

Dr. A.S. Arya
National Seismic Advisor,
Ministry of Home Affairs,
Government of India

NIDM, IIPA Campus
Ring Road, Near I.T.O.
New Delhi - 110002
(O) 011-23702432 Ext.217
(O) 011-65396386
(M) 9818997029
(e) anand.s.arya@undp.org

29th August, 2006

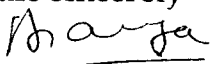
Dear Shri Verma,

It came to my notice that MoUD has issued the following document in regard to Model Building Bylaws of November, 2004 " Standard Operating Procedures Manual - First Edition: March 2005, Version 1.0 prepared by Town & Country Planning Organisation, Ministry of Urban Development, Government of India.

I have compared the main safety provisions as given in the MoUD document with those provided in the Model Building Bylaws issued by MHA - GoI to various States/UT's for implementation vide this Ministry's D.O. no. 31-1/2004-NDM-III dated 13th September, 2004.

The comparison in tabulated form along with 3 Annexures from MHA Model Building Bylaws (MBBL) are attached for your kind information. It will be seen that the safety provisions provided in MoUD document are also covered MHA document and adoption of MHA MBBL in addition to MoUD safety aspects will be in the nature of complimentary and not contradictory. This point needs to be brought to the notice of the various States & UT's for considering appropriate provisions in their building bylaws.

With warm regards

Yours sincerely

A.S. Arya

To,
Sh.Naveen Verma
Joint Secretary (DM)
Ministry of Home Affairs, North Block
New Delhi

C.C. to

1. P.S. to Secretary Urban Development, MoUD
2. Joint Secretary Urban Development, MoUD — *Mr. Rajamani*
3. Assistant Resident Representative (DRM), UNDP
4. Advisor (DM), NIDM
5. Director – NDM (III), MHA

**COMPARITIVE STATEMENT OF THE MODEL BUILDING BYLAWS PREPARED BY
MoUD (November 2004) & MHA (September 2004)**

| MODEL BYLAWS BY MoUD | MODEL BYLAWS BY MHA |
|--|---|
| <p>Under section 2.9:- Procedure for obtaining building permit. Notice: Every person who intends to erect, re-erect or make alteration in any place in a building or demolish any building shall give notice in writing to the authority of his intention in the prescribed form (Appendix-A & A-1)</p> | <p>Under section 4.3 Procedure for securing development permission 4.3.1 Forms of Application Every person who gives notice under relevant section of the Act shall furnish all information in forms and format prescribed herein and as may be amended from time to time by the Competent Authority. The following particulars and documents shall also be submitted along with the application. Certificate of undertaking: Certificate in the prescribed Form No.1 by the "Owner, Developer, Structural Engineer on Record and Architect on Record"; Form No.2 by the "Architect on Record"/ "Engineer on Record"; and Form No. 3 by the "Structural Engineer on Record; Form No. 4 by the "Construction Engineer on Record" as prescribed in Appendix B.</p> |
| <p>Remarks:- <i>As there are a number of professionals like architect, civil engineer/structural engineer, construction supervisor involved in the whole process, therefore it is necessary to put on record every construction professional from the beginning of any project activity.</i></p> | |
| <p>Under section 4.6 Requirement in respect of building sites 4.6.1 Damp sites: Wherever the dampness of a site or the nature of the soil renders such precautions necessary, the ground surface of the site between the walls of any building erected thereon shall be rendered damp-proof to the satisfaction of the authority.</p> | <p>Under section 4.4 General requirements for developments 4.4.1 Requirements of Site No land shall be used as a site for the construction of building- i) If the site is found to be liable to liquefaction by the Competent Authority under the earthquake intensity of the area, except where appropriate protection measures are taken. ii) If the Competent Authority finds that the proposed development falls in the area liable to</p> |

