CHIEF MINISTER's JAN AWAS YOJANA-2015
HOUSING FOR EWS & LIG

MANUAL OF STANDARDS AND SPECIFICATIONS

URBAN IMPROVEMENT TRUST, CHITTORGARH

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Construction of EWS & LIG flats (G+3) under Chief Minister's Jan Awas Yojana-2015 on turn key basis on govt. land located at Dagala ka khera Revenue Village Dagala ka Khera Chittorgarh.

Economically Weaker Sections (EWS) & Low Income Groups (LIG) Housing Under Provision 4A(i)

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Foreword

It is a general phenomenon that large number of people migrate from rural and sub urban areas to urban centers and such migrants face the biggest problem of shelter. With the increase in cost of land, building materials, labour and infrastructure, the availability of shelter is becoming out of the reach of most of them. Therefore, positive encouragement to create housing stock particularly for EWS/LIG segment of the society in urban areas has become necessary. Various studies conducted by various agencies of Government of India show that more than 85% of housing shortage is in the EWS/LIG category. Hence the role and intervention of the State Government is very important to fulfill the requirement of housing shortage in urban areas.

Policy intervention is needed to bridge the gap in housing demand and supply in urban areas. The State Government has accorded high priority to achieve the goal of providing adequate and affordable housing to all. By policy interventions the price of dwelling units for EWS/LIG segment has been controlled by extending various incentives and time bound approvals to private developers. Various provisions included in the policy intend to create housing stock for this segment in a big way. It also aims to utilize precious urban land to its maximum potential so as to cut down the price of dwelling units.

Various initiatives recently taken by Government of India, especially “Housing for All Mission” have also been considered while framing this policy so that the financial incentives extended to EWS/LIG segment in slum and non-slum areas could be availed of by such eligible beneficiaries.

PREFACE

Right to adequate housing is a basic human right as shelter is a basic human need. Provision of adequate housing is emerging as a major thrust area for Government ofIndia as well as the State Governments. Government of Rajasthan also accords a very high priority to this task. With increase in cost of land, building materials, labour and infrastructure, positive encouragement to affordable housing has become necessary for the economically weaker and low income groups. Hence the role and intervention of the State Government becomes important.

Sustainability of environment and development cannot be achieved without adequate & Affordable Housing. Creation of a large stock of housing at affordable prices for all is not a simple technological issue or a mere problem of the finance. It is a complex amalgam of a host of factors, which need to be tackled at all levels and in a synchronized manner.

The goal to provide Affordable Housing to all has an economic and social significance. Rajasthan has the largest area in the country which is 10.41% of the country's area. As per the 2011 census, urban population in Rajasthan is 24.8%.

At the National level, the total housing shortage in urban sector is estimated as 18.70 million, out of which more than 90 percent shortage is of EWS/LIG housing. In Rajasthan total housing shortage in the urban sector was estimated to be 1.05 million by Technical Group on Housing Shortage, constituted by Govt. of India out of which more than 85% is in the EWS/LIG category.

Due to rapid pace of urbanization, increasing rural to urban migration and gap between demand and supply, especially in EWS/LIG category there is a growing requirement for shelter and related infrastructure in urban areas of Rajasthan. It is felt that policy intervention is needed to bridge this gap in housing demand and availability. Shortage of affordable housing is emerging as a major challenge for the Government and is sought to be tackled through a series of measures and policy guidelines.

To achieve the goal of "Affordable Housing for All" and integrated habitat development we need to ensure equitable supply of land, shelter and services at affordable prices in Rajasthan, with special focus on economically weaker sections, Lower Income Groups and urban poor.

Affordable Housing Policy-2009 was launched in Dec. 2009 but due to certain shortcomings and bottlenecks in the implementation of policy, much progress could not be achieved. New policy has been prepared after review of existing policy and incorporating learnings from the past experiences, feedback from various stakeholders and new policy initiatives by the Government of India. This policy is named as "Chief Minister's Jan Avas Yojna-2015".

Department of Urban Development, Housing and Local Self Government undertook a detailed exercise in understanding various Policy Initiatives of Government of India and formulated the present policy for building stock of EWS/LIG houses to be constructed by Government agencies like Development Authorities, Improvement Trusts, ULBs, Housing Board etc. and by private sector To attract private developers for construction of houses for EWS/LIG segment of the society provisions have been made in this policy by giving a host of incentives to the private developers.

