PART – B

SECTION -A

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PARTICULAR SPECIFICATIONS & SPECIAL CONDITIONS

1. GENERAL

1 The order of preference in case of any discrepancy as indicated in condition No. 8.1 under "Conditions of Contract" give in standard CPWD contract form may be read as the following:

i) Nomenclature of items as per schedule of quantities.
ii) Particular specification and special condition, if any.
iii) CPWD specifications.
iv) Architectural Drawings
v) Indian standard specifications of B.I.S.
vi) Sound Engineering Practice

1.1 Wherever any reference to any Indian Standard Specifications of BIS or other International standards of ASTM / BS / EN occurs in the documents relating to this contract, the same shall be inclusive of all amendments issued there-to or revisions thereof, if any, up to the date of receipt of tenders.

1.2 The contractor shall work according to the programme of work as approved by the Engineer-in-charge, for which purpose, the contractor shall submit a programme of the work within 7 days from the stipulated date of start of the work based on computer software mutually agreed or in other format decided by Engineer-in-charge and as per clause 5 of GCC 2023 shall update the same every fortnight.

The contractor shall submit monthly progress report of the work in a computerized form. The progress report shall contain the following, apart from whatever else may be required as specified:

(i) Project information, giving the broad features of the contract of the work under the contract, and the broad structural or other details.

(ii) Introduction, giving a brief scope of the work under the contract, and the broad structural or other details.

(iii) Construction schedule of the various components of the work through a bar chart for the next three quarters (or as may be specified), showing the milestones, targeted tasks and upto date progress.

(iv) Progress chart of the various components of the work that are planned and achieved, for the month as well as cumulative upto the month, with reasons for deviations, if any, in a tabular format.

(v) Plant and machinery statement, indicating those deployed in the work, and their working status.

(vi) Man-power statement, indicating individually the names of all the staff deployed in the work, along with their designations.

(vii) Financial statement, indicating the broad details of all the running account payments received upto date, such as gross value of work done, advances taken, recoveries effected, amounts withheld, net payments, details of cheque payments received, etc.

(viii) A statement showing the extra and substituted items submitted by the contractor, and the payments received against them, items pending for sanction/decision by the Department, broad details of the Bank Guarantees, indicating clearly their validity periods, broad details of the insurance policies taken by the contractor, if any, the advances received and adjusted.

(ix) Progress photographs, in colour, of the various items/components of the work done upto date, to indicate visually the actual progress of the work.

(x) Quality assurance and quality control tests conducted during the month, with the results thereof.

(xi) Videography at various stages of construction right from the day of start of work to date of completion/occupation, covering all major events, inspections, visits by dignitaries etc.

1.3 The contractor shall take instructions from the Engineer-in-charge for stacking of materials at site. No excavated earth or building materials shall be stacked on areas where the buildings, roads, services or compound walls are to be constructed.

1.4 Unless otherwise provided in the Schedule of quantities, the rates tendered by the contractor shall be all inclusive and shall apply to all heights, lifts, leads and depths of the building and nothing shall be payable to him on this account.

1.5 ~~OFFICE INFRASTRUCTURE:~~

~~i. For Quality Control Measures and Monitoring the Quality of work, Maintenance of Test Registers, Progress reports and related documents, the contractor shall provide, within 30 days from the date of issue of commencement order of work and till completion of work including extended period of completion, One HP desktop (all in one) Computers having Intel core i7 processor, MS-Windows-11, One A-3 HP Brother Coloured Inkjet Printer cum scanner including consumables & One A-4 size HP/ Brother Laser Jet Printer cum Scanner including consumables, one no. 2 KVAUPS etc. with One no. of computer data entry operator with Diploma in Engineering and adequate knowledge in MS-Office& MS-Project (as minimum qualification) in the site office of Engineer-in-Charge at construction Site. The data entry operators will be at the disposal of the Engineer in- charge. ... entry operator in case found unfit by the engineer ... bral grounds. Nothing extra shall be paid on this account and the quoted rates of the contractor are inclusive of the salaries and other perks payable to the data entry operator. Failure of the contractor to deploy the data entry operator at the disposal of the Engineer-in-charge will attract a penalty of Rs 30000/- per each data entry operator which is non-refundable.~~

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~~ii. Contractor, within 30 days of commencement of work and till completion of work including extended period of completion, shall provide semi permanent site office (minimum 50 sqm. carpet area) comprising of one Conference room with 8 seater conference table and chairs, one executive chair, one drawing board, one projector and one office room for CPWD officials along with table, executive chair, almirah, and 2 visitor chairs. A common toilet facility is to be provided. All rooms are to be equipped with AC, ceiling/table fan, vitrified tile flooring, false ceiling. Contractor shall submit layout plan of site office for approval from Engineer- in-Charge within 10 days of commencement of work. Nothing extra shall be paid on this account and the quoted~~

~~rates of the contractor are inclusive of the expenditure on this account. Failure of the contractor to provide the office infrastructure will attract a penalty of Rs 100,000/- per month which is non-refundable.~~

~~iii. The contractor, at his own cost, shall make arrangement for Helmets, Gloves and leather shoes (meant of construction work inspection at site) for all field staff of the department during the entire period of construction for safety reasons. One helmet and one pair of shoes per each of the staff members (maximum eight members) of the departments per year shall be arranged by the contractor.~~

~~1.6 SITE INSPECTIC~~

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~~i. The agency, fron~~ ~~rk and till completion of work including extended period of completion, shall provide One no. four wheeler inspection vehicle not older than 2 years, of model Mahindra 3XO, Tata Curvv, Hyundai Creta, Kia Seltos, Volkswagen Taigun or equivalent with monthly running of 3000 KM with driver, fuel, toll charges and maintenance all complete. The vehicle shall be at the disposal of Engineer in Charge for the entire duration. Nothing extra shall be paid on this account and the quoted rates of the contractor are inclusive of the expenditure on this account. Failure of the contractor to provide the vehicle at the disposal of the Engineer in charge will attract a penalty of Rs 60,000/- per month which is non-refundable.~~

1.7 The structural and architectural drawings shall be properly correlated before executing the work. In case of any difference noticed between architectural and structural drawings, final decision, in writing of the Engineer-in-charge shall be obtained by the contractor before proceeding further.

1.8 Some restrictions may be imposed by the security staff etc. on the working and for movement of labour, materials etc. The contractor shall be bound to follow all such restriction / instructions including issue of identity cards to all persons authorized by him to do work / visit the work site and nothing shall be payable on this account.

1.9 The contractor shall make his own arrangements for obtaining electric connections, if required, and make necessary payments directly to the department concerned.

1.10 The contractor shall conduct his work, so as not to interfere with or hinder the progress or completion of the work being performed by other contractor (s) or by the Engineer-in-Charge and shall as far as possible arrange his work and shall place and dispose off the materials being used or removed, so as not to interfere with the operations of other contractors, or he shall arrange his work with that of the others in an acceptable and coordinated manner and shall perform it in proper sequence to the complete satisfaction of Engineer-in-Charge. The contractor shall be responsible for any damage due to hindrance caused by him.

1.11 Any cement slurry added over base surface for bond or for continuation of concreting, for protecting reinforcement bars, its cost shall be deemed to have been included in the respective items, unless specified otherwise and nothing extra shall be payable nor extra cement shall be considered in the cement consumption on this account.

1.12 Stacking of materials and excavated earth including its disposal shall be done as per the directions of the Engineer-in-Charge. Double handling of materials or excavated earth if required at any stage shall have to be done by the contractor at his own cost.

1.13 No claim for idle establishment & labour, machinery & equipments, tools & plants and the like, for any reason whatsoever, shall be admissible during the execution of work as well as after its completion.

1.12 Only Star headed Stainless Steel screws shall be used unless otherwise specified.

1.14 Work shall be carried out in professional manner with finished product serving the intended purpose with specified strength, durability and aesthetics.

1.15 Work activities shall be executed in well thought out sequences such that consequent activities not adversely affecting previously done work. Nothing extra shall be payable to protect the works already done.

1.16 The contractor shall prepare all the needed shop drawings well in advance and get them approved before placing the order and execution of the item.

1.17 The contractor shall, at his risk and cost, make all arrangements and shall provide all facilities as the Engineer-in-Charge may require for collecting, and preparing the required number of samples for such tests at such time and to such place or places as may be directed by the Engineer - in -Charge and bear all charges and cost of testing unless specifically provided for otherwise elsewhere in the contract or specifications.

1.18 The contractor shall not store /dump construction material or debris on metalled road.

1.19 The contractor shall get prior approval from Engineer-in-charge for the area where the construction material or debris can be stored beyond the metalled road. This area shall not cause any obstruction to the free flow of traffic / inconvenience to the pedestrians. It should be ensured by the contractor that no accidents occur on account of such permissible storage.

1.20 The contractor shall take appropriate protection measures like raising wind breakers of appropriate height on all sides of the plot / area using CGI sheets or plastic and / or other similar material to ensure that no construction material dust fly outside the plot area. Nothing extra shall be paid in this regard.

1.21 The contractor shall ensure that all the trucks or vehicles of any kind which are used for construction purposes / or are carrying construction material like cement, sand and other allied material are fully covered. The contractor shall take every necessary precaution that the vehicles are properly cleaned and dust free to ensure that enroute their destination, the dust, sand or any other particles are not released in air / contaminate air.

1.22 The contractor shall provide mask to every worker working on the construction site and involved in loading, unloading and carriage of construction material and construction debris to prevent inhalation of dust particles.

1.23 The contractor shall provide all medical help, investigation and treatment to the workers involved in the construction of building and carry of construction material and debris relatable to dust emission.

1.24 The contractor shall ensure that C&D waste is transported to the C & D waste site only and due record shall be maintained by the contractor.

1.25 The contractor shall compulsory use of wet jet in grinding and stone cutting.

1.26 The contractor shall comply all the preventive and protective environmental steps as stated in the MoEF guidelines, 2010 or amended thereafter.

1.27 The contractor shall carry out on-Road-Inspection for black smoke generating machinery. The contractor shall use cleaner fuel.

1.28 The contractor shall ensure that all DG sets, comply latest emission norms notified by MoEF.

1.29 The contractor shall use vehicles having pollution under control certificate. The emissions can be reduced by a large extent by reducing the speed of a vehicle to 20 kmph. Speed bumps shall be used to ensure speed reduction. In cases where speed reduction cannot effectively reduce fugitive dust, the contractor shall divert traffic to nearby paved areas.

1.30 The contractor shall ensure that the construction material is covered by tarpaulin. The contractor shall take all other precaution to ensure that no dust particles are permitted to pollute air quality as a result of such storage.

1.31 The paving of the path for plying of vehicles carrying construction material is more permanent solution to dust control and suitable for longer duration projects.

1.32 The agency is permitted for erect the site office, store yard and ground water extraction facility temporarily near the place of construction free of cost only after getting specific approval of Engineer in-charge. Contractor shall remove such structures on completion of work.

1.33 Entry to the campus may be restricted from particular entrance gate and agency has to follow security rules of the campus & nothing extra shall be payable on this account.

1.34 The contractor shall make the barricading with CGI sheet of minimum 3.0 metre height of site before commencement of work for which nothing extra shall be paid on this account.

1.35 The contractor shall make necessary arrangement to follow the guidelines / instruction issued by the concerned government authority for controlling and containing the spread of COVID-19 and nothing shall be paid extra in this regard.

1.36 The contractor will be responsible for approval from local bodies. If any structural design is further required the same shall be provided by the agency duly vetted from IIT Delhi / DTU Delhi / MANIT Bhopal/ RGPV Bhopal or any other institute duly approved by Engineer in charge. Nothing extra shall be paid on this account.

1.37 If it is required during construction to cut a tree or more trees than contractor is liable to take necessary permissions from Govt. Deptt. and expenditure incurred for taking permissions etc. may be reimburse to contractor after submission of vouchers/ bills.

2.0 FLOORING, SKIRTING, VENEERING, DADO, TREADS & RISERS OF STEPS, JAMBS, SILLS & SOFFITS

2.1 Nothing extra shall be payable for using combination of marble, granite and Kota in the required pattern at various locations unless otherwise specified.

2.2 Flooring in toilets, verandah, kitchen, courtyard and at other places if required shall be laid to the required slope/gradient as per the directions of the Engineer-in-Charge and nothing extra shall be paid on account of the same.

2.3 The pattern, spacing and locations of joints shall be as per drawings and direction of the Engineer-in-Charge and nothing extra shall be paid on account of the same.

3.0 SPECIALISED ITEMS

3.1 LIST OF SPECIALISED ITEMS:

(As specified in Annexure – 6- Page 154-156 (SOP) of CPWD Works Modified as Manual 2026.

3.2 **Procedure for Execution of the Specialized Items:**

Such items should be got executed only through associated agencies specialized in these fields. The contractor shall indicate the name(s) of his associated specialized agencies those fulfilling the conditions described in Annexure 6 of CPWD Works Manual-2026 as early as possible and within one month of award of work to Engineer-in-Charge for approval of competent authority.

3.3 Specialized Agencies

3.3.1 Specialized Agencies for items in case of Civil & Electrical works shall be approved by the competent authority. The contractors shall quote the rates after careful study of contract conditions, specifications, drawings & schedule of quantities.

3.3.2 It shall be the responsibility of main contractor to sort out any dispute / litigation with the Specialized Agencies without any time & cost overrun to the Department. The main contractor shall be solely responsible for settling any dispute / litigation arising out of his agreement with the Specialized Agencies. The contractor shall ensure that the work shall not suffer on account of litigation/ dispute between him and the specialized agencies / sub-contractor(s). No claim of hindrance in the work shall be entertained from the Contractor on this account. No extension of time shall be granted and no claim what so ever, of any kind, shall be entertained from the Contractor on account of delay attributable to the selection/rejection of the Specialized Agencies.

3.3.3 For specialized items, the main contractor cannot work as a specialized agency unless his name is already included in the list of approved specialized agencies for these items. The contractor shall get these items executed through the specialized agencies as approved by competent authority.

3.4 RATES

3.4.1 The rates quoted by the Contractor are deemed to be inclusive of site clearance, setting out work, profile, setting lay out on ground, establishment of reference bench mark(s), installing various signage, taking spot levels, survey with total station, construction of all safety and protection devices, compulsory use of helmet and safety shoes, and other appropriate safety gadgets by workers, imparting continuous training for all the workers, barriers, preparatory works, construction of clean, hygienic and well ventilated workers housings in sufficient numbers as per drawing supplied by Engineer in charge, working during monsoon or odd season, working beyond normal hours, working at all depths, height, lead, lift, levels and location etc. and any other unforeseen but essential incidental works required to complete this work. Nothing extra shall be payable on this account and no extension of time for completion of work shall be granted on these accounts.

3.4.2 The rates quoted by the tenderer, shall be firm and inclusive of all taxes and levies.

3.4.3 No foreign exchange shall be made available by the Department for importing (purchase) of equipment, plants, machinery, materials of any kind or any other items required to be carried out during execution of the work. No delay and no claim of any kind shall be entertained from the Contractor, on account of variation in the foreign exchange rate.

3.4.4 All ancillary and incidental facilities required for execution of work like labour camp, stores, fabrication yard, offices for Contractor, watch and ward, temporary ramp required to be made for working at the basement level, temporary structure for plants and machineries, water storage tanks, installation and consumption charges of temporary electricity, telephone, water etc. required for execution of the work, liaison and pursuing for obtaining various No Objection Certificates, completion certificates from local bodies etc., protection works, testing facilities / laboratory at site of work, facilities for all field tests and for taking samples etc. during execution or any other activity which is necessary (for execution of work and as directed by Engineer-in-Charge), shall be deemed to be included in rates quoted by the Contractor, for various items in the schedule of quantities. Nothing extra shall be payable on these accounts. Before start of the work, the Contractor shall submit to the Engineer-in-Charge, a site / construction yard layout, specifying areas for construction, site office, positioning of machinery, material yard, cement & other storage, fabrication yard, site laboratory, water tank etc.

3.4.5 For completing the work in time, the Contractor might be required to work in two or more shifts (including night shifts). No claim whatsoever shall be entertained on this account, not with-standing the fact that the Contractor may have to pay extra amounts for any reason, to the labourers and other staff engaged directly or indirectly on the work according to the provisions of the labour and other statutory bodies regulations and the agreement entered upon by the Contractor with them.

3.4.6 All material shall only be brought at site as per program finalized with the Engineer-in-Charge. Any pre-delivery of the material not required for immediate consumption shall not be accepted and thus not paid for.

3.5 CLEANLINESS OF SITE

The Contractor shall not stack building material / malba / muck/ rubbish on the land or road of the local development authority or on the land owned by the others, as the case may be. So, the muck, rubbish etc. shall be removed periodically as directed by the Engineer-in-Charge, from the site of work to the approved dumping grounds as per the local byelaws and regulations of the concerned authorities and all necessary permissions in this regard from the local bodies shall be obtained by the Contractor. Nothing extra shall be payable on this account. In case, the Contractor is found stacking the building material / malba as stated above, the Contractor shall be liable to pay the stacking charges / penalty as may be levied by the local body or any other authority and also to face penal action as per the rules, regulations and bye-laws of such body or authority. The Engineer –in-Charge shall be at liberty to recover, such sums due but not paid to the concerned authorities on the above counts, from any sums due to the Contractor including amount of the Security Deposit and performance guarantee in respect of this contract agreement.

3.6 INSPECTION OF WORK

In addition to the provisions of relevant clauses of the contract, the work shall also be open to inspection by the senior officers of CPWD in addition of the Engineer-in-Charge and his authorized representative. The contractor shall at times during the usual working hours and at all times at which reasonable notices of the intention of the Engineer-in-Charge or other officers as stated above to visit the works shall have been given to the Contractor, either himself be present to receive the orders and instructions

or have a responsible Site Engineer duly accredited in writing, to be present for that purpose Senior Officers of CPWD Authorities shall be inspecting the on-going work at site at any time with or without prior intimation.