| | |
|--|--|
| | storm surge during cyclone, except where protection measures are adopted to prevent storm surge damage. |
| - | 4.5.2 Exception for small building |
| Remarks:- <i>This is added to give relief from more stringent requirement of other than small buildings.</i> | |
| 5.0 Structural Design Refers to NBC Part VI and IS 1893, 13920, 4326, 13828, 13827 & 13935 for structural safety | 5.1 Structural Design Refers to NBC Part VI and BIS codes for:- <ul style="list-style-type: none"> • General structural safety (See Annex – 1) • Cyclone/wind protection (See Annex – 1) • Earthquake protection (See Annex – 1) • Protection of Landslide hazard (See Annex – 1) |
| Remarks:- <i>Part of NBC do not cover all the safety related codes also not in full, therefore attention has been drawn to the relevant BIS codes which incidently are revised and updated faster than the NBC.</i> | |
| - | 5.2 Structural Design Basis Report (Attached as Annex- 2) |
| Remarks:- <i>SDBR is required to be submitted along with the submission of building proposals which does not require the structural designs to be submitted at this stage but reveals the competence as well as approach and detail which the structural engineer will adopt in the design.</i> | |
| - | 5.4 Review of structural design by Structural design review panel (SDRP) |
| Remarks:- <i>The expert group considered the necessity of a competent review of the structural design under certain classes of the buildings. (See Annex – 3)</i> | |
| Structural Stability certificate to be issued by an architect/engineer/supervisor at the time of completion. | 5.5 Certification regarding structural safety in design:- Structural Engineer on Record to give a certificate of structural safety of design as per proforma given in form 3 (for proposed construction) and form 14 at the time of completion. |
| Remarks:- <i>‘Structural stability’ certificate is vague and can not be issued by an Architect and must be given by Structural Engineer on Record. He should be accountable for structure stability.</i> | |
| - | 5.6 CONSTRUCTIONAL SAFETY 5.6.1 Supervision All construction except load bearing buildings upto 3 storeys shall be carried out under supervision of the Construction Engineer on Record (CER) or Construction Management |

| | |
|--|---|
| | <p>Agency on Record (CMAR) for various seismic zones.</p> <p>5.6.2 Certification of structural safety in construction</p> <p>CER/ CMAR shall give a certificate of structural safety of construction as per proforma given in Form-13 at the time of completion.</p> |
| - | <p>5.7 Quality control and inspection</p> <p>All the construction for high-rise buildings higher than seven storeys, public buildings and special structures shall be carried out under quality inspection program prepared and implemented under the Quality Auditor on Record (QAR) or Quality Auditor Agency on Record (QAAR) in seismic zones IV & V. Quality Auditor on Record (QAR) or Quality Auditor Agency on Record (QAAR) shall give a certificate of quality control as per proforma given in Form-15.</p> <p>Quality Inspection Programme to be carried on the site shall be worked out by QAR/ QAAR in consultation with the owner, builder, CER/ CMAR.</p> |
| - | <p>5.11 MAINTENANCE OF BUILDINGS</p> <p>In case of building older than fifty years, it shall be the duty of the owner of a building, to get his building inspected by a Registered Structural Engineer (RSE) within a year from the date of coming into force of these regulations. The Structural Inspection Report (Form No.16) shall be produced by the Owner to the Appropriate Authority. If any action, for ensuring the structural safety and stability of the building is to be taken, as recommended by SER, it shall be completed within five years.</p> |
| <p><i>For ensuring structural safety from the point of view of quality of construction the above clauses have been specially included.</i></p> | |

Annexure – 1

5.1 STRUCTURAL DESIGN

For any building under the jurisdiction of these regulations structural design/retrofitting shall only be carried out by a Structural Engineer on Record (SER) or Structural Design Agency on Record (SDAR). Proof checking of various designs/ reports shall be carried out by competent authority as per Table-1 wherever applicable.

