

BHADERWAH DEVELOPMENT AUTHORITY

BHADARWAH.

TENDER DOCUMENT FOR

**Repairs and Renovation
of Tourist Hut-set No-1
at Lake View Resort
Gatha.**

*Chief Executive Officer
Bhadarwah Dev. Authority*

SALE AND ISSUE OF TENDER DOCUMENT

FOR

**Repairs and Renovation of
Tourist Hut-set No-1 at
Lake View Resort Gatha.**

*Reference to NIT No: 04of 09/2016
S. No 01*

Issued to	
Registration Card No:	
Cost of Document	
Received Vide Receipt No:	
Dated:	

Signature of the issuing Authority

*Executive Engineer
Bhaderwah Development Authority
Bhaderwah (Doda)*

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MEMORANDUM

I/We tender for the execution of _____

_____ and the work specified under written memorandum within the time specified in such memorandum at the rates specified in the attached schedule of quantities and in accordance, in all respects, with the specifications, design and instructions in writing, referred in the condition of contract and with such materials as are provided for, and in all other respects in accordance with such conditions so far as possible and applicable.

Name of the Employer	Chief Executive Officer, Bhaderwah Development Authority, Bhaderwah
General Description	
Earnest Money	
Amount	
CDR No:	
Dated:	
Name of Bank:	
Security Deposit	10% of the value of work
Defects Liability period	One year from the date of handing over
Time of Completion	____ Days from the three days after award of allotment or actual date of start which ever is earlier
Refund of security	50% on virtual completion of work & balance on expiry of defects liability period. One year from the date of completion and handing over of the project to the Authority

Should this tender be accepted in whole or in part, I/we hereby agree:-

- i. To abide by all terms and provisions of the said conditions annexed here to and all the terms and provisions contained in the Notice Inviting Tenders, so far as applicable and/r in default thereof to forfeit & pay to the Employer, or their successors the sum of money mentioned in the said conditions.
- ii. To execute all the works referred to in the tender documents upto the terms and conditions contained or referred to therein and to carry out such deviations as may be ordered upto a maximum of 50% (fifty percent) of the tendered value at the rates quoted in the tender documents.

A sum of Rs. _____ lacs (Rupees _____) is hereby forwarded in the shape of C.D.R. pledged to the C.E.O, Bhaderwah Development Authority, Bhaderwah, Doda, as earnest money. If, I/We, fail to commence the work specified in the above memorandum. I/we agree that the said Employer or their successors in office shall without prejudice to be at their right of remedy & at liberty to forfeit the said Earnest money absolutely. Otherwise the said earnest money shall be retained by the Employer.

Date: the _____ day of _____ 2016.

Signature of Contractor,
Before submission of tender

Witness _____

Contractor

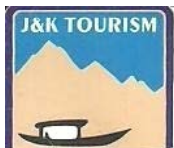
Letter of Acceptance

The above tender for the sum of Rs. _____ (Rupees
_____ only) submitted by
_____ is hereby accepted by me the Chief Executive
Officer, Bhaderwah Development Authority, Bhaderwah, District Doda, J&K State.

The _____ Day of _____ 2016.

Signature of Employer

Contractor



**GOVERNMENT OF JAMMU AND KASHMIR
OFFICE OF THE CHIEF EXECUTIVE OFFICER,
BHADERWAH DEVELOPMENT AUTHORITY
BHADERWAH, DISTRICT DODA.**



NOTICE INVITING TENDER
NIT No: 04 OF 09/2016

For and on behalf of the Governor of Jammu and Kashmir, Chief Executive Officer Bhadarwah Development Authority invites sealed item rates tender affixed with Rs 6/- revenue stamps from the reputed, approved, and eligible Contractors/Firms registered with State Govt./ CPWD/Irrigation/BRO/MES/NHPC/PSU or any other Govt. agency for the below mentioned works. The work is to be executed in accordance with the terms and conditions, Drawings, specifications, and design prescribed in tender document.

S. No	Name of work	Approx. Cost (Rs. In Lacs.)	Earnest Money (Rs in Lacs)	Time of Completion	Cost of Tender Documents (in Rupees)	Last Date for receipt of application and issue of Tender Documents	Class of Contractor
1	Repairs and Renovation of Tourist Hut-set No-1 at Lake View Resort Gatha.	4.50	0.09	20 days	500.00	15.9.16	A,B,C & D.
2	Repairs and Renovation of Tourist Hut-set No-2 at Lake View Resort Gatha.	4.50	0.09	20 days	500.00	15.9.16	A,B,C & D.
3	Repairs and Renovation of Tourist Hut-set No-3 at Lake View Resort Gatha.	4.50	0.09	20 days	500.00	15.9.16	A,B,C & D.
4	Repairs and Renovation of Restaurant Block, Shoping Kiosks, Booking Counter and Painting to outer Chain Link Fencing and railing around Lilly Pools at Lake View Resort Gatha.	4.55	0.091	20 days	500.00	15.9.16	A,B,C & D.

Other relevant information: - Position of AAA : Accorded
Position of funds : demanded
Position of TS : Under process

Terms & Conditions:

1. The tender Documents can be had from the office of the Chief Executive Officer, Bhadarwah Development Authority, Bhadarwah, District Doda, J&K, against payment of specified cost (non refundable) in cash or by bank draft or the same can be downloaded from our official website www.bhadarwahheavens.com from 09-09-2016 to 15-09-2016 and the cost of tender document of specified amount (non refundable) shall be accompanied with the tender of dated up 15-09-2016.

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2. **The technical qualification of the bidder should contain the following documents:-**
 - (i) *Attested copy of registration card duly renewed for the current financial year.*
 - (ii) *Sales tax clearance certificate issued by the Sales Tax Department ending last year with PAN and TIN No.*
3. The tender should be addressed to the Chief Executive Officer, Bhadarwah Development Authority, and sent under Registered post which should reach in the office of the Chief Executive Officer Bhadarwah Development Authority on or before **19.9.2016 up to 2 pm.**
4. The tender will be opened by the authority level tender opening committee headed by Chief Executive Officer, Bhadarwah Dev Authority, at Bhadarwah in his office chamber **on 20/9/2016 at 11.00 am** in presence of the contractors or their authorized representatives who may like to be present.
5. The tender must be accompanied by earnest money in the form of Call Deposit Receipt for amount shown against the each work of any scheduled bank pledged to the Chief Executive Officer Bhadarwah Development Authority without which no tender shall be entertained.
6. The earnest money will be released to the unsuccessful tenderers after 28 days from the date of acceptance of tender and in the case of successful tenderer it will be accounted towards security deposit. The earnest Money may be forfeited if the tenderer withdraws the tender after tender opening during the period of validity. No duplicate document shall be issued in lieu of reportedly issued and lost document.
7. As soon as acceptance of the tender is communicated to the successful tenderer, the contract shall be complete and binding on him. The successful tenderer shall execute an agreement with the Bhadarwah Development Authority within 7 Days after the issuance of the letter of intent to him. The expenses on that account and incidental charges shall be borne by the tenderer. Failure to execute such an agreement shall not, however, prevent the contract from being enforced

against him. The date of start of work shall be reckoned after seven days from the date of issue of allotment letter or actual start of work whichever is earlier.

8. In case of failure of the contractor to execute the work in part or in full the act shall amount to breach of contract. A registered notice or notice sent through a special messenger to the contractor for breach of contract shall be sufficient for authority to wind up or cancel his contract. In case contractor avoids receiving the notice or deliberately gives wrong address for communication where it becomes practically difficult to deliver the notice, the same shall be pasted on the entry gate of his known address in presence of a witness and the notice shall be treated as service notice to the contractor. His earnest money will be forfeited and he will be blacklisted for future. The BDA will be at liberty to get the left over work executed at his risk and cost. Any additional amount involved for such execution may be recovered from other claims/ resources of the contractor.
9. Misconduct or Misbehavior if any observed during the tender opening process with any officer/ official shall be dealt in terms of the enlistment & registration of contractors rules in the PWD and may result in recommendation for cancellation of registration card issued by any department.
10. The tenders shall be valid for at least 120 days from the date of opening. In the event of successful tenderers failing, declining or delaying the execution of the agreement, the Authority shall, without prejudice to any other remedy available to it under any law, for the time being in force in the state, be entitled to forfeit the earnest money in full or in part and impose such penalty as may be determined by the Authority.
11. The tenders on plain paper/ telegraphic tenders/ conditional tenders shall be rejected. Tenderers are advised to quote complete item rates (including material carriages & incidentals) against the advertised Bill of quantities. Tenders written in pencil shall be rejected. Tenders should be clearly written and writing sealed with transparent tape.
12. The tenders accepted will be checked by the Authority for any arithmetical errors. Errors will be corrected by the Authority as follows:
 - where there is a discrepancy between the rates in figures and in words, the rates in words will govern; and
 - Where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern.
 - The amount stated in the tender will be adjusted by the Authority in accordance.
13. The Authority reserves the right to itself to accept or reject any tender or part thereof or allot the contract to any contractor in full or in part without assigning any reason thereof.
14. In case of any dispute arising at any time between the tenderer and the Authority regarding interpretation of any of the terms and conditions of this notice, the same shall be referred to an officer of the Government as the concerned Minister In-charge may nominate for

arbitration under the law for arbitration for the time being in force in the state. The decision thereon of the Arbitrator shall be final, conclusive and binding on the parties. During arbitration case the Authority will not withhold the payment of undisputed items nor will the contractor stop the work till decision of the Arbitration.

15. Any clarification required by the tenderer in regard to the technical points etc. mentioned in the tender or the annexure hereto or otherwise pertaining to the works may be sought from the consultant or Executive Engineer, Bhaderwah Development Authority, Bhaderwah on any working day.
16. The tenderer may in his own interest inspect and examine the site and its surroundings, as also means or access to site and satisfy him-self before tendering as to the nature of ground, climatic conditions, the form and nature of site, by making prior appointment with the Executive Engineer, BDA, Bhadarwah well in time.
17. The following requirements should be adhered to:
 - The tender document should be signed and dated on each page by the tenderer or his duly authorized agent.
 - The tender document should be accompanied by a certified true copy of Power of Attorney of the signatory to the document. The Power of Attorney should include the power to agree to refer disputes to arbitration.
18. Tenderer shall not be entitled to any cost, charges or expenses incurred by them, or incidental to, or in connection with the preliminary investigations, surveys and preparation of design or submission of tender etc. In case the tender submitted by the tenderer is not accepted, tender document will not be returned to him.
19. The tender submitted by an individual shall be signed with his full name and his complete address shall be recorded thereon. If it is submitted by a firm, it shall be signed by a member of the firm who is duly authorized to enter into the contract. He shall sign his own name and give the name and address of each member of the firm and shall furnish power of Attorney along with the tender.
20. No foreign exchange shall be made available to the tenderer in connection with the execution of the work.
21. The work shall be carried out strictly according to the terms and conditions, specifications, design, drawing and plans described in Annexures. Where specifications do not cover any item, the specifications, terms and conditions of State PWD in force shall be made applicable.
22. Immediately after the communication of the acceptance of the tender, the contractor shall submit for approval the proposed methodology and program of construction backed with equipment and material planning and deployment duly supported with broad calculations and quality management plan proposed to be adopted justifying their capability of execution

and completion of the work as per technical specifications and within stipulated period of completion. No payment shall be made to the contractor on any account until such a programme has been submitted and approved.

23. No extra shall be paid for such arrangement; if the Executive Engineer, at any time during execution of the work is of the opinion that the contractor will or may fall behind the schedule of programme, a revised programme will be required to be submitted with added men, machines and working shifts.
24. All other terms and conditions if not covered but in vogue in State PWD shall hold good and form part of this NIT.
25. After opening the tenders, if the tendered amount works out 10% below the advertised cost extra security deposit 10% of the Adv. Cost shall have to be deposited by the lowest tenderer before allotting the work..
26. The contractor/firm shall be paid for the actual quantity of work executed and as measured at the site at the rate accepted by the deptt. The Deptt; reserves the right to increase or decrease any item or items of work. Any claim by the firm/Agency on this account shall not be entertained. The rates quoted shall hold good for any increase/decrease in quantity.

Executive Engineer
Bhadarwah Dev. Authority

No: BDA/2016-17/_____

Dated: _____

Copy to the:-

1. Secretary to Government, Tourism Department, J&K Govt. Civil Secretariat, Srinagar for information.
2. The District Development Commissioner, Doda for information.
3. Director Tourism Jammu for favour of information.
4. Additional District Development Commissioner Doda for information.
5. Sub Divisional Magistrate Bhadarwah for information.
- 6-7 Chief Executive Officer Bhadarwah Development Authority Bhadarwah/Kishtwar Dev. Authority for information.
8. Executive Engineer R&B Div. Bhadarwah.
- 9-10 President Contractor Association Bhadarwah/Doda for information.
11. Publicity Manager BDA for uploading of NIT 04 of 09/2016 on our official website. The process of downloading should be stopped on 15-09-2016
12. Notice Board
13. Office file

CHAPTER II **GENERAL CONDITION OF CONTRACT**

1. DEFINITION:

- The ‘Contract’ means the documents forming the tender and acceptance thereof, the formal agreement executed between Employer, and the contractor; and instructions & drawings issued from time to time. These above mentioned documents shall be treated as complementary to one another.
- In the contract the following expression shall, unless the context otherwise requires, have the meanings hereby respectively assigned to them:
 - “Authority” shall mean Bhaderwah Development Authority (BDA).
 - “Chief Executive Officer” shall mean Chief Executive officer, Bhaderwah Development Authority, Bhaderwah.
 - “Executive Engineer” shall mean Executive Engineer, BDA.
 - “PWD” shall mean Public Works Department of Govt. of J&K.
 - The expression ‘Works’ or ‘Work’ shall mean all works to be executed by the contractor in accordance with designs, drawings, plans & specifications described in this contract document.
 - The ‘Site’ shall mean the land and or other places on into or through which work is to be executed under the contract & shall also mean any adjacent land, path or street which may be allotted or used for the purpose of carrying out the contract.
 - The ‘Contractor(s)’ shall mean the individual or the firm or the company whether incorporated or not, undertaking the works & shall include the legal representative of such individual or the person composing such firm or company, or the successors of such firm or company and the permitted assigns of such individuals or firm or of company.
 - The ‘Employer’ means Chief Executive Officer, Bhaderwah Development. Authority, Bhaderwah, District Doda, Jammu.
 - ‘Engineer-in-Charge’ means Executive Engineer, BDA or any other person who may be deputed to the site of work from time to time by the Authority and authorized in writing for any purpose in relation to, or in connection with this contract.
 - ‘Plant’ and ‘equipment’ shall mean plant, machinery equipment, pipe work services & all other things to be provided, erected, installed, commissioned and maintained in accordance with the Contract.
 - ‘Temporary Works’ means all temporary works of every kind required in or about the execution completion and maintenance of the works and Plant.
 - ‘Approved’ means approved in writing including subsequent written confirmation of verbal approval and ‘approval’ means approval in writing including as aforesaid.
 - “Drawing” shall mean the drawings referred to in the specifications and any modification of such drawings approved in writing by the consultant/Executive Engineer with consent of the CEO and such other drawings as may from time to time be furnished in writing by the consultant/Executive Engineer with the approval of the Chief Executive officer.
- “Notice in writing or Written Notice” shall mean a notice or a communication in writing, typed or printed sent either under registered post or ordinary post to the last known private or business address or delivered personally by hand to the contractor.
- “Virtual Completion” Shall mean when the Work under this contract is in the opinion of the Executive Engineer fit for use and taken over by the Authority, after removal of scaffolding, plants, surplus materials and rubbish and cleaning of dirt from works and site including testing etc, complete in accordance with regulations in force.

- The terms “Bill of Quantities” and “Schedule of Prices” wherever they occur in this Contract shall be treated as synonymous & interchangeable

Singular & Plural	Words importing the singular only also include the plural and vice versa where the context requires.
Reading or Notes	The marginal headings of notes shall not be deemed to be part thereof or be taken into consideration in the interpretation or construction of various clauses or of the Contract.
Works include plant	The term “Works” shall be deemed to include “Plant” and “Equipment” as here in Equipment above defined wherever the context so requires but NOT vice versa.

2. Duties & Power of Engineer-in- Charge

The duties of the Engineer-in-Charge is to watch and supervise the works and to examine any materials to be used or workmanship employed connected with the project.

3. Assignment:

The Contractor shall not assign the contract or any part thereof or any benefit or interest therein or there under (other than a charge in favour of the contractor’s Bankers) of any amount due or to become due under this contract without the prior written consent of the Employer.

4. Sub-Let:

The Contractor shall not sub-let the whole or part of the Works, except where otherwise provided in the contract, the contractor shall not sub-let any part of the works without the prior written consent of the Employer (which shall not be unreasonably withheld) but such consent if given shall not relieve the contractor and he shall be responsible for the acts, defaults and negligence of any sub-contractor, his agents, servants or workmen as fully as if they were acts, defaults or neglects of the contractor his agents, servants and workmen. Provided always that, the provision of labour on a piece work basis, raw materials for the construction of works and items of plant/Equipment shall not be deemed to be sub-letting under this clause.

5. Documents, Mutually or Explanatory

The several documents forming the part of contract are to be taken as mutually explanatory of one and other and in case of ambiguities or discrepancies, the same shall be brought to the notice of the Engineer-in-Charge the order of procedure shall be

- Drawings & instruction issued to the Contractor.
- Schedule of Quantity Specifications.
- Special conditions on Contract and Notice Inviting Tender.
- General conditions of Contract.
- The Engineer-in-Charge who shall there upon issue to the Contractor instructions directing in what manner the work is to be carried out.

6. Drawings:

The drawings are detailed to contain the specification as also the procedure for instructions. The Contractor shall give adequate notice to the Engineer-in-charge of any further drawings or specification that he may require for the execution of the works, under the Contract, well in advance for execution. This shall not however be an excuse for delay in completion of any work.

7. One copy of the Drawings to be Kept at site:

One copy of the Drawings shall be kept by the Contractor at site and the same shall be available for inspection & use by the Engineer-in-charge, or by any other persons authorized by the Engineer-in-charge in writing. One copy shall be signed & kept on records so as to confirm contractor’s acceptance of having quoted for the works under reference.

8. Drawings Instructions.

The Engineer-in-Charge shall have full power and authority to supply to the contractor, from time to time during the progress of the works such further drawings and instructions as shall be, necessary for purpose of the proper and adequate execution and maintenance of the works and the Contractor shall carry out and be bound by the same.

9. Contract Agreement:

The Contractor shall when called upon so to enter into & execute a contract agreement in the form annexed with such modifications as may be necessary.

10. Inspection :

The Contractor shall inspect and examine the site and its surroundings & of site. shall satisfy himself before submitting his tender as to the nature of the ground and sub-soil the form and nature of the site and quantities and nature of the work and materials necessary for the completion of the works and the means of access to the site, the accommodation he may require & in general shall himself obtain all necessary information as to risk contingencies & other circumstances which may influence or affect his tender.

11. Sufficiency of Tender

The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the work and of the rates & prices stated in the priced schedule of the prices if (any), which rates and prices shall except in so far as it is obstruction, otherwise provided in contract cover all his obligations under the contract and all his matters and things necessary for the proper completion and maintenance of the works.

a). of complying with any instructions, which the Engineer-in-charge may issue to the Contractor in connection therewith and

b). of any proper reasonable measures approved by the Engineer-in-charge which the Contractor may take in the absence of specific instructions from the Engineer-in-Charge.

12. Works to Satisfaction of the Engineer- in-Charge:

Save in so far as it is legally or physically impossible, the contractor shall execute, complete and maintain the works in strict accordance with the contract to the satisfaction of the Engineer-in-charge and shall adhere strictly to the instructions and directions issued by Engineer-in-Charge on matters as refer to above.

13. Completion Schedule:

Immediately after the communication of the acceptance of his tender the Contractor shall, submit to the Engineer-in-Charge, for approval a Programme of execution outlining the proposed operations and order of completion of various activities in multiple working shifts giving sufficient details to demonstrate to the Authority the adequacy of the programme to complete the work within the time prescribed under this contract. No payment shall be made to the contractor/firm on any account until such a programme is submitted and approved. The submission to an approval by the furnishings of such particulars shall not relieve the contractor of any of his duties or responsibilities under the contract.

If the Engineer-in-Charge at any point of time during execution is of the opinion that the work under this contract will or may fall behind the schedule of programme, he may direct for added operations, method, equipment, the number of labours and working shifts so that the time lost is made up.

14. Contractor's Superintendence:

The Contractor shall give or provide all necessary Superintendence During the execution of the works and as long there after as the Engineer-in-charge may consider necessary for the proper fulfilling of the Contractor's obligations under the contract. The contractor or a competent and authorized agent or representative approved in writing by the Engineer-in-charge (such approval may at any time be withdrawn) is to be constantly on the works & shall give his whole time to the superintendence of the same. If such approval

shall be withdrawn by the Engineer-in-charge the Contractor shall as soon as is practicable (having regards to the requirement of replacing him as here in after mentioned) after receiving written notice of such withdrawal remove the agent from the site and shall not thereafter employ him again on the site in any capacity and shall replace him by another agent approved by the Engineer-in-Charge. Such authorized agents or representative shall receive on behalf of the Contractor instructions from the Engineer-in-Charge. Contractor shall provide at his own expense cost of hutments/dwelling units for his workers etc. and all such expenses shall deemed to have been taken care of in there quoted rates for the above works.

15. Contractor's Employees

The Contractor shall provide and Employ on the site in connection with the execution & maintenance of the works, only such technical assistants as are skilled & experienced in their respective callings and such sub-agents, foremen and dealing hands as competent to give proper supervision to the work they are required to supervise, and such technical assistant will be in sufficient numbers for each areas of works to be handled either in one area or field or both, contractor shall before start of work give a list of their technical staff and their nature of duties to the Engineer-in- Charge. Such skilled, semi-skilled and unskilled labour as is necessary for the proper and timely execution & maintenance of the works. Where required by the law or regulation of local or other authority, such personnel shall be duly licensee from the competent authority to practice their trades, professions and callings.

16. The Engineer-in-Charge shall be at liberty to object to and require the contractor to remove forthwith from the works any person employed by the contractor in or about the execution or maintenance of their works who in the opinion of the Engineer-in-Charge misconducts himself or is incompetent or negligent in the proper performance of his duties or whose employment is otherwise considered by the Engineer-in-Charge to be undesirable and such person shall not be again employed upon the works without the written permission of the Engineer-in-Charge. Any person so removed from the works shall be replaced without delay by the competent substitute approved by the Engineer-in-Charge.

17. The Contractor shall if required by the Engineer-in-Charge deliver returns in such form and at such intervals as the Engineer-in-Charge may prescribe showing the details of supervisory staff and the numbers of he several classes of labour, from time to time, employed by the contractor on the site.

18. Setting out of the works:

The Contractor shall be responsible for the true and proper setting out of the works and for the correctness of the position, levels, dimensions and alignment of all necessary parts of the works and for the provision of all necessary instruments appliances and labour in connection herewith. If at any time during the progress of the works an error shall appear or arise on the position, levels, dimensions or alignment of any part of the works, the contractor on being required to do so by the Engineer-in-Charge shall at his own expenses rectify such error to the satisfaction of the Engineer-in-Charge or his representative unless such error is based on incorrect data supplied in writing by the Engineer-in-Charge in which case the expense of rectifying the same shall be borne by the employer. The checking of any line or level by the Engineer-in-charge shall not in any way relieve the Contractor of his responsibilities for the correctness thereof and the Contractor shall carefully protect and preserve all bench marks sight rails, pegs and other things used in setting out the works.

19. Lighting, Watch and Ward.

The Contractor shall in connection with the works provide & maintain at his own cost all lights, guards, fencing, watch and ward, when and where necessary or required by the Engineer/in-Charge or by the authority for the protection of the works or for the safety and convenience of the public and others.

20. Care of Works/Plant Equipment.

From the commencement to the completion of the work, the contractor shall, take full responsibility for the care thereof, of Temporary works and Constructional plant and in case any damage loss or injury shall happen to the works/plants/Equipment or to any part thereof or to any Temporary work or constructional plant from any cause what-so-ever shall, at his own cost repair and make good orders and conditions, and in connection in every respect with the requirements of the Engineer-in-Charge/instructions.

21. Damage to persons and property:

If the contractor or his workers or servants break, deface, injure or destroy any part of the structure or other property in the vicinity of the works, belonging to any person in or on which they may be working, such structures, road, road kerbs, embankments, fence enclosure, water pipes, cables, drains, electrical or telephone posts or wires, trees, grass or grasslands, or cultivated ground contiguous to the premises on which the work or any part of it is being executed, shall make the same good at his own cost and in default, the Engineer-in-Charge shall cause the same to be made good and deduct the cost thereof from any sums that may be due to the contractor under this contract or from his security deposit.

22. Overtime/ Multiple Shifts

Contractors shall also not charge for any overtime/ Multiple Shift working incurred wholly or partly for uncompleted works etc. or for works which may have to be got done urgently as per the requirements of the Engineer-in-Charge or also as per the drawings supplied from time to time.

23. Third party Insurance

Before commencing the execution of the works, the contractor (but without limiting his obligations & responsibilities under relevant clause hereof) shall insure against any damage, loss or injury which may occur to any person (including any employee of the Employer) by or arising out of the execution of the works or temporary work or in the carrying out of the contract.

24. Accident or injury to workmen.

The Employer shall not be liable for in respect of any damages or compensation to workmen/labors in respect to or in consequence of any accident or injury to any workman or other person in the employment of the contractor save and except an accident or injury resulting from any act or default of the employer his agents or servants & the contractor shall indemnify & keep indemnified the Employer against all such damages and compensation (save & except as aforesaid) and against all claims demands, proceedings, costs charges & expenses what-so-ever in respect thereof or in relation thereto.

25. Insurance against Accident etc. workmen.

The contractor shall insure against such liability against an insures approved by the employer (such approval shall not be unreasonably withheld and to workmen shall contain such insurance during the whole of the time that person are employed by him on the work and shall when required to the employer such policy of insurance and the receipt for payment of the current premium provided always that in respect of any persons employed any sub-contractor the contractor & obligation to insure as aforesaid under this sub-clause shall be satisfied if the sub-contractor shall have insured in such manner that the Employer is indemnified under the policy but the contractor is to produce to the Employer when required such policy of insurance and the receipt for payment of the current premium.

26. Giving of Notice and payment of fees.

The Contractor shall give all notices and pay all fees required to be given or paid by National or State Statute Ordinance or other Law or any Regulation or Bye-Law of any local or other duly constituted authority in relation to the execution of the works and by the rules and Regulations of all public bodies and companies whose property and rights are affected or may be affected any way by the works or any temporary works.

27. Compliance with statues any Regulations etc.

The Contractor shall confirm in all respects with the provisions of any such statutes ordinance or law as aforesaid and the Regulations or Bye-Laws of local or other duly constituted authority which may be applicable to the works or to any temporary works and with such rules and regulations of public bodies and companies as aforesaid and shall keep the employer indemnified against all penalties and liabilities of every kind for breach of any such statute ordinance or law Regulation or Bye-Law.

28. Supply of plant material and labour.

Except where otherwise specified, the Contractor shall at his own expense supply and provide all the Constructional plant, Temporary and for Permanent works/plant/equipment labour (including the supervision of thereof) transport to or from the site and about the works and other things or every completion and maintenance of works/plant/equipment.

29. Clearance of site on completion.

On the completion of the Works the Contractor shall clear away and remove from the site all constructional plant, surplus materials, rubbish and Temporary works of every kind and leave the whole of the site and works clean and in a workman like condition to the satisfaction of the Engineer-in-charge.

30. Labour.

The Contractor shall make his own arrangement for engagement of all labour, local or otherwise and also provide for the transport, housing, feeding and payment thereof.

- The Contractor shall provide on the site to the satisfaction of the Engineer-in-charge water for the use of the Contractor's staff and work people.
- The Contractor shall in all dealings with labour in his employment have due regards to all recognized days of rest, religious festivals, & other customs.
- In the event of any outbreak of illness of an epidemic nature, the contractor shall comply with and carry out such regulations orders and requirements as may be made by the Government or the local medical or sanitary authorities for the purpose of dealing with and overcoming the same.
- The Contractor shall at all times take all reasonable precautions to prevent any unlawful riotous or disorderly conduct by or amongst his employees and for the preservation of peace and protection of persons and property in the neighborhood of the works against the same.
- The Contractor shall be also responsible for observance by his sub-contractors of the foregoing provisions.
- The Contractor shall employ labour in sufficient number to maintain the required rate of progress & of quality to ensure a workmanship of a degree required by the specification and to the satisfaction of the Engineer-in-charge. He shall be responsible at his own cost, for all recruiting, transport, welfare, sanitary and other accommodation, provision of necessary passports or permits for all personnel and employee required for this contract.
- The Contractor shall remain liable for the payment of all wages under Wages Act 1936, Minimum Wages Act, 1948, Employee's liability Act, 1936, Workmen's Compensation Act, 1923, Insurance, Provident Fund, Family Pension etc. or any other Act or enactments relating thereto and rules framed there under from time to time. In the interest of the work and its completion target, the contractor shall have to work in more than one shift & no liability in respect of any excess cost arising there from shall be borne by the Employer. The contractor may employ female labours if he chooses but he shall not employ in connection with the works any person who has not completed the minimum age as per law locally applicable.
- The Contractor shall comply fully with local laws dealing with the employment of person including where applicable the Indian Employment of children Act, 1938. The Indian Workmen's Compensation Act, 1923, the Factories Act, 1948, the minimum Wages Act,

1948, Contract Labour (Regulations & Abolition) Act, 1970, and any statutory amendment or re-enactment thereof for the time being in force.

- The Contractor during the progress of the works shall provide, erect and maintain at his own expense and to approved standards and scales all necessary temporary sanitary accommodation required for his workmen on the site in connection with the execution of works. The planning, sitting and erection of these buildings shall be approved by the Engineer-in-Charges & such temporary accommodation shall at all times during the progress of the works be kept tidy and in a clean and sanitary condition to the entire satisfaction of the Engineer-in-charge & at the contractor's expense. The contractor shall conform to the sanitary requirements of local medical & health authorities and at all times adopt such precautions as may be necessary to prevent soil pollution of the site.
- The Contractor shall at his own expense carry out all anti-material or other ailments, instructions given to him by the Engineer-in-charge or by any local authority including the filling up of barrow pits.
- The Contractor shall at his own expense carry out all instructions issued to him by the Engineer-in-Charge to effect a proper disposal of soil and other conservancy work in respect of the contractor's workmen or employees on the site. He shall also conform to the sanitary requirements of the local Medical and Health authorities.
- The Contractor will not at any time do, cause or permit any nuisance on the site or adjoining area or do anything which shall cause unnecessary disturbance or inconvenience to the owners, tenants or occupiers of other properties near the public generally and will secure the efficient protection of all land, river lakes and sea areas against pollution. The Contractor shall attend children of labourers and shall provide for its maintenance and upkeep.
- The Contractor shall provide and maintain upon the works sufficient, proper and efficient life-saving appliance and first aid equipment to the approval of the Engineer-in-charge and in accordance with the requirements of I.L.O Convention No.62. The appliance and equipment shall be for use at all times.
- The Contractor shall organize his operations in a workman like manner and take all necessary precautions to provide safety and prevent accidents on the site to both persons and property, more so if they will be working in proximity to working machinery of existing plants in operation. The Engineer-in-charge shall have the power in requiring the contractor to adopt from time to time such measures as they may consider necessary to ensure the above requirements. The Employer /Engineer-in-charge shall not be responsible for any consequence resulting from violation of safety requirements. In particular the Contractor shall ensure compliance with the following safety codes:-
 - IS: 3696 (Pt. I) - Safety code for scaffolds and ladders pt.I
 - IS: 3696 (Pt. II) - Do- Pt. II – Ladders
 - IS: 4130 (Pt. III) - Safety code for demolition work
 - IS: 4014 (Pt. II) - Code of practice for steel Tubular Scaffolding (Pt. II)- Safety Regulations for scaffolding.
- All statutory laws on labour in vogue from time to time shall be complied with & all basic amenities provided for & by the contractor shall indemnify the Authority against all claims what-so-ever on this.

31. Return of Labour.

The contractor shall if required by the Engineer-in-charge deliver to the Engineer-in-charge Representative or at his office a Return in details in such form and at such intervals as the Engineer-in-charge may prescribe showing the number as the several classes of labour from time to time employed by the Contractor on the site and such information regarding constructional plan as the representative may require.

32. Quantity of Materials and Workmanship and tests.

All materials and workmanship shall be of the representative kinds described in the contract & in accordance with Engineer-in-charge, and shall be subject from time to time to such test as the Engineer-in-charge may direct at the place of manufacture, of fabrication or on the site or at all or any of such places. The contractor shall provide such assistance instruments, machines, labor and materials as are normally required for examining, measuring and testing the quantity of any work & the quality or weight of any material incorporation in the works for testing as may be selected as required by Engineer-in-charge.

33. Cost of samples.

All samples shall be supplied by the Contractor at his own cost, if the supply thereof is clearly intended by or provided for in the specification or Bill of Quantities, but if not then at the cost of the Employer.

34. Cost of tests.

The cost of making any test shall be borne by the Contractor if such test is clearly intended by or provided for in the specification and (in the cases only of a test under load or of a test to ascertain whether the design of any finished or partially finished work is appropriate for the purpose which it was intended to fulfill) particularized in the specification in sufficient detail to enable the contractor to price or allow for the same in his tender.

35. Access to site.

The employers or any other person authorized by them shall at all times have access to the works and to the site and to all workshops and places where work is being prepared or from where materials, manufactured articles or machinery are being obtained for the work and contractor shall afford every facility for and every assistance in or in obtaining the right to such access.

36. Examination of work before covering up.

No work shall be covered up or put out of view without the approval of the Engineer-in-charge or their representative to and the contractor shall afford full opportunity for the Engineer-in-charge or afford full opportunity to examine and measure any work their representative to examine and measure any work which is about to be covered up or put out of view and to examine foundation before permanent work is placed thereon. The Contractor shall give due notice to the Engineer-in-Charge Representative whenever any such work of foundation is or are ready about to be ready for examination.

37. Uncovering and making openings.

The Contractor shall uncover any part or parts of the works or make openings in or through the same as the Engineer-in-charge may from time to time direct and shall reinstate & make good such part or part to the satisfaction of the Engineer-in-charge. If any part or parts have been recovered by or put out of view after compliance with the requirements of above sub-clause and foundation to be executed in accordance with the contract the expenses of uncovering making openings in or through reinstating and making good the same shall be borne by the Employer but any other case all such expenses shall be recoverable from him by the Employer from may deducted by the Employer from any monies due or which may become due to the contractor.

38. Removal of Improper work and materials.

The Engineer-in-charge shall during the progress of the work have power to order in writing from time to time.

- a). The removal from the site within such time or times as may be specified in the order of any materials which in the opinion of the Engineer-in-charge are not in accordance with the contract.
- b). the substitution of proper and suitable materials.
- c). The removal and proper re-execution (not withstanding and previous test thereof or interim payment thereof) of any work which in respect of materials or workmanship is not, in the opinion of the Engineer-in-charge in accordance with the contract.