3.7 GUARANTEE FOR WATER PROOFING TREATMENT:

The contractor shall give Ten years performance guarantee in the prescribed proforma as per NIT for the water proofing treatment. In addition, 10% (Ten percent) of the cost of water proofing items shall be retained as security, to watch the performance of the work executed. However, half of this amount (withheld) shall be released after five years, after the completion of the work, if no defect comes to notice. If any defect is noticed during the guarantee period, it shall be rectified by the contractor within Seven days after serving the notice by Department and, if not attended to, the same shall be got done through other agency at the risk and cost of the contractor. In any case the guaranteeing firms during the guarantee period shall inspect and examine the treatment once every year and make good any defect observed and Certificate to that effect shall be submitted to Department every year. However, the 10 % security deposit referred above can be replaced with bank guarantee of equivalent amount for relevant period.

4.0 Stainless Steel Railing/Handrails:

4.1 GENERAL

The contractor shall apply all materials, labour, tools, ladders, scaffolding and other equipment necessary for the completion and protection of all stainless-steel work.

4.2 MATERIAL

All stainless-steel pipes and plates shall conform to AISI 304 in 18/8 composition. 18 will be chromium and 8 will be Nickel and carbon content will be 0.03 maximum and the relevant clauses associated with this grade of steel to be followed.

4.3 SURFACE FINISH

Surface finish of all the stainless-steel materials will be in 240 grit satin finish / matt finish.

4.4 ACCESSORIES

Fixing will be done by stainless steel expansion bolts of approved size and make as per Engineer-in-charge and welding to be done by using organ welding rods and the surface being duly finished and cleaned by K2 passivation, which is nitric acid plus floric acid solution treatment by which the chances of corrosion will be eliminated and any burn out makes on the metal will also be eliminated.

4.5 COATING MASS

All stainless-steel material will have to be coated by a solution of Inox to avoid finger in prints and avoidance of settlement of environment / atmospheric dust.

4.6 MEASUREMENT

All the stainless steel finished parts shall be weighed correct to a gram and paid on weight basis.

4.7 RATE

The rate shall include the cost of all the materials, machinery and labour involved in all the operations described above including cartage, lifts and all taxes as applicable.

Any incidental additional requirements for execution of this item to the satisfaction of Engineer-in-Charge shall also be treated as included in the item and shown in attached drawing and nothing extra will be paid for such extra work.
Installation drawings for approval of the Engineer-in-charge-in-Charge and no work shall be performed until the approval of these drawings is obtained.

4.8 CO-OPERATION WITH OTHER CONTRACTORS/SPECIALIZED AGENCIES / SUB- CONTRACTORS

4.8.1 The Contractor shall take all necessary precautions to prevent any nuisance or inconvenience to the owners, tenants or occupants of the adjacent properties and to the public in general. The Contractor shall take all care, as not to damage any other adjacent property or other services running adjacent to the plot. If any damage is done, the same shall be made good by the Contractor at his own cost and to the entire satisfaction of the Engineer-in-Charge. The Contractor shall use such methodology and equipment for execution of the work, so as to cause minimum environmental pollution of any kind during construction. Further, the Contractor shall take all precautions to abide by the environmental related restrictions imposed by Madhya Pradesh Pollution control board, Govt. of Madhya Pradesh.

Utmost care shall be taken to keep the noise level to the barest minimum so that no disturbance as far as possible is caused to the occupants / users of adjoining buildings. No claim what so ever on account of site constraints mentioned above or any other site constraints, inadequate availability of skilled, semi-skilled or unskilled workers in the near vicinity, non-availability of construction machinery spare parts and any other constraints not specifically stated here, shall be entertained from the Contractor. Therefore, the Tenderers are advised to visit site and get first-hand information of site constraints. Accordingly, they should quote their tenders. Nothing extra shall be payable on this account.

4.8.2 The Contractor shall cooperate with and provide the facilities to the sub-Contractors and other agencies working at site for smooth execution of the work. The contractor shall indemnify the **client / user department against any claim(s) arising out of such disputes**

4.8.3. The Contractor shall:

(i) Allow use of scaffolding, toilets, sheds etc.
(ii) Properly co-ordinate their work with the work of other Contractors.
(iii) Provide control lines and benchmarks to his Sub-Contractors and the other Contractors.
(iv) Provide electricity and water at mutually agreed rates.
(v) Provide hoist and crane facilities for lifting material at mutually agreed rates.
(vi) Co-ordinate with other Contractors for leaving inserts, making chases, alignment of services etc. at site.
(vii) Adjust work schedule and site activities in consultation with the Engineer-in-Charge and other Contractors to suit the overall schedule completion.
(viii) Resolve the disputes with other Contractors/ sub-contractors amicably and the Engineer-in-Charge shall not be made intermediary or arbitrator.

4.8.4 The work should be planned in a systematic manner so as to ensure proper co-ordination of various disciplines viz. sanitary & water supply, drainage, rain water harvesting, electrical, fire-fighting, information technology, communication & electronics and any other services.

4.8.5 Other agencies will also simultaneously execute and install the works of sub-station / generating sets, air-conditioning, lifts, etc. for the work and the contractor shall afford necessary facilities for the same. The contractor shall leave such recesses, holes, openings trench etc. as may be required for such related works (for which inserts, sleeves, brackets, conduits, base plates, clamps etc. shall be supplied free of cost by the department unless otherwise specifically mentioned) and the contractor shall fix the same at time of casting of concrete, stone work and brick work, if required, and nothing extra shall be payable on this account.

4.8.6 The contractor shall conduct his work, so as not to interfere with or hinder the progress or completion of the work being performed by other contractor(s) or by the Engineer-In-Charge and shall as far as possible arrange his work and shall place and dispose off the materials being used or removed so as not to interfere with the operations of other contractor or he shall arrange his work with that of the others in an acceptable and in a proper co -ordination manner and shall perform it in proper sequence to the complete satisfaction of others.

5.0 Specification of Aluminum Work

Aluminum work under SH: "aluminum work" of tender document shall be got executed from approved agency. The agency for the aluminum work shall be got approved from the Engineer - in - Charge, well before actual commencement of the item of work. Necessary performance certificates in respect of agencies proposed to be engaged shall be submitted within 30 days from the date of issue of acceptance letter to substantiate technical capability and experience of the agency for prior approval of the Superintending Engineer-Gwalior

Specifications for Aluminum Door, Window, Ventilator:

5.1 : Extent and Intent:

The work shall be carried out through an approved specialist contractor who shall furnish all materials, labour, accessories equipment tool & plant, incidental. Required for providing and installing anodized aluminum door, windows, claddings, louvers and other items as called for on the drawings. The drawings and specifications cover the major requirement only. The supplying of additional fastenings, accessory features and mentioned specifically herein but which are necessary to make a complete installation shall be a part of the contract.

5.2 : General:

Aluminum doors, windows etc. shall be of sizes, section detail as shown on the drawings. The details shown on the drawings indicate generally the sizes of the component's parts and general standards. These may be varied slightly to suit the standards adopted by the manufacture. Before proceeding with any manufacturing, the contractor shall prepare and submit complete manufacturing and installation drawings for approval of Engineer-in-Charge and no work shall be performed until the approval of these drawings is obtained.

5.3 : Shop Drawings:

The contractor shall submit the **shop drawings** of doors, windows louvers cladding and other aluminum work, based on architectural drawings to Engineer-in-charge for his approval. The drawings shall show full size sections of door, window etc. thickness of metal (i.e. wall thickness) details of construction, sub frame / rough ground profile anchoring details, hardware as well as connection of windows doors, and other metal work to adjacent work. Samples of all joints and methods of fastening and joining shall be submitted to the Engineer-in-Charge for approval well in advance of commencing the work.

5.4 : Samples:

Samples of doors, windows, louvers etc. shall be fabricated assembled and submitted to the Engineer-in-Charge for his approval. They shall be of sizes, types etc. as decided by Engineer-in-Charge. All samples shall be provided the cost of the contractor.

5.5 : Sections:

Aluminum doors and windows shall be fabricated from extruded section of profiles as detailed on drawings. The sections shall be extruded by the manufacturers approved by the Engineer-in-Charge. The aluminum extruded section shall conform to IS designation 63400-WP(HV9WP old designation) with chemical composition and technical properties as per IS : 733 and 1285. The permissible dimensional tolerance of the extruded sections shall be such as not to impair the proper and smooth function / operation and appearance of doors and windows.

5.6 : Fabrications:

Doors, window etc. shall be fabricated to sizes as shown at factory and shall be of section, sizes combinations and details as shown in the Architectural drawings, all doors, windows etc. shall have mechanical joints. The joints shall be designed to withstand a wind load of 150 kgs. per sqm. the design shall also ensure that the maximum deflection of any member shall be accurately machined and fitted to form hairline joints prior to assembly. The joint and accessories such as cleats brackets, etc. shall be of such materials as not to cause any bi-metallic action, the design of the joints and accessories shall be such that the accessories are fully concealed. The fabrication of doors, windows etc. shall be done in suitable sections to facilitate easy transportation, handing and installation. Adequate provision shall be made in the door and windows members for anchoring to support and fixing of hardware and other fixture as approved by the Engineer-in-Charge.

5.7 : Anodizing:

All aluminum sections shall be anodized as per IS : 7088 and to required colour as specified in the item as per IS : 1868 grading, after cutting the members to requisite sizes. Anodizing shall be to the specified grade with minimum average thickness of 15 microns when measured as per IS : 6012. The anodic coating shall be properly sealed by steams or by boiling in deionized water or cold sealing process as per IS : 1868 / IS : 6057. Polythene tape protection shall be applied on the anodized sections before they are brought to site. All care shall be taken to ensure surface protection during transportation, storage at site and installation. The tape protection shall be removed on installation. The sample will be tested in the approved laboratory and cost of samples, cost of testing shall be borne by the contractor.

5.8 Powder Coating:

The powder used for powder coating shall be polyester powder made by **Berger or Jenson & Nicholson or equivalent.** The thickness of powder coating shall not be less than **60 micron** at any point measured with micrometer.

5.9 : Protection of Finish:

All aluminum members shall be wrapped with approved self-adhesive non-staining PVC tapes.

5.10 : Handling and Stacking:

5.10.1 Fabricated materials shall be carted in an approved manner to protect the material against any damage during transportation. The loading and unloading shall be carried out with utmost care. On receipt of materials at site, they shall be carefully examined to detect any damaged pieces. Arrangements shall be made for expeditious replacement of damaged pieces / parts. Materials found to be acceptable on inspections shall be repacked in crates and stored safely.

5.10.2 In the case of composite windows, and doors the different units are to be assembled first. The assembled composite units should be checked for line, level and plumb before final fixing is done. Unit may be serial numbered and identified as how to be assembled in their final location of situation so warrants.

5.10.3 Where aluminum comes into contact with masonry brick work / concrete / plaster or dissimilar metals, it shall be coated with approved insulation lacquer paint or plastic tape to ensure that electro chemical corrosion is avoided. Insulation materials shall be trimmed off to clear flush line on completion.

5.10.4 Silicon Sealant:

The peripheral gaps between plastered faces / RCC and aluminum sections shall be sealed both from inside and outside to make the windows watertight. Gaps up to 10mm between the peripheral aluminum member and masonry / RCC / Stone shall be sealed by inserting. Backer Rod manufactured by HT TROPLAST or Supreme Industries and by application of weather silicon / sealant of DOW corning / GE silicon make.

5.10.5 The contractor shall be responsible for assembling composite, bedding set straight plumb, level and for their satisfactory operation after fixing is complete.

5.11 : Installation:

5.11.1 Just prior to installation the doors, windows etc. shall be uncrated and stacked on edge on level bearers and supported evenly. The frame shall be fixed into position true to line and level using adequate number of expansion machine bolts, anchor fasteners of approved size and manufacture and in an approved manner. The holes in concrete / masonry members for housing anchor bolts shall be drilled with an electrical drill.

5.11.2 The doors windows assembled as shown on drawings shall be placed in correct final position in this opening and marks made on concrete members at jambs, sills and heads against the holes provided in frames for anchoring. The frame shall then be removed then the opening and laid aside. Neat holes with parattle sides of appropriate size shall then be drilled in the concrete members with an electric drill at the marking to house the expansion bolts. The expansion bolts shall then be inserted in the holes, struck with a light hammer till the nut is forced into the anchor shall. The frame shall then be placed in final position. In the opening and anchored to the support through cadmium plated machine screws of required sized threaded to expansion bolts. The frame shall be set in the opening by using wooden wedges at supports and be plumbed in position. the wedges shall invariably be placed at meeting points of glazing bars and frames.

5.11.3 : Neoprene Gaskets:

The E.P.D.M. gasket of suitable profile as manufactured by HANU INDUSTRIES; ANNAND LESCUYER make shall be provided at all required positions to make the

glazing airtight. The contractor shall provide and install Neoprene Gaskets of approved size and profile at all locations as shown and as called for to render the doors windows etc. absolutely air tight and weather tight. The contractor shall submit samples of the gaskets for approval and procure after approval only.

5.11.4 : Fittings :

The contractor shall cut the floor properly with stone cutting machine to exact size and shape. The spindle of suitable length to accommodate the floor finish shall be used. The contractor shall give the guarantee duly supported by the company for proper functioning of floor springs at least for **10 years**.

Hinges, stays handles, tower bolts, locks and other fittings shall be of quality and manufacturer as approved by the Engineer – in – Charge.

5.12 : Details of Test:

5.12.1 The various tests on aluminum sections shall be conducted in accordance with the relevant IS codes.

5.12.2 The minimum number of each unit of doors / windows shall be selected at random by Engineer-in-Charge as such that all the aluminum section shall be got tested.

S. No.	Details	No. of Tests
1.	Doors, Windows & Ventilators	**5% of Nos**. manufactured.

5.12.3 The sample of major member of each unit of doors / windows shall be selected at random by Engineer-in-Charge as such that all the aluminum section shall be got tested.

5.12.4 The cost of sample, carriage of the samples shall be borne by the contractor. **Testing charges shall be borne by the contractor.**

5.13 : **Acceptance Criterion:**

The aluminum sections shall conform to the provisions of the relevant items. For payment purpose only actual weight of sections shall be taken into account. If however, the sectional weight of any aluminum section is higher than the permissible variation then the weight payable shall be restricted to the weight of the section including permissible variation.

5.14 : **Measurement:**

Payment by weight shall be made for aluminum sections including beading only and all fixing angles cleats fittings and fixtures such as handles and hinges etc., shall not be included in the weight to be paid.

5.15 : **Rates:**

The rates of the items shall include the cost of all materials, labour and inputs required in all the above operations.

6.0 CONSUMPTION OF PIG LEAD AND IT'S VARIATION FOR SCI SANITARY PIPES AND FITTINGS AS PER IS:3989

In order to ensure that adequate lead is poured properly into the joints and to control waste in use of lead for caulking of joints of SCI pipes and fittings, at the beginning of the work three or four sample joints shall be made and the quantum of lead per joint approved by the Engineer in charge. The actual consumption of lead should be within variation of 5% of the approved sample job. This variation includes allowances of

wastage also. If the actual consumption of pig lead is less than the required consumption worked out on the above basis, the recovery on account of less use of lead shall be made from the contractor at market rate to be determined by the Engineer-in-charge, whose decision in the matter shall be final & binding.

7.0 FIXING OF SCI/CI PIPE

The SCI/CI pipes and G.I. pipes, wherever necessary, shall be fixed to RCC columns, beams etc. with rawl plugs, or appropriate fasteners as approved by Engineer-in-Charge, and nothing extra shall be payable on this account. GI pipes shall be wherever made to pass through wall / concrete then it shall be done using protective sleeves alround the pipes to protect it from damage, nothing extra shall be payable on this account.

8.0 CONDITION FOR CEMENT :-

8.1 The Contractor shall procure 43 grade Ordinary Portland cement (conforming to IS : 8112) or Portland slag cement (conforming to IS : 455) or Portland Pozzolana Cement (PPC) (Fly ash based) – conforming to IS : 1489 (Part-I) as required in the work, from reputed manufactures of cement such as ACC, Ultratech, Vikram, Shree Cement, Birla Gold, Ambuja & J.K. Cement or from any other reputed cement Manufacturer having a production capacity not less than one million tonnes per annum as approved by ADG for that sub region.

The tenderers may also submit a list of names of cement manufacturers which they propose to use in the work. The tender accepting authority reserves right to accept or reject name(s) of cement manufacture(s) which the contractor proposes to use in the work. No change in the tendered rates will be accepted if the tender accepting authority does not accept the list of cement manufacturer, given by the tenderer, fully or partially.

Supply of cement shall be taken in 50 Kg bags bearing manufacturer's name and ISI marking. Samples of cement arranged by the contractor shall be taken by the Engineer-in-charge and got issue in accordance with provisions of relevant BIS codes. In case test results indicate that the cement arranged by the Contractor does not conform to the relevant BIS codes, the same shall stand rejected and shall be removed from the site by the Contractor at his own cost within a week's time of written order from the Engineer-in-charge to do so.

If Portland Pozzolana cement or Portland slag cement is used, suitable modification in de-shuttering time etc. shall be done, if need be, as per specifications and standards and as directed by Engineer – in – charge and nothing extra shall be payable on this account. No extra payment / deduction shall be made from the payment to the contractor for using any of the above type of cement.

8.2 The cement shall be brought at site in bulk supply of approximately 50 tonnes or as decided by the Engineer - in - charge.

8.3 For each grade / type, cement bags shall be stored in two separate godowns, one for tested cement and the other for fresh cement (under testing) constructed by the

contractor at site of work as per sketch shown in CPWD Specification 2019 with weather proof roofs and walls, for which no extra payment shall be made. The size of the cement godown is indicated in the sketch for guidance only. The actual size of godown shall be as per site requirements and as per the direction of the Engineer in charge and nothing extra shall be paid for the same. The decision of the Engineer-in-charge regarding the capacity required/needed will be final. However, the capacity of each godown shall not be less than 100 tonnes. Each godown shall be provided with a single door with two locks. The keys of one lock shall remain with CPWD Engineer-in-charge or his authorized representative and that of other lock with the contractor at the site of work so that the cement is issued from godown according to the daily requirement with the knowledge of both the parties. The account of daily receipt and issue of cement shall be maintained in a register in the prescribed Proforma and signed daily by the contractor or his authorized agent in token of its correctness.

