SCHEDULE OF REINFORCEMENT

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>LOCATION</th>
<th>BAR MKD.</th>
<th>SHAPE</th>
<th>DIA. (mm)</th>
<th>SPACING (mm)</th>
<th>LENGTH (M.)</th>
<th>NOS.</th>
<th>TOTAL LENGTH (M.)</th>
<th>TOTAL WEIGHT (Kg.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>SLAB-BOTTOM</td>
<td>a1</td>
<td></td>
<td>25</td>
<td>125</td>
<td>11550</td>
<td>96</td>
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<td>SLAB-BOTTOM</td>
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<td>12435</td>
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QUANTITIES (PER SPAN)

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<tr>
<td>CONCRETE (cu.m.)</td>
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<tr>
<td>STEEL</td>
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</tr>
<tr>
<td>ASPHALTIC WEARING COAT (sq.m.)</td>
<td>113.36</td>
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</tbody>
</table>

NOTES:
1. ALL DIMENSIONS ARE IN MM UNLESS SPECIFIED OTHERWISE ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
2. GRADE OF CONCRETE:-
   (a) M-30 CONCRETE SHALL BE USED FOR SUPERSTRUCTURE.
3. SIZE OF COURSE AGGREGATE SHALL BE 20 mm & DOWN GRADED.
4. CLEAR COVER TO REINFORCEMENT SHALL BE 40 mm.
5. HY.S.D. BARS CONFIRMING TO IS-15015 WITH YIELD STRESS 415 Mpa
7. USE STANDARD DRAWINGS FOR:-
   (a) DRAINAGE SPOUTS AS PER DRG. SD/103.
   (b) RAILING AS PER DWR. SD/201
   (c) EXPANSION JOINT AS PER MOST STD. DRG.
   (d) 75 AVE. WEARING COAT AS PER DRG. SD/104.
   (e) APPROACH SLAB AS PER DRG. SD/107
   (f) SUPER STRUCTURE AS PER DRG. SD/107
8. LOADING AS PER IRC - 6

M/s Lion Engineering Consultants, Bhopal

Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Manu - Simlung Section of NH-44A (86 Kms) In The State of Tripura on EPC Mode.
NOTES:

1. ALL DIMENSIONS ARE IN MM UNLESS SPECIFIED OTHERWISE ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
2. GRADE OF CONCRETE:-
   (a) M-30 concrete shall be used for superstructure.
3. SIZE OF COURSE AGGREGATE SHALL BE 20 mm & DOWN GRADING.
4. CLEAR COVER TO REINFORCEMENT SHALL BE 40 mm.
5. H.Y.S.D. BARS CONFIRMING TO IS-15196 WITH YIELD STRESS 415 Mpa.
7. USE STANDARD DRAWINGS FOR:-
   (a) DRAINAGE SPOUTS AS PER DRG. SD/103.
   (b) EXPANSION JOINT AS PER MOST STD. DRG. NO. 304.6.6. OF IRC 21-2000.
8. LOADING AS PER IRC-6
1. All dimensions are in mm, unless otherwise specified.
2. Size of coarse aggregate as per M.O.S.T. specifications.
3. Clear cover to reinf 40 mm.
5. Ø indicates hdy bar confirming to IS:1785-1979.
6. Lap length of bars shall be 43 X DIA of bars, not more than 50% bars shall be lapped at any section.

