OFFICE OF THE CHIEF ENGINEER(Q.C.)
DELHI DEVELOPMENT AUTHORITY

No.CE(3)/QC/83/Cir/552-58 Dated the 8th Feb.,1983

Circular No 21

Subject: Quality Control - use of lime in masonry.

It is observed that the lime being used in D.D.A. works never conforms to specification. Sometimes the Ca O content is low, sometimes the cementing ovides of Iron Silicon and Aluminium are low and very often the lime is carbonated and unfit for use. Very often the lime is not slaked and lime mortar not ground in a grinder and cement lime mortar not mixed in a mixer. The result is a very weak mortar which results in collapse of the building.

The E.M. has therefore directed thatthe use of lime should be completely banned in D.D.A. works. However before making any substitution it should be checked that no undue benefit occures to the contractor.

(J.L.Pinto)
Chief Engineer(QC)

Copy forwarded to:-

1. Chief Engineer, DDA
2. All Addl.Chief Engineers, DDA.
3. All Chief Project Engineers, DDA.
4. All S.S.Ws, DDA
5. All S.E.s, DDA.
6. All E.Es., DDA.

OFFICE OF THE CHIEF ENGINEER (QC)
DELHI DEVELOPMENT AUTHORITY

NO: CE(3)QC/82/C17/859-64 Dated the 8th Feb., 1983

Subject: Quality Control - Bonding of intersecting walls. 22

One of the main reasons for the collapse of load bearing masonary buildings isthe lack of bond between intersecting walls. In practically all DDA buildings attempts are made to provide bond by toothing. Very often the teeth do not engage with each other and no mortar is provided. Sometimes even toothing is not provided.

The V.C. has expressed deep concern at the failure to provide bond in DDA buildings.

Para 6.2.4 5 of the C.P.W.D. Specifications Vol.I lays down that where toothings are provided the work should be raked back according to bond(and not toothed) at an angle not steeper than 45°.

All supervisory staff shall comply with this specification strictly and toothing shall not be allowed on any account. Any building in which intersecting walls are not bonded properly is structurally unsafe.

(J.L.Pinto)
Chief Engineer (Q.C.)

Copy forwarded to:-
1. Chief Engineer, D.D.A.
2. All A.C.Es. DDA
3. All C.P.Es. DDA.
4. All S.Es. (Civil), DDA.
5. All E.Es. (Civil), DDA.
6. All A.Es. (Civil), DDA.

OFFICE OF THE CHIEF ENGINEER (Q.C.)
DELHI DEVELOPMENT AUTHORITY

NO: CE(3)Q.C/82/Cir/85-75 Dated the 8th Feb.,1983

Subject: Quality Control - chases in masonry. - 23

One of the main reasons for the collapse of load bearing masonry buildings is the large number of long horizontal chases and nicks cut in the 230 mm load-bearing walls for shelves, electrical conduits and water supply pipes.

It is therefore necessary to completely avoid horizontal chases and nickes in load bearing walls by planning the work inthe following manner:-

(i) All horizontal runs for electrical wiring should be placed inthe slab & only vertical chasing allowed inthe wall.

(ii) Similarly horizontal runs of water supply pipes should be completely avoided in masonry walls.

(iii) All shelves should besupported on suitable supports resting on the slab and not in horizontal chases.

(iv) Niches in bathrooms toilets and other rooms should be completely avoided.

It is requested that these items may be so planned and constructed as to completely avoid horizontal chases or niches in load bearing masonry.

Also closely spaced in large holes should not be allowed in the masonry for scaffolding.

(J.L Pinto)
Chief Engineer (QC)

Copy forwarded to:-

1. Chief Engineer, DDA
2. ChiefArchitect, DDA
3. All Addl.Chief Engineers, DDA
4. All Chief Project Engineers, DDA.
5. All S.E's, DDA i/c S.E's (Electrical)
6. All Senior Architects, DDA.
7. All E.Es DDA i/c E.E.(Electrical)
8. All Architects DDA
9. All A.Es i/c A.E.(Elect) DDA.
10. All SS.Ws DDA.

(J.L.Pinto)
Chief Engineer (QC)

OFFICE OF THE CHIEF ENGINEER(QC)
DELHI DEVELOPMENT AUTHORITY

No. CE(3?)/QC/83/DDA/Insp./961 Dated the 16th Feb., 1983.

Subject:- Quality Control- Bonding of intersecting walls. 24

One of the main reasons for the collapse of load bearing masonary buildings is the lack of bond between intersecting walls. In practically all DDA buildings attempts are made to provide bond by teething. Very often the teeth do not engage with each other and no mortar is provided in the teeth.

The V.C. has expressed deep concern at the failure to provide bond in DDA buildings.

Para 6.2.4.5 of the C.P.W.D. Specifications Vol.I lays down that where joints are provided the work should be raked back according to bond (and not toothed) at an angle not steeper than 45°.

All supervisory staff shall comply with this specification strictly and toothing shall not be allowed on any account. Any building in which intersecting walls are not bonded properly is structurally unsafe.

The V.C. has desired that senior inspecting engineers viz. Executive Engineers, Superintending Engineers and Chief Engineers should check this aspect during their inspections of the works and ensure that walls are raked back accordingly to Bond and not toothed so that intersecting walls are properly bonded.

(J.L. Pinto)
Chief Engineer(Q.C.)

Copy for information to:-

1. Chief Engineer, DDA;
2. All S.E.s, DDA;
3. All E.Es.(Civil), DDA;
4. All E.Es.(Civil), DDA;
5. All A.P. Es.(Civil) DDA;
6. All A.Es.(Civil) DDA;

OFFICE OF THE CHIEF ENGINEER'
QUALITY CONTROL CELL
DDA VIKAS KUTEER NEW DELHI.

.....

No. F.68(203)HD.XII/C-Vi/8239-41. Dated: 28.2.83.

Subject: Quality Control Circulars.

Replies to the Observation Memos of the Quality Control Cell should be sent within 30 days. Specific replies should be given to each point indicating the action taken to investigate the structural soundness, rectify defective work, or get Reduced Rates Sanctioned by the S.E. Specific mention should also be made of the amount witheld from the contractor's bill pending completion of the above action. In the case of structural defects confirmation should be given that further work has been stopped pending rectification of defects.

The V.C. has taken serious note of the fact that replies to the Observation Memos of the Quality Control Cell are generally not forthcoming for long periods of time. He has decided that the above time limit should be strictly adhered to and if the reply is not received within the above period the case is to be referred to the Vigilance Branch for ex-parte action.

(J.L.Pinto)
Chief Engineer (QC)

Copy forwarded to:-

1. Chief Engineer, DDA,
2. Addl.Chief Engineers, DDA.
3. C.P.E.'s , DDA.
4. All S.E.s, DDA.
5. All E.E.s, DDA.

OFFICE OF THE CHIEF ENGINEER
QUALITY CONTROL CELL
VIKAS KUTEER:DDA:NEW DELHI.

No: CE(3)/QC/82/Cir/1336 Date: 21.3.83.

Circulars 26

Sub: Earthquake Resistant Design.

According to Appendix E of IS 1893-1975 Delhi falls in Earthquake Zone IV with a horizontal seismic coeffecient of 0.05. Therefore, according to Table 2 of IS 4326-1976, The lintel band is required for all load bearing structures.

The lintel band shall be 75 mm thick reinforced with 2 Nos. 10 mm dia Tor-steel bars., oneeach face of the wall with 12 mm cover and 6 mm dia links at 150 mm C/c.