8.4 The cement shall be got tested by Engineer –in –Charge and shall be used on the work only after satisfactory test results have been received. The contractor shall supply free of charge the cement required for testing including its transportation cost to testing laboratories. **The cost of tests shall be borne by the contractor / ~~Department in the manner indicated below :-~~**

~~(a) By the contractor, if the results show that the cement does not conform to relevant BIS codes.~~

~~(b) By the Department, if the results show that the cement conforms to relevant BIS codes.~~

8.4.1 All other charges of sampling, packing and transportation of sample shall also be borne by the Contractor.

8.5 The actual issue and consumption of cement on work shall be regulated and proper accounts maintained separately for each type of cement, as provided in clause 10 of the contract. The theoretical consumption of cement shall be worked out as per procedure prescribed in Clause 38 of the contract and shall be governed by conditions laid therein. However, for consumption lesser beyond permissible theoretical variation recovery shall be made in accordance with conditions of contract at Schedule A to F (**CPWD-7),** without prejudice to action for acceptance of work/item at reduced rate or rejection as the case may be. In case of excess consumption, no adjustment shall be made.

8.6 Cement brought to site and cement remaining unused after completion of work shall not be removed from site without written permission of the Engineer-in-charge.

9.0 CONDITIONS FOR REINFORCEMENT STEEL:-

1. The CPWD/Contractor shall procure IS marked TMT bars of various grades from The steel manufacturer such as SAIL, TATA, STEEL LTD., RINL, JINDAL STEEL & POWER LTD AND JSW Steel Ltd. or their authorized dealers having valid BIS license for IS:1786:2008 (Amendment -1 November 2012)

2. The steel manufacturers or their authorized dealers (as per following selection criteria) having valid BIS license for IS:1786:2008 (Amendment -1 November 2012)

The procured steel should have following qualities: -

i. Excellent ductility, bend ability and elongation of finished product due to possible refining technology.

ii. Consumption of steel should be accurate as per design.

iii. Steel should have no brittleness problem in finished product.

~~iv. Steel should carry the **quality of corrosion and earthquake** resistance.~~

v. Quality steel with achievement of proper level of Sulphur and phosphorus as per IS: 1786:2008.

3 The modified guidelines for procurement of steel issued vide No. CSQ / SE (TAS) /Steel/2024/262-H dated 14.08.2024 are given below: -

3.1 For reinforced cement concrete or pre-stressed concrete works, the reinforcement bars shall consist of the following grades conforming to IS 1786 : 2008 (Indian Standard Specification for high strength deformed steel bars and wires for concrete reinforcement) : Fe 415, Fe 415D, Fe415S, Fe500S and Fe550D.

3.2 The contractor shall obtain manufacturer's certificate stating the process of manufacture, chemical composition and test sheet giving result of each mechanical test applicable to the material purchased and submit it to the Engineer-in-charge. Each test certificate shall indicate the number of the cast to which it applies corresponding to the number or identification mark to be found on the material.

3.3 The Engineer-in-charge shall get each consignment tested for both chemical composition and physical properties (including bend and re-bend test) as specified in IS : 1786 from NABL accredited laboratory or any Government laboratory.

3.4 Reinforcement bar is one of the most important building materials. Its quality directly affects the life span, resistance to earthquake and durability of the structure. In order to ensure consistent quality of rebars.

The reinforcement shall be of reputed brands like SAIL, RINL, Tata, JSW, JSPL or any other equivalent make as approved by the NIT approving authority. **The contractor shall procure BIS marked ~~Low Alloy~~ TMT bars of minimum Fe-500D or more grade from the approved steel manufactures who are main producers (as per the list of approved makes furnishing part of this document) or their authorized dealers having valid BIS license for IS:1786-2008 and further conforming to the OM No. CSQ/SE(TAS)/Steel/2024/262-H dated 14.08.2024, so agency have to quote their rates accordingly.**

Steel reinforcement bar to be used in the work shall be BAR-SET-II as per circular dated 14.08.2024 and shall comply with the following tests –

Tests as per IS 1786 (latest version) and specified therein.

(A) Chemical Properties -
Ladle analysis of steel for above grades for maximum percentage of constituents.
i. Carbon (C), (ii) Sulphur (S) and (iii) Phosphorous (P) and (iv) Nitrogen and Carbon Equivalent

(B) Physical Properties-

(i) 0.2 percent proof stress / yield stress, minimum, N/mm2.

(ii) Ratio of Tensile Strength (Ts) to Actual Yield Strength (or 0.2% of yield stress (Ys)) of the test piece N/mm2.

(iii) Elongation, percent, Minimum, on gauge length 5.65√A, where A is the cross sectional area of the test piece.

(vi) Total elongation at maximum force, percentage, minimum on gauge length 5.65√A, where A is the cross-sectional area of the test piece.

(v) Bend test and re-bend test.

(vi) The mean area of ribs (in mm2) per unit length (in mm) above the core of the bar, projected on a plane normal to the axis of the bar.

(vii) Pull-out testing in accordance with IS 2770 (Part 1)

4 Competent authority shall approve the steel manufacturers.

5 The contractor shall have to obtain and furnish test certificates (Physical and Chemical) to the Engineer-in-charge in respect of all supplies of steel brought by him to the site of work.

6 Samples shall also be taken and got tested by the Engineer-in-Charge as per the provisions in this regard in relevant BIS codes. In case the test results indicate that the steel arranged by the contractor does not conform to the specifications the same shall stand rejected, and it shall be removed from the site of work by the contractor at his cost within a week time.

7 The steel reinforcement bars shall be brought to the site in bulk supply of ten tonnes or more as decided by the Engineer-in-charge.

8 The steel reinforcement shall be stored by the contractor at site of work in such a way as to prevent distortion and corrosion and nothing extra shall be paid on this account. Bars of different sizes and lengths shall be stored separately to facilitate easy counting and checking.

9 For checking nominal mass, tensile strength, bend test, re-bend test etc. specimen of sufficient length shall be cut from each size of the bar at random at frequency not less than that specified below:

Size of bar	For consignment below 100 tonnes	For consignment above 100 tonnes
Under 10mm dia bars	**One sample for each 25 tonnes or par thereof.**	**One sample for each 40 tonnes or part thereof.**
10mm to 16mm dia bars	**One sample for each 35 tonnes or part thereof.**	**One sample for each 45 tonnes or part thereof.**
Over 16mm dia bars	**One sample for each 45 tonnes or part thereof.**	**One sample for each 50 tonnes or part thereof.**

10 The contractor shall supply free of charge the steel required for testing including transportation to testing laboratories. The cost of tests shall be borne by the contractor.

11 The actual issue and consumption of steel on work shall be regulated and proper accounts maintained as provided in clause 10 of the contract. The theoretical consumption of steel shall be worked out as procedure prescribed in clause 42 of the contract and shall be governed by conditions laid therein. In case the consumption is less than theoretical consumption including permissible variations leading to under designing of the structural. The work shall be summarily rejected, otherwise recovery at the rate so prescribed shall be made after ensuring structural soundness and stability. In case of excess consumption, no adjustment needs to be made.

12 The steel brought to site and the steel remaining unused shall not be removed from site without the written permission of the Engineer-in-charge.

13 The contractor shall submit **original vouchers** from the manufacturer for the total quantity of steel supplied under each consignment to be used in the work. All consignment received at the work site shall be inspected by the Site staff along with the relevant documents before acceptance. The contractor shall obtain Original Vouchers and Test Certificates and furnish the same to the Engineer-in-Charge in respect of all the lots of steel brought by him from approved supplier to the site of work. The original vouchers and test certificates shall be **defaced** by the Site staff and kept on record in the site office.

14 Reinforcement including authorized spacer bars and laps shall be measured in length of different diameters as actually (not more than as specified in the drawings) used in the work nearest to a centimeter. Wastage and unauthorized overlaps shall not be measured.

15 The standard sectional weights referred to as in Table 5.4 in para 5.3.4 in CPWD Specifications will be considered for conversion of length of various sizes of M.S. Bars, Steel Bars and T.M.T. bars into Standard Weight.

16 Records of actual Sectional weights shall also be kept dia-wise and lot-wise. The average sectional weight for each diameter shall be arrived at from samples from each lot of steel received at site. The decision of the Engineer-in-Charge shall be final for the procedure to be followed for determining the average sectional weight of each lot. Quantity of each diameter of steel received at site of work each day will constitute one single lot for the purpose. The weight of steel by conversion of length of various sizes of bars based on the actual weighted average sectional weight shall be termed as Derived Actual Weight. However, for the stipulated issue of steel reinforcement up to and including 10mm diameter bars, the actual weight of steel issued shall be modified to take into account the variation between the actual and the standard coefficients and the contractors' accounts will be debited by the cost of modified quantity.

17 (a) If the Derived Weight as in sub-para above is less than the Standard Weight as in Sub-para above then the Derived Actual Weight shall be taken for payment provided, if it is within the following tolerances specified in IS1786-2008, otherwise whole lot will be rejected.

Tolerances on Nominal Mass

Nominal Size in mm	Tolerance on Nominal mass Percent		
	Batch	Individual Sample*	Individual sample for coil**
a) Upto and including 10	±7	-8	±8
b) Over 10 upto and Including 16	±5	-6	±6
c) Over 16	±3	-4	±4

* For individual sample plus tolerance is not specified.

* * For coils batch tolerance is not specified.

b) If the Derived Actual Weight is found more than the Standard Weight, the Standard Weight as per in sub-para above shall be taken for payment. In such case nothing extra shall be paid for the difference between the Derived Actual Weight and the Standard Weight.

18) The following procedure should be followed in case of removal of rejected/sub-standard materials from the site of work.

a. Whenever any material brought by the contractor to the site of work is rejected, entry thereof should invariably be made in the site order book under the signature of the AE/AEE giving approximate quantity of such materials.
b. As soon as the material is removed, a certificate to that effect may be recorded by the AE/AEE against the original entry, giving the date of removal a mode of removal i.e. whether by truck, carts or by manual labour. If removal is by truck, the registration number of the truck should be recorded.
c. When it is not possible for the AE/AEE to be present at the site of work at the time of actual removal of the rejected/sub-standard materials from the site the required certificate should be recorded by the Junior Engineer and the AE/AEE should countersign the certificate recorded by the Junior Engineer.

19) Cement should be kept in godowns under double locks and keys and its consumption account invariably maintained, whether the cement is supplied departmentally or arranged by the contractor. A register should be maintained at the site for this purpose. This register should contain the columns as shown in Annexure-30 of SOP modified as per manual 2026.

The pages of the register should be machined numbered and each page initialed by the EE. The cement godown and the register are required to be checked by the AE/EE in-charge of the work as per following schedule.

i) At least weekly or fortnightly, respectively in case of works at the Headquarters of AE/EE.

ii) Whenever they visit the site of work in case of works located outside the Sub-Divisional/Divisional Head Quarters.

~~20) In case contractor is permitted to use reinforcement steel other than above mentioned make as in 9.1 then:~~

~~(i) Base price of reinforcement steel is as stipulated under schedule 'F' shall be reduced by Rs. 3500/- MT. However, for operation of provisions of clause 10CA in such case, the indices for structural steel of secondary producers will be considered same as for primary producers.~~

~~(ii) The rate quoted by contractor of relevant item in tender of reinforcement steel work shall be reduced by Rs. 4.00 per kg.~~

9.0(A) Special condition for structural steel (Tee, Angle, Channel, Structural Tubes and plates & R.S. Joist)

9.1(A) The contractor shall procure Structural steel (Tee, Angle, Channel, Structural Tubes and plates & R.S. joist) from primary producers (SAIL, Tata Steel Ltd, RINL, Jindal Steel & Power Ltd. and JSW steel Ltd.).
In case of non-availability of structural steel from primary producers the NIT approving authority may permit use of structural steel procured from steel producers having valid BIS license confirming to IS -2062-2006

9.2(A) Samples shall be taken and got tested by the Engineer-in-charge confirming to relevant BIS code. In case the test results indicate that the structural steel arranged by the contractor does not conform to the specification, the same shall stand rejected, and it shall be removed from the site of work by the contractor at his cost within a week's time or written orders from the Engineer-in-charge to do so.

9.3(A) The structural steel shall be stored by the contractor at site of work in such a way as to prevent their distortion and corrosion, and nothing extra shall be paid on this account.

9.4(A) The contractor shall supply free of charge the structural steel sample required for testing including its transportation to testing laboratories . The cost of test shall be borne by the ~~department if it confirms to relevant BIS code else the testing charges shall be borne by the~~ contractor.

9.5(A) The steel brought to site and the steel remaining unused shall not be removed from site without the written permission of the Engineer-in-charge.

~~9.6(A) In case contractor is permitted to use structural steel other than above mentioned make as in 9.1(A) then:~~

~~**(1) Base Price of Structural Steel as stipulated under Schedule 'F' shall be reduced by Rs. 6700/- MT However, for operation of provision of clause 10CA in such case the indices for structural steel will be considered same as indicated in Indices issued by DG. CPWD for primary producer.**~~

~~**(2) The quoted rate of relevant item of tender of structural steel work shall be reduced by Rs. 8.00 per Kg.**~~

9.7(A) If the actual weight of structural steel to be used in the work differs from standard weight, the following procedure shall be followed for arriving at the quantity for payment.

(a) If the actual weight is more than standard weight only standard weight shall be considered for payment.

(b) If the actual weight is less than standard weight but within the permissible vitiation, only actual weight shall be considered for payment.

10.0 REINFORCED CEMENT CONCRETE WORK

10.1 DESIGN MIX CONCRETE

10.1.1 The RCC work shall be done with Design Mix Concrete unless otherwise specified. In the nomenclature of items wherever letter M has been indicated, the same shall imply for the Design Mix Concrete. For the nominal mix in RCC, CPWD Specifications shall be followed. The Design Mix Concrete will be designed based on the principles given in IS: 456-2000. The contractor shall design mixes for each grade of concrete indicating that the concrete ingredients and proportions will result in concrete mix meeting requirements specified. In case of use of admixture and or white cement, the mix shall be designed with these ingredients as well.

10.1.2 The concrete mix design will be carried out by the contractor through one of the following laboratories / Test houses and ready-mix concrete shall conform to accepted design mix. a) MANIT, Bhopal. b) Govt. Engineering College, Sagar. c) I.I.T., Delhi. d) Govt. Engineering College, Raipur. e) National Council for Cement & Building Materials, Ballabhgarh, Haryana f) G.S.I.T.S., Indore g) MITS, Gwalior h) Govt. Engineering College, Jabalpur i) Rajiv Gandhi Proudyogiki Vishwavidyalaya (RGPV), Bhopal j) Bundelkhand Institute Of Engineering and Technology Jhansi.

10.1.3 In the event of all the above laboratories being unable to carry out the requisite design / testing the contractor shall have to get the same done from any other laboratory with prior approval of the Engineer-in-Charge.

10.1.4 The contractor shall submit the mix design report from any of above approved laboratories for approval of Engineer-in-Charge **within time given by Engineer-in-Charge** from the date of issue of letter of acceptance of the tender.

10.1.5 In case of white Portland cement and the likely use of admixtures where CC/RCC is done with concrete pumps in concrete with ordinary Portland/white Portland cement, the contractor shall design and test the concrete mix by using trial mixes with white cement and /or admixtures also, for which nothing extra shall be payable.

10.1.6 Each time when there is change of source or characteristic properties of the ingredients used in the concrete mix during the work, a revised mix design shall be done and approval obtained from the approved Laboratory or as per the direction of the Engineer-in-Charge. Preferably only single source of cement shall be kept for the work. In case contractor decides to use more than one source of approved cement brand then for each brand separate design mix shall be done and got approved by Engineer-in-charge.

10.1.7 The Mix shall be designed to produce the grade of concrete having required workability and characteristic strength not less than as specified.

10.1.8 The mix design for a specified grade of concrete shall be done for a target mean compressive strength T ck = F ck + 1.65 S

Where,
F ck = Characteristic compressive strength at 28 days.
S= Standard deviation

The standard deviation for each grade of concrete shall be calculated separately.
The degree of quality control for this work is "Good" for which the standard deviation (s) obtained for different grades of concrete shall be as follows:-

Grade of Concrete	For "Good" quality of control
M 20	4.0
M 25	4.0
M 30	**5.0**
M 35	5.0
M 40	5.0

10.1.9 Out of the six specimens of each set, three shall be tested at seven days and remaining three at 28 days. The preliminary tests at seven days are intended only to indicate the strength likely to be attained at 28 days. All cost of mix designing and testing connected therewith including charges payable to laboratory shall be borne by the Contractor.

10.1.10 The samples of cement, aggregate (fine & coarse) to be sent to the laboratories shall be sealed in the presence of the Engineer- in -Charge and shall have his signature and cost of packaging, sealing, transportation, loading, unloading, cost of samples and the testing charges for Mix design in all cases shall be borne by the contractor.

10.1.11 Notwithstanding the approval granted by Engineer-in-Charge in aforesaid manner, the contractor shall be fully responsible for quality of concrete including input control, transportation and placement etc.

10.1.12 The Engineer-in-Charge reserves the right to exercise control over the ingredients, water and admixtures, purchased, stored and to be used in the concrete including conducting of tests for checking quality of materials fit or unfit for use in production of mix.

10.1.13. The Contractor shall submit the test data of the material used for concrete mix-design in the laboratories, so the material being used at site can be compared with those data / size etc.