39. Default of Contractor

In case of default on the part of the contractor in carrying out such order the employer shall be entitled to employ and pay other persons to carry out the same and all expenses consequent thereon or incidental thereto shall be borne by the contractor and shall be recoverable from him by the Employer from any amount due or which may become due to the contractor.

40. Suspension of work.

The Contractor shall, on the written order of the Engineer-in-charge suspend the progress of the works or any part thereof for such time or times and in such manner as the Engineer-in-charge consider necessary and shall during such suspension properly protect and secure the work so far as is necessary in the opinion of the Engineer-in-charge. The extra cost incurred by the contractor in giving effect to the Engineer-in-charge instruction under this clause shall be borne and paid by the employer, unless such suspension is

- a). otherwise provided for the contract or
- b). necessary for the proper execution of the work or any reason of weather conditions affecting the safety or quantity of the works or by some default on the part of the contractor.
- c). necessary for the safety of the works or any part thereof, provided that the contractor shall not be entitled to recover any such extra cost unless he gives notice in written of his intentions to claim to the Engineer-in-charge within 28 days of the Engineer-in-charge order. The Engineer-in-charge shall settle & determine the extra payment to be made to the contractor in respect of such claim as the Engineer-in-charge shall consider fair & reasonable.

41. Suspension more 90 days.

If the progress of the works or any part thereof is lasting suspended on the written order of the Engineer-in-charge for more than 90 days the contractor may serve a written notice on the Engineer-in-charge requiring permission within 28 days from the receipt thereof to proceed with the works or part thereof in regard to which progress is suspended and if such permission is not granted within that time the contractor by the further written notice so served may (but is not bound to) elect not to execute part of the works, as an omission of such part or where it affects the whole works, as an abandonment of the contract by the Employer.

42. Commencement works.

The contractor shall commence the works on site within the period contained in the Tender after the receipt by him of an order in writing to this effect from the Employer and shall proceed with the same with due expedition except as may be expressly sanctioned or ordered by the Employer or be wholly beyond the contractor's control.

43. Extension of time for completion.

Should the amount of extra or additional work of any kind or other special circumstances of any kind what so ever which may occur be such as fairly to entitle the contractor of the extension of the time for the completion of the work, & the Employer on the recommendation of the Engineer-in-charge, shall consider the grant of such or any extension of time for completion. Engineer-in-charge shall determine the amount of such extension provided that this is due to work or other special circumstances that have arisen or as soon thereafter as is practicable delivered to the Engineer-in-charge representative full and detailed particulars of any claim to extension of time to which he may consider himself entitled in order that such claim may be investigated at the time.

44. Execution of works of Repairs etc.

To the intent that the works shall at or as soon as practicable after the expiry of the defect liability period be delivered upon the Employer in a good and perfect condition (fair wear and tear excepted) to the satisfaction of the Engineer-in-charge. The contractor shall exercise all such work of repair amendment reconstructions, rectification, and making good

of defects, imperfections, shrinkage or other defaults as may be required of the contractor in defect liability period or within fourteen days after its expiry as result of an inspection made by or on behalf of the Engineer-in-charge prior to its expiry.

45. Remedy on contractor's failure to carry out work have required.

If the contractor fails to do any such work as aforesaid required by, the Employer shall be entitled to carry out such work by his own workman or other contractor & such work which the contractor should have carried out at the contractor's own cost, he shall be entitled to recover from the contractor the cost thereof or may deduct the same from any dues or that may become due to the contractor.

46. Variations.

No alterations, amendments, omissions, additions or other variation of the works/plants/equipment under the contract (here-in-after referred to as variations) shall be made by the contractor, except as ordered in writing by the Engineer-in-charge, who shall have full power subject to the provisions herein after contained, to instruct the contractor in writing to make such variation as the Engineer-in-charge consider proper and necessary and the contractor shall carry out such variations without prejudice to the contract, as through the said variations formed part of the contract.

If in the opinion of the contractor complying with any such variation would prevent his obligations or guarantees under the contract he shall promptly notify the Engineer-in-charge who shall decide forth with whether the variation shall be carried out as ordered. If the Engineer-in-charge confirms his previous instructions the contractor obligations & guarantees shall be modified to such extend as may be justified & notified by the Engineer-in-charge & considered by the Employer for acceptance on the recommendations of the Engineer-in-charge.

47. Valuation of variations.

The value (if any) of all variations shall be added to or deducted from the contract price as appropriate. The Engineer-in-charge shall ascertain and determine this in accordance with the rates & prices in the schedule of Prices/Bill of Quantities, so far as the same may be applicable & recommended by the Engineer-in-charge for the consideration of the employer for acceptance. In other cases, reasonable prices shall be fixed by the consideration of Employer for acceptance.

48. Notice to Contractor.

In the event of the Engineer-in-charge requiring any variations as reasonable and proper notice shall be given to the contractor as the same will enable him to make his arrangements there of and in cases where goods and materials are already prepared or any design drawings or patterns made or work done that required to be altered a reasonable sum in respect thereof shall be allowed by the Engineer-in-charge.

49. Plant etc. to be exclusive use on the works.

All constructional plant, temporary works and materials provided by the contractor shall when brought on to the site be deemed to be exclusively intended for the use on the works construction and completion of the works and the contractor shall not remove the same or any part thereof (save for the purpose of moving it from one part of the site of another) without the previous consents in writing of the Engineer-in-charge (which shall not be unreasonably withheld).

50. Clearance of site completion.

On completion of the works the contractor shall remove from of the site all the said constructional plant and temporary works remained there on and any un-used materials.

51. Quantities.

The quantities set out in the bill of quantities are the estimated quantities of the work but they are not to be taken as the actual & correct quantities of the works to be executed by the contractor in fulfillment of his obligations under the contract.

52. Works to be measured.

The Engineer-in-charge shall accept as otherwise stated ascertain and determine by measurement the value in accordance with the contract. He shall, when he requires any part or part of the works to be measured, give notice to the contractor's authorized agent or representative who shall, forthwith attend or send a qualified agent to assist Engineer-In-charge representative in taking such measurements and shall furnish all particulars required by either of them should the contractor not attend or neglect or omit to send such agent then measurement made by the Engineer-in-charge or approved by him shall be taken to be correct measurement of the work. For the purpose of measuring such permanent work as is to be measured by record drawings the Engineer-in-charge shall prepare record drawings, month of such work and the contractor as and when called upon to do so in writing shall within 14 days attend to examine and agree any such record drawings with the Engineer-in-charge shall sign the same when so agreed and if the contractor does not so attend to examine and agree any such record drawing they shall be taken to be correct. if after examination of such record drawings the contractor does not agree the same or does not sign the same as agreed they shall never-the-less be taken to be correct unless the contractor within 14 days of such examination lodge with the Engineer-in-charge, notice in writing in this respect in which such record drawings are claimed by him to be incorrect.

All measurement shall be from drawings executed at site and shall be checked in compliance (as per drawings), before measurement are done, all to the requirement of the Engineer-in-charge.

53. Method of measurements.

Where works have to be measured for any purpose whatsoever it shall be in accordance with IS 1200 unless otherwise specifically indicated in the contract and under the specific chapters.

54. Payment on account and Retention.

The contractor may at intervals specified in the Tender document claims for payments of advances on account of work done and materials delivered at the site in accordance with the contract. Such claims which shall be computed as under:-

55. Works:

Full value of the work executed on site to the satisfaction of the Engineer-in-charge less the deduction indicated in the tender which shall constitute the security deposit such deductions shall constitute to be effected from every interim valuation, unless otherwise stipulated.

56. Materials:

The percentage (%) indicated in the tender of the value of any non perishable materials which in the opinion of the Engineer-in-charge are in accordance with the contract and have been brought on site in connection herewith & adequately stored and protected against damage by any cause whatsoever, but which have not at the time of the advance being claimed been incorporated in the works scaffolding, props, formwork, sand, metal & constructional plant or machinery shall not qualify for such advances.

For the purpose of evaluating the works and materials as above the Engineer-in-charge shall prescribe & the contractor shall furnish such returns & documents as may be called for.

i) Any sums due from the contractor on account of stores or any such other things provided by the Employer shall be deducted from the first or subsequent advance.

The Engineer-in-charge shall from time to time recommend the amount which the contractor is entitled; payment "on account" shall be made there after on the recommendation of the Engineer-in-charge with in the period indicated in the tender.

ii) Any certificate for interim payment may be modified or corrected by subsequent interim certificate or by final certificate and no certificate of the Engineer-in-charge in respect of an advance payment shall of itself be conclusive evidence that the work which relates are in accordance with the contract

Contractor shall submit only commutative bills every time. Rates claimed shall be on the basis of work done at site and as approved by the Engineer-in-charge.

iii). Relevant updated measurements with the bill only shall be considered.

57. Final Bill.

As soon as possible after the works/plant/equipment have been completed and successfully commissioned, but not later than 2 months from certified completion date, the contractor shall forward certified final account to the Engineer-in-charge. This shall include reconciliation of all materials or things issued by the Employer. No claims will be entertained after receipts of the final bill.

The Engineer-in-charge shall check & certify the final quantities admissible on the final bill. The contractor shall be entitled to be paid this amount on the recommendation of the Engineer-in-charge, less the percentage indicated in the tender as security for performance during the defect liability period, and the value of all payments made on account against interim certificates, and any other amounts payable to the Employer & any other deductions required by law.

The amount retained from the final bill towards security for the performance during the maintenance period shall be released by the Employer on the issue of the maintenance certificate by the Engineer-in-charge. The security deposit shall be released along with the payment of the final bill.

The final bill shall be submitted by the contractor in a form approved & in the manner prescribed by the Engineer-in-charge.

58. Recovery of sums.

Whenever under the contract any sum of money shall be recoverable from or payable due by the contractor, the same may be deducted from any sum then due or may become due to the contractor, under the contract with the Employer.

59. Forfeiture.

If the contractor shall become bankrupt or have a receiving order made against him or shall present his petition in bankruptcy or shall make an arrangement with or assignment in favors of his creditors or shall agree to carry out the contract under a committee of inspection of his creditors or (being a corporation) shall go into liquidation (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) or if the contractor shall assign the contract without the consent in writing of the Engineer-in-charge, shall have an execution levied on his goods or if the Engineer-in-charge shall certify in writing to the Employer that in his opinion the contractor.

a). has abandoned the contract or

b). without reasonable excuse has failed to commence the works or has suspended the progress of the works for 28 days after receiving from the Engineer-in-charge written notice to proceed or

c). has failed to remove materials from the site or to pull down & replace work for 30 days after receiving from the Engineer-in-charge written notice that the said materials or work has been considered & rejected by the Engineer-in-charge under these conditions or

d). is not executing the works in accordance with the contract or is persistently or flagrantly neglecting to carry out his obligations under the contract of

e). has to the detriment of good workmanship or in defiance of the Engineer-in-charge instructions to the contrary sub-let any part of the contract

then the Employer may after giving 14 days notice in writing to the contractor enter upon the site & the work & expel contractor their from without there by avoiding the contract or releasing the contractor from any part of his obligations or liabilities under the contract or affecting the rights & powers conferred by the Employer on the Engineer-in-charge by the contract and may himself complete the works or may Employ any other contractor to complete the works & Employer or such other contractor may use for such completion so

much of the constructional plant temporary works and materials which have been deemed to be reserved exclusively for the execution of the works under the provision of the contract as he or they may think proper & the Employer may at any time sell any of the said constructional plant, temporary works and unused materials and apply the proceeds of sale in or which may become due to him from the contractor under the contract.

60. Payment after forfeiture.

If the Employer shall enter and expel the contractor under this clause he shall not be liable to pay to the contractor any money on account of the period of defective liability & thereafter until the cost of completion & maintenance damages for delay in completion (if any) all other expenses incurred by the employer have been ascertained and the amount thereof certified by the Engineer-in-charge the contractor shall then be entitled to receive only such sum or sums (if any) as the Engineer-in-charge may recommend and would be taken as due to him upon due completion by him after deducting the said amount. But if such amount shall exceed the sum which would have been payable to the contractor on due completion by him then the contractor shall upon demand pay to the employer the amount of such excess and it shall be deemed a debt due by the contractor to the employer and shall be recoverable accordingly.

61. Urgent repairs.

If by reason of any accident of failure or other event occurring to in or in connection with the works or any part thereof either during the execution of the works or during the period of defect liability, any remedial or other work or repair shall in the opinion of the Engineer-in-charge be urgently necessary for security and the contractor is unable or unwilling at once to do such work or repair as the contractor was liable to do at his own expense under the contract, all costs and charges properly incurred by the employer in so doing, on the demand be paid by the contractor to the Employer from any dues or which may become due to the contractor, provided, always that the Engineer-in-charge shall as soon after the occurrence as of any such urgency as may be reasonable practicable notify to the contractor thereof in writing.

62. Arbitration.

Except where otherwise provided in the contract all questions and disputes, relating to the meaning of specifications, designs, drawing and instructions herein before mentioned and as to the quality of workmanship or materials used on the work or as arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, order or those conditions concerning the works, or the execution or failure to execute the same whether arising during the progress of the work or after the completion or abandonment thereof shall be referred to arbitration under the provision of the Arbitration Act, 1940 or any statutory modification or re-enactment thereof and the rules made there under and for the time being in force such arbitration shall be conducted by two arbitrators, who in turn shall nominate an umpire before the arbitration. In case the arbitrators fail to arrive at a decision, the matter shall be referred to the umpire whose ruling shall be final and binding on both the parties to the dispute.

63. EXTRA ITEMS.

Rates of extra items if admissible shall be derived on the following basis

a). From nearest similar item of the tender.

b). Contractor shall submit his item rates (within fifteen days of being asked to execute such an item) along with necessary analysis of men & materials used therein and the proof thereof for the work to be executed at site, 10% over and above these rates shall only be considered towards his overheads and profits as certified by the Engineer-in-charge and the same shall become payable on recommendations of Engineer-in-charge.

64. Issue of Materials Employer.

The Engineer-in-charge may at this option issue such as are listed all other by materials for the work & temporary works shall be provided by the contractor at his own cost. If the Engineer-in-charge issues any of the materials listed above the contract price payable to the contractor shall stand reduced by the values of the materials issued by the Engineer-in-charge such values being calculated at the rates specified against each of the materials listed. The contractor shall not deal with such materials in any matter except for in execution of this contract.

65. Price Escalation:

No price escalation whatsoever shall be allowed in respect of any material or wages used or employed in connection with the execution of the works. All duties, taxes, octroi, turnover tax & service etc. shall be borne by the Contractor.

66. Site order Book.

A site order book shall be maintained by the Engineer Incharge at the site of works in which instructions shall be entered and communicated to the Contractor by the Engineer -In-charge as and when necessary. These orders shall be signed in token of receipt and complied with by the Contractor and nothing shall be written by him in reply. If the Contractor desires to represent any matter entered in the said order book, he may do so by a separate communication.

67. Error.

For any typographical error or omissions in the tender documents the interpretation given by the Executive Engineer Bhaderwah Development Authority, Bhaderwah will be final and binding on the contractor.

68. Other conditions

- Latest relevant BIS specifications shall govern this contract and work shall be carried out strictly in accordance with them.
- Time is the essence of this contract. The contractor is expected to work in more than one shifts and nothing extra shall be paid for the same.
- The employer shall not supply any material, however the contractor shall have to support the quality soundness of material by relevant tests as and when warranted under relevant BIS codes.
- In case of delay a penalty of 1/2% of the contract value per day subject to a maximum of 10% of the contract value shall be imposed on the contractors on liquidated damages. The decision of the Employer in this matter shall be final, conclusive and binding on the contractor.
- The architectural and other drawings shall, all times, be properly correlated for executing any work. Samples shall be prepared for approval before starting any items of work specified by the Engineer-in-charge including verifying and getting the layout approved etc.
- Rates quoted for the items in all individual sections shall be valid for carrying out the item of work at any place, any level and at any height.
- Collection and stacking of materials shall include all leads and lifts. The rates quoted by the Contractor shall hold well irrespective of the source from which the materials are brought so long as they confirm to the specifications, and as approved by the Engineer-in-charge.
- The contractor shall be personally responsible for watch and ward and handling, storing of all materials handed over to him by the Engineer-in-charge or brought by him to the site. Nothing extra shall be paid to him for this.
- When required by the Engineer-in-charge, the contractor shall supply for the purpose of testing, samples of any materials to be used in the works as per specifications. The contractor shall provide all such samples at his own cost including suitable packages to contain them, to the Engineer-in-charge. All the expenditure on account of packing of

samples, conveyance, handling & delivery up to the testing charges and fees to be paid in this respect shall be borne by the contractor including cost of all materials and samples.

- Contractors shall submit once every fortnight, a detailed report of the following;
- Materials procured, consumed & balance at site for previous week as well as expected deliveries during next fortnight.
- List of equipment and machinery at site, stand by as well as those under repair and equipment scheduled to arrive during next fortnight.
- Skilled –unskilled labour and supervisors working at site during past week expected increase in next fortnight.
- Steps proposed for speeding up the progress of work in the next week.
- Five photographs of the sites - four sets.
- Contractor must appoint full time responsible Site Engineer conversant with the nature of works and attend all site meetings etc.
- The contractor shall make his own arrangements for storage of any constructional material.

CHAPTER III
SPECIAL CONDITIONS AND TECHNICAL SPECIFICATIONS

1. The work shall be carried out according to this Specification, whether specifically mentioned or not. No extra in any form will be paid unless it is definitely stated as an item in the Schedule of Quantities. Wherever the specifications are not given or ambiguous, the relevant Indian Standard and further amendments/CPWD specifications will be considered as final and binding.
2. The work shall be carried out simultaneously with the electrical, sanitary and other services and in cooperation with the contractors for the above services. The work shall be carried on till it is completed satisfactorily along with the completion of essential portions of other services. The Building contractor shall keep the other contractors informed well in advance of the proposed programme of the work and shall give adequate notice to enable them to carry out their part of the work so that the building work is not hindered. The contractor shall further cooperate with the other contractors, in respect of any facilities required by them e.g. making holes in shuttering for sanitary pipes, electric conduits, fan hooks etc. However, nothing extra shall be admissible to him for such reasonable assistance and facilities afforded to other contractors, and the Building contractor shall be deemed to have taken those factors into consideration while quoting his rates.
3. The work shall be related to the drawings, which the contractor is presumed to have studied. Nothing extra will be paid for any item on account of its shape, size, location or other difficult circumstances, even if the schedule makes no distinction, as long as the item is shown in the drawings.
4. The sources of materials stated in the specifications are those from which materials are generally available. However, materials not conforming to specifications shall be rejected even if they come from the stated sources. The contractor should satisfy himself that sufficient quantity of material of acceptable specification is available from the stated or other sources and should tender accordingly.
 “Schedule” – shall mean the schedule of quantities.
 “Approved”, “allowed”, “accepted” – shall mean approval of the Engineer in charge in writing.
 “Required” means as instructed by the Engineer in charge.
5. The contractor, without extra charge shall fulfill the requirements of these specifications, i.e. the item rates quoted shall be deemed to have taken these specifications into account.
6. Drawings, Instructions, and Measurements:-
 All work shall be done according to the drawings and instructions of the Engineer in charge and the Contractor shall arrange to test materials and/or portions of the works at his own cost in order to prove their soundness and sufficiency. If after any such test and in the opinion of the Engineer in charge any work or portion of work is found to be defective or unsound, the Contractor shall pull down and re-execute the same at his own cost. Defective materials shall be removed from the site.
7. Clearing the site:-
 The site described and shown on the plans with 6 meters all around the building, shall be cleared of all obstructions, loose stones and materials, rubbish of all kinds as well as brushwood. All holes or hollows, whether originally existing or produced by removal of loose stone or brushwood shall be carefully filled up with earth well rammed and leveled off as directed. Also, the Contractor shall dress the site 6 metres all round the building after completion maximum cutting or filling being 30 cms. No extra shall be paid for this.
8. Trees:-

No trees shall be cut without permission. If any trees have to be cut, this shall form an extra item. For the purpose of the specification, a tree shall be defined as a growth which is more than 3 m high and whose diameter of the trunk at the base is not less than 30 cms.

9. Setting out and making profiles.

Masonry pillars will be erected at suitable points in the area to serve as benchmarks for the execution of the work. These benchmarks shall be connected with permanent benchmark approved by the Engineer-in-charge. Necessary profiles with pegs, bamboos and strings or “Bhurjis” shall be made to show the correct formation level before the work is started. The contractor shall supply labour and material for setting out and making profiles and “Bhurjis” for the work at his own cost. The profiles and “Bhurjis” shall be maintained during the execution of work.

10. Materials

Water

Water shall be from Municipal main or sweet tank or well. Water storage accommodation for the water shall be of sufficient size and as directed by Engineer-in-charge. The Government does not guarantee the supply of water. The contractor shall make his own arrangements for supply of water. In case the Government agrees to supply, the contractor shall pay the cost of water at the rates fixed by the Government.

Murrum

It shall be got from approved quarries. It shall be granular and gritty. It shall be free from dust, all rubbish, and any organic materials as well as clods of black cotton soils. The materials shall be got approved prior to its use in road construction.

The material shall be stacked on a level ground. If the item is only for supplying of murrum, then it shall be measured in cum. The rate shall include digging the murrum, supplying at site, conveying with all lead and lift and stacking the same at site as directed by the Engineer. The rate shall also include all tolls, duties, fees, royalties etc.

Sand

The sand shall be from a river or nallah or sea. It shall be clear, sound, properly graded, free from organic material; silt, clay etc. and it shall be well graded.

Stone

The stone shall be hard, sound, durable, and free from decay and weathering. No round or oblong pebbles shall be allowed. The stone shall be tested for abrasion value. Before the material is put to use the same shall have to be got approved from the Engineer-in-charge.

Earth

For filling and terracing shall be free from all rubbish organic or vegetable growth including roots, weeds etc. All clods shall be first broken down.

Portland cement

Cement shall comply with the Indian Standard specification and shall be of Indian or other make to be approved by the Engineer-in-charge, when stored in bags these shall be raised 30 cms. Above the ground and stacked in rows of 10 bags high, 0.6m clear from the walls.

11. Items of work

• Plain Cement Concrete

- i) Mixing: - All proportions shall be by volume, except cement, which shall be proportioned by weight unless otherwise specified. Mixing shall be done in a mechanical mixer as required for reinforced concrete work. However, in special case, hand mixing may be allowed by Engineer-in-charge when the following procedure shall be adopted. The several materials shall be accurately gauged in boxes and thoroughly mixed on a water-tight platform of adequate size, by being turned over at least thrice dry till the colour is uniform and then twice wet. Water shall be added gradually and no more than necessary to sufficiently wet the materials, only that much concrete shall be mixed which

can be used within half an hour. Each stack shall however not be larger than consuming one bag of cement. All such stacks shall be placed distinct from each other. In case hand mixing is allowed, the contractor shall put in 10% more cement than specified without extra charges.

ii) Protection: All plain and reinforced cement concrete shall be adequately protected. Newly placed concrete shall be protected by approved means from frost, sun, dust, storms and hot spells. Concrete placed below the ground shall be protected from falling earth during and after placing. Concrete placed in ground having deleterious salts shall be kept free from contact at least for three days, or as otherwise instructed, thereafter. Approved means shall also be taken to protect immature concrete from damage by debris, excessive loading, vibration, abrasion, floatation due to sub soil water and other influences that may impair the strength and durability of the concrete. This shall apply to all items of cement concrete. No extra charge shall be allowed for this.

iii) Laying:- concrete shall be laid in horizontal layers of not more than 150mm thick and gently rammed.

iv) Curing:- After laying, the concrete shall be kept wet for fifteen days. If cast in hot weather, it shall be covered with gunny bags, which shall be kept constantly wet. Other work on concrete shall not start until after three days of laying the concrete.

- Measurement

In cubic meter of exact length, breadth and depth as ordered by the Engineer in charge or as shown on the drawings. This shall be inclusive of any centering or shuttering required to complete the item.

- Joints in Cement Concrete

All longitudinal and transverse joints shall be confirm the details shown in Architectural drawings and/or as directed by Engineer-in-charge.

All joints shall be constructed true to the line with their faces perpendicular to the surface. Joints shall not vary more than 6mm from a true line or from their designated position.

The joints shall be formed by inserting the web of a “T” or any other suitable device with oiled surfaces into the concrete, when the concrete is stiff enough to receive the inserting device.

The “T” iron or any other device adopted shall be taken out carefully in such a way that it will not slump and close the slot.

- Transverse Expansion Joints.

Transverse Expansion Joints shall be of the premoulded type and shall be constructed at right angles to the centerline of the pavement and shall extend to the full width of the pavement. The spacing of the joints shall be 27m for pavement 10cm to 15cm thick and 36m for pavement 20cms thick or more and 10m for pavements below 10 cm thick.

- Transverse Contraction Joints

Transverse Contraction Joints shall be formed by a groove or cleft in the top of the slab. The groove shall be 13mm wide at the surface and 10mm wide at the bottom. It shall extend vertically downwards from the top to a depth equal to $\frac{1}{4}$ (one fourth) the depth of the pavement, track, runway etc. at the thinnest part of its section. The joints shall be located at 6m or 5.4m intervals depending on whether the expansion joint spacing is 36 or 27 m respectively.

- Transverse Construction Joints

Transverse Construction Joints shall be made at the end of each day's run or where unavoidable interruption or more than 30 minutes occur in the concreting operations.

Transverse Construction Joints shall be plain butt joints and formed so as to make a slab at least 3m in length. If this is not possible, the joints shall be formed at the preceding Transverse expansion or construction joint location. The exposed face of the joint shall be

- painted with approved quality bitumen before concreting the adjacent bay. The spacing of subsequent Transverse Contraction Joints shall be measured from the Transverse Contraction Joints last placed.
- Expansion Joints at structures:
Expansion joints shall be formed around all structure and features projecting though, into, or against the pavement. Such joints shall be 13mm wide and shall be of the premoulded type.
 - Arrangement of Transverse Joints:-
The Transverse Joints on each side of a longitudinal joint shall be of the same type and shall be in line with each other and not staggered.
 - Longitudinal Joints.
Longitudinal Joints shall be plain butt joints like Transverse Construction Joints.
 - Installation of Transverse Expansion Joints
The joints shall be set to the required line and grade and shall be held in the required position, during the placing and finishing of the concrete by securing stacks or other suitable device. It shall be ensured that the concrete pressure will not disturb their alignment. The joints shall be vertical and no joint shall deviate more than 6mm in the horizontal alignment either way from a straight line. The installing device shall have a length 6mm less than the required width of the slab and shall be cut to the required depth. The lower and the top edges shall be cut to conform to the prescribed cross section of the base and the crown of the slab respectively. The joint assembly shall be tested to determine whether it is firmly supported. Any assembly not firmly supported shall be reset.
 - Filling of Joints.
 - A. Expansion Joints.
 - (a) Pre-moulded joint filler: It shall conform to I.S.1838-1961, the thickness shall be 20mm or 25mm as specified and shall be maximum available standard length.
During the casting of the slab the pre moulded joint filler shall be placed accurately in position against the finished end of concrete slab. The filler shall remain 20mm below the top surface of the pavement and shall extend upto the sub-grade.
 - (b) Sealing compound: After the curing period is over, the joint portion above filler board shall be cleaned thoroughly as directed by Engineer-in-charge. The joints shall be filled with hot applied scaling compound Grade A (Normal) for concrete construction other than those which are subject to spillage of kerosene or other heavy petroleum oils and grade B (jet fuel resistant) for concrete constructions of runways for jet aircrafts conforming to ISI 834-1961.
 - B. Filling of contraction, construction and dummy joints:
These shall be done as per para A (b) above.
Measurement: Length and Depth of the joint shall be measured correct to a cm and width correct to 3mm.
Rate: The rate shall be taken in per cm depth, per cm width, per meter unit and it shall include the cost of materials and labour involved in all the operations described above.
12. **QUALITY**
All materials for incorporation into the works shall be of the best quality of their respective kinds as specified herein and shall be obtained from sources and suppliers approved by the Engineer-in-charge or their representative and shall comply strictly with the test prescribed herein after or where the tests are not laid down in this specification, with the requirements of the latest issue of the relevant Indian Standard by the Engineer-in-charge.
13. **INSPECTION AND TESTING**

All materials before being incorporated into the works shall be subjected to inspection and testing as provided in the conditions of contract and else where in the specifications. The cost of all samples for all tests required by these specifications of the approved standards shall deemed to be included in the contract rates.

No materials shall be used in the woks unless those have first been approved by the Engineer-in-charge of the owners.

14. SAMPLES

Samples of all materials proposed to be used in the works and to be supplied by the contractor, may be called for at any time by the Engineer-in-charge or their Representative.

15. INDEPENDENT TEST ANALYSIS

Independent test & analysis of any of the materials may be made from time to time by a testing house or analyst appointed by the Engineer-in-charge or their representative in order to check the supplier's works tests and analysis. The contractor shall be at his own expense supply and deliver to a Testing house or Analyst such materials as may be directed by the Engineer-in-charge or their representatives. The cost of all successful tests on actual basis, and all other costs shall be borne by the contractor. However, the testing of concrete cubes shall be governed by the specific terms set out herein after in these specifications.

16. BRICK WORK

The contractor shall furnish all labour , materials, tools & applications with services necessary to complete brick work masonry & floor tiling etc. in accordance with the drawings and as specified herein.

- **Mortar Preparation**

Cement mortar for brick work shall generally be as specified herein, namely in proportion of one of cement with 6 of sand by volume, or as indicated otherwise. Mortar shall be prepared by mixing cement & sand in specified proportion in the site. The mortar shall be used with in half an hour of mixing. No hand mixing is permitted.

- **MATERIALS**

Bricks shall be table moulded, of uniform size, shape and colour & must be well burnt so as to give a clear ringing sound when struck. They shall be clean, whole & free from flaws, cracks, stone or lump of any kind, especially lime. They shall have sharp edges and angles and even surfaces and shall be sound and hard to resist compression. They shall be from a source approved by the Engineer-in-charge. No brick after immersion in water for 24 hours shall absorb more than 15% of its weight. Where specifically agreed upon bricks shall be of the best quality locally available.

- **WORKMANSHIP**

All bricks shall to be used to kept soaked in water for at least 2 hours prior to use. The work shall set out by the contractor. No. brickbats shall be used for the work except where required to complete a standard bond.

All joints in brick work shall be uniformly laid. Each layer of brick work shall be laid plump & level with correct break of joints. No mortar joint shall exceed 15 mm in thickness.

The work shall be kept wet for at least 7 days after laying the last course.

Brick work shall not be raised more than 10 courses a day unless otherwise approved by the Engineer-in-charge.

Brick work shall be uniformly raised panel wise all round & no part shall be raised more than 1 meter above another, at any time. The contractor shall provide all necessary openings for doors, windows or such other services and shall embed all cuttings & fixtures(if separately paid for) at no extra cost 115 mm & 20 mm brick walls shall be

built fair faced on one side only. All other walls of greater thickness shall be built without exception with fair face to both sides.

Where specifically indicated 115 mm or thinner brick work shall be executed in one of the following ways.

With R.C. Stiffeners

Brick work be carried out in panels measuring 1.5 m x 1.5m with R.C.C. (1:2:4) verticals of 12 cm x 12 cm & horizontal stiffeners 12 cm x 8 cm, both reinforced with 4 Nos. 5 mm dia bars laid in 1:2:4 concrete properly filled in and cured. Such R.C.C. work shall not be measured separately but will be included in the rate for brick work.

- Reinforcement brick work

Such brick shall be in cement mortar 1:4. the Joint shall be increased suitable to embed the reinforcement, which shall be laid at every fourth course, consisting of hoop iron 25 mm wide 1.5 m thick with holes punched at every 15 cm the joints shall be well filled in and reinforcement properly surrounded with mortar & cured for not less than ten days. Care shall be taken to see that proper cover is provided to the reinforcement & the work laid continuously to ensure that no portion of the mortar attains initial set before mortar in adjoining portion is laid in position.

- Mode of payment shall be on the basis of codes of practice.

- In lieu of hoop iron, the Engineer may direct the use of mesh or M.S. bars as reinforcement.

17. STONE MASONRY

- Stones shall be set level, plumb with uniform joints set in full set bed of mortar, with joints filled.

- All stone to be well wetted, except in frostily weather, before setting and large stone to be set with a derrick rack out mortar joints when setting.

- Utmost care shall be taken during construction that the surface of the stones is not spoilt by concrete or mortar dropping on the stones and drying. The surface of the stones be immediately cleaned with water if any concrete or mortar does on fall the stone faces.

- Stones for masonry shall be best hard stone locally obtainable from approved quarries. The masonry, whenever required shall be composed generally of large stones clean flat bedded properly selected for their places and carefully laid, with a suitable proportion of smaller stones & chips to fill up interstices. The whole work shall be hand set and solidly bedded in and surrounded with mortar on every side except the face. There shall be no hollows or dry portions in work nor pinning in the face. The face stone shall be flat-bedded, shall tail back and be bound well into the body of the wall and shall not be of a height greater than either the breadth of face or length of the tail through-stones, covering the whole width or thickness of the wall or 60 cm long where the walls are horizontal and vertical. The face of the wall shall be strictly straight. The masonry shall be shaded from the sun & well moistened for at least three days after completion.

- Stone masonry shall be random, polygonal, or squared rubble either un-coursed or brought up to course, all as indicated.

- The rate for stone work shall include the cost of the following:-

- Selecting proper stones, breaking of boulders etc. in case the wall is to be constructed from stones available at site.

- Scaffolding if necessary.

- Raking out joints.

18. RUBBLE/BRICK PACKING

SCOPE OF WORK

The contractor shall furnish all labour materials tools & services necessary to complete all "packing" in the accordance with the drawings and as specified herein.

- **MATERIALS**

The rubble stone shall be sound, hard and durable. They shall have at least one dimension equal to the thickness of rubble packing and shall in any case, not be less than 15 cm in any direction. The stone shall be carefully hand-packed with longer side of each stone (which in no case shall be less than thickness of rubble packing) placed vertically with the smaller face of the two ends at the top. All interstices stone chips & the surface shall be made of uniform with the sand; the surface shall be formed to such stops as directed by the Engineer-in-charge. The rubble packing shall be thoroughly consolidated and sprinkled with water, if required by the Engineer-in-charge. The depth of the rubble packing shall be taken as consolidated depth. The concrete for flooring shall be laid over the rubble packing only after the Engineer-in-charge issue the order to that effect.

- **MEASUREMENT**

It shall be as per IS: 1200

19. **BRICK SOLING**

Where the soling is required to be provided with brick it shall conform to the following specifications.

Brick shall be of the quality indicated and shall be laid flat or on edge as indicated. The brick touching each other. Soling shall be closely packed leaving no interstices or gaps. Appropriate fillet shall be used to make up for dimensions which are part of a whole brick. After the soling is complete whole surface shall be subjected to consolidation by a light roller. Where indicated the joints shall be in cement mortar.