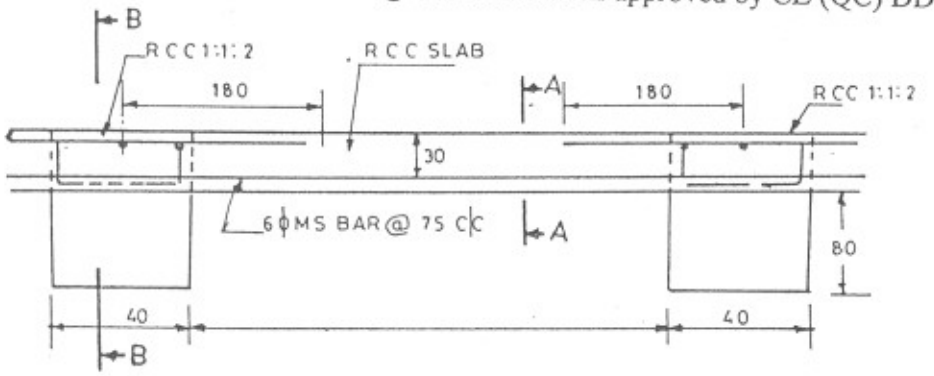
(J.L. PINTO)
Chief Engineer (Q.C)

Copy forwarded to:

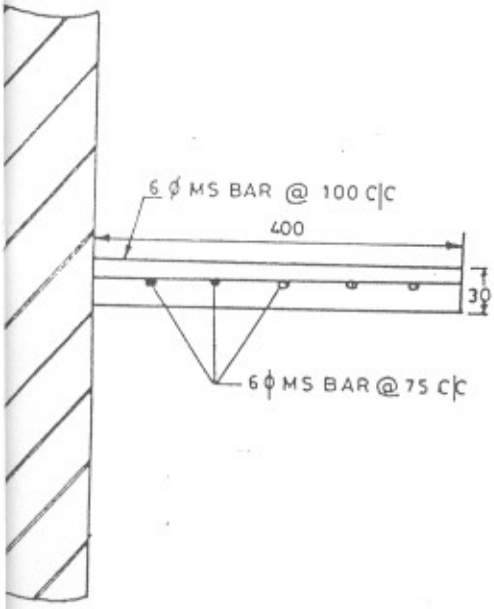
1. All SSW's DDA.
2. All SEs DDA.
3. All XEs DDA.
4. All SEs (Q.C)

(J.L. PINTO)
Chief Engineer (Q.C)

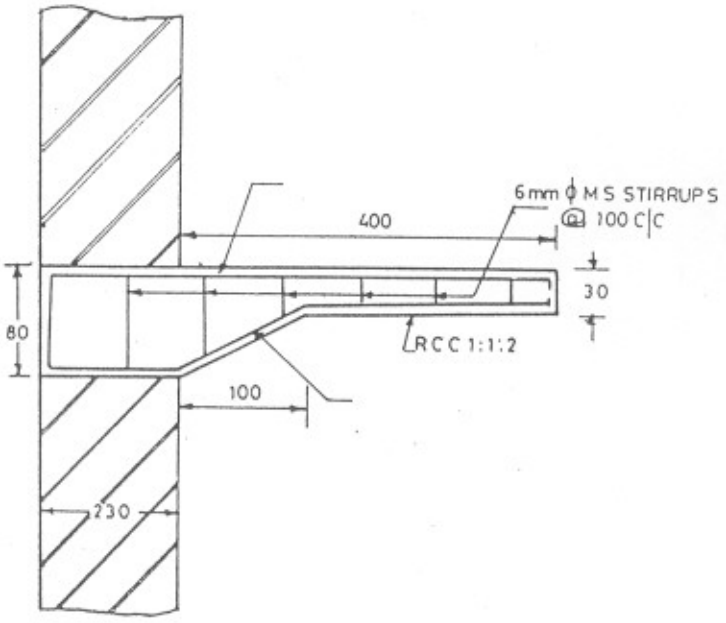
Encl. : Figure as stated structural Design of R.C.C. shelf approved by CE (QC) DDA.



ELEVATION OF SHELF



ECTION 'A-A' OF SHELF



SECTION 'B-B' OF SHELF

STRUCTRAL DRG.
R.C.C. SHELF.
NOT TO THE SCALE.
ALL DIMENSIONS IN mm.

No: (3) QC/Sk/Cir/1138 Date: 21.3.63.

Subject: Quality Control Circulars- 27
Supports for Shelves.

The Fact Finding Committee appointed by the L.G. and the Committee which inquired into the Vikaspuri collapse have strongly recommended that no horizontal chases should be allowed in bearing masonry walls.

In the case of the cooking platform, it can be supported on half brick walls resting on the floor slab.

Other shelves should be supported on R.C.C. brackets or T-iron brackets enclosed into the wall in holes not exceeding one header brick,. A similar arrangement on the worked out with T-iron brackets.

(J.L.PINTO.)
CE(QC)

Engl: Drawing with R.C.C. Brackets.

Copy to:-

1. All S.E.'s. D.D.A.
2. All E.E.'s. D.D.A.
3. All A.E.'s. D.D.A.

(J.L.PINTO.)
CE(QC)

OFFICE OF THE CHIEF ENGINEER
QUALITY CONTROL CELL
DDA VIKAS KUTEER NEW DELHI.

CE(1)QC/E2/2000/PF-I/1226 Dt.-10-3-83

27-A.

Subject: Quality Control Measures.

A meeting was held in the chamber of the Engineer Member on 29.1.83 to consider the proposals made by the Committee headed by Shri V.R. Vaish on measures to improve the quality of works in the DDA.

The following officers were present:-

1. Shri R.S. Gupta, Engineer Member in the Chair.
2. Shri V.R. Vaish, D.G.(Retd.), C.P.W.D.
3. Shri R.A. Khemani, Chief Engineer, DDA.
4. Shri J.L. Pinto, Chief Engineer(QC), DDA.
5. Shri T.S. Punn, Addl. Chief Architect.
6. Shri V.P. Chetal, C.P.E. (Indoor Stadium).
7. Shri V.V. Thakkar, Addl. Chief Engineer.
8. Shri Trilok Singh, C.P.E.
9. Shri K.B. Rajoria, A.C.E.
10. Shri H.D. Sharma, C.P.E.(Commr. Project).

The following decisions were taken in the meeting:-

1. Restriction of work load with manageable limits:

This is the most important recommendation of the report. All officers present agreed that this is the most important factor for improvement in the quality of the work. The Chief Engineer/A.C.Es/ C.P.E.s were requested to furnish the following information within a week:-

(i) Anticipated work load per division during the current year.

(ii) Actual work load per division during the year 1981-82.

(iii) Actual work load per division during 1980-81.

While working out the work load figures, expenditure on maintenance works and minor works, each costing upto Rs. 5 lakhs, is to be multiplied by the factor 2.25 in order to arrive at the equivalent construction load. For this purpose expenditure on maintenance and minor works costing upto Rs. 5 lakhs each should be shown separately. (Action-All CE/ACEs/CPEs). It was decided that in respect of construction & maintenance works the work load norms of the C.P.W.D. would be strictly followed viz. an equivalent construction load of Rs. 1.5 crores per division. However, in respect of conservancy works the norms laid down by the Municipalities would be followed. Shri V.P. Chetal was requested to obtain a copy of the norms followed for conservancy work and to send it to the E.M. (Action Shri V.P. Chetal).

2. Segregation of construction & maintenance of works:

It was agreed that construction works and maintenance works should be segregated at least upto the level of the Executive Engineer and it is desirable to segregate maintenance from construction at the S.E.s level also as far as possible. The term maintenance used above is meant to cover maintenance of the resettlement colonies and of the DDA staff quarters and is

Contd.

not meant to cover post construction maintenance of houses allotted to the public.

It was mentioned that segregation of maintenance from construction is necessary for the following reasons:-

(i) Whenever V.I.Ps intend to inspect or actually inspect the resettlement colonies the attention of all the engineers is diverted from construction work in order to concentrate on maintenance of the resettlement colonies & consequently the construction works are left to the mercy of the contractor.

(ii) If maintenance is segregated from construction it will not be necessary for the engineers to rush to the resettlement colonies and they can continue to concentrate on supervision of construction works.

(iii) Staff members can be posted according to aptitude and administrative requirements either in maintenance, construction or planning. At present there are only two options viz. construction and planning

It was also decided that minor works upto Rs. 5 lacs could be executed by the maintenance division and only works costing more than 5 lacks would be entrusted to construction divisions.

3. Post construction maintenance of the houses allotted to the public:-

The members present considered the possibility of attending to the maintenance of houses allotted to the public with the help of subscriptions from the residents in the colony. Doubts were expressed whether all the residents would agree to subscribe the fixed amount every year to create the maintenance fund. It was therefore decided to try this on an experimental basis in the case of one pocket for a period of two years after the date of handing over possession to the occupants. For this purpose the subscription for maintenance of the houses from the residents should be made compulsory for the period of two years and this amount should be collected by the DDA before the house is handed over to the occupant. This would require a corresponding change in the terms & conditions for allotment of flats.

4. Compact jurisdiction:

The recommendation made in the report was found to be acceptable.

5. Confidential reports of contractors:

The recommendation made in the report was found to be acceptable.

A committee consisting of the following members has been setup to asses the confidential reports of the contractors and to take disciplinary action where called for.

(i) Chief Engineer, DDA.
(ii) Addl. Chief Architect, DDA.
(iii) Chief Engineer (Q.C).
(iv) C.P.E.(Commercial Projects).
(v) S.E.Admn. (Member Secretary).

Contd.....