**NOTES:**

**REFERENCES DRG:**

1. DRG. NO. SD/200 GENERAL NOTES.
2. DRG. NO. SD/201 DETAILS OF R.C.C.RAILING.
3. DRG. NO. SD/203 DETAILS OF ELASTOMERIC BEARINGS ORG. NO. SD/203.
4. DRG. NO. SD/204 DETAILS OF ROLLER & ROLLER BEARINGS.
5. DRG. NO. SD/205 DETAILS OF MISCELLANEOUS ITEM.
6. DRG. NO. SD/242 DETAILS OF DECK SLAB (FOR BRIDGES WITHOUT FOOTPATHS).
7. DRG. NO. SD/244 DETAILS OF LONGITUDINAL GRIDDERS.
8. DRG. NO. SD/245 DETAILS OF CROSS GRIDDERS.
9. DRG. NO. SD/246 SH-1 & SH-2 DETAILS OF REINFORCEMENT.
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
2. ALL REINFORCEMENT SHOWN IN THIS DRAWING ARE TMT BARS CONFORMING TO I.S:1786 GRADE Fe 415.
3. DEVELOPMENT LENGTH WHEREVER PROVIDED SHALL BE AS PER CLAUSE 304.6.2.1 OF IRC 21-2000.
4. GRADE OF CONCRETE SHALL BE M30.
5. THESE DRAWINGS GENERATED ON THE BASIS OF MOST STD. DRAWING NO.-SD/242.
NOTE:
1. The location of jacks for lifting of the superstructure to replace bearing etc. is shown thus. The shall be distinctly etched for easy identification on the end cross girders and pier/abutment caps.
2. During the lifting operation, all the six jacks placed under the end cross-girder in line with the bearings shall be operated simultaneously using single operating console, grouping the pump and control system, so as to ensure that the reaction on all the six jacks are equal at all times.
3. Capacity of each jack shall not be less than 41 ton.
4. This drawing shall be read in conjunction with following drawings.
   a. General notes...Drg. No. SD/200
   b. Details of elastomeric bearings...Drg. no. SD/203.
   c. Details of elastomeric bearings...Drg. no. SD/203.
   d. General arrangement (for bridges without footpaths) Drg. No. SD/240.
   g. Detail of Deck Slab (for bridges with footpaths) Drg. No. SD/243.
   h. Detail of Deck Slab (for bridges with footpaths) Drg. No. SD/243.
   i. Detail of Longitudinal girders (for bridges without footpaths) Drg. No. SD/244.
**SCHEDULE OF REINFORCEMENT (PER SPAN)**

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>TYPE OF BARS</th>
<th>SHAPE OF BARS</th>
<th>DIA. (mm)</th>
<th>LENGTH (mm)</th>
<th>NO.</th>
<th>TOTAL LENGTH (M.)</th>
<th>TOTAL WEIGHT (Kg.)</th>
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<td>127.01</td>
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**MAXIMUM DEAD LOAD REACTIONS (IN K.N.)**

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<td>1636</td>
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**NOTE:-**

1. Dimension in the schedule are given as per IS:2502-1963.
2. The exact length of the bars will be determined by the actual laps/splices adopted at side.
3. This drawing shall be read in conjunction with following drawing
   a. General notes... Drg. No. SD/200
   b. Details of cross section girders... Drg. No. SD/245
   c. Schedule of reinforcement... Drg. No. SD/247 Sh-1

**M.S. BARS (MESH REINFORCEMENT IN LONGITUDINAL GIRDER)**

<table>
<thead>
<tr>
<th>QUANTITIES (PER SPAN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Steel ... ... H.Y.S.D BARS 19.81T</td>
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<tr>
<td>Including 5% extra M.S BARS ... 0.06T</td>
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</tbody>
</table>

References:

- General notes... Drg. No. SD/200
- Details of cross section girders... Drg. No. SD/245
- Schedule of reinforcement... Drg. No. SD/247 Sh-1
### SCHEDULE OF REINFORCEMENT (PER SPAN)

#### HYSB BARS

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>TYPE OF BAR</th>
<th>SHAPE OF BAR</th>
<th>DIA. (mm)</th>
<th>TOTAL LENGTH (M)</th>
<th>TOTAL WEIGHT (kg)</th>
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<tbody>
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<td>1.</td>
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#### M.S. BARS (MESH REINFORCEMENT IN LONGITUDINAL GIRDERS)

<table>
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<th>SL. NO.</th>
<th>TYPE OF BAR</th>
<th>SHAPE OF BAR</th>
<th>DIA. (mm)</th>
<th>TOTAL LENGTH (M)</th>
<th>TOTAL WEIGHT (kg)</th>
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<tr>
<td>1.</td>
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</tbody>
</table>

---

### NOTE:

1. Dimension in the schedule are given as per IS-2062-1963.
2. The exact length of the bars will be determined by the actual laps/splices adopted at side.
3. This drawing shall be read in conjunction with following drawing:
   a. General notes. Drg. No. SD/200
   b. Details of deck slab (for bridge with footpaths)...
      Drg. No. SD/243
   c. Details of longitudinal... Drg. No. SD/244

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Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two Lane With Paved Shoulders of Manu - Similung Section of NH-44A (86 Kms) In The State of Tripura on EPC Mode.