10.1.14 In case of change of parameters of ingredients (fine aggregate, cement, coarse aggregate) fresh concrete mix-design to be done as mentioned in paras 10.1.1, 10.1.2 & 10.1.6 to 10.1.10 above and got approved from the Engineer-in-Charge before execution.

10.1.15 The contractor shall make arrangement to install a mini laboratory at site for accelerated testing of design mix concrete as per IS : 9013. The department reserves right to take samples of design mix concrete from the mass production of the concrete for testing and compare with the laboratory's results.

10.1.16 Nothing shall be paid extra for installation and cost of batching plant and other arrangement for making necessary test of design mix concrete.

10.1.17 The item of design mix cement concrete shall be inclusive of all the ingredients including admixtures if required, labour, machinery T & P etc. (except shuttering which will be measured & paid for separately) required for a design mix concrete of required strength and workability. **The rate quoted by the agency shall be net & nothing extra shall be payable on account of change in quantities of concrete ingredients like aggregates and admixtures as per the approved mix design.**

10.1.18 Concrete shall be handled from the place of mixing to the place of final deposit / placement by methods, which prevent segregation, or loss of any ingredients and contamination.

10.1.19 Where concrete is conveyed by chutes, the chute shall be made of metal or fitted with metal lining. The approval of the Engineer-in-charge shall be obtained for the use of chutes in excess of 3 metres length and in such cases the concrete shall be remixed if so required by the Engineer-in-Charge or closed bottom buckets shall be used. If concrete is placed by pumping, the conduit shall be primed properly. Once pumping is started, it shall not be interrupted as far as possible. Concrete shall not be dropped into place from a height more than 1.5m.

10.1.20 Concreting of any portion of the work shall be done in presence of the representative of the Engineer-in-Charge and shall be done only after approval of the Engineer-in-Charge.

10.1.21 Concreting shall be carried out continuously between constructions joints shown on the drawings or as agreed by the Engineer-in-Charge. The contractor shall closely follow the sequence of concreting where it is specified in the drawings. If concreting is interrupted before reaching the predetermined joint an approved construction joint shall be provided. Construction joints shall be minimized as far as possible. These shall be set at right angles to the general direction of the member. The surface film of the first placed concrete should preferably be removed while the concrete is still green to expose the aggregate and leave a sound irregular surface. However, care shall be taken not to disturb the concrete already laid.

10.1.22 **Admixtures:** Wherever required, admixtures of approved quality only shall be mixed with concrete as specified. The admixtures shall conform to IS: 9103. The chloride content in the admixture shall satisfy the requirements of BS: 5075. The total amount of chlorides in the admixture mixed concrete shall also satisfy the requirements of IS 456-2000.

10.1.23 Use of ready mixed concrete (RMC) may also be permitted, with prior approval of Engineer –in – Charge, without any extra payment. Separate account of design mix concrete and RMC shall however be kept. The ready mixed concrete shall conform to the requirement of durability, workability and strength as laid down for design mix concrete.

10.2 Use of Fly Ash and Fly Ash Blended Cements in RCC Structures: -

10.2.1. General

10.2.1.1 IS : 456-2000 Code of Practice for plain and Reinforced Concrete (as amended up to date) shall be followed in regard to Concrete mix Proportion and its production as under :-

10.2.1.1.1 The concrete mix design shall be done as "Design Mix Concrete" as prescribed in clause – 9 of IS 456 mentioned above.

10.2.1.1.2 Concrete shall be manufactured in accordance with clause 10 of above mentioned IS : 456 covering quality assurance measures both technical and organizational, which shall also necessarily require a qualified Concrete Technologist to be available during manufacture of concrete for certification of quality of concrete.

10.2.1.2 Minimum M30 grade of concrete shall be used in all structural elements made with RCC both in load bearing and framed structure.

10.2.1.3 The mechanical properties such as modulus of elasticity, tensile strength, creep and shrinkage of flyash mixed concrete or concrete using flyash blended cements (PPCs) should not likely to be significantly different and their values are to be taken same as those used for concrete made with OPC. Fly ash when used in the production of concrete shall be strictly in conformity with IS : 3812 (Para 1 & 10).

10.2.1.4 To control higher rate of carbonation in early ages of concrete both in flyash admixed as well as PPC based concrete, water / binder ratio shall be kept

as low as possible, which shall be closely monitored during concrete manufacture. If necessitated due to low water / binder ratio, required workability shall be achieved by use of chloride free chemical admixtures conforming to IS : 9103. The compatibility of chemical admixtures and supper plasticizers with each set OPC, fly ash and / or PPC received from different sources shall be ensured by trials.

10.2.1.5 In environment subjected to aggressive chloride or sulphate attack in particular, use of flyash admixed or PPC based concrete is recommended. In cases, where structural concrete is exposed to excessive magnesium sulphate, flyash substitution / content shall be limited to 18% by weight. Special type of cement with low C3A content may also be alternatively used. Durability criteria like minimum binder content and maximum water / binder ratio also need to be given due consideration in such environment.

10.2.1.6 Wet curing period shall be enhanced to a minimum of 10 days or its equivalent. In hot and arid regions, the minimum curing period shall be 14 days or its equivalent.

10.2.2. Use of Flyash Admixed Cement Concrete (FACC) in RCC Structures: -

There shall be no bar on use of FACC in RCC structures subject to following additional conditions:-

10.2.2.1 Flyash shall have its chemical characteristics and physical requirements etc. conforming to IS : 3812 (Part-10) and shall be duly certified.

10.2.2.2 To ensure uniform blending of fly ash with cement in conformity with IS : 456, a specific facility needs to be created at site with complete computerized automated process control to achieve design quality or with similar facility from Ready Mix concrete (RMC) plants.

10.2.2.3 As per IS : 1489 (Part-I), Maximum 35% of OPC by mass is permitted to be substituted with fly ash conforming to IS : 3812 (Part-I)and same is reiterated.

10.2.2.4 Separate storage for dry fly ash shall be provided. Storage bins or silos shall be weather proof and permit a free flow and efficient discharge of fly ash. The filter or dust control system provided in the bins or silos shall be of sufficient size to allow delivery of fly ash maintained at specified pressure to prevent undue emission of fly ash dust, which may interfere weighing accuracy.

10.2.3. Use of Fly Ash Blended Cements in Cement Concrete (PPCC) in RCC structures

10.2.3.1 Subject to General Guidelines detailed out as above, PPC manufactured conforming to IS : 1489 (Part-I) shall be treated at par with OPC for manufacture of Design Mix Concrete for structural use in RCC.

10.2.3.2 Till the time, BIS makes it mandatory to print the %age of fly ash on each bag of cement, the certificate from the PPC manufacturer indicating the same shall be insisted upon before allowing use of such cements in works.

10.2.3.3 While using PPC for structural concrete work, no further admixing of fly ash shall be permitted.

11.0 PARTICULAR SPECIFICATIONS FOR AAC BLOCK MASONRY:

11.1 The AAC Blocks shall be procured from approved manufacturers and it shall conform to IS 2185-Part3 1984.

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11.2 The blocks shall be stored at site in stacks on a level dry surface.

11.3 The AAC blocks shall of grade I having density between 651 to 750 Kg per cum as per table I of IS 2185 Part 3 1984.

11.4 The thickness of joints in the masonry shall not exceed 10 mm and shall be of uniform thickness.

11.5 Maximum height of wall built on any day shall not be more than 1.2 metres (i.e. 6 layers).

11.6 The joints in the masonry shall be recessed and no flush pointing shall be done.

11.7 A slip membrane with PVC sheet of minimum thickness 400 micron, shall be introduced as per the recommendation of blocks manufacturer before laying the first course on the plinth beam.

11.8 The blocks shall not be soaked in water and instead they shall be dipped in water and taken out immediately to have only moist surface.

11.9 The vertical joints of the masonry shall be broken to have a minimum overlap of 100 mm.

11.10 Bed joint 2 Nos 6mm dia reinforcement bars may be placed in the joints after every 3rd course as per the nomenclature of item, to have good lateral stability.

11.11 It shall be ensured that the lintels are rest at either end of window opening only on full block and not on half or part blocks reinforcement shall be placed in the sill course of window openings in two successive horizontal joints and extend the same at least to 600 mm on either side of the jamb surface.

11.12 At a RCC column interface an MS anchor ("L" shape), of size 50x4 mm, 300 mm long out of which 100 mm length of L fixed on column using minimum two SS screws with PVC sleeves and 200 mm side of L embedded in masonry, be placed and fixed with screws at every 4th course so as to anchor the wall with RCC column for better lateral stability. The anchor shall be got approved from Engineer-in-Charge.

11.13 Curing of the masonry shall be done only by spraying water and no flooding shall be done by water jets / buckets.

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~~11.14 The chases in the wall surface for electrical conduits shall be done only by means of electrically operated saw to cut two parallel lines and the portion between the cuts shall be chiseled carefully. The depth of vertical chases should be limited to 1/3 rd of wall thickness and horizontal chases should not be more than 1/6th of wall thickness. The chases have to be properly packed with cement mortar 1:4 (1 cement : 4 sand) between pipes and chases.~~

~~11.15 The blocks shall be cut using a carpenter saw to have half blocks or any other suitable size block to close the masonry course or to break the vertical joint from the bottom course. Hammer or a mason's trowel shall not be used to cut the blocks.~~

~~11.16 GI wire mesh shall be fixed on all column wall and beams- wall junctions before taking up the plaster work.~~

~~11.17 The rates of the item for AAC blocks, includes all the elements described above, except at para 11.16 above.~~

12.0 EQUIPMENTS AND PLANTS (Refer Clause 18 of Schedule 'F')

12.1 The contractor has to deploy necessary tools & plants in required numbers to ensure smooth & timely execution of work, at his own cost & risk as per the requirement of work at different stages. The decision of Engineer-in-Charge shall be final regarding use of particular T&P(s) at a particular time(s) & the contractor has to adhere to the same strictly. The following description & quantum of T&P is given for general guidance which is not mandatory. However, the successful contractor shall give a list of tools and plants which he proposes to deploy to ensure smooth and timely execution as per different milestone fixed and timely completion of work while submitting the programme and progress chart.

I.	Batch mix Plant as per IS:4925 of capacity of minimum 08 cum per hour	As per requirement
II.	**Steel Centering and shuttering**	As per requirement
III.	Excavator Cum Loader.	As per requirement
IV.	Concrete mixer with hopper.	As per requirement
V.	Plate Vibrator.	As per requirement
VI.	Needle Vibrator.	As per requirement
VII.	Bar Bending Machine.	As per requirement
VIII	Bar Cutting Machine.	As per requirement
IX	Compressor 5 cmm.	As per requirement
X	Earth compactor 2 T	As per requirement
XI	Floor grinding machine	As per requirement
XII	Welding machine	As per requirement
XIII	DG Set(63 KVA) (One shall be suitable for batching plant)	As per requirement
XIV	Grinder, Drilling machine etc.	As per requirement
XV	Water Pump	As per requirement
XVI	Chase cutter	As per requirement
XVII	Concrete Pump	As per requirement

XVIII	Transit Mixer (Miller)	As per requirement

Note: The Engineer in charge may add or delete above listed mandatory machinery, tools and plants testing equipments as per actual requirement at site

12.2 To achieve the program of work as per programme the contractor must bring at site the required shuttering materials required for cement concrete and RCC work etc. within 30 days from the date of start of work. All other equipment shall be brought, installed and commissioned at site of work at least one week before their actual planned use at site. Work shop facilities for fabrication/addition and alterations, and other allied works shall be arranged by the contractor at his own cost.

12.3 The list of equipment/T&P/machinery as per para 12.1 is for general guidance. In addition to these, machinery / equipment as required shall be arranged by the contractor in case the requirement at any stage exceeds as per the programme finalized at his own cost and nothing extra whatsoever on this account shall be paid. This includes equipment for arrangement of concrete from RMC producing plants also.

12.4 All the equipment, T&P and machinery shall be kept in good condition.

13.0 SAFETY MEASURES AT SITE

In order to ensure safe construction, following shall be adhered for strict compliance at the site:-

(A)

(i) The work site shall be properly barricaded.

(ii) Adequate signage indicating 'Work in Progress – Inconvenience caused is Regretted' or Diversion Signs shall be put on the sites conspicuously visible to the public even during night hours. These are extremely essential where works are carried out at public places in use by the public.

(iii) The construction malba at site shall be regularly removed on daily basis.

(iv) All field officials and the workers must be provided with safety helmets, safety shoes and safety belts.

(v) Proper MS pipe scaffoldings with work – platforms and easy-access ladders shall be provided at site to avoid accidents.

(vi) Necessary First-Aid kit shall be available at the site.

Note :- No extra payment will be made for operation/activities mentioned above.

(B) **The Contractor has to take care of all safety measures required during execution of work for protection of his own labour as well as the residence residing there in the campus. In case of any accident happens in the campus during execution, due to lack of safety measures or any other reason what so ever, the agency is fully responsible and all the expenses on this account shall be bear by the contractor and nothing extra on this account shall be paid to the contractor and CPWD will not be responsible at all.**

14.0 LIST OF EQUIPMENT FOR SITE LABORATORY TO BE MADE AVAILABLE BY THE CONTRACTOR AT HIS OWN COST (Refer Clause 10 A of Schedule 'F')

A Laboratory testing instruments.

(1) Balances i. 7 Kg. to 10 Kg. capacity, semi-self indicating type – accuracy 10 gm. ii. 500 gm. Capacity, semi-self indicating type – accuracy 1 gm. iii. Pan balance – 5 Kg. capacity – accuracy 10 gms.	As per requirement
(2) Ovens–electrically operated, thermostatically controlled upto 110^0 C–sensitivity 1^0 C.	
(3) Sieves : as per IS 460 – 1962. i. I.S. sieves – 450 mm internal dia, of sizes 100mm, 80 mm, 63 mm, 50mm, 40 mm, 25mm, 20 mm, 12.5 mm, 10 mm, 6.3mm, 4.75 mm, complete with lid and pan. ii. I.S. sieves - 200 mm internal dia (brass frame) consisting of 2.36 mm, 1.18 mm, 600 microns, 425 microns, 300 microns, 212 microns, 150 microns, 90 microns, 75 microns with lid and pan.	As per requirement
(4) Sieve shaker capable of 200 mm and 300 mm dia sieves, manually operated with timing switch assembly.	
(5) Equipment for slump test–slump cone, steel plate, tamping rod, steel scale, scoop.	
(6) Dial gauges, 25 mm travel – 0.01 mm / division least count – 2 Nos.	
(7) 100 tones compression testing machine, electrical cum manually operated.	
(8) Graduated measuring cylinders 200 ml capacity – 3 Nos.	
(9) Enamel trays (for efflorescence test for bricks). i. 300 mm X 250 mm X 40 mm – 2 Nos. ii. Circular plates of 2850 mm dia – 4 Nos.	
(10) Construction water testing kits-.	As per requirement

B. **Field testing instruments.(**Following instruments in sufficient quantity as directed by the Engineer- in- Charge shall be made available by the contractor. It shall be ensured that the instruments always remain in serviceable condition else the same will be replaced.

(1) Steel tapes – 3 m.
(2) Vernier Calipers.
(3) Micrometer screw 25 mm gauge.
(4) A good quality plumb bob.
(5) Spirit level, minimum 30 cms long with 3 bubbles for horizontal vertical.
(6) Wire gauge (circular type) disc.
(7) Foot rule.
(8) Long nylon thread.
(9) Rebound hammer for testing concrete
(10) Dynamic penetrometer.
(11) Magnifying glass
(12) Screw driver 30 cms long
(13) Ball pin hammer, 100 gms.
(14) Plastic bags for taking samples
(15) Moisture meter for timber
(16) Earth resistance tests
(17) Meggar
(18) Depth Gauge
(19) Straight edge

} As per requirement.

Note: The Engineer in charge may add or delete above listed mandatory machinery, tools and plants testing equipments as per actual requirement at site

15.0 SPECIFICATIONS FOR FLY ASH BRICKS - All fly ash bricks as brought to the site shall conform to the strength & durability parameters as prescribed in the tender and CPWD specifications.

16.0 The contractor shall submit 'Method Statement' for the approval soon after the award of work. 'Method Statement' is a statement by which the construction procedures for important activities of construction are stated, checked and approved. Method Statement shall have description of the item with elaborate procedures in steps to implement the same. The specification of the materials involved their testing and acceptance criteria, equipments to be used, precautions to be taken, mode of measurements etc.

17.0 <u>TESTING OF MATERIALS</u>.

17.1 The contractor shall arrange carrying out of all tests required under the agreement through the laboratory as approved by the Engineer-in-Charge and shall bear all charges in connection therewith including fee for testing . For cement the same shall be governed by para Sl. No. 8.4 of particular specifications and special conditions of NIT. In all cases cost of samples and to & fro carriage shall be borne by the contractor. Contractor shall establish a laboratory at site of work at his own cost. The laboratory shall be equipped with all necessary equipment as per requirement of specification or as per direction of Engineer-in-

Charge. A list of laboratory equipment to be maintained by the contractor is enclosed at para Sl. No. 14 of Particular Specifications and special conditions of NIT. Establishing the laboratory at site shall not absolve the contractor from fulfilling the criteria of getting the test done in independent approved laboratories as per as per SOP-2026. The decision of the Engineer-in-Charge of allowing any test in the site laboratory shall be final.

17.2 Even ISI marked materials may be subjected to quality test at the discretion of the Engineer-in-charge besides testing of other materials as per the specifications described for the item/material. Whenever ISI marked materials are brought to the site of work the contractor shall, if required by the Engineer-in-charge, furnish manufacturer test certificate or test certificate from approved testing laboratory to establish that the material procured by the contractor for incorporation in the work satisfy the provisions if IS codes relevant to the material and/or the work done.

17.3 Sub-standard Material/Work : In case any material/work is found substandard the same shall be rejected by the Engineer-in-Charge and the same shall be removed from the site of work within 48 hour, failing which the same shall be got removed by the Engineer-in-Charge at the risk and cost of the contractor without giving any further notice and time.