The various incentives and time bound approval processes are aimed at attracting private sector investment into this sector in a big way with the help of the policy framework and the in-built incentives. The policy aims to motivate various agencies, including private developers to take up construction of Affordable Housing for EWS/LIG categories in various urban centers of Rajasthan.

Goals of Chief Minister's Jan Awas Yojana

1) To achieve the objective of Affordable Housing for All creation of EWS/LIG housing stock to fulfill housing shortage in the State.

2) To attract private investment for construction of houses for EWS/LIG segment of the society, by giving incentives to the private developers.

3) To motivate govt. agencies and private developers to take up construction of Affordable Housing.

4)To identify land for affordable housing which can be monetized by inviting private participation on a large scale.

5) To expedite the process of construction developers shall be facilitated by fast track approvals.

List of Symbols and Abbreviations

AASHTO	:	American Association of State Highway and Transportation Officials
ASTM	:	American Society for Testing and Materials
BIS	:	Bureau of Indian Standards
CBR	:	California Bearing 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
TMT	:	Thermo Mechanically Treated.
ULB	:	Urban Local Body (Municipal body)
UIT	:	Urban Improvement Trust

SECTION-1

GENERAL

SECTION 1

GENERAL

1.1 The work shall be executed as per Provision 4A(i) of Chief Minister's Jan Awas Yojana-2015 affordable housing on govt. land by private developer in 75:25 ratio (G+3) format

Provision 4A(i) & (ii)

Private Developer on Government Land or Land of Local Authority

Provision 4A (i) is for construction of Housing on Government Land in the ratio of 75:25 in which minimum of 75% area shall be used for EWS/LIG and remaining 25% area of land can be used for other categories of houses/flats/plots. In this provision EWS/LIG houses are to be constructed in G + 3 format.

Provision 4A (ii) is for construction of Housing on Government Land in the ratio of 75:25 in which minimum of 75% area shall be used for EWS/LIG and remaining 25% area of land can be used for other categories of houses/flats/plots. In this provision EWS/LIG houses are to be constructed in Multistoried format.

General Parameters

1. Minimum area

1 Hectare

2. Land distribution for EWS/LIG category

The developer would take up development of total land however construction of EWS/LIG shall be on minimum of 75% of the total land. Developer shall be free to construct MIG-B/HIG flats/plots/houses (high rise permitted) on remaining maximum of 25% of total land.

3. Sale price

Sale Price shall be Rs.1200/ sq.ft (Including Rs.50/ sq.ft for maintenance funds and Rs.150/ sq.ft for ULB) for both EWS and LIG Units, out of which maximum Rs.1000/ sq.ft. shall be paid to developer depending on the bid.

4. Allotment by

Housing units of EWS & LIG segment constructed on 75% of the land by Local Authority to the eligible beneficiaries as prescribed by Government. Any units constructed on remaining 25% of the land will be sold by developer

5. Completion period - For EWS/LIG component the time line for completion will as below :-

a) up to 200 EWS/LIG units - 30 months

b) above 200 upto 400 EWS/LIG units - 36 months

c) above 400 upto 600 EWS/LIG units - 42 months

d) above 600 EWS/LIG units – 48 months

*Completion certificate for complete project shall be issued in proportion to completion of EWS/LIG houses.

6. Ground Coverage
Maximum up to 50%

7. Side & Rear Setback
Shall be minimum of 3m for building height up to 15m and minimum 6m for building height above 15m.

8. Height
As per Building Byelaws

9. Parking
1 two wheeler for each unit of EWS and 2 two wheelers for each unit of LIG

10. Approach road Minimum 9m
Minimum 9m

11. EWS/LIG unit area
For EWS 325-350 sqft super built up area & for LIG 500-550 sqft super built up area

Note:
1. To make the scheme eligible for benefits of Housing for All Mission of Government of India parameters of the guidelines as per Annexure-B are to be adhered with.

2. Other technical parameters will be applicable as per prevailing Building Byelaws/Township Policy.

Incentive to Developers

12. Land Conversion/Land use change charges
Not applicable.

13. External Development Charges

Cost of External Development will be borne by Local Authority on EWS/LIG component and cost of external development on 25% of remaining land will be paid by developer.

14. Building Plan Approval Fee
As per prevailing rules to be paid by the developer on 25% remaining land area of developer.

