWINGS

DRAWING NO.	TITLE
SD/101	GENERAL NOTES
SD/102	MISCELLANEOUS DETAILS
SD/103 & SD/104	DETAILS OF R.C.C. RAILINGS (WITHOUT FOOTPATHS)
SD/105	DETAILS OF R.C.C. RAILINGS (WITH FOOTPATHS)
SD/106	R.C.C. SOLID SLAB
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SD/108	SUPERSTRUCTURE (INVERT SPANS 3.0m TO 10.0m)
SD/109	R.C.C. SOLID SLAB
SD/110	SUPERSTRUCTURE (INVERT SPANS 3.0m TO 10.0m)
SD/111	(WITH FOOTPATHS)
SD/112	(WITHOUT FOOTPATHS)

NO.	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. JAIN) (S. K. JAIN)	(S. K. JAIN)	SD/102	

DRG. NO. SD/103

REFER NOTE NO. A-10
OF DRG. NO. SD/101

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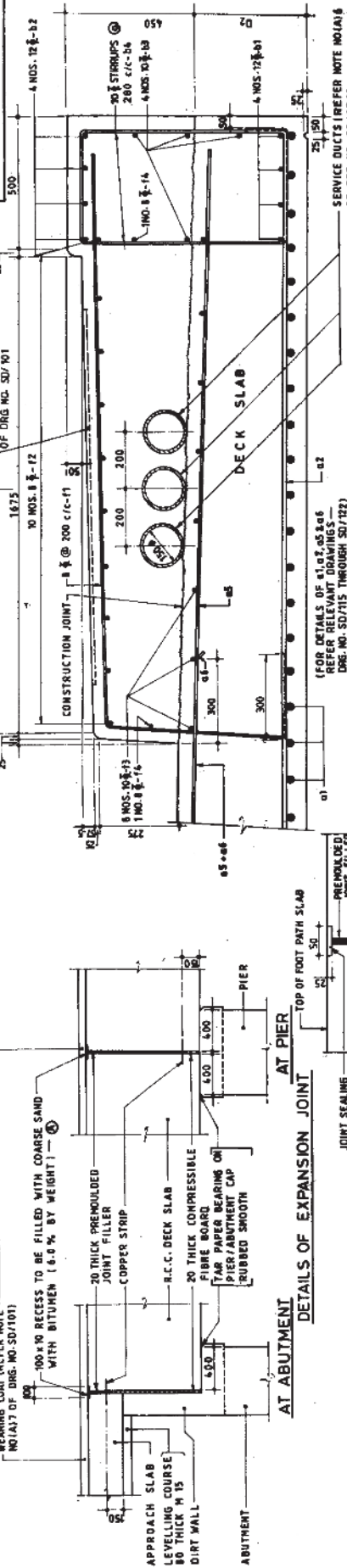
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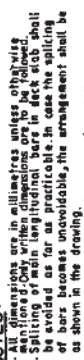
ENLARGED DETAILS OF FOOTPATH & KERB

(FOR DETAILS OF 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000)

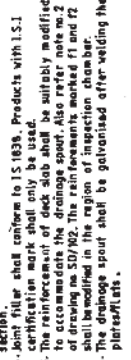
REFERENCE DRAWINGS

DRG. NO.	TITLE
SD/101	GENERAL NOTES
SD/102	GENERAL ARRANGEMENT
SD/103	MISCELLANEOUS DETAILS
SD/104	DETAILS OF R.C.C. RAILINGS
SD/105	DETAILS OF R.C.C. RAILINGS (WITH FOOTPATHS)
SD/106	R.C.C. SOLID SLAB
SD/107	THROUGH
SD/108	THROUGH
SD/109	THROUGH
SD/110	THROUGH
SD/111	THROUGH
SD/112	THROUGH
SD/113	THROUGH
SD/114	THROUGH
SD/115	THROUGH
SD/116	THROUGH
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SD/160	THROUGH
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SD/162	THROUGH
SD/163	THROUGH
SD/164	THROUGH
SD/165	THROUGH
SD/166	THROUGH
SD/167	THROUGH
SD/168	THROUGH
SD/169	THROUGH
SD/170	THROUGH
SD/171	THROUGH
SD/172	THROUGH
SD/173	THROUGH
SD/174	THROUGH
SD/175	THROUGH
SD/176	THROUGH
SD/177	THROUGH
SD/178	THROUGH
SD/179	THROUGH
SD/180	THROUGH
SD/181	THROUGH
SD/182	THROUGH
SD/183	THROUGH
SD/184	THROUGH
SD/185	THROUGH
SD/186	THROUGH
SD/187	THROUGH
SD/188	THROUGH
SD/189	THROUGH
SD/190	THROUGH
SD/191	THROUGH
SD/192	THROUGH
SD/193	THROUGH
SD/194	THROUGH
SD/195	THROUGH
SD/196	THROUGH
SD/197	THROUGH
SD/198	THROUGH
SD/199	THROUGH
SD/200	THROUGH