18 SUNKEN FLOOR SLAB, IT'S TREATMENT ETC.

18.1 Brick bat aggregate shall be from well burnt bricks. The proprietary waterproofing compound and the quantity to be used as per para 6.1.1.

18.2 The surface shall be thoroughly cleaned with wire brushes. All loose scales shall be removed and dusted off. The surface bottom as well sides shall be treated with cement slurry admixed with proprietary water proofing compound to penetrate into crevices and fill up all the pores in the surface.

18.3 After the slurry coat is laid, layer of well burnt brick bats of about 40mm size shall be laid in cement mortar of mix as specified by the specialist firm but not leaner than 1:5 (1cement: 5 coarse sand) admixed with proprietary water proofing compound, the mortar being filled to half the depth of the brick bat layer. The bricks bat layer shall be rounded off at junctions with the beam/wall etc. and tapered towards top to a height of 150 mm along beams/wall etc. Curing of this layer shall be done for three days.

18.4 After curing, the surface shall be applied with a coat of neat cement slurry admixed with proprietary water proofing compound.

18.5 Joints of brick bat shall be filled fully with cement mortar of mix as specified by the specialist firm but not leaner than 1:4 (1cement: 4 coarse sand) admixed with proprietary water proofing compound and top finished with average 20mm thick layer of same mortar. This layer of mortar shall be continued to the sides of beam/wall etc. The height upto which this treatment is to be extended on the sides shall be as directed by the Engineer-in-Charge. The surface shall be finished smooth with cement slurry admixed with proprietary water proofing compound.

18.6 While the water proofing treatment is done, it shall be ensured that the outlet pipes are properly fixed and the gaps between the wall and pipes are properly filled with brick/stone aggregate and cement mortar admixed with proprietary water proofing compound and grouted with cement slurry admixed with proprietary water proofing compound.

18.7 Water proof treatment shall be cured for a minimum period of two weeks.

18.8 Measurements

Measurements for the floor treatment shall be taken on the plan area of floor treated. Nothing extra shall be paid for rounding off at junctions and taking the treatment along the sides of beams and walls for about 150 mm

18.9 Rate

The rate shall include the cost of all labour and materials involved in all the operations described above. Base treatment and side treatment will be paid separately under respective items.

18.10 Cut Brick (Marukona)

18.11 "Where cut brick (Marukona) as required C.P.W.D. Specifications 2019 Vol. I on account of available quality of bricks the same shall be replaced by cement concrete 1:2:4 and no extra payment for the provisions of C.C. 1:2:4 nor would the quantity of C.C 1:2:4 thus provided be deducted from measurements of brick work."

18.12 Specifications for moorum

18.13 The contractor has to bring moorum required for filling under floors, from sources, approved by the Engineer-in-charge. The filling material shall be moorum obtained from pits of weathered disintegrated rocks free from organic matters and should preferably contain siliceous material and natural mixture of clay of calcarious origin. The size of moorum shall not be more than 20 mm.

18.14 The moorum brought to site shall be directly used for filling and no claim for double handling shall be entertained. Filling shall be done in regular horizontal layers, each not exceeding 20 cm. in depth. The moorum shall be free from all roots, grass and rubbish and all lumps and clods, if any, shall be broken. Each layer shall be consolidated by breaking clods, watering and ramming with steel rammers. The top surface of finally finished area shall be dressed.

18.15 Before filling is started in the area (under floors) contractor shall remove rank vegetation, grass, brushwood, shrubs and building rubbish etc. and nothing extra shall be paid for on this account.

19 SPECIFICATION FOR CEMENT CONCRETE INTERLOCKING PAVER BLOCK

The Cement concrete interlocking paver blocks shall be ISI Marked and of size, shape and shade as approved by the Engineer-in-charge. These shall be of make as specified in item nomenclature or equivalent brand and manufacture as approved by the Engineer-in-charge.

19.1 Technical Specifications of Paver Blocks:

i) The thickness of block shall not be less than 50mm and not more than 120 mm and shall also meet the thickness requirement specified under table I of IS : 15658:2006

ii) The Paver Block shall be factory made and manufactured using M30, M35, M40, M 50 and M55 grade of cement concrete having comprehensive strength not less than 30, 35, 40, 50, 55 N/sq. mm The water absorption after twenty four hours of soaking in water shall not be more than **7%** The density of the concrete shall not be less than 22 KN/Cum

iii) The surface should be of Antiskid and Anti glare type.

iv) The concrete pavers should have perpendicularities after release from the mould and same should be retained until the laying.

v) The Paver shall have a peripheral chamfer on the top edge to facilitate easy drain surface runoff. The size shall be 4 mm in height and 7.5 mm in total width.

vi) Pavers must have vertical spacer nibs on the sides. This is required to attain uniform interlocking space of 2-3mm all round the joints. This will ensure that jointing sand gets filled inside the joints once compacted.

vii) The concrete mix design should be followed for each batch of materials separately and automatic batching plant is to be used to achieve uniformity in strength and quality.

viii) Pavers shall be manufactured in single layer only.

19.2 The paver blocks shall be manufactured using standard (fast)colours/pigment. The thickness shall be 100mm +/- 2.0 mm

19.3 The interlocking blocks shall be supplied at site only after attainment of required strength at factory itself. It shall be ensured by the contractor that required strength at factory itself. It shall be ensured by the contractor that interlocking paver blocks are free of cracks etc. edges are not chipped / broken and that there is no shade variation; otherwise these shall be rejected and not allowed to be used in the work.

19.4 The leveling course of crush sand shall be laid, watered, if required and compacted to an average thickness of 50 mm using plate vibrator, Leveled properly and then slightly roughened using wire brush Then interlocking paver blocks shall laid in level, in a workman like manner and bedded properly in position with wooden mallets without use of chips or under priming of any sort and without any damage to the interlocking paver block. The pockets formed (at the edges of the pathway adjacent to the kerb etc; due to shape of the interlocking block) shall be filled with cement concrete of nominal mix 1: 1.5:3 (1 cement: 1.5 coarse sand: 3 graded stone aggregate 10 mm nominal size) admixed with pigment of required shade, neatly leveled and finished smooth. After it has set, joints between the interlocking paver blocks shall be filled with fine (sieved) crush sand and cured properly. Green work shall be protected from rain or other damaged properly, as required.

19.5 At least one sample (consisting of 3 units) in interlocking paver blocks shall be tested for every **500 sqm area** of pavement or part thereof or at frequency as directed by the Engineer-in-charge. The contractor's rate for the items involving the use of materials shall be deemed to cover the cost of samples. The cost of packaging, sealing, transportation, loading unloading etc. shall be borne by the contractor. Testing charges shall be borne by ~~the department only when the samples satisfy the provisions specified and conform to the requirements of the relevant specifications. If the results show that the samples do not satisfy the relevant specifications, the testing charges shall be borne by~~ the contractor

19.6 The rate is inclusive of cost of all inputs of labour, material, T & P etc. involved in the work. However for payment area shall be measured in sqm upto two places of decimals. All incidental charges of any kind including cartage, storage, wastage and safe custody of material etc shall be borne by the contractor and no claim whatsoever shall be entertained on this account.

20.0 CONDITIONS OF CONTRACT SPECIFIC TO GREEN BUILDING PRACTICES

The contractor shall strictly adhere to the following conditions as part of his contractual obligations:

20.1 SITE

20.1.1 The contractor shall ensure that adequate measures are taken for the prevention of erosion of the top soil during the construction .The contractor shall prepare and implement the Erosion and Sedimentation Control Plan (ESCP) provided to him after approval by the Engineer- in- Charge as part of the larger Construction Management Plan (CMP). The contractor shall obtain the Erosion and Sedimentation Control Plan (ESCP) Guidelines if required from the Engineer in Charge and then prepare "working plan" for the following month's activities as a CAD drawing showing the construction management, staging & ESCP. At no time soil should be allowed to erode away from the site and sediments should be trapped where necessary.

The contractor shall ensure that all the top soil excavated during construction works is neatly stacked and is not mixed with other excavated earth. The contractor shall take the clearance of the Engineer in Charge before any excavation. Top soil should be stripped to a depth of 20 cm (centimeters) from the areas to be disturbed, for example proposed area for buildings, roads, paved areas, external services and area required for construction activities etc. It shall be stockpiled to a maximum height of 40 cm in designated areas, covered or stabilized with temporary seeding for erosion prevention and shall be reapplied to site during plantation of the proposed vegetation or as directed by the engineer in charge. Top soil shall be separated from subsoil, debris and stones larger than 50 mm (millimeter) diameter. The stored top soil may be used as finished grade for planting areas.

20.1.2 The Contractor should follow the construction plan as proposed by the Architect / Engineer in Charge to minimize the site disturbance such as soil pollution due to spilling. If required use of staging and spill prevention and control plan to restrict the Spilling of the contaminating material on site needs to be resorted. Protection of top soil erosion by collection storage and reapplication of top soil, constructing sediment, contour trenching, mulching etc., may also be directed by the engineer in charge.

20.1.3 No excavated earth shall be removed from the campus unless suggested otherwise by Engineer in Charge. All subsoil shall be reused in backfilling/landscape, etc as per the instructions of the Engineer in Charge. The surplus excavated earth shall be disposed of by the contractor as per the direction of the engineer in charge at his own cost for reuse. A certificate of reuse as required by the Engineer-in-Charge shall be submitted by the contractor.

20.1.4 The contractor shall not change the natural gradient of the ground unless specifically instructed by the Engineer in Charge. This shall cover all natural

features like water bodies, drainage gullies, slopes, mounds, depressions, etc. Existing drainage patterns through or into any preservation area shall not be modified unless specifically directed by the Engineer-in-Charge.

20.1.5 The contractor shall not carry out any work which results in the blockage of natural drainage.

20.1.6 The contractor shall ensure that existing grades of soil shall be maintained around existing vegetation and lowering or raising the levels around the vegetation is not allowed unless specifically directed by the Engineer-in-Charge.

20.1.7 Contractor shall reduce pollution and land development impacts from automobiles use during construction.

20.1.8 Overloading of trucks is unlawful and creates the erosion and sedimentation problems, especially when loose materials like stone dust, excavated earth, sand etc. are moved. Proper covering shall be used by the contractor. Also, no overloading shall be permitted.

20.2 CONSTRUCTION PHASE AND WORKER FACILITIES

20.2.1 The contractor shall specify and limit construction activity in pre-planned/designated areas and shall start construction work after securing the approval for the same from the Engineer in Charge. This shall include areas of construction, storage of materials, and material and personnel movement.

20.2.2 Preserve and Protect Landscape during Construction

a The contractor shall ensure that no trees, existing or otherwise, shall be harmed and damage to roots. These shall be prevented during trenching, placing backfill, driving or parking heavy equipment, dumping of trash and protected from oil, paint, and other materials detrimental to plant health. These activities shall be restricted to the areas outside of the canopy of the tree, or, from a safe distance from the tree/plant by means of barricading. Trees will not be used for support; their trunks shall not be damaged by cutting and carving or by nailing posters, advertisements or other material. Lighting of fires or carrying out heat or gas emitting construction activity within the ground, covered by canopy of the tree is not at all permitted.

b The contractor shall take steps to protect trees or saplings if any identified for preservation within the construction site using tree guards of approved specification.

c Contractor should limit all construction activity within the specified area as per the Construction Management Plan (CMP) approved by Engineer in Charge.

d The contractor shall avoid cut and fill in the root zones, through delineating and fencing the drip line (the spread limit of a canopy projected on the ground) of all the trees or group of trees. The zones of movement of heavy equipment, parking, or excessive foot traffic shall be separated from the fenced plant protection zones.

e The contractor shall ensure that maintenance activities during construction period shall be performed as needed to ensure that the vegetation remains healthy.

20.2.3 Contractor shall be required to develop and implement a waste management plan, quantifying material diversion goals. He shall establish goals for diversion from disposal in landfills and incinerators, if required, and adopt a construction waste management plan to achieve these goals. A project wide policy of "Nothing leaves the Site" shall be followed. The Contractor's ingenuity is especially called towards meeting this prerequisite/ credit (as per IGBC LEED India, New Construction v1.0 & GRIHA , MNRE) and may consider recycling cardboard, metal, brick, acoustical tile, concrete, plastic, clean wood, glass, gypsum wallboard, carpet and insulation, designating a specific area(s) on the construction site for segregated or commingled collection of recyclable material, and track recycling efforts throughout the construction process, identifying construction haulers and recyclers to handle the designated materials at his cost. The diversion may include donation of materials to charitable organizations and salvage of materials on-site.

20.2.4 Contractor shall collect all construction waste generated on site. He may consider at segregating wastes based on their utility and examine means of sending such waste to manufacturing units which use them as raw material or other site which require it for specific purpose. Typical construction debris could be broken bricks, steel bars, broken tiles, spilled concrete and mortar etc.

20.2.5 The contractor shall provide potable water and other amenities for all workers as per the contract.

20.2.6 The contractor shall provide the minimum level of sanitation and safety facilities for the workers at site as described in CPWD General Conditions of contract. The contractor shall ensure cleanliness of workplace with regard to the disposal of waste and effluent; provide clean drinking water and latrines and urinals as per applicable provisions. Adequate toilet facilities shall be provided for the workmen within easy access of their place of work. The total no. to be provided shall not be less than 1 per 30 employees in any one shift. Toilet facilities shall be provided from the start of building operations, connection to a sewer shall be made as soon as practicable. Every toilet shall be so constructed that the occupant is sheltered from view and protected from the weather and falling objects. Toilet facilities shall be maintained in a sanitary condition. A sufficient quantity of disinfectant shall be provided and natural or artificial illumination shall also be provided.

20.2.7 The contractor shall ensure that air pollution due to dust/generators is kept to a minimum, preventing any adverse effects on the workers and other people in and around the site. The contractor shall ensure proper screening, covering stockpiles, covering brick and loads of dusty materials, wheel-washing facility, gravel pit, and water spraying. Contractor shall also ensure the following activities to prevent air pollution during construction:

- Clear vegetation only from areas where work will start right away
- Vegetate / mulch areas where vehicles do not ply.
- Apply gravel / landscaping rock to the areas where mulching / paving is impractical
- Identify roads on-site if applicable that would be used for vehicular traffic. Upgrade vehicular roads (if these are unpaved) by increasing the surface strength by improving particle size, shape and mineral types that make up the surface & base and add surface gravel to reduce source of dust emission to limit amount of fine particles (smaller than 0.075mm) to 10 – 20%
- Water spray, through a simple hose for small projects, to keep dust under control. Fine mists should be used to control fine particulate. However, this should be done with care so as not to waste water. Heavy watering can also create mud, which when tracked onto paved public roadways, must be promptly removed. Also, there must be an adequate supply of clean water nearby to ensure that spray nozzles don't get plugged.
- Water spraying shall be done on:

20.2.7.1 Any dusty materials before transferring, loading and unloading

20.2.7.2 Area where demolition work is being carried out

20.2.7.3 Any un-paved main haul road

20.2.7.4 Areas where excavation or earth moving activities are to be carried out

- The contractor shall ensure that the speed of vehicles within the site is limited to 10 km/hr.
- All material storages should be adequately covered and contained so that they are not exposed to situations where winds on site could lead to dust / particulate emissions.

- Spills of dirt or dusty materials will be cleaned up promptly so the spilled material does not become a source of fugitive dust and also to prevent of seepage of pollutant laden water into the ground aquifers. When cleaning up the spill, ensure that the clean-up process does not generate additional dust. Similarly, spilled concrete slurries or liquid wastes should be contained / cleaned up immediately before they can infiltrate into the soil / ground or runoff in nearby areas

- Provide hoardings of not less than 3m high along the site boundary, next to a road or other public area at his cost.

- Provide dust screens, sheeting or netting to scaffold along the perimeter of the building at his cost
- Cover stockpiles of dusty material with impervious sheeting at his cost.
- Cover dusty load on vehicles by impervious sheeting before they leave the site at his cost.

20.2.8 Contractor shall be required to provide an easily accessible area that serves the entire building and is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, corrugated cardboard, glass, plastics, and metals. He shall coordinate the size and functionality of the recycling areas with the anticipated collections services for glass, plastic, office paper, newspaper, cardboard, and organic wastes to maximize the effectiveness of the dedicated areas. Consider employing cardboard balers, aluminium can crushers, recycling chutes, and collection bins at individual workstations to further enhance the recycling program

20.2.9 The contractor shall ensure that no construction leachate (e.g. cement slurry etc.), is allowed to percolate into the ground. Adequate precautions will be taken to safeguard against this including reduction of wasteful curing processes, collection, basic filtering and reuse. The contractor shall follow requisite measures for collecting drainage water run-off from construction areas and material storage sites and diverting water flow away from such polluted areas. Temporary drainage channels, perimeter dike/swale, etc. shall be constructed to carry the pollutant-laden water directly to the treatment device or facility (municipal sewer line).

20.2.10 Staging (dividing a construction area into two or more areas to minimize the area of soil that will be exposed at any given time) should be done to separate undisturbed land from land disturbed by construction activity and material storage.

20.2.11 The contractor shall comply with the safety procedures, norms and guidelines (as applicable) as outlined in the document Part 7 Constructional practices and safety, 2005, National Building code of India, Bureau of Indian Standards. A copy of all pertinent regulations and notices concerning accidents, injury and first-aid shall be prominently exhibited at the work site. Depending upon the scope & nature of work, a person qualified in first-aid shall be available at work site to render and direct first-aid to causalities. A telephone may be provided to first-aid assistant with telephone numbers of the hospitals displayed. Complete reports of all accidents and action taken thereon shall be forwarded to the competent authorities.

20.2.12 The contractor shall ensure the following activities for construction workers safety, among other measures at his cost.

- Guarding all parts of dangerous machinery.
- Precautionary signs for working on machinery
- Maintaining hoists and lifts, lifting machines, chains, ropes, and other lifting tackles in good condition.