15. FAR
Minimum 140 units per acre and maximum up to 2.25 FAR (without betterment levy) shall be constructed on EWS/LIG component of scheme. For remaining part of the scheme as per prevailing building byelaws.

16. Split location Not applicable.
Not applicable.

17. Commercial use
As per building byelaws proportionate to FAR consumed in different segments.

18. TDR facility Not applicable.
Not applicable.

1. Allotment of land by the Local Authority would be made through an open bidding process. ULB will first decide the height, no. of blocks and no. of flats to be constructed and shall then invite EOI's to bid for the lowest cost of construction per sq. ft. (upper ceiling limit shall be Rs. 1000 per sq. ft.). ULB shall ensure that maximum no. of EWS/LIG houses are constructed on any given plot and in no case height will be less than G+3.

2. Highest bid price for EWS/LIG shall be Rs.1000.00 per sqft .

3. To facilitate the developers to obtain finances for the project from financial agencies creation of pari-passu charge of the land shall be arranged by concerned Local Authority as the ownership of the land remains with the Local Authority.
4. The Nodal Agency designated by the State Government, shall coordinate with the Banks/Housing Finance Institutions/other financing institutions to facilitate the beneficiaries to obtain loan. All necessary help shall be extended to the beneficiaries/allottees to access these institutions for loan.

a) Roads: ROW:

- Main roads 9m carriageway (min.), other roads 7m carriageway(min.),
- crust-thickness [Earthen embankment 300 mm (min.) above surrounding ground level ,Subgrade-100 mm, GSB-100 mm, WMM -150 mm, and 20 mm PMC + seal Coat (B)] ,surfacing: BT but preferred CC roads (DLC 150 mm, 150 mm th. PQC M 30-200 mm). All internal roads to drain away to the main urban peripheral roads.
- longitudinal grade (min. 1 in 1000) 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.

1 Building Work

Anti termite treatment (Pre construction)
Design for one additional storey, seismic resistant
Developer will be fully responsible for design, structural adequacy and detailing

Ceiling height	3000 mm from finished floor
PCC	M-15 1:3:6, min 100mm thick, min DPC 500 mm thick (M-20 as
RCC plinth	bear
Plinth height	600 mm
Stone masonry	CM 1:6
Plastering	20mm on stone masonry 12mm on brick masonry 6mm on block masonry External plaster should be with water proofing compound @
1kg/50kg cement.	
Steel	Tata, Sail, Usha or other as approved by IE / RM. CONCERN ULB/
AUTHOURITY/UIT	
RCC	M-20 design mix, batch mix plant
Shuttering	Steel plates and interlocking steel props
Flooring	Kharanja 150 / 230 mm Vitreous china tiles 600 x 600 mm floor 300 x 300 / 450 x 450 antiskid ceramic tiles ISI for toilets and
kitchens	
Door frame	Angle Frame EZ / local available stone chowkhat
Door opening	min 900 mm , height 2100 mm,
Solid core flush doors	35mm thick, BWP grade ISI, joinery hardware as per PWD/CPWD specifications PVC doors for toilet and internal doors
Window	sill 750mm from floor, size 1000 x 1200 min, at least one in each room, ventilators min size 600 x 600, section window 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 Section.
Steps	Rise max 150 mm, tread min 250m, MS railing
Fire Fighting	Fire fighting arrangement to be provided as per bye laws.
Kitchen	Marble / Kota stone top and one stainless steel sink 450 x 600 x 200
Painting	White wash inside and approved external maintenance free wall paint outside. First quality primer approved by CONCERN ULB/ AUTHOURITY/UIT. 3 coats of first quality enamel paint on window and flush doors.
Terracing	Brickbat coba in CM 1: 5 (with water proofing compound @1kg / 50 kg cement) with drainage slopes 1 : 60 (min) one 100 dia RWP per 35 Sqm of terrace area.
Water Supply	GI- UPVC / CPVC – ISI marked or better as approved by EIC Fittings – ISI marked or better OHT (675 lit / family) ISI marked Polycon, Syntex or better GWR as per standard practice of PHED / RUIDP, pumping pipe HD UPVC

for appropriate pressure min 10 kg / sqmm, flat connections, local tanks,

RWH, waste water recycling
GWR for days requirement as per standard practice of PHED / RUIDP

Sanitary Services

All pies HD, UPVC for 110 mm dia min.
UPVC pipes – ISI marked or better
Wares WC – Hindustan, Cera or equivalent
Fixture – ISI marked or better
MH- Precast RCC, Ferro Cement Concrete
STP – 540 lt/ flat / day- connecting the effluent to the urban sewerage.
Tree Plantation, Landscaping
Rain water harvesting and waste water recycling
Sanitary layout plans and materials to be approved, by RM/EIC, CONCERN ULB/ AUTHOURITY/UIT.