The S.E. Admn. will immediately call for confidential reports of contractors in the prescribed proforma from all Executive Engineers. The Executive Engineers will submit the report through the S.E. and Chief Engineer and the reports will be received and compiled by the S.E. Admn. The reports for the first half year should reach the S.E.Admn. within 4 weeks.

The C.P.E. (Commr. Projects) has been requested to obtain the specimen of the standard form from the C.P.W.D. to amend them suitably for use in the DDA and to get 10,000 forms printed immediately. About 10 forms are to be sent to each Executive Engineer urgently for filling up thr forms in respect of the year 1982.

(Action C.P.E.(Commr.Projects).

A separate confidential report of the contractor in respect of each work inspected by the Quality Control Cell will be filled up by the Chief Engineer (QC) and sent to the S.E. Admn. for compilation.

(Action Chief Engineer (QC).

Wherever very bad quality of work has been done or the Confidential reports are adverse and it has been decided to blacklist or debar such a contractor from takingup works in the DDA, a notice should be issued to the contractor to show cause why he should not be blacklisted (in the case of DDA contractors) or debarred from taking up works in the DDA (in the case of contractors not registered with the DDA). It was also decided that such a show-cause notice should be issued to all contractors mentioned in the list prepared by the Chief Engineer(QC) of contractors who have done very bad work.

(Action E.O. to E.M.,DDA)

6. Dismantling/reduced rates for sub-standard work:

This recommendation of the report was found to be acceptable.

In addition to the recommendation made in the report it was decided that where serious defects are noticed, further progress on the work should be stopped until these defects are completely rectified by the contractor. The authority competent to decide on stoppage of the work will be the Suptdg. Engineer. Such work will not be resumed until a certificate of complete rectification of defects isgiven by the Executive Engineer.

It was also decided that a core cutting machine should be immediately purchased by the DDA.

(Action Chief Engineer (QC).

It was decided that in cases where one or two cores taken from the RCC indicated strengths below the minimum compressive strength specified for structural safety, additional cores to give a total of 6 cores could be cut and the cores tested to assess the general quality of the work. If the compressive* for structural safety load tests should be conducted on a representative sample of slabs which are observed to be in the poorest condition by visual inspection and by testing with a Schmidt hammer. If the load test on the representative slabs are found to be satisfactory the work may be accepted at rates to be

*strength of the cores are below the limit specified.

Contd.....

satisfactory the work may be accepted at rates to be reduced in accordance with para 5.8.13.2 of the C.P.W.D. Specifications - 1977.

7. Inspections:

The recommendation made in the report was found to be acceptable.

8. Procurement of more materials by the DDA.

The recommendations made in the report were found to be acceptable. It was decided that the Addl. Chief Architect will issue within a fortnight, a list of standard sizes of the doors & windows to be used in DDA flats. In respect of doors the standard sizes as laid down in the I.S. standard would be adopted. Wherever the size shown in the drawing is different from that shown in the list prepared by the Addl. Chief Architect the nearest size shown in the list is to be adopted.

9. List of approved makes:

The recommendation made in the report was found to be acceptable.

It was decided to immediately set up a Committee consisting of the Chief Engineer, DDA, C.E.(QC), Addl. Chief Architect, A.C.E.II and S.S.W.II as Member Secretary to prepare a list of approved makes of important items of materials to be used in DDA works.

10. Checking of receipt of cement at site:

The recommendation made in the report was found to be acceptable.

11. Creation of Additional store division:

The recommendation made in the report was found to be acceptable.

12. Additional bricks kilns by the DDA:

While the recommendation was found to be acceptable, it was found in practice that sufficient land could not be located for setting up brick kilns. However efforts in this direction should continue.

13. Supplementary agreement for rectification of defects:

The recommendation made in the report was found to be acceptable.

It was also decided that for rectification of defects pointed out by the allottees a notice should be served on the contractor to attend the site within 24 hours for receiving instructions about rectification of the defects and in case of his failure to do so, the DDA would take up the work at his risk and cost.

14. Bonus Clause:

This was not discussed as it could be taken up later.

15. Transfer of staff in case of bad quality work:

The recommendation made in the report was found

Contd.....

to be acceptable.

16. List of good contractors:

The recommendation made in the report was found to be acceptable.

17. Training of supervisory staff:

As this requires the setting up of a suitable training organisation it was felt that this recommendation could be taken up separately.

18. List of common defects:

The recommendation was found to be acceptable.

19. Monitoring of projects:

The recommendation made in the report was found to be acceptable.

Sd/-	Sd/-
1. (R.S. Gupta) Engineer Member	2. (V.R. Vaish) D.G.(Retd.),C.P.W.D.
Sd/-	Sd/-
3. (R.A. Khemani) Chief Engineer	4. (J.L.Pinto) Chief Engineer(QC).

Copy forwarded to:-

1. Chief Engineer, DDA.
2. All ACEs and CPEs DDA.
3. All SEs, DDA
4. All EEs, DDA.

CE(QC)

OFFICE OF THE CHIEF ENGINEER
QUALITY CONTROL CELL
DDA, VIKAS KUTEER, NEW DELHI

.....

No.CE(3)/QC/82/Circular 497 Dated: 15-7-1983

CIRCULAR NO.28

Sub:- Quality Control Circulars

Inspite of the Report of the Fact Finding Committee and circulars issued repeatedly by this office it is observed that the practice of attempting to bond intersecting walls by toothing is still continuing.

Supervisory staff and senior inspecting officers are once again requested to ensure that the wall junctures are simultaneously mortared and joints in walls are made by raking back the masonry at 45°. This is extremely important for the stability of load bearing buildings.

(J.L. Pinto)
Chief Engineer (Quality Control)

Copy forwarded to:-

1. P.S. to E.M. for information
2. Chief Engineer, D.D.A.
3. All Addl.Chief Engineers
4. All Supdtg. Engineer(Civil)
5. All Ex.Engineers(Civil)
6. All Asstt.Engineers(Civil).

OFFICE OF THE CHIEF ENGINEER
QUALITY CONTROL CELL
DDA, VIKAS KUTEER, NEW DELHI

.....

No.CE(3)QC/82/Circular/498 Dated: 10-8-1983

CIRCULAR NO. 29

Sub:- Testing of water

The Fact Finding Committee has rightly stressed the importance of using water of good quality, particularly for R.C.C. works. Very often the field staff either negligently or deliberatly avoid testing of water samples used for construction.

2. All Executive Engineers(Quality Control) are requested to make it a point to collect water samples from tube wells used by the contractor for obtaining water for R.C.C. works, to ensure that water of proper quality is used in the work.

(J.L. Pinto)
Chief Engineer (Quality Control)