DETAIL OF COPPER STRIP



SECTION B-B



SECTION C-C



LAP SPLICES OF BARS IN TENSION



TRANSVERSE REINFORCEMENT AT LAP SPLICES IN KERBS

SECTION A-A

PLAN

DETAILS OF DRAINAGE SPOUT & COLLECTION PIT

SECTION A-A

SECTION B-B

SECTION C-C

LAP SPLICES OF BARS IN TENSION

TRANSVERSE REINFORCEMENT AT LAP SPLICES IN KERBS

SECTION A-A

SECTION B-B

SECTION C-C

LAP SPLICES OF BARS IN TENSION

TRANSVERSE REINFORCEMENT AT LAP SPLICES IN KERBS

SECTION A-A

SECTION B-B

SECTION C-C

LAP SPLICES OF BARS IN TENSION

TRANSVERSE REINFORCEMENT AT LAP SPLICES IN KERBS

SECTION A-A

SECTION B-B

SECTION C-C

LAP SPLICES OF BARS IN TENSION

TRANSVERSE REINFORCEMENT AT LAP SPLICES IN KERBS

SECTION A-A

SECTION B-B

SECTION C-C

LAP SPLICES OF BARS IN TENSION

TRANSVERSE REINFORCEMENT AT LAP SPLICES IN KERBS

SECTION A-A

SECTION B-B

SECTION C-C

LAP SPLICES OF BARS IN TENSION

TRANSVERSE REINFORCEMENT AT LAP SPLICES IN KERBS

SECTION A-A

SECTION B-B

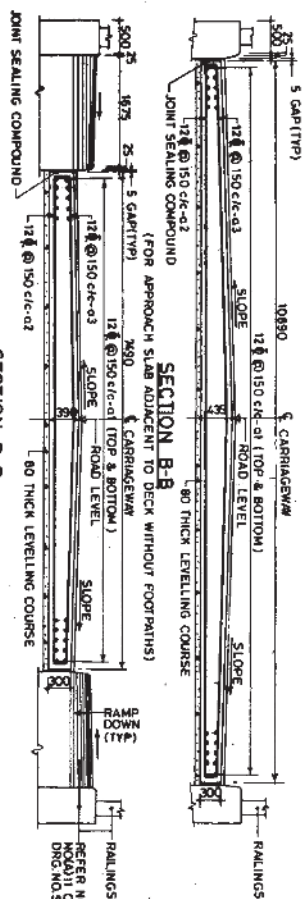
SECTION C-C

LAP SPLICES OF BARS IN TENSION

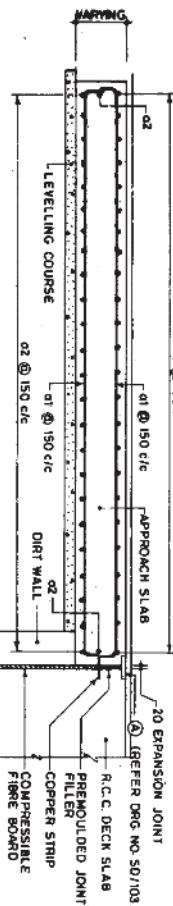
TRANSVERSE REINFORCEMENT AT LAP SPLICES IN KERBS

SECTION A-A

SECTION B-B



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



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

QUANTITIES	CONCRETE IN APPROACH SLAB (cu.m.)	WITH FOOTPATHS	WITHOUT FOOTPATHS
1	9.04	14.01	702
2	1022	26.22	39.12

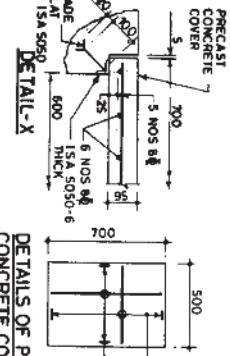
QUANTITIES

APPROACH SLAB ADJACENT TO DECK WITHOUT FOOTPATHS	APPROACH SLAB ADJACENT TO DECK WITH FOOTPATHS
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
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99	99
100	100