Generally, the structural design of foundations, elements of masonry, timber, plain concrete, reinforced concrete, pre-stressed concrete and structural steel shall conform to the provisions of part VI Structural Design Section – 1 Loads, Section – 2 Foundation, Section – 3 Wood, Section – 4 Masonry, Section– 5 Concrete & Section – 6 Steel of National Building Code of India (NBC), taking into consideration the Indian Standards as given below:

For General Structural Safety

1. IS: 456:2000 “Code of Practice for Plain and Reinforced Concrete
2. IS: 800-1984 “Code of Practice for General Construction in Steel
3. IS: 801-1975 “Code of Practice for Use of Cold Formed Light Gauge Steel Structural Members in General Building Construction
4. IS 875 (Part 2):1987Design loads (other than earthquake) for buildings and structures Part2 Imposed Loads
5. IS 875 (Part 3):1987Design loads (other than earthquake) for buildings and structures Part 3 Wind Loads
6. IS 875 (Part 4):1987Design loads (other than earthquake) for buildings and structures Part 4 Snow Loads
7. IS 875 (Part 5):1987Design loads (other than earthquake) for buildings and structures Part 5 special loads and load combination
8. IS: 883:1966 “Code of Practice for Design of Structural Timber in Building 9. IS: 1904:1987 “Code of Practice for Structural Safety of Buildings: Foundation”
10. IS1905:1987 “Code of Practice for Structural Safety of Buildings: Masonry Walls
11. IS 2911 (Part 1): Section 1: 1979 “Code of Practice for Design and Construction of Pile Foundation Section 1
Part 1: Section 2 Based Cast-in-situ Piles
Part 1: Section 3 Driven Precast Concrete Piles
Part 1: Section 4 Based precast Concrete Piles
Part 2: Timber Piles
Part 3 Under Reamed Piles
Part 4 Load Test on Piles

For Cyclone/Wind Storm Protection

12. IS 875 (3)-1987 "Code of Practice for Design Loads (other than Earthquake) for Buildings and Structures, Part 3, Wind Loads"
- 13 Guidelines (*Based on IS 875 (3)-1987*) for improving the Cyclonic Resistance of Low rise houses and other building

For Earthquake Protection

- 14 IS: 1893-2002 "Criteria for Earthquake Resistant Design of Structures (Fifth Revision)"
- 15 IS:13920-1993 "Ductile Detailing of Reinforced Concrete Structures subjected to Seismic Forces - Code of Practice"
- 16 IS:4326-1993 "Earthquake Resistant Design and Construction of Buildings - Code of Practice (Second Revision)"
- 17 IS:13828-1993 "Improving Earthquake Resistance of Low Strength Masonry Buildings - Guidelines"
- 18 IS:13827-1993 "Improving Earthquake Resistance of Earthen Buildings - Guidelines",
- 19 IS:13935-1993 "Repair and Seismic Strengthening of Buildings - Guidelines"

For Protection of Landslide Hazard

- 20 IS 14458 (Part 1): 1998 Guidelines for retaining wall for hill area: Part 1 Selection of type of wall.
- 21 IS 14458 (Part 2): 1997 Guidelines for retaining wall for hill area: Part 2 Design of retaining/breast walls
- 22 IS 14458 (Part 3): 1998 Guidelines for retaining wall for hill area: Part 3 Construction of dry stone walls
- 23 IS 14496 (Part 2): 1998 Guidelines for preparation of landslide – Hazard zonation maps in mountainous terrains: Part 2 Macro-zonation

Note: Whenever an Indian Standard including those referred in the National Building Code or the National Building Code is referred, the latest revision of the same shall be followed except specific criteria, if any, mentioned above against that code.

Annexure – 2

5.2 STRUCTURAL DESIGN BASIS REPORT

In compliance of the design with the above Indian Standard, the Structural Engineer on Record will submit a structural design basis report in the Proforma attached herewith covering the essential safety requirements specified in the Standard.

(i) The “Structural Design Basis Report (SDBR)” consists of four parts (**Form No.6**)

Part-1 - General Information/ Data

Part-2 - Load Bearing Masonry Buildings

Part-3 – Reinforced Concrete Buildings

Part-4 - Steel Buildings

(ii) Drawings and Documents to be submitted for approval of appropriate authorities shall include SDBR as detailed below:

Part - 1 Completed

Part - 2 (if applicable) – completed

Part -3 (if applicable) – undertaking that completed Part 3 will be submitted before commencement of construction.

Part– 4 (if applicable) – undertaking that completed Part 4 will be submitted before commencement of construction.

(iii) SDBR as detailed below shall be submitted to the appropriate authority as soon as design of foundation is completed, but not later than one month prior to commencement of construction.

