Sl. No.	Description		Clause Ref.
		Jal Nigam, Ghaziabad.	
13	The key equipments /machinery for construction of works shall be:	As below	Cl 16.2

Sl. No.	Name of equipment/machinery	Quantity
1	Concrete Mixture	01
2	Generator	01
3	Vibrator	01

Sl. No.	Description		Clause Ref.
14	Competent authorities are:	General Manager, C&DS., U.P. Jal Nigam.	Cl 24.1
15	(a) The period for submission of the programme for approval of Engineer ..... days from the issue of Letter of Acceptance	Ten days	Cl 26.1
	(b) The updated programme shall be submitted at interval of ..... days.	60 days	Cl 26.3
	(c) The amount to be withheld for late submission of an updated programme shall be	Rs. 10,000=00 per day	Cl 26.3
16	The key equipment for field laboratory shall be :	N/A	Cl 31.1a

Sl. No.	Name of equipment	Quantity

Sl. No.	Description		Clause Ref.
17	No increase in rates of any items specified in Bill Of Quantities is allowed due to variation in quantities	Not allowed for any limit.	Cl 36.1
18	The authorized person to make payments is	Project Manager, Unit-28, C&DS, U P Jal Nigam, Ghaziabad.	Cl 39.2
19	(a) Milestones to be achieved during the contract period	(1) 1/8th of the value of entire contract work up to 1/4th of the period allowed for completion of construction (2) 3/8th of the value of entire contract work up to ½ of the period allowed for completion of construction (3) 3/4th of the value of entire contract work up to ¾th of the period allowed for completion of construction	Cl 44.1
	(b) Amount of liquidated damages for Delay in completion of works.	For Whole of work 1 percent of the Initial Contract Price, rounded off to the nearest Thousand, per week.	
	(c) Maximum limit of liquidated damages for delay in completion of work.	10 per cent of the Initial Contract Price rounded off to the nearest thousand	
20	The standard form of Performance Security acceptable to the Employer shall be an unconditional Bank Guarantee of the type as presented in the Bidding Documents.	As per Tender Document.	Cl 46.1
21	The date by which "as-built" drawings (in scale as directed) in 2 sets are required is within .....of issue of certificate of completion of whole or part of the work, as the case may be.	4 Weeks	Cl 51.1
22	The amount to be withheld for failing to supply "as-built" drawings	Rs. 50,000.00	Cl 51.2

Sl. No.	Description		Clause Ref.
23	(a) The period for setting up a field laboratory with the prescribed equipment is .....days from the date of notice to start work.	7 (Seven) days	Cl 52.2.9
	(b) The following events shall also be fundamental breach of contract:	"The Contractor has contravened Clause 7.1 and Clause-9 of Part I General Conditions of Contract.	Cl 52.2.16

Appendix to Part I

General Condition of Contract

SALIENT FEATURES OF SOME MAJOR LABOUR LAWS APPLICABLE TO ESTABLISHMENTS ENGAGED IN BUILDING AND OTHER CONSTRUCTION WORK.

a) Workmen Compensation Act 1923: - The Act provides for compensation in case of injury by accident arising out of and during the course of employment.

b) Payment of Gratuity Act 1972: - Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed the prescribed minimum years (say, five years) of service or more or on death the rate of prescribed minimum days'(say, 15 days) wages for every completed year of service. The Act is applicable to all establishments employing the prescribed minimum number (say, 10) or more employees.

c) Employees P.F. and Miscellaneous Provision Act 1952: The Act Provides for monthly contributions by the Employer plus workers at the rate prescribed (say, 10% or 8.33%). The benefits payable under the Act are:

i. Pension or family pension on retirement or death as the case may be.

ii. Deposit linked insurance on the death in harness of the worker.

iii. Payment of P.F. accumulation on retirement/death etc.

d) Maternity Benefit Act 1951: - The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.

e) Contract Labour (Regulation & Abolition) Act 1970: - The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided, by the Principal Employer by Law. The principal Employer is required to take Certificate of Registration and the Contractor is required to take license from the designated Officer. The Act is applicable to the establishments or Contractor of Principal Employer if they employ prescribed minimum (say 20) or more contract labour.

f) Minimum Wages Act 1948: - The Employer is to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of buildings, roads, runways are scheduled employment.

g) Payment of Wages Act 1936: - It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.

h) Equal Remuneration Act 1979: - The Act provides for payment of equal wages for work of equal nature to male and female workers and for not making discrimination against female employees in the matters of transfers, training and promotions etc.

i) Payment of Bonus Act 1965: - The Act is applicable to all establishments employing prescribed minimum (say, 20)or more workmen. The Act provides for payments of annual bonus within the prescribed range of percentage of wages to employees drawing up to the prescribed amount of wages, calculated in the prescribed manner. The Act does not apply to certain establishments. The newly set-up establishments are exempted for five years in certain circumstances. States may have different number of employment size.

j) Industrial Disputes Act 1947: - The Act lays down the machinery and procedure for resolution of industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.

k) Industrial Employment (Standing Orders) Act 1946: - It is applicable to all establishments employing prescribed minimum (say, 100, or 50). The Act provides for laying down rules governing the conditions of employment by the Employer on matters provided in the Act and get these certified by the designated Authority.

l) Trade Unions Act 1926: - The Act lays down the procedure for registration of trade unions of workmen and Employers. The Trade Unions registered under the Act have been given certain immunities from civil and criminal liabilities.

m) Child Labour (Prohibition & Regulation) Act 1986: - The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulations of employment of children in all other occupations and processes. Employment of child labour is prohibited in building and construction industry.

n) Inter-State Migrant Workmen's (Regulation of Employment & Conditions of Service) Act 1979: - The Act is applicable to an establishment which employs prescribed minimum (say, five) or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The Inter-State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as Housing, Medical-Aid, Travelling expenses from home up to the establishment and back etc.

o) The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act 1996 and the Cess Act of 1996: - All the establishments who carry on any building or other construction work and employs the prescribed minimum (say, 10) or more workers are covered under this Act. All such establishments are required to pay cosset the rate not exceeding 2% of the cost of construction as may be modified by the Government. The Employer of the establishment is required to provide safety measures at the building or construction work and other welfare measures, such as canteens, first-aid facilities, ambulance, housing accommodations for workers near the work place etc. The Employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

p) Factories Act 1948: - The Act lays down the procedure for approval of plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is

applicable to premises employing the prescribed minimum (say, 10) persons or more with aid of power or another prescribed minimum (say, 20) or more persons without the aid of power engaged in manufacturing process.

q) Arbitration and Conciliation Act, 1996: - The Act lays down the procedure for appointment of Arbitrator, Arbitration and conciliation, Jurisdiction of Arbitral Tribunals, Recourse against Arbitral award appeals.

SECTION – 4

PART-II

CONDITIONS OF CONTRACT

SPECIAL CONDITIONS OF CONTRACT

SPECIAL CONDITIONS OF CONTRACT

1. **Contractor to indemnify Employer against Patent Rights :**

The contractor shall fully indemnify and keep indemnified the Employer against any action, claim or proceedings relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties which may be payable in respect of any article or part thereof included in the contract. In the event of any claims made under or action brought against Department/Government in respect of any such matters as aforesaid, the contractor shall be immediately notified thereof and the contractor shall be at liberty, at his own expense, to settle any dispute or to conduct any litigation that may arise there from, provided that the contractor shall not be liable to indemnify the Employer if the infringement of the patent or design or any alleged patent or design right is the direct result of an order passed by the Engineer in this behalf.

2. **Unfiltered water supply:**

The contractor(s) shall make his/their own arrangements for water required for the work and nothing extra will be paid for the same. This will be subject to the following conditions.

i. That the water used by the contractor(s) shall be fit for construction purposes to the satisfaction of the Engineer.

ii. The Engineer shall make alternative arrangements for supply of water at the risk and cost of contractor(s) if the arrangements made by the contractor(s) for procurement of water are in the opinion of the Engineer, unsatisfactory.

3. **Departmental water supply, if available:**

Water if available may be supplied to the contractor by the Department subject to the following conditions:-

i. The water charges @ 1% shall be recovered on gross amount of the work done.

ii. The contractor(s) shall make his/their own arrangement of water connection and lying of pipelines from existing main of source of supply.

iii. The Department does not guarantee to maintain uninterrupted supply of water and it will be incumbent on the contractor(s) to make alternative arrangements for water at his/their own cost in the event of any temporary break down in the water main so that the progress of his/their work is not held up for want of water. No claim of damage or refund of water charges will be entertained on account of such break down.

4. **Changes in firm's Constitution to be intimated:**

Where the contractor is a partnership firm, the prior approval in writing of the Engineer shall be obtained before any change is made in the constitution of the firm. Where the contractor is an individual

or a Hindu undivided family business concern, such approval as aforesaid shall likewise be obtained before the contractor enters into any partnership agreement where under the partnership firm would have the right to carry out the works hereby undertaken by the contractor. If previous approval as aforesaid is not obtained, the contract shall be deemed to have been assigned in contravention of the terms of the agreement and action may be taken at the risk and the cost of the Contractor.

5. **Recovery of Compensation paid to workmen:**

In every case in which by virtue of the provision sub-section (1) of Section 12, of the Workmen's Compensation Act.1 923, Employer is obliged to pay compensation to a workman employed by the contractor, in execution of the works, Employer will recover from the contractor, the amount of the compensation so paid, and, without prejudice to the rights of the Employer under sub-section (2) of Section 12, of the said Act, Employer shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by Employer to the contractor whether under this contract or otherwise. Employer shall not be bound to contest any claim made against it under sub-section (1) of Section 12, of the said Act, except on the written request of the contractor and upon his giving to Employer full security for all costs for which Employer might become liable in consequence of contesting such claim.

5.1 In respect of all labour directly or indirectly employed in the work for the performance of the contractors part of this contract, the contractor shall at his own expense arrange for the safety provisions as per Safety Code framed from time to time and shall at his own expense provide for all facilities in connection therewith. In case the contractor fails to make arrangement and provide necessary facilities as aforesaid, he shall be liable to pay a penalty of Rs. 2000/- for each default and in addition, the Engineer shall be at liberty to make arrangement and provide facilities as aforesaid and recover the costs incurred in that behalf from the contractor. The contractor shall be completely held responsible for any mishap at site due to insufficient safety measures.

6. **Building to Remain free from unauthorised Occupation:**

It shall be the responsibility of the contractor to see that the building under construction is not occupied by anybody unauthorised during construction, and is handed over to the Client with vacant possession of complete building. If such building though completed is occupied illegally, then the Engineer shall have the option to refuse to accept the said building I buildings in that position. Any delay in acceptance on this account will be treated as the delay in completion and for such delay, a levy up to 5% of tendered value of work may be imposed by the Employer whose decision shall be final both with regard to the justification and quantum and be binding on the contractor. However, Engineer, through a notice, may require the contractor to remove the illegal occupation any time on or before construction and delivery.