Copy to:-

1. Shri Bagga, E.E.(Q.C.)-I
2. Shri S.S. Mondal, E.E.(Q.C.)-II
3. Shri Mahendra Singh, E.E.(Q.C.)-III

OFFICE OF THE CHIEF ENGINEER
QUALITY CONTROL CELL
DDA, VIKAS KUTEER, NEW DLEHI

No. CE(3)/QC/82/CIR/1337 CIRCULAR NO. 29A Dated : 21.3.1983

Sub : QUALITY CONTROL CIRCULARS-PARAPET WALLS

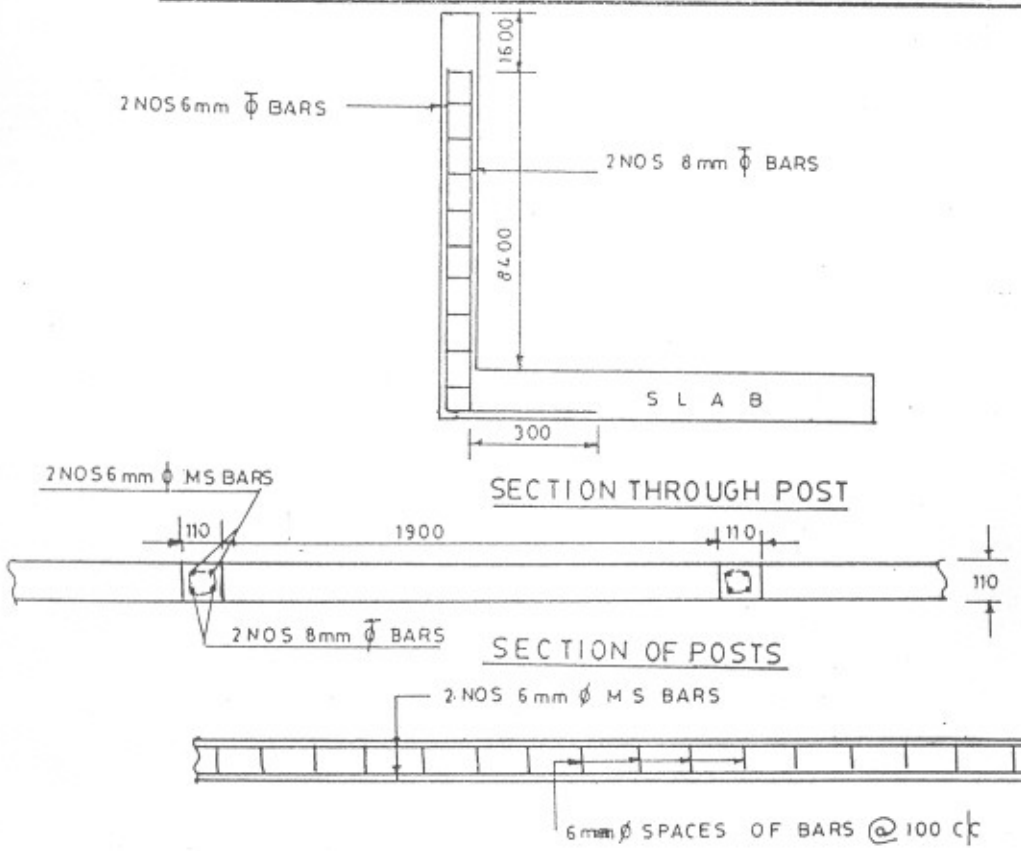
Very often it is seen that half Brick or brick on edge parapet walls are provided for staircases, balconies and roofs which are source of danger to the lives of occupants & which are unsafe when checked under I.S. Codes. A drawing is enclosed herewith of a Half Brick parapet wall reinforced with horizental bands & verticals posts. Brick-on-edge parapet walls should not be used at all & ½ brick parapet walls should be reinforced as shown in drawing. Reinforcement for verticle posts should be preplanned & embedded in supporting slab. The concrete should be of C.C. 1:2:4 mixed with measuring boxes in the specified Ratio.

Encl : SKETCH Approved by CE (QC) DDA

Supported vide CIR - 77

CHIEF ENGINEER (QC)

110mm THICK Rb PARAPET WALL FOR BALCONY AND ROOFS.



SECTION THROUGH POST

SECTION OF POSTS

SECTION OF TOP BAND

No: CE (3)QC/82/Cir/1337 Date: 21.3.83

Sub: Quality Control Circulars - 30
Parapet Walls.

Very often it is seen that half-brick or brick-on-edge parapet walls are provided for staircases, balconies and roofs which are a source of danger to the lives of the occupants and which are unsafe when checked under the I.S. Codes.

A drawing is enclosed herewith of a half brick parapet wall reinforced with a horizontal band and vertical posts. Brick-on-edge parapet walls should not be used at all and half brick parapet walls should be reinforced as shown in the drawing. Reinforcement for the vertical posts should be preplanned and embedded in the supporting slab. The concrete should be of CC 1:2:4 mixed with measuring boxes in the specified ratio.

(J.L. PINTO)
CE (Q.C)

Copy forwarded to:-

1. All SEs DDA.
2. All EEs DDA.
3. All AEs DDA.

(J.L. PINTO)
CE (Q.C).

OFFICE OF THE CHIEF ENGINEER
QUALITY CONTROL CELL
VIKAS KUTEER DDA NEW DELHI.

.....

No: CE(3)/QC/82/CIRCULAR FILE//537 8/4/83

Sub: QUALITY CONTROL CIRCULARS. - 31

A list of defects commonly observed in the various buildings under construction has been circulated vide C (3)/QC/82/Circular File/193 dated: 15.10.82. In spite of bringing out such defects to the knowledge of the supervisors and their controlling offices, it is observed that, in many cases, proper attention is not being given to improve the quality of works. To illustrate the point, a few of the defects which are still persisting are given below:

1. The vertical joints were hollow at places.
2. Reinforcement in lintels and beams exposed from bottom.
3. Joints in brick work not properly staggered.
4. Intersecting walls bonded by toothing instead of raking back at 45°.
5. The quality of concrete, in general, is found to be poor.-excessive sand & less cement.
6. Notches are cut subsequently for fixing holdfasts.
7. Mortar in brick work is weak.
8. Peela bricks are observed at places.
9. Curing to R.C.C. members appears to be inadequate.
10. Dates of various works involving consumption of cement are not recorded at the site of work.
11. At many places, raking out and filling with rich mortar are done superficially and not to a depth of 50MM.
12. Horizontal chases are being cut for electrical and plumbing works.

It is evident that more strict supervision on the works is needed to ensure that such defects are not repeated. The V.C has desired that special attention be given by senior inspecting officers to avoidance of such defects in future.

(J.L. PINTO)
Chief Engineer (Q.C)

Copy forwarded to:

1. CE/ACEs/CPEs DDA.
2. All SEs DDA.
3. All EEs DDA.

(J.L. PINTO)
Chief Engineer (Q.C)

OFFICE OF THE CHIEF ENGINEER.
QUALITY CONTROL CELL
VIKAS KUTEER:DDA:NEW DELHI.

No. CE(3)/QC/82/Cir. File/1610 Date:- 8-4-83

CIRCULAR-32.

Quality Control Circulars-Rectification of joints in the brickwork.

The necessity of taking out of weak mortar joints in the brickwork and refilling with good mortar duly compacted has been emphasized by this Cell time and again for all such locations where the original mortar was found to be weak. Though such rectification works have been taken up at some of the sites, instances have come to the knowledge of this Cell where subsequent plastering of brickwork have been taken up without carrying out the much needed rectification. Such a practice is tentamount to concealment of defects and should not be allowed at all.

The Executive Engineers should take immediate action to ensure that rectification works are given top priority and they should satisfy themselves about the completion of rectification work before allowing any new work to be taken up. This should also be applicable to all such works which have not been inspected by this Cell. It is further enjoined that the Executive Engineers shall be personally held responsible for any failure to comply with these instructions.

(J.L.PINTO.)
C.E.(Q.C)

Copy forwarded to:-

1. C.E.,All ACEs and CPEs,DDA.
2. All SEs and SSWs.
3. All EEs and SWs.

(J.L.PINTO.)
C.E.(Q.C)

OFFICE OF THE CHIEF ENGINEER
QUALITY CONTROL CELL
VIKAS MINAR DDA NEW DELHI

....

No: CE(3)/QC/82/Cir.File/1609 Date: 11-4-83

CIRCULAR-33

Sub: Quality Control Circulars- strengthening measures.

During inspection it is seen that some serious structural defects keep recurring in DDA works. The Fact Finding Committee appointed by the L.G. has recommended strengthening measures to be adopted where such defects occur. A copy of their recommendations is enclosed for guidance of the field staff.

Sd/- 11/4

(J.L. PINTO)
Chief Engineer (Q.C)

Encl: Strengthening Measures.

Copy forwarded to:

1. CE DDA.
2. All ACEs/CPEs DDA.
3. All SEs DDA.
4. All Executive Engineer DDA.

Sd/- 11/4

(J.L. PINTO)
Chief Engineer (Q.C)

4. Rectification of brick masonry on both sides of doors and windows, jabs and other areas where necessary by raking and filling of joints or by filling 1:2:4 cement concrete.

5. Double scaffolding on the outer face for raking of the joints and plastering.

6. Filling of scaffolding holes in the walls properly by cleaning the existing holes, applying cement mortar 1:4 on all sides, inserting tight fitting bricks, & filling cavities around with brick pieces cut to size in cement mortar 1:4.

7. In case of RCC slabs which have developed cracks and in case of RCC slabs which are found to be deficient after load testing is done, strengthening measures have to be taken to make these slabs safe. One of the methods of strengthening could be by guniting from top. In case of cracked slabs or where the cover of reinforcement is insufficient, guniting from the bottom may also be necessary.

8. After these above stated strengthening measures have been done a few RCC slabs will have to be load tested. When a load test is done there should be properly designed supports which should be 3" to 4" below the slab so that if the slab fails it will be supported on the shuttering. The loading on the slab should be done one fourth at a time and deflections observed before the next increment of load is applied. The loading should take into account the dead load yet to come due to flooring, mud phaska etc., for which the slab has been designed, besides the live load & extra per centage of the live load as prescribed by I.S. Code for testing. During the testing, observations of deflections and extent of recovery in deflection after the load is removed will have to be measured and properly recorded.

9. One set of flats for the full height should be loaded to test the walls. The slabs of the flats will be loaded with the full designed dead load plus 1.25 times the designed live load. The loading be done gradually ¼ at a time taking sufficient care for the safety of personnel in case of collapse.

OFFICE OF THE CHIEF ENGINEER
QUALITY CONTROL CELL
VIKAS KUTEER DDA NEW DELHI.