Electrical

Transformer, feeder / distribution, service lines and housing wiring (copper) meter, earthing, 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 geyserin toilet, exhaust fans in kitchen and toilets, Call bells, street light at 30 m c/c on PCC Poles 9 m high.
Conduit – PVC – ISI
Copper wires – cable – ISI
Switches – ISI
MCB/MCCB- Havels or better as approved by RM, CONCERN ULB/ AUTHOURITY/UIT
Electircal Bell – approved
Light fixtures – ISI
MX Boxes 18 G – as per design
The developer shall evaluate the electrical load and **construct a suitable power GSS as per approved design to cater to the projected power load.**
Power supply distribution plans and layouts to be approved. By IE, CONCERN ULB/ AUTHOURITY/UIT.

Campus Road – 5.5 Mtr. M-30 grade (with DCC or roller CC) with 1.5 m hard shoulder

Road ROW 7.5 m/ 9.0m)

GSB -150 mm Gr II
Base- 2 layers of WMM 150 mm th. each
Primer and 20 mm Th. PMC with seal coat

CC Road

GSB -150 mm Gr II
DLC -1 50 mm th. Laid with paver
CC- M-30, 200 mm th. Laid with paver
Side Drains – CC M-15
Kerbs / footpaths – CC M-15

STP – 540 lt/ flat / day- connecting the effluent to the urban sewerage.
Tree Plantation, Landscaping

Rain water harvesting and waste water recycling

Facilities

Location of Bus stops, public toilets, providing fire hydrants, solid waste management, Parks, Play Grounds, PHC, community / livelihood centre, crutch, small local market, cycle rickshaw stand, auto stand, thela stand etc, water huts, land for religious places, parking places, constructed community spaces with covered plinth area equal to one percent of the total super built up are of the project. One fully equipment and connected site office 1000 sqft plinth area for employer.
compound wall, gates and security structure.
Pre-engineered / Pre cast RCC will be preferred.
Letter – Boxes, crutch, PHC etc.
Drain (Road side and Campus)- Precast RCC (M-20) with RCC Cover .

Min. 1 mtr. width to be used as footpath .
Due provision for handicapped person's Ramp.

Timeline for Completion of the project

(A) For EWS/LIG Component of all the provisions shall be as below:-
(i) up to 200 EWS/LIG units - 30 months
(ii) above 200 upto 400 EWS/LIG units - 36 months
(iii) above 400 upto 600 EWS/LIG units – 42 months
(iv) above 600 EWS/LIG units - 48 months
(B) Completion certificate of the main project or developers own project shall be issued in proportion to the completion of EWS/LIG houses.
(C) If the developer completes construction of EWS/LIG houses within the scheduled period without getting any extension, the developer will get extra incentive of 0.10 FAR (equivalent to 10% of plot area used for EWS/LIG component) without betterment levy in the projects developed under any Chief Minister's Jan Awas Yojana-2015 36 provision except provision 1A and this can be given as TDR after obtaining completion certificate from the nodal agency/local authority.
(D) The period of completion shall be counted from the date of final release of approved Building Plans by the Urban Local Authority.
(E) In case the developer fails to construct EWS/LIG housing units within the stipulated time, penalty shall be imposed as follows:-

(i) For first three months Rs.50/- per sq.ft.
(ii) For next three months Rs.100/- per sq.ft.
(iii) For next six months Rs.200/- per sq.ft.
In case the construction is not completed even after six months after the stipulated time, the State Government may extend the period by another six months with charging penalty @ Rs. 200/- per sq.ft. After the expiry of extended time in case developer fails to complete the project, the Local Authority shall take over the project and get the remaining work completed and the incentives of TDR etc. shall be withdrawn. In case EWS/LIG components are not completed within the extended time period by private
developers, sanction of the building plans of the complete project including the main project in case of split location, shall stand cancelled.