7. **Engagement of agency for specialized works:**

Contractor has to **engage specialized agencies** for specialised items of works as mentioned in **Clause 2.20** of ITB. Only those specialised agencies/firms who have satisfactorily executed works as per following criteria during last 10 (Ten) years are eligible for the specialized works-

(a) Three similar works each costing not less than 30% of cost of this job in tender

Or

(b) Two similar works each costing not less than 40% of cost of this job in tender.

Or

(c) One similar work costing not less than 60% of cost of this job in tender.

Approval of the specialised agencies for each specialised work shall be obtained from the Engineer within one month of award of work. Even if, such specialised items of work shall be executed by the specialised agencies, the work shall be deemed to be executed by the tenderer for all purposes and the responsibility of the quality of items of works executed shall continue to be that of the tenderer only.

8. Contractor has to provide reinforcement cover blocks made of approved proprietary pre packed free flowing mortars as per approved make by Employer.

9. **Security of Assets:**

The contractor shall place a private security agency on the site of work for safety & security of materials, personnel's, vehicles and machinery etc. at his own cost. The security agency shall also regulate movement of materials, personnel's, vehicles and machinery. This agency shall follow the guidelines given by the Engineer. Nothing extra shall be paid on this account.

10. **Site Office:**

10.1 **For projects of above Rs. 75.00Cr tender cost:**

10.1.1 The contractor has to provide, maintain and run free of cost six office rooms with three toilets as per drawing provided by Engineer for the purpose of site office for field staff of Employer (Approx. area 135 sqm) and one conference hall of capacity of fifteen (15) persons (Minimum Size 8.00rnX4.50m) with one toilet for the purpose of holding meetings during the inspection of senior officers of Employer/third party/client department etc.

10.1.2 The contractor has to also make arrangement for furnishing of this site office as well as the conference hall with appropriate numbers of tables, chairs, conference table, ceiling fans, electric fittings, six nos. air conditioners, telephone, internet, photocopier, and two computers with one inkjet colour and one laser b/w printer and operators along with all consumables, regular electric supply (at no extra cost to the Employer) and purified drinking water facility and other furniture as

per direction of Engineer. No extra payment on account of this shall be made to the contractor.

10.1.3 One room for storage of samples, of minimum area of 40 sqm. must also be constructed at site for keeping various material brought by the contractor at site and approved by the Engineer. No extra payment on account of this shall be made to the contractor.

10.1.4 All the above structures should be decent looking and shall be constructed, run and maintained, cleaned as per directions of Engineer.

10.1.5 All the above structures shall be demolished after completion of work and the dismantled material shall be the property of the contractor.

10.2 **For projects of between Rs. 20.00 Cr to Rs. 75 Cr tender cost:**

10.2.1 The contractor has to provide, run and maintain free of cost four office rooms with attached toilets as per drawing provided by Engineer for the purpose of site office for field staff of Employer (Approx.area 95 sqm).

10.2.2 The contractor has to also make arrangement for furnishing of this site office appropriate numbers of tables, chairs, ceiling fans, electric fittings, six nos. air conditioners, telephone, internet, photocopier, and one computer with laser printer and operator along with all consumables, regular electric supply (at no extra cost to the Employer) and purified drinking water facility and other furniture as per direction of Engineer. No extra payment on account of this shall be made to the contractor.

10.2.3 One room for storage of samples, of minimum area of 40 sqm. must also be constructed at site keeping various material brought by the contractor at site and approved by the Engineer. No extra payment on account of these shall be made to the contractor.

10.2.4 All the above structures should be decent looking and shall be constructed as per direction of Engineer.

10.2.5 All the above structure shall be demolished after completion of work and the dismantled material shall be the property of the contractor.

10.3 For **Projects** of less than Rs. 20.00 Cr tendered cost above requirements/facilities will be decided by the Engineer on case to case basis whose decision shall be final and binding on the Contractor.

11. **Vehicles:**

11.1 **For projects of above Rs. 75 crores tender cost:**

11.1.1 The Contractor shall provide, establish and maintain two powered taxi (four whellers) registered vehicles with fuel, maintenance & driver holding commercial license (such as Innova or equivalent as per satisfaction of Engineer) & 2 nos. motorcycles (two wheelers) of minimun 175 c.c. engine capacity not older than one year, for Employer's site staff use on this project within 15 days of acceptance of tender.

11.1.2 The average running of each four wheeled vehicle shall be 3500 km/ month whereas for two wheeled vehicle this average running for each vehicle shall be 2000 km averaged on qualterly basis.

11.1.3 In case of non-compliance of the same, a penalty/recovery @ Rs. 60,000/- per month per four wheeled vehicle and @ Rs. 10000.00/- per two wheeled vehicle on pro rata daily basis shall be made from the contractor. In addition, the vehicles used by Engineer shall be adjusted from the contractor as per the Employer taxi charges.

11.2 **For Projects between Rs. 20.00 Cr to Rs.75.00 Cr tender cost:**

11.2.1 The contractor shall, within 15 days of acceptance of tender, provide one powered taxi registered vehicles with fuel, maintenance & driver holding commercial license, not older than one year (Sedan Vehicle such as Maruti Dzire, Honda Amaze or equivalent as per satisfaction of Engineer) for use of Employer's staff. The average running of the vehicle will be 3000 km/ month.

11.2.2 In case of non-compliance of the same penalty/ recovery @ Rs. 40,000/- per month may be made from the contractor on prorata daily basis. In addition, the vehicle to be used by Engineer shall be adjusted from the contractor as per the Employer taxi charges.

12. The contractor shall produce all original documents of Custom & other clearances of all the materials imported (if any) up to the quantity to be used for tendered work before use.

13. The contractor shall procure TMT bars of appropriate grade, as per design, from primary steel producers such as SAIL, Tata Steel Ltd, RINL, Jindal Steel & Power Ltd and JSW Steel Ltd or any other producer as approved by the Employer who are using iron ore as the basic raw material/input.

14. The contractor shall have to obtain vouchers and furnish test certificates to the Engineer in respect of all supplies of steel brought by him to the site of work.

15. The steel reinforcement bars shall be stored by the contractor at site of work in such a way as to prevent distortion & 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.

16. Reinforcement including authorised spacer bars and lap lengths shall be measured in length of different diameters, as actually (not more than as specified in the drawing) used in the work, nearest to a centimeter. Wastage and unauthorised overlaps shall not be measured.

17. The tenderer shall see the approaches to the site. In case any approach from main road is required by the contractor, the same shall be made good, improved and maintained by the contractor at his own cost. No payment shall be made on this account.

18. The contractor (s) shall give to the Municipality, Police and other authorities all necessary notices etc. that may be required by law and obtain all requisite Licenses for temporary obstructions, enclosures etc. and pay all fee, taxes and charges which may be leviable on account of these operations in executing the contract. He shall make good any damage to the adjoining property whether public or private and shall supply and maintain light and other for cautioning the public at night.

19. Contractor shall provide permanent bench marks and other reference points for the proper execution of work and these shall be preserved till the end of work. All such reference points shall be in relation to the levels and locations, given in the drawings.

20. The contractor shall make his own arrangement for obtaining electric connection and make necessary payments directly to the department concerned.

21. Other agencies doing works related with this project may also simultaneously execute their works and the contractor shall afford necessary facilities for the same. The contractor shall leave such necessary holes, openings etc. for laying/burying in the work, pipes cables, conduits, clamps, boxes and hooks for fan clamps etc. as may be required for the other agencies. Nothing extra over the Agreement rates shall be paid for doing these.

22. The building work shall be carried out in the manner complying in all respects with the requirements of the relevant bylaws and regulations of the local body under the jurisdiction of which the work is to be executed or as directed by the Engineer and nothing extra shall be paid on this account.

23. The contractor shall give a performance test of the entire installation(s) as per standing specifications before the work is finally accepted by making his own arrangements for water supply, electricity etc. and nothing extra whatsoever shall be payable for the same.

24. It shall be ensured by the contractor that no electric live wire is left exposed or unattended to avoid any accidents in this regard.

25. The structural and architectural drawings shall at all times be properly co-related before executing any work. However, in case of any discrepancy in the item given in the schedule of quantities appended with the tender and Architectural drawings relating to the relevant item, the former shall prevail unless otherwise given in writing by the Engineer.

26. The contractor shall maintain in perfect condition, all portions executed till completion of the entire work allotted to him. Where however phased delivery of work is contemplated these provisions shall apply separately to each phase.

27. If the work is carried out in more than one shift or during night no claim on this accounts shall be entertained.

28. The contractor shall be responsible for the watch and ward/guard of the buildings, safety of all fittings and fixtures including sanitary and water supply fittings and fixtures provided by him against pilferage and breakage during the period of installations and thereafter till the building is physically handed over to the department. No extra payment shall be made on this account.

29. The contractor shall take instructions from the Engineer for stacking of materials. No excavated earth or building materials etc. shall be stacked/collected in areas where other buildings, roads, services, compound walls etc. are to be constructed.

Any trenching and digging for laying sewer line/water lines/cable etc. shall be commenced by the contractor only when all men, machinery and materials have been arranged and closing of the trenches shall thereafter be ensured within least possible time.

30. The works shall be carried out in accordance with the Architectural drawings and structural drawings, to be issued from time to time by the Engineer. Before commencement of any item of work, the contractor shall correlate all the relevant architectural and structural drawings issued for the work and satisfy himself that the information available thereof is complete and unambiguous. The discrepancy, if any shall be brought to the notice of the Engineer before execution of the work. The contractor alone shall be responsible for any loss or damage executing by the commencement of work on the basis of any erroneous and or incomplete information.

31. The contractor shall take all precautions to avoid accidents, exhibiting caution boards day and night, speed limit boards, red flags, red light and providing necessary barriers and other measures required from time to time. The contractor shall be responsible for all damages and accidents due to negligence on his part.

32. Other agencies may also simultaneously execute and install the works of electrification, air conditioning, lifts, fire-fighting etc. for this work and the contractor shall provide necessary facilities for the same. The contractor shall leave such recesses, holes openings etc. as may be required for the electric, air-conditioning and other related works (for which inserts, sleeves, brackets, conduits base pinion, clamps etc. shall be got arranged 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 & brick work, if required and nothing extra shall be payable on this account.

33. The contractor shall conduct 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 and shall as

far as possible arrange his work and shall place and dispose of 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 coordinated manner and shall perform it in proper sequence to the complete satisfaction of others.

34. All Architectural drawings given in the tender other than those indicated in nomenclature of items are only indicative of the nature of the work and materials/fixings involved unless and otherwise specifically mentioned. However, the work shall be executed in accordance with the drawings duly approved by the Engineer.

35. Samples of all materials and fittings to be used in the work in respect of brand manufacturer and quality shall be got approved from the Engineer, and shall be preserved till the completion of the work. Articles bearing BIS certifications mark shall only be used unless no manufacturer has got BIS mark for the particular material. Any material/fitting whose sample has not been approved and any other unapproved material brought by the contractor shall be immediately removed as soon as directed.

Unless otherwise specified in the schedule of quantities the rates for all items shall be considered as inclusive of pumping/baling out water, if necessary, for which no extra payment shall be made. Those conditions shall be considered to include water from any source such as inflow of flood, surface and sub-soil water etc. and shall apply to the execution in any season.

36. **Environmental Compliance:**

All essential environmental measures including but not limited to the following are to be taken to control pollution.