Part-1 Completed

Part-2, Part-3 or Part-4 (if applicable) Completed

FORM NO. 6
(PARA 5.2)

STRUCTURAL DESIGN BASIS REPORT

1. This report to accompany the application for Building Development Permission.
2. In case information on items 3, 10, 17, 18 and 19 can not be given at this time, it should be submitted at least one week before commencement of construction.

| Part 1 | | | |
|---------------------|---|--------------------|----------------------------------|
| General Data | | | |
| S.No. | Description | Information | Notes |
| 1 | Address of the building <ul style="list-style-type: none"> • Name of the building • Plot number • Subplot number • TPS scheme <ul style="list-style-type: none"> a. Name b. Number • Locality/Township • District | | |
| 2 | Name of owner | | |
| 3 | Name of Builder on record | | |
| 4 | Name of Architect/Engineer on record | | |
| 5 | Name of Structural engineer on record | | |
| 6 | Use of the building | | |
| 7 | Number of storeys above ground level (including storeys to be added later, if any) | | |
| 8 | Number of basements below ground level | | |
| 9 | Type of structure <ul style="list-style-type: none"> • Load bearing walls • R.C.C frame • R.C.C frame and Shear walls • Steel frame | | |
| 10 | Soil data <ul style="list-style-type: none"> • Type of soil • Design safe bearing capacity | | IS: 1893 Cl. 6.3.5.2 IS: 1904 |
| 11 | Dead loads (unit weight adopted) <ul style="list-style-type: none"> • Earth • Water • Brick masonry • Plain cement concrete • Reinforced cement concrete • Floor finish • Other fill materials • Piazza floor fill and landscape | | IS: 875 Part 1 |

| | | | |
|----|---|--|-------------------------|
| 12 | Imposed (live) loads <ul style="list-style-type: none"> • Piazza floor accessible to Fire Tender • Piazza Floor not accessible to Fire Tender ♥ • Floor loads ♦ • Roof loads | | IS: 875 Part 2 |
| 13 | Cyclone / Wind <ul style="list-style-type: none"> • Speed • Design pressure intensity | | IS: 875 Part 3 |
| 14 | Seismic zone | | IS: 1893 2002) |
| 15 | Importance factor | | IS: 1893 (2002) Table 6 |
| 16 | Seismic zone factor(Z) | | IS: 1893 Table 2 |
| 17 | Response reduction factor | | IS: 1893 Table-7 |
| 18 | Fundamental natural period - approximate | | IS: 1893 Cl. 7.6 |
| 19 | Design horizontal acceleration spectrum value (A_h) | | IS: 1893 Cl. 6.4.2 |
| 20 | ♣ Expansion / Separation Joints | | |

- ♥ Enclose small scale plans of each floor on A₄ sheets
- ♦ In case terrace garden is provided, indicate additional fill load and live load
- ♣ Indicate on a small scale plan on A₄ sheet