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**M/s Lion Engineering Consultants, Bhopal**

**NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)**

**DEVELOPMENT CORPORATION LIMITED (NHIDCL)**

**PACKAGE-1**

MANU-LALCHERA-CHALEN GTA

SECTION OF NH-44A
1. SPECIFICATIONS INCLUDING PERMISSIBLE TOLERANCES FOR THE ELASTOMERIC BEARINGS SHALL BE IN ACCORDANCE WITH I.R.C.: 83 PART II 1987 STANDARD SPECIFICATIONS AND CODE OF PRACTICE FOR ROAD BRIDGES SECTION IX PART II ELASTOMERIC BEARINGS.


<table>
<thead>
<tr>
<th>ZONES</th>
<th>APPLICABILITY TO BRIDGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>I AND II</td>
<td>ALL BRIDGES</td>
</tr>
<tr>
<td>III AND IV</td>
<td>ALL BRIDGES UPTO TOTAL LENGTH OF 60 M</td>
</tr>
<tr>
<td>III AND IV</td>
<td>BRIDGES MORE THAN 60 M LENGTH (WHERE HORIZONTAL COEFFICIENT ($v_{0.075}$))</td>
</tr>
</tbody>
</table>

3. RAW MATERIAL: - CHLOROPRENE (CR) SHALL ONLY BE USED IN MANUFACTURE OF BEARINGS.

3.1 GRADES OF RAW ELASTOMER OF PROVEN USE IN ELASTOMERIC BEARINGS WITH LOW CRYSTALLIZATION RATES AND ADEQUATE SHELF LIFE (E.G. NEOPRENE WRT BAYPRENE NO OR EQUIVALENT) SHALL BE USED NO RECLAIMED RUBBER OR VULCANISED WASTES SHALL BE USED. THE RAW ELASTOMER CONTENT OF THE COMPOUND SHALL NOT BE LOWER THAN 60 %. THE ASH CONTENT SHALL NOT EXCEED 5% (AS PER TESTES CONDUCTED IN ACCORDANCE WITH ASTM D - 297) EPDM AND OTHER SIMILAR CANDIDATE ELASTOMERS FOR BRIDGE BEARINGS USE SHALL NOT BE PERMITTED.


5. ELASTOMERIC BEARINGS SHOULD NOT BE USED IN AREAS WHERE THE MINIMUM TEMPERATURE GOES BELOW (-) 100C.

6. BEARINGS SHALL BE HANDLED CAREFULLY. THESE SHALL BE PROJECTED FROM BRIGHT SUNLIGHT AND EXTREME COLD. THESE SHALL BE STORED NEATLY UNDER COVER TILL INSTALLATION.

7. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRG. NO. (i) DRAWINGS FOR GENERAL ARRANGEMENT, DETAILS OF LONGITUDINAL GIRDERS AND DETAILS FOR CROSS GIRDERS FOR THE CORRESPONDING SPANS.

8. BEARINGS SHALL BE PROCURED ONLY FROM PRE-QUALIFIED MANUFACTURES.
NOTES: -
1. ALL DIMENSIONS ARE IN MM, UNLESS OTHERWISE SPECIFIED.
2. SIZE OF COARSE AGGREGATE AS PER M.O.S.T. SPECIFICATIONS.
3. CLEAR COVER TO REINF 40 MM.
5. Ø INDICATES HYDRO BAR CONFIRMING TO IS: 1786-1979.
6. LAP LENGTH OF BARS SHALL BE 43 X DIA OF BARS, NOT MORE THAN 50% BARS SHALL BE LAPPED AT ANY SECTION.

EXTERNAL ENG. :-
1. ENG. NO. SC/002 GENERAL NOTES.
2. ENG. NO. SD/001 DETAILS OF R.C.C.RAILING.
3. ENG. NO. SD/002 DETAILS OF ELASTOMERIC BEARINGS ENG. NO. SD/103.
4. ENG. NO. SD/003 DETAILS OF ROCKER & ROLLER BEARINGS.
5. ENG. NO. SD/010 DETAILS OF MISCELLANEOUS ITEMS.
6. ENG. NO. SD/011 DETAILS OF DECK SLAB (FOR BRIDGES WITHOUT FOOTPATHS.
7. ENG. NO. SD/024 DETAILS OF LONGITUDINAL DIREDERS.
8. ENG. NO. SD/025 DETAILS OF CROSS GIRDERS.
9. ENG. NO. SD/026 DETAILS OF REINFORCEMENT.
The Reinforcement for railing posts should be properly anchored in the deck slab before casting the slab.