36.1 **Construction Vehicles, Equipment and Machinery:**

36.1.1 All vehicles, equipment and machinery to be procured for construction shall conform to the relevant Bureau of India Standard (BIS) norms.

36.1.2 Emission from the vehicles must conform to environmental norms.

36.1.3 Dust produced from the vehicular movement and other site activities is to be mitigated by sprinkling of water.

36.1.4 Noise limits for construction equipments shall not exceed 75dB(A), measured at one meter from the edge of the equipment in free area, as specified in the Environment Protection Act, 1986, schedule VI part E, as amended till date, The maximum noise levels near the construction site should be limited to 65dB (A) Leq (5 min) in project area.

36.2 **Construction Wastes Disposal:**

36.2.1 The pre-identified dump locations will be a part of solid waste management plan to be prepared by the Contractor in consultation with Engineer.

36.2.2 Contractor shall get approved the location of disposal site prior to commencement of the excavation on any section of the project location.

36.2.3 Contractor shall ensure that any spoils of material/construction waste will not be disposed of in any municipality solid waste collection bins.

36.3 **Procurement of Construction Materials:**

36.3.1 All vehicles delivering construction materials to the site shall be covered to avoid spillage of materials and maintain cleanliness of the roads.

36.3.2 Wheel Tires of all vehicles used by of the contractor, or any of his subcontractor or materials suppliers shall be cleaned and washed clear of all dust/mud before leaving the project premises. This shall be done by routing the vehicles through tire washing tracks.

36.3.3 Contractor shall arrange for regular water sprinkling at least twice a day (i.e. morning and evening) for dust suppression of the construction sites and unpaved roads used by his construction vehicles.

36.4 **Water Pollution:**

36.4.1 The Contractor shall take all precautionary measures to prevent the wastewater during construction to accumulate anywhere.

36.4.2 The wastewater arising from the project is to be disposed of in the manner that is acceptable to the Engineer.

36.5 **Air and Noise Pollution**

Contractor shall use dust screens and sprinkle water around the construction site to arrest spreading of dust in the air and surrounding areas.

36.5.1 Contractor shall ensure that all vehicles, equipment and machinery used for construction are regularly maintained and confirm that emission levels comply with environmental emission standards/norms.

36.5.2 For controlling the noise from Vehicles, Plants and Equipments, the Contractor shall confirm the following:

36.5.2.1 All vehicles and equipment used in construction will be fitted with exhaust silencers.

36.5.2.2 Servicing of all construction vehicles and machinery will be done regularly and during routine servicing operations, the effectiveness of exhaust silencers will be checked and if found defective must be replaced by the contractor immediately.

36.5.2.3 Noise emission from compactors (rollers) front loaders, concrete mixers, cranes (movable), vibrators and saws should be less than 75 dB(A).

36.5.2.4 As per the standards/guidelines for control of Noise Pollution from Stationary Diesel Generator (DG) sets, noise emission in dB(A) from DG Set (15-500 KVA) should be less than 94+1O log 1O (KVA).

36.6 Adequate drinking water facility should be provided at site, adequate number of decentralized latrines and urinals to be provided for construction workers.

36.7 Full time workers residing on site should be provided with clean and adequate temporary hutment.

36.8 Adopt measures to prevent air pollution in the vicinity of the site due to construction activities. The best practices should be followed (as adopted from international best practice documents and codes).

36.9 Identify roads on-site that would be used for vehicular traffic. Update vehicular roads (if these are unpaved) by increasing the surface strength by improving particle size, shape and mineral type that make up the surface base. Add surface gravel to reduce source of dust emission. Limit amount of fine particles (smaller than 0.075mm) to 10-20%. Limit vehicular speed on site 10 km/h. Nothing extra will be payable for this.

36.10 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.

36.11 Spills of dirt or dusty materials shall be cleaned up promptly so the spilled material does not become a source of fugitive dust and also to prevent 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.

36.12 Ensure that water spraying is carried out by wetting the surface by spraying water on:

36.12.1 Any dusty material.

36.12.2 Areas where demolition work is carried out.

36.12.3 Any unpaved main-haul road and.

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

36.13 The contractor shall ensure the following:

36.13.1 Cover and enclose the site by providing dust screen, sheeting or netting to scaffold along the perimeter of a building.

36.13.2 Covering stockpiles of dusty material with impervious sheeting.

36.13.3 Covering dusty load on vehicles by impervious sheeting before they leave the site.

36.13.4 Transferring, handling/storing dry loose materials like bulk cement and dry pulverized fly ash inside a totally enclosed system.

36.14 Clear vegetation only from areas where work will start right away

36.15 Provide sheet covering/barricading of site of not less than 3m height along the site boundary, next to a road or other public area. Nothing extra will be paid for this.

36.16 The contractor shall provide experienced personnel with suitable training to ensure that these methods are implemented. Prior to the commencement of any work, the method of working, plant equipment and air pollution control system to be used on -site should be made available for the inspection and approval of the Engineer to ensure that these are suitable for the project.

36.17 Employ measures to segregate the waste on-site into inert, chemical or hazardous wastes. Recycle the unused chemical/hazardous wastes such as oil, paint, batteries and asbestos. The inert waste is to be disposed of to Municipal Corporation/local bodies dump yard and landfill sites.

36.18 To preserve the existing landscape and protect it from degradation during the process of construction. Select proper timing for construction activity to minimize the disturbance such as soil pollution due to spilling of the construction material and its mixing with rainwater. The construction management plan including soil erosion control management plan shall be prepared accordingly. The application of soil erosion control measures includes construction of gravel pits and tire washing bays of approved size and specification for all vehicular site entry/exits, protection of slopes greater than 10%. Sedimentation Collection System and run-off diversion systems shall be in place before the commencement of construction activity. Preserve and protect the existing vegetation by not-disturbing or damaging the specified site areas during construction.

36.19 The Contractor should follow the construction plan as proposed by the Engineer/landscape consultant to minimize the site disturbance such as soil pollution due to spilling. Use staging and spill prevention and control plan to restrict the spilling of the contaminating material on site.

36.20 Spill prevention and control plans should clearly state measures to stop the source of the spill, measures to contain the spill and measures to dispose the contaminated material and hazardous wastes. It should also state the designation of personnel trained to prevent and control spills, hazardous wastes include pesticides, paints, cleaners and petroleum products.

36.21 A soil Erosion and Sedimentation Control Plan (ESCP) should be prepared prior to construction and should be applied effectively.

36.22 Hazardous wastes include pesticides, paints, cleaners, and petroleum products.

36.23 The contractor shall ensure that no construction leaches (Ex: cement slurry) is allowed to percolate into the ground. Adequate precautions are to 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).

36.24 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 otherwise.

37. **Safety Measures to be followed:**

37.1 Suitable scaffolds should be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely from ladders. When a ladder is used, an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well, suitable footholds and hand-hold shall be provided on the ladder and the ladder shall be given an inclination not steeper than 1/4 to 1 (1/4 horizontal and 1 vertical.)

37.2 Scaffolding of staging more than 3.6 m (12ft.) above the ground or floor, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached or bolted, braced and otherwise secured at least 90 cm. (3ft.) high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

37.3 Working platforms, gangways and stairways should be so constructed that they should not sag unduly or unequally, and if the height of the platform or the gangway or the stairway is more than 3.6 m (12ft.) above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened as described in 37.2 above.

37.4 Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of person or materials by providing suitable fencing or railing whose minimum height shall be 90 cm. (3ft.)

37.5 Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9m.

(30ft.) in length while the width between side rails in rung ladder shall in no case be less than 29 cm. for ladder up to and including 3 m. (10 ft.) in length. For longer ladders, this width should be increased at least 1/4 for each additional 30 cm. (1 foot) of length. Uniform step spacing of not more than 30 cm shall be kept. Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites or work shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The contractor shall provide all necessary fencing and lights to protect the public from accident and shall be bound to bear the expenses of defense of every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and cost which may be awarded in any such suit; action or proceedings to any such person or which may, with the consent of the contractor, be paid to compensate any claim by any such person.

37.5.1 **Excavation and Trenching** - All trenches 1.2 m. (4ft.) or more in depth, shall at all times be supplied with at least one ladder for each 30 m. (100 ft.) in length or fraction thereof, Ladder shall extend from bottom of the trench to at least 90 cm. (3ft.) above the surface of the ground. The side of the trenches which are 1.5 m. (5ft.) or more in depth shall be stepped back to give suitable slope or securely held by timber bracing, so as to avoid the danger of sides collapsing. The excavated materials shall not be placed within 1.5 m. (5ft.) of the edges of the trench or half of the depth of the trench whichever is more. Cutting shall be done from top to bottom. Under no circumstances, undermining or undercutting shall be done.

37.5.2 **Safety Measures for digging bore holes:-**

37.5.2.1 If the bore well is successful, it should be safely capped to avoid caving and collapse of the bore well. The failed and the abandoned ones should be completely refilled to avoid caving and collapse;

37.5.2.2 During drilling, Sign boards should be erected near the site with the address of the drilling contractor and the Engineer of the work;

37.5.2.3 Suitable fencing should be erected around the well during the drilling and after the installation of the rig on the point of drilling, flags shall be put 50 m around the point of drilling to avoid entry of people;

37.5.2.4 After the completion of the borewell, the contractor should cap the bore well properly by welding steel plate, cover the bore well with the drilled wet soil and fix thorny shrubs over the soil. This should be done even while repairing the pump;

37.5.2.5 After the borewell is drilled the entire site should be brought to the ground level.

37.6 **Demolition** - Before any demolition work is commenced and also during the progress of the work,

37.6.1 All roads and open areas adjacent to the work site shall either be closed or suitably protected.

37.6.2 No electric cable or apparatus which is liable to be a source of danger or a cable or apparatus used by the operator shall remain electrically charged.

37.6.3 All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render it unsafe.

37.7 All necessary personal safety equipment as considered adequate by the Engineer should be kept available for the use of the person employed on the site and maintained in a condition suitable for immediate use, and the contractor should take adequate steps to ensure proper use of equipment by those concerned: The following safety equipment shall invariably be provided.

37.7.1 Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.

37.7.2 Those engaged in white washing and mixing or stacking of cement bags or any material which is injurious to the eyes, shall be provided with protective goggles.

37.7.3 Those engaged in welding works shall be provided with welder's protective eye shields.

37.7.4 Stone breaker shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.

37.8 When the work is done near any place where there is risk of drowning, all necessary equipments should be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision, should be made for prompt first aid treatment of all injuries likely to be obtained during the course of the work.

37.9 Use of hoisting machines and tackle including their attachments, anchorage and supports shall conform to the following standards or conditions :-

37.9.1

37.9.1.1 These shall be of good mechanical construction, sound materials and adequate strength and free from patent defects and shall be kept repaired and in good working order.

37.9.1.2 Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength, and free from patent defects.

37.9.1.3 Use of durable and reusable formwork systems to replace timber formwork and ensure that formwork where used is properly maintained.

37.9.2 Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in charge of any hoisting machine including any scaffolding winch or give signals to operator.

