



MANUAL OF STANDARDS AND SPECIFICATIONS

For Development of Housing Project on PPP Mode

RAJASTHAN HOUSING BOARD

(Government of Rajasthan Enterprises)

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Construction of flats (G+3) or multistory units on RHB land on PPP mode on Design, Build Finance, Maintain And Handover basis as a Turn Key contract.

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Foreword

The Rajasthan Housing Board has initiated an ambitious Scheme of Development of Affordable Housing Project on Public Private Partnerships (PPPs) as a means of attracting private capital, improving efficiencies and reducing costs. This initiative provides for a model as under:

Private developers to develop housing projects on RHB land for Affordable Housing as (G+3) or multistory flats and all internal development like roads, drainage, Water supply, sanitary, elevators, power installation with power backup for common & essential services, street lighting, sewerage, parks, Landscaping, Rainwater harvesting, waste water recycling, etc.

Out of the total land parcel, housing for EWS/LIG shall be constructed minimum on 30% of FAR area, on remaining 70% FAR area the developer will be free for construction of MIG/HIG flats/houses (high rise permitted), with commercial use as per prevailing building by laws (No TDR benefit will be given). The developer to be selected through single stage, two envelop system. The developer offering the highest per sq.ft. rate of total area will be selected subject to fulfilling of other terms & conditions.

The Rajasthan Housing Board shall be interested in adoption of pre-engineered or pre-cast RCC constructions or all RCC construction to achieve the physical targets in time consistent with the factory made quality of precast components. Adoption of energy efficient green building concept shall also be appreciated.

For awarding these PPP Projects within a competitive, efficient and economic framework based on international best practices, Government of Rajasthan has adopted the Design & Build, (DB) and hand over approach that requires the Developer to bear the responsibility for detailed surveys, investigations, designs, drawings and execution on a turnkey basis. To ensure proper quality/ durability of executed work, it is proposed to appoint Quality Council of India (GOI body) approved/accredited Third Party Quality Inspection Agencies to continuously monitor the quality of execution in accordance with international standard ISO 17020. However, the accountability for providing safe and durable houses (design life more than 50 years) ultimately rests with the Developer/Builder. It therefore, mandates a Manual of Standards and Specifications that the developer must confirm to.

Consistent with the DB approach, only the core requirements of design, construction, and maintenance during the defect liability period of the housing complexes are to be specified. In sum, the framework should focus on the 'what' rather than the 'how' in relation to the delivery of housing complexes by the developer. This would enable cost efficiencies to occur because the shift to output-based specifications would provide the private sector with a greater opportunity to add value by innovating and optimizing on designs in a way normally denied to it under conventional input-based procurement specifications. For evolving standards conforming to the DB approach. The developer shall have to adopt the BIS, IRC and other standards in accordance with the housing construction industry in the country and abroad to provide the people with well-designed & durable houses as a life time asset.

The Manual would, by reference, form an integral part of the Agreement between the developer and the Rajasthan Housing Board and would be binding on the builder. Its provisions would be enforceable and any breach would expose the Developer to compensations/ penalties, including termination of the contract.

The Manual has been evolved after extensive consultations with a team of experts of Rajasthan Housing Board. Following the conventions of BIS, IRC etc. The Manual is now an approved technical document of the RHB for Housing Project on PPP Mode and stands at par with other such documents that are widely followed across the State/Country by way of code provisions. Other building construction agencies of the State Governments could get such specific manuals developed for their purposes.

Since the developer would be contractually bound by the provisions of the Manual, care has been taken to ensure that it is consistent with the provisions of the relevant codes. These standard documents should enable the respective Government departments to take up a larger program for development of safe and durable houses through PPPs, with quality monitored as per ISO 17020, at least cost to the users and to the public exchequer. The Manual reflects a delicate balance with a view to ensuring development of quality housing complexes and at the same time improving their financial viability by optimizing on costs and obligations. Modifications, if any, should be made/ got approved by the executing agencies with due regard to their legal, financial and technical implications on the underlying contractual framework.

The office-bearers of Rajasthan Housing Board, are to be complimented for their initiative in producing this volume with the assistance of eminent experts. Their contribution would go a long way towards the development of Housing Project on PPP Mode through PPPs - a modality that has become inevitable for attracting ever larger volumes of investment to this sector.

Dated:-

Chairman
Rajasthan Housing Board,
Jaipur

Preface

There is a very urgent need to construct durable quality houses for the millions that need it most and do not have resources or the logistic support structure to do it themselves. The Govt. of Rajasthan has taken the leading initiative.

The Rajasthan Housing Board shall be interested in adoption of pre-engineered or pre-cast RCC constructions to achieve the physical targets in minimum time consistent with the factory made quality of precast components. These will be constructed on “Design and Build” format wherein the developer/Contractors owns the responsibility of surveys, investigations, designs and drawings. The Employer shall approve these and to ensure proper quality, proposes to engage Quality Council of India (GOI body) approved/accredited third party quality inspection agencies to monitor the quality of works as per ISO 17020.

An attempt has been made to adopt a balanced approach by the Rajasthan Housing Board to bring in the latest technology and specifications, at the same time, keeping the cost of projects within manageable limits so as to attract more entrepreneurs. A document of this nature cannot remain static in view of the continuous up-gradation of technology over the years. Users of this Manual are going to be the best judge of the deficiencies, if any, in the document. Their feedback and suggestions will be greatly valued by Rajasthan Housing Board to keep this document updated measuring up to the expectations of the users. All codes and specifications mentioned in this manual are to be taken as their latest editions/revisions, where BIS specifications are silent, other international specifications or internationally adopted best practices can be substituted.

Date :

Chairman,
Rajasthan Housing Board,
Jaipur.

List of Symbols and Abbreviations

AASHTO	:	American Association of State Highway and Transportation official
ASTM	:	American Society for Testing and Materials
BIS	:	Bureau of Indian Standards
BAR	:	Builtup Area Ratio
CBR	:	California Bearing Ratio
FAR	:	Floor Area Ratio
HDPE	:	High Density Polyethylene
HYSD	:	High Yield Strength Deformed (Bars)
IE	:	Independent Engineer
IRC	:	Indian Roads Congress
IS	:	Indian Standards
ISO	:	International Standards Organisation
LL	:	Liquid Limit
MDA	:	Model Developer Agreement
MOSRTH	:	Ministry of Shipping, Road Transport & Highways
NBC	:	National Building Code 2005
OMC	:	Optimum Moisture Content
PCC	:	Plain Cement Concrete
PPM	:	Parts per million.
PL/PI	:	Plastic limit of soil / Plasticity Index
QAM	:	Quality Assurance Manual
QAP	:	Quality Assurance Plan
QS	:	Quality System
RCC	:	Reinforced Cement Concrete
ROW	:	Right of Way
RHB	:	Rajasthan Housing Board
TMT	:	Thermo Mechanically Treated.

SECTION-1

GENERAL

SECTION 1

GENERAL

1. **Selection of Land Parcel :**

Land shall be provided by RHB as per availability & suitability and free from all disputes for each project at single location or more than one locations.

For developed Land or Under process of Development, EDC will be charged from the Developer at the rate decided by RHB i.e.@ Rs..... per sq.mt.

2. **Selection of Developer** :- Developers will be selected by on line e-procurement single stage two bid system as per procedure laid down in the evaluation criteria (section-2 of this manual). Joint Venture/or Joint Development partnership will be allowed. Joint development partners must not be more than three and minimum Turn Over of Lead Partner must be 50% of the turn over required for the project.

(A) **Folder-1 (Technical Bid)** :- Preliminary selection would be based on qualitative assessment including financial track record of the developer.

Expertise & Experience : The developer should have completed two/or more Residential projects of large size (2 Hact. & above) in last five financial years with minimum construction area of residential units to be not less than 33.33% of FAR area of the proposed project based on standard FAR(1.33) i.e. sqmtr. (supporting documents e.g. completion certificates issued by competent authority & other documents to verify the area of projects and construction area will have to be provided by the bidder as per schedule-II).

Financial Track Record :- An average annual turnover of at least 60% of Project Cost during last 3 financial years. The estimated project cost shall be calculated on the basis of standard FAR of 1.33 and prevailing per Sq.ft. rate of construction (presently @Rs.1200/- per sqft).i.e. Estimated Project Cost = Project Area in sqft.x1.33x1200=Rs..... Audited balance sheets of last 3 financial years and other information's to be provided by the bidder as per schedule-I.

Bid Capacity :- The available bid capacity of the bidder/developer must be more than the estimated cost of proposed project. The available bid capacity will be calculated as per clause 3(V) of evaluation criteria.

Letter of credit from bank as per schedule (VII) minimum 30% of estimated project cost i.e. Rs.....

Earnest Money @2% of Project Cost in the form of DD or Bank Guarantee. Bank Guarantee must be valid up to at least for six months or till final approval of the project in favour of selected bidder, whichever is later. The Earnest Money of the selected bidder shall be retained by RHB and shall be adjusted against the returns to RHB in the last installment. The Earnest Money DD/Bank Guarantee and GST registration certificate must be deposited in the office of the procuring authority before the due date of opening of Technical Bid, failing which the Technical Bid & Financial Bid will not be opened.

(B) Folder-2 (Financial Bid) :-

The financial bid folder would be opened of only those bidders who have fulfilled evaluation criteria and have been declared as responsive by the competent authority.

Bid Criteria :- Bid parameters would be payment to RHB per Sq.ft. of total BAR area of the proposed project. The highest bidding firm shall be selected and issued a letter of acceptance. The selected developer shall be asked to submit DPR along with work plan & PERT chart within 60 days of issue of letter of acceptance. Thereafter, final approval/work order shall be issued in favour of selected firm.

The bid amount is to be paid by the selected developer to RHB in 6 monthly equated installments within 3 years from the date of final approval, failing which interest shall be levied as prescribed below :-

S.No.	Installment	Due date of Payment	Remark
1	1 st Installment	Within 60 days from the date of final approval of the project	Interest @12% per annum shall be levied for delay period for each delayed installment and if two consecutive installments are not deposited up to the due date of next installment in that case the approval/ developer agreement shall be cancelled and no any payment/compensation against the work executed in the above period shall be allowed from the ESCROW Account and all the amount including Earnest Money & performance security money shall be forfeited. Besides the above necessary action as per rules and regulations shall be taken up against the defaulter developer firm.
2	2 nd and Subsequent Installments	In every Six Months after due date of First Installment	

In evaluating financial bids the minimum share to RHB (amount receivable by RHB) must not be less than the expenditure incurred by RHB on land procurement and other expenses along with administrative charges. Earnest Money deposited would be adjusted against the payment to RHB in the last installment.

3. **General Parameters :-**

1	Land Distribution for EWS/LIG category	The developer would take up development of total land to the maximum possible level but not below the minimum stipulated BAR. However construction of EWS/LIG shall be minimum of 30% BAR of the total project (Minimum number of EWS units must be 35% of total units). The developer shall be free to construct MIG/HIG flats/houses (high rise permitted) & other permissible units on the remaining area as per prevailing building Bye Laws.
2.	Sale Price of EWS/LIG Houses	As decided by Govt.of Rajasthan for both EWS/LIG units. For other categories sale price to be decided by developer.
3.	Allotment	Registration, Allotment & Possessions of all units will be done by the developer. For EWS/LIG units registration & allotments will be done to eligible beneficiaries/applicants as per norms prescribed by the Govt./RHB. A transparent procedure for registration/allotment is to be followed, which will be looked after by a committee having representatives of State Govt./RHB and developer.
4.	Others	A minimum of 120 EWS/LIG units per acre shall be constructed.