| Part 2 | | Load bearing masonry buildings | | | Notes | | | | | | | | | | | | | | | |
|-------------|--|--|---|---|--|-------------|----|-----|----|---|----------|---|---|---|---|-----------|---|---|---|---|
| S.No. | Description | Information | | | Notes | | | | | | | | | | | | | | | |
| 1 | Building category | | | | IS:4326 Cl. 7 read with IS: 1893 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Bldg \ Zone</td> <td style="text-align: center;">II</td> <td style="text-align: center;">III</td> <td style="text-align: center;">IV</td> <td style="text-align: center;">V</td> </tr> <tr> <td style="text-align: center;">Ordinary</td> <td style="text-align: center;">B</td> <td style="text-align: center;">C</td> <td style="text-align: center;">D</td> <td style="text-align: center;">E</td> </tr> <tr> <td style="text-align: center;">Important</td> <td style="text-align: center;">C</td> <td style="text-align: center;">D</td> <td style="text-align: center;">E</td> <td style="text-align: center;">E</td> </tr> </table> | Bldg \ Zone | II | III | IV | V | Ordinary | B | C | D | E | Important | C | D | E | E |
| Bldg \ Zone | II | III | IV | V | | | | | | | | | | | | | | | | |
| Ordinary | B | C | D | E | | | | | | | | | | | | | | | | |
| Important | C | D | E | E | | | | | | | | | | | | | | | | |
| 2 | Basement Provided | | | | | | | | | | | | | | | | | | | |
| 3 | Number of floors including Ground Floor (all floors including stepped floors in hill slopes) | | | | | | | | | | | | | | | | | | | |
| 4 | Type of wall masonry | | | | | | | | | | | | | | | | | | | |
| 5 | Type and mix of Mortar | | | | IS:4326 Cl. 8.1.2 | | | | | | | | | | | | | | | |
| 6 | Re: size and position of openings (See note No.1) <ul style="list-style-type: none"> • Minimum distance (b₅) • Ratio (b₁+b₂+b₃)/l₁ or (b₆+b₇)/l₂ • Minimum pier width between consequent opening (b₄) • Vertical distance (h₃) • Ratio of wall height to thickness⁴ • Ratio of wall length between cross wall to thickness | | | | IS:4326 Table 4, Fig.7 | | | | | | | | | | | | | | | |
| 7 | Horizontal seismic band <ul style="list-style-type: none"> • at plinth level • at window sill level • at lintel level • at ceiling level • at eave level of sloping roof • at top of gable walls • at top of ridge walls | P <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | IP <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | NA <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | (see note no.2) IS:4326 Cl. 8.4.6 IS:4326 Cl. 8.3 IS:4326 Cl. 8.4.2 IS:4326 Cl. 8.4.3 IS:4326 Cl. 8.4.3 IS:4326 Cl. 8.4.4 | | | | | | | | | | | | | | | |
| 8 | Vertical reinforcing bar <ul style="list-style-type: none"> • at corners and T junction of walls • at jambs of doors and window openings | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | IS:4326 Cl. 8.4.8 IS:4326 Cl. 8.4.9 | | | | | | | | | | | | | | | |

| | | | | | |
|----|--|--------------------------|--------------------------|--------------------------|-------------------|
| 9 | Integration of prefab roofing/flooring elements through reinforced concrete screed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | IS:4326 Cl. 9.1.4 |
| 10 | Horizontal bracings in pitched truss <ul style="list-style-type: none"> • in horizontal plane at the level of ties • in the slopes of pitched roofs | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |

Notes

1. Information in item 6 should be given on separate A4 sized sheets for all walls with large number of openings.
2. P indicated **"Information Provided"**
TP indicates **"Information to be Provided"**
NA indicates **"Not Applicable"**
Tick mark one box

| Part 3 Reinforced concrete framed buildings | | | |
|---|--|-------------|---------------------|
| Sl no | Description | Information | Notes |
| 1 | Type of Building <ul style="list-style-type: none"> • Regular frames • Regular frames with Shear walls • Irregular frames • Irregular frames with shear walls • Soft storey | | IS: 1893 Cl. 7.1 |
| 2 | Number of basements | | |
| 3 | Number of floors including ground floor | | |
| 4 | Horizontal floor system <ul style="list-style-type: none"> • Beams and slabs • Waffles • Ribbed Floor • Flat slab with drops • Flat plate without drops | | |
| 5 | Soil data <ul style="list-style-type: none"> • Type of soil • Recommended type of foundation <ul style="list-style-type: none"> - Independent footings - Raft - Piles • Recommended bearing capacity of soil • Recommended, type, length, diameter and load capacity of piles • Depth of water table • Chemical analysis of ground water • Chemical analysis of soil | | IS: 1498 |
| 6 | Foundations <ul style="list-style-type: none"> • Depth below ground level • Type <ul style="list-style-type: none"> ▪ Independent ▪ Interconnected ▪ Raft ▪ Piles | | |
| 7 | System of interconnecting foundations <ul style="list-style-type: none"> • Plinth beams • Foundation beams | | IS: 1893 Cl. 7.12.1 |
| 8 | Grades of concrete used in different parts of building | | |
| 9 | Method of analysis used | | |
| 10 | Computer software used | | |
| 11 | Torsion included | | IS: 1893 Cl. 7.9 |