2 Developer will get :

Max Rs.1000.00	P.Sqft.(The super built up area for EWS flats shall be 325 – 350 sqft and for LIG 500-550 sqft.
25% land	utilization shall be as per prevailing building / Town ship bye laws 2.25 FAR without betterment levy

Developer have to pay 1% of project cost to concern ULB /AUTHOURITY for project supervision and management .No price escalation will be allow.

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.

1.3 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 UIT for review. The class of quality assurance shall not be less than Q-3. This will be approved within a week by the UIT 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 2005 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 before the last date of bid submission shall be considered applicable.

1.8 The terms BIS, shall mean the Bureau of Indian Standards, MORT&H 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 Executive/Assistant Engineer of the UIT.

1.10 In case of any conflict or inconsistency with the provisions of the applicable B I S , 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.

1.13 **Alternative Standard and Specifications:-**

The requirements stated in the Manual for the design of the housing Project are the minimum. The Developer will, however, be free to adopt international standards, practices on precast / prefabricated housing, Mivan shuttering, 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 UIT / Independent Engineer / Employer for approval and comments, if any. In case, the UIT /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 UIT, 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 workmen 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.

(iii) The Developer shall communicate the proposal for safety of traffic and workers during construction to the UIT for review and comments, if any.

(iv) 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 UIT / Employer's men, material, machinery etc.

(v) 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 UIT 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 B I S 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 R C C o r any materials/products for which facilities at site laboratory are not available.

1.17 **Definitions and Interpretation**

All the obligations of the Developer arising out of the provisions of this Manual shall be subject to, and shall conform to the provisions of the Developer Agreement.

1.18 This Manual is for Construction of Mega Housing for EWS &LIG in Rajasthan under the Chief Minister Jan Awas Yojana- 2015

2.0 **Payment**:-

As indicated in the RFP, the developer shall be paid (after statutory deductions and satisfactory reports on Third Party Quality Inspections) through an escrow account maintained in the name of UIT. The payment shall be in the following different stages as per percentages as under:

The loan amount transferred to the ESCROW account will be released by the Local Authority in 8 installments to the developer at different stages of construction as follows based on the certificate issued by 3rd party/nodal agency, after the verification of the progress of work under the approved work plan and cash flow :-

(i) After approval of Plans and commencement of foundation work	10%
(ii) Roof level of ground floor	15%
(iii) Roof level of first floor	15%
(iv) Roof level of second floor	15%
(v) Roof level of third floor	15%
(vi) On handing over to ULB	20%
(vii) After six months of handing over	5%
(viii) After twelve months of handing over	5%

3.0 <u>Period of Completion</u>:-

The maximum period of completion of a package shall be as per technical parameters as under from the date of commencement except for force majeure conditions but including the rainy and other seasons.

Technical Parameters for Developers:-

S.No	Category	Minimum Net Worth of the Company-Rs.	Minimum Turn over (Combined in last 5 or less years in housing including infrastructure)-Rs.	Experience of housing / land development / infrastructure projects.- years	Time period for completion of the complete project on 75% land .- years
1	2	3	4	5	6
(a)	Up to 10 acre	5 cr.	30 cr	3	4

Note : (i) Net Worth means paid up capital+ reserves-losses if any.

(ii) The requirement in column 3,4 ,5 shall be calculated on the basis of the experience of the applicant company along with the present /previous experience of the parent/sister concerns working in real estate sector subject to the condition that one of the directors of the applicant company shall also be the director of the parent/sister concern and shall have majority of shareholding in them.

(iii) Joint venture / special purpose vehicle / consortium can also be considered for eligibility.

(iv) The Net Worth and turnover of any joint venture company having experience in the field other than real estate sector shall also be considered for the eligibility criteria.

(v) The Government on the basis of any justified delay can extend the completion period by maximum of two years.

4.0 Construction on 25% Land Parcel provided free to the Developer:-

It could be started by the developer after the RCC/Steel framed structure for the project buildings is complete and may follow the project work lagging by 25% of the completion period of the project. The specifications and workmanship in the developer's part and the mass housing project should be equally good and comparable.

5.0 Taking over Building blocks completed in all respects:-

The developer could offer building blocks completed in all respects including services and disposals before the end of final completion period. The UIT may accept such building blocks if the completion certificate has been issued by the IE, UIT and occupancy certificate can be issued by the UIT. However, the defect liability period of the entire project shall commence when all blocks have been completed and handed over.