20. **REINFORCED CONCRETE AND ALLIED WORKS**

These specifications cover the general requirements for concrete to be used on jobs using on-site production facilities including requirements in regard to the quality, handling, storage of ingredients, proportioning, batching, mixing and testing of concrete and also requirements in regard to the quality, storage, bending and fixing of reinforcement. This also covers the transportation of concrete from the mixer to the place of final deposit and the placing, curing, protecting, repairing and finishing of concrete.

21. **APPLICABLE CODE AND SPECIFICATIONS**

MATERIALS

01. I.S. 269 - Specification for ordinary, rapid hardening & low heat Portland cement.
02. I.S. 455- Specification for Portland blast furnace slag cement.
03. I.S. 1489 - Specification for Portland-Pozzolona cement.
04. I.S. 4031 - Method of physical test for hydraulic cement.
05. I.S. 650 - Specification for standard sand for testing of cement
06. I.S. 383 - Specification for coarse and fine aggregate for use in mass concrete.
07. I.S. 515 - Specification for natural & manufactured aggregate for use in mass

CONCRETE

08. I.S. 2386 - Method of test for aggregate for concrete. (part I to VIII)
09. I.S 516 - Method of test for strength of concrete.
10. I.S. 3025 - Method of sampling and test (physical & chemical) for water used in
11. I.S. 432 - Specifications for mild steel and medium tensile steel bars & drawn (Part I&II) steel wire fabric for concrete reinforcement.
12. I.S. 1139 - Specification for hot rolled mild steel and medium tensile steel deformed bars for concrete reinforcement.
13. I.S. 1566 - Specification for plain hard drawn steel fabric for concrete reinforcement.
14. I.S. 1785 - Specification for cold twisted steel bars for concrete reinforcement.
15. I.S. 1786 - Specification for cold twisted steel bars for concrete reinforcement.
16. I.S. 2090 - Specification for high tensile steel bars used in prestressed concrete.
17. I.S. 303 - Plywood for general purpose.
18. I.S. 4990 - Specification for plywood for concrete shuttering work.
19. I.S. 1629 - Rules for grading of cut size of timber.
20. I.S. 2645 - Specification for integral cement water proofing compounds.

EQUIPMENT

01. I.S. 1791 - Specification for batch type concrete mixers.
02. I.S. 2438 - Specification for roller pan mixer.
03. I.S. 2506 - Specification for concrete vibrators, immersion type.
04. I.S. 2506 - Specification for creed board concrete vibrator.
05. I.S. 2514 - Specification for concrete vibrating table.
06. I.S. 3366 - Specification for pan vibrator.

07. I.S. 4656 - Specification for form vibrator for concrete.
 08. I.S. 2722 - Specification for portable swing weight batchers for concrete (single and double bucket type)
 09. I.S. 2750 - Specification for steel scaffoldings.

CODES OF PRACTICE

01. I.S. 456 - Code of practice for plain and reinforced concrete.
 02. I.S. 1343 - Code of practice for prestressed concrete.
 03. I.S. 457 - Code of practice for general construction of plain and reinforced concrete for dams and other massive structures.
 04. I.S. 3370 - Code of practice for concrete structures for storage of liquids.
 05. I.S. 3935 - Code of practice for composite construction.
 06. I.S. 3201 - Criteria for the design and construction of precast concrete trusses.
 07. I.S. 2204 - Code of practice for construction of reinforced concrete shell roof
 08. I.S. 2210 - Criteria for the design of R.C.C. shell structures and folded plates.
 09. I.S. 2751 - Code of practice for welding of mild steel structure and folded plates
 10. I.S.2502 - Code of practice for bending and fixing of bars for concrete reinforcement.
 11. I.S. 3558 - Code of practice for immersion vibrations for consolidating concrete.
 12. I.S. 3414 - Code of practice for design & installation of joints in buildings.
 13. I.S. 4054 - Code of practice for steel tubular, scaffolding.
 14. I.S. 2571 - Code of practice for laying in-situ cement concrete flooring.

22. SCREENING AND WASHING

a. Crushed rock shall be screened and or washed for the removal of dirt or dust coating, if so demanded by Engineer-in-charge.

b. Grading.

Coarse aggregates shall be either in single size or graded, in both case, the grading shall be within the following limits.

I.S. Sieve percentage passing for single sized designation aggregate of normal size.

	40 mm	20 mm	16 mm	12.5 mm	10 mm
63 mm	100	-	-	-	-
40 mm	85-100	100	-	-	-
20 mm	0-20	85-100	100	-	-
16 mm	-	-	85-100	100	-
12.5 mm	-	-	-	85-100	100
10 mm	0-5	0-20	0-30	0-45	85-100
4.75 mm	-	0-5	0-5	0-10	0-20
2.36 mm	-	-	-	-	0-5

Percentage by weight of aggregates.

S.No.		Uncrushed	Crushed
1.	Materials finer than 75 million I.S. Sieve.	3.00	3.00
2.	Coal and lignite	1.00	1.00
3.	Clay lumps	1.00	1.00
4.	Soft fragments	3.00	-
5.	Total of all the above substance	5.00	5.00

23. WATER

• Water used for both mixing and curing shall be free from injurious amounts of deleterious materials. Potable waters are generally satisfactory for mixing and curing concrete.

• In case of doubt, the suitability of water for making concrete shall be ascertained by the compressive strength and initial setting time test specified in I.S.456. The sample of water taken for testing shall be typical of the water proposed to be used for concreting, due account being paid to seasonal variation. The sample shall not receive any treatment before testing other than that envisaged in the regular supply of water proposed for use in concrete. The sample shall be stored in a clean container previously rinsed out with similar water.

- Average 28 days compressive strength of at least 3 Nos. Cm concrete cubes prepared with water proposed to be used shall not be less than 90% of the average strength of three similar concrete cubes prepared with distilled water.
- The initial setting time of test block made with the appropriate test cement and water proposed to be used shall not be less than 30 minutes and shall not differ more than plus/minus 30 minutes from the initial setting time of control test block, prepared with the appropriate test cement & distilled water. The test blocks shall be prepared and tested in accordance with the requirement of I.S. 4031.
- Where water can be shown to contain an excess of acid alkali, sugar or salt, Engineer-in-charge may refuse to permit its use. As a guide, the following concentration represent the maximum permissible values:-
- To neutralize 200 sample of water, using phenolphthalein as indicator, it should not require more than 2ml of 0.1 normal HCL. The details of test shall be as given in I.S. 3025.
- To neutralized 200 ml sample of water, using methyl orange s indicator, it should not required more than 10 ml of 0.1 normal HCL. The details of test shall be as given in I.S. 3025.
- Percentage of solids, when tested in accordance with the I.S. 025 shall not exceed the following:

I.S. Sieve percentage passing for graded aggregate Designation of normal Size.

	40 mm	20 mm	16 mm	12.5 mm
63 mm	100	-	-	-
40 mm	95-100	100	-	-
20 mm	30-70	95-100	100	-
12.5 mm	-	-	-	-
10 mm	10-35	22-55	30-70	40-85
4.75 mm	0-5	0-10	0-10	0-10
2.36 mm	-	-	-	-

24. CONSTRUCTION SAFETY

I.S. 3696 – Safety code for scaffolds & ladders (Part I & II).

25. MEASUREMENT

I.S.1200 - Methods of measurement of building works.

I.S. 3385 – Code of practice for measurement of civil engineering works.

26. OTHER REQUIREMENTS

In the event that state, city or other Govt. bodies have requirements more stringent than those set forth in this specifications, such requirements shall be considered part of specifications & it shall supersede these specifications where ever applicable.

27. GENERAL

The quality of materials and method and control of manufacture and transportation of all concrete work irrespective of mix. Whether reinforced or otherwise, shall conform to the applicable portions of this specifications.

The Engineer-in-charge shall have the right to inspect the source/s of material/s, the layout & operation of procurement & storage of materials, the concrete batching & mixing equipment, & the quality control system. Such as inspection shall be arranged by the contractor Engineer-in-charge approval shall be obtained, prior to starting of concrete work.

28. MATERIALS FOR STANDARD CONCRETE

The ingredients to be used in the manufacture of standard concrete shall consist solely of a standard type Portland cement, clean sand, natural coarse aggregate, clean water and admixtures, if specifically called for in the drawings or in the specifications.

CEMENT

a) Unless otherwise specified or called for by the Engineer-in-charge/Employer, cement shall be ordinary Portland cement in 50 kg bags. The use of bulk cement will be permitted only with the approval of the Engineer-in-charge, changing of brands or type of cement within the same structure will not be permitted.

b) A certified report attesting to the conformity of the cement to I.S. specifications by the cement manufacture's chemist shall be furnished to the Engineer-in-charge, if demanded.

Contractor will have to make his own arrangements for the storage of adequate quantity of cement. It will be the responsibility of the contractor to ensure adequate and proper storage. Cement in bulk may be stored in bins or silos which will provide complete protection from dampness, contamination & minimize caking and false set (storage under tarpaulins will not be permitted), well away from the outer walls & insulated from the floor to avoid contact with moisture, ground and so arranged to provide ready access damaged or reclaimed or partly set cement will not be permitted to be used and shall be removed from the site. The storage bins & the storage arrangements shall be such that there is no dead storage. No more than 12 bags shall be stacked any tier. The storage arrangements shall be approved by the Engineer-in-charge consignments of cement shall be stored as received & shall be consumed in the order of their delivery.

Cement held in storage for period of 90 days or long shall be tested, should at any time the Engineer-in-charge have reasons to consider that any cement is defective then irrespective of its origin &/or manufacturer's test certificate, such cement shall be tested immediately at a National Test Laboratory/ Approved Laboratory and until the results of such tests are found satisfactory, it shall not be used in any works.

Storage of Aggregates

All coarse and fine aggregates shall be stacked separately in stock piles on the material near the work site in bins properly constructed to avoid inner mixing of different aggregates. Contamination with foreign materials and earth during storage & while heaping the materials shall be avoided. The aggregates must be of specified quality not only at the time of receiving at site but more to at the time of loading into mixer. Rakers shall be used for lifting of the coarse aggregates from bins or stock piles. Coarse aggregates shall be piled in layers not exceeding 1.20 mtrs. In height to prevent coning or segregation. Each layer shall cover the entire area of the stock piles before succeeding layers are started. Aggregates that become segregated shall be rejected. Rejected material after remixing may be accepted, if subsequent tests demonstrate conformity with required gradation.

Specific Gravity

Aggregates having a specific gravity below 2.6 (saturated surface dry basis) shall not be used without special permission of the Engineer-in-charge.

FINE AGREGATE

Fine aggregate except as noted above, and for other than lightweight concrete shall consist of natural or crushed sand to I.S.383 the sand shall be clean, sharp, hard strong, and durable and shall be free from dust, vegetable substance, adherent coating, clay, loan, alkali, organic matter, mica, salt, or other delegations substances, which can be injurious to the setting qualities/strength/durability of concrete.

Machine made sand

Machine made sand will be acceptable, provided the constituent rock/gravel composition shall be sound, hard dense, non-organic, uncoated & durability of concrete.

Screening and Washing.

Sand shall be prepared for use by such screening or through washing, or both, as necessary to remove all objectionable foreign matter while separating the sand grains to the required size fractions. Sand with salt content more than 3 percent will not be permitted to be used unless the same is washed and the slit content is brought within 3% by weight. Fine aggregates conforming to grading zone IV shall not be used unless mix designs &

preliminary tests have shown its suitability for producing concrete of specified strength and workability.

Fineness Modules

The sand shall not have a fineness modules of less than 2.2 or more than 3.2 the fineness modulus is determined by adding the cumulative percentage retained on the following I.S. Sieve sizes (4.75 mm, 2.36 mm, 1.18 mm, 600 micron) and dividing the sum by 100.

COARSE AGGREGATE

Coarse aggregate for concrete except as noted & for other than light weight concrete shall conform to I.S. 383. This shall consist of natural or crushed stone & gravel & shall be clean and free from elongated flaky or laminated pieces adhering coatings, clay lumps, coal residue, clinkers, along, alkali, mica, organic matter or other deleterious matter.

29. PERMISSIBLE LIMIT FOR SOLIDS

Maximum Permissible Limit

- | | |
|---|--|
| a) Organic | 200 mg/1 |
| b) Inorganic | 3000 mg/1 |
| c) Sulphates (as SO ₄) | 500 mg/1 |
| d) Alkali Chloride (as Cl) | 200 mg/1 for plain concrete work & 1000 mg/1 for reinforced concrete work. |
| e) Suspended matter | 2000 mg/1 |
| f) The P.H. value of water shall generally be not less than 6.0 | |

30. REINFORCEMENT BARS

- a. Reinforcement bars shall be arranged by contractor and shall be cold twisted steel bars and high yield strength deformed bars as per as I.S. 1786, as shown and specified on the drawings. Wire mesh or fabric shall be in accordance with I.S. 1560. Substitution of reinforcement will not be permitted except upon written approval from the Engineer-in-charge.
- b. The reinforcement shall not be kept in direct contact with the ground but stacked on top of an arrangement of timber sleepers or the like. Reinforcement shall be coated with cement wash before stacking to prevent scale and rust. Fabricated reinforcement shall be carefully stored to prevent damage, distortion, corrosion and deterioration.
- c. Quality
- d. All steel shall be of Grade 1 quality unless specifically permitted by the Engineer-in-charge. No rerolled material will be accepted. If demanded by the Engineer-in-charge, contractor shall submit the manufacturer's test certificate for steel. Random tests on steel supplied by the contractor may be performed by Employer as per relevant Indian Standards. All costs incidental to such tests shall be at "contractor's expense" steel not conforming to specifications shall be rejected.
- e. All reinforcement shall be clean free from grease, oil, paint, dirt, loose mill scale, loose rust dust, bituminous materials of any other substances that will destroy or reduce the bond. Pitted & defective rods shall not be used. All bars shall be rigidly held in position before concreting. No welding of rods to obtain continuity shall be allowed unless approved by the Engineer-in-charge. If welding is approved the work shall be carried out as per I.S. 2751 according to best modern practices and is directed by the Engineer-in-charge. In all case of important connections, strength of bars welded with special precaution, as specified by the Engineer-in-charge shall be taken in welding of cold worked reinforcing bars & bars other than mild steel.
- f. Laps
- g. Laps & splices for reinforcement shall be as shown on the drawings splices in adjacent bars shall be staggered & the locations of all splices, except those specified on the drawings, shall not be lapped unless the length required exceeds the maximum available lengths of bars at site.
- h. Bending
- i. All bars shall be accurately bend according to the sizes & shapes shown on the detailed working drawings/bar bending schedules. They shall be bent gradually by machine or other approved means reinforcing bars shall not be straightened and bent in manner that will

injure the material bars containing cracks or splits shall be rejected. These shall be bent cold, except bars of over 25 mm in diameter which may be bent hot if specifically approved by the Engineer-in-charge. Bars which depend for their strength on cold working shall not be bent hot. Bars bent hot shall not be heated beyond cherry red colour (not exceeding 654 degree C.) & after bending shall be allowed to cool slowly without quenching. Bars incorrectly bent shall be rejected as such as shall not, in the opinion of the Engineer-in-charge injure the material. No reinforcement shall be bent when in position in the work without approval, whether or not it is partially embedded in hardened concrete. Bars having kinds or bends other than those required by design shall not be used.

j. Fixing

Reinforcement shall be accurately fixed by any approved means and maintained in the correct position shown in the drawings by the use of blocks, spacers, and chairs as per I.S. 2502 to prevent displacement during placing and compaction of concrete. Bars intended to be in contact at crossing point shall be securely bound together at all such point with number 1.6 gauge annealed soft iron wire. The vertical distances between required successive layers of bars in beams or similar members shall be maintained by the provision of mild steel spacer bars at such intervals that the main bars do not perceptibly sag between adjustment spacer bars.

k. Cover to reinforcement

Unless indicated otherwise on the drawings, clear concrete cover for reinforcement (exclusive of plaster or other decorative finish) shall be as follows:-

1. At each end of reinforcement bar not less than 25 mm nor less than twice the diameter of such bar.

2. For a longitudinal reinforcement bars in a column, not less than 40 mm nor less than the diameter of such bar. In the case of columns of minimum dimensions of 200 mm or under, whose reinforcing bars do not exceed 12 mm a cover of 25 mm may be used.

3. For a longitudinal reinforcement bars in a beam, not less than 25 mm nor less than the diameter of such bar.

4. For tensile, compressive, shear or other reinforcement in a slab, not less than 15 mm nor less than the diameter of such bar.

5. For any other reinforcement, not less than diameter of such bar

6. Increased cover thickness may be provided when surfaces of concrete members are exposed to the action of harmful chemicals as the case of concrete in contact with earth faces contaminations with such chemicals, acid, vapor, saline atmosphere, sulphurous smoke (as in the case of steam operated railways), etc. And such increase of cover may be between 15 mm and 50 mm beyond the figure in (1 to 5) above as may be specified by the Engineer-in-charge.

7. For reinforced concrete members totally immersed in sea water, the cover shall be 40 mm more than specified in (1 to 5) above.

8. For reinforced concrete members periodically immersed in sea water, or subject to sea spray, the cover of concrete shall be 50 mm more than that specified in (1 to 5) above.

9. For concrete of grade M-25 and above, the additional thickness of cover specified in (6, 7 & 8) above may be reduced to half. In all such cases the cover should not exceed 75 mm.

10. Projection to reinforcement in case of concrete exposed to harmful surroundings may also be given by providing a dense impermeable concrete with approved protective to the extra cover, mentioned in (6), (7) and (8) above, may be reduced by the Engineer-in-charge to those shown on the drawings.

11. The correct cover shall be maintained by cement mortar briquettes or other approved means reinforcement for footings, grade beams and slabs on sub grade shall be supported on precast concrete blocks as approved by the Engineer-in-charge. The use of pebbles or stones shall not be permitted.

12. The minimum clear distance between reinforcing bars shall be in accordance with I.S. 456 or as shown in drawings.

1. Inspection

- m. Erected & secured reinforcement shall be inspected and approved by Engineer-in-charge prior placement of concrete.
- n. For payment of work done under this item, the actual quantity of steel embedded in concrete as calculated and approved by the Engineer-in-charge, irrespective of the level or the height at which the work is done, shall be taken. The unit rate for reinforcement shall include all wastage, binding wire, etc. for which no separate payment shall be made laps shown in drawings as approved by the Engineer-in-charge and the reinforcement number of chars and space bars to keep the reinforcement in place and approved by the project Engineers shall be measured & paid for.

31. STEEL SHAPES ENCASED IN CONCRETE

Structural steel columns, beams girders and bracings to be encased in concrete shall be unpainted, if so indicated on the drawings. The encasing shall be done in concrete with 10 mm maximum size aggregate & a works cube strength not less than 15 N/sq mm at 28 days unless otherwise specified in drawings. The steel members shall be wrapped with galvanized wire mesh of the size indicated on the drawings. The Galvanized wire mesh shall be kept 20 mm from the edge or surface of the steel member will have a minimum cover of 50 mm unless otherwise indicated on the drawings. When clear cover to steel is more than 75 mm, mild steel bar and concrete with 20 mm coarse aggregate can be used.

32. DESIGN MIX CONCRETE

a) All reinforcement concrete in the works shall be “Design Mix Concrete” as defined in I.S. 456/1978. All “Design Mix Concrete” work to be carried out under these specifications shall be in grades designated as per table shown below:-

33. GRADE OF CONCRETE

Grade Designation	Specified Characteristics
	Compressive strength at 28 days. N/Sq mm
M 10	10
M 15	15
M 20	20
M 25	25
M 30	30
M 35	35
M 40	40

NOTE NO 1:- The characteristics strength is defined as the strength of materials below which not more than 5% of the test results are expected to fall.

NOTE NO 2:- In the designation of a concrete mix, letter M refers to the mix & the number to the specified characteristics compressive strength of 15 Cm cube at 28 days.

b) This mix shall be designation to produce the grade of concrete having the required workability and characteristics strength not less than appropriate values given in the table above.

34. b) Standard Deviation

Assumed Standard Deviation

Where sufficient test results for a particular grade of concrete are not available, the value of standard deviation given in table below may be assumed:-

35. ASSUMED STANDARD DEVIATION

Grade of concrete	Assumed Standard Deviation N/Sq m
M 10	2.3
M 15	3.5
M 20	4.6
M 25	5.3
M 30	6.0
M 35	6.3
M 40	6.6

36. PROPORTIONING, CONSISTENCY, BATCHING AND MIXING OF CONCRETE.

Proportioning

Aggregate

The proportions which shall be decided by conducting preliminary tests shall be by weight, there proportions of cement, fine and coarse Aggregate means of weight batches conforming to I.S. 2722 capably of controlling the weights within 1% of desired value. Except where it can be shown to the satisfaction of the Engineer-in-charge that supply properly graded aggregate of uniform quality can be maintained over the period of work , the grading of aggregate sizes & blending them in the right proportions. The different sizes shall be stocked in separate stock piles. The grading of coarse and fine aggregate shall be checked as frequently as possible, as determined by the Engineer-in-charge, to ensure maintaining of grading in accordance with the samples used in preliminary mix design. The material shall be stock piled well in advance of use.

Cement

The cement shall be considered by weight, for design mix.

Water

Only such quantity of water shall be added to the cement and aggregates in the concrete mix as to ensure dense concrete specified surface finish, satisfactory workability, consistent with the strength stipulated for each class, be such as not to cause separation of materials of the collection of excessive free water on the surface of the concrete.

Definition of water/Cement Ratio.

The water cement (W/C) ration is defined as the weight in the mix (including the surface moisture of the aggregates) divided by the weight of cement in the mix.

water/Cement Ratio

The actual water cement ration to be adopted shall be determined in each instance by contractor and approved by the Engineer-in-charge.

Proportioning by water/cement ratio

The w/c ratio specified for use by the Engineer-in-charge shall be maintained contractor shall determine the water content of the aggregates as frequently as directed by the Engineer-in-charge as the work progress and as specified in I.S. 2386 (Part III) & the mount of the mixing water added at the mixer shall be adjusted as directed by the Engineer-in-charge so as to maintain the specified w/c ratio. To allow for the variation in their moisture content, suitable adjustments in the weights of aggregates shall also be made.

12 b) Consistency & Slump

Concrete shall be of a consistency & workability suitable for the conditions of the job. After the amount of water required is determined, the consistency of the mix shall be maintained throughout the progress of the corresponding parts of the work and approved tests e.g. slump tests, compacting factory tests in accordance with I.S. 1199 shall be conducted from time to time to ensure the maintenance of such consistency.

The following tabulation gives a range of workability which shall generally be used for various types of construction unless otherwise instructed by Engineer-in-charge.

Placing Condition	WORKABILITY OF CONCRETE	
	Degree of workability	Value of workability
Concrete of shallow Sections with vibration	very low	20-10 seconds, vee bee time or 75-80 compacting factor
concrete of lightly reinforced sections with vibration	low	10-5 seconds, vee bee time or 80-85 compacting factor
concrete of lightly reinforced sections with vibration or heavily reinforced with vibrations	Medium	5-2 seconds, vee bee time or 85-95 compacting factor or 25-75 mm slump for 20 mm aggregate.
Concrete of heavy reinforced sections without vibrations	High	above 92, compacting factor or 75-125 mm slump for 20 mm aggregate

b) Batching & mixing of concrete

1. The proportions of the materials for the concrete mix as established by the preliminary test for mix design shall be allowed for all the concrete in the works & shall not be changed except when specifically permitted by the Engineer-in-charge.
2. The concrete may be produced by weight batching the ingredients may be preferred by the contractor. Mixer & the weight batcher shall be maintained in clean & serviceable condition, the accuracy of the weight batcher shall be maintained in clean & serviceable condition, the accuracy of the weight batcher shall be periodically be checked. Both mixer and the weight batcher shall be set up at a level on firm base and the hopper shall be loaded evenly. The needle shall be adjusted to zero when the hopper is empty. Fine & coarse aggregates shall be weighted separately.
3. Each time the work stops the mixer shall be cleaned out and when next commencing the mixing, the first batch shall have 10% additional cement to allow for striking in the drum.

SAMPLING AND TESTING CONCRETE IN THE FIELD

a) Facilities required for sampling materials and concrete in the field, if the Engineer-in-charge so desire shall be provided by the Contractor at no extra cost. The following equipment with operator shall be made available at Engineer-in-charge request (all must be in serviceable condition).

Cast iron cube moulds 15 cm size	- 6 Nos.
Slump cone complete with tamping	- 1 Set
Laboratory balance to weight upto 5 Kgs with Sensitivity of 10 gm	- 1 Set
I.S. Sieve for coarse & fine Aggregates	- 1 Set
A set of measures from 5.1 to 11	- 1 set
Electric oven with thermostat upto 120 Deg .C	- 1 No.
Pycnometer	- 1 No.
Calibrated glass jar 1 litre capacity	- 2 Nos.
Glass flasks & metal containers	- As required
Laboratory balance of 2 Kg capacity and of sensitivity of 1 gm.	- 1 no.

Sampling & strength test of concrete

1. Samples from fresh concrete shall be taken as per I.S. 1199-1959 and cubes shall be made cured and tested at 28 days in accordance with I.S. 516-1959.
2. In order to get a relatively quicker idea of the quality of concrete optional tests on beams for modulus of rapture at 72 plus or minus 2 hours or at 7 days or compressive strength tests at 7 days may be carried out in additional to 28 days compressive strength tests. For this purpose, the value give in table below may be taken for general guidance in the case of concrete made with ordinary Portland cement. In all cases, the 28 days compressive strength specified shall be the criterion for acceptance or rejection of the concrete. If, however, from tests carried out in particular job over a reasonable long period it has been established to the satisfaction of the Engineer-in-charge that a suitable ratio between 28 days compressive strength and the modulus of ruptures at 72 plus or minus 2 hours or 7 days or compressive strength, providing the expected strength values at the specified early age are consistently met.

OPTIONAL: TESTS REQUIRED OF CONCRETE

Grade of concrete	Compressive strength on 15 cm cubes, min. 7 days N/Sq. mm.	modulus of beam test, 72 plus or minus 2 hours N/Sq. mm	Rupture min at 7 days N/Sq. mm
M 10	07.0	1.2	1.7
M 15	10.0	1.5	2.1
M 20	13.5	1.7	2.4
M 25	7.0	1.9	2.7
M 30	20.0	2.1	3.0
M 35	23.5	2.3	3.2
M 40	27.0	2.5	3.4

Frequency of Sampling

A random sampling procedure shall be adopted to ensure that each concrete batch shall have a reasonable chance of being tested; that is, the sampling should be spread over the entire period of concreting and cover all mixing units.

Frequency

The minimum frequency of sampling of concrete of each grade shall be in accordance with the following:-

Quantity of concrete in the work, Cum	Number of samples
01-5	1
06-16	1
37. 16-30	38. 3
39. 31-50	40. 4
41. 51 - and above	42. 4 plus on additional samples for each additional 50 cum or part thereof

At least one sample shall be taken from each shift. However random sampling will also be done to ensure quantity work is being done.

d)) Test Specimen

Three test specimens shall be made from each sample for testing at 28 days. Additional cubes may be required for various purposes such as to determine the duration of concrete at 7 days or at the time of striking the frame work or to determine the duration of curing or so check the testing error. Additional cubes may also be required for testing cubes by accelerated methods as described in IS. 9013 -1978. The specimen shall be tested as described in IS.0516 - 1959.

e) Test Strength of Sample

The test strength of the sample shall be the average of the strength of three specimens. The individual variation should not be more than plus or minus 15% of the average.

CONSISTENCY

Slump test shall be carried out as demanded by Engineer-in-charge and invariably from the same batch of concrete from which the test cubes are made slump tests shall be done immediately after sampling.

CHAPTER IV
FORM OF AGREEMENT

This Agreement made the _____ day of 200____ between Messer _____ (herein after called "the Employer") of the one part & Messer _____ of the second part _____ (herein after called "the contractor") of the other part whereas the Employer is desirous that certain works should be _____ constructed , viz _____ and has accepted a Tender Submitted by the contractor for constructions, completion & maintenance of such work.

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:-

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the conditions of contract herein after referred to.
2. The following documents shall be deemed to form, and to be read, and construed as part of the Agreement, Viz:-
 - a). the said Tender Document & Appendix thereto.
 - b). Instructions to Tenderers & Notice Inviting Tender.
 - c). Letter of acceptance dated.
 - d) The conditions of contract (including special conditions).
 - e). The specifications.
 - f). The bill of Quantities.
 - g). the schedules.
3. In consideration of the payment to be made by the Employer to the contractor, the contractor hereby covenants with the Employer to construct, complete and maintain the works in conformity in all respects with the provisions of the contract.
4. The Employer hereby covenants to pay the contractor in consideration of the construction, completion & maintenance of the work, the contract price at the times and in the manner prescribed in the contract.

IN WITNESS whereof the parties hereto have caused their respective common seals to be hereunto affixed (or have hereunto set their respective hands and seals) on the day and year first above written.

Signed by _____
for & on behalf of the contractor in the presence of

Signed by _____
for & on behalf of the Employer in the presence of

Signature _____

Signature _____

Name _____

Signature _____

Address _____

Address _____

Occupation

Occupation

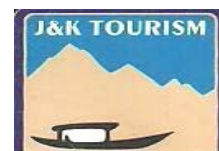
Name of work:- Repairs and Renovation of Tourist Hut-set No-1 at Lake View Resort Gatha.					
Adv. Cost :- 4.50 lacs		Ref. To NIT No. 04 of 09/2016 s. No 1		Item rate to be quoted by the contractor	
S. No	Description	Unit	Qty	Rate in Figure	Rate in words
1	Finishing wall with water proofing cement paint of required shade old work one or more coat applied @ 2.20 kg per 10 sqm	sqm	115.24		
2	Painting with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade one or more coat on old work .	sqm	242.20		
3	Polishing on wood work with French spirit polishing of approved brand and manufacture with one or more coats on old work.	sqm	70.45		
4	Finishing walls with textured exterior paint of required shade old work one or more coats applied @ 1.82 ltr/10 sqm	sqm	26.95		
5	Providing and laying vitrified floor tiles 8 mm thick of size 600 x 600mm with water absorption less than 0.8% and conforming to IS:15622 of approved make in all colour and shade laid on 20 mm thick cement mortar 1:4 mix (1 cement: 4 coarse sand) including grouting the joints with white cement and matching pigments etc complete	sqm	37.15		

6	Providing and fixing prelaminate wooden flooring 12 mm thick of cargo/Armstrong make fixed on 3mm thick base of foam sheet with quick set tile adhesive.	sqm	42.40		
7	Providing and fixing PVC wall panelling 3 mm thick of approved colour and make including all fittings	sft	1277.00		
8	Providing and fixing of wash basin with fixing accessories set of size 460x580x210mm with full pedestal of Jaquar make code No. SLS-WHT-6801, 6301	no	2.00		
9	Providing and fixing couple closet bowl-WC with PP seat cover , hinges , accessories set of size 650x375x800 with flushing systems and fittings of Jaquar Make code no . ARS-WHT-39951P-39201	no	2.00		
10	Providing and fixing of C.P brass bib cock long body 15 mm nominal bore of Jaquar make of approved quality Code No CON-107KN	no	4.00		
11	Providing and fixing of C.P brass bib cock straight line model 15 mm nominal bore of Jaquar make with wall flange code No. FLR-5047N	no	2.00		
12	Providing and fixing CP angle valve for wash basin mixer , geyser point of 15 mm dia of Jaquar make	no	6.00		
13	CP Jet of Jaquar make	no	2.00		

Note: Any typographical error in respect of unit, Qty, or nomenclature the same shall be corrected and paid as per estimate.

Signature of the Contractor

**Executive Engineer
Bhadrawah Dev.
Authority**



BHADERWAH DEVELOPMENT AUTHORITY

BHADARWAH.

TENDER DOCUMENT FOR

**Repairs and Renovation
of Tourist Hut-set No-2
at Lake View Resort
Gatha.**

*Chief Executive Officer
Bhadarwah Dev. Authority*

SALE AND ISSUE OF TENDER DOCUMENT

FOR

**Repairs and Renovation of
Tourist Hut-set No-2 at
Lake View Resort Gatha.**

*Reference to NIT No: 04 of 09/2016
S. No 02*

Issued to	
Registration Card No:	
Cost of Document	
Received Vide Receipt No:	
Dated:	

Signature of the issuing Authority

*Executive Engineer
Bhaderwah Development Authority
Bhaderwah (Doda)*

CONTENTS

1. Chapter I Notice Inviting Tender
2. Chapter II General Conditions of Contract
3. Chapter III Special Conditions & General Specifications of Contract
4. Chapter IV Bill of Quantity and Preamble.

MEMORANDUM

I/We tender for the execution of _____

_____ and the work specified under written memorandum within the time specified in such memorandum at the rates specified in the attached schedule of quantities and in accordance, in all respects, with the specifications, design and instructions in writing, referred in the condition of contract and with such materials as are provided for, and in all other respects in accordance with such conditions so far as possible and applicable.

Name of the Employer	Chief Executive Officer, Bhaderwah Development Authority, Bhaderwah
General Description	
Earnest Money	
Amount	
CDR No:	
Dated:	
Name of Bank:	
Security Deposit	10% of the value of work
Defects Liability period	One year from the date of handing over
Time of Completion	____ Days from the three days after award of allotment or actual date of start which ever is earlier
Refund of security	50% on virtual completion of work & balance on expiry of defects liability period. One year from the date of completion and handing over of the project to the Authority

Should this tender be accepted in whole or in part, I/we hereby agree:-

- i. To abide by all terms and provisions of the said conditions annexed here to and all the terms and provisions contained in the Notice Inviting Tenders, so far as applicable and/r in default thereof to forfeit & pay to the Employer, or their successors the sum of money mentioned in the said conditions.
- ii. To execute all the works referred to in the tender documents upto the terms and conditions contained or referred to therein and to carry out such deviations as may be ordered upto a maximum of 50% (fifty percent) of the tendered value at the rates quoted in the tender documents.

A sum of Rs. _____ lacs (Rupees _____) is hereby forwarded in the shape of C.D.R. pledged to the C.E.O, Bhaderwah Development Authority, Bhaderwah, Doda, as earnest money. If, I/We, fail to commence the work specified in the above memorandum. I/we agree that the said Employer or their successors in office shall without prejudice to be at their right of remedy & at liberty to forfeit the said Earnest money absolutely. Otherwise the said earnest money shall be retained by the Employer.

Date: the _____ day of _____ 2016.

Signature of Contractor,
Before submission of tender

Witness _____

Contractor

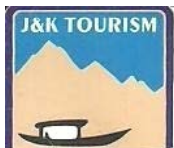
Letter of Acceptance

The above tender for the sum of Rs. _____ (Rupees
_____ only) submitted by
_____ is hereby accepted by me the Chief Executive
Officer, Bhaderwah Development Authority, Bhaderwah, District Doda, J&K Sate.

The _____ Day of _____ 2016.