- Durable and reusable formwork systems to replace timber formwork and ensure that formwork where used is properly maintained.
- Ensuring that walking surfaces or boards at height are of sound construction and are provided with safety rails or belts.
- Provide protective equipment; helmets etc.
- Provide measures to prevent fires. Fire extinguishers and buckets of sand to be provided in the fire-prone area and elsewhere.
- Provide sufficient and suitable light for working during night time.

20.2.13 The storage of material shall be as per standard good practices as specified in Part 7, Section 2 - Storage, Stacking and Handling practices, NBC 2005 and shall be to the satisfaction of the Engineer in Charge to ensure minimum wastage and to prevent any misuse, damage, inconvenience or accident. Watch and ward of the Contractor's materials shall be his own responsibility. There should be a proper planning of the layout for stacking and storage of different materials, components and equipment with proper access and proper maneuverability of the vehicles carrying the materials. While planning the layout, the requirements of various materials, components and equipment at different stages of construction shall be considered.

20.2.14 The contractor shall provide for adequate number of garbage bins around the construction site and the workers facilities and will be responsible for the proper utilization of these bins for any solid waste generated during the construction. The contractor shall ensure that the site and the workers facilities are kept litter free. Separate bins should be provided for plastic, glass, metal, biological and paper waste and labelled in both Hindi and English with suitable symbols.

20.2.15 The contractor shall prepare and submit 'Spill prevention and control plans' before the start of construction, clearly stating measures to stop the source of the spill, to contain the spill, to dispose the contaminated material and hazardous wastes, and stating designation of personnel trained to prevent and control spills. Hazardous wastes include pesticides, paints, cleaners, and petroleum products.

20.2.15.1 Contractor shall collect & submit the relevant material certificates for materials if directed by the Engineer in charge with high recycled (both post-industrial and post-consumer) content, including materials like RMC mix with fly-ash, glass with recycled content, calcium silicate boards etc.

20.2.16 Contractor shall collect the relevant material certificates for rapidly renewable materials such as bamboo, wool, cotton insulation, agri-fiber, linoleum, wheat board, strawboard and cork etc.

20.2.17 Where possible, the contractor shall select materials / vendors, harvested and manufactured regionally, within a 800-km radius of the project site.

20.2.18 Contractor shall adopt an IAQ (Indoor Air Quality) management plan to protect

the HVAC system during construction, control pollutant sources, and interrupt pathways for contamination. He shall sequence installation of materials to avoid contamination of absorptive materials such as insulation, carpeting, ceiling tile, and gypsum wallboard. He shall also protect stored on-site or installed absorptive materials from moisture damage.

20.2.19 The contractor shall ensure that a flush out of all internal spaces is conducted prior to handover. his shall comprise an opening of all doors and windows for 14 days to vent out any toxic fumes due to paints, varnishes, polishes, etc.

20.2.20 Contractor shall make efforts to reduce the quantity of indoor air contaminants that are odorous or potentially irritating harmful to the comfort and well-being of installer and building occupants. Contractor shall ensure that the VOC (Volatile Organic Compounds) content of paints, coatings and primers used must not exceed the VOC content limits mentioned below in case items of such paints are/is available in schedule of quantities.

Paints

Non-flat - 150 g/L Flat (Mat) - 50, g/L Anti corrosive/ anti rust - 250 g/L

Coatings / Clear wood finishes

Varnish - 350 g/L Lacquer - 550 g/L Floor coatings - 100 g/L Stains - 250 g/L

Sealers

Waterproofing sealer - 250 g/L Sanding sealer - 275 g/L Other sealers - 200 g/L

20.2.21 The VOC (Volatile Organic Compounds) content of adhesives and sealants used if prescribed in the schedule of quantities must be less than VOC content limits mentioned: **Architectural Applications** VOC Limit (g/l less water) Indoor Carpet adhesives - 50 g/L, Carpet Pad Adhesives - 50 g/L, Wood Flooring Adhesive - 100 g/L, Rubber Floor Adhesives - 60 g/L, Sub Floor Adhesives – 50 g/L, Ceramic Tile Adhesives - 65 g/L, VCT and Asphalt Tile adhesives - 50 g/L, Dry Wall and Panel Adhesives - 50 g/L, Structural Glazing Adhesives - 100 g/L, Multipurpose Construction Adhesives – 70 g/L, Substrate Specific Application VOC Limit (g/l less water), Metal to Metal - 30 g/L, Plastic Foams - 50 g/L, Porous material (except wood) - 50 g/L, Wood - 30 g/L, Fiber Glass – 80 g/L

20.2.22 Wherever required, Contractor shall meet and carry out documentation of all activities on site, supplementation of information, and submittals in accordance with IGBC LEED India New Construction v1.0 or GRIHA program standards and guidelines. Towards meeting the aforementioned building environmental rating standard(s) expert assistance shall be provided to him up on request.

20.2.23 Water Use during Construction Contractor should spray curing water on concrete structure and shall not allow free flow of water. Concrete structures should be kept covered with thick cloth / gunny bags and water should be sprayed on them. Contractor shall do water pounding on all sunken slabs using cement and sand mortar.

20.2.24 The Contractor shall remove from site all rubbish and debris generated by the Works and keep Works clean and tidy throughout the Contract Period. All the serviceable and non- serviceable (malba) material shall be segregated and stored separately. The malba obtained during construction shall be collected in well formed heaps at properly selected places, keeping in a view safe condition for workmen in the area. Materials which are likely to cause dust nuisance or undue environmental pollution in any other way, shall be removed from the site at the earliest and till then they shall be suitable covered. Glass & steel should be dumped or buried separately to prevent injury. The work of removal of debris should be carried out during day. In case of poor visibility artificial light may be provided.

20.2.25 The contractor shall provide O & M Manuals wherever applicable.

20.2.26 The contractor shall make himself conversant with the Site Waste Management Program Manual and actively contribute to its compilation by estimating the nature and volume of waste generated by the process/installation in question.

20.2.27 MATERIALS & FIXTURES FOR THE PROJECT

a) Contractor will produce wherever feasible certificate regarding distance of the source of the relevant material.

b) Unless otherwise stated cement used at site for reinforced concrete, precast members, mortar, plaster, building blocks, etc shall be PPC (Portland Puzzolana Cement). The PPC must meet the requirements of IS 1489 (Part I) as regards to fly ash content in cement The contractor shall obtain from the PPC manufacturer the certificate regarding fly ash content in the PPC in each batch of consignment.

c) The contractor has to comply as per MoEF issued notification 8.0.763(E) dated 14th Sept.1999 containing directive for greater fly ash utilization. Every construction agency engaged in the construction of buildings within a radius of 50 km radius of a Thermal Power Plant, have to use of 100% fly ash based bricks/blocks in their construction.

d) The contractor shall ensure that all paints, polishes, adhesives and sealants used both internally and externally, on any surface, shall be Low VOC products. The contractor shall get prior approval from the Engineer in Charge before the application of any such material.

e) All plumbing and sanitary fixtures installed shall be as per the prescription of the Engineer in Charge and shall adhere to the minimum LPM (litres per minute) and LPF (litres per flush) mentioned. The contractor shall employ 100% zero ODP (ozone depletion potential) insulation; HCFC (hydro-chlorofluorocarbon)/ and CFC (chlorofluorocarbon) free HVAC and refrigeration equipment and / halon-free fire suppression and fire extinguishing systems.

f) The contractor shall ensure that all composite wood products/agro-fibre products used for cabinet work, etc do not contain any added urea formaldehyde resin.

20.2.28 RESOURCES CONSUMED DURING CONSTRUCTION

a. The contractor shall ensure that the water and electricity is not wasted during construction. The Engineer in Charge can bring to the attention any such wastage and the contractor will have to ensure that such bad practices are corrected.

b. The contractor shall install necessary meters and measuring devices to record the consumption of water, electricity and diesel on a monthly basis for the entire tenure of the project.

c. The contractor shall ensure that all run-off water from the site, during construction is collected and reused to the maximum.

d. The contractor shall use treated recycled water of appropriate quality standards for construction, if available.

e. No lights shall be turned on during the period between 7:00 AM to 6:00 PM, without the permission of the Engineer in Charge.

20.2.29 CONSTRUCTION WASTE

Contractor shall ensure that wastage of construction material is within 3%.

a) All construction debris generated during construction shall be carefully segregated and stored in a demarcated waste yard. Clear, identifiable areas shall be provided for each waste type and measures employed to segregate the waste on site into inert, chemical, or hazardous wastes.

b) All construction debris shall be used for road preparation, back filling, etc, used if described in the schedule of quantities and as per the instructions of the Engineer in Charge, with necessary activities of sorting, crushing, etc.

c) No construction debris shall be taken away from the site, without the prior approval of the Engineer in Charge.

d) The contractor shall recycle the unused chemical/hazardous wastes such as oil, paint, batteries, and asbestos.

e) If and when construction debris is taken out of the site, after prior permissions from the Engineer in Charge, then the contractor shall ensure the safe disposal of all wastes and will only dispose of any such construction waste in approved dumping sites.

20.2.30 Documentation

a) The contractor shall, during the entire tenure of the construction phase, submit the following records to the Engineer in Charge on a monthly basis:

i) Water consumption in litres
ii) Electricity consumption in 'kwh' units
iii) Diesel consumption in litres
iv) Quantum of waste (volumetric/weight basis) generated at site and the segregated waste types divided into inert, chemical and hazardous wastes.

v) Digital photo documentation to demonstrate compliance of safety guidelines as specified here and in the Appendix on Safety Conditions.

b) The contractor shall, during the entire tenure of the construction phase, submit the following records to the Engineer in Charge on a fortnightly basis:

i) Quantities of material brought into the site, including the material issued to the contractor by the Engineer in charge.
ii) Quantities of construction debris (if at all) taken out of the site
iii) Digital photographs of the works at site, the workers facilities, the waste and other material storage yards, pre-fabrication and block making works, etc as guided by the Engineer in Charge.

c) The contractor shall submit a document after construction of the buildings, a brief description along with photographic records to show that other areas have not been disturbed during construction. The document should also include brief explanation and photographic records to show erosion and sedimentation control measures adopted. (Document CAD drawing showing site plan details of existing vegetation, existing buildings, existing slopes and site drainage pattern, staging and spill prevention measures, erosion and sedimentation control measures and measures adopted for top soil preservation during construction

d) The contractor shall submit to the Engineer in Charge after construction of the buildings, a detailed as built quantification of the following:
i. Total materials used,
ii. Total top soil stacked and total reused
iii. Total earth excavated
iv. Total waste generated,
v. Total waste reused,
vi. Total water used,
vii. Total electricity, and
viii. Total diesel consumed.

e) The contractor shall submit to the Engineer in Charge, before the start of construction, a site plan along with a narrative to demarcate areas on site from which top soil has to be gathered, designate area where it will be stored, measures adopted for top soil reservation and indicate areas where it will be reapplied after construction is complete.

f) The contractor shall submit to the Engineer in Charge, a detailed narrative (not more than 250 words) on provision for safe drinking water and sanitation facility for construction workers and site personnel.

g) Provide supporting document from the manufacturer of the cement specifying the fly-ash content in PPC used in reinforced concrete.

h) Provide supporting document from the manufacturer of the pre-cast building blocks specifying the fly ash content of the blocks used in an infill wall system.

i) The contractor shall, at the end of construction of the buildings, submit to the Engineer in Charge, submit following information, for all material brought to site for construction purposes, including manufacturer's certifications, verifying information, and test data, where Specifications sections require data relating to environmental issues including but not limited to:
i) Source of products: Supplier details and location of the supplier.
ii) Project Recyclability: Submit information to assist Owner and Contractor in recycling materials involved in shipping, handling, and delivery, and for temporary materials necessary for installation of products.

iii) Recycled Content: Submit information regarding product post-industrial recycled and post-consumer recycled content. Use the "Recycled Content Certification Form", to be provided by the Commissioning Authority appointed for the Project.

iv) Product Recyclability: Submit information regarding product and product's component's recyclability including potential sources accepting recyclable materials where ever applicable.

j) Provide final certification of well-managed forest of origin to provide final documentation of certified sustainably harvested status: Acceptable wood "certified sustainably harvested" certifications shall include:

a) Wood suppliers' certificate issued by one of the Forest Stewardship Council-accredited certifying agencies;

b) Suppliers' invoice detailing the quantities of certified wood products for project;

c) Letter from one of a certifying agency corroborating that the products on the wood supplier's invoice originate from certified well-managed forests.

i) Clean tech: Provide pollution clearance certificates from all manufacturers of materials

ii) **I**ndoor Air quality and Environmental Issues: Submit emission test data, sourced from the manufacturers, produced by acceptable testing laboratory listed in Quality Assurance Article for materials as required in each specific Specification section.

a) Certifications from manufacturers of Low VOC paints, adhesives, sealant and polishes used at this particular project site.

b) Certification from manufacturers of composite wood products/agro fibre products on the absence of added urea formaldehyde resin in the products supplied to them to this particular site.

c) Submit environmental and pollution clearance certificates for all diesel generators installed as part of this project.

Provide total support to Engineer in Charge and Green Building Consultants appointed by the Engineer- in- Charge in completing all Green Building Rating related formalities, including signing of forms, providing signed letters in the contractor's letterhead whenever required.

20.2.31 EQUIPMENT

a) To ensure energy efficiency during and post construction all pumps, motors and engines used during construction or installed, shall be subject to approval and as per the specifications of the Engineer in Charge.

b) All lighting installed by the contractor around the site and at the labour quarters during construction shall be CFL bulbs of the appropriate illumination levels. This condition is a must, unless specifically prescribed.

The contractor is expected to go through all other conditions of the LEED & GRIHA rating stipulations.

Failure to adhere to any of the above mentioned items, without approval of the Engineer in Charge, shall be deemed as a violation of contract and the contractor shall be held liable for penalty as per terms of the agreement.

21.1 Formwork for exposed concrete surfaces:-

21.1.1Where it is specifically shown on the drawings to have original fair face finish of concrete surface without any rendering of plastering, formwork shall be carried put by using plywood on steel plates of approved quality.

21.1.2The forms shall be constructed so as to produce a uniform and consistent texture and pattern on the face of the concrete. The formwork shall be placed so that all horizontals are constructed of lumber and are not paneled and the formwork joints shall be staggered.

21.1.3 To achieve a finish which shall be free of board marks, the formwork shall be faced with plywood or equivalent material in large sheets. The sheets shall be arranged in an approved pattern. Whenever possible, joints between sheets shall be arranged to coincide with architectural feature, sills, window heads or change in direction of surface. All joints between panels shall be vertical or horizontal unless otherwise directed. Suitable joints shall be approved between sheets. The joints shall be arranged and fitted so that no blemish or mark is imparted to the finished surfaces.

21.1.4 Forms for exposed concrete surfaces shall be constructed with grade strips (the underside of which indicate top of pour) at horizontal constructions joints, unless the use of groove strips is specified on the drawings. The reset forms shall be tightened against the concrete so that the forms will not be spread and permit abrupt irregularities or loss of mortar. Supplementary form ties shall be used as necessary to hold the reset forms tight against the concrete.

21.1.5 For fair faced concrete, the position of through bolts will be restricted and generally as indicated on the drawings.

21.1.6 Plywood and steel plates used in the formwork for obtaining exposed surfaces shall be got approved from Engineer-in-Charge on each use. However no forms will be allowed for reuse if it is doubtful to produce desired texture of exposed concrete.

21.1.7 Cement of only approved shade shall be used preferably of single lot to achieve integrity of texture.

21.2 Class of Surface Finish:-

21.2.1 For Beams & Slabs :

The finish shall be uniform, dense and smooth. no grout, no grain pattern, no crazing and no major blemishes shall be permitted. Abrupt irregularities not exceeding 3mm and gradual irregularities less than 5mm in 2m length only shall be permitted.

21.2.2 For Columns/Wall/Fins :

The finish shall be uniform and smooth leveling the surface of the compacted concrete shall be done with a screed board with power floating the surface and over that steel trowelling the surface under firm pressure characteristics of finish shall be brush marks < 3mm gradual irregularities less than 10mm in 2m.

21.3 Tolerance in Finished Concrete:-

The formwork shall be so made as to produce a finished concrete true to shape, lines, level, plumb and dimensions as shown in the drawings subject to the following tolerance unless otherwise specified in this specification or drawings.

21.4 WALL/COLUMN/FINS:

21.4.1 Variation from the plumb	± 6mm	Upto 3m height
21.4.2 Variation from the plumb of conspicuous liner	± 6mm	Upto 6m height
21.4.3 Variation in the size of wall openings	(+)15mm (-) 6mm	
19.4.4 Variation in parapet wall thickness		
(a) Upto 30cm thickness	± 6mm	

21.5 SLAB, BEAM & GIRDER FORMS:

21.5.1 Variation from the level or from the specified grid for beam soffit before removal of shores,

(a) In any 3m	± 6mm
(b) In any 6m	± 10mm

All the tolerances mentioned above shall apply to concrete dimensions only, and not to positioning of vertical steel or dowels. The tolerances given above are specified for local aberration in the finished concrete surface and should not be taken as tolerance for the entire structure taken as whole for the setting and alignment of formwork. Any error, within the above tolerance limits, or any other if noticed in any of the structure after part or portion stripping of forms, shall be corrected in the subsequent work to bring back the structure to its true line, level and alignment.

22.0 Ultrasonic pulse velocity method test for RCC as per technical circular No. 18 issued vide CE(CSQ) letter No. G-2/SE(QA)/CSQ/69 dated 12.02.2013 shall be carried out as a routine test to assess the homogeneity and uniformity of concrete. The fulfilling criteria and other conditions shall be as detailed, as per the method stated in the aforesaid circular.

23.0 **Conditions for Readymix concrete** :-

(a) The contractor can use concrete from RMC plants also with prior approval of the Engineer-in-charge, instead of preparing the same in central batching plant at site within agreement item of Batch Mix Plant without any extra cost, looking to expedite the progress and need of work. However for procuring RMC from approved plant the contractor shall follow the following conditions. Nothing extra shall be payable to the contractor for procuring RMC from the external plant.