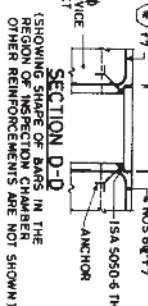
QUANTITIES

QUANTITIES

REFERENCE DRAWINGS	DRWG. NO.	TITLE
SD/101	GENERAL NOTES	
SD/102	GENERAL ARRANGEMENT	
SD/103	MISCELLANEOUS DETAILS	
SD/104	DETAILS OF R.C.C. RAILINGS	
SD/105	DETAILS OF R.C.C. RAILINGS	
SD/106	DETAILS OF R.C.C. RAILINGS	
SD/107	DETAILS OF R.C.C. RAILINGS	
SD/108	DETAILS OF R.C.C. RAILINGS	
SD/109	DETAILS OF R.C.C. RAILINGS	
SD/110	DETAILS OF R.C.C. RAILINGS	
SD/111	DETAILS OF R.C.C. RAILINGS	
SD/112	DETAILS OF R.C.C. RAILINGS	
SD/113	DETAILS OF R.C.C. RAILINGS	
SD/114	DETAILS OF R.C.C. RAILINGS	
SD/115	DETAILS OF R.C.C. RAILINGS	
SD/116	DETAILS OF R.C.C. RAILINGS	
SD/117	DETAILS OF R.C.C. RAILINGS	
SD/118	DETAILS OF R.C.C. RAILINGS	
SD/119	DETAILS OF R.C.C. RAILINGS	
SD/120	DETAILS OF R.C.C. RAILINGS	
SD/121	DETAILS OF R.C.C. RAILINGS	
SD/122	DETAILS OF R.C.C. RAILINGS	
SD/123	DETAILS OF R.C.C. RAILINGS	
SD/124	DETAILS OF R.C.C. RAILINGS	
SD/125	DETAILS OF R.C.C. RAILINGS	
SD/126	DETAILS OF R.C.C. RAILINGS	
SD/127	DETAILS OF R.C.C. RAILINGS	
SD/128	DETAILS OF R.C.C. RAILINGS	
SD/129	DETAILS OF R.C.C. RAILINGS	
SD/130	DETAILS OF R.C.C. RAILINGS	
SD/131	DETAILS OF R.C.C. RAILINGS	
SD/132	DETAILS OF R.C.C. RAILINGS	
SD/133	DETAILS OF R.C.C. RAILINGS	
SD/134	DETAILS OF R.C.C. RAILINGS	
SD/135	DETAILS OF R.C.C. RAILINGS	
SD/136	DETAILS OF R.C.C. RAILINGS	
SD/137	DETAILS OF R.C.C. RAILINGS	
SD/138	DETAILS OF R.C.C. RAILINGS	
SD/139	DETAILS OF R.C.C. RAILINGS	
SD/140	DETAILS OF R.C.C. RAILINGS	
SD/141	DETAILS OF R.C.C. RAILINGS	
SD/142	DETAILS OF R.C.C. RAILINGS	
SD/143	DETAILS OF R.C.C. RAILINGS	
SD/144	DETAILS OF R.C.C. RAILINGS	
SD/145	DETAILS OF R.C.C. RAILINGS	
SD/146	DETAILS OF R.C.C. RAILINGS	
SD/147	DETAILS OF R.C.C. RAILINGS	
SD/148	DETAILS OF R.C.C. RAILINGS	
SD/149	DETAILS OF R.C.C. RAILINGS	
