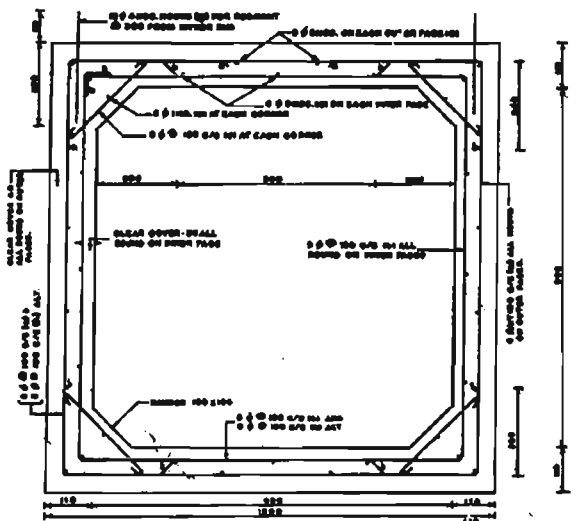
500.13.

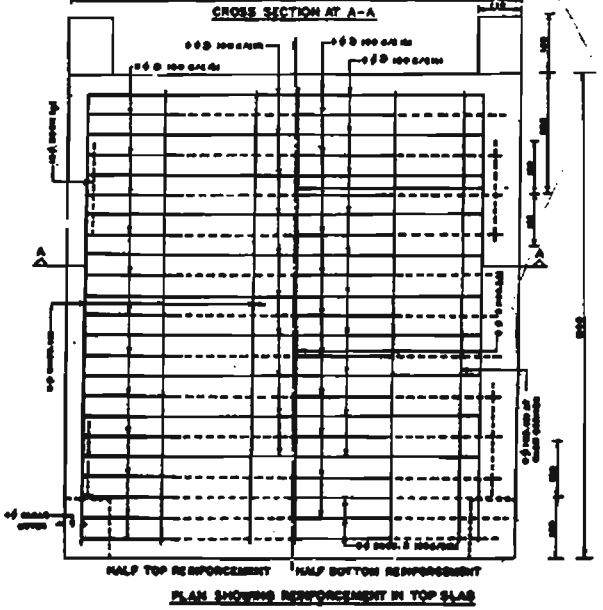
No. NHII/Misc/W/78 *Dated the 8th February, 1978*

Subject : Construction of Pre-Cast R.C.C. Box culverts

1. The present practice of construction of cross drainage works as per the conventional R.C. slab deck involves massive sections of piers/abutments and foundations. Besides, construction takes substantial time causing inconvenience to the fast moving traffic along the National Highways. As an alternative, pipe