Signature of Employer

Contractor



**GOVERNMENT OF JAMMU AND KASHMIR
OFFICE OF THE CHIEF EXECUTIVE OFFICER,
BHADERWAH DEVELOPMENT AUTHORITY
BHADERWAH, DISTRICT DODA.**



**NOTICE INVITING TENDER
NIT No: 04 OF 09/2016**

For and on behalf of the Governor of Jammu and Kashmir, Chief Executive Officer Bhadarwah Development Authority invites sealed item rates tender affixed with Rs 6/- revenue stamps from the reputed, approved, and eligible Contractors/Firms registered with State Govt./ CPWD/Irrigation/BRO/MES/NHPC/PSU or any other Govt. agency for the below mentioned works. The work is to be executed in accordance with the terms and conditions, Drawings, specifications, and design prescribed in tender document.

S. No	Name of work	Approx. Cost (Rs. In Lacs.)	Earnest Money (Rs in Lacs)	Time of Completion	Cost of Tender Documents (in Rupees)	Last Date for receipt of application and issue of Tender Documents	Class of Contractor
1	Repairs and Renovation of Tourist Hut-set No-1 at Lake View Resort Gatha.	4.50	0.09	20 days	500.00	15.9.16	A,B,C & D.
2	Repairs and Renovation of Tourist Hut-set No-2 at Lake View Resort Gatha.	4.50	0.09	20 days	500.00	15.9.16	A,B,C & D.
3	Repairs and Renovation of Tourist Hut-set No-3 at Lake View Resort Gatha.	4.50	0.09	20 days	500.00	15.9.16	A,B,C & D.
4	Repairs and Renovation of Restaurant Block, Shoping Kiosks, Booking Counter and Painting to outer Chain Link Fencing and railing around Lilly Pools at Lake View Resort Gatha.	4.55	0.091	20 days	500.00	15.9.16	A,B,C & D.

Other relevant information: - Position of AAA : Accorded
Position of funds : demanded
Position of TS : Under process

Terms & Conditions:

1. The tender Documents can be had from the office of the Chief Executive Officer, Bhadarwah Development Authority, Bhadarwah, District Doda, J&K, against payment of specified cost (non refundable) in cash or by bank draft or the same can be downloaded from our official website www.bhadarwahheavens.com from 09-09-2016 to 15-09-2016 and the cost of tender document of specified amount (non refundable) shall be accompanied with the tender of dated up 15-09-2016.

Cont. page...2...

Page...2...

2. **The technical qualification of the bidder should contain the following documents:-**

- (i) *Attested copy of registration card duly renewed for the current financial year.*
- (ii) *Sales tax clearance certificate issued by the Sales Tax Department ending last year with PAN and TIN No.*

3. The tender should be addressed to the Chief Executive Officer, Bhadarwah Development Authority, and sent under Registered post which should reach in the office of the Chief Executive Officer Bhadarwah Development Authority on or before **19.9.2016 up to 2 pm.**
4. The tender will be opened by the authority level tender opening committee headed by Chief Executive Officer, Bhadarwah Dev Authority, at Bhadarwah in his office chamber **on 20/9/2016 at 11.00 am** in presence of the contractors or their authorized representatives who may like to be present.
5. The tender must be accompanied by earnest money in the form of Call Deposit Receipt for amount shown against the each work of any scheduled bank pledged to the Chief Executive Officer Bhadarwah Development Authority without which no tender shall be entertained.
6. The earnest money will be released to the unsuccessful tenderers after 28 days from the date of acceptance of tender and in the case of successful tenderer it will be accounted towards security deposit. The earnest Money may be forfeited if the tenderer withdraws the tender after tender opening during the period of validity. No duplicate document shall be issued in lieu of reportedly issued and lost document.
7. As soon as acceptance of the tender is communicated to the successful tenderer, the contract shall be complete and binding on him. The successful tenderer shall execute an agreement with the Bhadarwah Development Authority within 7 Days after the issuance of the letter of intent to him. The expenses on that account and incidental charges shall be borne by the tenderer. Failure to execute such an agreement shall not, however, prevent the contract from being enforced

against him. The date of start of work shall be reckoned after seven days from the date of issue of allotment letter or actual start of work whichever is earlier.

8. In case of failure of the contractor to execute the work in part or in full the act shall amount to breach of contract. A registered notice or notice sent through a special messenger to the contractor for breach of contract shall be sufficient for authority to wind up or cancel his contract. In case contractor avoids receiving the notice or deliberately gives wrong address for communication where it becomes practically difficult to deliver the notice, the same shall be pasted on the entry gate of his known address in presence of a witness and the notice shall be treated as service notice to the contractor. His earnest money will be forfeited and he will be blacklisted for future. The BDA will be at liberty to get the left over work executed at his risk and cost. Any additional amount involved for such execution may be recovered from other claims/ resources of the contractor.
9. Misconduct or Misbehavior if any observed during the tender opening process with any officer/ official shall be dealt in terms of the enlistment & registration of contractors rules in the PWD and may result in recommendation for cancellation of registration card issued by any department.
10. The tenders shall be valid for at least 120 days from the date of opening. In the event of successful tenderers failing, declining or delaying the execution of the agreement, the Authority shall, without prejudice to any other remedy available to it under any law, for the time being in force in the state, be entitled to forfeit the earnest money in full or in part and impose such penalty as may be determined by the Authority.
11. The tenders on plain paper/ telegraphic tenders/ conditional tenders shall be rejected. Tenderers are advised to quote complete item rates (including material carriages & incidentals) against the advertised Bill of quantities. Tenders written in pencil shall be rejected. Tenders should be clearly written and writing sealed with transparent tape.
12. The tenders accepted will be checked by the Authority for any arithmetical errors. Errors will be corrected by the Authority as follows:
 - where there is a discrepancy between the rates in figures and in words, the rates in words will govern; and
 - Where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern.
 - The amount stated in the tender will be adjusted by the Authority in accordance.
13. The Authority reserves the right to itself to accept or reject any tender or part thereof or allot the contract to any contractor in full or in part without assigning any reason thereof.
14. In case of any dispute arising at any time between the tenderer and the Authority regarding interpretation of any of the terms and conditions of this notice, the same shall be referred to an officer of the Government as the concerned Minister In-charge may nominate for

arbitration under the law for arbitration for the time being in force in the state. The decision thereon of the Arbitrator shall be final, conclusive and binding on the parties. During arbitration case the Authority will not withhold the payment of undisputed items nor will the contractor stop the work till decision of the Arbitration.

15. Any clarification required by the tenderer in regard to the technical points etc. mentioned in the tender or the annexure hereto or otherwise pertaining to the works may be sought from the consultant or Executive Engineer, Bhaderwah Development Authority, Bhaderwah on any working day.
16. The tenderer may in his own interest inspect and examine the site and its surroundings, as also means or access to site and satisfy him-self before tendering as to the nature of ground, climatic conditions, the form and nature of site, by making prior appointment with the Executive Engineer, BDA, Bhadarwah well in time.
17. The following requirements should be adhered to:
 - The tender document should be signed and dated on each page by the tenderer or his duly authorized agent.
 - The tender document should be accompanied by a certified true copy of Power of Attorney of the signatory to the document. The Power of Attorney should include the power to agree to refer disputes to arbitration.
18. Tenderer shall not be entitled to any cost, charges or expenses incurred by them, or incidental to, or in connection with the preliminary investigations, surveys and preparation of design or submission of tender etc. In case the tender submitted by the tenderer is not accepted, tender document will not be returned to him.
19. The tender submitted by an individual shall be signed with his full name and his complete address shall be recorded thereon. If it is submitted by a firm, it shall be signed by a member of the firm who is duly authorized to enter into the contract. He shall sign his own name and give the name and address of each member of the firm and shall furnish power of Attorney along with the tender.
20. No foreign exchange shall be made available to the tenderer in connection with the execution of the work.
21. The work shall be carried out strictly according to the terms and conditions, specifications, design, drawing and plans described in Annexures. Where specifications do not cover any item, the specifications, terms and conditions of State PWD in force shall be made applicable.
22. Immediately after the communication of the acceptance of the tender, the contractor shall submit for approval the proposed methodology and program of construction backed with equipment and material planning and deployment duly supported with broad calculations and quality management plan proposed to be adopted justifying their capability of execution

and completion of the work as per technical specifications and within stipulated period of completion. No payment shall be made to the contractor on any account until such a programme has been submitted and approved.

23. No extra shall be paid for such arrangement; if the Executive Engineer, at any time during execution of the work is of the opinion that the contractor will or may fall behind the schedule of programme, a revised programme will be required to be submitted with added men, machines and working shifts.
24. All other terms and conditions if not covered but in vogue in State PWD shall hold good and form part of this NIT.
25. After opening the tenders, if the tendered amount works out 10% below the advertised cost extra security deposit 10% of the Adv. Cost shall have to be deposited by the lowest tenderer before allotting the work..
26. The contractor/firm shall be paid for the actual quantity of work executed and as measured at the site at the rate accepted by the deptt. The Deptt; reserves the right to increase or decrease any item or items of work. Any claim by the firm/Agency on this account shall not be entertained. The rates quoted shall hold good for any increase/decrease in quantity.

Executive Engineer
Bhadarwah Dev. Authority

No: BDA/2016-17/_____

Dated: _____

Copy to the:-

1. Secretary to Government, Tourism Department, J&K Govt. Civil Secretariat, Srinagar for information.
2. The District Development Commissioner, Doda for information.
3. Director Tourism Jammu for favour of information.
4. Additional District Development Commissioner Doda for information.
5. Sub Divisional Magistrate Bhadarwah for information.
- 6-7 Chief Executive Officer Bhadarwah Development Authority Bhadarwah/Kishtwar Dev. Authority for information.
8. Executive Engineer R&B Div. Bhadarwah.
- 9-10 President Contractor Association Bhadarwah/Doda for information.
11. Publicity Manager BDA for uploading of NIT 04 of 09/2016 on our official website. The process of downloading should be stopped on 15-09-2016
12. Notice Board
13. Office file

CHAPTER II
GENERAL CONDITION OF CONTRACT

1. DEFINITION:

- The ‘Contract’ means the documents forming the tender and acceptance thereof, the formal agreement executed between Employer, and the contractor; and instructions & drawings issued from time to time. These above mentioned documents shall be treated as complementary to one another.
- In the contract the following expression shall, unless the context otherwise requires, have the meanings hereby respectively assigned to them:
 - “Authority” shall mean Bhaderwah Development Authority (BDA).
 - “Chief Executive Officer” shall mean Chief Executive officer, Bhaderwah Development Authority, Bhaderwah.
 - “Executive Engineer” shall mean Executive Engineer, BDA.
 - “PWD” shall mean Public Works Department of Govt. of J&K.
 - The expression ‘Works’ or ‘Work’ shall mean all works to be executed by the contractor in accordance with designs, drawings, plans & specifications described in this contract document.
 - The ‘Site’ shall mean the land and or other places on into or through which work is to be executed under the contract & shall also mean any adjacent land, path or street which may be allotted or used for the purpose of carrying out the contract.
 - The ‘Contractor(s)’ shall mean the individual or the firm or the company whether incorporated or not, undertaking the works & shall include the legal representative of such individual or the person composing such firm or company, or the successors of such firm or company and the permitted assigns of such individuals or firm or of company.
 - The ‘Employer’ means Chief Executive Officer, Bhaderwah Development. Authority, Bhaderwah, District Doda, Jammu.
 - ‘Engineer-in-Charge’ means Executive Engineer, BDA or any other person who may be deputed to the site of work from time to time by the Authority and authorized in writing for any purpose in relation to, or in connection with this contract.
 - ‘Plant’ and ‘equipment’ shall mean plant, machinery equipment, pipe work services & all other things to be provided, erected, installed, commissioned and maintained in accordance with the Contract.
 - ‘Temporary Works’ means all temporary works of every kind required in or about the execution completion and maintenance of the works and Plant.
 - ‘Approved’ means approved in writing including subsequent written confirmation of verbal approval and ‘approval’ means approval in writing including as aforesaid.
 - “Drawing” shall mean the drawings referred to in the specifications and any modification of such drawings approved in writing by the consultant/Executive Engineer with consent of the CEO and such other drawings as may from time to time be furnished in writing by the consultant/Executive Engineer with the approval of the Chief Executive officer.
- “Notice in writing or Written Notice” shall mean a notice or a communication in writing, typed or printed sent either under registered post or ordinary post to the last known private or business address or delivered personally by hand to the contractor.
- “Virtual Completion” Shall mean when the Work under this contract is in the opinion of the Executive Engineer fit for use and taken over by the Authority, after removal of scaffolding, plants, surplus materials and rubbish and cleaning of dirt from works and site including testing etc, complete in accordance with regulations in force.

- The terms “Bill of Quantities” and “Schedule of Prices” wherever they occur in this Contract shall be treated as synonymous & interchangeable

Singular & Plural	Words importing the singular only also include the plural and vice versa where the context requires.
Reading or Notes	The marginal headings of notes shall not be deemed to be part thereof or be taken into consideration in the interpretation or construction of various clauses or of the Contract.
Works include plant	The term “Works” shall be deemed to include “Plant” and “Equipment” as here in Equipment above defined wherever the context so requires but NOT vice versa.

2. Duties & Power of Engineer-in- Charge

The duties of the Engineer-in-Charge is to watch and supervise the works and to examine any materials to be used or workmanship employed connected with the project.

3. Assignment:

The Contractor shall not assign the contract or any part thereof or any benefit or interest therein or there under (other than a charge in favour of the contractor’s Bankers) of any amount due or to become due under this contract without the prior written consent of the Employer.

4. Sub-Let:

The Contractor shall not sub-let the whole or part of the Works, except where otherwise provided in the contract, the contractor shall not sub-let any part of the works without the prior written consent of the Employer (which shall not be unreasonably withheld) but such consent if given shall not relieve the contractor and he shall be responsible for the acts, defaults and negligence of any sub-contractor, his agents, servants or workmen as fully as if they were acts, defaults or neglects of the contractor his agents, servants and workmen. Provided always that, the provision of labour on a piece work basis, raw materials for the construction of works and items of plant/Equipment shall not be deemed to be sub-letting under this clause.

5. Documents, Mutually or Explanatory

The several documents forming the part of contract are to be taken as mutually explanatory of one and other and in case of ambiguities or discrepancies, the same shall be brought to the notice of the Engineer-in-Charge the order of procedure shall be

- Drawings & instruction issued to the Contractor.
- Schedule of Quantity Specifications.
- Special conditions on Contract and Notice Inviting Tender.
- General conditions of Contract.
- The Engineer-in-Charge who shall there upon issue to the Contractor instructions directing in what manner the work is to be carried out.

6. Drawings:

The drawings are detailed to contain the specification as also the procedure for instructions. The Contractor shall give adequate notice to the Engineer-in-charge of any further drawings or specification that he may require for the execution of the works, under the Contract, well in advance for execution. This shall not however be an excuse for delay in completion of any work.

7. One copy of the Drawings to be Kept at site:

One copy of the Drawings shall be kept by the Contractor at site and the same shall be available for inspection & use by the Engineer-in-charge, or by any other persons authorized by the Engineer-in-charge in writing. One copy shall be signed & kept on records so as to confirm contractor’s acceptance of having quoted for the works under reference.

8. Drawings Instructions.

The Engineer-in-Charge shall have full power and authority to supply to the contractor, from time to time during the progress of the works such further drawings and instructions as shall be, necessary for purpose of the proper and adequate execution and maintenance of the works and the Contractor shall carry out and be bound by the same.

9. Contract Agreement:

The Contractor shall when called upon so to enter into & execute a contract agreement in the form annexed with such modifications as may be necessary.

10. Inspection :

The Contractor shall inspect and examine the site and its surroundings & of site. shall satisfy himself before submitting his tender as to the nature of the ground and sub-soil the form and nature of the site and quantities and nature of the work and materials necessary for the completion of the works and the means of access to the site, the accommodation he may require & in general shall himself obtain all necessary information as to risk contingencies & other circumstances which may influence or affect his tender.

11. Sufficiency of Tender

The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the work and of the rates & prices stated in the priced schedule of the prices if (any), which rates and prices shall except in so far as it is obstruction, otherwise provided in contract cover all his obligations under the contract and all his matters and things necessary for the proper completion and maintenance of the works.

a). of complying with any instructions, which the Engineer-in-charge may issue to the Contractor in connection therewith and

b). of any proper reasonable measures approved by the Engineer-in-charge which the Contractor may take in the absence of specific instructions from the Engineer-in-Charge.

12. Works to Satisfaction of the Engineer- in-Charge:

Save in so far as it is legally or physically impossible, the contractor shall execute, complete and maintain the works in strict accordance with the contract to the satisfaction of the Engineer-in-charge and shall adhere strictly to the instructions and directions issued by Engineer-in-Charge on matters as refer to above.

13. Completion Schedule:

Immediately after the communication of the acceptance of his tender the Contractor shall, submit to the Engineer-in-Charge, for approval a Programme of execution outlining the proposed operations and order of completion of various activities in multiple working shifts giving sufficient details to demonstrate to the Authority the adequacy of the programme to complete the work within the time prescribed under this contract. No payment shall be made to the contractor/firm on any account until such a programme is submitted and approved. The submission to an approval by the furnishings of such particulars shall not relieve the contractor of any of his duties or responsibilities under the contract.

If the Engineer-in-Charge at any point of time during execution is of the opinion that the work under this contract will or may fall behind the schedule of programme, he may direct for added operations, method, equipment, the number of labours and working shifts so that the time lost is made up.

14. Contractor's Superintendence:

The Contractor shall give or provide all necessary Superintendence During the execution of the works and as long there after as the Engineer-in-charge may consider necessary for the proper fulfilling of the Contractor's obligations under the contract. The contractor or a competent and authorized agent or representative approved in writing by the Engineer-in-charge (such approval may at any time be withdrawn) is to be constantly on the works & shall give his whole time to the superintendence of the same. If such approval

shall be withdrawn by the Engineer-in-charge the Contractor shall as soon as is practicable (having regards to the requirement of replacing him as here in after mentioned) after receiving written notice of such withdrawal remove the agent from the site and shall not thereafter employ him again on the site in any capacity and shall replace him by another agent approved by the Engineer-in-Charge. Such authorized agents or representative shall receive on behalf of the Contractor instructions from the Engineer-in-Charge. Contractor shall provide at his own expense cost of hutments/dwelling units for his workers etc. and all such expenses shall deemed to have been taken care of in there quoted rates for the above works.

15. Contractor's Employees

The Contractor shall provide and Employ on the site in connection with the execution & maintenance of the works, only such technical assistants as are skilled & experienced in their respective callings and such sub-agents, foremen and dealing hands as competent to give proper supervision to the work they are required to supervise, and such technical assistant will be in sufficient numbers for each areas of works to be handled either in one area or field or both, contractor shall before start of work give a list of their technical staff and their nature of duties to the Engineer-in- Charge. Such skilled, semi-skilled and unskilled labour as is necessary for the proper and timely execution & maintenance of the works. Where required by the law or regulation of local or other authority, such personnel shall be duly licensee from the competent authority to practice their trades, professions and callings.

16. The Engineer-in-Charge shall be at liberty to object to and require the contractor to remove forthwith from the works any person employed by the contractor in or about the execution or maintenance of their works who in the opinion of the Engineer-in-Charge misconducts himself or is incompetent or negligent in the proper performance of his duties or whose employment is otherwise considered by the Engineer-in-Charge to be undesirable and such person shall not be again employed upon the works without the written permission of the Engineer-in-Charge. Any person so removed from the works shall be replaced without delay by the competent substitute approved by the Engineer-in-Charge.

17. The Contractor shall if required by the Engineer-in-Charge deliver returns in such form and at such intervals as the Engineer-in-Charge may prescribe showing the details of supervisory staff and the numbers of he several classes of labour, from time to time, employed by the contractor on the site.

18. Setting out of the works:

The Contractor shall be responsible for the true and proper setting out of the works and for the correctness of the position, levels, dimensions and alignment of all necessary parts of the works and for the provision of all necessary instruments appliances and labour in connection herewith. If at any time during the progress of the works an error shall appear or arise on the position, levels, dimensions or alignment of any part of the works, the contractor on being required to do so by the Engineer-in-Charge shall at his own expenses rectify such error to the satisfaction of the Engineer-in-Charge or his representative unless such error is based on incorrect data supplied in writing by the Engineer-in-Charge in which case the expense of rectifying the same shall be borne by the employer. The checking of any line or level by the Engineer-in-charge shall not in any way relieve the Contractor of his responsibilities for the correctness thereof and the Contractor shall carefully protect and preserve all bench marks sight rails, pegs and other things used in setting out the works.

19. Lighting, Watch and Ward.

The Contractor shall in connection with the works provide & maintain at his own cost all lights, guards, fencing, watch and ward, when and where necessary or required by the Engineer/in-Charge or by the authority for the protection of the works or for the safety and convenience of the public and others.

20. Care of Works/Plant Equipment.

From the commencement to the completion of the work, the contractor shall, take full responsibility for the care thereof, of Temporary works and Constructional plant and in case any damage loss or injury shall happen to the works/plants/Equipment or to any part thereof or to any Temporary work or constructional plant from any cause what-so-ever shall, at his own cost repair and make good orders and conditions, and in connection in every respect with the requirements of the Engineer-in-Charge/instructions.

21. Damage to persons and property:

If the contractor or his workers or servants break, deface, injure or destroy any part of the structure or other property in the vicinity of the works, belonging to any person in or on which they may be working, such structures, road, road kerbs, embankments, fence enclosure, water pipes, cables, drains, electrical or telephone posts or wires, trees, grass or grasslands, or cultivated ground contiguous to the premises on which the work or any part of it is being executed, shall make the same good at his own cost and in default, the Engineer-in-Charge shall cause the same to be made good and deduct the cost thereof from any sums that may be due to the contractor under this contract or from his security deposit.

22. Overtime/ Multiple Shifts

Contractors shall also not charge for any overtime/ Multiple Shift working incurred wholly or partly for uncompleted works etc. or for works which may have to be got done urgently as per the requirements of the Engineer-in-Charge or also as per the drawings supplied from time to time.

23. Third party Insurance

Before commencing the execution of the works, the contractor (but without limiting his obligations & responsibilities under relevant clause hereof) shall insure against any damage, loss or injury which may occur to any person (including any employee of the Employer) by or arising out of the execution of the works or temporary work or in the carrying out of the contract.

24. Accident or injury to workmen.

The Employer shall not be liable for in respect of any damages or compensation to workmen/labors in respect to or in consequence of any accident or injury to any workman or other person in the employment of the contractor save and except an accident or injury resulting from any act or default of the employer his agents or servants & the contractor shall indemnify & keep indemnified the Employer against all such damages and compensation (save & except as aforesaid) and against all claims demands, proceedings, costs charges & expenses what-so-ever in respect thereof or in relation thereto.

25. Insurance against Accident etc. workmen.

The contractor shall insure against such liability against an insures approved by the employer (such approval shall not be unreasonably withheld and to workmen shall contain such insurance during the whole of the time that person are employed by him on the work and shall when required to the employer such policy of insurance and the receipt for payment of the current premium provided always that in respect of any persons employed any sub-contractor the contractor & obligation to insure as aforesaid under this sub-clause shall be satisfied if the sub-contractor shall have insured in such manner that the Employer is indemnified under the policy but the contractor is to produce to the Employer when required such policy of insurance and the receipt for payment of the current premium.

26. Giving of Notice and payment of fees.

The Contractor shall give all notices and pay all fees required to be given or paid by National or State Statute Ordinance or other Law or any Regulation or Bye-Law of any local or other duly constituted authority in relation to the execution of the works and by the rules and Regulations of all public bodies and companies whose property and rights are affected or may be affected any way by the works or any temporary works.

27. Compliance with statues any Regulations etc.

The Contractor shall confirm in all respects with the provisions of any such statutes ordinance or law as aforesaid and the Regulations or Bye-Laws of local or other duly constituted authority which may be applicable to the works or to any temporary works and with such rules and regulations of public bodies and companies as aforesaid and shall keep the employer indemnified against all penalties and liabilities of every kind for breach of any such statute ordinance or law Regulation or Bye-Law.

28. Supply of plant material and labour.

Except where otherwise specified, the Contractor shall at his own expense supply and provide all the Constructional plant, Temporary and for Permanent works/plant/equipment labour (including the supervision of thereof) transport to or from the site and about the works and other things or every completion and maintenance of works/plant/equipment.

29. Clearance of site on completion.

On the completion of the Works the Contractor shall clear away and remove from the site all constructional plant, surplus materials, rubbish and Temporary works of every kind and leave the whole of the site and works clean and in a workman like condition to the satisfaction of the Engineer-in-charge.

30. Labour.

The Contractor shall make his own arrangement for engagement of all labour, local or otherwise and also provide for the transport, housing, feeding and payment thereof.

- The Contractor shall provide on the site to the satisfaction of the Engineer-in-charge water for the use of the Contractor's staff and work people.
- The Contractor shall in all dealings with labour in his employment have due regards to all recognized days of rest, religious festivals, & other customs.
- In the event of any outbreak of illness of an epidemic nature, the contractor shall comply with and carry out such regulations orders and requirements as may be made by the Government or the local medical or sanitary authorities for the purpose of dealing with and overcoming the same.
- The Contractor shall at all times take all reasonable precautions to prevent any unlawful riotous or disorderly conduct by or amongst his employees and for the preservation of peace and protection of persons and property in the neighborhood of the works against the same.
- The Contractor shall be also responsible for observance by his sub-contractors of the foregoing provisions.
- The Contractor shall employ labour in sufficient number to maintain the required rate of progress & of quality to ensure a workmanship of a degree required by the specification and to the satisfaction of the Engineer-in-charge. He shall be responsible at his own cost, for all recruiting, transport, welfare, sanitary and other accommodation, provision of necessary passports or permits for all personnel and employee required for this contract.
- The Contractor shall remain liable for the payment of all wages under Wages Act 1936, Minimum Wages Act, 1948, Employee's liability Act, 1936, Workmen's Compensation Act, 1923, Insurance, Provident Fund, Family Pension etc. or any other Act or enactments relating thereto and rules framed there under from time to time. In the interest of the work and its completion target, the contractor shall have to work in more than one shift & no liability in respect of any excess cost arising there from shall be borne by the Employer. The contractor may employ female labours if he chooses but he shall not employ in connection with the works any person who has not completed the minimum age as per law locally applicable.
- The Contractor shall comply fully with local laws dealing with the employment of person including where applicable the Indian Employment of children Act, 1938. The Indian Workmen's Compensation Act, 1923, the Factories Act, 1948, the minimum Wages Act,

1948, Contract Labour (Regulations & Abolition) Act, 1970, and any statutory amendment or re-enactment thereof for the time being in force.

- The Contractor during the progress of the works shall provide, erect and maintain at his own expense and to approved standards and scales all necessary temporary sanitary accommodation required for his workmen on the site in connection with the execution of works. The planning, sitting and erection of these buildings shall be approved by the Engineer-in-Charges & such temporary accommodation shall at all times during the progress of the works be kept tidy and in a clean and sanitary condition to the entire satisfaction of the Engineer-in-charge & at the contractor's expense. The contractor shall conform to the sanitary requirements of local medical & health authorities and at all times adopt such precautions as may be necessary to prevent soil pollution of the site.
- The Contractor shall at his own expense carry out all anti-material or other ailments, instructions given to him by the Engineer-in-charge or by any local authority including the filling up of barrow pits.
- The Contractor shall at his own expense carry out all instructions issued to him by the Engineer-in-Charge to effect a proper disposal of soil and other conservancy work in respect of the contractor's workmen or employees on the site. He shall also conform to the sanitary requirements of the local Medical and Health authorities.
- The Contractor will not at any time do, cause or permit any nuisance on the site or adjoining area or do anything which shall cause unnecessary disturbance or inconvenience to the owners, tenants or occupiers of other properties near the public generally and will secure the efficient protection of all land, river lakes and sea areas against pollution. The Contractor shall attend children of labourers and shall provide for its maintenance and upkeep.
- The Contractor shall provide and maintain upon the works sufficient, proper and efficient life-saving appliance and first aid equipment to the approval of the Engineer-in-charge and in accordance with the requirements of I.L.O Convention No.62. The appliance and equipment shall be for use at all times.
- The Contractor shall organize his operations in a workman like manner and take all necessary precautions to provide safety and prevent accidents on the site to both persons and property, more so if they will be working in proximity to working machinery of existing plants in operation. The Engineer-in-charge shall have the power in requiring the contractor to adopt from time to time such measures as they may consider necessary to ensure the above requirements. The Employer /Engineer-in-charge shall not be responsible for any consequence resulting from violation of safety requirements. In particular the Contractor shall ensure compliance with the following safety codes:-
 - IS: 3696 (Pt. I) - Safety code for scaffolds and ladders pt.I
 - IS: 3696 (Pt. II) - Do- Pt. II – Ladders
 - IS: 4130 (Pt. III) - Safety code for demolition work
 - IS: 4014 (Pt. II) - Code of practice for steel Tubular Scaffolding (Pt. II)- Safety Regulations for scaffolding.
- All statutory laws on labour in vogue from time to time shall be complied with & all basic amenities provided for & by the contractor shall indemnify the Authority against all claims what-so-ever on this.

31. Return of Labour.

The contractor shall if required by the Engineer-in-charge deliver to the Engineer-in-charge Representative or at his office a Return in details in such form and at such intervals as the Engineer-in-charge may prescribe showing the number as the several classes of labour from time to time employed by the Contractor on the site and such information regarding constructional plan as the representative may require.

32. Quantity of Materials and Workmanship and tests.

All materials and workmanship shall be of the representative kinds described in the contract & in accordance with Engineer-in-charge, and shall be subject from time to time to such test as the Engineer-in-charge may direct at the place of manufacture, of fabrication or on the site or at all or any of such places. The contractor shall provide such assistance instruments, machines, labor and materials as are normally required for examining, measuring and testing the quantity of any work & the quality or weight of any material incorporation in the works for testing as may be selected as required by Engineer-in-charge.

33. Cost of samples.

All samples shall be supplied by the Contractor at his own cost, if the supply thereof is clearly intended by or provided for in the specification or Bill of Quantities, but if not then at the cost of the Employer.

34. Cost of tests.

The cost of making any test shall be borne by the Contractor if such test is clearly intended by or provided for in the specification and (in the cases only of a test under load or of a test to ascertain whether the design of any finished or partially finished work is appropriate for the purpose which it was intended to fulfill) particularized in the specification in sufficient detail to enable the contractor to price or allow for the same in his tender.

35. Access to site.

The employers or any other person authorized by them shall at all times have access to the works and to the site and to all workshops and places where work is being prepared or from where materials, manufactured articles or machinery are being obtained for the work and contractor shall afford every facility for and every assistance in or in obtaining the right to such access.

36. Examination of work before covering up.

No work shall be covered up or put out of view without the approval of the Engineer-in-charge or their representative to and the contractor shall afford full opportunity for the Engineer-in-charge or afford full opportunity to examine and measure any work their representative to examine and measure any work which is about to be covered up or put out of view and to examine foundation before permanent work is placed thereon. The Contractor shall give due notice to the Engineer-in-Charge Representative whenever any such work of foundation is or are ready about to be ready for examination.

37. Uncovering and making openings.

The Contractor shall uncover any part or parts of the works or make openings in or through the same as the Engineer-in-charge may from time to time direct and shall reinstate & make good such part or part to the satisfaction of the Engineer-in-charge. If any part or parts have been recovered by or put out of view after compliance with the requirements of above sub-clause and foundation to be executed in accordance with the contract the expenses of uncovering making openings in or through reinstating and making good the same shall be borne by the Employer but any other case all such expenses shall be recoverable from him by the Employer from may deducted by the Employer from any monies due or which may become due to the contractor.

38. Removal of Improper work and materials.

The Engineer-in-charge shall during the progress of the work have power to order in writing from time to time.

- a). The removal from the site within such time or times as may be specified in the order of any materials which in the opinion of the Engineer-in-charge are not in accordance with the contract.
- b). the substitution of proper and suitable materials.
- c). The removal and proper re-execution (not withstanding and previous test thereof or interim payment thereof) of any work which in respect of materials or workmanship is not, in the opinion of the Engineer-in-charge in accordance with the contract.

39. Default of Contractor

In case of default on the part of the contractor in carrying out such order the employer shall be entitled to employ and pay other persons to carry out the same and all expenses consequent thereon or incidental thereto shall be borne by the contractor and shall be recoverable from him by the Employer from any amount due or which may become due to the contractor.

40. Suspension of work.

The Contractor shall, on the written order of the Engineer-in-charge suspend the progress of the works or any part thereof for such time or times and in such manner as the Engineer-in-charge consider necessary and shall during such suspension properly protect and secure the work so far as is necessary in the opinion of the Engineer-in-charge. The extra cost incurred by the contractor in giving effect to the Engineer-in-charge instruction under this clause shall be borne and paid by the employer, unless such suspension is

- a). otherwise provided for the contract or
- b). necessary for the proper execution of the work or any reason of weather conditions affecting the safety or quantity of the works or by some default on the part of the contractor.
- c). necessary for the safety of the works or any part thereof, provided that the contractor shall not be entitled to recover any such extra cost unless he gives notice in written of his intentions to claim to the Engineer-in-charge within 28 days of the Engineer-in-charge order. The Engineer-in-charge shall settle & determine the extra payment to be made to the contractor in respect of such claim as the Engineer-in-charge shall consider fair & reasonable.

41. Suspension more 90 days.

If the progress of the works or any part thereof is lasting suspended on the written order of the Engineer-in-charge for more than 90 days the contractor may serve a written notice on the Engineer-in-charge requiring permission within 28 days from the receipt thereof to proceed with the works or part thereof in regard to which progress is suspended and if such permission is not granted within that time the contractor by the further written notice so served may (but is not bound to) elect not to execute part of the works, as an omission of such part or where it affects the whole works, as an abandonment of the contract by the Employer.

42. Commencement works.

The contractor shall commence the works on site within the period contained in the Tender after the receipt by him of an order in writing to this effect from the Employer and shall proceed with the same with due expedition except as may be expressly sanctioned or ordered by the Employer or be wholly beyond the contractor's control.

43. Extension of time for completion.

Should the amount of extra or additional work of any kind or other special circumstances of any kind what so ever which may occur be such as fairly to entitle the contractor of the extension of the time for the completion of the work, & the Employer on the recommendation of the Engineer-in-charge, shall consider the grant of such or any extension of time for completion. Engineer-in-charge shall determine the amount of such extension provided that this is due to work or other special circumstances that have arisen or as soon thereafter as is practicable delivered to the Engineer-in-charge representative full and detailed particulars of any claim to extension of time to which he may consider himself entitled in order that such claim may be investigated at the time.

44. Execution of works of Repairs etc.

To the intent that the works shall at or as soon as practicable after the expiry of the defect liability period be delivered upon the Employer in a good and perfect condition (fair wear and tear excepted) to the satisfaction of the Engineer-in-charge. The contractor shall exercise all such work of repair amendment reconstructions, rectification, and making good

of defects, imperfections, shrinkage or other defaults as may be required of the contractor in defect liability period or within fourteen days after its expiry as result of an inspection made by or on behalf of the Engineer-in-charge prior to its expiry.