6.1 Other decisions by the Employer during execution:-

The developer could approach the UIT, employer for any major issues which could economise the cost of execution or result in early completion, result in energy savings to the occupants, or improve the durability of constructions. Such issues could be considered if the overall cost of the project is not increased and the resulting benefit is credited to the Employer.

Secretary UIT Chittorgarh
Ajmer road Chittorgarh Pin 311001

SECTION-2

OBLIGATIONS OF THE DEVELOPER & UIT

SECTION 2

OBLIGATIONS OF THE DEVELOPER & UIT

1. The UIT on behalf of the Govt. of Rajasthan 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 contract agreement and submission of the performance security.

   b) To support the developer in obtaining service connections for power, and water, obtain environment impact clearance (especially if tree cutting is involved) , obtain social impact mitigation approvals, obtain approval to drill a tube well for requirement of water for the stakeholders and others in the building complex as per Govt. law and rules in force.

   c) To convey approvals to i) layout plans, ii) designs, iii) working drawings etc. sought in a minimum period but not later than 45 days in any case.

   d) To coordinate with the Independent Engineer and the GoR for early decisions (technical) on the project.

   e) To process release of payments by the UIT through the escrow account, as per schedule against developer bills where these are due.

   f) To create a non-interfering / supporting 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 on the information provided by UIT or other Govt. agency but 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, crush, playground for children, parking areas, health centre, required elements of green buildings concept etc.

   iii) The works 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.

   iv) 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.

v) To comply to the instructions of the UIT and the third party quality inspections as per ISO 17020.

vi) To make available the best of the specified materials, machinery and equipment, experienced /trained operating personnel, fittings and fixtures, etc.

vii) 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 programme to be submitted for approval to the UIT. Failure to achieve the mile stones shall attract imposition of liquidated damages as per contract.

Secretary UIT Chittorgarh
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SECTION-3

GENERAL DESIGN FEATURES

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, domestic cattle, cycle rickshaw trolleys, 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 confirm 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 UIT.

(v) The UIT 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 weightage for this technology.

(vi) In case of insitu 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 pressed steel filled with concrete. All door shutters shall be factory made solid core flush doors conforming to IS 2202, BWP grade 35 mm thick. The Kitchen and toilet doors shall have melamine coating to prevent ingress of water.

(viii) The flooring shall be polished Kota stone 18-20 mm th. laid over granular filling and PCC M10 as per design.

(ix) Anti-termite treatment (preconstruction) shall be provided as per BIS.

(x) The terracing shall be in Brickbatcoba in Cement Mortar 1:5 as per standard CPWD specifications. The terraces shall have a slope and RW pipes as per BIS.

(xi) The walls etc in case of insitu construction shall be with best local materials like stone or bricks (>75 kg/sqcm strength) with a min. of 20 mm th plaster in CM 1:6 on stone and 12 mm th in case of brick walls. External plasters shall use water proofing compounds.

(xii) RCC in OPC shall be cured for 28 days and that with PPC shall be cured for 40 days.

(xiii) 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.

3.2 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. 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 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.

(v) 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 it was 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 UIT/for his review and comments, if any.

(i) Sub surface exploration / geo-tech investigation, materials test report

(ii) Design and drawings of foundations, substructure and superstructure of structures.
(iii) Any other information relevant to the design report.

4.1 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 UIT Independent Engineer shall not relieve the developer of this responsibility.

SECTION-4

MATERIALS AND SPECIFICATIONS FOR STRUCTURES

SECTION-4

MATERIALS AND SPECIFICATIONS FOR STRUCTURES

4.2 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 UIT 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 UIT 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/warrantee etc. . The item shall be procured only after due approval by UIT.

(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.

4.3 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,

(ii) 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.

4.4 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.

4.5 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 SO_3 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.

(d) The maximum value of flakiness index for coarse aggregates shall not exceed 35 percent.

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.

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.

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.

4.8 Steel

4.8.1 Reinforcement/Un-tensioned Steel : IS 1786: Brands: Tata, Sail, or others as approved by UIT.

(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.

4.8.2 **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.

4.9 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.

4.10 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.

4.11 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.

4.12 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.

4.13 **Local building materials**:

These have a optimising 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 UIT. The developer shall have to insure the structures constructed with such materials for a period of 20 years.

