Capacity Development of the National Capital Region Planning Board
Package 2 Component B
TA No. 7055-IND

Volume V-A3 : Detailed Drawings
Detailed Project Report for Flyover at Mohan Nagar Junction in Ghaziabad

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Capacity Development of the National Capital Region Planning Board (NCRPB) – Component B (TA No. 7055-IND)

FINAL REPORT
Volume V-A3: DPR for Flyover at Mohan Nagar Junction in Ghaziabad
Detailed Drawings

July 2010
A) GENERAL

1. These notes are applicable for drawings for RSC structure (IPSC) structures to the extent relevant.
2. The design of flyovers to be done in accordance with the IRC Codes of practice, IRC-901 standards and specifications and relevant IS Codes of practice.
   Following codes shall be referred for any clarification:
   I. IRC - 5 - 2000
   II. IRC - 6 - 2000
   III. IRC - 16 - 2000
   IV. IRC - 21 - 2000
   V. IRC - 78 - 2000
   VI. IRC - 83 - 2000
3. The construction shall be done in accordance with MORTH specification for road and bridge work - 2000 and other supplementary technical specifications.
4. All dimensions are in mm; only written dimensions shall be followed. No drawing shall be scaled. Levels and Elevations are in meters unless specified otherwise.
5. The following loads have been considered in the design:
   a) Two lane of IRC Class 70HR or four lanes of IRC Class A on carriageway, whichever produces the worst effect.
   b) Weighing test load with density of 2.2 T/m cube is considered in the design.
6. The designs are applicable for "SEVERE" conditions of exposure.

B) MATERIALS SPECIFICATIONS
Concrete
1. Concrete shall be of design mix and shall have characteristic strength for different type as follows:
   1) Girders/Deck slab/ Diaphragms
   2) Pier cap/Pier pedestal
   3) Prestressed anchorages
   4) Crash Barrier
   5) Leveling course
2. Ordinary Portland cement conforming to IS:2690 or High strength Ordinary Portland cement conforming to IS:5152 is capable of achieving the required design concrete strength shall only be used.
3. To improve workability of concrete and cement grout, admixtures conforming to IS:6255 and IS:3103 could be permitted subject to satisfactory proven use.
4. Minimum cement content shall be 380 Kg/m³ for RCC structure and 400 Kg/m³ for PSC.
5. Maximum water cement ratio shall be 0.40.
6. The nominal maximum size of aggregate to be used in RCC works shall be 20mm.
Reinforcement
1. All reinforcing steel shall be of High Yield Strength Deformed Bars, Grade designation Fe-415 conforming to IS:1415-1978 and 450 MPA Grade designation Fe-500, conform to IS:1432 part-l.
2. Notation for bar reinforcement shall be as follows.
   a) Diameter of bar
   b) Centre to centre
   3. Bar spacing indicated on the drawing shall be perpendicular to bars unless indicated in the drawing.
   4. Steel space bars shall be provided between adjacent layers of parallel reinforcement spaced at not more than 6 times the bars diameter. The diameter of the space bar shall be at least 25mm but not less than the bars diameter.
   5. Binding wire should be annealed 16 gauge mild steel wire free from corrosive matter, dust etc.
Water
1. Water to be used in concrete, grouting and curing shall conform to Clause A.1 of IRC, SP-35-2000.
2. Maximum water cement ratio shall be 0.40.
Expansion Joints
1. The expansion joints must be robust, durable, watertight and replaceable. It must be provided over the full width of superstructure including kerb and footpath following the profile of the same (where relevant).
2. Expansion joints shall be of approved manufacturers and be of proven type. Details of expansion joints shall be approved before commencement of construction. Site fabricated expansion joints shall be prohibited.
3. Presence of manufacturers representative at the time of positioning of embedded parts and installation of expansion joints is mandatory.
Bearings
1. POT type of bearings from approved manufacturers shall only be used.
2. Presence of manufacturers representative at the time of placement of bearings is mandatory. Pedestals details at every location shall be worked out separately by the contractor approved by the Engineer-in-Charge.
C) WORKMANSHIP/DETAILING
1. Cover
   Minimum cover to any reinforcement shall be as specified in IRC, 21 - 2000 clause 303.4 unless specified otherwise.
   Clear cover to main reinforcement shall be as follows:
   a) Girders/Deck slab/ Diaphragms
   b) Pier cap/Pier pedestal
   c) Prestressed anchorages
   d) Crash Barrier
   For ensuring proper cover to reinforcement bars, mortar blocks of same grade as of the parent concrete shall be provided & should be able to withstand cramping during concreting.
   2. Wisking of reinforcement bars shall not be permitted.
   4. Construction joints shall be provided at locations shown in the drawing.
   5. Minimum length shall be kept as 60d where "d" is the diameter of bars.
6. Supporting diaphragms shall be less than 12 mm shall be provided at suitable intervals, as per IS:2502-1983
7. Every edge of concrete shall be chamfered (0.5m x 0.15m).
8. Shuttering plates shall be suitably stiffened to enable the compaction by form vibrations.
9. Full wall screen vibrator shall be used for compaction of concrete in deck slab. Proper compaction of concrete shall be ensured by the use of form and/or needle vibrators.
10. Formwork details shall be submitted by the contractor for approval of the Engineer-in-Charge and shall be tested before use.
11. Bar sizers shall be used where needed according to approved fabrication drawings. Indicating them clearly and shall conform to provisions of IRC 21 - 2000 and other relevant clauses.
12. All setting out dimensions, reduced levels, concrete dimensions to be verified at site before construction commences. Any discrepancy shall be brought to the notice of the Engineer in Charge.

D) SPECIAL NOTES ON PRESTRESSING
1. Ultimate tensile strength of the wire shall not be less than 1861 N/mm².
2. H.T. wire shall conform to appendix 1 of IS:1785 part-1.
3. All cables shall have smooth profile (without kinks).
4. BBR system of prestressing or equivalent system shall be adopted after getting the consent of the design engineer.
5. Sheathing for the cables shall be made of corrugated HDPE ducts of approved make.
6. The expansion joints are based on the following disks, wobble coefficient 0.05% length.
7. Tensioning force shall be measured. A slip of form is considered in design. No extra allowance is permissible.
8. The ducts shall be grouted after stressing is completed. As per appendix 5 of IRC-18 - 2000 and with approval of engineer-in-charge. Tensioning pressure shall be between 0.25N/mm² to 0.75N/mm².
9. The cables shall be stressed only on the 26th day after casting when grout attains strength of 80%.
10. The cables shall be stressed from both the ends simultaneously.
11. The sequence of stressing of cables shall be followed from the respective drawings.
12. The clear cover to sheathings shall be a minimum of 75mm.
13. Grout vent pipes shall be located at high and low points of the tendon profile.
14. Prestressing steel interaction with the tendons shall be adjusted as directed by engineering in charge.
15. For details of anchorages adopted refer bara zma compact system. (anchor type M25)
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