

DELHI DEVELOPMENT AUTHORITY
OFFICE OF THE CHIEF ENGINEER (DESIGN)
CENTRAL DESIGN ORGANIZATION


No. CE (D)TC/13/84/DDA/ 481

Dated 27 June 2005

CIRCULAR - 20 (REVISED 2005)

Sub: General Instructions for Structural Design.

Certain general instructions were issued by Chief Engineer (Design) vide Circular No. 20 (Revised 2003) dated 18.9.2003. These instructions have been modified and are re-circulated through this office Circular No. 20 (Revised 2005). It is requested that these instructions may be circulated to all Engineers working under your control.


(R.C. KINGER)
CHIEF ENGINEER (DESIGN)

Encl. As above.

All Chief Engineers / DDA.

Copy alongwith enclosures forwarded to:

1. All Executive Engineers (Design)/CDO for information.

SUPTG. ENGINEER (D)/CDO/DDA

DESIGN CIRCULAR NO. 20 (REVISED 2005)

(A) GENERAL NOTES

- 1 Work shall be taken up only for the approved scheme.
- 2 All dimensions are in mm unless otherwise specified.
- 3 In case of any discrepancy in drawings or site conditions or Architectural drawings, the same shall be brought to the notice of Central Designs Organisation for reconciliation before execution.
- 4 No dimension shall be scaled out, only written dimensions shall be followed.
- 5 All central line dimensions shall be extracted from the Architectural Drawings.
- 6 If the area requires any filling, such filling would be kept to the minimum and plinth level would be decided accordingly. Filling of earth shall be done simultaneously for equal depths on both sides of the wall.
- 7 If it is a filled up area it should be ensured that the foundation rests within the original/virgin soil at a specific depth as recommended by the soil consultant.
- 8 It may be ensured by the Executive Engineer In-charge that houses/building under construction are situated sufficiently away from a retaining wall, nallah, well or ditch so as to ensure stability of soil / building. If necessary soil consultant/Central Design Organisation should be consulted.
- 9 It must be ensured by EE In-charge that there existed no nallah, water course at site which might have been filled up and may get activated leading to ingress of water below foundations and partial settlement thereof. Effective drainage arrangement shall be made for life time of the structure.
- 10 115 mm thick walls and those above cantilever are to be non-load bearing, which will be constructed after deshuttering the slab above, unless specified otherwise.
- 11 Projections provided for ornamental effect in elevation shall be suitably anchored back to the main structure.
- 12 Masonry where supported on cantilevers shall be firmly tied to main structure in accordance with IS-4326-1993.

8. 230 mm thick load bearing brick work in cup board, provided in the rooms shall be continuous from foundation to terrace level. Brick work shall be stopped at lintel level for casting loft slab and continue over it.
9. 200 mm thick lean concrete shall be provided under masonry wall sections unless specified otherwise.
10. There shall be no change in the position of load bearing walls, from floor to floor unless specified otherwise.
11. Thickness of walls shall not be reduced for any fixture. In case such recession in masonry is necessary, reinforced cement concrete precast box of suitable shape shall be provided when brick work proceeds.
12. The masonry walls at expansion joint should be raised uniformly to avoid unequal loading on foundation.
13. Vertical reinforcement bars at corner & junctions of walls shall be provided at all floors as per IS-4326-1993 for four storeyed masonry buildings.

(C) ADDITIONAL NOTES FOR RCC WORK

1. All the provisions of IS-456-2000 shall be followed.
2. Unless noted otherwise, all Reinforced Cement Concrete work (except pile work & columns) shall be done in M-25 design mix concrete as per CPWD specifications 2002 and IS 456-2000. All columns & piles shall be provided in concrete grade M 35.
3. High yield strength deformed bars conforming to IS-1786-1985 (Grade Fe 415) shall be used. Testing shall be got done to ensure that TMT bars, in case used, conform to IS 1786-1985 and Modulus of Elasticity conform to IS 456-2000.
4. Generally not more than $1/3^{\text{rd}}$ of the steel reinforcement shall be lapped at one location (Restricted to Max. 50%).
5. The development length for reinforcement in tension, unless otherwise specified, shall be 40.3 times the bar diameter for the concrete grade M 25 and 33.20 times the bar diameter for the concrete grade M 35.
6. Nominal cover to all steel reinforcement including secondary reinforcements distribution and stirrups, unless shown otherwise in

- 13 Between adjoining footings at different levels, a clear horizontal distance shall be maintained so that slope of the joining line of footing beds is not steeper than 1 vertical : 2 horizontal. Where required suitable, drop in steps shall be provided in the foundation bed, maintaining a slope not steeper than 1 vertical : 2 horizontal for the cross wall also.
- 14 Design for compound/partition walls and plinth protection shall be finalized by the Executive Engineer In-charge.
- 15 Expansion/separation joints are to be provided as per drawing/codal requirements (IS-3414-1968 and IS4326-1993 and IS 1893-2002).
- 16 The drawings shall not be used for other work/works of similar nature except for the one issued for.
- 17 The compound wall shall not be constructed alongwith the walls of the main building.
- 18 In case during the excavation/piling work, the soil parameter are found different than that of given in Soil Investigation Report and subsequent clarification, it shall be immediately brought to the notice of CDO before further execution.
- 19 30 mm thick lean concrete shall be laid underneath foundation, Grade Beams, Mat, Raft and Pile cap wherever required.

