APPENDIX A
LOAD TEST ON PILES

The test was conducted as per IS-2911 Part IV-1979 Code of practice for design and construction of pile foundation (Load test on piles).

A.1 PREPARATION OF PILES FOR TEST

The top of the pile was prepared for application of loads and observation of deflections. The piles were tested after a minimum period of 28 days after casting. Suitable arrangements for transferring the uplift load to the piles were made during casting of the test pile (refer Figure A.1). The pile was taken about 300 mm above GL for working convenience and finished square. After completion of the uplift test the projection of plates above the pile head was sheared off and finished smooth with a 6 mm thick plate to provide seating for the jack for the down thrust test. For side thrust test, one of the sides of the pile head was finished smooth with a 6 mm thick steel plate.

A.2 LOAD TESTS

A.2.1 Test set up: The test set-up adopted for various types of tests is shown in Figure A.1 to A.8. The assembly comprise of a loading frame, a centre hole jack and a calibrated load cell along with other accessories like pressure gauge, dial gauges, etc.

A.2.1.1 Uplift: A central hole hydraulic jack was seated over the reaction beam and a load cell was placed above the hydraulic jack and was held in position by means of a tie rod and a lock nut. The tie rod was connected to the pile by a suitable arrangement as shown in Figure A.2 and A.6. The load was applied by operating the hydraulic pump. The load cell registers the
FIG. A1. ARRANGEMENT FOR TRANSFERRING UPLIFT LOAD

SECTION-XX
(SQUARE FINISH ABOVE GL)

SECTION-YY

SECTION-AA

DETAILED AT:

NOTE:
1. ANY ONE OF THE PILE SHOWN IN THE PILE GROUP WILL BE THE TEST PILE.
2. THE CIRCULAR PILE SHALL BE BROUGHT TO A CONICAL SHAPE FROM 200 MM CC AND FINISHED SQUARE ABOVE GROUND LEVEL.
3. 45 X 45 X 50 ON EACH SIDE OF PILE IS FOR PLACING THE DIAL GAUGE TO MEASURE THE PILE DEFLECTION.
FIG. A.2. DETAILS OF TEST SET UP FOR UPLIFT TEST

REFERENCE BEAM FOR FIXING DIAL GAUGE STAND ON EITHER SIDE OF TEST PILE TO BE SET UP TEMPORARILY AT THE TIME OF TESTING.
FIG. A3. DETAILS OF TEST SET UP-DOWN THRUST TEST
FIG. A4. DETAILS OF TEST SET UP FOR SIDE THRUST TEST
FIG. A5. DETAILS OF REACTION PILES

**DETAILS OF FOUNDATION BOLT**

**NOTES:**

1. **G.L.** DENOTES GROUND LEVEL
2. CONCRETE MIX SHALL BE OF M 200
3. THE CIRCULAR PILE SHALL BE BROUGHT TO A CONICAL SHAPE FROM 300MM BELOW GROUND LEVEL AND FINISHED SQUARE ABOVE G.L.
FIG. A6. TEST SET UP FOR UPLIFT

FIG. A7. TEST SET UP FOR DOWN THRUST
FIG. A8.a. TEST SET UP FOR SIDE THRUST
FIG. A8.b. TEST SET UP FOR SIDE THRUST
magnitude of load on the digital display unit. The pull exerted by the tie rod will cause an uplift on the pile and the deflections were indicated through the dial gauges suitably fixed to the pile.

A.2.1.2 Down thrust: The jack and the load cell were positioned in between the pile top and the reaction beam. Suitable packing was inserted in the gap (Figure A.3 and A.7) The other details of test set up are as given in test set up for uplift. (Refer Figure A.2)

A.2.1.3 Side thrust: One of the reaction piles used for supporting the reaction beam in other tests was strengthened and utilised to take-up the reaction of the jack while applying thrust. The square finished reaction pile was strengthened by abutting it to a horizontal beam properly secured to the ground. (Refer Figure A.5)

The jack and the load cell were properly positioned in between the reaction pile and the test pile in a horizontal configuration. The gap left was filled up by positioning a wooden block of suitable size. The jack was positioned on a smoothly finished surface whereas the load cell and the filler blocks were held in position by the pressure developed between the jack and the test pile. (Refer Figure A.4 and A.8).

A.2.2 Load application: The general method of load application for all the three types of tests namely:

- Uplift
- Down thrust
- Side thrust

is dealt with overleaf.
An initial load of about 5% of the safe load was applied to take up any slackness in the test set-up. The dial gauge readings at this load were taken as the base from which subsequent displacements were calculated.

Subsequent loadings were applied at an increment of approximately 20 to 25% of safe load and the corresponding deflections were noted.

Each increment of load was maintained for a period of one hour. The relaxation in load was compensated by applying additional pressure using the jack.

The safe load was maintained for 24 hours and the displacement reading was noted every hour.

After maintaining safe load for 24 hours, further loadings unto 1.5 times the safe load was applied.

The load on the pile was removed in one stage by releasing the jack steadily after completion of the test and rebound observations were made.