37.9.3 In case of every hoisting machine and of every chain ring hook, shackle swivel and pulley block used in hoisting or as means of suspension, the safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of a hoisting machine having a variable safe working load each safe working load and the condition under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.

37.9.4 The contractors shall notify the safe working load of the machine to the Engineer whenever he brings any machinery to site of work and get it verified by Engineer.

37.10 Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguards. Hoisting appliances should be provided with such means as will reduce to the minimum the risk of accidental descent of the load. Adequate precautions should be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations which are already energized, insulating mats, wearing apparel, such as gloves, sleeves and boots as may be necessary should be provided. The worker should not wear any rings, watches and carry keys or other materials which are good conductors of electricity.

37.11 All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near places of work.

37.12 These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent place at work spot. The person responsible for compliance of the safety code shall be named therein by the contractor.

37.13 To ensure effective enforcement of the rules and regulations relating to safety precautions the arrangements made by the contractor shall be open to inspection by the Labour Officer or Engineer or their representatives.

37.14 Notwithstanding the above clauses as above there is nothing in these to exempt the contractor from the operations of any other Act or Rule in force in the Republic of India.

38. FIRST-AID FACILITIES

38.1 At every work place, there shall be provided and maintained, so as to be easily accessible during working hours, first-aid boxes at the rate of not less than one box for 150 contract labour or part thereof ordinarily employed.

38.2 The first-aid box shall be distinctly marked with a red cross on white back ground and shall contain the following equipment:-

38.2.1 For work places in which the number of contract labour employed does not exceed 50-

Each first-aid box shall contain the following equipments :-

1. 6 small sterilised dressings.
2. 3 medium size sterilised dressings.
3. 3 large size sterilised dressings.
4. 3 large sterilised burn dressings.
5. 1 (30 ml.) bottle containing a two per cent alcoholic solution of iodine.
6. 1 (30 ml.) bottle containing salvolatile having the dose and mode of administration indicated on the label.
7. 1 snakebite lancet.
8. 1 (30 gms.) bottle of potassium permanganate crystals.
9. 1 pair scissors.
10. 1 copy of the first-aid leaflet issued by the Director General, Factory Advice Service and Labour Institutes, Government of India.
11. 1 bottle containing 100 tablets (each of 5 gms.) of aspirin.
12. Ointment for burns.
13. A bottle of suitable surgical antiseptic solution.

38.2.2 For work places in which the number of contract labour exceed 50.

Each first-aid box shall contain the following equipments.

1. 12 small sterilised dressings.
2. 6 medium size sterilised dressings.
3. 6 large size sterilised dressings.
4. 6 large size sterilised burn dressings.

5. 6 (15 gms.) packets sterilised cotton wool.
6. 1 (60 ml.) bottle containing a two per cent alcoholic solution iodine.
7. 1 (60 ml.) bottle containing salvolatile having the dose and mode of administration indicated on the label.
8. 1 roll of adhesive plaster.
9. 1 snake bite lancet.
10. 1 (30 gms.) bottle of potassium permanganate crystals.
11. 1 pair scissors.
12. 1 copy of the first-aid leaflet issued by the Director General Factory Advice Service and Labour Institutes /Government of India.
13. A bottle containing 100 tablets (each of 5 gms.) of aspirin.
14. Ointment for burns.
15. A bottle of suitable surgical antiseptic solution.

38.3 Adequate arrangements shall be made for immediate recoupment of the equipment when necessary.

38.4 Nothing except the prescribed contents shall be kept in the First-aid box.

38.5 The first-aid box shall be kept in charge of a responsible person who shall always be readily available during the working hours of the work place.

38.6 A person in charge of the First-aid box shall be a person trained in First-aid treatment in the work places where the number of contract labour employed is 150 or more.

38.7 In work places where the number of contract labour employed is 500 or more and hospital facilities are not available within easy distance from the works. First-aid posts shall be established and run by a trained compounder. The compounder shall be on duty and shall be available at all hours when the workers are at work.

38.8 Where work places are situated in places which are not towns or cities, a suitable motor transport shall be kept readily available to carry injured person or person suddenly taken ill to the nearest hospital.

SECTION – 5

SPECIFICATIONS

SPECIFICATIONS:

For items mentioned in the Schedule 'G' i.e. BOQ, the Contractor shall follow UPPWD Specifications/ BIS Standards/ CPWD Specifications relevant to the particular items of work. Wherever these specifications are not available standard engineering practices will be adopted with the approval of the Engineer. Some of the broad specifications are listed hereunder-

1. **Site Clearance:**
   - **1.1** Before the earth work is started, the area coming under cutting and filling shall be cleared of shrubs, rank vegetation, grass, brushwood, trees and saplings of girth up to 30cm measured at a height of one metre above ground level and rubbish removed up to a distance of 50 metres outside the periphery of the area under clearance. The roots of trees and saplings shall be removed to a depth of 60cm below ground level or 30 cm below formation level or 15 cm below sub grade level, whichever is lower, and the holes or hollows filled up with the earth, rammed and leveled.
   - **1.2** The trees of girth above 30 cm measured at a height of one metre above ground shall be cut only after permission of the Engineer is obtained in writing. The roots of trees shall also be removed as specified in Clause 1.1 payment for cutting such trees and removing the roots shall be made separately.
   - **1.3** Existing structures and services such as old buildings, culverts, fencing, water supply pipe lines, sewers, power cables, communication cables, drainage pipes etc. within or adjacent to the area if required to be diverted/removed, shall be diverted/dismantled as per directions of the Engineer and payment for such diversion/dismantling works shall be made separately.
   - **1.4** Lead of 50m mentioned in the 'Schedule Of Quantities' is the average lead for the disposal of excavated earth within the site of work. The actual lead for the disposal of earth may be more or less than the 50 m for which no cost adjustment shall be made in the rates.
2. **Setting Out And Making Profiles:**
   - **2.1** A masonry pillar to serve as a bench mark will be erected at a suitable point in the area, which is visible from the largest area. This bench mark shall be constructed connected with the standard bench mark as approved by the Engineer. Necessary profiles with strings stretched on pegs, bamboos or 'Burjis' shall be made to indicate the correct formation levels before the work is started. The contractor shall supply labour and material for constructing bench mark, setting out and making profiles and connecting bench mark with the standard bench mark at his own cost. The pegs, bamboos or 'Burjis' and the bench mark shall be maintained by the contractor at his own cost during the excavation to check the profiles.
   - **2.2** The ground levels shall be taken at 5 to 15 metres intervals (as directed by the Engineer Charge) in uniformly sloping ground and at closer intervals where local mounds, pits or undulations are met with. The ground levels shall be recorded in field books and plotted on plans. The plans shall be drawn to a scale of 5 metres to one cm or any other suitable scale decided by the Engineer. North direction line and position of bench mark shall invariable be shown on the plans. These plans shall, be signed by the contractor and the

Engineer or their authorized representatives before the earth work is started. The labour required for taking levels shall be supplied by the contractor at his own cost.

3. Earth Work& Filling:

3.1 All excavation operations manually or by mechanical means shall include excavation and 'getting out' the excavated materials. In case of excavation for trenches, basements, water tanks etc. 'getting out' shall include throwing the excavated materials at a distance of at least one metre or half the depth of excavation, whichever is more, clear off the edge of excavation. In all other cases 'getting out' shall include depositing the excavated materials as specified. The subsequent disposal of the excavated material shall be either stated as a separate item or included with the items of excavation stating lead.

3.2 In case of excavation for foundation in trenches or over areas, the bed of excavation shall be to the correct level or slope and consolidated by watering and ramming. If the excavation for foundation is done to a depth greater than that shown in the drawings or as required by the Engineer, the excess depth shall be made good by the contractor at his own cost with the concrete of the mix used for levelling/ bed concrete for foundations. Soft/defective spots at the bed of the foundations shall be dugout and filled with concrete (to be paid separately) as directed by the Engineer.

3.3 The earth used for filling shall be free from all roots, grass, shrubs, rank vegetation, brushwood,tress, sapling and rubbish.

3.4 Filling with excavated earth shall be done in regular horizontal layers each not exceeding 20 cm in depth. All lumps and clods exceeding 8 cm in any direction shall be broken. Each layer shall be watered and consolidated with steel rammer or ½ tons roller. Where specified, every third and top must layer shall also be consolidated with power roller of minimum 8 tonnes. Wherever depth of filling exceeds 1.5 metre vibratory power roller shall be used to consolidate the filing unless otherwise directed by Engineer-in-charge. The top and sides of filling shall be neatly dressed. The contractor shall make good all subsidence and shrinkage in earth fillings, embankments, traverses etc. during execution and till the completion of work unless otherwise specified.

3.5 Sand shall be clean and free from dust organic and foreign matter and its grading shall be within the limits of grading zone IV or V specified in Section 3 'Mortars' of CPWD Specifications, 2009.

4. Anti-Termite Treatment:

4.1 The termites find access to the super-structure of the building either through the timber buried in the ground or by means of mud shelter tubes constructed over unprotected foundations. Anti-termite treatment can be either during the time of construction i.e. pre-constructional chemical treatment or after the building has been constructed i.e. treatment for existing building.

4.2 Prevention of the termite from reaching the super-structure of the building and its contents can be achieved by creating a chemical barrier between the ground, from where the termites come and other contents of the building which may form food for the termites. This is achieved by treating the soil beneath the building and around the foundation with a suitable insecticide.

4.3 ***Chemicals:*** Any one of the following chemicals in water emulsion to achieve the percentage concentration specified against each chemical shall be used:

(i) Chlorphriphos emulsifiable concentrate of 20%

(ii) Lindane emulsifiable concentrate of 20%

Anti-termite treatment chemical is available in concentrated form in the market and concentration is indicated on the sealed containers. To achieve the specified percentage of concentration, Chemical should be diluted with water in required quantity before it is used. Graduated containers shall be used for dilution of chemical with water in the required proportion to achieve the desired percentage of concentration.

5. Design Mix Concrete:

The contractor shall be required to submit two separate design mix of concrete with and without using plasticizers, separately. The decision of the engineer to specify the design mix of concrete based on above shall be final.

5.1 Coarse aggregate: As per UPPWD/CPWD Specifications.

5.2 Fine Aggregate: As per UPPWD/CPWD Specifications.

5.3 Water: It shall conform to requirements laid down in IS:456: 2000 and UPPWD/CPWD specifications.

5.4 Cement: Cement arranged by the contractor will be PPC (in bags) conforming to IS: 1489-Part-l. If for any reasons, cement other than that specified in this Para for example OPC of grade 43 or higher grade is brought to site by contractor, payments rate as well as the quantity to be used in the design mix concrete will remain unchanged.

5.5 Slump: Design slump should be clearly specified in the mix design.

5.6 Admixtures shall not be used without approval of Engineer. Wherever required, admixtures of approved quality shall be mixed with concrete as specified. The admixtures shall conform to IS: 9103. The chlorides content in the admixture shall satisfy the requirements of BS: 5075. The total amount of chlorides admixture mixed concrete shall also satisfy the requirements of IS: 456. The contractor shall not be paid anything extra for admixture required for achieving desired workability without any change in specified water cement ratio for RCC/CC work.