4. **Technical parameters for EWS/LIG component:-** (As per CMJAY Policy-2015 provision-4C)

1.	Ground Coverage	Maximum upto 50%
2	Side & Rear Set Back	(i) Minimum 3 meter for building height upto 15 meter. (ii) Minimum 6 meter for building height above 15 meter.
3	Height	As per building Bye Laws
4	Parking	(i) One, Two Wheeler for each unit of EWS and (ii) Two, Two wheeler for each unit of LIG
5	Approach Road	Minimum 9 meter.
6	EWS/LIG Unit area	For EWS minimum 350 sqft Super Built up Area but carpet area shall not exceed 30 sqm. For LIG minimum 500 sqft super built up area but carpet area shall not exceed 60 sqmt.
7	General specifications for EWS/LIG units	As per CMJAY norms.

5. **Other Parameters :-**

1.	Internal Development	All internal development works (all internal roads, footpaths, water supply including overhead tank & distribution lines, electric distribution line, internal sewer line, STP/Biodigester, drainage, rainwater harvesting structure, street lights, parks, plantation etc. and other community facilities) shall be done by the developer at his own cost and as per bye laws/town ship policy.
2	External Development Charges	In case external development already exists (Provided by RHB) or under process, then EDC fixed by RHB will be paid by developer along with bid amount in installments.
3	Lay out plan and building plan approval fee	As per prevailing rules to be paid by the developer for the total area.
4	FAR/BAR	As per prevailing building byelaws.
5	Commercial/Other permissible use	As per building byelaws proportionate to BAR consumed in different segments.

NOTE :

- (1) **“Housing for All”** (HFA) Mission of Govt. of India parameters/guidelines will be applicable as and when notified by GOI/GOR.
- (2) Other Technical Parameters will be applicable as per prevailing Building Bye laws/Township policy.
- (3) No any change in the layout plan, building plan, DPR, work plan and general specifications shall be permitted after issue of final approval. In case, any change in the project is essential/unavoidable, prior permission of the competent authority/project monitoring committee in RHB shall be obtained by the developer.

6. (A) Eligibility for selection and allotment to beneficiaries/applicants of EWS/LIG category :- (As per CMJAY Policy)

- (i) The maximum annual income of applicants should be as follows or as per guidelines issued from time to time by State Govt. or revision in future under PMAY shall be applicable :-

Income Group	Maximum Income per year (In Rs.)
Economically Weaker Section (EWS)	Up to Rs. 3,00,000/-
Lower Income Group (LIG)	Above Rs.3,00,000/- upto 6,00,000/-

- (ii) Income certificate to be certified by concerned employer in case of salaried individual and if the individual is self employed the income certificate to be certified by Tehsildar/Municipal officers/S.D.O. or any State official authorized by the State Govt. or self attested income and residence certificate/affidavit duly notarized . Beneficiary identification shall be linked to AADHAR/BHAMASHAH card or any other unique identification to avoid duplication of allotment.
- (iii) The applicant should not own any leasehold or freehold house or plot either in his own name or in the name of spouse or any dependent member (including unmarried children) of his family in any urban area of Rajasthan. An affidavit certified by the Notary Public shall be submitted to this effect.
- (iv) The applicant must be preferably a bonafide resident of the state of Rajasthan.
- (v) Every allottee shall become member of the Residents Welfare Society, which will maintain common services and regular up keep of housing property and shall pay monthly maintenance charges to the society as prescribed. An undertaking to this effect will have to be signed by the allottee before possession is handed over to him. The concerned local authority would ensure that RWA is constituted as per rules/laws inforce.
- (vi) The allotment of residential units shall be made on the basis of 99 years lease.
- (vii) Every allottee shall be required to deposit annual lease money to RHB at the prescribed rate in two half yearly installments upto 15th January & 15th July of each year. If any allottee deposits One Time Lease i.e. advance lease money for 8 years then he will be exempted from the lease money in future.
- (viii) In case of any dispute/doubt, the provisions of CMJAY shall be applicable.

6 (B) Registration of beneficiaries/applicants of EWS/LIG Category:

- (i) Soon after approval of the project but not later than 60 days after approval of the project, the developer would invite applications from eligible persons for registration along with following non-refundable registration amount :-
- (a) Rs. 2000/- for EWS
(b) Rs. 3500/- for LIG.

- (ii) The registration amount of unsuccessful/rejected applicants will be refunded without any interest.
- (iii) The amount received on account of registration shall be kept in a separate account opened for the project and may be utilized by it towards administrative expenses on the scheme.
- (iv) Applications received for EWS/LIG Units shall be scrutinized by the developer in consultation with RHB to assess the eligibility of candidates. Allotment of houses to identified eligible beneficiaries of the projects should be made following a transparent procedure as approved by Govt. SLSMC/RHB and the beneficiaries selected should be part of HFAPoA. Preference in allotment may be given to physically handicapped person, senior citizens, scheduled castes, scheduled tribes, other backward classes, minorities, single woman, transgender and other weaker and vulnerable sections of the society as per norms fixed by the Govt./RHB. While making the allotment the families with different-abled persons and senior citizens may be allotted houses preferably on the Ground Floor or Lower floors. The allotment procedure shall be transparent and time bound. Information to the successful applicants shall be given through news papers/by post/electronic mode/electronic mode.
- (v) The designated Nodal Agency along with RHB shall coordinate in sanctioning of loan to the successful applicants from financial institutions like banks, NHB, HUDCO, and other financial institutions etc.
- (vi) The amount of loan obtained by the successful applicants shall be directly deposited by the Banks in ESCROW account opened for the project.
- (vii) Maintenance fund as prescribed by the Govt. shall be charged form beneficiaries and deposited in a corpus fund to be created for each project. The fund accrued in this account shall be used by RWA for maintenance only.

7. Time Line for completion of the project :

- (i) For EWS/LIG component of the project timeline shall be as below :-
 - (a) Up to 200 units - 24 months
 - (b) 201 to 400 units - 30 months
 - (c) 401 to 600 units - 36 months
 - (d) 601 units & above - 42 months
- (ii) For other units the completion period will be as per prevailing building Bye Laws/Township Policy.

NOTE :

- (i) Completion certificate of the project shall be issued in proportion to the completion of EWS/LIG houses.
- (ii) The period of completion shall be counted from the date of final approval of project.
- (iii) In case the developer fails to construct EWS/LIG units within the stipulated time or fails to maintain the prorata progress as per work plan & PERT chart provided by the developer along with DPR, extension may be granted on payment of :-
 - a) Rs.5000/- per unit for first 03 months
 - b) Rs.10,000/- per unit for next 03 month.
 - c) Rs.20,000/- per unit for next 06 month.

In case construction is not completed in the extended period of 12 months after the stipulated time, RHB shall take over the project and get the remaining work completed at the risk and cost of the developer. In such a case, the approval/agreement shall be cancelled and no any compensation/payment against the work executed so far will be allowed to the developer from the ESCROW account and all the installments of bid amount/security amount/earnest money shall be forfeited

8. Release of payment to developer from the Escrow Account of the project.

- (i) The amount deposited by allottees or by financial institution/bank against loan to the allottees in the ESCROW account will be released by the RHB in 7 installments to the developer at different stages of construction as follows based on the certificate issued by 3rd Party inspection agency (agency to be appointed by RHB), after the verification of the progress of work under the approved work plan and cash flow :-

Tentative Schedule for (G+3) format :-

- a) On completion of foundation work - 10%
 - b) Roof level of ground floor including walls - 15%
 - c) Roof level of first floor including walls - 15%
 - d) Roof level of second floor including walls - 15%
 - e) Roof level of third floor including walls - 15%
 - f) On completion of the project - 20%
 - g) After six months of handing over to RWA - 5%
 - h) After twelve months of hand over to RWA - 5%
- (ii) Before release of final installment to the developer, it will be ensured by RHB that the construction has been completed as per specified norms, parameters and quality standard.
 - (iii) For construction of multistory apartments, payment schedule shall be prepared by RHB in consultation with developer.

- (iv) No any additional fund other than available in the "Escrow account" shall be provided by RHB.
- (v) The developer will have to arrange its own source of fund (through loan against the project from financial institutions or other way) for timely completion of the project.
- (vi) The developer himself will make all possible efforts (as per law) for recovery of due amount from the allottees, if any.

9. Quality Control :-

It shall be compulsory for the developer to establish quality control laboratory at the site of the project. The developer shall also obtain material testing certificate from any of the NABL accredited laboratory. Third party inspection shall be carried out by a panel of experts agencies (involving govt. engineering college/institution/departments), so that the quality of the work may be maintained. Payment of running bill will be allowed on the basis of third party inspection report. The general specifications and amenities to be provided by the developer shall be as per prevailing Building Bye Laws & BIS Codes.

10. Miscellaneous :-

- (i) To get the financial assistance under "**Housing for All**" mission, the Project will be got approved from the SLSMC (State Level Sanctioning and Monitoring Committee) and after approval of SLSMC, it shall be sent to MoHUPA, GOI. Therefore all the parameters of PMAY scheme shall have to be followed at the initial stages itself. RHB shall ensure that the project conforms to guidelines of the "**Housing for All**" mission, so that beneficiaries get the advantages of subsidy.
- (ii) Any subsidy/central assistance as per the policy for "**Housing for All**" mission will be directly credited to the eligible beneficiary loan account and will be transferred to the Escrow account of the project by the bank/financial institution.
- (iii) Provisions of GST, Excise Duty/VAT including any other tax liability and concession provided by the Government shall be applicable as per law and to be born by the Developer.
- (iv) Provisions of Real Estate Regulation Act (RERA) applicable as per law will have to be complied by the developer.
- (v) Complete waiver of fire cess on EWS/LIG component of the project will be applicable.
- (vi) Selected developer shall give a Bank Guarantee as performance guarantee at the rate of 1% of the total cost of the project to RHB for timely completion of the project. (Bank guarantee from co-operative Bank/Credit Society shall not be accepted).

- (vii) The developer shall maintain the complete project for 5 year after the completion of the project. During this period the developer will constitute a Residents Welfare Association(RWA) and will handover the project to RWA. One time maintenance amount as decided by the Government/RHB in consultation with developer will have to be deposited by developer as a corpus amount in a separate maintenance fund after completion of the project, so that maintenance work is taken care of. Contribution by allottees of the houses can also be added to the corpus.
- (viii) If the developer leaves the work incomplete, RHB will get the work completed at the risk and cost of the developer. It shall be compulsory for the developer to submit an affidavit to this effect at the time of submission of the DPR of the project.
- (ix) The expenditure on internal development works shall be borne by the developer. He will not be allowed to charge the cost of internal development to EWS/LIG components from beneficiaries.
- (x) The developer shall construct the houses according to the type design and building specifications approved by Govt./RHB and in accordance with the norms fixed under the applicable building regulations and conform to BIS & NBC of India.
- (xi) All the obligations of the developer arising out of the provision of this manual shall be subject to and shall conform to the provisions of Developer Agreement.
- (xii) After completion of the scheme, the developer shall submit to the RHB two sets of 'As Built Drawings' of the whole Project and shall simultaneously make declaration regarding completion of the Project and inform RHB about the same. For issue of completion certificate of the project no charges shall be levied on EWS/LIG component.
- (xiii) All tax liabilities/levies and labour cess etc applicable as per law shall be born by the developer and any financial burden, if arise on account of change in existing rules/regulations related with taxes/levies shall also be born by the developer but if any relaxation in taxes/levies are provided by the Govt. the benefit of the same shall provided to RHB/applicants.
- (xiv) All responsibilities as per applicable acts/laws related with labour safety, insurance, provident fund and accidental claims etc. shall be born by the developer.
- (xv) In case of any dispute, it shall be first resolved by the independent Engineer/Addl.Chief Engineer/Chief Engineer & the Developer, and if not resolved, it shall be referred to Dispute Resolution Board (DRB) to be constituted by RHB/GOR. The decision of the DRB shall be final & binding on both parties.