SD/150	DETAILS OF R.C.C. RAILINGS	
SD/151	DETAILS OF R.C.C. RAILINGS	
SD/152	DETAILS OF R.C.C. RAILINGS	
SD/153	DETAILS OF R.C.C. RAILINGS	
SD/154	DETAILS OF R.C.C. RAILINGS	
SD/155	DETAILS OF R.C.C. RAILINGS	
SD/156	DETAILS OF R.C.C. RAILINGS	
SD/157	DETAILS OF R.C.C. RAILINGS	
SD/158	DETAILS OF R.C.C. RAILINGS	
SD/159	DETAILS OF R.C.C. RAILINGS	
SD/160	DETAILS OF R.C.C. RAILINGS	
SD/161	DETAILS OF R.C.C. RAILINGS	
SD/162	DETAILS OF R.C.C. RAILINGS	
SD/163	DETAILS OF R.C.C. RAILINGS	
SD/164	DETAILS OF R.C.C. RAILINGS	
SD/165	DETAILS OF R.C.C. RAILINGS	
SD/166	DETAILS OF R.C.C. RAILINGS	
SD/167	DETAILS OF R.C.C. RAILINGS	
SD/168	DETAILS OF R.C.C. RAILINGS	
SD/169	DETAILS OF R.C.C. RAILINGS	
SD/170	DETAILS OF R.C.C. RAILINGS	
SD/171	DETAILS OF R.C.C. RAILINGS	
SD/172	DETAILS OF R.C.C. RAILINGS	
SD/173	DETAILS OF R.C.C. RAILINGS	
SD/174	DETAILS OF R.C.C. RAILINGS	
SD/175	DETAILS OF R.C.C. RAILINGS	
SD/176	DETAILS OF R.C.C. RAILINGS	
SD/177	DETAILS OF R.C.C. RAILINGS	
SD/178	DETAILS OF R.C.C. RAILINGS	
SD/179	DETAILS OF R.C.C. RAILINGS	
SD/180	DETAILS OF R.C.C. RAILINGS	
SD/181	DETAILS OF R.C.C. RAILINGS	
SD/182	DETAILS OF R.C.C. RAILINGS	
SD/183	DETAILS OF R.C.C. RAILINGS	
SD/184	DETAILS OF R.C.C. RAILINGS	
SD/185	DETAILS OF R.C.C. RAILINGS	
SD/186	DETAILS OF R.C.C. RAILINGS	
SD/187	DETAILS OF R.C.C. RAILINGS	
SD/188	DETAILS OF R.C.C. RAILINGS	
SD/189	DETAILS OF R.C.C. RAILINGS	
SD/190	DETAILS OF R.C.C. RAILINGS	
SD/191	DETAILS OF R.C.C. RAILINGS	
SD/192	DETAILS OF R.C.C. RAILINGS	
SD/193	DETAILS OF R.C.C. RAILINGS	
SD/194	DETAILS OF R.C.C. RAILINGS	
SD/195	DETAILS OF R.C.C. RAILINGS	
SD/196	DETAILS OF R.C.C. RAILINGS	
SD/197	DETAILS OF R.C.C. RAILINGS	
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SD/199	DETAILS OF R.C.C. RAILINGS	
SD/200	DETAILS OF R.C.C. RAILINGS	