2. This drawing shall be read in conjunction with following drawings.
   (i) General notes-Drg. No. SD/200.
   (ii) Details of R.C.C. Railing - Drg. No. SD/201.
   (iii) Details of Elastomeric bearings-Drg. No. SD/203.
   (iv) Details of rocker and roller bearings-Drg. No. SD/204.
   (v) Details of miscellaneous item-Drg. No. SD/205.
   (vi) General arrangement (for bridges without footpaths-Drg. No. SD/220.
   (vii) Details of longitudinal girders-Drg. No. SD/224.
   (viii) Details of Cross - girders-Drg. No. SD/225.
   (ix) Schedule of reinforcement- Drg. No. SD/226. Sh.1 7 Sh.-2.

Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Manu - Simlung Section of NH-44A (86 Kms) In The State of Tripura on EPC Mode.
LONGITUDINAL SECTION OF OUTER GIRDER

LONGITUDINAL SECTION OF INNER GIRDER

SECTION A-A

SECTION B-B

SECTION C-C

SECTION D-D

NOTES

1. Longitudinal girder shall be given upward camber on account of dead load deflection as given in the table - I
2. 32 Ø spacer bars shall be provided @ 1 m/c/c between two tiers of longitudinal bars of girders.
3. This drawing shall be read in conjunction with the following drgs.
   a. General notes.....Drg No. SD/200.
   b. Details of elastomeric bearing Drg. No. SD/203
   c. Details of rocket and roller bearing Drg. No. SD/204
   d. General arrangement (for Bridge without footpath)
      Drg. No. SD/220
   e. General arrangement (for
      Bridge with footpath) Drg. No.
      SD/221
   f. Details of deck slab (for Bridge without footpath) Drg.
      No. SD/222
   g. Details of deck slab (for Bridge with footpath) Drg. No.
      SD/223
   h. Details of cross girders... Drg. No. SD/225
   i. Schedule of reinforcement (for Bridge without
      footpath) Drg. No. SD/226. Sh-1 & Sh-2
   j. Schedule of reinforcement (for Bridge with footpath)
      Drg. No. SD/227. Sh-1 & Sh-2

TABLE I

<table>
<thead>
<tr>
<th>C.L. OF SPAN</th>
<th>DEAD LOAD</th>
</tr>
</thead>
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<tr>
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<td>1.00</td>
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</table>

FOR DECK SLAB

REFER DRG

C.L. OF SPAN

LONGITUDINAL SECTION OF INNER GIRDER

DEAD LOAD DEFLECTION DIAGRAM
NOTES :-

1. The location of jacks for lifting of the superstructure to replace bearing etc. is shown thus ▲. The shall be distinctly etched for easy identification on the end cross girders and pier/abutment caps.

2. During the lifting operation, all the six jacks placed under the end cross-girder in line with the bearings shall be operated simultaneously using single operating console, grouping the pump and control system, so as to ensure that the reaction on all the six jacks are equal at all times.

3. Capacity of each jack shall not be less than 41 ton.

4. This drawing shall be read in conjunction with following drawings.
   i) General notes...Drg. No. SD/200.
   ii) Details of elastomeric bearings...Drg. no. SD/203.
   iii) Details of rocker and roller bearings...Drg. no. SD/204.
   iv) General arrangement (for bridges without footpaths) Drg. No. SD/220.
   v) General arrangement (for bridges with footpaths) Drg. No. SD/221.
   vi) Detail of Deck Slab (for bridges without footpaths) Drg. No. SD/222.
   vii) Detail of Deck Slab (for bridges with footpaths) Drg. No. SD/223.
   viii) Detail of Longitudinal girders (for bridges without footpaths) Drg. No. SD/224.
   ix) Schedule of reinforcements for 21.6 m span (for bridges without footpaths) Drg. No. SD/226.
   x) Schedule of reinforcements for 21.6 m span (for bridges with footpaths) Drg. No. SD/227.
**SCHEDULE OF REINFORCEMENT (PER SPAN)**