5.7 Grade of Concrete: The compressive strength of various grades of concrete shall to be given as below:

	Grade designation	Compressive strength on 15 cm cubes min. 7 days (N/mm2)	Specified characteristic compressive strength at 28 days (N/mrn2)	Minimum cement quantity (Kg. per cum. Mtr.)	Maximum water cement ratio
I	M20	Nominal Mix	20	As per table 5, clause 6.1.2,8.2.4.1 & 9.1.2 page 20 of IS 456-2000	0.50
II	M25	As per design	25		0.50
III	M30	As per design	30		0.45
IV	M35	As per design	35		0.45
V	M40	As per design	40		0.40

Note

(i) In the designation of a concrete mix letter M refers to the mix and number to the specified characteristic compressive strength of 15 cm x 15 cm x 15 cm - cube 28 days expressed in N/mrn2

(ii) Design slump has to be constantly monitored and maintained during placing of concrete through slump tests carried out as per PWD/CPWD specifications for Mortar, Concrete and RCC works, and records maintained accordingly.

5.8 The concrete mix design/laboratory tests with and without admixture shall be got done by contractor at his own cost and will be carried out by the contractor through one of the following laboratory *Test* houses:

5.8.1 IITKanpur, IIT Varanasi, IIT Roorkee, HBTI Kanpur.

5.8.2 Other Approved Labs/Govt. Engineering Institutions as directed by the Engineer.

The various ingredients for mix design/laboratory tests shall be sent to the test houses through the Engineer and the samples of such aggregate &cement shall be preserved at site by the department.

5.9 The contractor shall submit the mix design report from any of above approved laboratory for approval of Engineer-in-Charge within 30 days from the date of issue of letter of acceptance of the tender. No concreting shall be done until the mix design is approved by the Engineer.

5.10 In case of change of source or characteristic properties of the ingredients used in the concrete mix during the work, a revised laboratory mix design report conducted at laboratory established at site shall be submitted by the contractor as per the direction of the Engineer.

6. Approval Of Design Mix:

The mix design for a specified grade of concrete shall be done for a target mean compressive strength Tck=Fck+ 1.65 s.

Where Fck= Characteristic compressive strength of 28 days

s = Standard deviation which depends on degree of quality control

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 bellow:

Grade of Concrete	For "Good" quality of control
M25	4.00
M30	5.00
M35	5.00
M40	5.00

Of the six specimen 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 to be attained at 28 days

6.1 All cost of mix designing and testing connected therewith including charges payable to the laboratory shall be borne by the contractor.

6.2 The batching plant shall conform to IS:4925. It shall have the facilities of presetting the quantity to be weighed with automatic cutoff when the same is achieved. Concreting at places may have to be resorted to through concrete pump for which nothing extra shall be paid.

6.3 All other operations in concreting work like Mixing, Slump, Laying Placing of concrete, compaction curing etc. not mentioned in this particular specification for Design Mix of concrete shall be as per Employer.

7. Work Strength Test:

7.1 Test Specimen:Workstrength test shall be conducted in accordance with IS: 456 on random sampling. Each test shall be conducted on six specimens, three of which shall be tested at 7 days and remaining three at 28 days.

7.2 Test Results Of Samples:

The test result of the sample shall be the average of the strength of three specimens. The individual variation shall not be more than 15 percent of the average. If more, the test results of the sample are invalid. Not more than 90% of the total test shall be done at the laboratory established at site by contractor and 10% testing of materials shall be got done from IIT/ NIT. However, for the tests to be carried out by the external laboratories, the contractor shall supply free of charge all the materials required for testing, including transportation. If the tests which were to be conducted in the site laboratory are conducted in other laboratories for any the reasons the cost of such tests shall be borne by the contractor.

7.3 Lot Size

The minimum frequency of sampling of concrete of each grade shall be according to the following: -

Quantity of concrete in the work cubic metre per day	Number of samples.
1-5	1
6-15	2
16-30	3
31-50	4
51& above	4 + one additional sample for additional 50 cubic meter or part thereof.

Note: At least one sample shall be taken from each shift.

7.4 STANDARDS OF ACCEPTANCE

(i) In case the test result of all the samples is above the characteristic compressive strength, the concrete shall be accepted.

(ii) In case the test result of one or more samples fails to meet the requirement (i) above it shall be accepted if both the following conditions are met:

a) Any individual test result is not less than (Fck - 4) N/mm2

b) The mean of test result from any group of four consecutive samples is more than (Fck+4) N/mm2.

(iii)Concrete of each grade shall be assessed separately.

(iv) Concrete is liable to be rejected if it is porous or honeycombed, its placing has been interrupted without providing a proper construction joint or the reinforcement has been displaced beyond the tolerances specified, or construction tolerances have not been met. However the hardened concrete may be accepted after carrying out suitable remedial measures to the satisfaction of the Engineer for which nothing extra is payable to the contractor.

7.5 Only MS centering/shuttering and scaffolding material unless & otherwise specified/permitted shall be used for all RCC work to give an even finish of concrete surface. However marine ply shuttering in exceptional cases as per site requirement may be used on specific request from contractor on approval by the Engineer.

7.6 In case of actual average compressive strength being less than specified strength which shall be governed by Para 'Standard of Acceptance" as above the rate payable shall be worked out accordingly on prorata basis.

7.7 In case of rejection of concrete on account of unacceptable compressive strength governed by Para "Standard of Acceptance" as above, the work for which samples have failed shall be redone at the cost of contractors. However the Engineer may order for additional test (like cutting cores, ultrasonic pulse velocity test, load tests on structure or part of structure etc.) to be carried out at the cost of contractor to ascertain if the portion of structure wherein concrete represented by the sample has been used, can be retained on the basis of results of individual or combination of these tests. The contractor shall take remedial measures necessary to retain the structure as approved by the Engineer without any extra cost. However for payment the basis of rate payable to contractor shall be governed by the 28 days cube test results.

8. **Sanitary Installations, Water Supply And Drainage:**

8.1 The work of water supply and sanitary installations shall be got executed by the contractor in accordance with design & drawings provided by Consultant through Engineer. The entire responsibility for the quality of work will however rest with the building contractor only.

8.2 The work of water supply, internal sanitary installations and drainage etc. shall be carried out as per the bylaws of the Municipal Corporation or any other local body.

8.3 The contractor shall engage licensed plumbers for the work. Nothing extra shall be paid/reimbursed for the same.

8.4 The contractor shall give a performance test of the entire installation(s) as per standing specifications before the work is finally accepted by making his own arrangements for water supply, electricity etc. and nothing extra whatsoever shall be payable for the same.

8.5 The work in general shall be carried out as per PWD/ CPWD specifications. Rate includes all materials, labour and all the operations mentioned in the respective items unless and otherwise specifically mentioned.

8.6 The contractor shall be responsible for all the protection of sanitary, water supply fittings and fixtures against pilferage and breakage during the period of installation until the completion *I* handing over of the work.

8.7 The contractor shall submit completion plans for water supply internal sanitary installations and building drainage work within thirty days of the date of completion. These plans are to be submitted on drawings prepared preferably through computers (1 original copy+ 3 photocopies) on suitable scales to show the general arrangement and desired details.

9. **Water Proofing Treatments:**

The contractor shall associate himself with the specialised firm, for water proofing treatment for basement/flower ground floor, underground tank and on roofs. Guarantee in the prescribed Proforma attached with tender document shall be given by the contactor, for a period of 10 years from end of defect liability period prescribed in the contract which shall be also signed by engaged specified firm. 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.

10. **uPVC Window Works:**

The contractor shall associate himself with the specialised firm, for uPVC Window Work for all the windows. Guarantee in the prescribed Proforma attached with tender document shall be given by the contactor, for a period of 10 years from end of defect liability period prescribed in the contract which shall be also signed by engaged specified firm.

11. **Sewerage Treatment Plant (If Proposed):**

The contractor shall associate himself with the specialised firm, for installation and commissioning of Sewerage Treatment Plant. Guarantee in the prescribed Proforma attached with tender document shall be given by the contactor, for a period of 10 years from end of defect liability period prescribed in the contract which shall be also signed by engaged specified firm. 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.

12. **Antitermite Treatment Works:**

The contractor shall associate himself with the specialised firm, for antitermite treatment of the building.Guarantee in the prescribed Proforma attached with tender document shall be given by the contactor, for a period of 10 years from end of defect liability period prescribed in the contract which shall be also signed by engaged specified firm. 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.

13. **Additional Specifications For Internal Electrical Works:**

13.1 The work stall be carried out strict compliance to UPPWD Specifications or CPWD Specifications in that order and in accordance with Indian Electricity Rules, 1956, Indian Electricity Act, 2003 as amended up to date and as per instructions of the Engineer including as below and nothing will be paid extra.

13.2 All material shall be got approved from Engineer before use. All damages done to the building during execution of Electrical work shall be the responsibility of the contractor and the same will be made good immediately at his own cost to the satisfaction of the Engineer. Any expenditure incurred by the department in this condition shall be recovered from the contractor and decision of the Engineer about recovery shall be final.

13.3 All hardware items such as screws, thimbles, G.I. wires etc. which are essentially required for completing an item as per specifications will be deemed to be included in the item even when the same have not been specifically mentioned. All hardware materials such as nuts/bolls/screws/washers etc. to be used in the work shall be zinc/cadmium plated iron.

13.4 CONDUIT LAYOUT shall be prepared by contractor and got approved before execution of work. In case contractor does not do so before start of work, recovery @ 2(two)% of tendered amount of IE Works shall be made from the bill. Minimum No. of Junctions to be kept, & if required junctions to be kept underneath the fitting locations in corridor/ rooms so that junctions are not visible after fittings are fixed/ in position. Drop of conduit shall be well planned w.r.t. location of fitting/ D.B. and crisscrossing to be avoided. All chases in walls shall be cut using electrical chisels/ cutters. For this purpose electricity shall be arranged by contractor. In case contractor fails to do chase cutting by electrical chisels/cutters and resorts to manual methods, a recovery of Rs. 50/- per point shall be made from contractor's bill.

Whenever point wiring items is executed in casing system PVC box of make approved by Employer shall be provided in place of MS box. In case cable in the lift shaft is also to be fixed contractor shall have to liaison with CIVIL/Lift agency to make use of the scaffolding provided by them.

13.5 Any conduit which is not to be wired by the contractor shall be provided with GI fish wire for wiring by some other agency subsequently. Nothing extra shall be paid for the same.

13.6 Copper wire up to 4 sq.mm. may be single stranded or multi stranded whereas wires 4 sq.mm, shall be multi-stranded conductor. Termination of multi- stranded conductors shall be done using crimping type thimbles at both the ends. Nothing extra shall be paid for the same.

13.7 All metal boxes to be applied primer and painted, then only should be installed else recovery @ Rs. 20/- per point should be made from contractor's bill. Boxes shall rave socket arrangement for tightening screws, instead of simple holes in M.S. sheet. Boxes shall be again painted at the time of wiring.