- (xvi) Provisions of water harvesting, Solar Energy, Green Building Concept, Fire Fighting, Garbage Disposal etc. shall be applicable as per prevailing Building Byelaws / Building Regulations.
- (xvii) The cost of litigation suffered by RHB for any misdoing of developer would be charged to developers account.
- (xviii) The Project shall be launched in the joint name of RHB and the Developer.

OBLIGATIONS OF THE DEVELOPER & RHB

1. The RHB commits that:
 - a) To hand over possession of at least 60% of the encumbrance free site on the date of stipulated commencement i.e. within 30 days of the signing of the developer agreement and submission of the performance security.
 - b) To convey approvals to the building plans submitted by developer.
 - c) To coordinate with the Independent Engineer and the GOR for early decisions (technical) on the project.
 - d) To process release of payments from the ESCROW account, as per schedule on developers request where these are due.
 - e) To create cordial working environment at the project site.
2. The Developer commits that:
 - i) To prepare a comprehensive & dependable project report after all required surveys, sub-soil and geo-tech investigations, tests on local and other materials, proposing methodologies and output test parameters. The developer shall not depend only on the information provided by RHB or other Govt. agency but shall on his own testing etc.
 - ii) The architectural plans be designed by a qualified and experienced architect, including structural designs, services, landscaping, firefighting, rainwater harvesting, committed Service/ Ground water reservoirs of adequate capacities, drainage, roads, campus power lines, sewerage, common facilities, security, livelihood centre, creach, playground for children, parking areas, health centre, required elements of green buildings concept etc.
 - iii) To arrange its own source of fund. No any financial assistance will be provided by RHB.
 - iv) To make arrangements for recovery of due amount from allottees get it deposited in the ESCROW A/c of the project.
 - v) The works to be supervised by qualified and experienced building engineers, structural engineers, concreting & shuttering foreman, Electrical, water supply and sanitary engineers, and other specialist engineers. Safety at the work site be the first priority.
 - vi) To establish a fully equipped field laboratory with equipment (preferably NABL accredited), temperature controlled, experienced testing personnel, consumables, testing environment, all codes and books of specifications etc.)To comply to the instructions of the RE, RHB/ IE and the third party quality inspections as per ISO 17020.
 - vii) To make available the best of the specified materials, machinery and equipment, experienced/trained operating personnel, fittings and fixtures, etc.

- viii) To produce and use design mix concrete from a batch mix plant, tested steel reinforcement and PVC cover blocks. To limit the use of fly ash and other pozzolana to a maximum of 20% in using RMC. To use only properly designed metal shuttering, and interlocking steel props.
- viii) To provide detailed working drawings for all components and also completion drawings on completion of works.
- ix) To create and support a positive working environment at site.
- x) To achieve the targeted physical progress at the project. The proposed mile stones to be achieved shall be committed by the developer on the construction program to be submitted for approval to the RHB. Failure to achieve the mile stones shall attract imposition of liquidated damages as per contract.
- xi) The builder/ developer shall have to prepare DPR to be submitted in state/central government for availing the grant or subsidy to be transferred to beneficiaries.
- xii) The builder/Developer shall maintains the complete project for 5 years after its completion and during this period the developer will constitute a Resident welfare Association (RWA) and will hand over project to RWA.
- xiii) One time maintenance amount as decided by Govt./RHB in consultation with developer will have to be deposited by developer as corpus amount in a separate maintenance A/c of the project and will be transferred to RWA.

**Chief Engineer,
Rajasthan Housing Board, Jaipur.**

SECTION-2

EVALUATION CRITERIA

SECTION - 2

RAJASTHAN HOUSING BOARD



EVALUATION CRITERIA

Post qualification method for selection of developers

Evaluation criteria for post qualifications methods for selection of developer as detailed hereunder, shall now be applicable in PPP Projects and bids shall be invited under single stage two bid system as per PWF & AR in force and as amended from time to time.

1. **APPLICABILITY :**

The requirement of post qualification method for finalization of developer / bidders shall be adopted as under :-

2. **PROCEDURE:**

- i. **Online Single Stage:** Two bid system would be adopted. Folder-1; being the Technical Bid shall contain information in respect of potential assessment based on predetermined evaluation criteria and folder-2 shall contain unconditional financial bid. Each folder would be up loaded & locked separately and named as folder-1 Technical Bid and folder -2 Financial Bid. Besides the above folders a third folder containing the proof of earnest money & GST Registration certificate would also be uploaded by the bidding developer. The DD/BG of EM, self attested copy of GST registration certificate, DD of e-tendering fee in favour of RISL and DD of bid documents cost as specified in the notice inviting Bid would be deposited in the office of procuring authority before the due date of opening of Technical Bid.
- ii. The technical bid folder will be opened on the date and time specified in the Notice Inviting bids and the bid would be evaluated by a committee consisting of Dy. H.C., TA to ACE, AO TO ACE and Add.Chief Engineer concerned.
- iii. After evaluation of technical bid with respect to pre-determined evaluation criteria, a comparative statement of all bids will be prepared. The authority competent to sanction the bid will approve the responsive qualified bidders. No relaxation/ deviation shall be made in evaluation criteria after opening of technical bid.
- iv. The financial bid folder will be opened of only those bidders who have fulfilled evaluation criteria and have been declared as being responsive by the competent authority.
- v. Bid will be sanctioned by the competent authority as per the delegation of powers in force and as amended from time to time.

3. **CRITERIA** : Criteria for assessment for respective project would be as follows:

- i. The developer should have completed two or more Residential Projects of area not less than two hact. during the last five financial years inclusive of current year.
- ii. The developer should have completed residential units with total construction area of not less than 33.33%of standard BAR of the proposed project i.e. not less thansq.mt. in last five financial years.
- iii. The developer should have achieved an average annual financial turnover of at least 60% of estimated project cost during last three financial years i.e. not below Rs..... .
- iv. The developer should be able to deploy the key personnel and machinery/equipments specified in Schedule-V & VIII respectively, in the execution of the project. The machinery and equipment should be available to the bidder on ownership or confirm lease basis for which appropriate proof will have to be submitted.

v. **Bid Capacity**

The developer who meet the minimum qualification criteria will be qualified only if his available bid capacity is more than the estimated project cost i.e. Rs..... lacs. The available bid capacity will be calculated as under:-

$$\text{Assessed available bid capacity} = (A \times N \times 3 - B)$$

A=Maximum value of civil engineering works executed in any two years during the last five financial years (updated to present price level) taking into account the complete as well as works in progress.

N=Number of years prescribed for completion of the project for which bids are invited.

B=Value, at present price level, of existing commitments and ongoing works to be completed during the period of completion of project for which bids are invited.

NOTE :

- (i) The statements showing the value of existing commitments and ongoing works as well as stipulated period of completion remaining for each of works listed should be supported with appropriate certificates issued by competent authority. Unattested photocopies shall not be considered and original shall have to be presented on demand.
- (ii) The present price level for turn over and cost of completed work for the previous years value shall be increased @ 10% every year, arithmetically.

(iii) Bidders should provide accurate information on any litigation or arbitration resulting from contracts complete or under execution by them over the last five years. (Schedule-IX) The maximum value (updated at the present price level) of disputed amount claimed in litigation/ Arbitration resulting from contracts executed in last five years shall be deducted from the calculated Bid capacity of the bidder.

4. **Documentation :**

The developer should furnish the following documents along with the technical bid.

- (a) Information regarding financial resources and capacity in Schedule-I.
- (b) Information regarding details of projects completed in the last five years in Schedule-II duly supported by the certificate.
- (c) Information regarding all projects completed by the applicant bidder during the last three years duly supported by the certificate (Schedule-III).
- (d) Information regarding ongoing projects to calculate the bid capacity i.e. details of existing commitment. (Schedule-IV).
- (e) Information and affidavit regarding Technical Personnel & Key Personnel. (Schedule-V)
- (f) Information and affidavit regarding machinery and equipment required for deployment as detailed in Schedule-VI.
- (g) Letter of credit from the Bank equivalent to a minimum of 30% of the estimated project cost. A model draft is placed in Schedule-VII.
- (h) Details of litigation or arbitration contract in Schedule-VIII.

5. **IMPORTANT NOTE**

The bidder must ensure that all the required information is furnished by him is complete in all respects. He would not be allowed to withdraw/add any document or to rectify any information furnished therein, after submitting the bid except as per provisions of RPPP Act..

6. **REJECTION OF BIDS**

- i. RHB reserves the right to reject any bid, or to disqualify any or all the bidders, without assigning any reasons.
- ii. if a bid is not accompanied with the requisite inforamatory documents mentioned in Clauses 4(a) to 4(h), or is not accompanied with the earnest money, copy of Goods & Service Tax Registration Certificate, it would be liable for rejection.

iii. Furnishing of incorrect or incomplete information or concealment of any information required in the bid documents would render the bid liable for rejection.

7. **Provident Fund Act Compliance:-** P.F. Registration No./ Certificate is to be enclosed. If the same is not furnished then, as per existing provisions, action will be taken and any amount found due against PF, the same will not be recommended for release from the ESCROW A/c till submission of P.F. clearance from P.F. Department.

8. **Clarification of Bidding Documents**

A prospective bidder requiring any clarification of the bidding documents may notify in writing to the bid inviting authority, who will respond to the request for clarification which is received before 10 days to the deadline for submission of bid as per NIB. The copy of clarification including the description of the enquiry (without disclosing it's source) will be forwarded to all purchasers of the bidding documents.

9. **Amendment of Bidding documents**

Before the deadline for submission of bids, the bid inviting authority may modify the bidding documents by issuing addenda.

Any addendum thus issued shall be the part of the bidding documents and shall be communicated in writing to all the purchasers of the bidding documents. Prospective bidders shall acknowledge receipt of each addendum to bid issuing authority.

10. **Extension of bid period :** Bid inviting authority may extend, the deadline for submission of bids as and when necessary.

11. **Preparation of Bids**

(i) **Language of the Bid**

All documents relating to the bid shall be in English Language.

(ii) **Bid Prices**

The unit rates and prices shall be quoted by the bidder only in Indian Rupees.....

(both in figures and words)

(iii) **Bid Validity**

Bid shall remain valid till final approval of the bid or return of EMD, whichever is later.

(iv) **Late Bids**

Any bids received by RHB after prescribed deadline will be returned unopened to the bidder.

(v) Correction of Errors :

Bids determined to be substantially responsive will be checked by RHB as follows :

- (a) In case of** discrepancy between the rates in figures and in words, the rates advantageous to RHB shall be taken as valid & correct rate.
- (b)** In case of discrepancy between the unit and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted, will govern.
- (c)** The amount stated in the bid will be adjusted in accordance with the above procedure for the correction of errors, and shall be considered as binding upon the bidder. If the bidder does not accept the correct amount the bid will be rejected, and the EMD may be forfeited.