(B) **ADDITIONAL NOTES FOR LOAD BEARING MASONRY CONSTRUCTION**

- 1 All the provisions of IS-1905-1987 shall be followed.
- 2 Cement mortar for foundation masonry with bricks of class designation 75 shall be 1:6 (Cement:6 fine sand) from foundation level to first off set below plinth.
- 3 Load bearing masonry wall are shown hatched in the plan.
- 4 No shuttering shall be provided for the column faces flushing 230 mm thick masonry walls. The walls shall be constructed prior to the casting of the columns, so as to provide proper bond between RCC and masonry.
- 5 Lintel bands shall be provided in all storeys as per IS-4326-1993.
- 6 Lintel bands reinforcement shall be continuous through column, lintels over openings and junctions of walls.
- 7 Suitable bed blocks shall be provided under the beams.

drawings, shall be as follows. (These are based on fire rating 1 hours refer circular No. 22/CDO).

Slabs	20mm
Terrace slabs, chajjas, fins	25mm
Beams (Clear to stirrups)	30mm
Columns (Clear to stirrups)	40mm
Piles (Clear to stirrups)	50mm
Footings and all foundation members	50mm
Pile cap	60mm
RCC Walls (230 Th)	25mm

- 7 Distribution reinforcement for suspended floor slabs, not shown in the drawings, shall be provided as 8 @ 300 c/c for 100mm thick RCC slabs.
- 8 Floor slabs, except otherwise specified, are 100mm thick. Reinforcement bending shall be done as per bar detailing schedule (Refer SP-34(S&T)-1987).
- 9 For all beams, bearing shall be structurally stable/sound.
- 10 Depressions in slabs wherever indicated are the maximum permissible. These may be reduced as per site requirements.
- 11 Bearing for the slab shall be for full brick width of the End wall/beam.
- 12 Ductility reinforcement detailing, for earthquake resistant designs, shall be provided as per IS 13920-1993.
- 13 Height of the columns pedestal (including depth of the footing) shall be not less than 32.2 times the largest dia. of the column bar.
- 14 Clear height of the pedestal shall not exceed three times the least lateral dimension of the pedestal.
- 15 Suitable camber shall be provided for the large spanned and cantilever member as per relevant CPWD specification. Centering for the cantilevers shall be removed only after adequate counter weight is available.
- 16 Side face reinforcement shall be provided for beams where depth of the web is more than 750 mm.
- 17 Additional reinforcement be provided around cutouts/opening as per fig.9.10 & 9.11 (Page 130) of SP 34 (S&T) 1987.

18 The stirrups in beams/columns shall be closed one having a 135° hooks with extensions at each end equal to 10 dia of stirrups or 75 mm, whichever is greater.

(D) PILES

1 All piles shall be cast in design mix concrete of Grade M35.

2 The pile details shown in drawing are subject to clearance of initial load test results by the Engineer-in-charge.

3 The minimum spacing of piles of uniform shaft shall be three times the shaft dia: of the piles unless specified otherwise.

4 The center to centre spacing for bored cast-in-situ under-reamed piles in a group should be two times the bulb dia (D_u). It shall not be less than 1.5 D_u .

5 The maximum spacing of piles shall not exceed 3 meter.

6 For the execution and testing of pile foundation, all the relevant clauses of IS Code 2911 (Part 1 to IV) with upto date amendments shall be followed.

7 The piles shall project 50mm into the cap/Grade beam/raft.

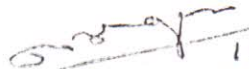
8 The reinforcement from the pile shall be properly anchored into the pile cap/grade beam/raft as per drawing.

9 Filling wherever required shall be done as per specifications, prior to taking up of the pile work.

10 Length of piles specified in the drawing are from the virgin soil only. (Refer Bore Hole logs in Soil Investigation report for level of virgin soil). Additional length, over and above the design length, shall be provided for the piles, equal to the filled up depth.

11 The routine test shall be carried out as per IS 2911 Part -IV-1985.

12 For intermediate piles wherever distances are not specified, shall be treated as centrally located.


16/6/2015
CHIEF ENGINEER (DESIGN)

CDO/DDA

Subject: Design Circular No. (Revised 2005)

Due to the change in the grade of ~~structural~~ concrete in structural members and foundations there is need to make corresponding changes in the provisions specified in Design Circular No. Accordingly the said circular has been revised and put up for approval of CE (D) please.

SE(D)II

S Jay Shankar
16/06/05

Decision to adopt M35 for pile foundations and columns, as discussed ^{with} the Engineer Member, in view of field conditions & environmental effects, there is need to revise circular No 20 (2003). Accordingly fair draft is put up for approval please.

S Jay Shankar
16/6/05
SE(D)II

CE (D): Apprd.
Int. Control govt
all fees including
COE and CECHG)

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16/6/05

Please arrange to get revised circular No 20 & circular for activity soft requirement.

S Jay Shankar AE