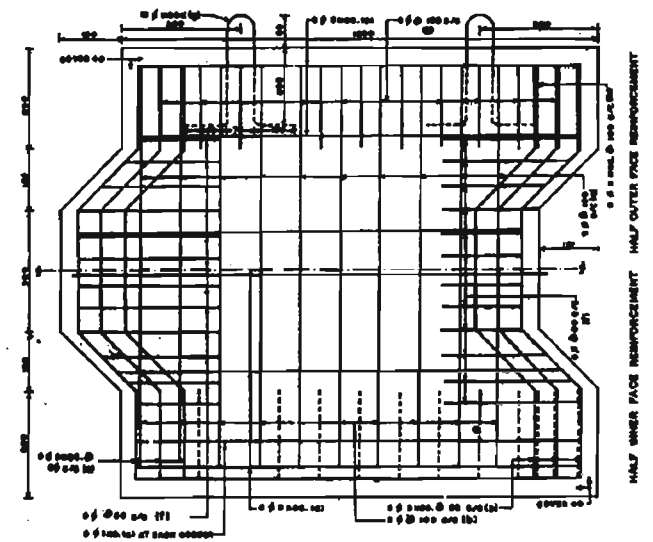


CROSS SECTION AT A-A



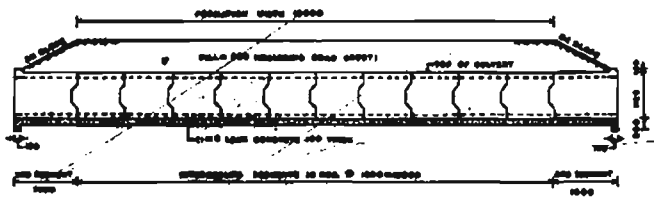
HALF TOP REINFORCEMENT HALF BOTTOM REINFORCEMENT

PLAN SHOWING REINFORCEMENT IN TOP SLAB



HALF INNER FACE REINFORCEMENT HALF OUTER FACE REINFORCEMENT

SIDE ELEVATION

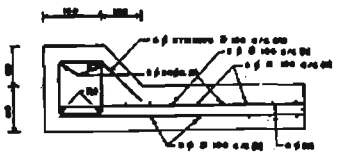


CROSS SECTION

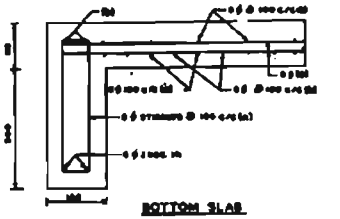
HIGH YIELD STRENGTH DEFORMED BARS

NOTES:-

1. CONCRETE SHALL HAVE A MINIMUM 28 DAYS WORKS CUBE STRENGTH OF 200 KG/CM² ON 150mm CUBES.
2. REINFORCEMENT STEEL USED SHALL BE HIGH YIELD STRENGTH DEFORMED BARS CONFORMING TO I.S. 432-1966 OR I.S. 1786-1966 WITH LATEST AMENDMENTS.
3. CONCRETE COVER OF 25 mm. ON INNER FACES AND 40 mm ON OUTER FACES SHALL BE PROVIDED. STRICT QUALITY CONTROL SHALL BE EXERCISED SO AS TO PROVIDE WELL COMPACTED DENSE CONCRETE.
4. THE DETAILS SHOWN IN THIS DRAWING SHALL BE APPLICABLE FOR AN EARTH FILL OF 90 CMS. ABOVE THE BOX CULVERT (INCLUDING ROAD CRUST). IN CASE THE BOX CULVERT IS TO BE USED WHERE EARTH FILLING IS DIFFERENT FROM THE VALUE SPECIFIED ABOVE, THE BOX SECTION SHALL HAVE TO BE CHECKED FOR STRUCTURAL ADEQUACY BEFORE ADOPTING.
5. LEAN CONCRETE 1:4:8 (1 CMS. THICK MAY BE PROVIDED BELOW THE BASE OF BOX CULVERT.
6. THE MAXIMUM PRESSURE ON FOUNDATION SOIL BELOW THE BOX WORKS OUT TO 0.97 T/M². THE PERMISSIBLE BEARING CAPACITY OF SOIL MAY BE CHECKED TO ENSURE THAT IT IS NOT LESS THAN THE VALUE SPECIFIED ABOVE.
7. ADEQUATELY DESIGNED RETURN WALLS SHALL BE PROVIDED.
8. ALL DIMENSIONS ARE IN MILLIMETRES.



TOP SLAB



BOTTOM SLAB

DETAILS SHOWING THICKENING AT THE FREE ENDS OF END SEGMENTS

PRECAST R.C.C. BOX CULVERT 0.90 M x 0.90 M x 1.2 M. LONG

BRO. No. SD-/SDSC.7/77

culverts are being adopted wherever available. These are not only cheaper but quicker to construct, but pipes are not available in all places within economic lead. Therefore a need is being felt for a suitable alternative to pipes which is not only economical, but simple and quicker to construct. The pre-cast R.C. Box culvert is one such alternative.

2. The Tamil Nadu Highway Department have proposed a type design of 0.9 m × 0.9 m and 1.2 m long units of pre-cast box culverts. The proposal has been examined and accepted for adoption on National Highways. The structural aspects have also been scrutinised in the Bridge Standard Zone and a drawing No. DB/Misc/7/77 showing the details of the Box units and cross-section of box culvert has been prepared. A copy of this drawing is enclosed for information and necessary action. This may be adopted whenever found suitable. The drawing is self explanatory. it may be however mentioned here that the permissible value of the bearing capacity of the soil should not be less than 6.5 T/m^2.

3. The scheme envisages pre-casting the units at a suitable and convenient central casting yard utilising the usual equipments available normally everywhere viz., a mixer, a vibrator and a set of steel mould for casting the units. Thereafter, they are transported to the site whenever required by the usual means and erection is done by manual labour. The erection can be done by tying the unit to a wooden Balli lifted by labourers at either ends. This will not therefore require any extra erection equipment.

4. Suggestions for improvements are welcome and comments may be sent to the undersigned.