No: CE(3)/QC/82/Cir File/1536 Date:

Sub: Quality Control Circulars - Priming Coat on steelwork, 34

In a number of works it has been observed that the priming coat applied to steelwork consists of red oxide.

According to para 13.34.1.2 of the CPWD specifications, 1977, the approved primer for steelwork is Zinc Chromate Primer conforming to IS 104-1962. It should be ensured that only Zinc Chromate Primer of an approved brand and manufacture is allowed to be used as a Priming Coat.

(J.L. PINTO)
Chief Engineer (Q.C)

Copy forwarded to:

1. CE/ACEs/CPEs
2. All SEs (Civil)
3. All EEs (Civil)

(J.L. PINTO)
Chief Engineer (Q.C)

OFFICE OF THE CHIEF ENGINEER
QUALITY CONTROL CELL
DDA, VIKAS KUTEER, NEW DELHI

No. CE(3)/QC/82/Circular File/1537 Dated : 18.2.1983

CIRCULAR NO. 35

Sub : QUALITY CONTROL CIRCULARS - DEFECTS IN BUILDING

A list of defect commonly observed in the various buildings under construction has been circulated vide CE(3)/QC/82/Circular File/193 dated 15.10.82. In spite of bringing out such defects to the knowledge of the supervisors and their controlling offices, it is observed that, in many cases, proper attention is not being given to improve the quality of works. To illustrate the point, a few of the defects which are still persisting are given below :-

1. The vertical joints were hollow at places.
2. Reinforcement in lintels and beams exposed from bottom.
3. Joints in brick work not properly staggered.
4. Intersecting wall is bonded by teething instead of raking back at 45°
5. The quality of concrete, in general, is found to be poor-excessive sand and less cement.
6. Notches are cut subsequently for fixing holdfasts.
7. Mortar in brick work is weak.
8. Peela bricks are observed at places.
9. Curing to R.C.C. members appears to be inadequate.
10. Date of various works involving consumption of cement are not recorded at the site of work.
11. At many places, raking out and filling with rich mortar are done superficially and not to a depth of 50MM.
12. Horizontal chase are being cut for electrical and plumbing works.

It is evident that more strict supervision on the works is needed to ensure that such defects are not repeated. The V. C. has desired that special attention be given by senior inspecting officers to avoidance of such defects in future.

Related to CIR - 41

(J. L. PINTO)
Chief Engineer (QC)

OFFICE OF THE CHIEF ENGINEER.
QUALITY CONTROL CELL
VIKAS KUTEER:DDA:NEW DELHI.

No.CE(3)/QC/82/Cir.file/352 Dt:- 28/12/82

CIRCULAR NO.36.

Sub: Quality Control Circulars
R.C.C. columns.

It is very alarming to note that the strength of concrete in columns is generally very low, sometimes as low as 30 kg/cm^2 as revealed by the REBOUND values. This occurs because the concreting of columns is not supervised by the JE & AE and is left to unskilled labourers.

The coarse sand used in excessive and of poor quality and the coarse aggregate is also in excess with the result that the cement content is low and the water cement ratio high.

While collapse of a slab or beam may be localised, collapse of a column is invariably catostrophic. Some weak columns have shown signs of distress by cracking.

It is therefore very essential that concreting of columns should be supervised by the AE & JE. The boxes of coarse aggregate should be accurately levelled and the correct quantity of fine aggregate used after allowing for bulkage. The mix should be stiff and a viberator should be used for compaction.

25/1

(J.L.PINTO)
CHIEF ENGINEER(QC).

Copy forwarded to:-

1. P.S. to E.M. for information.
2. C.E., DDA.
3. All ACEs.
4. All SEs.
5. All EEs.
6. All AEs.

25/1.

(J.L.PINTO)
CHIEF ENGINEER(QC).

OFFICE OF THE CHIEF ENGINEER.
QUALITY CONTROL CELL
VIKAS KUTEER:DDA:NEW DELHI.

No.CE/3/QC/82/Cir/499 Date:- 10.8.83

CIRCULAR NO 37.

Sub:Quality Control Circulars
Mudphuska terracing.

Almost invariably complaints are received from the public about heavy leakage through the roof during the rainy season. The main reasons are:-

1. Inadequate bitumen paint on the slab.
2. Depressions in the tile brick surface leading to ponding of water.
3. Grouting of joints between tiles with sand instead of cement mortar.

The quality of bitumen applied should be controlled by maintaining a Bitumen Register.

The surface should slope uniformly without any depressions or low spots.

Bhoosa in the proportion of 35 kg per sq.m. of soil shall be added to the mudplaster 25mm thick provided over the mudphuska & gobri leaping shall be done after this plaster has dried.

The joints in the tiles shall be grouted with cement mortar(1 cement:3 fine sand) so that the joints are completely filled with mortar. The cement shall be mixed with 5% crude oil by weight of cement so that the mortar becomes resilient & does not crack. The mortar shall be properly cured.

(J.L.PINTO)
C.E.(QC).DDA.

Copy forwarded to:-

1. PS to E.M. for information.
2. C.E., DDA.
3. All ACEs, DDA.
4. All SEs, DDA.
5. All EEs, DDA.
6. All AEs, DDA.

(J.L.PINTO)
C.E.(QC).DDA.

OFFICE OF THE CHIEF ENGINEER
QUALITY CONTROL CELL
DDA, VIKAS KUTEER, NEW DELHI

No: CE(3)/Q.C/82/Cir/500 Date:- 10.8.83

C I R C U L A R NO: 38.

SUB:- QUALITY CONTROL CIRCULARS
DAMPNESS & SEEPAGE

In almost all houses built by the D.D.A. the major complaint is about dampness & seepage due to leakage from water supply & sanitary fittings.

The V.C. has expressed concern about this & has desired that steps should be taken to eradicate this defect in future.

For this purpose it is essential that all fittings, pipes, and joints should be tested with water and observed to ensure that no leakage occurs. The pipes & fittings may be covered up only after all pipes, joints & fittings have been tested under working conditions. If this is done carefully a large number of complaints about dempness & seepage can be eliminated.

(J.L.PINTO)
CHIEF ENGINEER(QC)

Copy forwarded to:-

1. P.S. to E.M. for information
2. C.E., D.D.A.
3. All ACEs, D.D.A.
4. All SEs, D.D.A.
5. All EEs, D.D.A.
6. All AEs, D.D.A.

(J.L.PINTO)
CHIEF ENGINEER(QC)

OFFICE OF THE CHIEF ENGINEER.
QUALITY CONTROL CELL
VIKAS KUTEER:DDA:NEW DELHI

No.CE(3)/QC/Cir.File/353 Dt: 25/7/85

GENERAL CIRCULAR - 39

It has been observed that replies from the EEs to various observation memos issued by this Cell do not follow a uniform pattern. While in some cases the EEs send the replies to their Superintending Engineers, with a copy endorsed to the Quality Control Cell, in other cases the reply is being addressed to the EE(Quality Control) with a copy to SE, ACE etc.

In future it may be ensured that the reply to the observation memo is submitted in accordance with the procedure laid down for the CTE under para 19(read with para 23) of Section 57, Chapter VI, CPWD Manual Vol.II. The field EE shall therefore submit his reply direct to this office without routing it through his SE and CE/ACE. Action at SE's level shall be taken as prescribed under above paras of the CPWD Manual.

All concerned may kindly note for strict compliance in future.

25/7

(Er.J.L.PINTO)
CHIEF ENGINEER(QC).

Copy forwarded to:-

1. CE, All ACEs and CPEs, DDA.
2. All SEs and SSWs, DDA.
3. All EEs and SWs.
4. EEs (Quality Control)

25/7

(Er.J.L.PINTO)
CHIEF ENGINEER(QC).

OFFICE OF THE CHIEF ENGINEER
QUALITY CONTROL CELL
DDA, VIKAS KUTEER, NEW DELHI.
****

No. Dated:- 10-8-1983.

CIRCULAR NO.40

Sub:- Quality Control Circulars - Removal of foem-work in cold weather.

The Fact Finding Committee have recommended that the minimum period that shall elapse after concrete is laid and before the centring is struck should be suitably increased in the case of Pozzolona Cement and should be further increased during the months of November to February when the temperatures are low. Slabs, beams and columns may collapse in winter as the grim in strength is very slow due to low temperatures.

The Concrete Association of India have been consulted and they have recommended that the removal periods specified for removal of foem-work after the concrete is laid should be increased by 50% in the months of November to February, particularly when Pozzolona Cement is used. Great care should be taken by the supervisory staff to ensure that thee increased periods are adhered to.

(J.L. Pinto)
Chief Engineer(Q.C.)