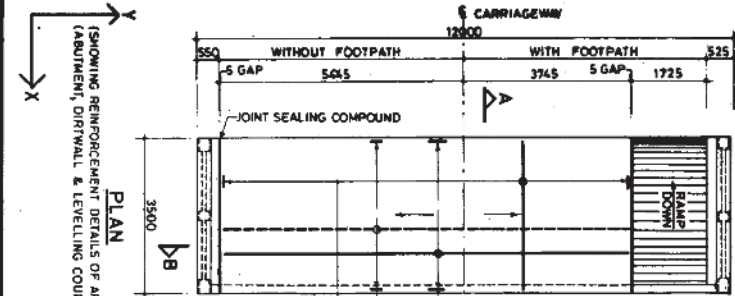
DETAIL-X
DETAILS OF PRECAST CONCRETE COVER FOR INSPECTION CHAMBER



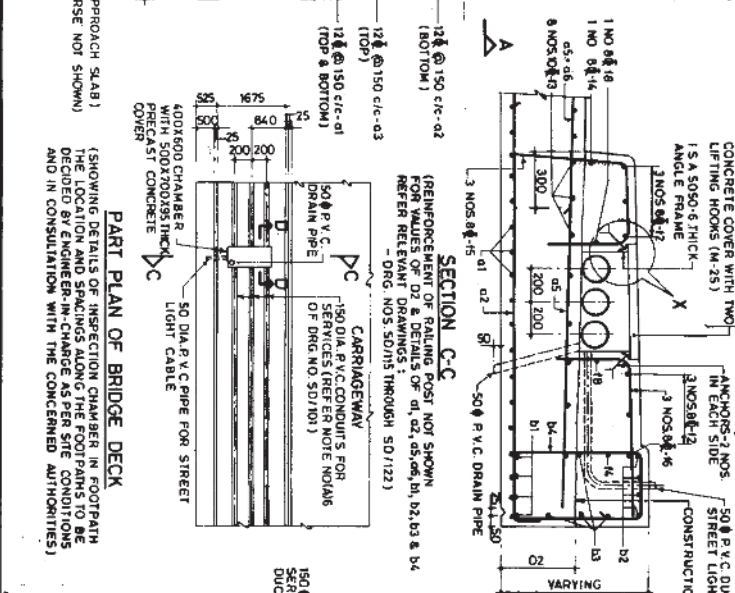
SECTION D-D
(SHOWING SHAPE OF BARS IN THE REGION OF INSPECTION CHAMBER OTHER REINFORCEMENTS ARE NOT SHOWN)

- NOTES:-
- All dimensions are in millimetres unless otherwise mentioned.
 - Only written dimensions are to be followed.
 - The reinforcement of rolling posts shall be incorporated before casting of deck slab. The rollings shall conform to drawing no. SD/001/006 or any other approved type.
 - Dimensions in schedule of reinforcement are given as per 1:5:2502.
 - Schedule of reinforcement does not include change in reinforcement around inspection chamber, precast cover to chamber and railings.

RECOMMENDED BY	APPROVED BY	DRG. NO.
SD/104	SD/104	SD/104
SD/105	SD/105	SD/105
SD/106	SD/106	SD/106
SD/107	SD/107	SD/107
SD/108	SD/108	SD/108
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SD/195	SD/195	SD/195
SD/196	SD/196	SD/196
SD/197	SD/197	SD/197
SD/198	SD/198	SD/198
SD/199	SD/199	SD/199
SD/200	SD/200	SD/200



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



SECTION A-A
(REINFORCEMENT OF RAILING POST NOT SHOWN FOR VALUES OF D2 & DETAILS OF d1, d2, d3, d4, d5, d6, d7, d8, d9, d10, d11, d12, d13, d14, d15, d16, d17, d18, d19, d20, d21, d22, d23, d24, d25, d26, d27, d28, d29, d30, d31, d32, d33, d34, d35, d36, d37, d38, d39, d40, d41, d42, d43, d44, d45, d46, d47, d48, d49, d50, d51, d52, d53, d54, d55, d56, d57, d58, d59, d60, d61, d62, d63, d64, d65, d66, d67, d68, d69, d70, d71, d72, d73, d74, d75, d76, d77, d78, d79, d80, d81, d82, d83, d84, d85, d86, d87, d88, d89, d90, d91, d92, d93, d94, d95, d96, d97, d98, d99, d100, d101, d102, d103, d104, d105, d106, d107, d108, d109, d110, d111, d112, d113, d114, d115, d116, d117, d118, d119, d120, d121, d122, d123, d124, d125, d126, d127, d128, d129, d130, d131, d132, d133, d134, d135, d136, d137, d138, d139, d140, d141, d142, d143, d144, d145, d146, d147, d148, d149, d150, d151, d152, d153, d154, d155, d156, d157, d158, d159, d160, d161, d162, d163, d164, d165, d166, d167, d168, d169, d170, d171, d172, d173, d174, d175, d176, d177, d178, d179, d180, d181, d182, d183, d184, d185, d186, d187, d188, d189, d190, d191, d192, d193, d194, d195, d196, d197, d198, d199, d200, d201, d202, d203, d204, d205, d206, d207, d208, d209, d210, d211, d212, d213, d214, d215, d216, d217, d218, d219, d220, d221, d222, d223, d224, d225, d226, d227, d228, d229, d230, d231, d232, d233, d234, d235, d236, d237, d238, d239, d240, d241, d242, d243, d244, d245, d246, d247, d248, d249, d250, d251, d252, d253, d254, d255, d256, d257, d258, d259, d260, d261, d262, d263, d264, d265, d266, d267, d268, d269, d270, d271, d272, d273, d274, d275, d276, d277, d27