### A) H Y S D BARS

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>TYPE OF BARS</th>
<th>SHAPE OF BARS</th>
<th>DIA. (mm)</th>
<th>LENGTH (m)</th>
<th>NO.</th>
<th>TOTAL LENGTH (M.)</th>
<th>TOTAL WEIGHT (Kg.)</th>
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### B) M.S. BARS (MESH REINFORCEMENT IN LONGITUDINAL GIRDLERS)

1. U
2. V

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**NOTE:**

1. Dimension in the schedule are given as per IS:2502-1963.
2. The exact length of the bars will be determined by the actual laps/splices adopted at side.
3. This drawing shall be read in conjunction with following drawing:
   a. General notes: Drg. No. SD/200
   b. Details of deck slab (for bridge without footpaths): Drg. No. SD/222
   c. Details of longitudinal: Drg. No. SD/224 Sh-1
# SCHEDULE OF REINFORCEMENT (PER SPAN)

## HYSD BARS

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>TYPE OF BARS</th>
<th>SHAPE OF BARS</th>
<th>DIA. (mm)</th>
<th>LENGTH (mm)</th>
<th>NO.</th>
<th>TOTAL LENGTH (m)</th>
<th>TOTAL WEIGHT (Kg)</th>
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## MAXIMUM DEAD LOAD REACTIONS (IN K.N.)

<table>
<thead>
<tr>
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<th>At Abutment</th>
<th>At Pier</th>
</tr>
</thead>
<tbody>
<tr>
<td>2137</td>
<td>4274</td>
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</tr>
</tbody>
</table>

## M.S. BARS (MESH REINFORCEMENT IN LONGITUDINAL GIRDER)

### QUANTITIES (PER SPAN)

1. STEEL 26.50 T. H.Y.S.D. BARS 0.06 T. M.S. BARS
   (including 5% extra for laps and wastage)

2. CONCRETE 152.00 m³
   * Excluding quantities for railing

### NOTE:-

1. Dimension in the schedule are given as per IS:2502-1963.
2. The exact length of the bars will be determined by the actual laps/splices adopted at side.
3. This drawing shall be read in conjunction with following drawing
   a. General notes...Drg. No. SD/200
   b. Details of cross section girders...Drg. No. SD/225
   c. Schedule of reinforcement... Drg. No. SD/226 Sh-1

### MAXIMUM DEAD LOAD REACTIONS (IN K.N.)

<table>
<thead>
<tr>
<th></th>
<th>At Abutment</th>
<th>At Pier</th>
</tr>
</thead>
<tbody>
<tr>
<td>8585</td>
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</tr>
<tr>
<td>1453</td>
<td>36.24</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>9.95</td>
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### SCHEDULE OF REINFORCEMENT (SD-226, SH-2) - (FOR 21.6M SPAN)

## M.S. BARS (MESH REINFORCEMENT IN LONGITUDINAL GIRDER)

### QUANTITIES (PER SPAN)

1. STEEL 26.50 T. H.Y.S.D. BARS 0.06 T. M.S. BARS
   (including 5% extra for laps and wastage)

2. CONCRETE 152.00 m³
   * Excluding quantities for railing

### NOTE:-

1. Dimension in the schedule are given as per IS:2502-1963.
2. The exact length of the bars will be determined by the actual laps/splices adopted at side.
3. This drawing shall be read in conjunction with following drawing
   a. General notes...Drg. No. SD/200
   b. Details of cross section girders...Drg. No. SD/225
   c. Schedule of reinforcement... Drg. No. SD/226 Sh-1

### MAXIMUM DEAD LOAD REACTIONS (IN K.N.)

<table>
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<tr>
<th></th>
<th>At Abutment</th>
<th>At Pier</th>
</tr>
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<tr>
<td>8585</td>
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<td>24</td>
<td>9.95</td>
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### SCHEDULE OF REINFORCEMENT (SD-226, SH-2) - (FOR 21.6M SPAN)
SCHEDULE OF REINFORCEMENT (Per Approach Slab)

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>LOCATION</th>
<th>BAR MKD.</th>
<th>SHAPE</th>
<th>DIA. (mm)</th>
<th>SPACING (mm)</th>
<th>LENGTH (mm)</th>
<th>NOS.</th>
<th>TOTAL LENGTH (m)</th>
<th>WEIGHT (kg)</th>
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<td>11020</td>
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<tr>
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<td>SLAB-TOP</td>
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<td>11020</td>
<td>24</td>
<td>264.48</td>
<td>235</td>
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</table>