Copy to:-

1. P.S. to E.M., for information.
2. Chief Engineer, D.D.A.
3. All A.C.Es. of D.D.A.
4. All Supdtg.Engineers(Civil),DDA.
5. All Executive Engineers(Civil),DDA
6. All Asstt.Engineers(Civil), DDA.

(J.L. Pinto)
Chief Engineer(Q.C.)

OFFICE OF THE CHIEF ENGINEER
QUALITY CONTROL CELL
DDA, VIKAS KUTEER, NEW DELHI.
******

No. Dated:- 10-8-1983.

CIRCULAR NO. 41

Sub:- Quality Control Circulars - Methods of rectifying defects.

Some methods of rectifying defects in buildings specified by the Fact Finding Committee are enclosed herewith for information and guidance.

(J.L.PINTO)
CHIEF ENGINEER (Q.C.)

Encl: Methods of rectifying defects.

Copy forwarded to:-

1. P.S. to E.M.
2. Chief Engineer, DDA.
3. All A.C.Es., D.D.A.
4. All S.Es., D.D.A.
5. All E.Es., D.D.A.

Methods of Rectifying Defects

1. Walls out of plane or plumb or cracked.

If there are any cracks in the masonry or the wall is out of plumb or out of plane by more than 12 mm., the masonry should be strengthened. The entire height of the wall should be plotted on paper to find out which portions deviate from the vertical. On the wall surface weld mesh should be fixed with V - hooks hammered into the wall. If lime is present in the mortar the weld mesh should be fixed to steel hold-fasts embedded in cement concrete filled into holes drilled in the wall. The surface should then be gunited to a minimum thickness of 25 mm. to make the final surface vertical. The gunite layers above and below the slab should be bonded by double bars passing through holes drilled in the slab.

2. R.C.C. Columns.

The strength of the concrete in column should be checked by a properly calibrated schmidt hammer and/or ultrasonic methods. The actual load on the column should be calculated and the minimum strength of concrete required to carry that load with the required factor of safety assessed. In these design calculations due allowance should be made for initial curvature of columns or eccentricity of loading due to columns being out of plumb or due to other defects noticed during inspection.

If the concrete strength required for sustaining the load is more than the actual concrete strength or where the actual strength of the concrete is less than 75 kg. per sq. cm., the column should be strengthening by encasing it in R.C.C., 1 : 1½ : 3. The minimum thickness of the encasing concrete should be 75 mm. and the encasing concrete above and below a slab should be properly bonded by dowel bars passing through holes drilled in the slab.

3. Relaying Slabs.

Where any slab is to be dismantled and relaid, the whole slab shall be dismantled to a depth of 75 mm. into the wall on all sides. Before concreting, additional reinforcement consisting of a cage with 4 Nos. 16 mm. bars tied with 6 mm M.S. stirrups @ 150 mm c/c shall be laid in both directions forming a grid 1 m x 1m. This additional reinforcement shall be embedded in concrete for the full thickness of the wall by cutting the old concrete to a width of 150 mm and to the full depth of 230 mm.

4. Lintel Band

As stipulated in I.S.4326 - 1976, a lintel band shall be provided in all load bearing construction. The lintel band shall be 75 mm. thick reinforced with 2 Nos. 10 mm. dia Tar Steel bars, one on each face of the wall with suitable cover and 6 mm. dia links @ 150 mm. c/c.

Circular no 42

135

No. CE/3/QC/82/Cir.file/82-83/503 Dated: 10.8.83

Subject: Quality Control Circulars - Maximum possible variation on chemical analysis.

....

According to the Ramaiyer Committee, the cement content on chemical analysis may show a maximum variation of 25%.

Thus if OPC is used

Let the actual mix be X : Y

On chemical analysis this may show as

0.75X : Y

or

X : 1.33 Y

i.e. the values for fine & coarse aggregate have to be divided by 1.33. If Portland Pozzolona cement is used the Soluble Silica content may be 17% instead of 21% as in OPC. Therefore if the actual mix is

X cement : Y aggregate

On chemical analysis this may show

as $\frac{17\ X}{21}$: Y

or X : 1.24 Y

Allowing for a possible 25% variation in cement content the sample may show as 0.75 X : 1.24 Y on chemical analysis or

X : 1.65 y.

Thus if OPC is used the values for fine & coarse aggregate may be divided by 1.33 to arrive at a definite conclusion whether less cement has been used and if P.P.C was used the values for fine and coarse aggregate may be divided by 1.65. These figures may be indicated while communicating the results of chemical analysis. Experiments conducted in our laboratory indicate the probable actual mix adopted can be obtained by dividing the values for fine and coarse aggregate by 1.33 when Portland Pozzolona cement is used i.e. the variation in cement content on chemical analysis is of the order of 7% only.

(J.U.Pinto)
Chief Engineer (QC)

Copy forwarded to:-

1. Shri R.C.Dagga, S.E.-I, DDA, Ashok Vihar, N.Delhi
2. Shri S.S.Mondal, E.E.II, DDA, Vikas Kutbee.
3. Shri Mahendra Singh, E.E.III, DDA, Ashok Vihar

for information and necessary action.

(J.U.PINTO)
C.E. (QC)

QUALITY CONTROL CELL
DDA, VIKAS KUTEER, NEW DELHI
****

No.CE(3)/QC/DDA/ Dated: 7-9-1983.

CIRCULAR NO. 43

Sub:- Quality Control Circulars - Hot Mix concrete or Macadam

Wherever Hot Mix Dense Asphallic Concrete or Hot Mix Dense Bituman Macadam are checked by the Quality Control Cell, the following checks will be carried out by the Quality Control Cell.

1. Sample of aggregate for checking gradation.
2. Out turn register showing daily consumption of bitumen and out turn.
3. Sample of crust to check binder content - permissible variation ± 0.3%.
4. Permissible tolerance 6 mm in 3000 mm in longitudinal direction and 4 mm. in transverse direction.
5. Cores to be cut for measuring field density - three samples for every 500 sq.m. - Average field density not less than 98% of laboratory density.
6. Cores to be cut for binder content and sieve analysis of aggregate.
7. Thickness to be measured.
8. The following tests to be conducted on aggregate:-
   (i) Los Angles direction value
   (ii) Stripping value
   (iii) Water absorption.
   (iv) Flakiness Index.
9. Sample of filler for Sieve Analysis.
10. Scrutinise Register of Mandatory Tests Conducted.

(J.L. Pinto)
Chief Engineer(Q.C.)

Copy forwarded to:-

1. P.S. to E.M. for information.
2. Chief Engineer, D.D.A.
3. All Addl.Chief Engineers.
4. All Supdtg.Engineers.
5. All Ex.Engineers i/c, E.Es.(Q.C.)
6. All A.Es. i/c, A.Es.(Q.C.).

(J.L. Pinto)
Chief Engineer(Q.C.)

OFFICE OF THE CHIEF ENGINEER
QUALITY CONTROL CELL
DDA, VIKAS KUTEER, NEW DELHI
****

No. CE(3)QC/Circle/DDA/711-17 Dated: 8-9-1983.

Sub:- Technical Circulars - Raft foundations.

During inspection of some works in Motia Khan it was observed that the external walls have been placed right at the edge of the raft foundation without providing any projection on the outside.

Such concentrated edge loads on the edge of the raft result in contact pressures which may be up to 4 times the average contact pressure. Such high contact pressures may render the foundation soil into a plastic condition and may result in plastic flow of the soil under the raft towards the outside. This may result in loss of soil support under the edge of the raft thus increasing the negative moment in the raft.

A projection of even 1/12 of the length of the raft beyond the external wall reduce the maximum contact pressure at the edge of the raft by about 50% and reduces the negative moment in the raft by about 75%.

Except in unavoidable situations like a structure abutting a property line , it would therefore be desirable to project the raft some distance beyond the external wall to avoid plastic flow due to high contact pressures and to effect economics in steel and concrete.

(J.L. PINTO)
CHIEF ENGINEER(Q.C.)

Copy forwarded to:-

1. Chief Engineer, D.D.A.
2. Addl.Chief Engineer-II,
3. Addl.Chief Engineer(Designs)
4. S.S.W-I
5. S.S.W-II
6. E.E.(Q.C.)-II
7. E.E.(Q.C.)-III

(J.L. PINTO)
CHIEF ENGINEER(Q.C.)

"Letters despatched 9/8/83

OFFICE OF THE CHIEF ENGINEER
QUALITY CONTROL CELL
DDA, VIKAS KUTEER, NEW DELHI.
****

No.EE(3)/QC./DDA/956 Dated: 1/10-1983.

CIRCULAR No.44

Sub:- Technical Circulars.