SCHEDULE OF REINFORCEMENT FOR RAILING ON ONE SIDE

S/N	LOCATION	BAR MKD.	SHAPE	DIA. (mm)	SPACING (mm)	LENGTH (mm)	NOS	TOTAL LENGTH(m)	WEIGHT (kg)
1	RAILINGS	a1		ø	100	940	$\frac{A-50}{100} \times N1$ $= 13$	M1 = 940 1000 M1 = 13	L1 = 0.395
2	RAILINGS	a2	—	ø	-	(A-50)	$\frac{S-N}{50} \times N2$ $= 12$	M2 = (A-50) 1000 M2 = 12	L2 = 0.395
3	RAILINGS	a3	—	10	-	(A-50)	$\frac{3-N}{50} \times N3$ $= 13$	M3 = (A-50) 1000 M3 = 13	L3 = 0.417
4	POST	a4		12	-	n + 689	$\frac{h+689-nk}{n} \times M4$ $= 14$	L4 = 689 1000 L4 = 14	L4 = 0.889
5	POST	a5		ø	-	ø ø ø	$\frac{8+(N+1)}{N} \times M5$ $= 15$	M5 = 889 1000 M5 = 15	L5 = 0.935

NOTES:-

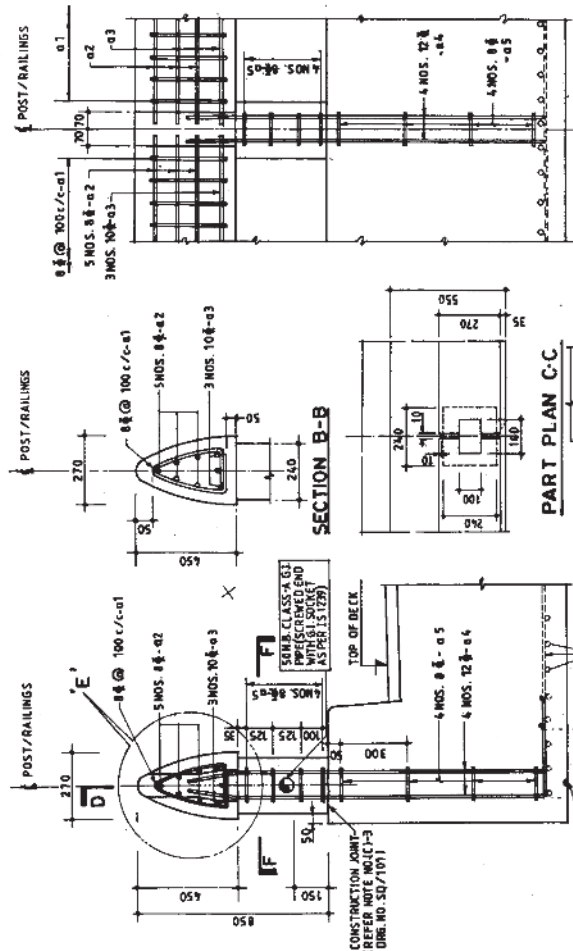
- All dimensions are in millimetres unless otherwise specified. Dimensions in parentheses are to be followed, without only written dimensions are to be followed.
- The maximum size of the aggregate released for ground concrete work shall be limited to 1/3 of the thickness of the concrete.
- The centre to centre spacing s_x between adjacent 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 kerb and deck slab have not been shown in the drawing.
- Reinforcing bars shall be built after the structural concrete of the bridge deck is placed and the slab curing for the reinforcement is released.
- Painting shall be completed immediately from its time and grade.
- Spill shall be carried with a trowels not to exceed 1500.
- Special care shall be taken to finish the surfaces of the cast-in-situ portion.