4.14 General specifications for the works:

4.14.1 Buildings:

	Particulars of Item	Specifications
	Sand for Drainage layer, foundation, backfill and under floors(where required for clayey soil beds):	Grading zone I/II
	Foundation Concrete:	PCC M10-100 mm th
	Foundation Masonry:	RR Stone /Brick (Ist Class-75 kg/sqcm) masonry in CM 1:6
	Bitumen paint below DPC	VG 30 @ 1.7 kg/sqm in 2 layers
	DPC: 100 mm th.	RCC M 20 with nominal Reinforcement (2#12 at bottom and 2#10 at top, stirrups ; 8 mm at 300 c/c) .
	Plinth protection-600 mm wide, 1% outward slope .	PCC M 10, 75 mm th. over stone/brick kharanja 150/230 mm th.
	Superstructure masonry	Brick (Ist Class-75 kg/sqcm), CC blocks masonry in CM 1:6,
		RR Stone masonry 300 mm th. on all 3floors, BW 230 mm th. on all floors
		PCC block masonry in CM 1:6 (min. 200 mm th)
	Partition walls	BW / PCC blocks (75 mm th) in CM 1:6
	Scaffolding, centering and shuttering	Steel plates / marine grade ply 19 mm th, on steel props and jacks, to be approved by the IE
	Reinforcement steel: IS 1786	Tata, Sail, Usha, or equivalent as approved by the IE
	Roofing	RCC, M20 as per design
	Flooring (everywhere including kitchen and toilets, steps) : GF	Non plastic soils: i)Local soil well compacted. ii))Stone on end / brick on end kharanja 150/230 mm th, iii)PCC M10: 100 mm th. iv) Vitrified , antiskid, ceramic tiles. In kitchen and toilets, as per approval, vi) Polished Kota stone or Marble (Adanga) of size 600x600 mm, minimum 20 mm th.in the living rooms and common areas" along with tiles etc. as mentioned.

		For Clayey soils: i) Compacted sand Grading zone 3 or 4 (in full replacement of local soil. Rest as above.
	Terracing	i)VG 30 @ 1.7 kg/sqm in 2 layers ii) Brick Bat Coba as per CPWD specifications.
	PCC M 15 coping	50 mm th. Precast, top slope 1%(inwards)
	Rain water down take pipes.	1-110 mm dia for each 35 sqm of terrace area, brought down to plinth protection level, duly encased in BW in CM 1:6.
	Plasters inside	CM 1:6 , 20 mm over stone masonry and 12 mm th. over BW and 6 mm th. over Block masonry
	Ceiling plaster	Should not be required.
	Skirting/Dado	Glazed tiles of approved make and size.
	Plastering out side	CM 1:6 with water proofing compound.
	Joinery: Frames	Pressed steel door frames (125mmx65 mm for Double Rebate and 100 mm x50 mm for Single Rebate),
	-do- Shutters 35 mm th, anodized Aluminum hardware.	Ferro cement paneled., Alternatively: Factory made solid core flush doors, BWP grade marked IS 2202, or PVC (for internal doors)
		Windows to have fixed wire gauge outside.
	-do- Toilet shutters	PVC doors 35 mm th.
	Paints	Ist quality primer Asian, British, Nerolac or equivalent approved by UIT and 3 coats of Ist Quality enamel paint of any of the above brands. Colours to be approved by RAVIL
	Wall finishing	Birla putty.
	White wash in side	3-4 coats
	Water supply	
	GI/ uPVC Pipes/ fixtures _PVC 10 kg/sqcm and 20 kg/sqcm pressure.	ISI marked or better
	Non-pressure pipes	-do-
	Fittings:	ISI marked or better
	OHT 675 lit/family ; Double walled	ISI marked Polycon , Sintex or better
	Sanitary services	
	uPVC Pipes / specials all dia	ISI marked or better
	Wares: WC	ISI marked or better
	Fixtures: PVC	-do-