13.8 For Sub main Wiring, Colour Code for different phases and Neutral (R.Y.B. black) to be maintained. While circuit wiring, wiring for fan point, wiring for light point shall be done with different colours for easy identification. Wiring for neutral shall be done with back colour and all connections to fans & fittings wherever visible shall be made with white PVC insulated copper wire or wherever cover sleeve may be provided. At Switch board, Switch shall be fixed in a logical manner w.r.t. fitting layout.

13.9 Unless specifically approved by Engineer loose wire box, above DB shall not be provide however DB's shall rave loose wire box of same make.

13.10 All connections to MC B's shall be made using thimble/lugs.

13.11 All DB's i/c incoming &outgoing MCB's shall be suitably numbered with PAINT for location/circuits. DB shall be fixed in recess suitably (30 mm. approx. projected from unplastered wall) to ease opening of door. Top of DB to match with door frame height as per site conditions.

13.12 Phenolic laminated sheet shall be of Egg white colour, and shall be filed/rounded at edges and of minimum 3mm thick.

13.13 All fittings and fans should be property earthed through the protective conductor.

13.14 Provision of earth bars in main boards, earth terminal block in DB's &earth studs in all metal boxes shall be made, connection to this stud shall be crimped.

13.15 A camp type termination should be made in the termination of earth strips (where provided) to pipe electrodes to provide surface type contact.

13.16 The earthing shall be carried out in the presence of the Engineer or his authorized representative

13.17 The size at switch box for providing Modular Plate type Switch/Sockets shall be properly settled to take care of all necessary switches/screws/fan regulators. Blanking plate if required shall also be provided at no extra cost.

13.18 For point wiring in steel conduit all piano type switch or all modular type switches/sockets/telephone/outlets/T.V. outlets shall be of make approved by C&DS.

13.19 Whenever supply items like fans & fitting etc. are also included in the Schedule of work, such items shall be executed only after completion of at least 75% of the wiring items.

13.20 The contractor shall make his own arrangement at his own cost for electrical/general tools and plants required for the work.

13.21 The work shall be carried out according to approved drawing/details which shall be subsequently issued to the successful tenderer for execution of work and as per instructions of the Engineer who will have the right to change the layout as per requirement at site and the contractor shall not have any claim due to change in layout.

13.22 The work shall be carried out in engineering like manner. The bad workmanship will not be accepted and defects shall be rectified at contractor's cost of the satisfaction of the Engineer The programme of electrical works are to be co-ordinated in accordance with the building work and no claim for idle labour will stipulated in the tender, electrical work, shall have to be completed along with completion of civil work.

13.23 All the debris of the electrical works should be removed and the site should be cleared by the contractor immediately after the accruing of debris. Similarly and rejected material should be immediately cleared off from the site by the contractor.

13.24 Watch and ward of the material/equipment shall be the responsibility of the contractor till handing over of installation to the department.

13.25 The contractor or his representative is bound to sign the site order book as and when required by the Engineer and to comply with the remarks therein.

13.26 The entire installation shall be at the risk and responsibility of the contractor until these are tested and handed over to the department.

13.26.1 Some of the items of work, if already executed; on that case the successful tenderer shall have to use these items for completing the work. For wiring, the existing conduit wherever required shall be used by the contractor. The recovery will be made for these items as accepted rate of similar items.

13.27 **Test Certificate**:- Test certificate for the work carried out shall also be submitted falling which recovery @1% tendered amount & maximum of Rs. 15000/- shall be made from final bill.

13.28 **Panels:-** Drawing of panel shall be submitted for approval within 30 days from award of work and fabrication to be taken up only after approval of such drawing. Before painting proper surface treatment shall be done and then powder coated. These shall be offered for inspection during fabrication.

13.29 Quantities indicated in Schedule of work are only tentative, contractor shall consult Engineer before procurement. Payment shall be made only for the quantities actually executed and measured.

13.30 Contractor has to plan his activities, so that electrical work is to be carried out in close co-ordination with CIVIL work and in no case CIVIL work be delayed because of delay in electrical work and the work has to be completed accordingly.

13.31 The makes for items shall be as per lists attached.

13.32 Material to be used in the work shall be ISI marked as applicable. The material in required quantity to be used in the work shall be got approved from the Engineer before its use at site. The Engineer shall reserve the right to instruct the contractor to remove the material which in his opinion, is not as per specifications.

13.33 Contractor shall preserve copies of invoices, test certificates, gate passes etc. to prove the genuineness of material / purchases. The responsibility of procurement, genuine material of specialized works shall rest with the contractor.

List of Preferred Makes

1- Specifications/Brands Names of materials and finishes as approved are listed below. Although this list is fairly comprehensive, however approved equivalent materials and finishes of other firms may be used, in case it is established by the Engineer that the brands specified below are not available in the market and subject to approval of the Client as well as General Manager, concerned.

2- All branded materials will be ISI Marked of approved specifications (wherever BIS Specifications are available).

3- Listing of the materials does not absolve the Contractor from his responsibility of using the products only if they are satisfied about quality and performance of the products. Proper quality checking must be performed for every product being used.

Sl. No.	Name of Materials	Approved Brand/Make
(A)	**CIVIL WORKS**	
1	Cement PPC/OPC43 Grade IS 8112:1989 IS 1489 (Part - 1): 1991	ACC, J.P. Rewa, Birla, Diamond, Ambuja cement, Shree, Prism, Ultratech, Lafarge, Bangur, Binani (I.S.I. Marked of approved quality)
2	White Cement	J&K White, Birla White (I.S.I Marked)
3	Putty	Birla, J.K. Putty
4	Plaster of Paris	Shree Ram, Adhar Shree, Sakarni, Decotouch.
5	AAC Blocks	BILT, Magicrete or equivalent.
6	Structural Steel / TMT bars-Fe 500/415 IS 1786:2008, IS 2062:2011	
	(a) Primary Producers (Iron Ore as basic raw material)	SAIL, TATA, RINL, Jindal Steel & Power Ltd. and Jindal Saw Ltd.
	(b) MS Hallow Tubular/ Box sections	SAIL , TATA, Jindal, RINL Essar Steel
7	Aluminum sections	Hindalco, Jindal, Indian Aluminum Co., Bhoruka, Mahavir.
8	Fittings for Aluminum Doors and Windows	Ebco, Doorline, Classic, Argent, Crown, Hardima,Everite, Sigma, Earl Bihari (Ebco). **For 'A' Class Buildings- Besides above Ozone, Dorma.**
9	Aluminum Composite Panels	Alstrong, Aluco-bond, Aludecor/Durabuild.
10	(a) Mineral Fibre False Ceiling	Armstrong, OWA, Hi-Steel, Saint Gobain, USG Boral.
	(b) Metal False Ceiling	Hi-Steel, Hunter Duglus, Armstrong, Saint Gobain, Durlum, USG Boral.
	(c) PVC Laminated Gypsum Ceiling Tiles	Hi-Steel
11	Adhesives/Glues. IS: 9103:1999 **(Mandatory for Toilets)**	Fevicol, Bermicol, Pidilite, Vam Organic, CICO (I.S.I. Marked of approved quality)

Sl. No.	Name of Materials	Approved Brand/Make
12	Roofing (a) A.C. Sheet (b) G.I. Sheet (IS 277:2003) (c) Alloy sheets	 UPAL, CHARMINAR, A.C.C. TATA Shakti, Trishul, Jindal, Bhushan. KALZIP, BEMO, SANKO, KINGSPAN-RIGIDAL, TATA
13	Flush Doors/Particle Boards / Laminated Boards IS 12823:1990 Grade-I Type-II, IS 1659:2004, IS 2202 (Part 1) : 1999	Novapan, Ecoboard, Bhutan Board Duro, National, Euro, Kitply, Kitlam, Sarda Ply, Green Ply, Eco Merino, Bison Panels, Century, Archid, Nothern Plywood.
14	PVC Door Shutters & Frames	Sintex or Plasopan, M/s Raj Shri or equivalent.
15	Laminates	Decolam, Merino,Greenlam, Archid, Century.
16	Water Proofing Compounds/Admixtures IS:2645:2003, IS: 9103:1999	Pidilite, Sika Qualcrete, Impermo, Mec, Duraseal, Acco-Proof, CICO, Degussa, Don, Fosroc, Penetron MC Bauchemie, Chocksey, Fairmate, Sunanda Chemicals.
17	Crystalline Waterproofing Admixtures	Penetron, Xypex or equivalent.
18	Polymer Waterproofing	Kerkoll, BASF, MC
19	Antitermite Chemicals	Premise(Byer), Choropyriphos.
20	Chemical/Mechanical Anchor Fasteners	HILTI, FISCHER, Canon.
21	Dry/ Liquid Distemper	ICI, Nerolac, Berger, Johnson & Nicholson, Asian Paints, Shalimar Paint.
22	Water Proofing Cement Paints/ Primers/ Synthetic Paints	Snowcem Plus, Asian, Berger, Nitcocem, Sanotex, Pentuco, Nitcotex, ICI, Nerolac.
23	Epoxy Paint	Neroalc. Sika, Bal Endura
24	Hydraulic Door Closer	Godrej, Hardwyn (Eddy)/Hitech/Sandhu. **For 'A' Class Buildings- Besides above Ozone, Dorma.**
25	Textured Exterior Paint	Sandtex Matt, Syntex, Apex, Neortex, Colourtex.
26	Mortice Latch	Godrej/Harrison
27	Floor Springs, IS 6315:1992	Hardwyn /Hitech/Sandhu/Godrej
28	Float Glass/ Clear Glass, IS 14900:2000	Atul, Modi Guard, Saint Gobain, AIS or equivalent.
29	Reflective Glass for Structural Glazing/Windows	Asahi India, Saint Gobain, Modi Float, Glaverbel.
30	Drapery Rod	Vista/Mac/Vesta
31	Ceramic Glazed Tiles/Vitrified Tiles IS 13712:1993/ IS: 15622: 2006	Premium Quality Nitco, Somany, Kajaria, Simpolo, Vermora, Johnson, Orient/Bell, RAK, Asian of approved design, colour and shade to be used in consultation with Client.
32	Eoxy Grout for Tile (Tile Adhesive)	Cico, Bell, Pidilite, BASF, SIKA, Bal Endura/Keracol/ Laticrete or equivalent
(B)	**INTERNAL ELECTRIFICATION WORKS**	
1	M.S Conduit Pipe & Accessories	BEC, NIC, KT, MONARCH, AKG/ M-Kay/ RM Com ISI MARKED