NOTES:-
1. ALL DIMENSIONS 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 CONFIRM TO DRAWING NO. SD/105 OR SD/106 OR ANY OTHER APPROVED TYPE.
3. DIMENSIONS IN SCHEDULE OF REINFORCEMENT ARE GIVEN AS PER IS 2502.
4. SCHEDULE OF REINFORCEMENT DOES NOT INCLUDE CHANGE IN REINFORCEMENT AROUND INSPECTION CHAMBER, PRECAST COVER TO CHAMBER AND RAILINGS.
NOTE:  
1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSION ARE TO BE FOLLOWED.
2. SPlicing OF MAIN LONGLITUAL BARS IN DECK SLAB SHALL BE AVOIDED AS FAR AS PRACTICABLE.
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 CONFIRM TO IS 1838. PRODUCTS WITH I.S.I. CERTIFICATION MARK SHALL ONLY BE USED.
5. THIS DRAWING GENERATED ON THE BASIS OF MOST STD. DRAWING NO. SD/103.
6. THIS DRAWING SHOULD BE CORELATE WITH STD. DRAWING MOST SD/103 AT THE TIME EXECUTION.

Expansion Joints:
1. THE EXPANSION JOINTS MUST BE ROBUST, DURABLE, WATER TIGHT AND REPLACEABLE. IT MUST BE PROVIDED OVER THE FULL WIDTH OF SUPERSTRUCTURE INCLUDING KERB AND FOOTPATH FOLLOWING THE PROFILE OF THE SAME WHERE RELEVANT. EXPANSION JOINTS SHALL BE OBTAINED ONLY FROM APPROVED MANUFACTURES AND BE OF PROVEN TYPE. DETAILS OF EXPANSION JOINTS MAY BE GOT APPROVED BEFORE COMMENCEMENT OF CONSTRUCTION. SITE FABRICATED EXPANSION JOINTS SHALL BE PROHIBITED.
2. THE EXPANSION JOINT SHALL HAVE THE FOLLOWING ADDITIONAL ESSENTIAL FEATURES:
   i. IT SHALL CATER FOR A TOTAL MOVEMENT OF 20 MM WITH ORIGINAL GAP OF 40 MM BETWEEN CONCRETE FACES.
   ii. IT SHALL BE EITHER FROM ELASTOMER OR SHALL HAVE A CUSHION OF ELASTOMER TO ENABLE ABSORPTION OF SHOCK TRANSMITTED BY VEHICLES.
   iii. FABRICATED STEEL PARTS IN THE NOISING OF EXPANSION JOINTS SHALL BE POSITIONED ACCURATELY BEFORE THE CONCRETING OF THAT PORTION OF THE DECK SLAB.
   iv. PRESENCE OF MANUFACTURER’S REPRESENTATIVE AT THE TIME OF CONCRETING OF NOISING AND INSTALLATION OF EXPANSION JOINTS IS MANDATORY.


BITumen – A BITumen COMPOSITION OF AIR-BLOW GRADE HAVING A SOFTENING POINT (RING AND BALL METHOD) OF NOT LESS THAN 80 °C.

**CONSULTANTS:** M/s Lion Engineering Consultants, Bhopal

**CLIENT:** National Highways Infrastructure Development Corporation Limited (NHIDCL)

**ENGINEERING CONSULTANTS Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two Lane With Paved Shoulders of Manu - Simlung Section of NH-44A (86 Kms) In The State of Tripura on EPC Mode.**

**PACKAGE-1**

**PROJECT TITLE:** MANU-LALCHERA-CHALENTA SECTION OF NH-44A
(A) GENERAL

1. These notes are applicable for the Standard Drawings for R.C.C. T-beam and slab superstructure with and without footpath.

2. These drawings are applicable only for right bridges with over all width of 12m.

3. No. raised footpath 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 shall be followed in drawing shall be scaled.