45. Remedy on contractor's failure to carry out work have required.

If the contractor fails to do any such work as aforesaid required by, the Employer shall be entitled to carry out such work by his own workman or other contractor & such work which the contractor should have carried out at the contractor's own cost, he shall be entitled to recover from the contractor the cost thereof or may deduct the same from any dues or that may become due to the contractor.

46. Variations.

No alterations, amendments, omissions, additions or other variation of the works/plants/equipment under the contract (here-in-after referred to as variations) shall be made by the contractor, except as ordered in writing by the Engineer-in-charge, who shall have full power subject to the provisions herein after contained, to instruct the contractor in writing to make such variation as the Engineer-in-charge consider proper and necessary and the contractor shall carry out such variations without prejudice to the contract, as through the said variations formed part of the contract.

If in the opinion of the contractor complying with any such variation would prevent his obligations or guarantees under the contract he shall promptly notify the Engineer-in-charge who shall decide forth with whether the variation shall be carried out as ordered. If the Engineer-in-charge confirms his previous instructions the contractor obligations & guarantees shall be modified to such extend as may be justified & notified by the Engineer-in-charge & considered by the Employer for acceptance on the recommendations of the Engineer-in-charge.

47. Valuation of variations.

The value (if any) of all variations shall be added to or deducted from the contract price as appropriate. The Engineer-in-charge shall ascertain and determine this in accordance with the rates & prices in the schedule of Prices/Bill of Quantities, so far as the same may be applicable & recommended by the Engineer-in-charge for the consideration of the employer for acceptance. In other cases, reasonable prices shall be fixed by the consideration of Employer for acceptance.

48. Notice to Contractor.

In the event of the Engineer-in-charge requiring any variations as reasonable and proper notice shall be given to the contractor as the same will enable him to make his arrangements there of and in cases where goods and materials are already prepared or any design drawings or patterns made or work done that required to be altered a reasonable sum in respect thereof shall be allowed by the Engineer-in-charge.

49. Plant etc. to be exclusive use on the works.

All constructional plant, temporary works and materials provided by the contractor shall when brought on to the site be deemed to be exclusively intended for the use on the works construction and completion of the works and the contractor shall not remove the same or any part thereof (save for the purpose of moving it from one part of the site of another) without the previous consents in writing of the Engineer-in-charge (which shall not be unreasonably withheld).

50. Clearance of site completion.

On completion of the works the contractor shall remove from of the site all the said constructional plant and temporary works remained there on and any un-used materials.

51. Quantities.

The quantities set out in the bill of quantities are the estimated quantities of the work but they are not to be taken as the actual & correct quantities of the works to be executed by the contractor in fulfillment of his obligations under the contract.

52. Works to be measured.

The Engineer-in-charge shall accept as otherwise stated ascertain and determine by measurement the value in accordance with the contract. He shall, when he requires any part or part of the works to be measured, give notice to the contractor's authorized agent or representative who shall, forthwith attend or send a qualified agent to assist Engineer-In-charge representative in taking such measurements and shall furnish all particulars required by either of them should the contractor not attend or neglect or omit to send such agent then measurement made by the Engineer-in-charge or approved by him shall be taken to be correct measurement of the work. For the purpose of measuring such permanent work as is to be measured by record drawings the Engineer-in-charge shall prepare record drawings, month of such work and the contractor as and when called upon to do so in writing shall within 14 days attend to examine and agree any such record drawings with the Engineer-in-charge shall sign the same when so agreed and if the contractor does not so attend to examine and agree any such record drawing they shall be taken to be correct. if after examination of such record drawings the contractor does not agree the same or does not sign the same as agreed they shall never-the-less be taken to be correct unless the contractor within 14 days of such examination lodge with the Engineer-in-charge, notice in writing in this respect in which such record drawings are claimed by him to be incorrect.

All measurement shall be from drawings executed at site and shall be checked in compliance (as per drawings), before measurement are done, all to the requirement of the Engineer-in-charge.

53. Method of measurements.

Where works have to be measured for any purpose whatsoever it shall be in accordance with IS 1200 unless otherwise specifically indicated in the contract and under the specific chapters.

54. Payment on account and Retention.

The contractor may at intervals specified in the Tender document claims for payments of advances on account of work done and materials delivered at the site in accordance with the contract. Such claims which shall be computed as under:-

55. Works:

Full value of the work executed on site to the satisfaction of the Engineer-in-charge less the deduction indicated in the tender which shall constitute the security deposit such deductions shall constitute to be effected from every interim valuation, unless otherwise stipulated.

56. Materials:

The percentage (%) indicated in the tender of the value of any non perishable materials which in the opinion of the Engineer-in-charge are in accordance with the contract and have been brought on site in connection herewith & adequately stored and protected against damage by any cause whatsoever, but which have not at the time of the advance being claimed been incorporated in the works scaffolding, props, formwork, sand, metal & constructional plant or machinery shall not qualify for such advances.

For the purpose of evaluating the works and materials as above the Engineer-in-charge shall prescribe & the contractor shall furnish such returns & documents as may be called for.

i) Any sums due from the contractor on account of stores or any such other things provided by the Employer shall be deducted from the first or subsequent advance.

The Engineer-in-charge shall from time to time recommend the amount which the contractor is entitled; payment "on account" shall be made there after on the recommendation of the Engineer-in-charge with in the period indicated in the tender.

ii) Any certificate for interim payment may be modified or corrected by subsequent interim certificate or by final certificate and no certificate of the Engineer-in-charge in respect of an advance payment shall of itself be conclusive evidence that the work which relates are in accordance with the contract

Contractor shall submit only commutative bills every time. Rates claimed shall be on the basis of work done at site and as approved by the Engineer-in-charge.

iii). Relevant updated measurements with the bill only shall be considered.

57. Final Bill.

As soon as possible after the works/plant/equipment have been completed and successfully commissioned, but not later than 2 months from certified completion date, the contractor shall forward certified final account to the Engineer-in-charge. This shall include reconciliation of all materials or things issued by the Employer. No claims will be entertained after receipts of the final bill.

The Engineer-in-charge shall check & certify the final quantities admissible on the final bill. The contractor shall be entitled to be paid this amount on the recommendation of the Engineer-in-charge, less the percentage indicated in the tender as security for performance during the defect liability period, and the value of all payments made on account against interim certificates, and any other amounts payable to the Employer & any other deductions required by law.

The amount retained from the final bill towards security for the performance during the maintenance period shall be released by the Employer on the issue of the maintenance certificate by the Engineer-in-charge. The security deposit shall be released along with the payment of the final bill.

The final bill shall be submitted by the contractor in a form approved & in the manner prescribed by the Engineer-in-charge.

58. Recovery of sums.

Whenever under the contract any sum of money shall be recoverable from or payable due by the contractor, the same may be deducted from any sum then due or may become due to the contractor, under the contract with the Employer.

59. Forfeiture.

If the contractor shall become bankrupt or have a receiving order made against him or shall present his petition in bankruptcy or shall make an arrangement with or assignment in favors of his creditors or shall agree to carry out the contract under a committee of inspection of his creditors or (being a corporation) shall go into liquidation (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) or if the contractor shall assign the contract without the consent in writing of the Engineer-in-charge, shall have an execution levied on his goods or if the Engineer-in-charge shall certify in writing to the Employer that in his opinion the contractor.

a). has abandoned the contract or

b). without reasonable excuse has failed to commence the works or has suspended the progress of the works for 28 days after receiving from the Engineer-in-charge written notice to proceed or

c). has failed to remove materials from the site or to pull down & replace work for 30 days after receiving from the Engineer-in-charge written notice that the said materials or work has been considered & rejected by the Engineer-in-charge under these conditions or

d). is not executing the works in accordance with the contract or is persistently or flagrantly neglecting to carry out his obligations under the contract of

e). has to the detriment of good workmanship or in defiance of the Engineer-in-charge instructions to the contrary sub-let any part of the contract

then the Employer may after giving 14 days notice in writing to the contractor enter upon the site & the work & expel contractor their from without there by avoiding the contract or releasing the contractor from any part of his obligations or liabilities under the contract or affecting the rights & powers conferred by the Employer on the Engineer-in-charge by the contract and may himself complete the works or may Employ any other contractor to complete the works & Employer or such other contractor may use for such completion so

much of the constructional plant temporary works and materials which have been deemed to be reserved exclusively for the execution of the works under the provision of the contract as he or they may think proper & the Employer may at any time sell any of the said constructional plant, temporary works and unused materials and apply the proceeds of sale in or which may become due to him from the contractor under the contract.

60. Payment after forfeiture.

If the Employer shall enter and expel the contractor under this clause he shall not be liable to pay to the contractor any money on account of the period of defective liability & thereafter until the cost of completion & maintenance damages for delay in completion (if any) all other expenses incurred by the employer have been ascertained and the amount thereof certified by the Engineer-in-charge the contractor shall then be entitled to receive only such sum or sums (if any) as the Engineer-in-charge may recommend and would be taken as due to him upon due completion by him after deducting the said amount. But if such amount shall exceed the sum which would have been payable to the contractor on due completion by him then the contractor shall upon demand pay to the employer the amount of such excess and it shall be deemed a debt due by the contractor to the employer and shall be recoverable accordingly.

61. Urgent repairs.

If by reason of any accident of failure or other event occurring to in or in connection with the works or any part thereof either during the execution of the works or during the period of defect liability, any remedial or other work or repair shall in the opinion of the Engineer-in-charge be urgently necessary for security and the contractor is unable or unwilling at once to do such work or repair as the contractor was liable to do at his own expense under the contract, all costs and charges properly incurred by the employer in so doing, on the demand be paid by the contractor to the Employer from any dues or which may become due to the contractor, provided, always that the Engineer-in-charge shall as soon after the occurrence as of any such urgency as may be reasonable practicable notify to the contractor thereof in writing.

62. Arbitration.

Except where otherwise provided in the contract all questions and disputes, relating to the meaning of specifications, designs, drawing and instructions herein before mentioned and as to the quality of workmanship or materials used on the work or as arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, order or those conditions concerning the works, or the execution or failure to execute the same whether arising during the progress of the work or after the completion or abandonment thereof shall be referred to arbitration under the provision of the Arbitration Act, 1940 or any statutory modification or re-enactment thereof and the rules made there under and for the time being in force such arbitration shall be conducted by two arbitrators, who in turn shall nominate an umpire before the arbitration. In case the arbitrators fail to arrive at a decision, the matter shall be referred to the umpire whose ruling shall be final and binding on both the parties to the dispute.

63. EXTRA ITEMS.

Rates of extra items if admissible shall be derived on the following basis

a). From nearest similar item of the tender.

b). Contractor shall submit his item rates (within fifteen days of being asked to execute such an item) along with necessary analysis of men & materials used therein and the proof thereof for the work to be executed at site, 10% over and above these rates shall only be considered towards his overheads and profits as certified by the Engineer-in-charge and the same shall become payable on recommendations of Engineer-in-charge.

64. Issue of Materials Employer.

The Engineer-in-charge may at this option issue such as are listed all other by materials for the work & temporary works shall be provided by the contractor at his own cost. If the Engineer-in-charge issues any of the materials listed above the contract price payable to the contractor shall stand reduced by the values of the materials issued by the Engineer-in-charge such values being calculated at the rates specified against each of the materials listed. The contractor shall not deal with such materials in any matter except for in execution of this contract.

65. Price Escalation:

No price escalation whatsoever shall be allowed in respect of any material or wages used or employed in connection with the execution of the works. All duties, taxes, octroi, turnover tax & service etc. shall be borne by the Contractor.

66. Site order Book.

A site order book shall be maintained by the Engineer Incharge at the site of works in which instructions shall be entered and communicated to the Contractor by the Engineer -In-charge as and when necessary. These orders shall be signed in token of receipt and complied with by the Contractor and nothing shall be written by him in reply. If the Contractor desires to represent any matter entered in the said order book, he may do so by a separate communication.

67. Error.

For any typographical error or omissions in the tender documents the interpretation given by the Executive Engineer Bhaderwah Development Authority, Bhaderwah will be final and binding on the contractor.

68. Other conditions

- Latest relevant BIS specifications shall govern this contract and work shall be carried out strictly in accordance with them.
- Time is the essence of this contract. The contractor is expected to work in more than one shifts and nothing extra shall be paid for the same.
- The employer shall not supply any material, however the contractor shall have to support the quality soundness of material by relevant tests as and when warranted under relevant BIS codes.
- In case of delay a penalty of 1/2% of the contract value per day subject to a maximum of 10% of the contract value shall be imposed on the contractors on liquidated damages. The decision of the Employer in this matter shall be final, conclusive and binding on the contractor.
- The architectural and other drawings shall, all times, be properly correlated for executing any work. Samples shall be prepared for approval before starting any items of work specified by the Engineer-in-charge including verifying and getting the layout approved etc.
- Rates quoted for the items in all individual sections shall be valid for carrying out the item of work at any place, any level and at any height.
- Collection and stacking of materials shall include all leads and lifts. The rates quoted by the Contractor shall hold well irrespective of the source from which the materials are brought so long as they confirm to the specifications, and as approved by the Engineer-in-charge.
- The contractor shall be personally responsible for watch and ward and handling, storing of all materials handed over to him by the Engineer-in-charge or brought by him to the site. Nothing extra shall be paid to him for this.
- When required by the Engineer-in-charge, the contractor shall supply for the purpose of testing, samples of any materials to be used in the works as per specifications. The contractor shall provide all such samples at his own cost including suitable packages to contain them, to the Engineer-in-charge. All the expenditure on account of packing of

samples, conveyance, handling & delivery up to the testing charges and fees to be paid in this respect shall be borne by the contractor including cost of all materials and samples.

- Contractors shall submit once every fortnight, a detailed report of the following;
- Materials procured, consumed & balance at site for previous week as well as expected deliveries during next fortnight.
- List of equipment and machinery at site, stand by as well as those under repair and equipment scheduled to arrive during next fortnight.
- Skilled –unskilled labour and supervisors working at site during past week expected increase in next fortnight.
- Steps proposed for speeding up the progress of work in the next week.
- Five photographs of the sites - four sets.
- Contractor must appoint full time responsible Site Engineer conversant with the nature of works and attend all site meetings etc.
- The contractor shall make his own arrangements for storage of any constructional material.

CHAPTER III
SPECIAL CONDITIONS AND TECHNICAL SPECIFICATIONS

1. The work shall be carried out according to this Specification, whether specifically mentioned or not. No extra in any form will be paid unless it is definitely stated as an item in the Schedule of Quantities. Wherever the specifications are not given or ambiguous, the relevant Indian Standard and further amendments/CPWD specifications will be considered as final and binding.
2. The work shall be carried out simultaneously with the electrical, sanitary and other services and in cooperation with the contractors for the above services. The work shall be carried on till it is completed satisfactorily along with the completion of essential portions of other services. The Building contractor shall keep the other contractors informed well in advance of the proposed programme of the work and shall give adequate notice to enable them to carry out their part of the work so that the building work is not hindered. The contractor shall further cooperate with the other contractors, in respect of any facilities required by them e.g. making holes in shuttering for sanitary pipes, electric conduits, fan hooks etc. However, nothing extra shall be admissible to him for such reasonable assistance and facilities afforded to other contractors, and the Building contractor shall be deemed to have taken those factors into consideration while quoting his rates.
3. The work shall be related to the drawings, which the contractor is presumed to have studied. Nothing extra will be paid for any item on account of its shape, size, location or other difficult circumstances, even if the schedule makes no distinction, as long as the item is shown in the drawings.
4. The sources of materials stated in the specifications are those from which materials are generally available. However, materials not conforming to specifications shall be rejected even if they come from the stated sources. The contractor should satisfy himself that sufficient quantity of material of acceptable specification is available from the stated or other sources and should tender accordingly.
 “Schedule” – shall mean the schedule of quantities.
 “Approved”, “allowed”, “accepted” – shall mean approval of the Engineer in charge in writing.
 “Required” means as instructed by the Engineer in charge.
5. The contractor, without extra charge shall fulfill the requirements of these specifications, i.e. the item rates quoted shall be deemed to have taken these specifications into account.
6. Drawings, Instructions, and Measurements:-
 All work shall be done according to the drawings and instructions of the Engineer in charge and the Contractor shall arrange to test materials and/or portions of the works at his own cost in order to prove their soundness and sufficiency. If after any such test and in the opinion of the Engineer in charge any work or portion of work is found to be defective or unsound, the Contractor shall pull down and re-execute the same at his own cost. Defective materials shall be removed from the site.
7. Clearing the site:-
 The site described and shown on the plans with 6 meters all around the building, shall be cleared of all obstructions, loose stones and materials, rubbish of all kinds as well as brushwood. All holes or hollows, whether originally existing or produced by removal of loose stone or brushwood shall be carefully filled up with earth well rammed and leveled off as directed. Also, the Contractor shall dress the site 6 metres all round the building after completion maximum cutting or filling being 30 cms. No extra shall be paid for this.
8. Trees:-

No trees shall be cut without permission. If any trees have to be cut, this shall form an extra item. For the purpose of the specification, a tree shall be defined as a growth which is more than 3 m high and whose diameter of the trunk at the base is not less than 30 cms.

9. Setting out and making profiles.

Masonry pillars will be erected at suitable points in the area to serve as benchmarks for the execution of the work. These benchmarks shall be connected with permanent benchmark approved by the Engineer-in-charge. Necessary profiles with pegs, bamboos and strings or “Bhurjis” shall be made to show the correct formation level before the work is started. The contractor shall supply labour and material for setting out and making profiles and “Bhurjis” for the work at his own cost. The profiles and “Bhurjis” shall be maintained during the execution of work.

10. Materials

Water

Water shall be from Municipal main or sweet tank or well. Water storage accommodation for the water shall be of sufficient size and as directed by Engineer-in-charge. The Government does not guarantee the supply of water. The contractor shall make his own arrangements for supply of water. In case the Government agrees to supply, the contractor shall pay the cost of water at the rates fixed by the Government.

Murrum

It shall be got from approved quarries. It shall be granular and gritty. It shall be free from dust, all rubbish, and any organic materials as well as clods of black cotton soils. The materials shall be got approved prior to its use in road construction.

The material shall be stacked on a level ground. If the item is only for supplying of murrum, then it shall be measured in cum. The rate shall include digging the murrum, supplying at site, conveying with all lead and lift and stacking the same at site as directed by the Engineer. The rate shall also include all tolls, duties, fees, royalties etc.

Sand

The sand shall be from a river or nallah or sea. It shall be clear, sound, properly graded, free from organic material; silt, clay etc. and it shall be well graded.

Stone

The stone shall be hard, sound, durable, and free from decay and weathering. No round or oblong pebbles shall be allowed. The stone shall be tested for abrasion value. Before the material is put to use the same shall have to be got approved from the Engineer-in-charge.

Earth

For filling and terracing shall be free from all rubbish organic or vegetable growth including roots, weeds etc. All clods shall be first broken down.

Portland cement

Cement shall comply with the Indian Standard specification and shall be of Indian or other make to be approved by the Engineer-in-charge, when stored in bags these shall be raised 30 cms. Above the ground and stacked in rows of 10 bags high, 0.6m clear from the walls.

11. Items of work

• Plain Cement Concrete

- i) Mixing: - All proportions shall be by volume, except cement, which shall be proportioned by weight unless otherwise specified. Mixing shall be done in a mechanical mixer as required for reinforced concrete work. However, in special case, hand mixing may be allowed by Engineer-in-charge when the following procedure shall be adopted. The several materials shall be accurately gauged in boxes and thoroughly mixed on a water-tight platform of adequate size, by being turned over at least thrice dry till the colour is uniform and then twice wet. Water shall be added gradually and no more than necessary to sufficiently wet the materials, only that much concrete shall be mixed which

can be used within half an hour. Each stack shall however not be larger than consuming one bag of cement. All such stacks shall be placed distinct from each other. In case hand mixing is allowed, the contractor shall put in 10% more cement than specified without extra charges.

ii) Protection: All plain and reinforced cement concrete shall be adequately protected. Newly placed concrete shall be protected by approved means from frost, sun, dust, storms and hot spells. Concrete placed below the ground shall be protected from falling earth during and after placing. Concrete placed in ground having deleterious salts shall be kept free from contact at least for three days, or as otherwise instructed, thereafter. Approved means shall also be taken to protect immature concrete from damage by debris, excessive loading, vibration, abrasion, floatation due to sub soil water and other influences that may impair the strength and durability of the concrete. This shall apply to all items of cement concrete. No extra charge shall be allowed for this.

iii) Laying:- concrete shall be laid in horizontal layers of not more than 150mm thick and gently rammed.

iv) Curing:- After laying, the concrete shall be kept wet for fifteen days. If cast in hot weather, it shall be covered with gunny bags, which shall be kept constantly wet. Other work on concrete shall not start until after three days of laying the concrete.

- Measurement

In cubic meter of exact length, breadth and depth as ordered by the Engineer in charge or as shown on the drawings. This shall be inclusive of any centering or shuttering required to complete the item.

- Joints in Cement Concrete

All longitudinal and transverse joints shall be confirm the details shown in Architectural drawings and/or as directed by Engineer-in-charge.

All joints shall be constructed true to the line with their faces perpendicular to the surface. Joints shall not vary more than 6mm from a true line or from their designated position.

The joints shall be formed by inserting the web of a "T" or any other suitable device with oiled surfaces into the concrete, when the concrete is stiff enough to receive the inserting device.

The "T" iron or any other device adopted shall be taken out carefully in such a way that it will not slump and close the slot.

- Transverse Expansion Joints.

Transverse Expansion Joints shall be of the premoulded type and shall be constructed at right angles to the centerline of the pavement and shall extend to the full width of the pavement. The spacing of the joints shall be 27m for pavement 10cm to 15cm thick and 36m for pavement 20cms thick or more and 10m for pavements below 10 cm thick.

- Transverse Contraction Joints

Transverse Contraction Joints shall be formed by a groove or cleft in the top of the slab. The groove shall be 13mm wide at the surface and 10mm wide at the bottom. It shall extend vertically downwards from the top to a depth equal to $\frac{1}{4}$ (one fourth) the depth of the pavement, track, runway etc. at the thinnest part of its section. The joints shall be located at 6m or 5.4m intervals depending on whether the expansion joint spacing is 36 or 27 m respectively.

- Transverse Construction Joints

Transverse Construction Joints shall be made at the end of each day's run or where unavoidable interruption or more than 30 minutes occur in the concreting operations.

Transverse Construction Joints shall be plain butt joints and formed so as to make a slab at least 3m in length. If this is not possible, the joints shall be formed at the preceding Transverse expansion or construction joint location. The exposed face of the joint shall be

- painted with approved quality bitumen before concreting the adjacent bay. The spacing of subsequent Transverse Contraction Joints shall be measured from the Transverse Contraction Joints last placed.
- Expansion Joints at structures:
Expansion joints shall be formed around all structure and features projecting though, into, or against the pavement. Such joints shall be 13mm wide and shall be of the premoulded type.
 - Arrangement of Transverse Joints:-
The Transverse Joints on each side of a longitudinal joint shall be of the same type and shall be in line with each other and not staggered.
 - Longitudinal Joints.
Longitudinal Joints shall be plain butt joints like Transverse Construction Joints.
 - Installation of Transverse Expansion Joints
The joints shall be set to the required line and grade and shall be held in the required position, during the placing and finishing of the concrete by securing stacks or other suitable device. It shall be ensured that the concrete pressure will not disturb their alignment. The joints shall be vertical and no joint shall deviate more than 6mm in the horizontal alignment either way from a straight line. The installing device shall have a length 6mm less than the required width of the slab and shall be cut to the required depth. The lower and the top edges shall be cut to conform to the prescribed cross section of the base and the crown of the slab respectively. The joint assembly shall be tested to determine whether it is firmly supported. Any assembly not firmly supported shall be reset.
 - Filling of Joints.
 - A. Expansion Joints.
 - (a) Pre-moulded joint filler: It shall conform to I.S.1838-1961, the thickness shall be 20mm or 25mm as specified and shall be maximum available standard length.
During the casting of the slab the pre moulded joint filler shall be placed accurately in position against the finished end of concrete slab. The filler shall remain 20mm below the top surface of the pavement and shall extend upto the sub-grade.
 - (b) Sealing compound: After the curing period is over, the joint portion above filler board shall be cleaned thoroughly as directed by Engineer-in-charge. The joints shall be filled with hot applied scaling compound Grade A (Normal) for concrete construction other than those which are subject to spillage of kerosene or other heavy petroleum oils and grade B (jet fuel resistant) for concrete constructions of runways for jet aircrafts conforming to ISI 834-1961.
 - B. Filling of contraction, construction and dummy joints:
These shall be done as per para A (b) above.
Measurement: Length and Depth of the joint shall be measured correct to a cm and width correct to 3mm.
Rate: The rate shall be taken in per cm depth, per cm width, per meter unit and it shall include the cost of materials and labour involved in all the operations described above.
12. **QUALITY**
All materials for incorporation into the works shall be of the best quality of their respective kinds as specified herein and shall be obtained from sources and suppliers approved by the Engineer-in-charge or their representative and shall comply strictly with the test prescribed herein after or where the tests are not laid down in this specification, with the requirements of the latest issue of the relevant Indian Standard by the Engineer-in-charge.
13. **INSPECTION AND TESTING**

All materials before being incorporated into the works shall be subjected to inspection and testing as provided in the conditions of contract and else where in the specifications. The cost of all samples for all tests required by these specifications of the approved standards shall deemed to be included in the contract rates.

No materials shall be used in the woks unless those have first been approved by the Engineer-in-charge of the owners.

14. **SAMPLES**

Samples of all materials proposed to be used in the works and to be supplied by the contractor, may be called for at any time by the Engineer-in-charge or their Representative.

15. **INDEPENDENT TEST ANALYSIS**

Independent test & analysis of any of the materials may be made from time to time by a testing house or analyst appointed by the Engineer-in-charge or their representative in order to check the supplier's works tests and analysis. The contractor shall be at his own expense supply and deliver to a Testing house or Analyst such materials as may be directed by the Engineer-in-charge or their representatives. The cost of all successful tests on actual basis, and all other costs shall be borne by the contractor. However, the testing of concrete cubes shall be governed by the specific terms set out herein after in these specifications.

16. **BRICK WORK**

The contractor shall furnish all labour , materials, tools & applications with services necessary to complete brick work masonry & floor tiling etc. in accordance with the drawings and as specified herein.

- **Mortar Preparation**

Cement mortar for brick work shall generally be as specified herein, namely in proportion of one of cement with 6 of sand by volume, or as indicated otherwise. Mortar shall be prepared by mixing cement & sand in specified proportion in the site. The mortar shall be used with in half an hour of mixing. No hand mixing is permitted.

- **MATERIALS**

Bricks shall be table moulded, of uniform size, shape and colour & must be well burnt so as to give a clear ringing sound when struck. They shall be clean, whole & free from flaws, cracks, stone or lump of any kind, especially lime. They shall have sharp edges and angles and even surfaces and shall be sound and hard to resist compression. They shall be from a source approved by the Engineer-in-charge. No brick after immersion in water for 24 hours shall absorb more than 15% of its weight. Where specifically agreed upon bricks shall be of the best quality locally available.

- **WORKMANSHIP**

All bricks shall to be used to kept soaked in water for at least 2 hours prior to use. The work shall set out by the contractor. No. brickbats shall be used for the work except where required to complete a standard bond.

All joints in brick work shall be uniformly laid. Each layer of brick work shall be laid plump & level with correct break of joints. No mortar joint shall exceed 15 mm in thickness.

The work shall be kept wet for at least 7 days after laying the last course.

Brick work shall not be raised more than 10 courses a day unless otherwise approved by the Engineer-in-charge.

Brick work shall be uniformly raised panel wise all round & no part shall be raised more than 1 meter above another, at any time. The contractor shall provide all necessary openings for doors, windows or such other services and shall embed all cuttings & fixtures(if separately paid for) at no extra cost 115 mm & 20 mm brick walls shall be

built fair faced on one side only. All other walls of greater thickness shall be built without exception with fair face to both sides.

Where specifically indicated 115 mm or thinner brick work shall be executed in one of the following ways.

With R.C. Stiffeners

Brick work be carried out in panels measuring 1.5 m x 1.5m with R.C.C. (1:2:4) verticals of 12 cm x 12 cm & horizontal stiffeners 12 cm x 8 cm, both reinforced with 4 Nos. 5 mm dia bars laid in 1:2:4 concrete properly filled in and cured. Such R.C.C. work shall not be measured separately but will be included in the rate for brick work.

- Reinforcement brick work

Such brick shall be in cement mortar 1:4. the Joint shall be increased suitable to embed the reinforcement, which shall be laid at every fourth course, consisting of hoop iron 25 mm wide 1.5 m thick with holes punched at every 15 cm the joints shall be well filled in and reinforcement properly surrounded with mortar & cured for not less than ten days. Care shall be taken to see that proper cover is provided to the reinforcement & the work laid continuously to ensure that no portion of the mortar attains initial set before mortar in adjoining portion is laid in position.

- Mode of payment shall be on the basis of codes of practice.

- In lieu of hoop iron, the Engineer may direct the use of mesh or M.S. bars as reinforcement.

17. STONE MASONRY

- Stones shall be set level, plumb with uniform joints set in full set bed of mortar, with joints filled.

- All stone to be well wetted, except in frostily weather, before setting and large stone to be set with a derrick rack out mortar joints when setting.

- Utmost care shall be taken during construction that the surface of the stones is not spoilt by concrete or mortar dropping on the stones and drying. The surface of the stones be immediately cleaned with water if any concrete or mortar does on fall the stone faces.

- Stones for masonry shall be best hard stone locally obtainable from approved quarries. The masonry, whenever required shall be composed generally of large stones clean flat bedded properly selected for their places and carefully laid, with a suitable proportion of smaller stones & chips to fill up interstices. The whole work shall be hand set and solidly bedded in and surrounded with mortar on every side except the face. There shall be no hollows or dry portions in work nor pinning in the face. The face stone shall be flat-bedded, shall tail back and be bound well into the body of the wall and shall not be of a height greater than either the breadth of face or length of the tail through-stones, covering the whole width or thickness of the wall or 60 cm long where the walls are horizontal and vertical. The face of the wall shall be strictly straight. The masonry shall be shaded from the sun & well moistened for at least three days after completion.

- Stone masonry shall be random, polygonal, or squared rubble either un-coursed or brought up to course, all as indicated.

- The rate for stone work shall include the cost of the following:-

- Selecting proper stones, breaking of boulders etc. in case the wall is to be constructed from stones available at site.

- Scaffolding if necessary.

- Raking out joints.

18. RUBBLE/BRICK PACKING

SCOPE OF WORK

The contractor shall furnish all labour materials tools & services necessary to complete all "packing" in the accordance with the drawings and as specified herein.

- **MATERIALS**

The rubble stone shall be sound, hard and durable. They shall have at least one dimension equal to the thickness of rubble packing and shall in any case, not be less than 15 cm in any direction. The stone shall be carefully hand-packed with longer side of each stone (which in no case shall be less than thickness of rubble packing) placed vertically with the smaller face of the two ends at the top. All interstices stone chips & the surface shall be made of uniform with the sand; the surface shall be formed to such stops as directed by the Engineer-in-charge. The rubble packing shall be thoroughly consolidated and sprinkled with water, if required by the Engineer-in-charge. The depth of the rubble packing shall be taken as consolidated depth. The concrete for flooring shall be laid over the rubble packing only after the Engineer-in-charge issue the order to that effect.

- **MEASUREMENT**

It shall be as per IS: 1200

19. **BRICK SOLING**

Where the soling is required to be provided with brick it shall conform to the following specifications.

Brick shall be of the quality indicated and shall be laid flat or on edge as indicated. The brick touching each other. Soling shall be closely packed leaving no interstices or gaps. Appropriate fillet shall be used to make up for dimensions which are part of a whole brick. After the soling is complete whole surface shall be subjected to consolidation by a light roller. Where indicated the joints shall be in cement mortar.

20. **REINFORCED CONCRETE AND ALLIED WORKS**

These specifications cover the general requirements for concrete to be used on jobs using on-site production facilities including requirements in regard to the quality, handling, storage of ingredients, proportioning, batching, mixing and testing of concrete and also requirements in regard to the quality, storage, bending and fixing of reinforcement. This also covers the transportation of concrete from the mixer to the place of final deposit and the placing, curing, protecting, repairing and finishing of concrete.

21. **APPLICABLE CODE AND SPECIFICATIONS**

MATERIALS

01. I.S. 269 - Specification for ordinary, rapid hardening & low heat Portland cement.
02. I.S. 455 - Specification for Portland blast furnace slag cement.
03. I.S. 1489 - Specification for Portland-Pozzolona cement.
04. I.S. 4031 - Method of physical test for hydraulic cement.
05. I.S. 650 - Specification for standard sand for testing of cement
06. I.S. 383 - Specification for coarse and fine aggregate for use in mass concrete.
07. I.S. 515 - Specification for natural & manufactured aggregate for use in mass

CONCRETE

08. I.S. 2386 - Method of test for aggregate for concrete.
(part I to VIII)
09. I.S. 516 - Method of test for strength of concrete.
10. I.S. 3025 - Method of sampling and test (physical & chemical) for water used in
11. I.S. 432 - Specifications for mild steel and medium tensile steel bars & drawn (Part I&II) steel wire fabric for concrete reinforcement.
12. I.S. 1139 - Specification for hot rolled mild steel and medium tensile steel deformed bars for concrete reinforcement.
13. I.S. 1566 - Specification for plain hard drawn steel fabric for concrete reinforcement.
14. I.S. 1785 - Specification for cold twisted steel bars for concrete reinforcement.
15. I.S. 1786 - Specification for cold twisted steel bars for concrete reinforcement.
16. I.S. 2090 - Specification for high tensile steel bars used in prestressed concrete.
17. I.S. 303 - Plywood for general purpose.
18. I.S. 4990 - Specification for plywood for concrete shuttering work.
19. I.S. 1629 - Rules for grading of cut size of timber.
20. I.S. 2645 - Specification for integral cement water proofing compounds.

EQUIPMENT

01. I.S. 1791 - Specification for batch type concrete mixers.
02. I.S. 2438 - Specification for roller pan mixer.
03. I.S. 2506 - Specification for concrete vibrators, immersion type.
04. I.S. 2506 - Specification for creed board concrete vibrator.
05. I.S. 2514 - Specification for concrete vibrating table.
06. I.S. 3366 - Specification for pan vibrator.

07. I.S. 4656 - Specification for form vibrator for concrete.
 08. I.S. 2722 - Specification for portable swing weight batchers for concrete (single and double bucket type)
 09. I.S. 2750 - Specification for steel scaffoldings.