(b) For procurement of ready mix concrete from approved RMC plants, the contractor shall, within a 15 days of award of the work, submit list of at least three RMC plant companies of repute along with details of transit mixer and pumps etc. to be deployed indicating name of owner / company, its location capacity, technical establishment, past experience and text of MOU proposed to be entered between purchaser (the contractor) and supplier (RMC Plant). The Engineer – in – Charge shall give approval in writing (subject to draw of MOU). The contractor shall draw the MOU with approved RMC plant owner / company and submit to Engineer – in – Charge within a week of such approval. The contractor will not be allowed to purchase ready mixed – concrete without completion of above stated formalities for use in this project. Notwithstanding the approval granted by Engineer-in-charge in aforesaid manner, the contractor shall be fully responsible for quality of concrete including input control, transportation and placement etc.

(c) The Engineer-in-charge will reserve right to inspect at any such stage and reject the concrete if he is not satisfied about quality of product. The contractor should therefore draw MOU / agreement with RMC owner / company very carefully, keeping all terms and conditions / specifications forming a part of this tender document. Including the following controls.

i. The Engineer-in-charge reserves the right to exercise control over the ingredients, water and admixtures purchased, stored and to be used in the concrete including conducting of tests for checking quality of Materials, recordings of test results and declaring the Materials fit or unfit for use in production of mix.
ii. Calibration checks of the RMC.
iii. Weight and quantity check on the ingredients, water and admixtures added for batch mixing.
iv. Time of mixing of concrete.
v. Testing of fresh concrete, recordings of results and declaring the mix fit or unfit for use. This will include continuous control on the workability during production and taking corrective action.

For exercising such control, the Engineer-in-charge (if required) shall periodically depute his authorized representative at the RMC plant. It shall be responsibility of the contractor to ensure that all-necessary requirement manpower & facilities are made available to Engineer-in-charge and / or his authorized representative at RMC plant.

(d) The ready mix concrete should be produced in RMC plant using fully automatic batching plant having capacity to produce 30 cum/hr. The plant should have computerized control and shall give print out of all the ingredients.

(e) All required relevant records of RMC shall be made available to the Engineer-in-charge or his authorized representative. Engineer-in-charge shall, as required specify guidelines & additional procedures for quality control & other parameters in respect of materials and production & transportation of concrete mix, which shall be binding on the contractor & the RMC plant.

(f) PPC as per schedule of the contract (conforming to relevant IS Codes) of brand / make / source as approved by Engineer-in-charge shall only be used for production of concrete.

(g) The RMC produced concrete be accepted by Engineer-in-Charge at site after receipt of the same after fulfilling all the requirements of mix mentioned in the tender documents.

(h) The item of design mix cement concrete shall be inclusive of all the ingredients including admixtures if required, labour, machinery, T&P etc. required for a design mix concrete of required strength and workability. The rate quoted by the agency shall be net & nothing extra shall be payable on account of change in quantities of concrete ingredients like cement and aggregates and admixtures etc. as per the approved mix design.

(i) Ready mix concrete shall be arranged in quality as required at site of work by transportation in a transit mixer. [The general conditions of transit mixer and other requirement shall conform to IS:5892.] Ready mix concrete shall be supplied as per the pre-agreed schedule approved by Engineer-in-charge.

(j) All other operations in concreting work like Mixing, Slump, transportation, laying / placing of concrete, compaction, curing etc. not mentioned in this particular specification for Design Mix Concrete shall be as per IS : 456-2000 or amended thereafter.

(k) For design mix concrete of RCC other than those specified above, the contractor shall use the Design mix concrete produced by a central batching and mixing plant at his own cost. The

contractor, if he so desires, can arrange the design mix concrete also from Ready mix concrete producer after obtaining written approval of the Engineer-in-charge. Nothing extra whatsoever shall be payable on this account.

(l) Ready mix concrete shall be arranged in quantity as required at site of work. The ready mix concrete shall be supplied as per the pre-agreed schedule approved by Engineer-in-charge. Nothing extra shall be payable on this account.

(m) The item of design mix cement concrete (produced at site as well as arranged from RMC producer) shall be inclusive of all the ingredients including admixtures if required, labour, machinery, transportation etc. (except reinforcement and shuttering which will be measured & paid as per provision of contract) required for a design mix concrete of required strength and workability. The rate quoted by the agency shall be net & nothing extra shall be payable on account of changes in quantities of concrete ingredients like cement and aggregates and admixtures etc. as per approved mix design except for quantity of extra cement payable as per schedule of quantity. Other operations in concreting work like Mixing, Slump, transportation, laying / placing of concrete, compaction, curing etc. not mentioned in this particular specification for Design Mix of Concrete shall be as per IS : 456-2000.

24 Maintenance of Registers:

(i) All the registers for tests of material to be carried out at construction site or in outside laboratories shall be maintained by the contractor. These register shall be issued to the contractor by Engineer-in-Charge in the same manner as being issued to CPWD field staff.

(ii) The test registers to be issued to the contractor are :

a) Materials at site account register.
b) Cement register.
c) Master test registers.
d) Cube test register.
e) Paint register.
f) Drawing register.
g) Bitumen Register.
h) Inspection register.

(iii) All the entries in the register will be made by the designated engineering staff of the contractor and same should be regularly reviewed by AE/EE.

(iv) Contractor shall be responsible for safe custody of all the registers.

(v) Submission of copy of all test registers, material at site register along with each alternate running account bill and final bill shall be mandatory. These registers should be duly checked in division office.

25. WATER PROOFING TREATMENT

The contractor shall associate himself with the specialized firm, to be approved by the Engineer-in-charge in writing, for water proofing treatment for basement/lower ground floor, underground tank and on roofs. Guarantee in the prescribed proforma attached with tender document shall be given by the specialized firm, for a period of 10 years from the date after the maintenance period prescribed in the contract, which shall be counter signed by the contractor as token of overall responsibility. In addition 10% (ten percent) of the cost of water proofing items shall be retained as guarantee to watch the performance of the work done. However half of this retained amount will be released after five years, if the performance of the work done is found satisfactory. If

however any defect is noticed during the guarantee period, it shall be rectified by the contractor within seven days of intimation. In case it is not attended to, the same will be got done by another agency at the risk and cost of the contractor. This guarantee deposit can however be released in full if a bank guarantee of equivalent amount for 10 years is produced and deposited with the department by the contractor.

26. The Contractor has to take care of all safety measures required during execution of work for protection of his own labour as well as the residence residing there in the campus. He should make proper barricading as per the contract and also deploy extra labour if required, to ensure safety and to avoid any unforeseen accidents etc. In case of any accident happens in the campus during execution, due to lack of safety measures or any other reason what so ever, the agency is fully responsible and all the expenses on this account shall be bear by the contractor and nothing extra on this account shall be paid to the contractor and CPWD will not be responsible at all.

27. Hard rock excavated in the work shall be the property of contractor for which amount @ Rs. 359.90 per cum shall be deducted from contractor's bill. The contractor can either use the same after necessary working (Chiselling, hammering ,etc.) in the RR masonry work or take away the same from site .Recovery shall be made after measurement of stack of hard rock after reduction for voids as per CPWD specifications and direction of Engineer-in-charge.

EXECUTIVE ENGINEER (GPD)
CPWD GWALIOR

Annexure – 'A'

On Non-Judicial Stamp Paper of minimum Rs. 100

(Guarantee offered by Bank to CPWD in connection with the execution of contracts)

Form of Bank Guarantee for Earnest Money Deposit / Performance Guarantee / Security Deposit / Mobilization Advance

1. Whereas the Executive Engineer…….(name of division)……, CPWD on behalf of the President of India (hereinafter called "The Government") has invited bids under ……(NIT Number) …….dated …….for……(name of work) …….. The Government has further agreed to accept irrevocable Bank Guarantee for Rs. ……..(Rupees ……only) valid upto ……..(date)* …….as Earnest Money Deposit from ……..(name and address of contractor) ……..(hereinafter called "the contractor") for compliance of his obligations in accordance with the terms and conditions of the said NIT.

   Or**

   Whereas the Executive Engineer……..(name of division)……..,CPWD on behalf of the President of India (hereinafter called "The Government") has entered into an agreement bearing number ……. With …….……..(name and address of contractor)…… ……..(hereinafter called "the contractor") for execution of work …..……(name of work) …….. The Government has further agreed to accept irrevocable Bank Guarantee for Rs. ……..(Rupees ……only) valid upto ……..(date)* …….as Performance Guarantee / Security Deposit / Mobilization Advance from the said Contractor for compliance of his obligations in accordance with the terms and conditions of the agreement.
2. We, …….(indicate the name of the bank)……..(herein after referred to as "the Bank") , hereby undertake to pay to the Government an amount not exceeding Rs. ……..(Rupees……only) on demand by the Government within 10 days of the demand.
3. We,……(indicate the name of the Bank)……..,, do here by undertake to pay the amount due and payable under this guarantee without any demur, merely on the demand from the Government stating that the amount claimed is required to meet the recoveries due or likely to be due from the said Contractor. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs……(Rupees……only).
4. We, ……(indicate the name of the Bank)……, further undertake to pay the Government any money so demanded notwithstanding any dispute or disputes raised by the contractor in any suit or proceeding pending before any Court or Tribunal, our liability under this Bank Guarantee being absolute and unequivocal. The payment so made by us under this Bank Guarantee shall be a valid discharge of our li9ability for payment there under and the Contractor shall have no claim against us for making such payment.

5. We, ……(indicate the name of Bank)……, further agree that the Government shall have the fullest liberty without our consent and without affecting in any manner our obligation here under to vary any of the terms and conditions of the said agreement or to extended time of performance by the said Contractor from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said contractor and to forbear or enforce any of the terms and conditions relating to the said agreement and wr shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractor or for any forbearance, act of omission on

the part of the Government or any indulgence by the Government to the said Contractor or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. We, ……(indicate the name of the Bank)…….., further agree that the Government at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor at the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee the Government may have in relation to the contractor's liabilities.
7. This guarantee will not be discharged due to the change in the constitution of the Bank or the contractor.
8. We, ……(indicate the name of the Bank)…….., undertake not to revoke this guarantee except with the consent of the Government in writing.
9. This Bank Guarantee shall be valid up to …….unless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs…….(Rupees……only) and unless a claim in writing is lodged with us within the date of expiry or extended date of expiry of this guarantee, all our liabilities under this guarantee shall stand discharged.

Date…….

Witnesses:

1. Signature……..
   Name and address

   Authorized signatory
   Name
   Designation
   Staff code no.
   Bank seal

2. Signature ……..
   Name and address

*Date to be worked out on the basis of validity period or 90 days where only financial bids are invited and 180 days for two / three bid system from the date of submission of tender.

**In paragraph1, strike out the portion not applicable. Bank Guarantee will be made either for earnest money or for performance guarantee / security deposit / mobilization advance, as the case may be.

Annexure 'B'

FORMAT OF RECEIPT OF DEPOSITION OF ORIGINAL EMD

Receipt of deposition of original EMD
(Receipt No. ...../ date.....)

Name of work : C/o Training Hostel/Facility including furniture and electrical work at CAFRI Campus Jhansi (U.P.)

1. **NIT No: 08/SE/EE/GPD(Gwalior)/2026-27**
2. **Estimated Cost : Rs. 2,91,89,058/-(Civil – Rs. 2,25,95,936/- + Electrical – Rs 65,93,122/-)**
3. **Amount of Earnest money Deposit ₹ 5,83,781/-**
4. **Last date of submission of bid 25-11-2026 upto 03:00 PM.**

1. **Name of contractor.....#....**
2. **Form of EMD .....#....**
3. **Amount of Earnest Money Deposit .....#....**
4. **Date of submission of EMD .....#.....**

Signature, Name and Designation of EMD receiving officer (EE/AE(P)/AAO) along with stamp

Email:----------
Contact No.----------

(# To be filled by EMD receiving Executive Engineer, or NIT issuing EE as the case may be)

Annexure 'F'

Undertaking on structural stability and soundness of already completed buildings and infrastructure projects: -

I / we undertake and confirm that any building / infrastructure constructed by our firm / partnership firm / company has not suffered any failure, making it unfit for intended use, either due to structural design and defects or due to use of sub-standard materials or execution of sub-standard work, poor workmanship or any other reason during the last 25 (twenty-five) years.

I/we, further undertake that if such information comes to the notice of CPWD, then Engineer-in-charge shall be free to terminate the bid / agreement and to forfeit the entire amount of earnest money deposit, performance guarantee and security deposits.

I / we, also undertake that in addition to above, the Engineer-in-charge shall be free to debar us forever from tendering in CPWD.

The decision of Engineer-in-charge or any higher authority shall be final and binding.

Signature of
Notary with seal

Signature of bidder or
an authorized person
Of the firm with stamp

Note: **Affidavit to be furnished on a 'non-judicial' stamp paper of Rs. 200/- (scanned copy of the notarized affidavit to be uploaded at the time of submission of bid.)**

Annexure - I

(SPECIMEN)

(Ref. para 3.7 of Particular Specifications and Special conditions)

GUARANTEE TO BE EXECUTED BY CONTRACTORS FOR REMOVAL OF DEFECT AFTER COMPLETION IN RESPECT OF WATER PROOFING WORKS

The Agreement made this …….day of ……two thousand and …… between ……son of …….of …….(hereinafter called the **Guarantor** of the one part) and the PRESIDENT OF INDIA (hereinafter called Government of the other part).

WHEREAS this agreement is supplementary to a contract (hereinafter called the Contract) dated …….. and made between the **GUARANTOR** of the one part and the Government of the other part, whereby the Contractor, inter alia, undertook to render the buildings and structures in the said contract recited completely water and leak – proof.

AND WHEREAS **GUARANTOR** agreed to give a guarantee to the effect that the said structures will remain water and leak-proof **for ten years** from the date of giving of water proofing treatment.

NOW THE **GUARANTOR** hereby guarantees that water proofing treatment given by him will render the structures completely leak-proof and the minimum life of such water proofing treatment shall be ten years to be reckoned from the date after the maintenance period prescribed in the contract.

Provided that the guarantor will not be responsible for leakage caused by earthquake or structural defects or misuse of roof or alteration and for such purpose;

(a) Misuse of roof shall mean any operation which will damage water proofing treatment, like chopping of firewood and things of the same nature which might cause damage to the roof;
(b) Alteration shall mean construction of an additional storey or a part of the roof or construction adjoining to existing roof whereby proofing treatment is removed in parts;
(c) The decision of the Engineer-in-charge with regard to cause of leakage shall be final.

During this period of guarantee the **guarantor** shall make good all defects and in case of any defect being found, render the building water –proof to the satisfaction of the Engineer-in-Charge at his cost, and shall commence the work for such rectification within seven days from the date of issue of the notice from the Engineer-in-Charge calling upon him to rectify the defects, failing which the work shall be got done by the Department by some other contractor at the **GUARANTOR'S** cost and risk. The decision of the Engineer-in-Charge as to the cost, payable by the **Guarantor** shall be final and binding.

That if **GUARANTOR** fails to execute the water proofing or commits breach thereunder then the **GUARANTOR** will indemnify the Principal and his successors against all loss, damage, cost, expense or otherwise which may be incurred by him by reason of any default on the part of the **GUARANTOR** in performance and observance of this supplementary agreement. As to the amount of loss and / or damage and / or cost incurred by the Government the decision of the Engineer – in – Charge will be final and binding on the parties.

IN WITNESS WHEREOF these presents have been executed by the Obligor ……. and by …….. and for and on behalf of the PRESIDENT OF INDIA on the day, month and year above written.

Signed, sealed and delivered by OBLIGOR in the presence of –

1. …….
2. …….

Signed for and on behalf of THE PRESIDENT OF INDIA by ……..in the presence of –

1. …….
2. …….

Annexure –II

GUARANTEE BONDS/AFFIDAVIT FOR ALUMINIUM WORK

GUARANTEE TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF ALUMINIUM WORKS / **UPVC** WINDOWS

The agreement made this _____ day of _____ two thousand and _____ between _____ S/o _____ (hereinafter called the GUARANTOR of the one part) and the PRESIDENT OF INDIA (hereinafter called the Government of the other part).

WHEREAS THIS agreement is supplementary to a contract. (Herein after called the Contract) dated _____ and made between the GUARANTOR OF THE ONE PART AND the Government of the other part, whereby the contractor interalia, under look to render the work in the said contract recited structurally stable workmanship and use of sound materials.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the effect that the said work will remain structurally stable and guarantee against faulty workmanship, finishing, manufacturing defects of materials and leakages etc.

NOW THE GUARANTOR hereby guarantee that work executed by him will remain structurally stable, after the expiry of maintenance period prescribed in the contract for the minimum life of **5 (Five)** years, to be reckoned from the date after the expiry of maintenance period prescribed in the contract.

The decision of the Engineer in charge with regard to nature and cause of defects shall be final.

During the period of guarantee the guarantor shall make good all defects to the satisfaction of the Engineer in charge calling upon him to rectify the defects, failing which the work shall be got done by the Department by some other contractor at the guarantor's cost and risk. The decision of the Engineer in charge as to the cost payable by the Guarantor shall be final and binding.

That if the guarantor fails to make good all the defects, commits breach there under then the guarantor will indemnify the Principal and his successor against all loss, damage cost expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and / or damage and / or cost incurred by the Government the decision of the Engineer in charge will be final and binding on the parties.

IN WITHNES WHEREOF those presents have been executed by the obligator _____ and _____ by for and on behalf of the PRESIDENT OF INDIA on the day , month and year first above written.

Signed sealed and delivered by OBLIGATOR in presence of :.

1. _____
2. _____

SIGNED FOR AND ON BEHALF OF THE PRESIDENT OF INDIA BY_____ _____ in the presence of :

1. _____
2. _____

Annexure –III

GUARANTEE TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF WATER SUPPLY AND SANITARY INSTALLATIONS

The agreement made this ____ Day of ____ Two thousand …….. between M/s _____ S/o _____ (Hereinafter called the GUARANTOR of the one part) and the President of India (hereinafter called the Government of the other part).