QUANTITIES (PER SPAN)

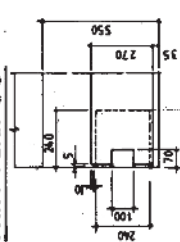
EFFECTIVE SPAN (m)	NUMBER OF DIVISIONS N	A (mm)	h (mm)	QUANTITY	
				STEEL (kg)	CONCRETE (m ³) @ 24 KG/M ³ RAIL POSTS
3	2	1200	915	95	0.43
4	3	146.7	945	127	0.64
5	3	1800	1015	143	1.03
6	4	1600	1045	176	1.22
7	4	1850	1115	195	1.41
8	5	1600	1215	230	1.60
9	5	1840	1285	249	1.79
10	6	1734	1365	288	1.99

REFERENCE DRAWINGS

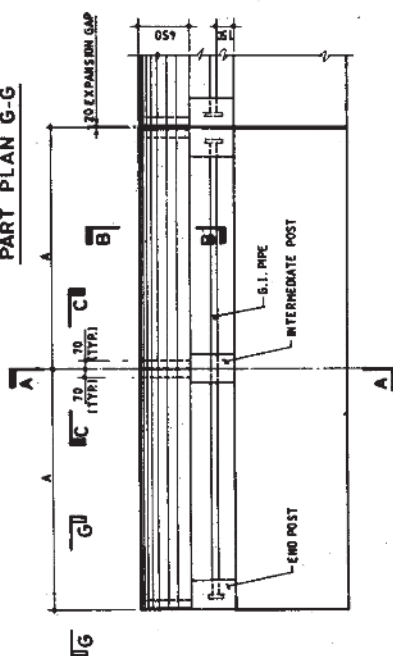
DRAWING NO.	TITLE
10/101	GENERAL NOTES
10/102	GENERAL ARRANGEMENT
10/103 & SD/104	MISCELLANEOUS DETAILS
10/105	R.C. SOLID SLAB
10/106	SUPERSTRUCTURE (RIGHT 2 SPANS 3-ON TO NO. ONE WITHOUT FOOTPATHS)
10/107	THROUGH
10/111	

[illegible]

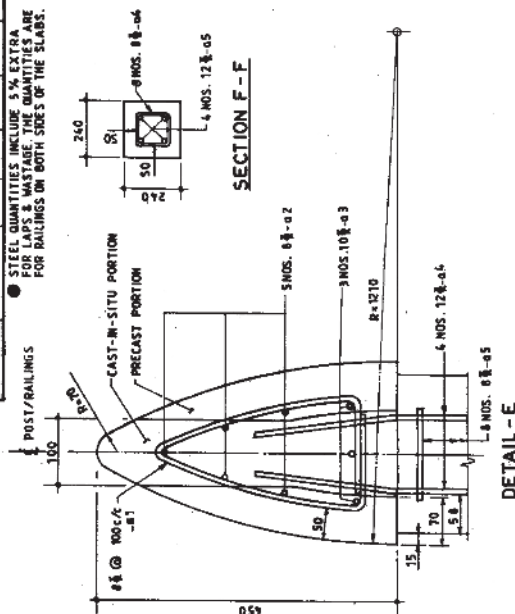
SECTION D - D



PART PLAN G-G



GENERAL ELEVATION



SECTION F - F

DETAIL - E

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	9.40	100	9.40	1.3
2	RAILINGS	a2		8	(A-50)	1.00	100	1.00	0.395
3	RAILINGS	a3		10	(A-50)	1.00	100	1.00	0.395
4	POST	a4		12	h + 469	1.00	100	1.00	0.617
5	POST	a5		8	688	1.00	100	1.00	0.395

* FOR END POST INNER TWO BARS, THE SHAPE IS

QUANTITIES (PER SPAN)

EFFECTIVE SPAN (m)	NUMBER OF DIVISIONS (N)	A (mm)	B (mm)	STEEL (kg)	CONCRETE (m³)
3	2	1700	1300	107	0.45
4	3	1447	1350	143	0.84
5	3	1600	1400	159	1.03
6	4	1600	1450	196	1.32
7	4	1600	1500	215	1.41
8	5	1600	1600	254	1.66
9	5	1600	1670	273	1.79
10	6	1734	1750	316	1.98