CODES OF PRACTICE

01. I.S. 456 - Code of practice for plain and reinforced concrete.
 02. I.S. 1343 - Code of practice for prestressed concrete.
 03. I.S. 457 - Code of practice for general construction of plain and reinforced concrete for dams and other massive structures.
 04. I.S. 3370 - Code of practice for concrete structures for storage of liquids.
 05. I.S. 3935 - Code of practice for composite construction.
 06. I.S. 3201 - Criteria for the design and construction of precast concrete trusses.
 07. I.S. 2204 - Code of practice for construction of reinforced concrete shell roof
 08. I.S. 2210 - Criteria for the design of R.C.C. shell structures and folded plates.
 09. I.S. 2751 - Code of practice for welding of mild steel structure and folded plates
 10. I.S.2502 - Code of practice for bending and fixing of bars for concrete reinforcement.
 11. I.S. 3558 - Code of practice for immersion vibrations for consolidating concrete.
 12. I.S. 3414 - Code of practice for design & installation of joints in buildings.
 13. I.S. 4054 - Code of practice for steel tubular, scaffolding.
 14. I.S. 2571 - Code of practice for laying in-situ cement concrete flooring.

22. SCREENING AND WASHING

a. Crushed rock shall be screened and or washed for the removal of dirt or dust coating, if so demanded by Engineer-in-charge.

b. Grading.

Coarse aggregates shall be either in single size or graded, in both case, the grading shall be within the following limits.

I.S. Sieve percentage passing for single sized designation aggregate of normal size.

	40 mm	20 mm	16 mm	12.5 mm	10 mm
63 mm	100	-	-	-	-
40 mm	85-100	100	-	-	-
20 mm	0-20	85-100	100	-	-
16 mm	-	-	85-100	100	-
12.5 mm	-	-	-	85-100	100
10 mm	0-5	0-20	0-30	0-45	85-100
4.75 mm	-	0-5	0-5	0-10	0-20
2.36 mm	-	-	-	-	0-5

Percentage by weight of aggregates.

S.No.		Uncrushed	Crushed
1.	Materials finer than 75 million I.S. Sieve.	3.00	3.00
2.	Coal and lignite	1.00	1.00
3.	Clay lumps	1.00	1.00
4.	Soft fragments	3.00	-
5.	Total of all the above substance	5.00	5.00

23. WATER

• Water used for both mixing and curing shall be free from injurious amounts of deleterious materials. Potable waters are generally satisfactory for mixing and curing concrete.

• In case of doubt, the suitability of water for making concrete shall be ascertained by the compressive strength and initial setting time test specified in I.S.456. The sample of water taken for testing shall be typical of the water proposed to be used for concreting, due account being paid to seasonal variation. The sample shall not receive any treatment before testing other than that envisaged in the regular supply of water proposed for use in concrete. The sample shall be stored in a clean container previously rinsed out with similar water.

- Average 28 days compressive strength of at least 3 Nos. Cm concrete cubes prepared with water proposed to be used shall not be less than 90% of the average strength of three similar concrete cubes prepared with distilled water.
- The initial setting time of test block made with the appropriate test cement and water proposed to be used shall not be less than 30 minutes and shall not differ more than plus/minus 30 minutes from the initial setting time of control test block, prepared with the appropriate test cement & distilled water. The test blocks shall be prepared and tested in accordance with the requirement of I.S. 4031.
- Where water can be shown to contain an excess of acid alkali, sugar or salt, Engineer-in-charge may refuse to permit its use. As a guide, the following concentration represent the maximum permissible values:-
- To neutralize 200 sample of water, using phenolphthalein as indicator, it should not require more than 2ml of 0.1 normal HCL. The details of test shall be as given in I.S. 3025.
- To neutralized 200 ml sample of water, using methyl orange s indicator, it should not required more than 10 ml of 0.1 normal HCL. The details of test shall be as given in I.S. 3025.
- Percentage of solids, when tested in accordance with the I.S. 025 shall not exceed the following:

I.S. Sieve percentage passing for graded aggregate Designation of normal Size.

	40 mm	20 mm	16 mm	12.5 mm
63 mm	100	-	-	-
40 mm	95-100	100	-	-
20 mm	30-70	95-100	100	-
12.5 mm	-	-	-	-
10 mm	10-35	22-55	30-70	40-85
4.75 mm	0-5	0-10	0-10	0-10
2.36 mm	-	-	-	-

24. CONSTRUCTION SAFETY

I.S. 3696 – Safety code for scaffolds & ladders (Part I & II).

25. MEASUREMENT

I.S.1200 - Methods of measurement of building works.

I.S. 3385 – Code of practice for measurement of civil engineering works.

26. OTHER REQUIREMENTS

In the event that state, city or other Govt. bodies have requirements more stringent than those set forth in this specifications, such requirements shall be considered part of specifications & it shall supersede these specifications where ever applicable.

27. GENERAL

The quality of materials and method and control of manufacture and transportation of all concrete work irrespective of mix. Whether reinforced or otherwise, shall conform to the applicable portions of this specifications.

The Engineer-in-charge shall have the right to inspect the source/s of material/s, the layout & operation of procurement & storage of materials, the concrete batching & mixing equipment, & the quality control system. Such as inspection shall be arranged by the contractor Engineer-in-charge approval shall be obtained, prior to starting of concrete work.

28. MATERIALS FOR STANDARD CONCRETE

The ingredients to be used in the manufacture of standard concrete shall consist solely of a standard type Portland cement, clean sand, natural coarse aggregate, clean water and admixtures, if specifically called for in the drawings or in the specifications.

CEMENT

a) Unless otherwise specified or called for by the Engineer-in-charge/Employer, cement shall be ordinary Portland cement in 50 kg bags. The use of bulk cement will be permitted only with the approval of the Engineer-in-charge, changing of brands or type of cement within the same structure will not be permitted.

b) A certified report attesting to the conformity of the cement to I.S. specifications by the cement manufacture's chemist shall be furnished to the Engineer-in-charge, if demanded.

Contractor will have to make his own arrangements for the storage of adequate quantity of cement. It will be the responsibility of the contractor to ensure adequate and proper storage. Cement in bulk may be stored in bins or silos which will provide complete protection from dampness, contamination & minimize caking and false set (storage under tarpaulins will not be permitted), well away from the outer walls & insulated from the floor to avoid contact with moisture, ground and so arranged to provide ready access damaged or reclaimed or partly set cement will not be permitted to be used and shall be removed from the site. The storage bins & the storage arrangements shall be such that there is no dead storage. No more than 12 bags shall be stacked any tier. The storage arrangements shall be approved by the Engineer-in-charge consignments of cement shall be stored as received & shall be consumed in the order of their delivery.

Cement held in storage for period of 90 days or long shall be tested, should at any time the Engineer-in-charge have reasons to consider that any cement is defective then irrespective of its origin &/or manufacturer's test certificate, such cement shall be tested immediately at a National Test Laboratory/ Approved Laboratory and until the results of such tests are found satisfactory, it shall not be used in any works.

Storage of Aggregates

All coarse and fine aggregates shall be stacked separately in stock piles on the material near the work site in bins properly constructed to avoid inner mixing of different aggregates. Contamination with foreign materials and earth during storage & while heaping the materials shall be avoided. The aggregates must be of specified quality not only at the time of receiving at site but more to at the time of loading into mixer. Rakers shall be used for lifting of the coarse aggregates from bins or stock piles. Coarse aggregates shall be piled in layers not exceeding 1.20 mtrs. In height to prevent coning or segregation. Each layer shall cover the entire area of the stock piles before succeeding layers are started. Aggregates that become segregated shall be rejected. Rejected material after remixing may be accepted, if subsequent tests demonstrate conformity with required gradation.

Specific Gravity

Aggregates having a specific gravity below 2.6 (saturated surface dry basis) shall not be used without special permission of the Engineer-in-charge.

FINE AGREGATE

Fine aggregate except as noted above, and for other than lightweight concrete shall consist of natural or crushed sand to I.S.383 the sand shall be clean, sharp, hard strong, and durable and shall be free from dust, vegetable substance, adherent coating, clay, loan, alkali, organic matter, mica, salt, or other delegations substances, which can be injurious to the setting qualities/strength/durability of concrete.

Machine made sand

Machine made sand will be acceptable, provided the constituent rock/gravel composition shall be sound, hard dense, non-organic, uncoated & durability of concrete.

Screening and Washing.

Sand shall be prepared for use by such screening or through washing, or both, as necessary to remove all objectionable foreign matter while separating the sand grains to the required size fractions. Sand with salt content more than 3 percent will not be permitted to be used unless the same is washed and the slit content is brought within 3% by weight. Fine aggregates conforming to grading zone IV shall not be used unless mix designs &

preliminary tests have shown its suitability for producing concrete of specified strength and workability.

Fineness Modules

The sand shall not have a fineness modules of less than 2.2 or more than 3.2 the fineness modulus is determined by adding the cumulative percentage retained on the following I.S. Sieve sizes (4.75 mm, 2.36 mm, 1.18 mm, 600 micron) and dividing the sum by 100.

COARSE AGGREGATE

Coarse aggregate for concrete except as noted & for other than light weight concrete shall conform to I.S. 383. This shall consist of natural or crushed stone & gravel & shall be clean and free from elongated flaky or laminated pieces adhering coatings, clay lumps, coal residue, clinkers, along, alkali, mica, organic matter or other deleterious matter.

29. PERMISSIBLE LIMIT FOR SOLIDS

Maximum Permissible Limit

- | | |
|---|--|
| a) Organic | 200 mg/1 |
| b) Inorganic | 3000 mg/1 |
| c) Sulphates (as SO ₄) | 500 mg/1 |
| d) Alkali Chloride (as Cl) | 200 mg/1 for plain concrete work & 1000 mg/1 for reinforced concrete work. |
| e) Suspended matter | 2000 mg/1 |
| f) The P.H. value of water shall generally be not less than 6.0 | |

30. REINFORCEMENT BARS

- a. Reinforcement bars shall be arranged by contractor and shall be cold twisted steel bars and high yield strength deformed bars as per as I.S. 1786, as shown and specified on the drawings. Wire mesh or fabric shall be in accordance with I.S. 1560. Substitution of reinforcement will not be permitted except upon written approval from the Engineer-in-charge.
- b. The reinforcement shall not be kept in direct contact with the ground but stacked on top of an arrangement of timber sleepers or the like. Reinforcement shall be coated with cement wash before stacking to prevent scale and rust. Fabricated reinforcement shall be carefully stored to prevent damage, distortion, corrosion and deterioration.
- c. Quality
- d. All steel shall be of Grade 1 quality unless specifically permitted by the Engineer-in-charge. No rerolled material will be accepted. If demanded by the Engineer-in-charge, contractor shall submit the manufacturer's test certificate for steel. Random tests on steel supplied by the contractor may be performed by Employer as per relevant Indian Standards. All costs incidental to such tests shall be at "contractor's expense" steel not conforming to specifications shall be rejected.
- e. All reinforcement shall be clean free from grease, oil, paint, dirt, loose mill scale, loose rust dust, bituminous materials of any other substances that will destroy or reduce the bond. Pitted & defective rods shall not be used. All bars shall be rigidly held in position before concreting. No welding of rods to obtain continuity shall be allowed unless approved by the Engineer-in-charge. If welding is approved the work shall be carried out as per I.S. 2751 according to best modern practices and is directed by the Engineer-in-charge. In all case of important connections, strength of bars welded with special precaution, as specified by the Engineer-in-charge shall be taken in welding of cold worked reinforcing bars & bars other than mild steel.
- f. Laps
- g. Laps & splices for reinforcement shall be as shown on the drawings splices in adjacent bars shall be staggered & the locations of all splices, except those specified on the drawings, shall not be lapped unless the length required exceeds the maximum available lengths of bars at site.
- h. Bending
- i. All bars shall be accurately bend according to the sizes & shapes shown on the detailed working drawings/bar bending schedules. They shall be bent gradually by machine or other approved means reinforcing bars shall not be straightened and bent in manner that will

injure the material bars containing cracks or splits shall be rejected. These shall be bent cold, except bars of over 25 mm in diameter which may be bent hot if specifically approved by the Engineer-in-charge. Bars which depend for their strength on cold working shall not be bent hot. Bars bent hot shall not be heated beyond cherry red colour (not exceeding 654 degree C.) & after bending shall be allowed to cool slowly without quenching. Bars incorrectly bent shall be rejected as such as shall not, in the opinion of the Engineer-in-charge injure the material. No reinforcement shall be bent when in position in the work without approval, whether or not it is partially embedded in hardened concrete. Bars having kinds or bends other than those required by design shall not be used.

j. Fixing

Reinforcement shall be accurately fixed by any approved means and maintained in the correct position shown in the drawings by the use of blocks, spacers, and chairs as per I.S. 2502 to prevent displacement during placing and compaction of concrete. Bars intended to be in contact at crossing point shall be securely bound together at all such point with number 1.6 gauge annealed soft iron wire. The vertical distances between required successive layers of bars in beams or similar members shall be maintained by the provision of mild steel spacer bars at such intervals that the main bars do not perceptibly sag between adjustment spacer bars.

k. Cover to reinforcement

Unless indicated otherwise on the drawings, clear concrete cover for reinforcement (exclusive of plaster or other decorative finish) shall be as follows:-

1. At each end of reinforcement bar not less than 25 mm nor less than twice the diameter of such bar.

2. For a longitudinal reinforcement bars in a column, not less than 40 mm nor less than the diameter of such bar. In the case of columns of minimum dimensions of 200 mm or under, whose reinforcing bars do not exceed 12 mm a cover of 25 mm may be used.

3. For a longitudinal reinforcement bars in a beam, not less than 25 mm nor less than the diameter of such bar.

4. For tensile, compressive, shear or other reinforcement in a slab, not less than 15 mm nor less than the diameter of such bar.

5. For any other reinforcement, not less than diameter of such bar

6. Increased cover thickness may be provided when surfaces of concrete members are exposed to the action of harmful chemicals as the case of concrete in contact with earth faces contaminations with such chemicals, acid, vapor, saline atmosphere, sulphurous smoke (as in the case of steam operated railways), etc. And such increase of cover may be between 15 mm and 50 mm beyond the figure in (1 to 5) above as may be specified by the Engineer-in-charge.

7. For reinforced concrete members totally immersed in sea water, the cover shall be 40 mm more specified in (1 to 5) above).

8. For reinforced concrete members periodically immersed in sea water, or subject to sea spray, the cover of concrete shall be 50 mm more than that specified in (1 to 5) above).

9. For concrete of grade M-25 and above, the additional thickness of cover specified in (6, 7 & 8) above) may be reduced to half. In all such cases the cover should not exceed 75 mm.

10. Projection to reinforcement in case of concrete exposed to harmful surroundings may also be given by providing a dense impermeable concrete with approved protective to the extra cover, mentioned in (6), (7) and (8) above, may be reduced by the Engineer-in-charge to those shown on the drawings.

11. The correct cover shall be maintained by cement mortar briquettes or other approved means reinforcement for footings, grade beams and slabs on sub grade shall be supported on precast concrete blocks as approved by the Engineer-in-charge. The use of pebbles or stones shall not be permitted.

12. The minimum clear distance between reinforcing bars shall be in accordance with I.S. 456 or as shown in drawings.

1. Inspection

- m. Erected & secured reinforcement shall be inspected and approved by Engineer-in-charge prior placement of concrete.
- n. For payment of work done under this item, the actual quantity of steel embedded in concrete as calculated and approved by the Engineer-in-charge, irrespective of the level or the height at which the work is done, shall be taken. The unit rate for reinforcement shall include all wastage, binding wire, etc. for which no separate payment shall be made laps shown in drawings as approved by the Engineer-in-charge and the reinforcement number of chars and space bars to keep the reinforcement in place and approved by the project Engineers shall be measured & paid for.

31. STEEL SHAPES ENCASED IN CONCRETE

Structural steel columns, beams girders and bracings to be encased in concrete shall be unpainted, if so indicated on the drawings. The encasing shall be done in concrete with 10 mm maximum size aggregate & a works cube strength not less than 15 N/sq mm at 28 days unless otherwise specified in drawings. The steel members shall be wrapped with galvanized wire mesh of the size indicated on the drawings. The Galvanized wire mesh shall be kept 20 mm from the edge or surface of the steel member will have a minimum cover of 50 mm unless otherwise indicated on the drawings. When clear cover to steel is more than 75 mm, mild steel bar and concrete with 20 mm coarse aggregate can be used.

32. DESIGN MIX CONCRETE

a) All reinforcement concrete in the works shall be “Design Mix Concrete” as defined in I.S. 456/1978. All “Design Mix Concrete” work to be carried out under these specifications shall be in grades designated as per table shown below:-

33. GRADE OF CONCRETE

Grade Designation	Specified Characteristics
	Compressive strength at 28 days. N/Sq mm
M 10	10
M 15	15
M 20	20
M 25	25
M 30	30
M 35	35
M 40	40

NOTE NO 1:- The characteristics strength is defined as the strength of materials below which not more than 5% of the test results are expected to fall.

NOTE NO 2:- In the designation of a concrete mix, letter M refers to the mix & the number to the specified characteristics compressive strength of 15 Cm cube at 28 days.

b) This mix shall be designation to produce the grade of concrete having the required workability and characteristics strength not less than appropriate values given in the table above.

34. b) Standard Deviation

Assumed Standard Deviation

Where sufficient test results for a particular grade of concrete are not available, the value of standard deviation given in table below may be assumed:-

35. ASSUMED STANDARD DEVIATION

Grade of concrete	Assumed Standard Deviation N/Sq m
M 10	2.3
M 15	3.5
M 20	4.6
M 25	5.3
M 30	6.0
M 35	6.3
M 40	6.6

36. PROPORTIONING, CONSISTENCY, BATCHING AND MIXING OF CONCRETE.

Proportioning

Aggregate

The proportions which shall be decided by conducting preliminary tests shall be by weight, there proportions of cement, fine and coarse Aggregate means of weight batches conforming to I.S. 2722 capably of controlling the weights within 1% of desired value. Except where it can be shown to the satisfaction of the Engineer-in-charge that supply properly graded aggregate of uniform quality can be maintained over the period of work , the grading of aggregate sizes & blending them in the right proportions. The different sizes shall be stocked in separate stock piles. The grading of coarse and fine aggregate shall be checked as frequently as possible, as determined by the Engineer-in-charge, to ensure maintaining of grading in accordance with the samples used in preliminary mix design. The material shall be stock piled well in advance of use.

Cement

The cement shall be considered by weight, for design mix.

Water

Only such quantity of water shall be added to the cement and aggregates in the concrete mix as to ensure dense concrete specified surface finish, satisfactory workability, consistent with the strength stipulated for each class, be such as not to cause separation of materials of the collection of excessive free water on the surface of the concrete.

Definition of water/Cement Ratio.

The water cement (W/C) ration is defined as the weight in the mix (including the surface moisture of the aggregates) divided by the weight of cement in the mix.

water/Cement Ratio

The actual water cement ration to be adopted shall be determined in each instance by contractor and approved by the Engineer-in-charge.

Proportioning by water/cement ratio

The w/c ratio specified for use by the Engineer-in-charge shall be maintained contractor shall determine the water content of the aggregates as frequently as directed by the Engineer-in-charge as the work progress and as specified in I.S. 2386 (Part III) & the mount of the mixing water added at the mixer shall be adjusted as directed by the Engineer-in-charge so as to maintain the specified w/c ratio. To allow for the variation in their moisture content, suitable adjustments in the weights of aggregates shall also be made.

12 b) Consistency & Slump

Concrete shall be of a consistency & workability suitable for the conditions of the job. After the amount of water required is determined, the consistency of the mix shall be maintained throughout the progress of the corresponding parts of the work and approved tests e.g. slump tests, compacting factory tests in accordance with I.S. 1199 shall be conducted from time to time to ensure the maintenance of such consistency.

The following tabulation gives a range of workability which shall generally be used for various types of construction unless otherwise instructed by Engineer-in-charge.

Placing Condition	WORKABILITY OF CONCRETE	
	Degree of workability	Value of workability
Concrete of shallow Sections with vibration	very low	20-10 seconds, vee bee time or 75-80 compacting factor
concrete of lightly reinforced sections with vibration	low	10-5 seconds, vee bee time or 80-85 compacting factor
concrete of lightly reinforced sections with vibration or heavily reinforced with vibrations	Medium	5-2 seconds, vee bee time or 85-95 compacting factor or 25-75 mm slump for 20 mm aggregate.
Concrete of heavy reinforced sections without vibrations	High	above 92, compacting factor or 75-125 mm slump for 20 mm aggregate

b) Batching & mixing of concrete

1. The proportions of the materials for the concrete mix as established by the preliminary test for mix design shall be allowed for all the concrete in the works & shall not be changed except when specifically permitted by the Engineer-in-charge.
2. The concrete may be produced by weight batching the ingredients may be preferred by the contractor. Mixer & the weight batcher shall be maintained in clean & serviceable condition, the accuracy of the weight batcher shall be maintained in clean & serviceable condition, the accuracy of the weight batcher shall be periodically be checked. Both mixer and the weight batcher shall be set up at a level on firm base and the hopper shall be loaded evenly. The needle shall be adjusted to zero when the hopper is empty. Fine & coarse aggregates shall be weighted separately.
3. Each time the work stops the mixer shall be cleaned out and when next commencing the mixing, the first batch shall have 10% additional cement to allow for striking in the drum.

SAMPLING AND TESTING CONCRETE IN THE FIELD

a) Facilities required for sampling materials and concrete in the field, if the Engineer-in-charge so desire shall be provided by the Contractor at no extra cost. The following equipment with operator shall be made available at Engineer-in-charge request (all must be in serviceable condition).

Cast iron cube moulds 15 cm size	- 6 Nos.
Slump cone complete with tamping	- 1 Set
Laboratory balance to weight upto 5 Kgs with Sensitivity of 10 gm	- 1 Set
I.S. Sieve for coarse & fine Aggregates	- 1 Set
A set of measures from 5.1 to 11	- 1 set
Electric oven with thermostat upto 120 Deg .C	- 1 No.
Pycnometer	- 1 No.
Calibrated glass jar 1 litre capacity	- 2 Nos.
Glass flasks & metal containers	- As required
Laboratory balance of 2 Kg capacity and of sensitivity of 1 gm.	- 1 no.

Sampling & strength test of concrete

1. Samples from fresh concrete shall be taken as per I.S. 1199-1959 and cubes shall be made cured and tested at 28 days in accordance with I.S. 516-1959.
2. In order to get a relatively quicker idea of the quality of concrete optional tests on beams for modulus of rapture at 72 plus or minus 2 hours or at 7 days or compressive strength tests at 7 days may be carried out in additional to 28 days compressive strength tests. For this purpose, the value give in table below may be taken for general guidance in the case of concrete made with ordinary Portland cement. In all cases, the 28 days compressive strength specified shall be the criterion for acceptance or rejection of the concrete. If, however, from tests carried out in particular job over a reasonable long period it has been established to the satisfaction of the Engineer-in-charge that a suitable ratio between 28 days compressive strength and the modulus of ruptures at 72 plus or minus 2 hours or 7 days or compressive strength, providing the expected strength values at the specified early age are consistently met.

OPTIONAL: TESTS REQUIRED OF CONCRETE

Grade of concrete	Compressive strength on 15 cm cubes, min. 7 days N/Sq. mm.	modulus of beam test, 72 plus or minus 2 hours N/Sq. mm	Rupture min at 7 days N/Sq. mm
M 10	07.0	1.2	1.7
M 15	10.0	1.5	2.1
M 20	13.5	1.7	2.4
M 25	7.0	1.9	2.7
M 30	20.0	2.1	3.0
M 35	23.5	2.3	3.2
M 40	27.0	2.5	3.4

Frequency of Sampling

A random sampling procedure shall be adopted to ensure that each concrete batch shall have a reasonable chance of being tested; that is, the sampling should be spread over the entire period of concreting and cover all mixing units.

Frequency

The minimum frequency of sampling of concrete of each grade shall be in accordance with the following:-

Quantity of concrete in the work, Cum	Number of samples
01-5	1
06-16	1
37. 16-30	38. 3
39. 31-50	40. 4
41. 51 - and above	42. 4 plus on additional samples for each additional 50 cum or part thereof

At least one sample shall be taken from each shift. However random sampling will also be done to ensure quantity work is being done.

d)) Test Specimen

Three test specimens shall be made from each sample for testing at 28 days. Additional cubes may be required for various purposes such as to determine the duration of concrete at 7 days or at the time of striking the frame work or to determine the duration of curing or so check the testing error. Additional cubes may also be required for testing cubes by accelerated methods as described in IS. 9013 -1978. The specimen shall be tested as described in IS.0516 - 1959.

e) Test Strength of Sample

The test strength of the sample shall be the average of the strength of three specimens. The individual variation should not be more than plus or minus 15% of the average.

CONSISTENCY

Slump test shall be carried out as demanded by Engineer-in-charge and invariably from the same batch of concrete from which the test cubes are made slump tests shall be done immediately after sampling.

**CHAPTER IV
FORM OF AGREEMENT**

This Agreement made the _____ day of 200____ between Messer _____ (herein after called “the Employer”) of the one part & Messer _____ of the second part _____ (herein after called “the contractor”) of the other part whereas the Employer is desirous that certain works should be _____ constructed , viz _____ and has accepted a Tender Submitted by the contractor for constructions, completion & maintenance of such work.

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:-

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the conditions of contract herein after referred to.
2. The following documents shall be deemed to form, and to be read, and construed as part of the Agreement, Viz:-
 - a). the said Tender Document & Appendix thereto.
 - b). Instructions to Tenderers & Notice Inviting Tender.
 - c). Letter of acceptance dated.
 - d) The conditions of contract (including special conditions).
 - e). The specifications.
 - f). The bill of Quantities.
 - g). the schedules.
3. In consideration of the payment to be made by the Employer to the contractor, the contractor hereby covenants with the Employer to construct, complete and maintain the works in conformity in all respects with the provisions of the contract.
4. The Employer hereby covenants to pay the contractor in consideration of the construction, completion & maintenance of the work, the contract price at the times and in the manner prescribed in the contract.

IN WITNESS whereof the parties hereto have caused their respective common seals to be hereunto affixed (or have hereunto set their respective hands and seals) on the day and year first above written.

Signed by _____
for & on behalf of the contractor in the
presence of

Signature _____

Name _____

Address _____

Occupation

Signed by _____
for & on behalf of the Employer in the
presence of

Signature _____

Signature _____

Address _____

Occupation

BILL OF QUANTITIES

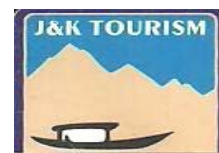
Name of work:- Repairs and Renovation of Tourist Hut-set No-2 at Lake View Resort Gatha.					
Adv. Cost :- 4.50 lacs		Ref. To NIT No. 04 of 09/2016 s. No 2		Item rate to be quoted by the contractor	
S. No	Description	Unit	Qty	Rate in Figure	Rate in words
1	Finishing wall with water proofing cement paint of required shade old work one or more coat applied @ 2.20 kg per 10 sqm	sqm	115.24		
2	Painting with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade one or more coat on old work .	sqm	242.20		
3	Polishing on wood work with French spirit polishing of approved brand and manufacture with one or more coats on old work.	sqm	70.45		
4	Finishing walls with textured exterior paint of required shade old work one or more coats applied @ 1.82 ltr/10 sqm	sqm	26.95		
5	Providing and laying vitrified floor tiles 8 mm thick of size 600 x 600mm with water absorption less than 0.8% and conforming to IS:15622 of approved make in all colour and shade laid on 20 mm thick cement mortar 1:4 mix (1 cement: 4 coarse sand) including grouting the joints with white cement and matching pigments etc complete	sqm	37.15		

6	Providing and fixing prelaminated wooden flooring 12 mm thick of cargo/Armstrong make fixed on 3mm thick base of foam sheet with quick set tile adhesive.	sqm	42.40		
7	Providing and fixing PVC wall panelling 3 mm thick of approved colour and make including all fittings	sft	1277.00		
8	Providing and fixing of wash basin with fixing assosaries set of size 460x580x210mm with full pedestal of jaquar make code No. SLS-WHT-6801, 6301	no	2.00		
9	Providing and fixing couple closet bowl-WC with PP seat cover , hinges , assosaries set of size 650x375x800 with flushing sisterns and fittings of Jaquar Make code no . ARS-WHT-39951P-39201	no	2.00		
10	Providing and fixing of C.P brass bib cock long body 15 mm nominal bore of Jaquar make of approved quality Code No CON-107KN	no	4.00		
11	Providing and fixing of C.P brass bib cock straight line model 15 mm nominal bore of Jaquar make with wall flange code No. FLR-5047N	no	2.00		
12	Providing and fixing CP angle valve for wash basin mixer , gyser point of 15 mm dia of Jaquar make	no	6.00		
13	CP Jet of Jacquar make	no	2.00		

Note: Any typographical error in respect of unit, Qty, or nomenclature the same shall be corrected and paid as per estimate.

Signature of the Contractor

**Executive Engineer
Bhadarwah Dev.
Authority**



BHADERWAH DEVELOPMENT AUTHORITY

BHADARWAH.

TENDER DOCUMENT FOR

**Repairs and Renovation
of Tourist Hut-set No-3
at Lake View Resort
Gatha.**

*Chief Executive Officer
Bhadarwah Dev. Authority*

SALE AND ISSUE OF TENDER DOCUMENT

FOR

**Repairs and Renovation of
Tourist Hut-set No-3 at
Lake View Resort Gatha.**

*Reference to NIT No: 04 of 09/2016
S. No 03*

Issued to	
Registration Card No:	
Cost of Document	
Received Vide Receipt No:	
Dated:	

Signature of the issuing Authority

*Executive Engineer
Bhaderwah Development Authority
Bhaderwah (Doda)*

CONTENTS

1. Chapter I Notice Inviting Tender
2. Chapter II General Conditions of Contract
3. Chapter III Special Conditions & General Specifications of Contract
4. Chapter IV Bill of Quantity and Preamble.

MEMORANDUM

I/We tender for the execution of _____

_____ and the work specified under written memorandum within the time specified in such memorandum at the rates specified in the attached schedule of quantities and in accordance, in all respects, with the specifications, design and instructions in writing, referred in the condition of contract and with such materials as are provided for, and in all other respects in accordance with such conditions so far as possible and applicable.

Name of the Employer	Chief Executive Officer, Bhaderwah Development Authority, Bhaderwah
General Description	
Earnest Money	
Amount	
CDR No:	
Dated:	
Name of Bank:	
Security Deposit	10% of the value of work
Defects Liability period	One year from the date of handing over
Time of Completion	____ Days from the three days after award of allotment or actual date of start which ever is earlier
Refund of security	50% on virtual completion of work & balance on expiry of defects liability period. One year from the date of completion and handing over of the project to the Authority

Should this tender be accepted in whole or in part, I/we hereby agree:-

- i. To abide by all terms and provisions of the said conditions annexed here to and all the terms and provisions contained in the Notice Inviting Tenders, so far as applicable and/r in default thereof to forfeit & pay to the Employer, or their successors the sum of money mentioned in the said conditions.
- ii. To execute all the works referred to in the tender documents upto the terms and conditions contained or referred to therein and to carry out such deviations as may be ordered upto a maximum of 50% (fifty percent) of the tendered value at the rates quoted in the tender documents.

A sum of Rs. _____ lacs (Rupees _____) is hereby forwarded in the shape of C.D.R. pledged to the C.E.O, Bhaderwah Development Authority, Bhaderwah, Doda, as earnest money. If, I/We, fail to commence the work specified in the above memorandum. I/we agree that the said Employer or their successors in office shall without prejudice to be at their right of remedy & at liberty to forfeit the said Earnest money absolutely. Otherwise the said earnest money shall be retained by the Employer.

Date: the _____ day of _____ 2016.

Signature of Contractor,
Before submission of tender

Witness _____

Contractor

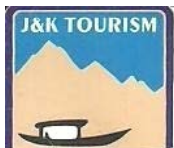
Letter of Acceptance

The above tender for the sum of Rs. _____ (Rupees
_____ only) submitted by
_____ is hereby accepted by me the Chief Executive
Officer, Bhaderwah Development Authority, Bhaderwah, District Doda, J&K Sate.

The _____ Day of _____ 2016.

Signature of Employer

Contractor



**GOVERNMENT OF JAMMU AND KASHMIR
OFFICE OF THE CHIEF EXECUTIVE OFFICER,
BHADERWAH DEVELOPMENT AUTHORITY
BHADERWAH, DISTRICT DODA.**



**NOTICE INVITING TENDER
NIT No: 04 OF 09/2016**

For and on behalf of the Governor of Jammu and Kashmir, Chief Executive Officer Bhadarwah Development Authority invites sealed item rates tender affixed with Rs 6/- revenue stamps from the reputed, approved, and eligible Contractors/Firms registered with State Govt./ CPWD/Irrigation/BRO/MES/NHPC/PSU or any other Govt. agency for the below mentioned works. The work is to be executed in accordance with the terms and conditions, Drawings, specifications, and design prescribed in tender document.

S. No	Name of work	Approx. Cost (Rs. In Lacs.)	Earnest Money (Rs in Lacs)	Time of Completion	Cost of Tender Documents (in Rupees)	Last Date for receipt of application and issue of Tender Documents	Class of Contractor
1	Repairs and Renovation of Tourist Hut-set No-1 at Lake View Resort Gatha.	4.50	0.09	20 days	500.00	15.9.16	A,B,C & D.
2	Repairs and Renovation of Tourist Hut-set No-2 at Lake View Resort Gatha.	4.50	0.09	20 days	500.00	15.9.16	A,B,C & D.
3	Repairs and Renovation of Tourist Hut-set No-3 at Lake View Resort Gatha.	4.50	0.09	20 days	500.00	15.9.16	A,B,C & D.
4	Repairs and Renovation of Restaurant Block, Shoping Kiosks, Booking Counter and Painting to outer Chain Link Fencing and railing around Lilly Pools at Lake View Resort Gatha.	4.55	0.091	20 days	500.00	15.9.16	A,B,C & D.

Other relevant information: - Position of AAA : Accorded
Position of funds : demanded
Position of TS : Under process

Terms & Conditions:

1. The tender Documents can be had from the office of the Chief Executive Officer, Bhadarwah Development Authority, Bhadarwah, District Doda, J&K, against payment of specified cost (non refundable) in cash or by bank draft or the same can be downloaded from our official website www.bhadarwahheavens.com from 09-09-2016 to 15-09-2016 and the cost of tender document of specified amount (non refundable) shall be accompanied with the tender of dated up 15-09-2016.

Cont. page...2...

Page...2...