Sl. No.	Name of Materials	Approved Brand/Make
2	PVC conduit Pipe including its accessories IS 9537 (Part 1): 1980/ IEC 60614-1 (1978)	Harsh, CAP Plastics, PARAFLEX, Seiko, Precision, Asian, AKG ISI MARKED
3	Metal clad socket and plug having scrapping earth arrangement.	Hager, Schneider (CG), L&T, Gerard, Legrand.
4	Luminaries, LED-IS 10322 (Part 1) : 1982/ IEC 598-1 (1979) Fluorscent-IS 10322 (Part 1) : 1982/ IEC 598-1 (1979)	PHILIPS, BAJAJ, CROMPTON, Wipro, GE/OSRAM/Syska/Havells ISI MARKED
5	MCB & MCB DB, IS 2675:1983	L&T, Schneider, MDS, Legrand, ABB, C&S, Hager, Havells. Siemens
6	M.S. Boxes	Should be Galvanized
7	BAKALITE SHEET	HYLEM, FORMICA
8	FAN/EXHAUST FAN IS 374:1979	BAJAJ, CROMPTON, KHAITAN, GEC, ORIENT, POLAR, ORTEM, HAVELLS, USHA
9	PVC insulated copper wires i/c control cables, TV/ Telephone Cable, IS 694:1990/IEC 60227-1 to 5 (1979)	R.R. Kable/Finolex/Lapp Kable/ Havells/ Skytone/Seiko/Ploycab, National (NC)/SBEE Cables.
10	1100 V Grade PVC/ XLPE Insulated steel armoured and overall PVC sheathed, IS 694:1990/IEC 60227-1 to 5 (1979)	NICCO, Havells/Finolex/Universal, Rallison/KEI/Gloster Havells/ National /CCI Polycab/SBEE Cables.
11	MCCB, Timer, SFU, FSU, HRC Fuses, Cable management System/ DLP Trunking. IS 13032:1991	Siemens/L&T/Schneider/ABB/C&S.
12	Piano Switches/Sockets/T.V./ Telephone outlet, Ceiling Rose IS 3854:1997	Anchor,Rider, Leader, Havells, Precision, SSK, CPL/ Kinjal
13	Modular type Switches/Sockets T.V./ Telephone outlet/Cell bell / Buzzer.	Legrand/Siemens/L&T/ABB/Moeler/M.K./ Havells/ Philips/Anchor Roma, MDS Mosaic, Crabtree, Kinjal.
14	Ammeter/Voltmeter IS 1248 (Part 2): 2003/ IEC 60051-2 (1984)	AE/IMP/Rishabh/HPL, Universal Electric, L&T, Vaishno (only Digital Type to be used)
15	Selector Switch	Kaycee/Siemens/Bhartiya Cutler Hammer/L&T/ Hager
16	Change over Switch	HPL/H-Elecon/Standard/L&T. / Siemens/Gerard/Clipsal
17	Cable Glands	COMIC, Raychem
18	Cable Tray	Pilco, MEK
19	Indicating Lamps	Teknic/Siemens/L&T/ Vaishnov.
20	Panel Board/ Feeder Pillar/Meter Board	CPRI approved manufactures for PANELS (tested in last three years of current rating required or higher) and having ISO: 9001 Certification.
21	Rising Main	L&T/ MDS-Legrand/ C&S/ Schneider/GE
22	Energy Meter/ Multifunctional/ Intelligent Energy Meter	Siemens/HPL/L&T/ Hensel/ Anchor/Havells.
23	Wall Brackets	DECON/Philips/GE/ Havells/ Lustre
24	Angle Holder/Batten Holder	ISI Marked Kinjal/Emperor/ Anchor

Sl. No.	Name of Materials	Approved Brand/Make
25	GEYESER	Racold/ Bajaj/ Crompton/ Jagaur
26	Internet Cable	D-Link/Avaya/Lucent/Finolex/HCL
27	Pumps, IS 9542-1980	
a	Centrifugal Pumps	Kirloskar/ Beacon/ KSB/ Khimline/ Stork
b	Submersible Pumps IS 8034-1989	Modi Industries/ KSB/ Pullen/ ABS/ AQUA/BS/MBH/Hindustan. Groundfos.
c	Copper conductor Flat Submersible Cable, IS 694:1990/IEC 60227-1 to 5 (1979)	Finolex / Havells / Universal / Polycab / Skytone
28	**Electrical Equipment**	
a	Power Transformer	Bharat Bijlee Ltd. / Crompton Greaves/ Kirloskar/ Voltas/ NGEF/ ABB/ ALSTOM/ Raksan.
b	11 KV Panels	ABB/ Jyoti/ NGEF/ Siemens/ Crompton Greaves/ BHEL/ SCHNEIDER/ ALSTOM
c	415 Panels/ MCB/ MCCB	L&T/ Siemens/ Bhartia Culter Hammer/ GE/ ABB/ SCHEIDER/ LEORAND
d	Instruments & Controls	Universal/ Automatic Electric Ltd./ Meco Instruments/ SHCAN
e	Air Circuit Breaker	Larsan & Turbo/ Siemens/ GE/ SCHNEIDER/ ABB
f	Starters	BHEL/ Perimal Engg./ Enterprising Engg./ Pan Asia/ Seimens, L&T, Schneider (CG), GE
g	Bus Duct	Best & Cromption Engg. Ltd/ Power Gear P. Ltd./ LEORAND
h	Switches & Fuses	L & T/ Siemens/ GE/ ALSTOM/ C&S
29	(a) Fire Extinguishers IS 15683:2006	Ceasefire/Deflame / Bharat /Newage / Fire Shield / Steelage Industries/ Kooverji Devshi/ Fire Stop/ ETCO/ HFE Guard/ Agni/ National/ Vijaya Fire Protection Systems /
	(b) Heat/Smoke Detector/Fire Alarm Panel/Manual Call Point & Speakers	System Sensor /Morley-IAS/ Edwards /Notifier/Honeywell/Agni/National
30	D.G. Sets Engine- IS 10001 Alternator- IS 13364 (part-1)	Kirloskar green/ Greaves Cotton Ltd./ Crompton Greaves/ Ashok Leyland/ Caterpillar/ Cummins/ Volvo / Penta/ Mahindra/TIL/Eicher
(C)	**SANITARY WORKS**	
1	Pipes Fitting & Valves	
a	MS Pipes up to 200 dia	Tata Steel/ GST/ BST/ Jindal
b	MS Pipes above 200mm dia	HSL-Heavy/ Mukand/ Jindal/ Tata Steel
c	CI Class Pipes & Fittings	BRM/ Oriental/ Electrosteel/Kesoram/ Udadhaya/ IISCO.
d	Centrifugally (Spun) Cast Iron Pipe (Double Flanged)	NECO, (red) or equivalent conforming to IS: 3989.
e	Sand Cast Iron Pipes & Fittings (IS: 1729)	AMC/ALC/Bengal Iron/HEP/Avon/Hepco
f	C.I Sluice valve, Fire Hydrant & Fixture	Kirloskar, IVS, Leader, Venus, Upadhyay, Sarkar, Suraj, Burn, Zoloto, Kent (I.S.I. Marked of approved quality)

Sl. No.	Name of Materials	Approved Brand/Make
g	HDPE Pipes (Water Supply) IS 4985:2000 & IS 14233:1999	Finolex/ Uniplast/ Supreme/ Duroline/Prince
h	uPVC Pipes (For use in sanitary insallations)	Kisan, Ajanta, Ajay, Uniplas, Supreme, Duroline, Finolex, Jain, Oriplast, Prince, SFMC/Ashirvad
i	cPVC Pipes (Water Supply) IS 16088: 2012, IS 15778:2007	Astral, Ajay, Supreme or equivalent.
j	PP-R Pipes & Fittings (Water Supply)	Finolex, Supreme, SFMC
k	Specialised Waste Pipes	Astral Silencio, Supreme Skyrise (HD Low noise system Waste Pipes).
l	Ball Valves	Zoloto, IBP, Arco.
2	PVC Flushing cistern	Parryware, Hindware, Jaquar, Cera.
3	Mirrors	Saint Gobain, Modi Guard, HNG, Asahi India, Cera, Atul.
4	White Vitreous China Wares	Parryware/Hindware, Neycer, Johnson Peddar, Cera (I.S.I. Marked of approved quality). **For 'A' Class Buildings- Besides above Roca, Duravit, Kohler or equivalent.**
5	Wash Basin and WC PAN	Parryware, Hindware, Jaguar, Cera, Jhonson Peddar, Neycer. **For 'A' Class Buildings- Besides above Roca, Duravit, Kohler or equivalent.** For EWC in toilets of Type-IV/V residential buildings or individual toilets of Class 'A' buildings wall hung type pans should be preferred for ease of cleaning.
6	Low Level PVC Flushing Cistern	Parryware, Hindware, Jhonson Peddar, Seabird, Orient, Cera,Alpine .
7	Plastic Seat Covers with frame	----------as above----------
8	Brass/ C.P. Brass Fittings, IS:7784:1993	ESS-ESS, Jaquar, Jhonson, Marc, Cera, , Kohler, L&K, Parryware, GEM, ARK, Plumber, Kingston, PARKO, Metro, Vardhman.
9	PTMT Fittings, IS:9763	Prayag, Prakash, Surya
10	Kitchen Sink / Stainless Steel sink, IS: 13983:1994	Salem, Kingston-Cobra, Cera, Neelkhanth, AMC, Nirali, Parryware, Diamand.
11	G.I. Pipe and Fittings	TATA, Surya, Jindal, QST, GST, Hissar, SAIL, TT Swastik.
12	Ductile Iron Pipes & Specials	Kesoram, Electro Steel, Electrotherm, Jindal Saw.
13	Polythylene Water Storage Tank, IS: 12701:1996	Sintex, Electroplast, Star, Lotus, Purewell, Sheetal, Uniplast.
14	Stone Ware pipe Grade "A"	Parry Perfect, Mahakaushal, Swastic, Anil Hind Ceramic, Orind, and Dev Raj Anand.
15	Manhole covers- CI	RIF, Kajeco, NECO, SKF.

SECTION – 6

SCHEDULES

SCHEDULE-"A"

Brief Details of Works and its Location

PROVISION :-

- Guard Room(Covered area-12.37sqm)
- Electric Sub-station(Covered Area-50.54sqm)
- Pump Room(Covered Area-12.145sqm)
- Boring & Submersible pumo
- Rain water harvesting & Drain
- External Water supply & Severage works
- Consrtuction of CC Interlocking Road in the campus
- Construction of Boundarywall-551.59RM
- Construction of MS Gate-2 Nos
- Transfarmer(1600KVA) – 2Nos
- External Elctrical Works
- Maintenance Shed
- Earth Filling in Campus

SITE AND LOCATION:-

The proposed site is located at Distt:-Ghaziabad

I / We have read understood and accept for compliance, the above mentioned instructions and conditions of this schedule and have taken these factors into account while quoting rates in Schedule "G".

Signature.....

Name of Contractor.....

Address.....

SCHEDULE – "B"

DRAWINGS ACCOMPANYING THE CONTRACT:

Drawings such as Site Plans, Lay-out plans, Structural/ Architectural Drawings are not available with the bidding documents downloaded from the website and may be obtained from the office of the Project Manager. Unit-28, C&DS, U P Jal Nigam, situated at Ghaziabad on payment of Free of Cost.

I / We have read understood and accept for compliance, the above mentioned instructions and conditions of this schedule and have taken these factors into account while quoting rates in Schedule "G".

Signature.....

Name of Contractor.....

Addr**ess.....**

SCHEDULE "C"

LIST OF SAMPLES:-

The following samples are to be submitted by the tenderer within seven days from the date of order to commence the work. **As per Bid Document**

SCHEDULE "D"

SAMPLES TO BE SUPPLED BY THE CONTRACTOR:- As per Bid Document

SCHEDULE "E"

TESTS:-Refer Clause 31 of General Conditions of Contract.