WHEREAS this agreement is supplementary to a contract (hereinafter called the contract) dated _____ and made between the GUARANTOR OF THE ONE PART AND the Government of the other part, whereby the contractor inter-alia, undertook to render the work in the said contract recited structurally stable workmanship, finishing and use of sound materials.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the affect that the said work will remain structurally stable and guaranteed against faulty workmanship, finishing, manufacturing defects of materials and leakages, etc.

NOW THE GUARANTOR hereby guarantee that the work executed by him will remain structurally stable after the expiry of maintenance period prescribed in the contract for the minimum life of **10 Years (Ten years)** to be reckoned from the date after the expiry of maintenance period prescribed in the contract**.**

The decision of the Engineer-in-charge with regard to nature and cause of defect shall be final.

During this period of guarantee, the guarantor shall make good all defects to the satisfaction of the Engineer-in-Charge calling upon him to rectify the defects failing which the work shall be got done by the Department by some other contractor at the Guarantor's cost and risk. The decision of the Engineer-in-Charge as to the cost payable by the guarantor shall be final and binding.

That if the guarantor fails to make good all the defects, commits breach thereunder, then the guarantor will indemnify the principal and his successor against all loss, damage, cost expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage and/or cost incurred by the Government, the decision of the Engineer-In-Charge will be final and binding on both the parties.

IN WITNESS WHEREOF these presents have been executed by the obligator _____ and _____ by _____ for and on behalf of the PRESIDENT OF INDIA on the day, month and year first above written.

Signed, sealed and delivered by OBLIGATOR in the presence of:

1._____ 2. _____

SIGNED FOR AND ON BEHALF OF THE PRESIDENT OF INDIA BY ____in the presence of :-

1._____ 2. _____

Annexure 'IV'

FORMAT FOR UNDERTAKING FOR SITE INSPECTION

To,

The EE (GPD)
C.P.W.D. Gwalior (M.P.)

I/we hereby give an undertaking for the given work as

follows: NIT No.: - 08/SE/EE/GPD (Gwalior)/2026-27

Name of work: C/o Training Hostel/Facility including furniture and electrical work at CAFRI Campus Jhansi (U.P.)

I/we have inspected and examined the site and its surroundings is / are satisfied before submitting our bid as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation I/we may require and in general shall myself / ourselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect our bid. I/we shall be deemed to have full knowledge of the site whether I/we inspect it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. I/we shall be responsible for arranging and maintaining at our own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents.

Submission of a bid by a I/we implie(s) that I/we have read this notice and all other contract documents and has made myself / ourself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to us by the Government and local conditions and other factors having a bearing on the execution of the work.

Place : Date :

Yours faithfully

(Signatures)

Annexure 'V'

FORMAT FOR UNDERTAKING

To,

The EE (GPD)
C.P.W.D. Gwalior (M.P.)

I/we hereby give an undertaking for the given work as follows:

NIT No. :- 08/SE/EE/GPD (Gwalior)/2026-27

Name of work : C/o Training Hostel/Facility including furniture and electrical work at CAFRI Campus Jhansi (U.P.)

I/we have studied the special Note as laid down in NIT Page No.6, Para XI and I am quoting the rates after taking this special Note into consideration in addition to all other special conditions mentioned in this NIT. I assure that I shall follow all the Special Conditions of this NIT as well as the Special Note given at Page No. 6, Para XI, failing which, I / we shall be solely responsible on this account for any action taken by CPWD in this regard.

Place :

Date :

Yours faithfully

(Signatures of Bidder(s))

LIST OF APPROVED MATERIALS (CIVIL)

Note :

1. Unless otherwise specified, the brand/make of the material as specified in the item nomenclature or in the particular specifications or in the list of approved materials attached in the tender, shall be used in the work.
2. The Contractor shall obtain prior approval from the Engineer-in-charge before placing order for any specific material/ Brand/ Make.
3. Whenever the specified brand of material is not available than, the Engineer-in-charge may approve any material equivalent to that specified subject to proof being offered by the Contractor for its equivalence and its non-availability to his satisfaction.

	MATERIALS:	BRAND/MAKE
1.	AAC Block	Siporex, Ultratech, Ecolite, J.K. Laxmi (Cement Ltd.), Dlite Blocks, Orillite – Kota, Aerocon Buildwell Pvt. Ltd., Ujjain, Birla Aerocon.
2.	AAC Block Adhesive	Ferrous crete(Ferro-1188), ARDEX ENDURA (White Star), Ultratech (Fixed-Block)
3.	i) Acrylic Smooth exterior paint	Asian paint/, Berger, ICI dulux
	ii) Acrylic emulsion paint	Asian paint, Berger, Nerolac, ICI dulux
	iii) Synthetic enamel paint	Asian paint, Nerolac, Berger, ICI dulux
	iv) 1st quality acrylic distemper	Asian paint, Berger, Nerolac, ICI dulux.
4.	Epoxy Adhesive	FOSROC, Aquomix , Choksey, BAL-ENDURA , Ultratech, Ferrous Crete.
5.	Aluminium Composite Panel	Alpolic, Aluco Bond, Reynobond, Euro bond, Alstrong, Aludecor.
6.	Aluminium Extrusions / sections	Hindalco, Indian Aluminium Co., Jindal
7.	Annealed Float Glass	Saint Gobain, Modi Guard, AIS.
8.	Bitumen	Indian Oil, Hindustan Petroleum, Bharat Petroleum
9.	Calcium Silicate Board / Tiles	Aerolite, Hilux, Starpan
10.	CC Pavers / Grass Pavers	**Nitco, Hindustan, Ultra, KJS Concrete, Devcons, Duracrete, Goyal Concrete Pipes. Parthsarthy.**
11.	Centrifugally Cast Iron Pipe & Fittings	NECO, SKF, BIC, RIF, KAPILANSH, M/s Raj Pattern Makers & Founders Pvt. Ltd.(RPMF)
12.	Ceramic Tiles	Kajaria, Somany, Nitco, Johnson, RAK Ceramics, Orient Bell.
13.	Chequered / Tactile Tiles	Dura, Eurocon, Modern, Hindustan, Johnson, Eavison, NITCO
14.	CI Manhole Cover	BIC, SKF, Hepco, Kapilansh, RIF, RPMF,NECO.
15.	CI Double flanged non-return valves	Kirloskar, Sant, Kartar
16.	CP fittings	Jaquar, Kohler, Grohe.
17.	CPVC Pipes & Fittings	Astral , Ashirvad, Prince, Supreme, Finolex, VECTUS, Prayag Polymers Pvt. Ltd.
18.	Curtain Carrier / Drapery Rod	Marvel, Vista levlor, Johnson.
19.	Dash fastener, Expansion Bolt	Hilti, Bosch Fischer
20.	Hydraulic Door closer, Floor springs	Dorma, Hettich, Hafele, Geze, Hardwyn,Ozone, Godrej.
21.	Ductile Iron Pipe (Water Supply)	Electro steel, Kesoram, KDUPL, Electro Spun, TATA, DUCTURA, JINDAL
22.	GRC tile	Unistone, Eurocon, Dazzle, Pavit
23.	Epoxy Grouting Compound	Pidilite, Ferrous Crete(Ferro-102), MYK, LATICRETE, Ardexendura, Ultratech
24.	Epoxy Primer & Paints	Berger, Pidilite, CICO, BASF, SIKA, Asianpaints
25.	Fire Check door with frame	Shakti Horman, Navair, Godrej, DormaKABA.
26.	Float Glass Mirror/ Toughened/ Frosted Glass Mirror/Fire rated glass	Saint Gobain, M/s Gold Plus Glass Industries Ltd., Modi guard, AIS.
27.	Flush Doors (ISI Mark only)	Century, Kitlam, Archid, Greenply, Duro.
28.	Friction Stay	Earl-Bihari, Geze, Hettich, Securistyle, Ebco, Godrej.
29.	Galvanized/Stainless Steel Anchor Fasteners	Arrow, Hilti, Fischer
30.	GI Pipe & fittings	Tata, Zenith, Jindal, Prakash Surya, Swastik, Unik,Zoloto
31.	GI Sheet	Sail, TATA, Jindal
32.	Gun Metal Gate Valve & all types of valves	Zoloto, Leader, SANT, Prayag Polymers Pvt. Ltd.
33.	Glass Mosaic Tile	Bisazza, Italia, Palladio, Mridul
34.	Gypsum Board (False Ceiling)	Boral Gypsum, India Gypsum, Saint- Gobain
35.	Gypsum Plaster	Ferrouscrete, Ultratech, Gyprock (Elite 90)
36.	FRP Door	Fiberways, Bhatt FRP, Cappello, Jayna, Shiv Shakti
37.	Hardener	Hardcrete of Snowcem India, Pidilite, CICO. Asian Paints, Ferrous Crete
38.	HDPE Pipes	Astral, Supreme, Prayag Polymers Pvt. Ltd.
39.	Jet Assembly for EWC/Health Faucet	Jaquar, Grohe, Kohler.
40.	Kitchen loft tank	Sintex, Tirupati Structurals Ltd, KMS Plast world P.Ltd. Planet Plastics, Sri Kamakshi Traders, Sreyah Novel InC. PLASTO.
41.	Laminate and Veneers	Merino, Greenlam, Formica, Kitlam, Durian (Cedar Décor Private Limited)

CORRECTION **NIL** INSERTION **NIL**

CUTTING **NIL** OVERWRITING **NIL**

AE (Admn.) O/o SE,Gwalior

42.	Locks / Latch/bolts/handle/door stopper	Godrej, Dorma, Yale, Doorset, Hafele, Prayag Polymers Pvt. Ltd.Ozone.
43.	Marine Plywood / BWP Ply	Duro, Century, Greenlam, Kitply.
44.	Melamine Polish	Asianpaints, Pidilite, ICI Dulux, Berger
45.	Metal False Ceiling	Armstrong, Durlum, Lafarge, Anutone, Hunter Douglas, Hi steel.
46.	Mineral Fibre/ GRG Ceiling	Armstrong, Daiken, Anutone, Diamond, Credence,Saint Gobain Gyproc, Lafarge.
47.	M.S. Pipe (Railing)	Jindal, Tata, RINL, Prakash Surya
48.	M.S. Tubes	Tata, Apollo, Prakash Surya,RINL
49.	Multi-coat Synthetic Plaster/ Textured Exterior wall paint	Spectrum, Heritage, BASF, SIKA Ultratech, Asianpaints, Fosroc , Berger
50.	Plywood,	Greenply, Century, Duro
51.	Polycarbonate Sheet	Bayer, Macrolux, Danpalon India Ltd.
52.	Polysulphide / Silicon Sealant	Pidilite, Fosroc, Tuffseal, Chouksey Chemicals, Ferrous Crete
53.	PPR Pipes	SFMC, SAFE, Poineer Industries, Vectus, Prayag Polymers Pvt. Ltd.
54.	Precast CC interlocking Tiles/ Precast concrete pipes, manhole cover etc.	Hindustan, Paver India, KK, Goyal Concrete pipes, Mehatab.
55.	Precoatd Profile Sheet	Tata, Jindal, Everest.
56.	Pre-laminated Particle Board	Ecoboard, Action-Tesa, Duro, Century Ply, Greenlam
57.	Pressed steel door frame	M/s Engineers & Fabricator, Raipur, M/s J.K. Enternprises, Jaipur, M/s Jangid Engineering Works, Jaipur, M/s Swastik, M/s Super Industries, Mohali, M/s SKS Steel Industries, New Delhi.
58.	PTMT Fitting	Prayag Polymers Pvt. Ltd., Supreme ,Finolex.
59.	PVC Cistern	Steelbird, Jindal, Seabird, Prayag Polymers Pvt. Ltd., Supreme.
60.	PVC Connection Pipe	Supreme, Prince, Finolex, Prayag Polymers Pvt. Ltd.
61.	PVC Rain Water Pipe & Fitting (SWR) Pipes	Finolex, Kasta, Supreme, Astral, Prince, Vectus, Prayag Polymers Pvt. Ltd. Kisan.
62.	PVC Shutter/ WPC (door shutter & panel/ sheets/frames)	Polygreen, Rajshri, Plastogreen, Sintex,
63.	PVC Water storage Tank (Only ISI)	VECTUS, Water well, Plasto, Sintex, Prayag Polymers Pvt. Ltd.,
64.	Ready Mix Concrete (RMC)	Lafarge, Alchon, ACC, L&T, Grasim, Ultratech, RMC Ind
65.	Ready Mix Plaster	Ultratech, Ferrous Crete, Saint Gobain, Asian Paint.
66.	Sluice Valve	Kirloskar, Venus, Kalpana, SANT, KARTAR, Zolto
67.	Solid PVC frames and shutters/WPC	Polygreen, Rajshri, Plastogreen, Sintex
68.	Stainless Steel	Jindal, Salem, TATA, SAIL
69.	Stainless steel Sink with or without Draining board.	Nirali, Hindware, Frankee, Neelkanth, Prayag Polymers Pvt. Ltd., JINDAL
70.	Stainless steel Door/Window fittings & Fixtures	Dorma, Ozone, D.Line, Hettich, Kich, Geze, Doorset, HAFELE, Prayag Polymers Pvt. Ltd.
71.	Structural steel section	TATA, SAIL, RINL, JSW Steel Ltd., Jindal Steel & Power Ltd., APL Apollo.
72.	Super plasticizer / admixture	Sika, Fosroc, Chouksey Chemicals, BASF, Pidilite, Bergr, Asian paint.
73.	Tensile Fabric	Bluestone, Encon, Structure Flex
74.	Tile Adhesive	Ferrous Crete(Ferro-1122), Ardex Endura (Gold Star), PIDILITE (Fevimate XL), WEABR(Saint-Gobin) Sika, Fosroc.
75.	Towel Ring/Towel Rod/Towel Rack/soap Dispenser/Soap dish holder	Jaquar, Kolher, Grohe
76.	Tubular Steel Window	M/s Engineers & Fabricator, Raipur, M/s J.K. Enterprises, Jaipur, M/s Swastik Super Industries, Mohali (Punjab) M/s Jangid Engg. Jaipur
77.	UPVC Pipes & Fittings	Astral Flowguard, Ashirvad, Prince, Supreme, Finolex,VECTUS, Prayag Polymers Pvt. Ltd. ,TEXMO
78.	UPVC Windows	Fenesta, Aluplast, Kommerling, Duraplast.
79.	Washbasin, Orrisa Pattern W.C., Wall mounted European W.C. Seat with Cistern	Jaquar, Kohler, Grohe, Prarryware, Hindware.
80.	Vitrified Tile	Johnson -Marbonite, Somany, Kajaria, NITCO, RAK
81.	Wall Putty	JK, BIRLA, Asian, Ferrous Crete
82.	Waste Pipe	Kamal, Viking, Jaquar, Prayag Polymers Pvt. Ltd.
83.	Water Proofing Compound	Pidilite, Cico, Fosroc, BASF, Ardex Endura, Sika, Asian paints, Kryton Buildmat Co. Pvt.. Ltd., Berger.
84.	White Cement	JK White, Birla White, Grasim
85.	Urinal	Jaquar, Kohler, Grohe

86.	S.S. butt hinges	Prayag Polymers Pvt. Ltd., Ozone , Doorset , Godrej.
87.	Ordinary Portland Cement / Portland Pozzolona Cement /Sulphate Resisting Portland cement	**ACC, Ultratech, Birla Gold, Ambuja & J.K. Cement.**
88.	Reinforcement Steel TMT bars Fe-500D or more	SAIL, Tata Steel, RastriyaIspat Nigam Ltd. (RINL), JSW Steel Ltd., Jindal Steel & Power Ltd.
89.	CRS steel bars Fe-500D or more	SAIL, Tata Steel, RastriyaIspat Nigam Ltd. (RINL), JSW Steel Ltd., Jindal Steel & Power Ltd.
90.	UPVC windows (profile)	Fenesta,,Kommerlimg, Aluplast, Duroplast
91.	UPVC Doors and window hardware	Rotto, Dorset, Kinlong.
92.	APP Membrane	Swastik, Sika, Asian paints, IWL
93.	Expansion joint	D.S Brown, CS Group, Sanfield, Vexcolt
94.	Vertical/Roller blinds	D-Decor, Vista Levoural , Deck, Hunder Duglus
95.	Anti carbonation pant	SIKA, BASF, Asian Paints
96.	Rockwool/glass wool	Saint Gobain, Armacell , Roxul Rockwool
97.	Acoustical wooden panel, fabric panel, pet panel, acoustical false ceiling	Knauf India Pvt. Ltd. , Credence acoustic and ceilings Pvt. Ltd, Anutone acoustics Pvt. Ltd , Topakustik AG

Note : All the make approved by the O/o ADG, (Region Bhopal), CPWD, Bhopal upto the previous day submission of bid are also approved.

Condition Regarding Approved Makes and Equivalents:-

1. The make/brand of products specified in the Schedule of Quantities (SOQ), Nomenclature of Items, and the List of Approved Makes shall be strictly adhered to. However, in the event that the specified make/brand is not available in the market, the contractor shall submit a request for approval of an equivalent make/brand to the Engineer-in-Charge within thirty (30) days from the date of award of work.

2. Approval of such equivalent make/brand shall be considered only if the originally specified make/brand is not available in the market, and shall be at the sole discretion of the Engineer-in-Charge. In cases where the rate of the approved equivalent make is lower than that of the specified make, the difference in cost shall be adjusted and recovered from the contractor. However, if the rate of the approved equivalent make is higher, no extra payment shall be admissible.

3. For items/materials not appearing in the Schedule of Quantities (SOQ), Nomenclature of Items, and the List of Approved Makes, the decision of the Engineer-in-Charge regarding the make/brand to be used shall be final and binding on the contractor.