2. **The technical qualification of the bidder should contain the following documents:-**
 - (i) *Attested copy of registration card duly renewed for the current financial year.*
 - (ii) *Sales tax clearance certificate issued by the Sales Tax Department ending last year with PAN and TIN No.*
3. The tender should be addressed to the Chief Executive Officer, Bhadarwah Development Authority, and sent under Registered post which should reach in the office of the Chief Executive Officer Bhadarwah Development Authority on or before **19.9.2016 up to 2 pm.**
4. The tender will be opened by the authority level tender opening committee headed by Chief Executive Officer , Bhadarwah Dev Authority, at Bhadarwah in his office chamber **on 20/9/2016 at 11.00 am** in presence of the contractors or their authorized representatives who may like to be present.
5. The tender must be accompanied by earnest money in the form of Call Deposit Receipt for amount shown against the each work of any scheduled bank pledged to the Chief Executive Officer Bhadarwah Development Authority without which no tender shall be entertained.
6. The earnest money will be released to the unsuccessful tenderers after 28 days from the date of acceptance of tender and in the case of successful tenderer it will be accounted towards security deposit. The earnest Money may be forfeited if the tenderer withdraws the tender after tender opening during the period of validity. No duplicate document shall be issued in lieu of reportedly issued and lost document.
7. As soon as acceptance of the tender is communicated to the successful tenderer, the contract shall be complete and binding on him. The successful tenderer shall execute an agreement with the Bhadarwah Development Authority within 7 Days after the issuance of the letter of intent to him. The expenses on that account and incidental charges shall be borne by the tenderer. Failure to execute such an agreement shall not, however, prevent the contract from being enforced

against him. The date of start of work shall be reckoned after seven days from the date of issue of allotment letter or actual start of work whichever is earlier.

8. In case of failure of the contractor to execute the work in part or in full the act shall amount to breach of contract. A registered notice or notice sent through a special messenger to the contractor for breach of contract shall be sufficient for authority to wind up or cancel his contract. In case contractor avoids receiving the notice or deliberately gives wrong address for communication where it becomes practically difficult to deliver the notice, the same shall be pasted on the entry gate of his known address in presence of a witness and the notice shall be treated as service notice to the contractor. His earnest money will be forfeited and he will be blacklisted for future. The BDA will be at liberty to get the left over work executed at his risk and cost. Any additional amount involved for such execution may be recovered from other claims/ resources of the contractor.
9. Misconduct or Misbehavior if any observed during the tender opening process with any officer/ official shall be dealt in terms of the enlistment & registration of contractors rules in the PWD and may result in recommendation for cancellation of registration card issued by any department.
10. The tenders shall be valid for at least 120 days from the date of opening. In the event of successful tenderers failing, declining or delaying the execution of the agreement, the Authority shall, without prejudice to any other remedy available to it under any law, for the time being in force in the state, be entitled to forfeit the earnest money in full or in part and impose such penalty as may be determined by the Authority.
11. The tenders on plain paper/ telegraphic tenders/ conditional tenders shall be rejected. Tenderers are advised to quote complete item rates (including material carriages & incidentals) against the advertised Bill of quantities. Tenders written in pencil shall be rejected. Tenders should be clearly written and writing sealed with transparent tape.
12. The tenders accepted will be checked by the Authority for any arithmetical errors. Errors will be corrected by the Authority as follows:
 - where there is a discrepancy between the rates in figures and in words, the rates in words will govern; and
 - Where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern.
 - The amount stated in the tender will be adjusted by the Authority in accordance.
13. The Authority reserves the right to itself to accept or reject any tender or part thereof or allot the contract to any contractor in full or in part without assigning any reason thereof.
14. In case of any dispute arising at any time between the tenderer and the Authority regarding interpretation of any of the terms and conditions of this notice, the same shall be referred to an officer of the Government as the concerned Minister In-charge may nominate for

arbitration under the law for arbitration for the time being in force in the state. The decision thereon of the Arbitrator shall be final, conclusive and binding on the parties. During arbitration case the Authority will not withhold the payment of undisputed items nor will the contractor stop the work till decision of the Arbitration.

15. Any clarification required by the tenderer in regard to the technical points etc. mentioned in the tender or the annexure hereto or otherwise pertaining to the works may be sought from the consultant or Executive Engineer, Bhaderwah Development Authority, Bhaderwah on any working day.
16. The tenderer may in his own interest inspect and examine the site and its surroundings, as also means or access to site and satisfy him-self before tendering as to the nature of ground, climatic conditions, the form and nature of site, by making prior appointment with the Executive Engineer, BDA, Bhadarwah well in time.
17. The following requirements should be adhered to:
 - The tender document should be signed and dated on each page by the tenderer or his duly authorized agent.
 - The tender document should be accompanied by a certified true copy of Power of Attorney of the signatory to the document. The Power of Attorney should include the power to agree to refer disputes to arbitration.
18. Tenderer shall not be entitled to any cost, charges or expenses incurred by them, or incidental to, or in connection with the preliminary investigations, surveys and preparation of design or submission of tender etc. In case the tender submitted by the tenderer is not accepted, tender document will not be returned to him.
19. The tender submitted by an individual shall be signed with his full name and his complete address shall be recorded thereon. If it is submitted by a firm, it shall be signed by a member of the firm who is duly authorized to enter into the contract. He shall sign his own name and give the name and address of each member of the firm and shall furnish power of Attorney along with the tender.
20. No foreign exchange shall be made available to the tenderer in connection with the execution of the work.
21. The work shall be carried out strictly according to the terms and conditions, specifications, design, drawing and plans described in Annexures. Where specifications do not cover any item, the specifications, terms and conditions of State PWD in force shall be made applicable.
22. Immediately after the communication of the acceptance of the tender, the contractor shall submit for approval the proposed methodology and program of construction backed with equipment and material planning and deployment duly supported with broad calculations and quality management plan proposed to be adopted justifying their capability of execution

and completion of the work as per technical specifications and within stipulated period of completion. No payment shall be made to the contractor on any account until such a programme has been submitted and approved.

23. No extra shall be paid for such arrangement; if the Executive Engineer, at any time during execution of the work is of the opinion that the contractor will or may fall behind the schedule of programme, a revised programme will be required to be submitted with added men, machines and working shifts.
24. All other terms and conditions if not covered but in vogue in State PWD shall hold good and form part of this NIT.
25. After opening the tenders, if the tendered amount works out 10% below the advertised cost extra security deposit 10% of the Adv. Cost shall have to be deposited by the lowest tenderer before allotting the work..
26. The contractor/firm shall be paid for the actual quantity of work executed and as measured at the site at the rate accepted by the deptt. The Deptt; reserves the right to increase or decrease any item or items of work. Any claim by the firm/Agency on this account shall not be entertained. The rates quoted shall hold good for any increase/decrease in quantity.

Executive Engineer
Bhadarwah Dev. Authority

No: BDA/2016-17/_____

Dated: _____

Copy to the:-

1. Secretary to Government, Tourism Department, J&K Govt. Civil Secretariat, Srinagar for information.
2. The District Development Commissioner, Doda for information.
3. Director Tourism Jammu for favour of information.
4. Additional District Development Commissioner Doda for information.
5. Sub Divisional Magistrate Bhadarwah for information.
- 6-7 Chief Executive Officer Bhadarwah Development Authority Bhadarwah/Kishtwar Dev. Authority for information.
8. Executive Engineer R&B Div. Bhadarwah.
- 9-10 President Contractor Association Bhadarwah/Doda for information.
11. Publicity Manager BDA for uploading of NIT 04 of 09/2016 on our official website. The process of downloading should be stopped on 15-09-2016
12. Notice Board
13. Office file

CHAPTER II
GENERAL CONDITION OF CONTRACT

1. **DEFINITION:**

- The ‘Contract’ means the documents forming the tender and acceptance thereof, the formal agreement executed between Employer, and the contractor; and instructions & drawings issued from time to time. These above mentioned documents shall be treated as complementary to one another.
- In the contract the following expression shall, unless the context otherwise requires, have the meanings hereby respectively assigned to them:
 - “Authority” shall mean Bhaderwah Development Authority (BDA).
 - “Chief Executive Officer” shall mean Chief Executive officer, Bhaderwah Development Authority, Bhaderwah.
 - “Executive Engineer” shall mean Executive Engineer, BDA.
 - “PWD” shall mean Public Works Department of Govt. of J&K.
 - The expression ‘Works’ or ‘Work’ shall mean all works to be executed by the contractor in accordance with designs, drawings, plans & specifications described in this contract document.
 - The ‘Site’ shall mean the land and or other places on into or through which work is to be executed under the contract & shall also mean any adjacent land, path or street which may be allotted or used for the purpose of carrying out the contract.
 - The ‘Contractor(s)’ shall mean the individual or the firm or the company whether incorporated or not, undertaking the works & shall include the legal representative of such individual or the person composing such firm or company, or the successors of such firm or company and the permitted assigns of such individuals or firm or of company.
 - The ‘Employer’ means Chief Executive Officer, Bhaderwah Development. Authority, Bhaderwah, District Doda, Jammu.
 - ‘Engineer-in-Charge’ means Executive Engineer, BDA or any other person who may be deputed to the site of work from time to time by the Authority and authorized in writing for any purpose in relation to, or in connection with this contract.
 - ‘Plant’ and ‘equipment’ shall mean plant, machinery equipment, pipe work services & all other things to be provided, erected, installed, commissioned and maintained in accordance with the Contract.
 - ‘Temporary Works’ means all temporary works of every kind required in or about the execution completion and maintenance of the works and Plant.
 - ‘Approved’ means approved in writing including subsequent written confirmation of verbal approval and ‘approval’ means approval in writing including as aforesaid.
 - “Drawing” shall mean the drawings referred to in the specifications and any modification of such drawings approved in writing by the consultant/Executive Engineer with consent of the CEO and such other drawings as may from time to time be furnished in writing by the consultant/Executive Engineer with the approval of the Chief Executive officer.
- “Notice in writing or Written Notice” shall mean a notice or a communication in writing, typed or printed sent either under registered post or ordinary post to the last known private or business address or delivered personally by hand to the contractor.
- “Virtual Completion” Shall mean when the Work under this contract is in the opinion of the Executive Engineer fit for use and taken over by the Authority, after removal of scaffolding, plants, surplus materials and rubbish and cleaning of dirt from works and site including testing etc, complete in accordance with regulations in force.

- The terms “Bill of Quantities” and “Schedule of Prices” wherever they occur in this Contract shall be treated as synonymous & interchangeable

Singular & Plural	Words importing the singular only also include the plural and vice versa where the context requires.
Reading or Notes	The marginal headings of notes shall not be deemed to be part thereof or be taken into consideration in the interpretation or construction of various clauses or of the Contract.
Works include plant	The term “Works” shall be deemed to include “Plant” and “Equipment” as here in Equipment above defined wherever the context so requires but NOT vice versa.

2. Duties & Power of Engineer-in- Charge

The duties of the Engineer-in-Charge is to watch and supervise the works and to examine any materials to be used or workmanship employed connected with the project.

3. Assignment:

The Contractor shall not assign the contract or any part thereof or any benefit or interest therein or there under (other than a charge in favour of the contractor’s Bankers) of any amount due or to become due under this contract without the prior written consent of the Employer.

4. Sub-Let:

The Contractor shall not sub-let the whole or part of the Works, except where otherwise provided in the contract, the contractor shall not sub-let any part of the works without the prior written consent of the Employer (which shall not be unreasonably withheld) but such consent if given shall not relieve the contractor and he shall be responsible for the acts, defaults and negligence of any sub-contractor, his agents, servants or workmen as fully as if they were acts, defaults or neglects of the contractor his agents, servants and workmen. Provided always that, the provision of labour on a piece work basis, raw materials for the construction of works and items of plant/Equipment shall not be deemed to be sub-letting under this clause.

5. Documents, Mutually or Explanatory

The several documents forming the part of contract are to be taken as mutually explanatory of one and other and in case of ambiguities or discrepancies, the same shall be brought to the notice of the Engineer-in-Charge the order of procedure shall be

- Drawings & instruction issued to the Contractor.
- Schedule of Quantity Specifications.
- Special conditions on Contract and Notice Inviting Tender.
- General conditions of Contract.
- The Engineer-in-Charge who shall there upon issue to the Contractor instructions directing in what manner the work is to be carried out.

6. Drawings:

The drawings are detailed to contain the specification as also the procedure for instructions. The Contractor shall give adequate notice to the Engineer-in-charge of any further drawings or specification that he may require for the execution of the works, under the Contract, well in advance for execution. This shall not however be an excuse for delay in completion of any work.

7. One copy of the Drawings to be Kept at site:

One copy of the Drawings shall be kept by the Contractor at site and the same shall be available for inspection & use by the Engineer-in-charge, or by any other persons authorized by the Engineer-in-charge in writing. One copy shall be signed & kept on records so as to confirm contractor’s acceptance of having quoted for the works under reference.

8. Drawings Instructions.

The Engineer-in-Charge shall have full power and authority to supply to the contractor, from time to time during the progress of the works such further drawings and instructions as shall be, necessary for purpose of the proper and adequate execution and maintenance of the works and the Contractor shall carry out and be bound by the same.

9. Contract Agreement:

The Contractor shall when called upon so to enter into & execute a contract agreement in the form annexed with such modifications as may be necessary.

10. Inspection :

The Contractor shall inspect and examine the site and its surroundings & of site. shall satisfy himself before submitting his tender as to the nature of the ground and sub-soil the form and nature of the site and quantities and nature of the work and materials necessary for the completion of the works and the means of access to the site, the accommodation he may require & in general shall himself obtain all necessary information as to risk contingencies & other circumstances which may influence or affect his tender.

11. Sufficiency of Tender

The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the work and of the rates & prices stated in the priced schedule of the prices if (any), which rates and prices shall except in so far as it is obstruction, otherwise provided in contract cover all his obligations under the contract and all his matters and things necessary for the proper completion and maintenance of the works.

a). of complying with any instructions, which the Engineer-in-charge may issue to the Contractor in connection therewith and

b). of any proper reasonable measures approved by the Engineer-in-charge which the Contractor may take in the absence of specific instructions from the Engineer-in-Charge.

12. Works to Satisfaction of the Engineer- in-Charge:

Save in so far as it is legally or physically impossible, the contractor shall execute, complete and maintain the works in strict accordance with the contract to the satisfaction of the Engineer-in-charge and shall adhere strictly to the instructions and directions issued by Engineer-in-Charge on matters as refer to above.

13. Completion Schedule:

Immediately after the communication of the acceptance of his tender the Contractor shall, submit to the Engineer-in-Charge, for approval a Programme of execution outlining the proposed operations and order of completion of various activities in multiple working shifts giving sufficient details to demonstrate to the Authority the adequacy of the programme to complete the work within the time prescribed under this contract. No payment shall be made to the contractor/firm on any account until such a programme is submitted and approved. The submission to an approval by the furnishings of such particulars shall not relieve the contractor of any of his duties or responsibilities under the contract.

If the Engineer-in-Charge at any point of time during execution is of the opinion that the work under this contract will or may fall behind the schedule of programme, he may direct for added operations, method, equipment, the number of labours and working shifts so that the time lost is made up.

14. Contractor's Superintendence:

The Contractor shall give or provide all necessary Superintendence During the execution of the works and as long there after as the Engineer-in-charge may consider necessary for the proper fulfilling of the Contractor's obligations under the contract. The contractor or a competent and authorized agent or representative approved in writing by the Engineer-in-charge (such approval may at any time be withdrawn) is to be constantly on the works & shall give his whole time to the superintendence of the same. If such approval

shall be withdrawn by the Engineer-in-charge the Contractor shall as soon as is practicable (having regards to the requirement of replacing him as here in after mentioned) after receiving written notice of such withdrawal remove the agent from the site and shall not thereafter employ him again on the site in any capacity and shall replace him by another agent approved by the Engineer-in-Charge. Such authorized agents or representative shall receive on behalf of the Contractor instructions from the Engineer-in-Charge. Contractor shall provide at his own expense cost of hutments/dwelling units for his workers etc. and all such expenses shall deemed to have been taken care of in there quoted rates for the above works.

15. Contractor's Employees

The Contractor shall provide and Employ on the site in connection with the execution & maintenance of the works, only such technical assistants as are skilled & experienced in their respective callings and such sub-agents, foremen and dealing hands as competent to give proper supervision to the work they are required to supervise, and such technical assistant will be in sufficient numbers for each areas of works to be handled either in one area or field or both, contractor shall before start of work give a list of their technical staff and their nature of duties to the Engineer-in- Charge. Such skilled, semi-skilled and unskilled labour as is necessary for the proper and timely execution & maintenance of the works. Where required by the law or regulation of local or other authority, such personnel shall be duly licensee from the competent authority to practice their trades, professions and callings.

16. The Engineer-in-Charge shall be at liberty to object to and require the contractor to remove forthwith from the works any person employed by the contractor in or about the execution or maintenance of their works who in the opinion of the Engineer-in-Charge misconducts himself or is incompetent or negligent in the proper performance of his duties or whose employment is otherwise considered by the Engineer-in-Charge to be undesirable and such person shall not be again employed upon the works without the written permission of the Engineer-in-Charge. Any person so removed from the works shall be replaced without delay by the competent substitute approved by the Engineer-in-Charge.

17. The Contractor shall if required by the Engineer-in-Charge deliver returns in such form and at such intervals as the Engineer-in-Charge may prescribe showing the details of supervisory staff and the numbers of he several classes of labour, from time to time, employed by the contractor on the site.

18. Setting out of the works:

The Contractor shall be responsible for the true and proper setting out of the works and for the correctness of the position, levels, dimensions and alignment of all necessary parts of the works and for the provision of all necessary instruments appliances and labour in connection herewith. If at any time during the progress of the works an error shall appear or arise on the position, levels, dimensions or alignment of any part of the works, the contractor on being required to do so by the Engineer-in-Charge shall at his own expenses rectify such error to the satisfaction of the Engineer-in-Charge or his representative unless such error is based on incorrect data supplied in writing by the Engineer-in-Charge in which case the expense of rectifying the same shall be borne by the employer. The checking of any line or level by the Engineer-in-charge shall not in any way relieve the Contractor of his responsibilities for the correctness thereof and the Contractor shall carefully protect and preserve all bench marks sight rails, pegs and other things used in setting out the works.

19. Lighting, Watch and Ward.

The Contractor shall in connection with the works provide & maintain at his own cost all lights, guards, fencing, watch and ward, when and where necessary or required by the Engineer/in-Charge or by the authority for the protection of the works or for the safety and convenience of the public and others.

20. Care of Works/Plant Equipment.

From the commencement to the completion of the work, the contractor shall, take full responsibility for the care thereof, of Temporary works and Constructional plant and in case any damage loss or injury shall happen to the works/plants/Equipment or to any part thereof or to any Temporary work or constructional plant from any cause what-so-ever shall, at his own cost repair and make good orders and conditions, and in connection in every respect with the requirements of the Engineer-in-Charge/instructions.

21. Damage to persons and property:

If the contractor or his workers or servants break, deface, injure or destroy any part of the structure or other property in the vicinity of the works, belonging to any person in or on which they may be working, such structures, road, road kerbs, embankments, fence enclosure, water pipes, cables, drains, electrical or telephone posts or wires, trees, grass or grasslands, or cultivated ground contiguous to the premises on which the work or any part of it is being executed, shall make the same good at his own cost and in default, the Engineer-in-Charge shall cause the same to be made good and deduct the cost thereof from any sums that may be due to the contractor under this contract or from his security deposit.

22. Overtime/ Multiple Shifts

Contractors shall also not charge for any overtime/ Multiple Shift working incurred wholly or partly for uncompleted works etc. or for works which may have to be got done urgently as per the requirements of the Engineer-in-Charge or also as per the drawings supplied from time to time.

23. Third party Insurance

Before commencing the execution of the works, the contractor (but without limiting his obligations & responsibilities under relevant clause hereof) shall insure against any damage, loss or injury which may occur to any person (including any employee of the Employer) by or arising out of the execution of the works or temporary work or in the carrying out of the contract.

24. Accident or injury to workmen.

The Employer shall not be liable for in respect of any damages or compensation to workmen/labors in respect to or in consequence of any accident or injury to any workman or other person in the employment of the contractor save and except an accident or injury resulting from any act or default of the employer his agents or servants & the contractor shall indemnify & keep indemnified the Employer against all such damages and compensation (save & except as aforesaid) and against all claims demands, proceedings, costs charges & expenses what-so-ever in respect thereof or in relation thereto.

25. Insurance against Accident etc. workmen.

The contractor shall insure against such liability against an insures approved by the employer (such approval shall not be unreasonably withheld and to workmen shall contain such insurance during the whole of the time that person are employed by him on the work and shall when required to the employer such policy of insurance and the receipt for payment of the current premium provided always that in respect of any persons employed any sub-contractor the contractor & obligation to insure as aforesaid under this sub-clause shall be satisfied if the sub-contractor shall have insured in such manner that the Employer is indemnified under the policy but the contractor is to produce to the Employer when required such policy of insurance and the receipt for payment of the current premium.

26. Giving of Notice and payment of fees.

The Contractor shall give all notices and pay all fees required to be given or paid by National or State Statute Ordinance or other Law or any Regulation or Bye-Law of any local or other duly constituted authority in relation to the execution of the works and by the rules and Regulations of all public bodies and companies whose property and rights are affected or may be affected any way by the works or any temporary works.

27. Compliance with statues any Regulations etc.

The Contractor shall confirm in all respects with the provisions of any such statutes ordinance or law as aforesaid and the Regulations or Bye-Laws of local or other duly constituted authority which may be applicable to the works or to any temporary works and with such rules and regulations of public bodies and companies as aforesaid and shall keep the employer indemnified against all penalties and liabilities of every kind for breach of any such statute ordinance or law Regulation or Bye-Law.

28. Supply of plant material and labour.

Except where otherwise specified, the Contractor shall at his own expense supply and provide all the Constructional plant, Temporary and for Permanent works/plant/equipment labour (including the supervision of thereof) transport to or from the site and about the works and other things or every completion and maintenance of works/plant/equipment.

29. Clearance of site on completion.

On the completion of the Works the Contractor shall clear away and remove from the site all constructional plant, surplus materials, rubbish and Temporary works of every kind and leave the whole of the site and works clean and in a workman like condition to the satisfaction of the Engineer-in-charge.

30. Labour.

The Contractor shall make his own arrangement for engagement of all labour, local or otherwise and also provide for the transport, housing, feeding and payment thereof.

- The Contractor shall provide on the site to the satisfaction of the Engineer-in-charge water for the use of the Contractor's staff and work people.
- The Contractor shall in all dealings with labour in his employment have due regards to all recognized days of rest, religious festivals, & other customs.
- In the event of any outbreak of illness of an epidemic nature, the contractor shall comply with and carry out such regulations orders and requirements as may be made by the Government or the local medical or sanitary authorities for the purpose of dealing with and overcoming the same.
- The Contractor shall at all times take all reasonable precautions to prevent any unlawful riotous or disorderly conduct by or amongst his employees and for the preservation of peace and protection of persons and property in the neighborhood of the works against the same.
- The Contractor shall be also responsible for observance by his sub-contractors of the foregoing provisions.
- The Contractor shall employ labour in sufficient number to maintain the required rate of progress & of quality to ensure a workmanship of a degree required by the specification and to the satisfaction of the Engineer-in-charge. He shall be responsible at his own cost, for all recruiting, transport, welfare, sanitary and other accommodation, provision of necessary passports or permits for all personnel and employee required for this contract.
- The Contractor shall remain liable for the payment of all wages under Wages Act 1936, Minimum Wages Act, 1948, Employee's liability Act, 1936, Workmen's Compensation Act, 1923, Insurance, Provident Fund, Family Pension etc. or any other Act or enactments relating thereto and rules framed there under from time to time. In the interest of the work and its completion target, the contractor shall have to work in more than one shift & no liability in respect of any excess cost arising there from shall be borne by the Employer. The contractor may employ female labours if he chooses but he shall not employ in connection with the works any person who has not completed the minimum age as per law locally applicable.
- The Contractor shall comply fully with local laws dealing with the employment of person including where applicable the Indian Employment of children Act, 1938. The Indian Workmen's Compensation Act, 1923, the Factories Act, 1948, the minimum Wages Act,

1948, Contract Labour (Regulations & Abolition) Act, 1970, and any statutory amendment or re-enactment thereof for the time being in force.

- The Contractor during the progress of the works shall provide, erect and maintain at his own expense and to approved standards and scales all necessary temporary sanitary accommodation required for his workmen on the site in connection with the execution of works. The planning, sitting and erection of these buildings shall be approved by the Engineer-in-Charges & such temporary accommodation shall at all times during the progress of the works be kept tidy and in a clean and sanitary condition to the entire satisfaction of the Engineer-in-charge & at the contractor's expense. The contractor shall conform to the sanitary requirements of local medical & health authorities and at all times adopt such precautions as may be necessary to prevent soil pollution of the site.
- The Contractor shall at his own expense carry out all anti-material or other ailments, instructions given to him by the Engineer-in-charge or by any local authority including the filling up of barrow pits.
- The Contractor shall at his own expense carry out all instructions issued to him by the Engineer-in-Charge to effect a proper disposal of soil and other conservancy work in respect of the contractor's workmen or employees on the site. He shall also conform to the sanitary requirements of the local Medical and Health authorities.
- The Contractor will not at any time do, cause or permit any nuisance on the site or adjoining area or do anything which shall cause unnecessary disturbance or inconvenience to the owners, tenants or occupiers of other properties near the public generally and will secure the efficient protection of all land, river lakes and sea areas against pollution. The Contractor shall attend children of labourers and shall provide for its maintenance and upkeep.
- The Contractor shall provide and maintain upon the works sufficient, proper and efficient life-saving appliance and first aid equipment to the approval of the Engineer-in-charge and in accordance with the requirements of I.L.O Convention No.62. The appliance and equipment shall be for use at all times.
- The Contractor shall organize his operations in a workman like manner and take all necessary precautions to provide safety and prevent accidents on the site to both persons and property, more so if they will be working in proximity to working machinery of existing plants in operation. The Engineer-in-charge shall have the power in requiring the contractor to adopt from time to time such measures as they may consider necessary to ensure the above requirements. The Employer /Engineer-in-charge shall not be responsible for any consequence resulting from violation of safety requirements. In particular the Contractor shall ensure compliance with the following safety codes:-
 - IS: 3696 (Pt. I) - Safety code for scaffolds and ladders pt.I
 - IS: 3696 (Pt. II) - Do- Pt. II – Ladders
 - IS: 4130 (Pt. III) - Safety code for demolition work
 - IS: 4014 (Pt. II) - Code of practice for steel Tubular Scaffolding (Pt. II)- Safety Regulations for scaffolding.
- All statutory laws on labour in vogue from time to time shall be complied with & all basic amenities provided for & by the contractor shall indemnify the Authority against all claims what-so-ever on this.

31. Return of Labour.

The contractor shall if required by the Engineer-in-charge deliver to the Engineer-in-charge Representative or at his office a Return in details in such form and at such intervals as the Engineer-in-charge may prescribe showing the number as the several classes of labour from time to time employed by the Contractor on the site and such information regarding constructional plan as the representative may require.

32. Quantity of Materials and Workmanship and tests.

All materials and workmanship shall be of the representative kinds described in the contract & in accordance with Engineer-in-charge, and shall be subject from time to time to such test as the Engineer-in-charge may direct at the place of manufacture, of fabrication or on the site or at all or any of such places. The contractor shall provide such assistance instruments, machines, labor and materials as are normally required for examining, measuring and testing the quantity of any work & the quality or weight of any material incorporation in the works for testing as may be selected as required by Engineer-in-charge.

33. Cost of samples.

All samples shall be supplied by the Contractor at his own cost, if the supply thereof is clearly intended by or provided for in the specification or Bill of Quantities, but if not then at the cost of the Employer.

34. Cost of tests.

The cost of making any test shall be borne by the Contractor if such test is clearly intended by or provided for in the specification and (in the cases only of a test under load or of a test to ascertain whether the design of any finished or partially finished work is appropriate for the purpose which it was intended to fulfill) particularized in the specification in sufficient detail to enable the contractor to price or allow for the same in his tender.

35. Access to site.

The employers or any other person authorized by them shall at all times have access to the works and to the site and to all workshops and places where work is being prepared or from where materials, manufactured articles or machinery are being obtained for the work and contractor shall afford every facility for and every assistance in or in obtaining the right to such access.

36. Examination of work before covering up.

No work shall be covered up or put out of view without the approval of the Engineer-in-charge or their representative to and the contractor shall afford full opportunity for the Engineer-in-charge or afford full opportunity to examine and measure any work their representative to examine and measure any work which is about to be covered up or put out of view and to examine foundation before permanent work is placed thereon. The Contractor shall give due notice to the Engineer-in-Charge Representative whenever any such work of foundation is or are ready about to be ready for examination.

37. Uncovering and making openings.

The Contractor shall uncover any part or parts of the works or make openings in or through the same as the Engineer-in-charge may from time to time direct and shall reinstate & make good such part or part to the satisfaction of the Engineer-in-charge. If any part or parts have been recovered by or put out of view after compliance with the requirements of above sub-clause and foundation to be executed in accordance with the contract the expenses of uncovering making openings in or through reinstating and making good the same shall be borne by the Employer but any other case all such expenses shall be recoverable from him by the Employer from may deducted by the Employer from any monies due or which may become due to the contractor.

38. Removal of Improper work and materials.

The Engineer-in-charge shall during the progress of the work have power to order in writing from time to time.

- a). The removal from the site within such time or times as may be specified in the order of any materials which in the opinion of the Engineer-in-charge are not in accordance with the contract.
- b). the substitution of proper and suitable materials.
- c). The removal and proper re-execution (not withstanding and previous test thereof or interim payment thereof) of any work which in respect of materials or workmanship is not, in the opinion of the Engineer-in-charge in accordance with the contract.

39. Default of Contractor

In case of default on the part of the contractor in carrying out such order the employer shall be entitled to employ and pay other persons to carry out the same and all expenses consequent thereon or incidental thereto shall be borne by the contractor and shall be recoverable from him by the Employer from any amount due or which may become due to the contractor.

40. Suspension of work.

The Contractor shall, on the written order of the Engineer-in-charge suspend the progress of the works or any part thereof for such time or times and in such manner as the Engineer-in-charge consider necessary and shall during such suspension properly protect and secure the work so far as is necessary in the opinion of the Engineer-in-charge. The extra cost incurred by the contractor in giving effect to the Engineer-in-charge instruction under this clause shall be borne and paid by the employer, unless such suspension is

- a). otherwise provided for the contract or
- b). necessary for the proper execution of the work or any reason of weather conditions affecting the safety or quantity of the works or by some default on the part of the contractor.
- c). necessary for the safety of the works or any part thereof, provided that the contractor shall not be entitled to recover any such extra cost unless he gives notice in written of his intentions to claim to the Engineer-in-charge within 28 days of the Engineer-in-charge order. The Engineer-in-charge shall settle & determine the extra payment to be made to the contractor in respect of such claim as the Engineer-in-charge shall consider fair & reasonable.

41. Suspension more 90 days.

If the progress of the works or any part thereof is lasting suspended on the written order of the Engineer-in-charge for more than 90 days the contractor may serve a written notice on the Engineer-in-charge requiring permission within 28 days from the receipt thereof to proceed with the works or part thereof in regard to which progress is suspended and if such permission is not granted within that time the contractor by the further written notice so served may (but is not bound to) elect not to execute part of the works, as an omission of such part or where it affects the whole works, as an abandonment of the contract by the Employer.

42. Commencement works.

The contractor shall commence the works on site within the period contained in the Tender after the receipt by him of an order in writing to this effect from the Employer and shall proceed with the same with due expedition except as may be expressly sanctioned or ordered by the Employer or be wholly beyond the contractor's control.

43. Extension of time for completion.

Should the amount of extra or additional work of any kind or other special circumstances of any kind what so ever which may occur be such as fairly to entitle the contractor of the extension of the time for the completion of the work, & the Employer on the recommendation of the Engineer-in-charge, shall consider the grant of such or any extension of time for completion. Engineer-in-charge shall determine the amount of such extension provided that this is due to work or other special circumstances that have arisen or as soon thereafter as is practicable delivered to the Engineer-in-charge representative full and detailed particulars of any claim to extension of time to which he may consider himself entitled in order that such claim may be investigated at the time.

44. Execution of works of Repairs etc.

To the intent that the works shall at or as soon as practicable after the expiry of the defect liability period be delivered upon the Employer in a good and perfect condition (fair wear and tear excepted) to the satisfaction of the Engineer-in-charge. The contractor shall exercise all such work of repair amendment reconstructions, rectification, and making good

of defects, imperfections, shrinkage or other defaults as may be required of the contractor in defect liability period or within fourteen days after its expiry as result of an inspection made by or on behalf of the Engineer-in-charge prior to its expiry.

45. Remedy on contractor's failure to carry out work have required.

If the contractor fails to do any such work as aforesaid required by, the Employer shall be entitled to carry out such work by his own workman or other contractor & such work which the contractor should have carried out at the contractor's own cost, he shall be entitled to recover from the contractor the cost thereof or may deduct the same from any dues or that may become due to the contractor.

46. Variations.

No alterations, amendments, omissions, additions or other variation of the works/plants/equipment under the contract (here-in-after referred to as variations) shall be made by the contractor, except as ordered in writing by the Engineer-in-charge, who shall have full power subject to the provisions herein after contained, to instruct the contractor in writing to make such variation as the Engineer-in-charge consider proper and necessary and the contractor shall carry out such variations without prejudice to the contract, as through the said variations formed part of the contract.

If in the opinion of the contractor complying with any such variation would prevent his obligations or guarantees under the contract he shall promptly notify the Engineer-in-charge who shall decide forth with whether the variation shall be carried out as ordered. If the Engineer-in-charge confirms his previous instructions the contractor obligations & guarantees shall be modified to such extend as may be justified & notified by the Engineer-in-charge & considered by the Employer for acceptance on the recommendations of the Engineer-in-charge.

47. Valuation of variations.

The value (if any) of all variations shall be added to or deducted from the contract price as appropriate. The Engineer-in-charge shall ascertain and determine this in accordance with the rates & prices in the schedule of Prices/Bill of Quantities, so far as the same may be applicable & recommended by the Engineer-in-charge for the consideration of the employer for acceptance. In other cases, reasonable prices shall be fixed by the consideration of Employer for acceptance.

48. Notice to Contractor.

In the event of the Engineer-in-charge requiring any variations as reasonable and proper notice shall be given to the contractor as the same will enable him to make his arrangements there of and in cases where goods and materials are already prepared or any design drawings or patterns made or work done that required to be altered a reasonable sum in respect thereof shall be allowed by the Engineer-in-charge.

49. Plant etc. to be exclusive use on the works.

All constructional plant, temporary works and materials provided by the contractor shall when brought on to the site be deemed to be exclusively intended for the use on the works construction and completion of the works and the contractor shall not remove the same or any part thereof (save for the purpose of moving it from one part of the site of another) without the previous consents in writing of the Engineer-in-charge (which shall not be unreasonably withheld).

50. Clearance of site completion.

On completion of the works the contractor shall remove from of the site all the said constructional plant and temporary works remained there on and any un-used materials.

51. Quantities.

The quantities set out in the bill of quantities are the estimated quantities of the work but they are not to be taken as the actual & correct quantities of the works to be executed by the contractor in fulfillment of his obligations under the contract.