| | | | |
|----|--|--|--|
| 12 | Base shear a. Based on approximate fundamental period b. Based on dynamic analysis c. Ratio of a/b | | IS: 1893 Cl. 7.5.3 |
| 13 | Distribution of seismic forces along the height of the building | | IS:1893 Cl. 7.7 (provide sketch) |
| 14 | The column of soft ground storey specially designed | | IS:1893 Cl. 7.10 |
| 15 | Clear minimum cover provided in • Footing • Column • Beams • Slabs • Walls | | IS: 456 Cl. 26.4 |
| 16 | Ductile detailing of RC frame • Type of reinforcement used • Minimum dimension of beams • Minimum dimension of columns • Minimum percentage of reinforcement of beams at any cross section • Maximum percentage of reinforcement at any section of beam • Spacing of transverse reinforcement in 2-d length of beams near the ends • Ratio of capacity of beams in shear to capacity of beams in flexure • Maximum percentage of reinforcement in column • Confining stirrups near ends of columns and in beam-column joints a. Diameter b. Spacing • Ratio of shear capacity of columns to maximum seismic shear in the storey | | IS: 456 Cl. 5.6 IS:13920 Cl. 6.1 IS:13920Cl. 7.1.2 IS: 456 Cl. 26.5.1.1(a) IS:13920 Cl. 6.2.1 IS: 456 Cl. 26.5.1.1(b) IS:13920 Cl. 6.2.2 IS: 13920 Cl. 6.3.5 IS: 456 Cl. 26.5.3.1 IS: 13920 Cl. 7.4 |

General Notes

1. A certificate to the effect that this report will be completed and submitted at least one month before commencement of Construction shall be submitted with the application for Building Development Permission.
2. In addition to the completed report following additional information shall be submitted, at the latest, one month before commencement of Construction.
 - 2.1 Foundations
 - 2.1.1 In case raft foundation has been adopted indicate K value used for analysis of the raft
 - 2.1.2 In case pile foundations have been used give full particulars of the piles, type, dia, length, capacity
 - 2.1.3 In case of high water table indicate system of countering water pressure, and indicate the existing water table, and that assumed to design foundations.
 - 2.2 Idealization for Earthquake analysis
 - 2.2.1 In case of a composite system of shear walls and rigid frames, give distribution of base shear in the two systems on the basis of analysis, and that used for design of each system.
 - 2.2.2 Indicate the idealization of frames and shear walls adopted in the analysis with the help of sketches.
 - 2.3 Submit framing plans of each floor
 - 2.4 In case of basements, indicate the system used to contain earth pressures

| Part 4 Buildings in Structural Steel | | | |
|--------------------------------------|--|--|--|
| 1 | Adopted method of Design | <input type="radio"/> Simple <input type="radio"/> Semi-rigid <input type="radio"/> Rigid | IS: 800; Cl. 3.4.4 IS: 800; Cl. 3.4.5 IS: 800; Cl. 3.4.6 |
| 2 | Design based on | <input type="radio"/> Elastic analysis <input type="radio"/> Plastic analysis | IS: 800; Section-9 SP: 6 (6) |
| 3 | Floor Construction | <input type="radio"/> Composite <input type="radio"/> Non-composite <input type="radio"/> Boarded | |
| 4 | Roof Construction | <input type="radio"/> Composite <input type="radio"/> Non-composite <input type="radio"/> Metal <input type="radio"/> Any other | |
| 5 | Horizontal force resisting system adopted | <input type="radio"/> Frames <input type="radio"/> Braced frames <input type="radio"/> Frames & shear walls | <i>Note: Seismic force As per IS: 1893 Would depend on system</i> |
| 6 | Slenderness ratios maintained | Members defined in Table 3.1, IS: 800 | IS: 800; Cl. 3.7 |
| 7 | Member deflection limited to | Beams, Rafters Crane Girders Purlins Top of Columns | IS: 800; Cl. 3.13 |
| 8 | Structural members | <input type="radio"/> Encased in Concrete <input type="radio"/> Not encased | IS: 800; Section-10 |
| 9 | Proposed material | <input type="radio"/> General weld-able <input type="radio"/> High strength <input type="radio"/> Cold formed <input type="radio"/> Tubular | IS: 2062 IS: 8500 IS: 801, 811 IS: 806 |
| 10 | Minimum metal thickness Specified for corrosion protection | <input type="radio"/> Hot rolled sections <input type="radio"/> Cold formed sections <input type="radio"/> Tubes | IS: 800, Cl. 3.8 Cl. 3.8.1 to Cl. 3.8.4 Cl. 3.8.5 Cl. 3.8.5 |
| 11 | Structural connections | <input type="radio"/> Rivets <input type="radio"/> C T Bolts <input type="radio"/> S H F G Bolts <input type="radio"/> Black Bolts <input type="radio"/> Welding-Field | IS: 800; Section-8 IS: 1929, 2155, 1149 IS: 6639, 1367 IS: 3757, 4000 IS: 1363, 1367 |