SECTION-3

General Design Features & Technical Specificatins

SECTION 3

GENERAL DESIGN FEATURES

3.1 GENERAL

- (i) This Section lays down the standards for Controls for design and general/specific features for construction of housing complexes as per part 3 to 10 of the National Building code 2005. These shall be reviewed and approved by the Independent Engineer before execution.
- (ii)
 - a) The campus roads shall have a minimum ROW of 9 m and the main arterial roads shall have a ROW of 20 m. These shall integrate with the urban roads connecting the Project complex to the main town, Railway station, Bus depots, Hospital, School, Police station etc.
 - b) The services like drainage, sewerage, Power lines, road side illumination, water supply, telecommunication, etc. shall be designed and integrated to the main urban network. Others like fire detection, Alarm & fighting, rainwater harvesting, parking, plantation and landscaping, play areas, community/ livelihood center shall be designed and provided as per NBC 2005.
 - c) The stakeholders in EWS & LIG categories may require space on ground for parking for two wheelers etc. The project should provide for these.
 - d) The buildings shall be designed after due surveys, subsoil and geo-tech investigations, requirements of earthquake resistant designs, expansion joints etc.
 - e) Special care shall be taken for foundations in clayey or black cotton soils against capillary rise of moisture and the shrink and swell of the soils and to counteract against these characteristics.
- (iii) The architectural designs of the flats shall conform to provisions of the NBC 2005 for the sizes of rooms, kitchens, toilets, orientation, light and ventilation etc. and the structural design of the Project buildings and services shall conform to the BIS standards as a minimum. The Developer shall ensure that the constructions are conforming or better than the requirements of BIS. It will be preferred to use Materials, fixtures, pipes, wires and cables, joinery, sanitary wares and water supply
- (iv) As far as possible, uniformity of design standards shall be maintained throughout the Project. In case of any change, it shall be effected with the due approval of the RE, RHB/Independent Engineer, RHB.
- (v) The RHB intends to prefer precast prefabricated RCC construction, Mivan shuttering construction in the best interests of quality and period of completion. The Technical evaluation of the bids this will carry due weight age for this technology.

- (vi) In case of in situ construction, cement concrete shall be manufactured with batch mix plants (weight based) as per the approved design mix, all shuttering and scaffolding shall be designed with shuttering ply or steel plates and steel props and pipes, plastic cover blocks used for cover to steel etc. shall be provided. All materials shall be tested and duly approved by the Independent Engineer.
- (vii) The door frames shall be EZ-7 steel iron section. All door shutters shall be factory made solid core flush doors conforming to IS 2202, BWP grade 30 mm thick. The Kitchen and toilet doors shall have PVC door shutters.
- (i) The flooring shall be MAT finish tiles of size 400mm X 400mm in rooms, 300mm X 300mm in toilets, Kitchen & balconies, Kota stone flooring in corridors & stairs steps laid over cement sand mortar 1:4. At ground floor 75mm thick CC 1:3:6 over 150mm thick stone kharanja under the floor.
- (ix) Anti-termite treatment (pre construction) shall be provided as per BIS.
- (x) The terracing shall be Water proofing treatment with Cement concrete M-15 grade with water proofing compound @ 1 kg/50 kg cement & fibre reinforcement with drainage slopes 1: 60 (min) and RW pipes as per BIS.
- (xi) The walls etc in case of in situ construction shall be with best local materials like stone or clay or fly ash bricks (>75 kg/sqcm strength) with 12/20mm thick internal plaster in CM 1:6 & 20mm thick external plaster in CM 1:4 with water proofing compound @ 1 kg/ 50 kg cement bag.
- (xii) All materials shall conform to BIS specifications as the minimum, a select list of which is appended with the appendices. For other materials also, the developer shall refer the relevant BIS code.
- (xiii) Provision to be made as per Building Bye Laws.

3.2

- (i) Designing these buildings on the Green building concept/ energy efficiency concept with solar lights, geysers, plastic doors and windows, energy efficient light fixtures may optimize the O&M expanses.
- (ii) Buildings shall be designed (as per IS 456-2000) for one additional storey then the proposed construction and shall have Earthquake resistance structural provisions for the zone in which the project is located. Buildings planned with more than G+3 stories shall be provided with elevators.
- (iii) Due provisions be made for handicapped persons with ramps and toilet entries.
- (iv) All campus roads shall be 7 m wide as per approved planning, Cement Concrete M 30 grade (with DLC/ or Roller CC as per design) with 1.5 m hard shoulders and the design of pavement/ geometrics, profile, junctions shall be approved by the Independent Engineer RHB.
- (v) RWH system shall be planned to recharge ground water. All road side and campus drainage shall be in precast RCC (M 20) with the RCC cover (min width 1.00 m) used as a footpath. These shall be designed as per relevant IRC codes.
- (vi) The project should be environmentally richer than with plantation of trees, shrubs and ground cover. These social categories also deserve the best of the environment.

- (vii) The waste water may be treated and recycled to optimize its use. Solid waste may be disposed through the main town systems.
- (viii) Other user facilities may be provided as required.

3.3 Form Work

The Developer shall be responsible for the safe, workable design and methodology for all temporary or permanent forms, staging and centering required for supporting and forming the concrete of shape, dimensions and surface finish as shown on the drawings. The following guidelines shall be adopted:

- (a) Only steel formwork with interlocking steel props etc. shall be permitted. Use of Wooden ballies are strictly prohibited.
- (b) Shuttering oil (release agent) used shall be such, which permits easy removal of shutters without leaving stains or other marks on the surface of the concrete. Requirements given under Clause 3.5 of IRC:87 shall also be complied with.
- (c) In case of tubular staging of heights more than 10 m, special attention shall be paid to the structural adequacy of the system, efficacy of the connections (clamps etc), and foundations. Foundation blocks of adequate thickness in M15 cement concrete shall be provided under the base plates to prevent unequal settlements.

All bent tubular props shall be straightened before re-use and the member with deviation from straightness more than 1 in 600 of its length shall not be re-used. For re-used props, suitable reduction in the permissible loads shall be made depending upon their condition in accordance with recommendations of the manufacturer and as reviewed by Independent Engineer.

3.4 Design Report

The Developer shall furnish the design report including the following to the RHB/ Independent Engineer for his review and comments, if any.

- (i) Sub surface exploration/ geo-tech investigation, materials test report
- (iii) Design and drawings of foundations, substructure and superstructure of structures.
- (iv) Any other information relevant to the design report.

4.0 Responsibility for Design and structural adequacy:

The developer shall be fully responsible for the design, structural adequacy and detailing of buildings, roads, drainage and all other structures. The review by RHB/ Independent Engineer shall not relieve the developer of this responsibility.

TECHNICAL SPECIFICATIONS

a) Roads: ROW:

- Main roads 9m carriageway (min.), other roads 7m carriage way(min.),
- crust-thickness [Earthen embankment/cutting as per site condition, Subgrade-150 mm WBM grade-I, 100mm thick plain cement concrete 1:4:8 & 150mm thick M-30 grade CC Pavement as per IRC provision. All internal roads to drain away to the main urban peripheral roads.
- longitudinal grade (as per IRC) and cross profile (min. 3% in BT and 1.5% in CC) as per survey and design,
- road side drains (foot path, width 1m min.) , junctions etc. storm water drainage, street lights, junctions , etc. as per approved design, connectivity to peripheral network, ducts for water supply, Telecommunications, Power cables on both sides of roads.

b) Buildings:- (for EWS&LIG component)

- Preconstruction Anti-termite** treatment as per IS 6313, Plinth height 600 mm (min.) above the crown of the road in front , ramp for handicapped,
- Foundation** as per structural design based on the SBC tested at each site, to be approved by the RHB/ Independent Engineer appointed by the Govt.
- Foundation PCC** 1:3:6 100 mm (min), DPC 50 mm (min.) in Plain Cement Concrete M-15 grade, M-25 grade RCC plinth beam over two coats of hot bitumen VG 40 @1.7 kg/sqm, etc.
- Stone masonry** in CM 1:6, Use building stone , headers 1 m c/c horizontally and vertically (staggered in each course), or clay bricks of class designation 75 (min)/ clay fly ash brick laid in English bond,
- Door openings** width 900 mm (min), height 2100 mm, window sill 750 mm from floor, size 1000x1200 mm (min) at least one in each room, ventilators min. size 600x600 mm, ceiling height 3000 mm from finished floor,
- All **RCC M-25** design mix (min) produced with batch mix plant, laid and compacted, with steel plates and interlocking steel props as centering and shuttering (**vertical supports with Wooden ballies shall not allowed**). Plinth, lintel beams as per design. Designs to be Earthquake resistant as per codes according to the location of project. All buildings to be RCC framed structure with brick/CC block masonry walls.
- Flooring** -PCC 1:3:6-100 mm, MAT finish tiles 400x400mm in rooms & 300x300mm for toilets and kitchen, makes duly approved after testing by the RHB. Ceramic glazed tiles (confirming to relevant IS code) skirting and dado in kitchen and bath room, WC at ground floor flooring shall be done above stone kharanja 150mm & cement concrete 1:3:6 75mmthick.
- Plasters**- 12/20mm thick internal plaster in CM 1:6 & 20mm thick external plaster in CM 1:4 with water proofing compound @ 1 kg/ 50 kg cement bag.

- Terracing** Water proofing treatment with Cement concrete M-15 grade with water proofing compound @ 1 kg/50 kg cement & fibre reinforcement with drainage slopes 1: 60 (min), one 100 mm dia RWP per 35 sqm of terrace area.
- Openable Steel section windows** as per IS 1038,min area of 1.2 sqm in one room with wire gauge and guard bars and sunshades, EZ-7 steel section **door frames** as per relevant IS specification amended up to date
- Solid core flush door shutters** 30 mm thick IS 2202-(P-II) BWP grade (ISI marked) with commercial ply on front and back in room & PVC door shutters in Kitchen & Toilets, Joinery hard ware as per PWD/CPWD specifications.
- Steps** riser 150 mm max, tread 300 mm min., Mild steel railing.
- One cupboard 900x2100 mm with machine cut & machine polished shelves in each room.
- Green Marble working top in kitchen & one stainless steel kitchen sink 450x600 mmx175 mm.
- Post boxes, individual meters, name plates, Occupant boards, two wheeler parking (one for EWS & two for LIG flats) for each occupant.
- Internal & External Paint wash: Oil bound distemper with suitable base inside the flats, 100% exterior emulsion paint in common areas and approved external maintenance free 400 to 500 micron thick texture paint on external wall.

c) Water Supply:-

Over head water tank above stair or as suitable for 50.0% of one day demand & separate fire tank as per fire fighting requirement, under ground clear water tank for two day demand with suitable pumping machinery (100% standby pumps shall also be provided), pipe line network from CWR to over head tank & over head tank to individual flats as per design. End pressure at tap point shall not exceed 12m, if needed pressure reducing valve shall be provided for maintaining the pressure.

Rain Water Harvesting system, OHT and GWR for firefighting etc. connectivity to peripheral network, Water supply and materials, pipes, fittings and fixtures to be ISI marked minimum and be approved by the IE/ RHB.

d) Sanitary:-

All sanitary wares (Wash hand basin, Water Closet, Cistern) & bath fixtures (bib and pillar cocks, angle valves, stop cocks and wheel/half turn valves) of ISI marked, vitreous china wares Hindustan, Cera or equivalent, all pipes SN-4/uPVC SWR for 110 mm dia min., properly designed Sewage Treatment Plants with effluent drained through sewerage lines (urban and outfall) and connections to houses. Connectivity to peripheral network, sanitary layout plans and materials to be approved by the IE, RHB.

e) Power Supply:-

GSS, PSS, Transformer, feeder/ distribution lines, service lines and house wiring (copper wire)/ meters and separate earth for house & elevator, street lighting etc. connectivity to peripheral network, Telecom lines. CFL Fittings and fixtures, min. 2 light points, 1 fan point, 2 plug points, one TV point in each room/ one power point for geyser in toilet, exhaust fans in kitchen and toilets. Call bells, Street light at 30 m c/c on PCC/MS poles 9 m high. Power supply distribution plans and layouts to be approved by the IE, RHB.

f) Elevators

As per building Bye Laws and of reputed manufactures.

g) Fire fighting System

Fire fighting system as per provision of National Building Code amendments to date with hydrant, hooter, fire switch, hose reel sufficient in length to cover to all flats of that floor, terrace pump with auto start system, micro processor based semi addressable panel at Guard room having zone wire LED for Fire & Fault, Fire hydrant at ground floor to take/give to fire tenders with fire escape stair.

h) Landscaping:-

Land profiling and leveling, Designed landscaping, Plantation and lawns etc. as per approved plans.

i) Public Amenities:-

Locations for public toilets, Parks, Play grounds, community/ livelihood center, small local market, etc. parking places as per prevailing Building Bye Laws/Township Policy.

h) Others:-

As specified in the scope of work in the bid document, plus one fully equipped and connected (furniture, documentation and communication equipment etc.) site office (1000 sqft plinth area) for the employer, compound walls, gates and security structures. Other materials and specifications to be approved by the RHB/Independent Engineer.