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

NOTES:-

- All dimensions are in millimetres unless otherwise mentioned. Only whole dimensions are to be followed.
- The concrete part shall be limited to 12 m for safety.
- The centre to centre spacing of the reinforcement bars shall be as shown in the drawing. The length of the reinforcement bars shall be as shown in the drawing.
- The details of reinforcement in kerb and deck slab have not been shown in the drawing.
- Reinforcement shall be provided in the structural concrete of the superstructure.
- Reinforcement shall be provided in the structural concrete of the substructure.
- Special care shall be taken to match the surface of the cast-in-situ portion.

REFERENCE DRAWINGS

DRAWING NO.	TITLE
SD/101	GENERAL NOTES
SD/102	GENERAL ARRANGEMENT
SD/103 & SD/104	MISCELLANEOUS DETAILS
SD/105	R.C.C. SOLID SLAB
SD/106	R.C.C. SOLID SLAB (WITH FOOTPATHS)
SD/107	R.C.C. SOLID SLAB (WITH FOOTPATHS)

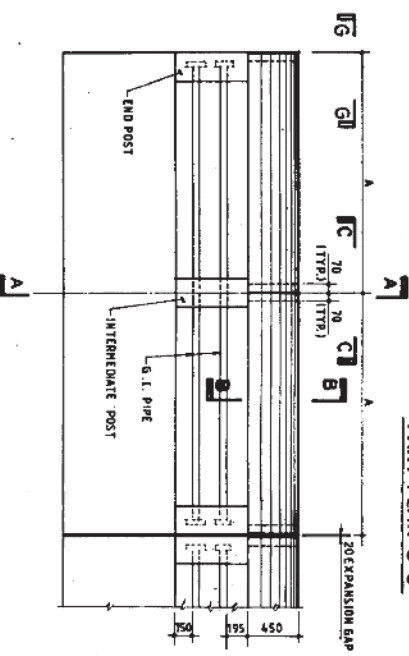
REV	DATE	DESCRIPTION	BY
1			

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

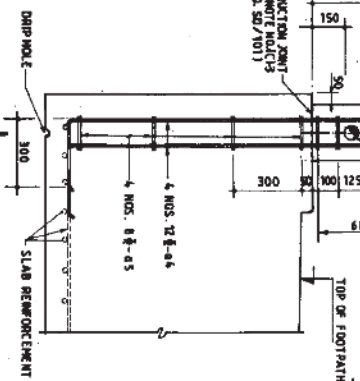
STANDARD DRAWINGS FOR ROAD BRIDGES
R.C.C. SOLID SLAB
SUPERSTRUCTURE (RIGHT) SPAN 3.0m TO 10.0m
(WITH FOOTPATHS)

RECOMMENDED BY	APPROVED BY	DRG. NO.
(S. K. KUMAR)	(S. K. KUMAR)	SD/106
E.E.	S.E.	

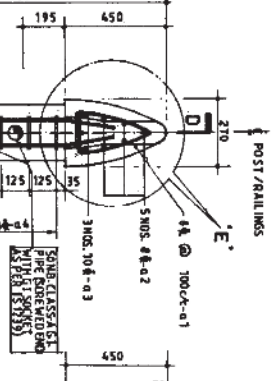
GENERAL ELEVATION



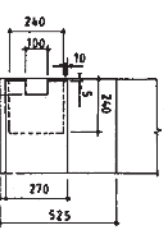
SECTION A-A



SECTION B-B



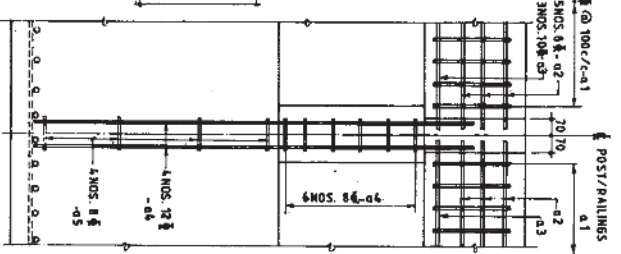
PART PLAN C-C



PART PLAN G-G



SECTION D-D



SECTION E-E