| | | | |
|-----------|--|--|---|
| <p>12</p> | <p>Minimum Fire rating Proposed, with method</p> | <p>Shop (Specify welding type proposed) ○ Composite ○ Rating ----- hours ○ Method proposed- - In tumescent Painting - Spraying - Quilting - Fire retardant boarding</p> | <p>IS: 816, 814, 1395, 7280, 3613, 6419 6560, 813, 9595 IS: 1641, 1642, 1643</p> |
|-----------|--|--|---|

Annexure – 3

5.4 REVIEW OF STRUCTURAL DESIGN

- (i) The Competent Authority shall create a Structural Design Review Panel (SDRP) consisting of senior SER's and SDAR's whose task will be to review and certify the design prepared by SER or SDAR whenever referred by the competent authority.
- (ii) The Reviewing Agency shall submit addendum to the certificate or a new certificate in case of subsequent changes in structural design.
- (iii) Table-1 gives requirements of SDRP for different seismic zones namely III, IV and V and for structures of different complexities
- (iv) In seismic Zone II, buildings & structures greater than 40m in height will require proof checking by SDRP as per detail at sl. no.03 of Table 1.

TABLE - 1
PROOF CHECKING REQUIREMENTS FOR STRUCTURAL DESIGN

| SR NO | TYPE OF STRUCTURE | SUBMISSION FROM SER or SDAR | TO BE PROOF-CHECKED |
|-------|--|--|---------------------|
| 01 | LOAD BEARING BUILDINGS UPTO 3 STOREYS | SDBR* | NOT TO BE CHECKED |
| 02 | BUILDINGS UPTO SEVEN STOREYS (R.C.C /STEEL FRAMED STRUCTURE) | SDBR | TO BE CHECKED |
| | | PRELIMINARY DESIGN | TO BE CHECKED |
| 03 | BUILDINGS GREATER THAN SEVEN STOREYS (R.C.C /STEEL FRAMED STRUCTURE) | SDBR | TO BE CHECKED |
| | | PRELIMINARY DESIGN | TO BE CHECKED |
| | | DETAILED STRUCTURAL DESIGN AND STRUCTURAL DRAWINGS | TO BE CHECKED |
| 04 | PUBLIC BUILDINGS (A) LOAD BEARING BUILDINGS UPTO 3 STOREYS | SDBR | NOT TO BE CHECKED |
| | | | |
| | (B) R.C.C/STEEL STRUCTURES | SDBR | TO BE CHECKED |
| | | PRELIMINARY DESIGN | TO BE CHECKED |
| 05 | SPECIAL STRUCTURES | SDBR | TO BE CHECKED |
| | | PRELIMINARY DESIGN | TO BE CHECKED |
| | | DETAILED STRUCTURAL DESIGN AND STRUCTURAL DRAWINGS | TO BE CHECKED |

* SDBR – Structural Design Basis Report

Notes:

- Public building means assembly of large number of people including schools, hospitals, courts etc.
- Special structure means large span structures such as stadium, assembly halls, or tall structures such as water tanks, TV tower, chimney, etc.

It will be seen from the table that there is a wide range of structure typology, and the requirement by the Competent Authority for third party verification will depend on the type of structure.