	MH	Precast RCC, Ferro cement covers.
	Septic Tank	One for 500 users
	Soakage pits	Two for each for above
	Electrical Installation	
	Conduit: PVC	ISI marked
	Copper Wires/cable	-do-
	Switches	-do-
	MCB/MCCB	Havel's or better as approved by RM RAVIL.
	Earthing Jell	Approved
	Light fixtures	ISI marked.
	MS boxes 18G	18 Gauge , As per design.
	Joinery hardware	As per PWD specifications, Approved by Resident Manager RAVIL.
	Roads: BT	12m , 9 m ROW
	Embankment	Local non plastic soil, In case of clayey subgrades, mixture of soil (70%)and sand (30%).
	Sub-base	GSB-100 mm, Grade II
	Base	1 layers of WMM 150 mm th.
	Primer and 20 mm th. PC	
	Roads : CC	6m, 4.5 m ROW, hard shoulders 1.5 m each side.
	Embankment	Local non plastic soil, In case of clayey subgrades, mixture of soil (70%)and sand (30%).
	Sub-base	GSB-100 mm, Grade II
	DLC	150 mm th. laid with paver
	CC, M10	100 mm th.laid with paver
	Side drains	CC M15.
	Kerbs/foot path	CC M 15
Note: 1. Better materials and fittings shall be approved by the UIT		
2: Samples of hardware shall be –do-		

SECTION-5

LANDSCAPING
AND
TREE PLANTATION

SECTION 5

LANDSCAPING AND TREE PLANTATION

5.1 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 afforestation. The Government shall specify the number of trees which are required to be planted by the Developer as compensatory afforestation. 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.

5.2 Design Considerations in various locations:-

5.2.1 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.

5.2.2 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.

5.2.3 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.

5.3 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.

SECTION-6

RAIN WATER HARVESTING & WASTE WATER RECYCLING

SECTION 6

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 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 UIT.

6. **Waste water recycling**: All waste water shall be re-cycled through STP to specified quality standards and used for plantation, and other misc. uses.

SECTION-7

FIRE DETECTION, ALARM & FIGHTING

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 RAVIL and the IE.

2. Fire Exit — 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: Shall be duly protected from fire hazard with an approved design.

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

Appendices

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&IV-1969,1999)	
40.	Plain and Reinforced Concrete –Code of practice (IV Revision).	456-2000	Cubes IS 516, Admixtures IS 9103, workability: IS 1199,
41.	Code of practice for use of structural steel in general building construction. Revised.	800-1962	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
	GYPSUM 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 Ist to IVth.	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 1127
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).
	IRC 43-1972	Tools, Equipment and Appliances for Concrete Pavement Construction.
2.	IRC:44-1976	Tentative Guidelines for Cement Concrete Mix Design for Pavements (for Non-Air Entrained and Continuously Graded Concrete) (First Revision)
3.	IRC:57-1974	Recommended Practice for Sealing of Joints in Concrete Pavements
4.	IRC:58-2002	Guidelines for the Design of Plain Jointed Rigid Pavements for Highways (Second Revision)
5.	IRC:61-1976	Tentative Guidelines for the Construction of Cement Concrete Pavements in Hot Weather
6.	IRC:68-1976	Tentative Guidelines on Cement-Flyash Concrete for Rigid Pavement Construction
7.	IRC:77-1979	Tentative Guidelines for Repair of Concrete Pavements Using Synthetic Resins
8.	IRC:84-1983	Code of Practice for Curing of Cement Concrete Pavements
9.	IRC:91-1985	Tentative Guidelines for Construction of Cement Concrete Pavements in Cold Weather.
	IRC: 98-1997	Accommodation of Utility Services on Roads in Urban Areas.
10.	IRC:SP:49-1998	Guidelines for the Use of Dry Lean Concrete as Sub-base for Rigid Pavement.
11.	IRC:SP:62-2004	Guidelines for the Design and Construction of Cement Concrete Pavement for Rural Roads
12.	IRC:SP:63-2004	Guidelines for the Use of Interlocking Concrete Block Pavement
13.	IRC:SP-68-2005	Guidelines for Construction of Roller Compacted Concrete Pavements

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

1.	IRC:42-1972	Performa for Record of Test Values of Locally Available Pavement Construction Materials

1 (L) Road Drainage

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

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

1 (N) Road Machinery

1.	IRC:43-1972	Recommended Practice for Tools, Equipment and Appliances for Concrete Pavement Construction

FOR CONSTRUCTIONAL PRACTICES AND SAFETY:
Please follow the specifications as in :

NATIONAL BUILDING CODE OF INDIA 2005

ART 7 CONSTRUCTIONAL PRACTICES AND SAFETY