- i)** The developer shall also pay for labour Cess (1% of total contract value), One percent of Contract value to be paid to RHB for consultants to be engaged for the project, all taxes, duties and royalties, and 0.25% of the contract value as seed money to the maintenance fund as per CMJAY.

- 1.3 The Project housing layout with about 120 houses per acre shall be planned by the developer and the Employer shall examine and approve it. A typical GAD and the site plan of project land shall be provided by the RHB and the desirable project facilities proposed shall conform to the design requirements set out in this Manual which are the minimum prescribed. The detailed project report shall be prepared by the developer who shall be solely responsible for undertaking all the necessary surveys, investigations and detailed working architectural and structural designs / designs of services in accordance with the codes, specifications and good industry practice with due diligence, and he shall have no claim against RHB/ Employer/ Government for

any loss, damage, risk, costs, liabilities or obligations arising out of or in relation to the project report/ data and other information provided by the Employer / Government. This approval shall not relieve the Developer from his responsibility of no fault on planning, design and execution. Min. design life of building structures to be 75 years. The DPR shall be approved by the IE/ RHB.

- 1.4 Alternative designs and Specifications for the buildings, services/appurtenances and structures (roads, culverts, drains, retaining/ compound walls, plantations, rainwater harvesting, waste water recycling, security structures, campus illumination etc.) may be adopted by the Developer in accordance with design requirements set out in this Manual and three copies of each shall be sent to the Resident Engineer RHB/Independent Engineer for approval and comments, if any. In particular, such comments shall specify the conformity, or otherwise, of such designs and Specifications with the requirements specified in this Manual and the BIS, IRC codes. The conditions specified in subsequent para 1.13 may also be referred to.
- 1.5 At least two weeks prior to commencement of the work, the Developer shall draw up a Quality Assurance Manual (QAM) covering the three tiered Quality System (QS), Quality Assurance Plan (QAP) and documentation for all aspects of the testing on buildings and other works and send two copies each to the Resident Engineer RHB/ IE for review. The class of quality assurance shall not be less than Q-3. This will be approved within a week by the RHB and others.
- 1.6 The Codes, Standards and Technical Specifications applicable for the design of housing project components are:
 - (i) Bureau of Indian Standards (BIS) specifications for buildings, services & structures.
 - (ii) National Building code amended up to date for planning, safety and structures.
 - (iii) Indian Roads Congress (IRC) Codes and Standards, for roads, drainage, parking, Plantation etc.
 - (iv) Any other standards referred to in the Manual and any supplement issued with the bid document.
- 1.7 Latest version of the Codes, Standards, Specifications, etc. notified/published amended up to date before the last date of bid submission shall be considered applicable.
- 1.8 The terms BIS, shall mean the Bureau of Indian Standards, MORTH is 'Ministry of Road Transport and Highways' or any successor or substitute thereof shall be considered as synonymous. IRC is Indian Roads Congress.
- 1.9 The terms 'Engineer' used in the Specifications shall be deemed to be substituted by the term " Independent Engineer" to the extent it is consistent with the provisions of the Development Agreement and this Manual. It will also mean the Resident Engineer of RHB.

- 1.10 In case of any conflict or inconsistency with the provisions of the applicable BIS, IRC Codes, Standards or MOSRTH Specifications, the provisions contained in this Manual and the Specifications and Standards specified in this Manual shall apply.
- 1.11 In the absence of any specific provision on any particular issue in the aforesaid Codes or Specifications read in conjunction with the Specifications and Standards contained in this Manual, the following Standards shall apply in order of priority:
- (i) Bureau of Indian Standards (BIS)
 - (ii) IRC/ CPWD/ British Standards, or American Association of State Highway and Transportation Officials (AASHTO) Standards, or American Society for Testing and Materials (ASTM) Standards
 - (iii) Any other specifications / standards proposed by the Developer and reviewed by the IE.
- 1.12 All items of building works shall conform to State Public Works Department (State PWD)/Central Public Works Department (CPWD)/ Rajasthan Housing Board Specifications for similar Class of building works and standards given in the National Building Code (NBC). To the extent, specific provisions for building works are made in BIS, IRC/ State PWD specifications, the same shall prevail over the CPWD/ NBC provisions. For this purpose, building works shall be deemed to include buildings, facility / service structures, road side illumination , resident facilities, rain water harvesting, landscape elements, fire detection/alarm & fighting, social and environment impact mitigation measures and/or any other works incidental to the building works. Chief Engineer, Resident Engineer, RHB and the IE shall be the authority to adjudicate on specifications and designs.
- 1.13 **Alternative Standard and Specifications:-**

The requirements stated in the Manual for the design of the Mass housing Project are the minimum. The Developer will, however, be free to adopt international standards, practices on precast/ prefabricated housing, alternative specifications, methodologies, materials and standards to bring in innovation in the design and construction provided they are comparable with the standards prescribed in the Manual. The Specifications and techniques which are not included in the BIS/ IRC Specifications/ State PWD Specifications shall be supported with authentic standards and Specifications like NBO , Euro Codes, British Standards and Australian Code etc. Such a proposal shall be submitted by the Developer to the RHB/ Independent Engineer/ Employer for approval and comments, if any. In case, the RHB/Independent Engineer is of the opinion that the proposal submitted by the Developer is not in conformity with any of the international standards or codes, then he will record his reasons for non-acceptance and convey the same to the Developer for compliance. A record shall be kept by the Resident Engineer RHB, of the compliance by the Developer of the minimum Specifications and Standards specified in the Manual and any non-compliance shall be dealt with in terms of the provisions of the Project Agreement. The Developer shall be responsible for adverse consequences, if any, arising from any such non-compliance.

- 1.14 Before taking up any construction or maintenance operations the Developer shall first work out a safety plan as per National Building Code part 7: “Constructional Practices and safety” to ensure the following:
- (i) Safety of workman with helmet, safety belts/ chain, shoes, gloves and insulating pads etc. during the period of construction (including but not limited to the adequate illumination during night time, use of potable water for construction and human consumption) and the reduction of potential inconveniences / delays to passer byes.
 - (ii) Safety of the workers engaged in neighboring construction.
 - (iii) The reliability of equipment, shuttering and scaffolding, power installations etc. during construction shall conform to the requirements of BIS Code for safety at Construction sites and corresponding Specifications. The Developer shall furnish and comply to a safety plan as per the above code.
 - (iv) The Developer shall communicate the proposal for safety of traffic and workers during construction to the Resident Engineer RHB/ Independent Engineer/ for review and comments, if any.
 - (v) The developer shall procure a comprehensive insurance cover (Contractor’s All Risk) for the men, materials, machineries and equipment including adequate third party liability for the project. The cover shall include the RHB/ Employer’s men, material, machinery etc.
 - (vi) The developer shall comply to all labour welfare regulations/ acts in force and maintain due documentation in compliance to the above.
 - (vii) The developer shall construct a site office for RHB and the IE with a minimum plinth area of 1000 sft at his cost, and furnish/equip (with furniture, updated technology computers/internet-wi-fi connections/printers, copiers and other documentation equipment) before the commencing with project buildings.
- 1.15 The Developer shall set up an adequately equipped field laboratory (refer page 42 of the bid document) for testing of materials and finished products as prescribed in BIS Specifications. It shall house all necessary codes and books of specifications also. It shall make necessary arrangements at his cost for additional/confirmatory testing like the rebound hammer/ UVR of RCC or any materials/ products for which facilities at site laboratory are not available.

1.16 Review and comments by Independent Engineer:-

Independent Engineer shall be appointed by the Employer to assist RHB in the execution, act as an adjudicator for minor disputes and also as a technical auditor for variations. In cases where the Developer is required to send any drawings or documents to the RHB/ Independent Engineer for review and comments, and in the event such comments are received by the Developer, it shall duly consider such comments in accordance with the Developer Agreement and Good Industry Practice for taking appropriate action thereon.

MATERIALS AND SPECIFICATIONS FOR STRUCTURES

1. General

- (i) All materials to be used in the structures shall be in conformity with the BIS/ IRC/ Specifications, unless specified otherwise in this Section. If the Developer proposes to use any material, which is not covered in BIS/ IRC/ Specifications, it shall conform to relevant International Standards, if there are any, or to the requirements specified in this Manual. Proprietary products proven by international usage in comparable building projects, proposed to be used shall be supported with authenticated licensing arrangement with the manufacturer.
- (ii) The Developer shall identify the proposed sources of materials and submit the proposal to RE, RHB/IE for review and comments, if any, prior to delivery. If it is found that proposed sources of supply do not produce uniform and satisfactory products at any time during execution, the Developer shall procure acceptable materials conforming to the specifications from other sources.
- (iii) The samples required for review shall be supplied well in advance, at least 48 hours or minimum time required for carrying out the relevant tests, whichever is more. Delay in submission of samples shall not be acceptable as a reason for delay in completion of the works/extension of time for completion.
- (iv) In case of manufactured items, the Developer shall submit to the Independent Engineer/ RE, RHB for review and comments, if any, the details pertaining to the product like make, ISI marking, product catalogue, instructions on installation, testing and commissioning, guarantee/warranty etc. . The item shall be procured only after due approval by RHB/IE.
- (v) The Developer shall set up a full-fledged laboratory at site, as per the agreement for testing of all materials and finished products. He shall make arrangements for additional/confirmatory testing of any material including imported materials/products for which facilities at site laboratory are not available.

2. Structural Concrete

- a) The Concrete for use in structures shall conform to the provisions in IS 456-2000, Clauses 302.6 to 302.9 of IRC:21 and Section 1700 of MOSRTH Specifications. Sampling and Testing of Concrete shall be as per Clause 302.10 of IRC:21. Acceptance criteria for concrete shall conform to Clause 302.11 of IRC:21. Concrete to be produced shall conform to the specified requirements.
- b) A dense and well compacted concrete provides effective protection against corrosion of steel in reinforced concrete members. To achieve this, the Developer shall pay special attention to the following elements, which have a bearing on the production of a durable concrete:-

- (i) Quality of materials - cement, aggregate, water and admixtures, both mineral and chemical,
 - (ii) Mix design,
 - (iii) Mixing and placing of concrete - Concrete shall preferably be produced in a mixing and batching plant,
 - (iv) Vibration and compaction,
 - v) Curing,
 - (vi) Cover to reinforcement, and
 - (vii) Detailing.
- c) The following points are also important in production of durable concrete, which shall be duly considered and adopted:-
- (i) Minimum chloride content in concrete as specified in IRC:21,
 - (ii) Regular testing of water used for making concrete as per IRC:21,
 - (iii) Compatibility testing of admixtures with type of cement,
 - (iv) Permeability test for concrete,
 - (v) Testing of aggregates for alkali-silica reaction.
- (d) The mix designs for concrete shall be got reviewed by the Independent Engineer prior to construction.

3. Cement :

Any OPC/PPC of cement specified in IRC:21 or IS 269, 8112, or IS 1489 for PPC : may be used for the works subject to limitations, if any, specified therein.