SCHEDULE "F"

COMPLETION OF WORK:-

The completed work, as specified herein shall mean the total works as specified in schedule "A" to "G" finished in all respects to the entire satisfaction of the Engineer completed within 180(Days) calendar months from the date of written order to commence the work and remove defects noticed/found within 12(Twelve) calendar months from the date of handing over of the works.

Any defects noticed in the work during the above period shall be repaired / rectified or replaced in whole or part thereof. No extra payment shall be made for such repairs / rectifications.

I / We have read, understood and accept for compliance, the above mentioned instructions and conditions of this schedule and have taken these factors into account while quoting rates.

Signature.....

Name of Contractor.....

Addr**ess.....**

SCHEDULE-G

BILL OF QUANTITIES

Preamble

1. The Bill of Quantities shall be read in conjunction with the Instructions to Bidders, Conditions of Contract, Special Conditions of Contract, Technical Specifications and Drawings.

2. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. These are liable to change upto any extent for which no claim shall be admitted whatsoever. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices tendered in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix within the terms of the Contract.

3. The rates and prices tendered against Bill of Quantities shall, except in so far as it is otherwise provided under the Contract, include all constructional plant, labour, supervision, materials, erection, maintenance, insurance, profit, and other Taxes **(excluding GST)**, cess (including labour cess) and duties, together with all general risks, liabilities and obligations set out or implied in the Contract.

4. The rates and prices shall be quoted in percentage terms and resultant contract price will be entirely in Indian Currency.

7. General directions and descriptions of work and materials are not necessarily repeated or summarized in the Bill of Quantities. References to the relevant sections of the contract documentation shall be made before entering % age against the Bill of Quantities.

8. The method of measurement of completed work for payment shall be in accordance with the UPPWD/CPWD Specifications unless otherwise provided in contract.

10. Rock is defined as all materials which, in the opinion of the Engineer, require blasting, or the use of metal wedges and sledgehammers, or the use of compressed air drilling for its removal, and which cannot be extracted by ripping with a tractor of at least 150kw with a single rear mounted heavy duty ripper.

BILL OF QUANTITY

PROPOSED GUARD ROOM

(Based on U.P.P.W.D. S.O.R. - GHAZIABAD w.e.f. - 03-02-2020 & DSR-2018)

S.N.	DESCRIPTION OF ITEM	QUANTITY	UNIT	Rates (Less 5%	Amount
1	Earth work in exacavation in trenches for foundations and for pipes cables etc. in ordinary soil(loam clay or sand) including lift upto 1.5 m and dressing of sides and ramming of bottom sand disposal of surplus excavated earth as directed by the Engineer i/c with in a lead of 50m.				
(i)	Excavation up to 1.50 Mt. depth	12.933	CUM	90.25	1167.24
2	Filling of carted earth.	5.983	CUM	314.36	1880.74
3	Providing and laying in cement concrete 1:4:8 (1 cement :4 coarse sand :8 graded Stone aggregate 40 mm nominal size) and curing complete,including cost of form- work,in foundation and floors.	3.464	CUM	5529.00	19151.80
4	Sand filling in plinth under floors including watering, ramming, consolidating and dressing complete including lead up to 50m and lift upto 1.5m and including cost of sand.	1.416	CUM	437.00	618.67
5	Providing and injecting chemical emulsion for preconstructional antitermite treatment and creating a chemical barrier under and alround the column pits wall trenches basement excavation top surface if plinth filling junction of wall and floor, along the the external perimeter of binding expansion joints, surrounding of pipes and conduits etc, complete (plinth area of the building at ground floor only shall be measured as per I.S.6313(PartII 1981)Alderine emulsifiable concentrate or any other approved material such as Heptrachlor or Chlordane will be used. The rate of application of chemical emulsion shall be as follows : (1)Treatment for masonary & foundation 5 liters per sqm. (2) Back fill in immediate contact with foundation 7.5 liters/sqm (3) Treatment of top surface of plinth filling 5 liters/sqm				
	(4)Treatment junction of wall and the floor 7.5 liters /sqm (5)Treatment of soil along external perimeter of building 7.5 liters/sqm. (6) Treatment of soil under apron along external perimter 5 liters/sqm. (As per manufacturer's standard dilution)	12.370	SQM	190.00	2350.30
6	R.C.C. work with cement approved coarse sand and 20 mm. guage approved stone grit im the proportion of 1:1.5:3 in lintels of doors and windows excluding supply of reinforcement and its fixing and binding the same with 24 BWG binding wire and including necessary centering and shuttering etc.and also including supply of all materials, labour and tools and plants etc, required for proper completion of the works. strength of the concrete shall not beless than M-200.				
	Up to plinth level	0.388	CUM	7928.13	3073.82
	Above plinth level	0.300	CUM	7928.13	2378.44
7	As in item no. 6 above but for slabs (Using 1:1.5:3 Mix concrete)	2.060	CUM	7315.00	15068.90
8	As in item 7 but for the lighter beams i.e. having spans upto 6 m. (Using 1:1.5:3 Mix concrete)	0.140	CUM	8498.13	1189.74
9	As in item 7 above but in R.C.C. Raft foundation and footing with approved stone ballast.(Using 1:1.5:3 Mix concrete)	0.183	CUM	7168.13	1313.30
10	As in item 7 above but in Column with approved stone ballast.(Using 1:1.5:3 Mix concrete)				
	Up to plinth level	0.140	CUM	7600.00	1064.00
	Above plinth level	0.160	CUM	7600.00	1216.00
11	Class M-150 brick work in 1:6 cement coarse sand (of 2.25 fineness modulus) mortar in foundation & plinth including supply of all materials, labour, tools and plants etc. required for proper completion of the work.	9.246	CUM	4493.50	41548.61
12	Providing and laying damp-proof course 40mm thick with cement concrete 1:2:4 (1 cement : 2 coarse sand (zone-III): 4 graded stone aggregate 12.5mm nominal size)	3.260	SQM	286.45	933.82
13	Painting on D.P.C. with two coats of air blown bitumen VG -10 Grade @ 1.70 Kg/Sqm approx including cost of fuel if any.	3.260	SQM	104.50	340.67
13	Same as in item no. 11 above but in super-structure above plinth level up to floor two level (up to two storeys) including necessary cutting and moulding of brick work as required and also including honeycombed brick work in thickness of wall more than 12cms.	8.540	CUM	5054.00	43161.16
14	Same as in item no. 13 but in 1:4 cement and coarse sand mortar in superstructure for wall thickness 12 cms & below brick work.	0.860	CUM	5310.50	4567.03

15	P/F Mild steel or iron in plain work such as reinforced concrete or reinforced, brick work (when not included in over all rates) wrought to required shape as necessary including bending for proper completion of the work and including supply of steel its wastage bend hooks and authorised over lapping shall be measured upto floor two level.	2.917	QTL	5791.33	16892.66
16	15 mm cement plaster on rough side of single or half brick wall of mix: 1:4 (1 cement: 4 coarse sand)	4.81	SQM	262.61	1262.51
17	15 mm cement plaster in single coat on rough side of single or half brick wall for interior plastering up to floor two level including internal rounded angles not exceeding 80 mm in girth and finshed even and smooth. (1) 1 cement : 6 fine sand	33.010	SQM	147.25	4860.72
18	12mm cement plaster in single coat on fair side of single or half brick wall for exterior plastering up to floor two level including internal rounded angles chamfers, and/or rounded angles not exceeding 80mm in girth and finished even and smooth no extra for mixing any additive. (1)1 cement : 6 fine sand	67.640	SQM	133.00	8996.12
19	6mm thick plaster in 1:3 on ceiling and soffits of stairs upto floor two level.				
20	Cement concrete flooring 1:2:4 (1 cement :2 coarse sand :4 graded stone aggregate 12-20mm nominal size laid in one layer neat cement (25 mm thick floor).	10.062	SQM	223.25	2246.34
21	Cement concrete flooring 1:2:4 (1 cement :2 coarse sand :4 graded stone aggregate 12-20mm nominal size laid in one layer neat cement (40 mm thick floor).	8.320	SQM	313.50	2608.32
22	2 cm (3/4") thick cement plaster in dado or skirting in 1:2 consisting of one part and 2 parts of approved coarse sand laid in panels, finished with 3 mm floating coat of neat cement or cement and marble dust in ratio or 5:1 including supply of all materials, labour & T&p etc. required for proper completion of the work.	2.230	SQM	209.00	466.07
23	Providing and fixing glass strips of 3.15 mm thickness in joints of floor and skirting at the time of laying floors flush with floor level including labour,tools,plants etc. complete	29.120	RM	17.10	497.95
24	Supply and fixing 6 mm thick China glazed tiles in flooring or in skirting or dado laid with 1:3 cement and approved coarse sand mortar finished with white cement slurry jointing and polishing complete including supply of all materials, labour and tool sand plants etc.	8.510	SQM	855.00	7276.05
25	Mild steel or iron work of small sizes and sections such as holding down bolts, hold fast tierods,gratings etc. (when not included in an over all rates) wrought to required from including supply of steel and its wastage including cost of bolts, nuts if required for and welding, grinding and making holes as required completion of work fabrication of holes doors, chaukhats nosing.				
(a)	Fabrication of hold fast for door chaukhats and windows.	13.20	KG	53.20	702.24
(b)	Fabrication of grill / railing	40.95	KG	60.33	2470.31
(c)	Fabrication of Z-section steel windows.	47.25	KG	66.50	3142.13
(d)	Angle Iron door chaukhats	30.45	KG	53.20	1619.94
26	Supply & fixing of flush doors commercial quality conforming to IS : 2202 (Part I) 1983 including fixing of wooden cleats and stoppers and including fixing and adjustment of hinges, bolts, locks, handles, springs, fiting with necessary screws to be supplied departmentally. 35 mm thick including ISI marked Stainless Steel butt hinges with necessary screws	3.675	SQM	1553.44	5708.90
27	Fixing of Door, windows/ventilators chaukhats in position.				
	(a) Door chaukhats	2.000	NOS	285.00	570.00
	(b) Window chaukhats	2.000	NOS	256.50	513.00
	(c) Ventilator chaukhats	1.000	NOS	142.50	142.50
28	Providing & fixing glass panes with putty and glazing clips in steel doors, windows, clerestory windows, all complete with : 4.0 mm thick glass panes.	3.150	SQM	741.48	2335.67
29	Distempering (Two coat) with dry distemper of approved brand and manufacture & of required shade on undecorated wall surface to give an even shade over & including a priming coat with cement primer of approved brand & manufacture such as Berger,J&N, Shalimar, Asian paints after thoroughly brushing the surface free from mortar droppings & other foreign matters & also including preparing the surface even with plaster of paris or approved synthetic material & sand papered smooth including cost ofall materials	48.420	SQM	59.85	2897.94
30	Finishing walls with water-proofing on cement paint of approved make such as super snowcem, durrocem, robiacem, gurucem, supercem quality and of required shade on undecorated wall surfaces (two coat) overone and including one coat white cement primer to give an even shade after thoroughly brushing the surface to powdered materials including curing and cost of all materials.	67.640	SQM	57.00	3855.48