5. Design criteria:
   i. The design is to the following codes:
      (a) IRC : 5-1985
      (b) IRC : 6-1966 (Reprint)
      (c) IRC : 21-1987 (Part-I)
      (d) IRC : 83-1987 (Part-II)

   ii. The Following loads have been considered in the design:
      (a) IRC : 5-1985
      (b) IRC : 21-1987
      (c) IRC : 21-1987 (Reprint)
      (d) IRC : 83-1987

   iii. For detailed information with footpaths, refer clause 222 of IRC 6-1996. Reprint - 1985

6. (B) MATERIALS SPECIFICATION

   Concrete:
   1. Concrete shall be design mix and shall have minimum 28 days characteristic strength on 150 mm cubes as 25 MPa for “MODERATE” condition of exposure and 30 MPa for “SEVERE” condition of exposure.
   2. High strength ordinary portland cement conforming to IS: 8112 or 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. To improve workability of concrete, admixtures conforming to IS : 6925 and IS:19/103 may be permitted subject to satisfactory proven use. Admixtures generating hydrogen, nitrogen etc. should not be used.
   4. Concrete content in concrete shall not be less than 310 kg/cum of concrete for “MODERATE” environment and 400 kg/cum of concrete for “SEVERE” environment.
   5. Maximum water cement ratio shall be 0.45 for “MODERATE” environment and 0.40 for “SEVERE” environment.

   Reinforcement:
   All reinforcing steel shall be of High Yield Strength Deformed Bars (Grade designation S 415) conforming to IS:1786 (except for mesh reinforcement which shall be MS bars Grade designation S 240 conforming to IS:432 Part-I mild steel.

Water:
Water to be used in concreting and curing shall conform to Clause 302.4 of IRC : 21-1987.

Expansion Joints:
1. All expansion joints must be robust, durable, water tight and replaceable. It must be provided over the full width of superstructure including kerb and footpath following the profile of the same (where relevant). Expansion joints shall be only from approved manufacturers and be of proven type. Design of expansion joints may be got approved before commencement of construction. Site fabricated expansion joints shall be prohibited.

2. The expansion joint shall have the following additional essential features:
   i. It shall cater for a total movement of 20mm with original gap of 40mm between concrete faces.
   ii. It shall be either from elastomer or shall have a cushion of elastomer to enable absorption of shock transmitted by vehicles.

3. Fabricated steel parts in the nosing of expansion joints shall be positioned accurately before the concreting of that portion of the deck slab.

4. Presence of manufacturer's representative at the time of concreting of nosing and installation of expansion joints is mandatory.

Bearings:

(C) WORKMANSHIP / DETAILING

1. Minimum clear cover to all reinforcement including stirrups shall be 50 mm unless shown otherwise in the drawings. This shall be distinctly etched on end cross girders and pier/ abutment caps.

2. Bearing of reinforcement bars shall be as per IS:2502.

3. Supporting bars shall be provided at intervals as per IS:2502.

4. Concrete shall be produced in a mechanical mixer of capacity not less than 200 tnes having integral weigh batching facility and automatic water measuring and dispensing device.

5. Proper compaction of concrete shall be ensured by use of form and/or needle vibrators. Use of full width screw vibrators for compaction of concrete in deck slab shall be ensured.

6. Shuttering plates shall suitably be stiffened to enable the compaction by form vibrators.

7. Sharp edges of concrete shall be chamfered.

8. The Location of Jacks for lifting up the superstructure to replace bearing etc. is shown thus : This shall be distinctly etched on end cross girders and pier/ abutment caps.

(D) SPECIFICATIONS

The work shall be executed in accordance with MOST Specifications for Road & Bridge Works (2nd revision, 1988) except where-over otherwise mentioned.

(E) REFERENCE TO DRAWINGS

Drawing No.
Drg. No. SD/201
Details of R.C.C. railings
(for bridges without footpaths.)

Drg. No. SD/202
Details of R.C.C. railings
(for bridges with footpaths.)

Drg. No. SD/203
Details of elastic bearings.

Drg. No. SD/204
Details of Rucker and roller bearings.

Drg. No. SD/205
Details of miscellaneous items.

M/s Lion Engineering Consultants, Bhopal
NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)

Project Title: R.C.C. T-BEAM AND SLAB SUPER STRUCTURE WITH & WITHOUT FOOTPATH

Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two Lane With Paved Shoulders of Manu - Similung Section of NH-44A (86 kms) In The State of Tripura on EPC Mode.

PLAN \ LAYOUT DRAWING

PACKAGE-1
MANU-LALCHERA-CHALENGTA
SECTION OF NH-44A