During inspection of some LIG flats recently the following defects in design come to notice:-

(i) On the roof the C.C. gola in the parapet wall was omitted. This has resulted in widespread leakage and dampness in the flats below.

(ii) Rain water from the first floor balconies was discharged through spouts over the entrances to the ground floor flats.

(iii) Rain water pipes from the roof were made to discharge into a C.I. funnel at Ground floor lintel level which is bound to overflow and splash into the flats through the windows.

(iv) Instead of providing vent cowls above roof level, these were provided at first floor level and the sewer gases emitted pass into the flats through the windows giving a foul stench.

It was stated by the field staff that these economies were suggested by HUDCO.

The V.C. has desired that such design short comings in the drainage system should not recur in future.

(J.L. Pinto)
Chief Engineer(Q.C.)

Copy forwarded to:-

1. P.S. to E.M. for information.
2. Chief Engineer, D.D.A.
3. All Addl-Chief Engineers, D.D.A.
4. Addl.Chief Engineer(Designs).
5. All S.S.Ws., D.D.A.
6. All S.Es, D.D.A.
7. All E.Es.(Q.C.)
8. File No.F/72/61/CE/QC/Inspn./EE-I.

(J.L. Pinto)
Chief Engineer(Q.C.)

OFFICE OF THE CHIEF ENGINEER
QUALITY CONTROL CELL
DDA, VIKAS KUTEER, NEW DELHI
****

No.

Dated 19-10-1[illegible].

CIRCULAR NO. 44 - A

Sub:- Flush Door Shutters.

A copy of the list of suppliers of flush door shutters approved by the C.P.W.D. vide D.G.(Works) Memo No.SSW/NDZ/SWI/ASW V/23/1915 dated 23-10-1978 is enclosed herewith for information and guidance. Contractors may be directed to procure shutters from these firms only.

(S.L. Pinto)
Chief Engineer(Q.C.)

Encl:- List of approved suppliers of Flush Door Shutters.

Copy to:-

1. P.S. to E.M.
2. Chief Engineer(D.D.A.).
3. All A.C.Es.
4. All S.Es.(Civil)
5. All E.Es(Civil)
6. All E.Es. (Q.C.)
7. All A.Es.

L) Wooden flush door, shutters plywood face panels solid core and hollow core IS:2191 (Part I) 1973 and IS: 2202(Part I) - 1973

1. Assam Railway & Trading Co.Ltd., Margherita(Assam) Brand ARTDOR.
2. National Plywood Industries Pvt.Ltd. Tinsukia (Assam).
3. Sarda Plywood Industries Ltd., P.O. Jeypore, Distt.Dibrugarh(Assam) having their office at 9 Parsee Church Street, Calcutta-700 001.

Li) Wooden flush door shutters (solid core type) with plywood face panels-IS:2202 (Part-I) - 1973.

1. Wood Craft Products Ltd., P.O. Jeypore, Distt.Lakhimpur (Upper Assam) having their office at 9/1, R.N. Mukherjee Road, (7th Floor), Calcutta-700 001. Brand: 'ROCKET PLY'.
2. Mysore Commercial Union Ltd., Post Bag No.2276, Yeswantpur, Bangalore, 22.Brand: 'MYSOBORD'
3. Nikir Hills Saw and Plywood Factory P.O. Dippu, Nilkir Hills(Assam).
4. Assam Valley Plywood(Pvt.) Ltd., 67-B, Netaji Subhash Road, Calcutta.
5. Sudershan Plywood Industries, A.T. Road, Margherita, Dist. Dibrugarh, Assam.

Flush Door Shutters of size other than those laid down in I.S.2202-1973(Part-I).

1. M/s. Indian Plywood manufacturing Co.Ltd., Bombay.
2. M/s. Jayshir Plywood India, Exchange, Calcutta.
3. M/s. Kutty Flush Doors and furniture Co.Pvt.Ltd., Koyambedu, Madras.
4. M/s. Hindustan Housing Factory Ltd. Jangpura, New Delhi.
5. M/s. Assam Railways and Trading Co.Ltd., Margherita, Assam.
6. M/s. Nuboard Mfg.Co.Ltd.,Shahabad. Road, Rampur.
7. M/s. Woodrafts Assam Indian Exchange, Calcutta.
8. M/s. Sitapur Plywood manufacturers Ltd., Post Box No.6, Sitapur-261001(U.P.).
9. M/s. Woodcrafts Products Ltd., 9/1 R.N.Mukherjee Road, 7th Floor, Calcutta-700 001.
10. M/s. Darda Plywood Industries Pvt.Ltd., 1/7, Desh Bandhu Gupta Road, Delhi.

OFFICE OF THE CHIEF ENGINEER
QUALITY CONTROL CELL
DDA, VIKAS KUTEER, NEW DELHI.
****

No.CE(3)/QC/1029 Dated: 19/1/15

CIRCULAR NO.45

Sub:- Steel doors, windows & ventilators.

A copy of the list of suppliers of hot rolled steel sections for doors, windows, and ventilators approved by the D.G.(Works) under his Memo No.SSW/NDZ/SWI/ASW V/23/1915 dated 23-10-73 is enclosed herewith for information and guidance. Contractors may be directed to procure steel sections from these firms only.

(J.L. Pinto)
Chief Engineer(Q.C.)

Encl: List of approved suppliers of Hot Rolled Sections for doors, windows and ventilators.

Copy to:-

1. P.S. to E.M.
2. Chief Engineer, D.D.A.
3. All A.C.Es.
4. All S.Es.(Civil)
5. All E.Es.(Civil)
6. All E.Es.(Q.C.)
7. All A.Es.(Civil).

Hot rolled steel sections for doors, windows and ventilators F-7B and IS:7452-1974

a) Frame bar for ventilators F7B and glazing bar T6 for horizontal glazing bars T2 glazing bar in windows.

1. Ma n Industrial Corporation Ltd.,
P.E.131, Near Loco,
Jaipur.

2. Chaliha Rolling Mills Pvt.Ltd.
5, Mission Row, Calcutta-1,
Brand: CHALIROLL.

b) Sizes T3, T6, F7B and F8

3. Ahmedabad Steel Craft & rolling Mills,
Near Odhav Bus Stand, Ahmedabad-21,
having their office at Gupta Chambers,
Near Bageecha Mills, outside Sarangpur,
Ahmedabad.

c) Sizes F4B and F7B

4. Mahabir Steel Rolling Mills,
Kabool Road, G.T. Road,
Shahdara, Delhi.

d) Size F7B

5. Rukmani Steel Industries, Kadugodi Post,
White field, Bangalore, having their
office at 29/2, Kengal
Hanumantiah Road, Shantinagar,
Bangalore-27.

e) Size T2 & T6 window sections &
F7B section

6. Shree Raghnath Industries,
57, Malipanchghora Street,
Lilluah, Howrah having their
office at 207, Maharshi Devendra Road,
Calcutta.

OFFICE OF THE CHIEF ENGINEER
QUALITY CONTROL CELL
DDA VIKAS KUTEER NEW DELHI.
.....

No.C.E.(3)/QC/1031 Dated:19.10.83.

CIRCULAR NO.46

Subject: Quality Control Circulars - Road Work.

In execution of Road Works the following important points are to be kept in mind:-

1. Tests on aggregate:

(i) Los angeles Abrasion Value $\leq$ -- 50%
(ii) Aggregate Impact Value $\leq$ -- 40%
(iii) Flakiness Index $\leq$ -- 15%
(iv) Gradation of Aggregate.

2. Bitumen Registers & out-turn Registers to be maintained - empties to be kept at site.

3. Grading of screenings to be checked.

4. Stack measurements of aggregate & screenings- deduct 7.5% for looseness in stacking.

5. Quantities of material for 100mm thick base course for 10 sq.m.

Aggregate	--	1.35 cu.m.
Screenings	--	0.42 cu.m.
Binding material-		0.1 cu.m.

6. Camber required 1 in 72 - Check with camber template - 12mm tolerance for cross profile.

7. 3 m.straight edge to check longitudenal profile - 12 mm tolerance allowed.

8. Actual roller hoppes to be checked with theoretical.

9. Material required for 10 sq.m. of W.B.M. 75 mm thick.

Aggregate	--	1 cu.m.
Screenings	--	0.2 cu.m.
Binding material	--	0.09 cu.m.