4. Coarse Aggregates

- (a) Before the commencement of the works, at least three samples in accordance with the procedure laid down in IS: 2430 shall be taken for each quarry source to ascertain the quality, suitability and fitness of the available material for use in the works. Fresh tests shall be conducted, in case there is any change in the source or the type of rock being quarried. The proposal, along with a copy of test reports, shall be submitted to the Independent Engineer for review and comments, if any.
- (b) Aggregates having more than 0.5% sulphate as SO₃ and water absorption more than 2% may not be used.
- (c) In case of doubt, the alkali-aggregate reactivity shall be tested in accordance with IS: 2386 (Part 6). Coarse aggregates having positive alkali-silica reaction (ASR) shall not be used.
- (a) The maximum value of flakiness index for coarse aggregates shall not exceed 35 percent.

5. Sand/Fine Aggregates

- (a) All fine aggregates shall conform to IS:383 and tests for conformity shall be carried out as per IS:2386 (Part I to VIII). The fineness modulus of fine aggregates shall be between 2.0 and 3.5.
- (b) Before the commencement of the works, at least three samples as per IS: 2430 shall be taken for each quarry source, to ascertain the quality, suitability and fitness of the available material for use in the works and the proposal along with a copy of test reports shall be submitted to the Independent Engineer for review and comments, if any.
- (c) Fine aggregates having positive alkali-silica reaction shall not be used.

6. Water

- (a) Water for use in the works for mixing and curing shall be in conformity with Clause 302.4 of IRC:21 or IS 456-2000 (Cl; 5.4)
- (b) Water from each source shall be tested before the start of works and thereafter every three months and after each monsoon, till the completion of the works and proposal along with a copy of test reports shall be submitted to the Independent Engineer for review and comments, if any.

7. Chemical Admixtures

- (a) Chemical Admixtures are proprietary items and shall be obtained only from reputed manufacturers with proven track record, quality assurance and full-fledged laboratory facilities for manufacture and testing.
- (b) The chemical admixtures shall comply with IS: 9103 and meet the requirements stipulated in Clause 5.5 of IS:456.

8. Steel

8.1 Reinforcement/ Un-tensioned Steel : IS 1786: as approved in RHB.

- (i) All reinforcing steel for use in works, shall be procured from original producers or their authorised agents.
- (ii) Only new steel shall be brought to the site. Every bar shall be inspected before assembling on the work and defective, brittle or burnt bars shall be discarded. Cracked ends of bars shall be cut before use.
- (iii) All reinforcement shall be free from loose rust and coats of paints, oil, mud or any other substances, which may destroy or reduce bond. The reinforcement bars bent and fixed in position shall be free from loose rust or scales, coats of paints, oil, mud or chloride contamination and other corrosion products. Where cleaning of corroded portions is required, effective method of cleaning such as sand blasting or other method shall be submitted to the Independent Engineer for prior review and comments, if any.

8.2 Structural Steel

All structural steel, castings and forgings, fasteners (bolts, nuts, washers and rivets), welding consumables, wire ropes and cables shall conform to the provisions of Clauses 505.1.2, 505.2, 505.3, 505.4 and 505.6 of IRC:24 respectively.

9. Storage of Materials

All materials shall be stored at proper places so as to prevent their deterioration or intrusion of foreign matter and to ensure the preservation of their quality and fitness for the work. Any material which has deteriorated or has been damaged or is otherwise considered defective after review by the Independent Engineer shall not be used in the works and shall be removed from site by the Developer at his cost. Such materials shall not be made acceptable by any modifications.

10. Reports to be submitted

The Developer shall submit test results of all materials and finished products proposed to be used in the Project Highway, as specified in the QC documents, to the Independent Engineer for review and comments, if any.

11. New materials: In case the developer proposes some new materials, not hitherto used in Rajasthan, he shall submit the original (relevant) code of specification and the reference to the projects where used and the comments by the client (not below the rank of Executive Engineer) on their performance.

12. Similarly, in case a technology other than cast-in-situ, precast RCC or pre-engineered steel frame construction is proposed, detailed literature on the technology, projects where used and comments by the client (not below the rank of Executive Engineer) on their performance. The reasons of preference of such technologies on optimization of costs and period of construction should also be submitted in details. The benefits of such optimization vis-à-vis the established should be transferred to the project. Technologies, not tried and tested are not advised to be proposed.

13. Local building materials:

These have a optimizing effect on the cost provided they conform to the specifications and the requirements of durability. Test values on such materials be submitted for acceptance by the RHB. The developer shall have to insure the structures constructed with such materials for a period of 20 years.

LANDSCAPING AND TREE PLANTATION

1 GENERAL

The Developer shall plant trees and shrubs of required number and type at the appropriate locations within the project campus and in the land earmarked by the Government for a forestation. The Government shall specify the number of trees which are required to be planted by the Developer as compensatory a forestation. The Developer shall also maintain the trees and shrubs in good condition during the defect liability Period as per the maintenance schedule. The guidelines given in this Section shall be followed in plantation of trees and shrubs.

2 Design Considerations in various locations:-

2.1 Set-back Distance of Trees and Other Plantation

Trees on the roadside shall be sufficiently away from the roadway so that they are not a hazard to road traffic or restrict the visibility. Most vulnerable locations in this regard are the inside of curves, junction corners and cut slopes. Trees shall be placed at a minimum distance of 10-12 m from the centre line of the extreme traffic lane, to provide recovery area for the vehicle that runs off the road. A second row of trees 6 m further away will also be desirable and planted, wherever possible. Preferably, the first row of trees shall consist of species with thick shade and other rows of vertical growth type providing thin shade. The distances for alternative rows of trees shall be reckoned from the nearest edge of the pavement. Besides trees, suitable shrubs and ground cover should also be planted as per design.

2.2 Spacing of Avenue Trees:

The spacing of avenue trees will depend on the type and growth characteristics of trees, requirement of maintenance, penetration of distant views, etc. A range of 3-5 m would meet the requirement for most varieties.

2.3 Choice of Trees:

The following guidelines shall be kept in view while selecting the species of trees to be planted:

- (i) Trees shall be selected with due regard to soil, rainfall, temperature and water level.
- (ii) The species must be capable of developing a straight and clean bole up to a height of 2.5 to 3.5 m from the ground level.
- (iii) The selected trees shall, preferably, be fast growing and wind-firm. These shall not be thorny or drop too many leaves.
- (iv) The trees shall be deep rooted as shallow roots injure pavements
- (v) In urban areas, the species selected shall be of less spreading type, so that these do not interfere with overhead services, clear view of signs and efficiency of roadway lighting.

3. Maintenance of Plants

The Developer shall submit scheme for plantation and maintenance of plants and trees to the Independent Engineer for review and comments, if any.

RAIN WATER HARVESTING

1. Rajasthan State is rain fed economy and water is the elixir of life. Every drop of rain water is to be conserved to sustain human, cattle and plant life. It has been a tradition to sustenance in our desert State. Govt. of Rajasthan is constructing such structures in their own buildings, roadside locations and even insisting on the subjects to provide one in their private dwellings.
2. These mass housing complexes shall be ideal choice for such structures and all rainwater should be provided for conservation. Many standard designs have been developed by JDA and others that could be adopted.
3. This water could either be stored and processed for drinking/ plant consumption purposes or made to reach the aquifers of the wells/tube wells located in the complex.
4. These complexes should have structures to conserve at least 70% rain water through open and runoff from the roofs of all houses built in the complex.
5. The design of a suitable rainwater harvesting structures shall be proposed by the developer for approval by the RHB.

Govt. of Rajasthan attaches due importance to safety of its people and hence adequate provisions are to be provided in this project.

FIRE AND LIFE SAFETY, AS PER APPROVED LAYOUT PLAN

1. Down-comer – An arrangement of firefighting within the building by means of down-comer pipe connected to terrace tank through terrace pump, gate valve and non-return valve and having mains not less than 100 mm internal diameter with landing valves on each floor/landing. It is also fitted with inlet connections at ground level for charging with water by pumping from fire service appliances and air release valve at roof level to release trapped air inside. The design of GWR and OHT for fire shall be got approved by the RHB and the IE.
2. Fire Exit – Properly connected with fire escape stair shall have to be provided at each Floor.
3. Horizontal Exit – An arrangement which allows alternative egress from a floor area to another floor at or near the same level in an adjoining building or an adjoining part of the same building with adequate fire separation.
4. Means of Egress – A continuous and unobstructed way of travel from any point in a building or structure to a place of comparative safety.
5. General Requirements of All Individual Occupancies

5.1 *General*

All buildings shall satisfy certain requirements which contribute, individually and collectively, to the safety of life from fire, smoke, fumes and panic arising from these or similar causes. There are, however, certain general principles and common requirements which are applicable to all or most of the occupancies.

5.2 *Vertical opening*

Every vertical opening between the floors of a building shall be suitably enclosed or protected, as necessary, to provide the following:

- a) Reasonable safety to the occupants while using the means of egress by preventing spread of fire, smoke, or fumes through vertical openings from floor to floor to allow occupants to complete their use of the means of egress.
- b) Further it shall be ensured to provide a clear height of 2 100 mm in the passage/escape path of the occupants.

5.3 *Electrical Installations:*

Electrical Installations Shall be duly protected from fire hazard with an approved design.

5.4 *Fire extinguishers*

Fire extinguisher shall be provided on each floor and at approved locations on the campus.

5.5 *Two way Hydrant*

Two way Hydrant shall be installed in side campus to facilitate the fire tender to take or feed water from the system.

5.5 *Fire NOC*

Developer shall be responsible for getting temporary/final fire safety certificate from the local body responsible for the same at his own cost.

APPENDICES

(Bid form & References)

RAJASTHAN HOUSING BOARD

S.No.	Contents	Page No.
1	Schedule-I Financial Resources & Capability	45
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FINANCIAL RESOURCES AND CAPABILITY

[Refer Clause 4[a]]

1. Name of Firm
2. Name [s] of partner / Director
3. Capital
 - a] Authorised
 - b] Issued and Paid up
4. a] Details of the projects completed and firm's performance during last three financial years [information to be furnished in Schedule-III]
- b] Details of work in hand performance record [information to be furnished in Schedule –IV]
5. Furnish Balance Sheet and Profit & Loss Statement with Audited Report for the last three years.

S.No.	Fin. Year	Working Capital	Net Worth	Turnover	Gross Income in Rs.
1.					
2.					
3.					

Average Annual Financial Turnover Rs.....

6. Have you ever been denied tendering facilities by any Government / Public Sector Undertaking?
7. List of your sources of Finance.
8. Certificate of Financial Soundness by Bank.
9. Name and Address of Bank from whom reference can be obtained.
10. Have you ever been declared bankrupt? [If Yes, Please give details.]

Signature of Bidder

Schedule-II

DETAILS OF PROJECT COMPLETED DURING LAST 5 YEARS

[REFER CLAUSE-4][B]

BULIDING WORKS

S.No	Name of Project	Firm	Place [District/State]	Financial Year of Completion of Project	Principal item of work						
					Nos. of Residential Units construction	Total Area of Project	Total constructed Area of Residential Units	Copy of Approved Layout Plan of Completed Project	Completion Certificate no. & dt.	Certificate issuing authority	Certificate attached at CP
1	2	3	4	5	6	7	8	9	10	11	12
		****						CP.....			CP...
								CP.....			CP...

Note : The Certificate from Engineer-In-Charge in support of the above to be enclosed.

Schedule-III

[Refer Clause 4 (c)

ENGINEERING WORKS COMPLETED BY THE BIDDING DEVELOPER DURING LAST 3 YEARS (“A”)

S.No	Name of Work	Work executed	Place and state	Tendered Cost	Stipulated time of completion	Time in which completed	Date of completion	Reasons for delay	Principal features of works	Value of work done
1	2	3	4	5	6	7	8	9	10	11
	Total									
	% of bid Qty.									

Note : The Certificate from competent Authority in support of the above to be enclosed.

Signature of Bidder

Schedule-IV

[Refer Clause 4 (d)]

DETAILS OF WORKS IN HAND AND TO BE COMPLETED (Status as on date of submission of bid)

S.No.	Name of Work	Place and State	Works in Hand				Works tendered for			Remarks
			Tendered cost (Rs. In Lacs)	Cost of works remaining to be executed	Stipulated period of completion	Anticipated Date of Completion	Estimated cost (Rs. in Lacs.)	Date of award of work	Stipulated Date & period of completion	
1	2	3	4	5	6	7	8	9	10	11

Signature of Bidder

Note: The Certificate from the competent authority in support of the above to be enclosed.

The Bid Capacity be calculated with respect to the above information.

**DETAILS OF CONSTRUCTION EQUIPMENT
AVAILABLE FOR THIS WORK
[Refer Clause 4 [f]]**

Name of Bidder

S.No.	Name of Machinery	No.	Make & Capacity	Year of Manufacture	Source of availability [Owned / Leased other] [If other Specify Source]

1. I / We herby certify that the above information is correct to the best of my/our Knowledge and belief.
2. I / We herby undertake to deploy the required machinery and equipment and when required in the execution of this project.

Affidavit on Non Judicial Stamp Paper of Rs. 50/- be given in support of the above information.

Signature of Bidder

LETTER OF CREDIT FROM BANK

[(Refer Clause 4 (g))]

CERTIFIED that M/s. _____ who is bidding for the work of construction of

..... is a prestigious account holder of the Bank and the firm shall be advanced the sum of

Rs. _____ Lacs (A minimum of 30% of the estimated project cost) for the construction work after completion of all formalities for such advance.

Authorised Signatory

& Seal of the Bank

Note: Bidders applying for more than one work shall produce the letter of credit cumulatively for the total value of bids.

Schedule-VIII

[Refer Clause 4 (i)]

DETAILS OF LITIGATION OR ARBITRATION CONTRACTS

S.No.	Name of Work (with Agreement No. & Date)	Client	Work order Amount	Disputed Amount Claimed in Litigation / Arbitration	Date of Raising Disputed Amount	Actual Award Amount, If the case is decided	Cause of Litigation and matter in dispute
1	2	3	4	5	6	7	8

Signature of Bidder

RAJASTHAN HOUSING BOARD, DIV-II, JAIPUR

UNDERTAKING IN LIEU OF AGREEMENT

I/ We hereby agree to abide by all the condition laid down in the printed agreement of the Rajasthan Housing Board amended up to, which is in force, in execution of this work and also under take to follow the specifications of the Board as laid down for Building / Road/ Sanitary / Electrification/ Joinery / Steel Window/ Steel door frames / Park Railing work as may be applicable to this contract.

Signature of Contractor

Address

.....

.....

Phone.....

RAJASTHAN HOUSING BOARD, JAIPUR

TO BE FILLED-IN BY THE DEVELOPER

ABSTRACT OF DETAILS

NAME OF WORK :

1 Detail of turnover for the last three financial years.

S.No.	Financial Year	Turn over in lacs	Copy of audited account/balance sheet enclosed at page

2 Detail of projects completed during last five financial years.

S.No.	Name of Project	Place [District/State]	Financial Year of Completion of Project	Certificate attached at CP
1	2	3	4	5

3. Projects to be completed status as on date of submission of bid.

S.No.	Name of work	Tender Cost	Work completed in lac	Balance work to be completed in lac	Certificate Enclosed at C.P.

4. Work tendered for status as on date of submission of application

S.No.	Name of work	Tender Cost	Enclosed at C.P.
	Total		

6. Details of letter of credit from bank

S.No.	Name of Bank	Date of issue	Amount in lac	Certificate Enclosed at C.P.
1				

7. GST Certificate

S.No.	Date of Issue	Name of Issuing Authority	Validity Date	Certificate Enclosed at C.P.
1				

I hereby declare that the information furnished above S.No. 1 to 7 are correct and have not concealed any information concerned to the technical bid.

Date

Signature of Bidder

Besides the BIS codes (as under) on building materials, methodologies, sampling and testing, and IRC codes (as listed ahead) about the campus roads, CC pavement and other matters to be referred.

SUMMARY OF BIS CODES FOR BUILDING MATERIALS (for reference)

S.No	Materials	BIS code for	
		Specifications :IS	Sampling/Testing :IS
	CEMENT AND CONCRETE		
1.	Coarse and Fine Aggregates from natural sources for concrete	383-1970	2386 (Part 1-8) 1963
2.	Standard sand for testing of cement	650-1966	650-1966
3.	Portland Slag Cement	455-1976	4031& 4032-1968
4.	Portland -Pozzolana Cement	1489-1976	4031 & 4032-1968
5.	Ordinary and Low Heat Portland Cement	269-1976	4031 & 4032-1968
6.	Cement OPC or PPC	269/1489 (I) /8112/12269.	650
7.	Masonry Cement	3466-1967	4031-1968
8.	High Alumina Cement for Structural use	6452-1972	4031 & 4032-1968
9.	Super sulphated Cement	6909-1973	4031 & 4032-1968
10.	Rapid Hardening Portland Cement	8041-1978	4031 & 4032-1968
11.	White Portland Cement	8042-1978	4031 & 4032-1968
12.	Hydrophobic Portland Cement	8043-1978	4031 & 4032-1968
13.	High Strength Ordinary Portland Cement	8112-1976	4031 & 4032-1968
14.	Concrete Masonry works-Hollow and solid concrete Blocks.	2185(P-I)-1979	2185(P-I)-1979
15.	Load Bearing Light weight Concrete Blocks.	3590-1966	3590-1966
16.	Hollow and Solid Concrete Blocks	2185-(P-I)-1979	
17.	CC Flooring Tiles.	1237	
18.	Laying and Finishing of CC Flooring Tiles.	1443	
19.	Specifications for Cement Concrete flooring tiles (Ist Rev).	1237-1980	1237
20.	Autoclaved Cellular Concrete Blocks.	5482-1969	6441(P-I)-1972

21.	Autoclaved Reinforced Cellular Concrete wall slabs.	6072-1971	3809-1966
22.	Autoclaved Reinforced Cellular Concrete Floor and Roof slabs.	6073-1971	3809-1966
23.	Precast Concrete Coping Blocks	5751-1969	5751-1969
24.	Precast concrete Kerbs	5758-1970	5758-1970, (A&B).
25.	Reinforced Concrete Fence Posts	4996-1968	4966-1968
26.	Precast Concrete cable covers	5820-1970	5820-1970
27.	Concrete Porous Pipes for under Drainage.	4350-1967	
28.	Perforated Concrete pipes	7319-1974	3597-1966
29.	Precast Reinforced Concrete Door and Window frames	6523-1972	-
30.	Unreinforced Corrugated and Semi-corrugated Asbestos Cement Sheets.	459-1970	5913-1970
31.	Asbestos Cement Flat Sheets	2096-1966	2096-1966/1974
32.	Code of practice for laying Asbestos Cement Sheets.	3007(P I)-1999 (IR)	
33.	Code of practice for laying Asbestos Cement Sheets.	3007(P II)-1965,1999(IR)	3597-1966, sampling IS 458
34.	Pre-stressed Concrete Pipes including fittings.	784-1978	3597-1966
35.	Steel Cylinder Reinforced Pipes.	1916-1963	1916-1963
36.	Specials for Steel Cylinder Reinforced Pipes.	7322-1974	7322-1974
37.	Concrete Porous pipes for Under drainage.	4350-1967	4350-1967
38.	Perforated Concrete Pipes.	7319-1974	3597-1966
39.	Code of practice for concrete structures for storage of liquids.	3370(I/II/1965&I V-1969,1999)	
40.	Plain and Reinforced Concrete -Code of practice (IV Revision).	456-2000	Cubes IS 516, Admixtures IS 9103, workability: 1199,
41.	Code of practice for use of structural steel in general building construction. Revised.	800-1962	IS :800
42.	Use of steel Tubes in General Building construction.	806-1968 (IR)	800

43.	Specifications for mild steel tubes; Tubular and other wrought steel fittings.	1239(Ist)-1979,1990(VR),1239(P II)-1982,1992(IVR)	1894-1972, 2329-1963, 2328-1963,2335-1963,sampling -4711-1974
44.	Specification for weld able structural steel (IIIrd Rev).	2062-1984	1608-1972, 3803-1974, 1599-1974,1757-1974,10842-1984
	POZZOLANAS		
45.	Fly Ash for use as Pozzolana and Admixture.	3812-1981	1727-1967
	LIMES		
46.	Sand lime Bricks	4319-1976	4319-1976 & IS 3495(P-I)-1976
	STONES		
47.	Natural Building stones for Masonry work.	1127-1970	1127-1974
48.	Marble (Blocks, Slabs and Tiles).	1130-1969	1122, 1124-1974,
49.	Structural Granite	3316-1974	1121,1122, 1124-1974,
50.	Sand Stone (Slabs and Tiles)	3622-1977	1121, 1124, 1126-1974 & 1706-1972
51.	Laterite Stone Block for Masonry.	3620-1979	1121/1124-1974
	CLAY PRODUCTS FOR BUILDINGS		
52.	Burnt Clay Hollow Blocks for walls and partitions.	3952-1978	3952-1978
53.	Common Burnt Clay Building Bricks.	1077-1976	3495-1976 (P-I/II/III)
54.	Heavy Duty Burnt Clay Building Bricks.	2180-1970	--do--
55.	Burnt Clay Perforated Building Bricks.	2222-1979	-- do --
56.	Burnt Clay Facing Bricks.	2691-1972	-- do --
57.	Burnt Clay Paving Bricks.	3583-1975	-- do --
58.	Burnt clay Sewer Bricks.	4885-1968	-- do --
59.	Burnt Clay Soling Bricks.	5779-1970	-- do --
60.	Special Shapes Clay Bricks.	6165-1971	6165-1971
61.	Burnt Clay Jallies	7556-1975	7556-1975
62.	Clay Roofing Tiles , Mangalore Pattern.	654-1972	654-1972

63.	Clay Ridge and Ceiling Tiles.	1464-1973	1464-1973
64.	Clay Flooring Tiles.	1478-1969	1478-1969
65.	Burnt Clay Flat Terracing Tiles-Machine made.	2690(P-I)-1975	2690-1975
66.	Hollow Clay Tiles for Floors and roofs(P-I, Filler Type).	3951(P-I)-1975	3951-1975
67.	Hollow Clay Tiles for Floors and roofs(P-II, Structural Type).	3951(P-II)-1975	3951-1975
GYP SUM BUILDING MATERIALS.			
68.	Gypsum Plaster Boards.	2095-1982	2542-1981
69.	Gypsum Building Plasters (Part-I: Excluding Premixed Light Weight Plasters)	2547(P-I)-1976	1288-1973, IS 2542-1978
70.	Gypsum Building Plasters (Part-II: Premixed Light Weight Plasters).	2547(P-II)-1976	2542-1978
71.	Gypsum Partition Blocks (Non-load Bearing-Solid and Hollow Types) .	2849-1964	2542-1978
FLOOR COVERINGS AND OTHER FINISHES.			
72.	Cement Concrete Flooring Tiles.	1237-1980	1237-1980
73.	Sand For Plaster.	1542-1977	1727-1967, IS 2250-1980, IS 2386-1963
74.	Flexible PVC Flooring	3462-1979	3462-1979
75.	Polystyrene Wall Tiles	3463-1966	3464-1980
76.	Ceramic unglazed Acid Resisting Tiles.	4457-1982	4457-1982
77.	Chemical Resistant Mortars (Silicate Type)	4832(P-I)-1969	4456-1967
78.	Chemical Resistant Mortars (Resin Type).	4832(P-II)-1969, 4443-1980	4456-1967
79.	Chemical Resistant Mortars (Sulphur Type)	4832(P-III)- 1969,4442-1980	4456-1967
80.	Acid Resistant bricks	4860-1968	1237-1980
81.	Linoleum Sheets and Tiles	653-1980	9704-1980
82.	Rubber Flooring Materials for general purpose.	809-1970	3400-1980
83.	Bitumen Mastic for Flooring.	1195-1978	1195-1978