10. Pits to be excavated 1 m X 1m and actual material obtained compared with theoretical.

11. Premix - Aggregate to be stack measured.

Thickness	Bitumen tack coat	Required carpet	Stone chippings required	
			12.5mm	10mm
2 cm.	1 kg./sq.m.	52 kg. per cu.m of 12.5 mm size & 50 kg.per cu.m. of 10mm size.	1.8	0.9
2.5 cm.	1kg./sq.m.	-do-	2.25	1.12

Bitumen - asphalt 30/40 or 80/100 heated and mixed with solvent at the rate of 70 gms. per kg. of asphalt to be temperature of 149 to 177°C.

contd.....

Tolerances -- 10mm in 3m longitudinally and 6m in cross profile.

30 cm.X30 cm. to be cut and material collected to be tested in laboratory for bitumen content and volume of aggregate.

(J.L.Pinto)
Chief Engineer (QC)

Copy to:-

1. P.S. to E.M..
2. Chief Engineer, DDA.
3. All A.C.E.s, DDA for information.
4. All S.E.s(C) for information.
5. All Executive Engineers for information.
6. All E.E.s (Q.C.), DDA.
7. All A.E.s(C) for necessary action.

(J.L.Pinto)
C.E.(QC)
13.10.83

CE(QC(3)/1090 dated 5.10.83.

OFFICE OF THE CHIEF ENGINEER
QUALITY CONTROL CELL
DDA, VIKAS MINAR, NEW DELHI.
****

No. CE(3)/Q.C./ Dated: -10-1983.

CIRCULAR NO.47

Sub:- Cold weather concreting.

The Fact Finding Committee have recommended that the periods stipulated in the C.P.W.D. specifications which should elapse before form work is struck for R.C.C. work should be suitably increased when pozzolona cement is used and should be further increased during the months from November to February when the ambient temperatures are low.

The matter was referred to the Cement Research Institute of India and they have advised that whenever Portland Pozzolona Cement is used it is necessary to delay the striking of form by three days beyond the periods specified in the I.S. Code and the C.P.W.D. specifications.

In respect of cold weather concreting I.S.-7861 (Part-II-1981) recommends the following minimum time limits for striking form work to normal structural concrete when the member is carrying only its own weight and when the ambient temperature is about 3°C. The periods given below apply to ordinary Portland Cement Concrete:-

(i)	Sides of beams, walls and columns	- 5 days.
(ii)	Slabs (props left under)	- 7 days.
(iii)	Beam soffits(props left under)	-14 days.
(iv)	Removal of props to slabs	-14 days.
(v)	Removal of props to beams.	-28 days.

When cubes have been stored and cured under actual site conditions, they can be used to confirm whether the concrete has attained the necessary strength to allow the safe removal of forms. I.S.456-1978 stipulates that forms can be struck when the concrete has reached a strength at least twice the stress to which the concrete may be subjected at the time of removal of form work.

(J.L. Pinto)
Chief Engineer(Q.C.)

Copy forwarded to:-

1. P.S. to E.M., for information.
2. Chief Engineer, D.D.A.
3. All the A.C.Es, D.D.A.
4. ALL the S.Es., D.D.A.
5. All Ex.Engineer, D.D.A.
6. All Ex.Engineer(Q.C.)

s.p.

OFFICE OF THE CHIEF ENGINEER
QUALITY CONTROL CELL
DDA, VIKAS KUTEER, NEW DELHI.
****

No.CE(Q.C.)/3/1089 Dated:-8-10-1983.

CIRCULAR NO. 48

Sub:- Quality Control Circulars - Water supply works.

During execution of water supply works, the following important points are to be kept in mind:-

1. Air valves to be provided at high points in the system.
2. Pressure Relief Valves to be provided near the discharge ends of pumps and near the sluice valve at the end of a long pipeline.
3. Pig lead to be tested.
4. Centrifugally cast iron pipes - thickness, weight, hardness, hydrostatic pressure test, ring test, cracks in pipes.
5. Cushion over pipes - 1 metre under roads and 750 mm. elsewhere.
6. Thrust blocks to be provided at bends and tees.
7. Pressure Test & Leakage Test to be conducted for every 500 m length at twice the working pressure.
8. Weight of lead in joints:-

80 mm	- 1.8 Kg.
100 mm	- 2.2.Kg.
125 mm	- 2.6 Kg.
150 mm	- 3.4 Kg.
200 mm	- 5.0 Kg.
250 mm	- 6.1 Kg.
300 mm	- 7.2 Kg.
350 mm	- 8.4 Kg.
400 mm	- 9.5 Kg.

Variation of 20% permissible.

9. Lead Register showing daily receipts, issues and out-turn.
10. Spun yarn soaked in bitumen.
11. Weights of sluice valves and fittings.
12. For sluice valves - 3 mm rubber insertion or 1.5 mm chemically treated compressed fibre board of not less than 0.183 Kg.//Sq.cm.
13. For R.C.C. pipes - absorption test, bend test, dimensional tests, hydrostatic pressure tests, bursting pressure tests and weight of reinforcement per metre.

(J.L. Pinto)
Chief Engineer(Q.C.)

Copy to:-
1. P.S. to E.M.
2. Chief Engineer & All A.C.Es. of D.D.A.
3. All S.Es(Civil) & All E.Es.(Civil).
4. All E.Es.(Q.C.)
5. All A.Es.(Civil).

OFFICE OF THE CHIEF ENGINEER.
QUALITY CONTROL CELL
VIKAS KUTEER:DDA:NEW DELHI

No.CE/QC/Cir/3/1088 Date:- 26-10-83

CIRCULAR No.49.

Sub: Quality Control Circulars-Drainage Works.

During execution of drainage works, the following important points should be kept in mind:-

1. Gradients.

100 mm	1 in 57
150 mm	1 in 100.
200 mm	1 in 145.
250 mm	1 in 195.

2. Manhole Covers.

	Description	Cover	Frame
L.D.	455 X 610 mm	23 kg.	15 kg.
M.D.	500 mm dia	58 kg.	58 kg.
H.D.	560 mm dia	108 kg.	100 kg.

1.5% variation permissible.

3. Covers and frames to be coated with black bituminous composition.

4. Stoneware pipes.

Internal dia	Thickness
100 mm	12 mm
150 mm	16 mm
200 mm	17 mm
250 mm	20 mm

5. Maximum distance between manholes-30 mm.

6. Stoneware pipes.

Minimum cashion-900 mm. Upto a depth of 1200 mm provide 150 mm cement concrete all round a beyond 1200 mm depth provide 150 mm cement concrete up to banches. At joints, tarred gasket of kemp yarn soaked in thick cement slurry to be caulked and the remaining gap filled with 1 cment :1 fine sand. Conduct pressure test of 2.5. mm head.

7. Dry brick pitching.

At top and at every 3 mm internal, brick courses of half brick width shall be laid on end,

8. R.C.C. pipes.

i) Hydrostatre pressure test.
ii) Absorption test.
iii) Bursting pressure.

Contd....2.....

iv)Three edge pressure tests.

Conduct pressure test of 2.5 mm head.

(J.L.PINTO)
CHIEF ENGINEER(QC).

Copy to:-

1. P.S. to B.M.
2. C.E., D.D.A.
3. All ACEs.
4. All SEs(Civil).
5. All EEs(Civil).
6. All EEs(Q.C.)
7. All AEs(Civil).

(J.L.PINTO)
CHIEF ENGINEER(Q.C.)

OFFICE OF THE CHIEF ENGINEER
QUALITY CONTROL CELL
DDA, VIKAS KUTEER, NEW DELHI.
****

No. C.E.(Q.C.)/(3)/DDA//091 Dated: 26-10-1983.

Sub:- Quality Control Circulars - 50
Lintel bearings.

Para 5.8 of I.S.1905 - 1980 stipulates that the length of the bearing of a lintel at each end shall not be less than 9 cm. or one tenth of the span, whichever is more, and the area of the bearing shall be sufficient to ensure that the stresses in the masonry(combination of wall stresses, stresses due to arching action and bearing stresses from the lintel) do not exceed the permissible stresses.

It is often observed that the bearing lengths are much less than 9 cm. and that the depth of the lintel over the bearing is less than that over the opening.

If the length of bearing is less, the depth of embedment of the lintel steel in the masonry is totally inadequate and this may result in failure at that section under seismic forces. If such a defect occurs, it becomes very difficult to rectify it.

The supervisory staff should instruct the contractor and the masons to provide adequate bearing length for the lintel on either side and to ensure that the depth of the lintel over the bearing is not less than that over the opening.

(J.L. Pinto)
Chief Engineer(Q.C.)

Copy to:-

1. P.S. to E.M.
2. Chief Engineer, D.D.A.
3. All Addl.Chief Engineers, D.D.A.
4. All Supdtg.Engineers,(Civil).
5. All Ex.Engineers(Civil).
6. All Ex.Engineers(Q.C.).
7. All Asstt.Engineers(Civil).