84.	Bitumen Mastic, Antistatic and Electrically conducting grade.	8374-1977	8374-1977
	Waterproofing and Damp-proofing Materials		
85.	Bitumen Felts for Waterproofing and Damp proofing.	1322-1970	1322-1970
86.	Bituminous Compounds for Waterproofing and Caulking Purposes.	1580-1969	1209, 1211, 1217-1978
87	Integral Cement Waterproofing Compounds	2645-1975	4031-1968, IS 6925-1973
75.	Bitumen Mastic for use in Waterproofing of Roofs.	3037-1965	1195-1978
75a.	Code of practice for application of bitumen mastic for water proofing of roofs.	4365-1967	
76.	Bitumen Primer for use in Waterproofing and Damp proofing.	3384-1965	1203, 1206, 1213, 1216-1978
77.	Bitumen Mastic for Tanking and Damp proofing.	5871-1970	5871-1970, 1195-1978
77a.	Pressed steel door frames	4351-1976	
78.	Glass Fibre Base Coal Tar Pitch and Bitumen Felts.	7193-1974	7193-1974
	SANITARY APPLIANCES AND WATER FITTINGS		
79.	Flushing Cisterns For Water Closets and Urinals (Valve less symphonic Type)	774-1971	774-1971
80.	Cast Copper Alloy Screw-Down Bib Taps and Stop Valves for water services.	781-1977	781-1977
81.	Caulking Lead	782-1978	782-1977
82.	Self Closing Taps	1711-1970	1711-1970
83.	Cast Iron Manhole Covers and Frames.	1726(P-I-VII)-1974	1726(P-I-VII)-1974
84.	Pillar Taps for water supply purposes.	1795-1982	1795-1982
85.	Automatic Flushing cisterns for Urinals.	2326-1970	2326-1970
86.	Plastic Water closet seats and covers.	2548-1980	2548-1980
87.	Vitreous China Sanitary appliances.	2526 (P-I to XV) 1974-1981	2526 (P-I to XV) 1974-1981
88.	Ferrules for water services.	2692-1978	2692-1978

89.	Copper Alloy waste fittings for Wash-Basins and Sinks.	2963-1979	2963-1979
90.	Plug cocks for water supply purposes.	3004-1979	3004-1979
91.	Waste Plug and its accessories for Sinks and Wash basins.	3311-1979	3311-1979
92.	Plastic Flushing Cisterns (Valve less Siphonic type) For Water Closets and Urinals.	7231-1974	7231-1974
93.	Low Density Polyethylene pipes For Potable Water Supplies.	3076-1968	3076-1968
94.	High Density Polyethylene Pipes For Potable Water Supplies, sewage and Industrial Effluents	4984-1978	4984-1978
95.	Unplasticized PVC Pipes For Potable Water Supplies.	4895-1981	4895-1981
96.	Injection Moulded PVC Socket Fittings with Solvent Cement Joints For Water Supplies.	7834 (P I to VIII)- 1975	7834 (P I to VIII)- 1975
97.	Injection Moulded High density Polyethylene (HDPE) Fittings for Potable Water Supplies.	8008 (P-I to VII)- 1976	8008 (P-I to VII)-1976
98.	Fabricated High Density Polyethylene (HDPE) Fittings For Potable Water Supplies.	8360(P-I to III)- 1977	8360(P-I to III)-1977
99.	Code of practice for installation of septic tanks (IInd Rev).	2470 (Ist)-1985	
100.	Code of practice for installation of septic tanks P-2 (IInd Rev).	2470 (IInd)-1985	
	Builders (Joinery) Hardware.		
101.	Tower Bolts (part I-Ferrous Metals)	204-1978	204-1978
102.	Tower Bolts (part II-Non-Ferrous Metals)	204-1978	204-1978
103.	Non Ferrous Metal Butt Hinges.	205-1978	205-1978
104.	Tee and Strap Hinges.	206-1981	206-1981
105.	Door Handles.	208-1979	208-1979
106.	Mild steel sliding door bolts for use with padlocks.	281-1973	281-1973
107.	Parliament Hinges.	362-1982	362-1982
108.	Timber Paneled and Glazed shutters	1003	
109.	Timber Door, Window and ventilator frames.	4021	
110.	Factory made flush doors BWP/other grade	2202 (P-I/II)	4020-1967
111.	Methods of test for wooden flush doors.	4020-1967	4020
112.	ISI Hand book for structural Engineers.	SP-6(2)-1962	

113.	Cold formed Light Gauge Steel Structural Members in General building Construction.	801	
114.	Specifications for steel door frames.	4351	
115.	Code of practice for use of metal arc welding for general construction in mild steel.	816-1969	822
116.	Code of practice for inspection of welds.	822-1970	Radiographic:IS 1182-1967,2478-1963, 2595-1963,2598- 1966, 3657-1966 Ultrasonic Test: 2417-1963,3664-1966, 4225-1967,4260-1967, Magnetic Particle Flaw detection: 3415-1966, 3703-1966, 3568-1966 Testing of welding: 3600-1966.
117.	Assessment of Butt, Fillet and Fusion welds in Steel sheet, Plate and Pipe.	4943	6441(P I-V)-1972, 3346-1980
118.	Code of practice for structural safety of buildings: loading standards.	875 (PI)-1957, 1997(IIR)	875
119.	Code of practice for structural safety of buildings: loading standards.	875 (PII)- 1987(IIR)	IS875
120.	Code of practice for structural safety of buildings: loading standards.	875 (PIII)-1987, (IIR)	IS875
121.	Code of practice for structural safety of buildings: loading standards.	875 (PV)-1987, (IIR)	875
122.	Code of practice for design and construction of simple spread foundations.	1080- 1962,1985(IIR)	1080
123.	Code of practice for calculation of settlement of Foundations.	8009(P II)-1980	
124.	Dimensions and Workmanship of Natural Building stones for Masonry work.	1127-1970	
125.	Marble (Blocks, Slabs, and Tiles)	1130-1969	1122 / 1124-1974.
125.	Specification for steel tubes for structural Purposes.	1161-1968 (II R),1998(IVR)	1894-1962, 2335-1963, 2329-1963,
127.	Methods of measurements of Civil Engineering works, , various parts and latest revisions from	1200 -1973	1200

128.	Specifications for Aldrin Technical (Ist Rev).	1306-1974	4711-1974, 2335-1963,554-1975
129.	Code of practice for anti-termite measures in Buildings.	6313 (P I)-1981(IR)	
130.	Code of practice for anti-termite measures in Buildings.	6313 (P II)-1981	
131.	Code of practice for anti-termite measures in Buildings.	6313 (P III)-2001(IIR)	
132.	Code of practice for lighting of Public thoroughfares (Ist Rev).	1944(I&II)-1970	NA
133.	Specification for Luminaries for street lighting.	2149-1970	1913-1969,
134.	Code of practice for natural ventilation of Buildings.	3362-1965	
135.	Indian Standard guide for heat insulation of nonindustrial buildings.	3792-1966	
136.	Methods of measurements of Plinth , carpet and Rent able areas of building works (Ist Rev).	3861-1975,2002(IIR)	
137a.	Codes for Earthquake Engineering	SP 22 BIS	
137b	Earthquake design of buildings	4326	
138.	Hand book on concrete mixes	SP 23 BIS	
139.	Hand book on RCC Detailing	SP 34 BIS	
140.	Pre-cast Cement Concrete Poles for Power Line	1322	
141.	Steel Doors, windows and Ventilators.	1038	
142.	Architectural and Building Drawings	962	
143.	Strength of natural building stones	1121(I)	Identification 1123, Durability 1126, workmanship
144.	Basic Requirements for water supply	1172	
145.	Aluminum Doors and windows for residential buildings	1948	
146.	Testing of Cement Concrete Pipes	3597	
148.	Ancillary structures in Sewerage	4111(I)	
149.	Refuse chutes in Multistoried Buildings	6924	

IRC Codes to be referred

1.(I) Design, Construction and Maintenance of Cement Concrete Pavements

1.	IRC:15-2002	Standard Specifications and Code of Practice for Construction of Concrete Roads (Third Revision).
2.	IRC 43-1972	Tools, Equipment and Appliances for Concrete Pavement Construction.
3.	IRC:44-1976	Tentative Guidelines for Cement Concrete Mix Design for Pavements (for Non-Air Entrained and Continuously Graded Concrete) (First Revision).
4.	IRC:57-1974	Recommended Practice for Sealing of Joints in Concrete Pavements.
5.	IRC:58-2002	Guidelines for the Design of Plain Jointed Rigid Pavements for Highways (Second Revision).
6.	IRC:61-1976	Tentative Guidelines for the Construction of Cement Concrete Pavements in Hot Weather.
7.	IRC:68-1976	Tentative Guidelines on Cement-Fly ash Concrete for Rigid Pavement Construction
8.	IRC:77-1979	Tentative Guidelines for Repair of Concrete Pavements Using Synthetic Resins
9.	IRC:84-1983	Code of Practice for Curing of Cement Concrete Pavements
10.	IRC:91-1985	Tentative Guidelines for Construction of Cement Concrete Pavements in Cold Weather.
11.	IRC: 98-1997	Accommodation of Utility Services on Roads in Urban Areas.
12.	IRC:SP:49-1998	Guidelines for the Use of Dry Lean Concrete as Sub-base for Rigid Pavement.
13.	IRC:SP:62-2004	Guidelines for the Design and Construction of Cement Concrete Pavement for Rural Roads.
14.	IRC:SP:63-2004	Guidelines for the Use of Interlocking Concrete Block Pavement.
15.	IRC:SP-68-2005	Guidelines for Construction of Roller Compacted Concrete Pavements.

1 (II) Project Preparation, Contract Management and Quality Control

1.	IRC:42-1972	Performa for Record of Test Values of Locally Available Pavement Construction Materials.
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1 (III) Road Drainage

1.	IRC:SP:42-1994	Guidelines on Road Drainage.
2.	IRC:SP:50-1999	Guidelines on Urban Drainage

1 (IV) Road Bitumen

1.	IS 1201-1220-1978	Testing of Tar and bitumen.
2.	IS: 73-1961, 1992 (IIR)	Specification for paving bitumen (Revised)
3.	IS: 8887-1978 , 1995 (IR)	Specifications for Bitumen Emulsion for roads
4.	IS-1202-1958, 1211-1958, 1209-1958, 1205-1958, 1203-1958, 1208-1958, 1212-1956, 1203-1958, 1216-1958. Sampling IS 73-1961	Testing and sampling

1 (V) Road Machinery

1.	IRC:43-1972	Recommended Practice for Tools, Equipment and Appliances for Concrete Pavement Construction
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FOR CONSTRUCTIONAL PRACTICES AND SAFETY:

Please follow the specifications as in :

NATIONAL BUILDING CODE OF INDIA 2005

PART 7 CONSTRUCTIONAL PRACTICES AND SAFETY