52. Works to be measured.

The Engineer-in-charge shall accept as otherwise stated ascertain and determine by measurement the value in accordance with the contract. He shall, when he requires any part or part of the works to be measured, give notice to the contractor's authorized agent or representative who shall, forthwith attend or send a qualified agent to assist Engineer-In-charge representative in taking such measurements and shall furnish all particulars required by either of them should the contractor not attend or neglect or omit to send such agent then measurement made by the Engineer-in-charge or approved by him shall be taken to be correct measurement of the work. For the purpose of measuring such permanent work as is to be measured by record drawings the Engineer-in-charge shall prepare record drawings, month of such work and the contractor as and when called upon to do so in writing shall within 14 days attend to examine and agree any such record drawings with the Engineer-in-charge shall sign the same when so agreed and if the contractor does not so attend to examine and agree any such record drawing they shall be taken to be correct. if after examination of such record drawings the contractor does not agree the same or does not sign the same as agreed they shall never-the-less be taken to be correct unless the contractor within 14 days of such examination lodge with the Engineer-in-charge, notice in writing in this respect in which such record drawings are claimed by him to be incorrect.

All measurement shall be from drawings executed at site and shall be checked in compliance (as per drawings), before measurement are done, all to the requirement of the Engineer-in-charge.

53. Method of measurements.

Where works have to be measured for any purpose whatsoever it shall be in accordance with IS 1200 unless otherwise specifically indicated in the contract and under the specific chapters.

54. Payment on account and Retention.

The contractor may at intervals specified in the Tender document claims for payments of advances on account of work done and materials delivered at the site in accordance with the contract. Such claims which shall be computed as under:-

55. Works:

Full value of the work executed on site to the satisfaction of the Engineer-in-charge less the deduction indicated in the tender which shall constitute the security deposit such deductions shall constitute to be effected from every interim valuation, unless otherwise stipulated.

56. Materials:

The percentage (%) indicated in the tender of the value of any non perishable materials which in the opinion of the Engineer-in-charge are in accordance with the contract and have been brought on site in connection herewith & adequately stored and protected against damage by any cause whatsoever, but which have not at the time of the advance being claimed been incorporated in the works scaffolding, props, formwork, sand, metal & constructional plant or machinery shall not qualify for such advances.

For the purpose of evaluating the works and materials as above the Engineer-in-charge shall prescribe & the contractor shall furnish such returns & documents as may be called for.

i) Any sums due from the contractor on account of stores or any such other things provided by the Employer shall be deducted from the first or subsequent advance.

The Engineer-in-charge shall from time to time recommend the amount which the contractor is entitled; payment "on account" shall be made there after on the recommendation of the Engineer-in-charge with in the period indicated in the tender.

ii) Any certificate for interim payment may be modified or corrected by subsequent interim certificate or by final certificate and no certificate of the Engineer-in-charge in respect of an advance payment shall of itself be conclusive evidence that the work which relates are in accordance with the contract

Contractor shall submit only commutative bills every time. Rates claimed shall be on the basis of work done at site and as approved by the Engineer-in-charge.

iii). Relevant updated measurements with the bill only shall be considered.

57. Final Bill.

As soon as possible after the works/plant/equipment have been completed and successfully commissioned, but not later than 2 months from certified completion date, the contractor shall forward certified final account to the Engineer-in-charge. This shall include reconciliation of all materials or things issued by the Employer. No claims will be entertained after receipts of the final bill.

The Engineer-in-charge shall check & certify the final quantities admissible on the final bill. The contractor shall be entitled to be paid this amount on the recommendation of the Engineer-in-charge, less the percentage indicated in the tender as security for performance during the defect liability period, and the value of all payments made on account against interim certificates, and any other amounts payable to the Employer & any other deductions required by law.

The amount retained from the final bill towards security for the performance during the maintenance period shall be released by the Employer on the issue of the maintenance certificate by the Engineer-in-charge. The security deposit shall be released along with the payment of the final bill.

The final bill shall be submitted by the contractor in a form approved & in the manner prescribed by the Engineer-in-charge.

58. Recovery of sums.

Whenever under the contract any sum of money shall be recoverable from or payable due by the contractor, the same may be deducted from any sum then due or may become due to the contractor, under the contract with the Employer.

59. Forfeiture.

If the contractor shall become bankrupt or have a receiving order made against him or shall present his petition in bankruptcy or shall make an arrangement with or assignment in favors of his creditors or shall agree to carry out the contract under a committee of inspection of his creditors or (being a corporation) shall go into liquidation (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) or if the contractor shall assign the contract without the consent in writing of the Engineer-in-charge, shall have an execution levied on his goods or if the Engineer-in-charge shall certify in writing to the Employer that in his opinion the contractor.

a). has abandoned the contract or

b). without reasonable excuse has failed to commence the works or has suspended the progress of the works for 28 days after receiving from the Engineer-in-charge written notice to proceed or

c). has failed to remove materials from the site or to pull down & replace work for 30 days after receiving from the Engineer-in-charge written notice that the said materials or work has been considered & rejected by the Engineer-in-charge under these conditions or

d). is not executing the works in accordance with the contract or is persistently or flagrantly neglecting to carry out his obligations under the contract of

e). has to the detriment of good workmanship or in defiance of the Engineer-in-charge instructions to the contrary sub-let any part of the contract

then the Employer may after giving 14 days notice in writing to the contractor enter upon the site & the work & expel contractor their from without there by avoiding the contract or releasing the contractor from any part of his obligations or liabilities under the contract or affecting the rights & powers conferred by the Employer on the Engineer-in-charge by the contract and may himself complete the works or may Employ any other contractor to complete the works & Employer or such other contractor may use for such completion so

much of the constructional plant temporary works and materials which have been deemed to be reserved exclusively for the execution of the works under the provision of the contract as he or they may think proper & the Employer may at any time sell any of the said constructional plant, temporary works and unused materials and apply the proceeds of sale in or which may become due to him from the contractor under the contract.

60. Payment after forfeiture.

If the Employer shall enter and expel the contractor under this clause he shall not be liable to pay to the contractor any money on account of the period of defective liability & thereafter until the cost of completion & maintenance damages for delay in completion (if any) all other expenses incurred by the employer have been ascertained and the amount thereof certified by the Engineer-in-charge the contractor shall then be entitled to receive only such sum or sums (if any) as the Engineer-in-charge may recommend and would be taken as due to him upon due completion by him after deducting the said amount. But if such amount shall exceed the sum which would have been payable to the contractor on due completion by him then the contractor shall upon demand pay to the employer the amount of such excess and it shall be deemed a debt due by the contractor to the employer and shall be recoverable accordingly.

61. Urgent repairs.

If by reason of any accident of failure or other event occurring to in or in connection with the works or any part thereof either during the execution of the works or during the period of defect liability, any remedial or other work or repair shall in the opinion of the Engineer-in-charge be urgently necessary for security and the contractor is unable or unwilling at once to do such work or repair as the contractor was liable to do at his own expense under the contract, all costs and charges properly incurred by the employer in so doing, on the demand be paid by the contractor to the Employer from any dues or which may become due to the contractor, provided, always that the Engineer-in-charge shall as soon after the occurrence as of any such urgency as may be reasonable practicable notify to the contractor thereof in writing.

62. Arbitration.

Except where otherwise provided in the contract all questions and disputes, relating to the meaning of specifications, designs, drawing and instructions herein before mentioned and as to the quality of workmanship or materials used on the work or as arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, order or those conditions concerning the works, or the execution or failure to execute the same whether arising during the progress of the work or after the completion or abandonment thereof shall be referred to arbitration under the provision of the Arbitration Act, 1940 or any statutory modification or re-enactment thereof and the rules made there under and for the time being in force such arbitration shall be conducted by two arbitrators, who in turn shall nominate an umpire before the arbitration. In case the arbitrators fail to arrive at a decision, the matter shall be referred to the umpire whose ruling shall be final and binding on both the parties to the dispute.

63. EXTRA ITEMS.

Rates of extra items if admissible shall be derived on the following basis

a). From nearest similar item of the tender.

b). Contractor shall submit his item rates (within fifteen days of being asked to execute such an item) along with necessary analysis of men & materials used therein and the proof thereof for the work to be executed at site, 10% over and above these rates shall only be considered towards his overheads and profits as certified by the Engineer-in-charge and the same shall become payable on recommendations of Engineer-in-charge.

64. Issue of Materials Employer.

The Engineer-in-charge may at this option issue such as are listed all other by materials for the work & temporary works shall be provided by the contractor at his own cost. If the Engineer-in-charge issues any of the materials listed above the contract price payable to the contractor shall stand reduced by the values of the materials issued by the Engineer-in-charge such values being calculated at the rates specified against each of the materials listed. The contractor shall not deal with such materials in any matter except for in execution of this contract.

65. Price Escalation:

No price escalation whatsoever shall be allowed in respect of any material or wages used or employed in connection with the execution of the works. All duties, taxes, octroi, turnover tax & service etc. shall be borne by the Contractor.

66. Site order Book.

A site order book shall be maintained by the Engineer Incharge at the site of works in which instructions shall be entered and communicated to the Contractor by the Engineer -In-charge as and when necessary. These orders shall be signed in token of receipt and complied with by the Contractor and nothing shall be written by him in reply. If the Contractor desires to represent any matter entered in the said order book, he may do so by a separate communication.

67. Error.

For any typographical error or omissions in the tender documents the interpretation given by the Executive Engineer Bhaderwah Development Authority, Bhaderwah will be final and binding on the contractor.

68. Other conditions

- Latest relevant BIS specifications shall govern this contract and work shall be carried out strictly in accordance with them.
- Time is the essence of this contract. The contractor is expected to work in more than one shifts and nothing extra shall be paid for the same.
- The employer shall not supply any material, however the contractor shall have to support the quality soundness of material by relevant tests as and when warranted under relevant BIS codes.
- In case of delay a penalty of 1/2% of the contract value per day subject to a maximum of 10% of the contract value shall be imposed on the contractors on liquidated damages. The decision of the Employer in this matter shall be final, conclusive and binding on the contractor.
- The architectural and other drawings shall, all times, be properly correlated for executing any work. Samples shall be prepared for approval before starting any items of work specified by the Engineer-in-charge including verifying and getting the layout approved etc.
- Rates quoted for the items in all individual sections shall be valid for carrying out the item of work at any place, any level and at any height.
- Collection and stacking of materials shall include all leads and lifts. The rates quoted by the Contractor shall hold well irrespective of the source from which the materials are brought so long as they confirm to the specifications, and as approved by the Engineer-in-charge.
- The contractor shall be personally responsible for watch and ward and handling, storing of all materials handed over to him by the Engineer-in-charge or brought by him to the site. Nothing extra shall be paid to him for this.
- When required by the Engineer-in-charge, the contractor shall supply for the purpose of testing, samples of any materials to be used in the works as per specifications. The contractor shall provide all such samples at his own cost including suitable packages to contain them, to the Engineer-in-charge. All the expenditure on account of packing of

samples, conveyance, handling & delivery up to the testing charges and fees to be paid in this respect shall be borne by the contractor including cost of all materials and samples.

- Contractors shall submit once every fortnight, a detailed report of the following;
- Materials procured, consumed & balance at site for previous week as well as expected deliveries during next fortnight.
- List of equipment and machinery at site, stand by as well as those under repair and equipment scheduled to arrive during next fortnight.
- Skilled –unskilled labour and supervisors working at site during past week expected increase in next fortnight.
- Steps proposed for speeding up the progress of work in the next week.
- Five photographs of the sites - four sets.
- Contractor must appoint full time responsible Site Engineer conversant with the nature of works and attend all site meetings etc.
- The contractor shall make his own arrangements for storage of any constructional material.

CHAPTER III
SPECIAL CONDITIONS AND TECHNICAL SPECIFICATIONS

1. The work shall be carried out according to this Specification, whether specifically mentioned or not. No extra in any form will be paid unless it is definitely stated as an item in the Schedule of Quantities. Wherever the specifications are not given or ambiguous, the relevant Indian Standard and further amendments/CPWD specifications will be considered as final and binding.
2. The work shall be carried out simultaneously with the electrical, sanitary and other services and in cooperation with the contractors for the above services. The work shall be carried on till it is completed satisfactorily along with the completion of essential portions of other services. The Building contractor shall keep the other contractors informed well in advance of the proposed programme of the work and shall give adequate notice to enable them to carry out their part of the work so that the building work is not hindered. The contractor shall further cooperate with the other contractors, in respect of any facilities required by them e.g. making holes in shuttering for sanitary pipes, electric conduits, fan hooks etc. However, nothing extra shall be admissible to him for such reasonable assistance and facilities afforded to other contractors, and the Building contractor shall be deemed to have taken those factors into consideration while quoting his rates.
3. The work shall be related to the drawings, which the contractor is presumed to have studied. Nothing extra will be paid for any item on account of its shape, size, location or other difficult circumstances, even if the schedule makes no distinction, as long as the item is shown in the drawings.
4. The sources of materials stated in the specifications are those from which materials are generally available. However, materials not conforming to specifications shall be rejected even if they come from the stated sources. The contractor should satisfy himself that sufficient quantity of material of acceptable specification is available from the stated or other sources and should tender accordingly.
 “Schedule” – shall mean the schedule of quantities.
 “Approved”, “allowed”, “accepted” – shall mean approval of the Engineer in charge in writing.
 “Required” means as instructed by the Engineer in charge.
5. The contractor, without extra charge shall fulfill the requirements of these specifications, i.e. the item rates quoted shall be deemed to have taken these specifications into account.
6. Drawings, Instructions, and Measurements:-
 All work shall be done according to the drawings and instructions of the Engineer in charge and the Contractor shall arrange to test materials and/or portions of the works at his own cost in order to prove their soundness and sufficiency. If after any such test and in the opinion of the Engineer in charge any work or portion of work is found to be defective or unsound, the Contractor shall pull down and re-execute the same at his own cost. Defective materials shall be removed from the site.
7. Clearing the site:-
 The site described and shown on the plans with 6 meters all around the building, shall be cleared of all obstructions, loose stones and materials, rubbish of all kinds as well as brushwood. All holes or hollows, whether originally existing or produced by removal of loose stone or brushwood shall be carefully filled up with earth well rammed and leveled off as directed. Also, the Contractor shall dress the site 6 metres all round the building after completion maximum cutting or filling being 30 cms. No extra shall be paid for this.
8. Trees:-

No trees shall be cut without permission. If any trees have to be cut, this shall form an extra item. For the purpose of the specification, a tree shall be defined as a growth which is more than 3 m high and whose diameter of the trunk at the base is not less than 30 cms.

9. Setting out and making profiles.

Masonry pillars will be erected at suitable points in the area to serve as benchmarks for the execution of the work. These benchmarks shall be connected with permanent benchmark approved by the Engineer-in-charge. Necessary profiles with pegs, bamboos and strings or “Bhurjis” shall be made to show the correct formation level before the work is started. The contractor shall supply labour and material for setting out and making profiles and “Bhurjis” for the work at his own cost. The profiles and “Bhurjis” shall be maintained during the execution of work.

10. . Materials

Water

Water shall be from Municipal main or sweet tank or well. Water storage accommodation for the water shall be of sufficient size and as directed by Engineer-in-charge. The Government does not guarantee the supply of water. The contractor shall make his own arrangements for supply of water. In case the Government agrees to supply, the contractor shall pay the cost of water at the rates fixed by the Government.

Murrum

It shall be got from approved quarries. It shall be granular and gritty. It shall be free from dust, all rubbish, and any organic materials as well as clods of black cotton soils. The materials shall be got approved prior to its use in road construction.

The material shall be stacked on a level ground. If the item is only for supplying of murrum, then it shall be measured in cum. The rate shall include digging the murrum, supplying at site, conveying with all lead and lift and stacking the same at site as directed by the Engineer. The rate shall also include all tolls, duties, fees, royalties etc.

Sand

The sand shall be from a river or nallah or sea. It shall be clear, sound, properly graded, free from organic material; silt, clay etc. and it shall be well graded.

Stone

The stone shall be hard, sound, durable, and free from decay and weathering. No round or oblong pebbles shall be allowed. The stone shall be tested for abrasion value. Before the material is put to use the same shall have to be got approved from the Engineer-in-charge.

Earth

For filling and terracing shall be free from all rubbish organic or vegetable growth including roots, weeds etc. All clods shall be first broken down.

Portland cement

Cement shall comply with the Indian Standard specification and shall be of Indian or other make to be approved by the Engineer-in-charge, when stored in bags these shall be raised 30 cms. Above the ground and stacked in rows of 10 bags high, 0.6m clear from the walls.

11. Items of work

• Plain Cement Concrete

- i) Mixing: - All proportions shall be by volume, except cement, which shall be proportioned by weight unless otherwise specified. Mixing shall be done in a mechanical mixer as required for reinforced concrete work. However, in special case, hand mixing may be allowed by Engineer-in-charge when the following procedure shall be adopted. The several materials shall be accurately gauged in boxes and thoroughly mixed on a water-tight platform of adequate size, by being turned over at least thrice dry till the colour is uniform and then twice wet. Water shall be added gradually and no more than necessary to sufficiently wet the materials, only that much concrete shall be mixed which

can be used within half an hour. Each stack shall however not be larger than consuming one bag of cement. All such stacks shall be placed distinct from each other. In case hand mixing is allowed, the contractor shall put in 10% more cement than specified without extra charges.

ii) Protection: All plain and reinforced cement concrete shall be adequately protected. Newly placed concrete shall be protected by approved means from frost, sun, dust, storms and hot spells. Concrete placed below the ground shall be protected from falling earth during and after placing. Concrete placed in ground having deleterious salts shall be kept free from contact at least for three days, or as otherwise instructed, thereafter. Approved means shall also be taken to protect immature concrete from damage by debris, excessive loading, vibration, abrasion, floatation due to sub soil water and other influences that may impair the strength and durability of the concrete. This shall apply to all items of cement concrete. No extra charge shall be allowed for this.

iii) Laying:- concrete shall be laid in horizontal layers of not more than 150mm thick and gently rammed.

iv) Curing:- After laying, the concrete shall be kept wet for fifteen days. If cast in hot weather, it shall be covered with gunny bags, which shall be kept constantly wet. Other work on concrete shall not start until after three days of laying the concrete.

- Measurement

In cubic meter of exact length, breadth and depth as ordered by the Engineer in charge or as shown on the drawings. This shall be inclusive of any centering or shuttering required to complete the item.

- Joints in Cement Concrete

All longitudinal and transverse joints shall be confirm the details shown in Architectural drawings and/or as directed by Engineer-in-charge.

All joints shall be constructed true to the line with their faces perpendicular to the surface. Joints shall not vary more than 6mm from a true line or from their designated position.

The joints shall be formed by inserting the web of a “T” or any other suitable device with oiled surfaces into the concrete, when the concrete is stiff enough to receive the inserting device.

The “T” iron or any other device adopted shall be taken out carefully in such a way that it will not slump and close the slot.

- Transverse Expansion Joints.

Transverse Expansion Joints shall be of the premoulded type and shall be constructed at right angles to the centerline of the pavement and shall extend to the full width of the pavement. The spacing of the joints shall be 27m for pavement 10cm to 15cm thick and 36m for pavement 20cms thick or more and 10m for pavements below 10 cm thick.

- Transverse Contraction Joints

Transverse Contraction Joints shall be formed by a groove or cleft in the top of the slab. The groove shall be 13mm wide at the surface and 10mm wide at the bottom. It shall extend vertically downwards from the top to a depth equal to $\frac{1}{4}$ (one fourth) the depth of the pavement, track, runway etc. at the thinnest part of its section. The joints shall be located at 6m or 5.4m intervals depending on whether the expansion joint spacing is 36 or 27 m respectively.

- Transverse Construction Joints

Transverse Construction Joints shall be made at the end of each day's run or where unavoidable interruption or more than 30 minutes occur in the concreting operations.

Transverse Construction Joints shall be plain butt joints and formed so as to make a slab at least 3m in length. If this is not possible, the joints shall be formed at the preceding Transverse expansion or construction joint location. The exposed face of the joint shall be

- painted with approved quality bitumen before concreting the adjacent bay. The spacing of subsequent Transverse Contraction Joints shall be measured from the Transverse Contraction Joints last placed.
- Expansion Joints at structures:
Expansion joints shall be formed around all structure and features projecting though, into, or against the pavement. Such joints shall be 13mm wide and shall be of the premoulded type.
 - Arrangement of Transverse Joints:-
The Transverse Joints on each side of a longitudinal joint shall be of the same type and shall be in line with each other and not staggered.
 - Longitudinal Joints.
Longitudinal Joints shall be plain butt joints like Transverse Construction Joints.
 - Installation of Transverse Expansion Joints
The joints shall be set to the required line and grade and shall be held in the required position, during the placing and finishing of the concrete by securing stacks or other suitable device. It shall be ensured that the concrete pressure will not disturb their alignment. The joints shall be vertical and no joint shall deviate more than 6mm in the horizontal alignment either way from a straight line. The installing device shall have a length 6mm less than the required width of the slab and shall be cut to the required depth. The lower and the top edges shall be cut to conform to the prescribed cross section of the base and the crown of the slab respectively. The joint assembly shall be tested to determine whether it is firmly supported. Any assembly not firmly supported shall be reset.
 - Filling of Joints.
 - A. Expansion Joints.
 - (a) Pre-moulded joint filler: It shall conform to I.S.1838-1961, the thickness shall be 20mm or 25mm as specified and shall be maximum available standard length.
During the casting of the slab the pre moulded joint filler shall be placed accurately in position against the finished end of concrete slab. The filler shall remain 20mm below the top surface of the pavement and shall extend upto the sub-grade.
 - (b) Sealing compound: After the curing period is over, the joint portion above filler board shall be cleaned thoroughly as directed by Engineer-in-charge. The joints shall be filled with hot applied scaling compound Grade A (Normal) for concrete construction other than those which are subject to spillage of kerosene or other heavy petroleum oils and grade B (jet fuel resistant) for concrete constructions of runways for jet aircrafts conforming to ISI 834-1961.
 - B. Filling of contraction, construction and dummy joints:
These shall be done as per para A (b) above.
Measurement: Length and Depth of the joint shall be measured correct to a cm and width correct to 3mm.
Rate: The rate shall be taken in per cm depth, per cm width, per meter unit and it shall include the cost of materials and labour involved in all the operations described above.
12. **QUALITY**
All materials for incorporation into the works shall be of the best quality of their respective kinds as specified herein and shall be obtained from sources and suppliers approved by the Engineer-in-charge or their representative and shall comply strictly with the test prescribed herein after or where the tests are not laid down in this specification, with the requirements of the latest issue of the relevant Indian Standard by the Engineer-in-charge.
13. **INSPECTION AND TESTING**

All materials before being incorporated into the works shall be subjected to inspection and testing as provided in the conditions of contract and else where in the specifications. The cost of all samples for all tests required by these specifications of the approved standards shall be deemed to be included in the contract rates.

No materials shall be used in the works unless those have first been approved by the Engineer-in-charge of the owners.

14. **SAMPLES**

Samples of all materials proposed to be used in the works and to be supplied by the contractor, may be called for at any time by the Engineer-in-charge or their Representative.

15. **INDEPENDENT TEST ANALYSIS**

Independent test & analysis of any of the materials may be made from time to time by a testing house or analyst appointed by the Engineer-in-charge or their representative in order to check the supplier's works tests and analysis. The contractor shall be at his own expense supply and deliver to a Testing house or Analyst such materials as may be directed by the Engineer-in-charge or their representatives. The cost of all successful tests on actual basis, and all other costs shall be borne by the contractor. However, the testing of concrete cubes shall be governed by the specific terms set out herein after in these specifications.

16. **BRICK WORK**

The contractor shall furnish all labour, materials, tools & applications with services necessary to complete brick work masonry & floor tiling etc. in accordance with the drawings and as specified herein.

- **Mortar Preparation**

Cement mortar for brick work shall generally be as specified herein, namely in proportion of one of cement with 6 of sand by volume, or as indicated otherwise. Mortar shall be prepared by mixing cement & sand in specified proportion in the site. The mortar shall be used within half an hour of mixing. No hand mixing is permitted.

- **MATERIALS**

Bricks shall be table moulded, of uniform size, shape and colour & must be well burnt so as to give a clear ringing sound when struck. They shall be clean, whole & free from flaws, cracks, stone or lump of any kind, especially lime. They shall have sharp edges and angles and even surfaces and shall be sound and hard to resist compression. They shall be from a source approved by the Engineer-in-charge. No brick after immersion in water for 24 hours shall absorb more than 15% of its weight. Where specifically agreed upon bricks shall be of the best quality locally available.

- **WORKMANSHIP**

All bricks shall to be used to be kept soaked in water for at least 2 hours prior to use. The work shall set out by the contractor. No. brickbats shall be used for the work except where required to complete a standard bond.

All joints in brick work shall be uniformly laid. Each layer of brick work shall be laid plump & level with correct break of joints. No mortar joint shall exceed 15 mm in thickness.

The work shall be kept wet for at least 7 days after laying the last course.

Brick work shall not be raised more than 10 courses a day unless otherwise approved by the Engineer-in-charge.

Brick work shall be uniformly raised panel wise all round & no part shall be raised more than 1 meter above another, at any time. The contractor shall provide all necessary openings for doors, windows or such other services and shall embed all cuttings & fixtures (if separately paid for) at no extra cost 115 mm & 20 mm brick walls shall be

built fair faced on one side only. All other walls of greater thickness shall be built without exception with fair face to both sides.

Where specifically indicated 115 mm or thinner brick work shall be executed in one of the following ways.

With R.C. Stiffeners

Brick work be carried out in panels measuring 1.5 m x 1.5m with R.C.C. (1:2:4) verticals of 12 cm x 12 cm & horizontal stiffeners 12 cm x 8 cm, both reinforced with 4 Nos. 5 mm dia bars laid in 1:2:4 concrete properly filled in and cured. Such R.C.C. work shall not be measured separately but will be included in the rate for brick work.

- Reinforcement brick work

Such brick shall be in cement mortar 1:4. the Joint shall be increased suitable to embed the reinforcement, which shall be laid at every fourth course, consisting of hoop iron 25 mm wide 1.5 m thick with holes punched at every 15 cm the joints shall be well filled in and reinforcement properly surrounded with mortar & cured for not less than ten days. Care shall be taken to see that proper cover is provided to the reinforcement & the work laid continuously to ensure that no portion of the mortar attains initial set before mortar in adjoining portion is laid in position.

- Mode of payment shall be on the basis of codes of practice.

- In lieu of hoop iron, the Engineer may direct the use of mesh or M.S. bars as reinforcement.

17. STONE MASONRY

- Stones shall be set level, plumb with uniform joints set in full set bed of mortar, with joints filled.

- All stone to be well wetted, except in frostily weather, before setting and large stone to be set with a derrick rack out mortar joints when setting.

- Utmost care shall be taken during construction that the surface of the stones is not spoilt by concrete or mortar dropping on the stones and drying. The surface of the stones be immediately cleaned with water if any concrete or mortar does on fall the stone faces.

- Stones for masonry shall be best hard stone locally obtainable from approved quarries. The masonry, whenever required shall be composed generally of large stones clean flat bedded properly selected for their places and carefully laid, with a suitable proportion of smaller stones & chips to fill up interstices. The whole work shall be hand set and solidly bedded in and surrounded with mortar on every side except the face. There shall be no hollows or dry portions in work nor pinning in the face. The face stone shall be flat-bedded, shall tail back and be bound well into the body of the wall and shall not be of a height greater than either the breadth of face or length of the tail through-stones, covering the whole width or thickness of the wall or 60 cm long where the walls are horizontal and vertical. The face of the wall shall be strictly straight. The masonry shall be shaded from the sun & well moistened for at least three days after completion.

- Stone masonry shall be random, polygonal, or squared rubble either un-coursed or brought up to course, all as indicated.

- The rate for stone work shall include the cost of the following:-

- Selecting proper stones, breaking of boulders etc. in case the wall is to be constructed from stones available at site.

- Scaffolding if necessary.

- Raking out joints.

18. RUBBLE/BRICK PACKING

SCOPE OF WORK

The contractor shall furnish all labour materials tools & services necessary to complete all "packing" in the accordance with the drawings and as specified herein.

- **MATERIALS**

The rubble stone shall be sound, hard and durable. They shall have at least one dimension equal to the thickness of rubble packing and shall in any case, not be less than 15 cm in any direction. The stone shall be carefully hand-packed with longer side of each stone (which in no case shall be less than thickness of rubble packing) placed vertically with the smaller face of the two ends at the top. All interstices stone chips & the surface shall be made of uniform with the sand; the surface shall be formed to such stops as directed by the Engineer-in-charge. The rubble packing shall be thoroughly consolidated and sprinkled with water, if required by the Engineer-in-charge. The depth of the rubble packing shall be taken as consolidated depth. The concrete for flooring shall be laid over the rubble packing only after the Engineer-in-charge issue the order to that effect.

- **MEASUREMENT**

It shall be as per IS: 1200

19. **BRICK SOLING**

Where the soling is required to be provided with brick it shall conform to the following specifications.

Brick shall be of the quality indicated and shall be laid flat or on edge as indicated. The brick touching each other. Soling shall be closely packed leaving no interstices or gaps. Appropriate fillet shall be used to make up for dimensions which are part of a whole brick. After the soling is complete whole surface shall be subjected to consolidation by a light roller. Where indicated the joints shall be in cement mortar.

20. **REINFORCED CONCRETE AND ALLIED WORKS**

These specifications cover the general requirements for concrete to be used on jobs using on-site production facilities including requirements in regard to the quality, handling, storage of ingredients, proportioning, batching, mixing and testing of concrete and also requirements in regard to the quality, storage, bending and fixing of reinforcement. This also covers the transportation of concrete from the mixer to the place of final deposit and the placing, curing, protecting, repairing and finishing of concrete.

21. **APPLICABLE CODE AND SPECIFICATIONS**

MATERIALS

01. I.S. 269 - Specification for ordinary, rapid hardening & low heat Portland cement.
02. I.S. 455 - Specification for Portland blast furnace slag cement.
03. I.S. 1489 - Specification for Portland-Pozzolona cement.
04. I.S. 4031 - Method of physical test for hydraulic cement.
05. I.S. 650 - Specification for standard sand for testing of cement
06. I.S. 383 - Specification for coarse and fine aggregate for use in mass concrete.
07. I.S. 515 - Specification for natural & manufactured aggregate for use in mass

CONCRETE

08. I.S. 2386 - Method of test for aggregate for concrete. (part I to VIII)
09. I.S. 516 - Method of test for strength of concrete.
10. I.S. 3025 - Method of sampling and test (physical & chemical) for water used in
11. I.S. 432 - Specifications for mild steel and medium tensile steel bars & drawn (Part I&II) steel wire fabric for concrete reinforcement.
12. I.S. 1139 - Specification for hot rolled mild steel and medium tensile steel deformed bars for concrete reinforcement.
13. I.S. 1566 - Specification for plain hard drawn steel fabric for concrete reinforcement.
14. I.S. 1785 - Specification for cold twisted steel bars for concrete reinforcement.
15. I.S. 1786 - Specification for cold twisted steel bars for concrete reinforcement.
16. I.S. 2090 - Specification for high tensile steel bars used in prestressed concrete.
17. I.S. 303 - Plywood for general purpose.
18. I.S. 4990 - Specification for plywood for concrete shuttering work.
19. I.S. 1629 - Rules for grading of cut size of timber.
20. I.S. 2645 - Specification for integral cement water proofing compounds.

EQUIPMENT

01. I.S. 1791 - Specification for batch type concrete mixers.
02. I.S. 2438 - Specification for roller pan mixer.
03. I.S. 2506 - Specification for concrete vibrators, immersion type.
04. I.S. 2506 - Specification for creed board concrete vibrator.
05. I.S. 2514 - Specification for concrete vibrating table.
06. I.S. 3366 - Specification for pan vibrator.

07. I.S. 4656 - Specification for form vibrator for concrete.
 08. I.S. 2722 - Specification for portable swing weight batchers for concrete (single and double bucket type)
 09. I.S. 2750 - Specification for steel scaffoldings.

CODES OF PRACTICE

01. I.S. 456 - Code of practice for plain and reinforced concrete.
 02. I.S. 1343 - Code of practice for prestressed concrete.
 03. I.S. 457 - Code of practice for general construction of plain and reinforced concrete for dams and other massive structures.
 04. I.S. 3370 - Code of practice for concrete structures for storage of liquids.
 05. I.S. 3935 - Code of practice for composite construction.
 06. I.S. 3201 - Criteria for the design and construction of precast concrete trusses.
 07. I.S. 2204 - Code of practice for construction of reinforced concrete shell roof
 08. I.S. 2210 - Criteria for the design of R.C.C. shell structures and folded plates.
 09. I.S. 2751 - Code of practice for welding of mild steel structure and folded plates
 10. I.S.2502 - Code of practice for bending and fixing of bars for concrete reinforcement.
 11. I.S. 3558 - Code of practice for immersion vibrations for consolidating concrete.
 12. I.S. 3414 - Code of practice for design & installation of joints in buildings.
 13. I.S. 4054 - Code of practice for steel tubular, scaffolding.
 14. I.S. 2571 - Code of practice for laying in-situ cement concrete flooring.

22. SCREENING AND WASHING

a. Crushed rock shall be screened and or washed for the removal of dirt or dust coating, if so demanded by Engineer-in-charge.

b. Grading.

Coarse aggregates shall be either in single size or graded, in both case, the grading shall be within the following limits.

I.S. Sieve percentage passing for single sized designation aggregate of normal size.

	40 mm	20 mm	16 mm	12.5 mm	10 mm
63 mm	100	-	-	-	-
40 mm	85-100	100	-	-	-
20 mm	0-20	85-100	100	-	-
16 mm	-	-	85-100	100	-
12.5 mm	-	-	-	85-100	100
10 mm	0-5	0-20	0-30	0-45	85-100
4.75 mm	-	0-5	0-5	0-10	0-20
2.36 mm	-	-	-	-	0-5

Percentage by weight of aggregates.

S.No.		Uncrushed	Crushed
1.	Materials finer than 75 million I.S. Sieve.	3.00	3.00
2.	Coal and lignite	1.00	1.00
3.	Clay lumps	1.00	1.00
4.	Soft fragments	3.00	-
5.	Total of all the above substance	5.00	5.00

23. WATER

• Water used for both mixing and curing shall be free from injurious amounts of deleterious materials. Potable waters are generally satisfactory for mixing and curing concrete.

• In case of doubt, the suitability of water for making concrete shall be ascertained by the compressive strength and initial setting time test specified in I.S.456. The sample of water taken for testing shall be typical of the water proposed to be used for concreting, due account being paid to seasonal variation. The sample shall not receive any treatment before testing other than that envisaged in the regular supply of water proposed for use in concrete. The sample shall be stored in a clean container previously rinsed out with similar water.

- Average 28 days compressive strength of at least 3 Nos. Cm concrete cubes prepared with water proposed to be used shall not be less than 90% of the average strength of three similar concrete cubes prepared with distilled water.
- The initial setting time of test block made with the appropriate test cement and water proposed to be used shall not be less than 30 minutes and shall not differ more than plus/minus 30 minutes from the initial setting time of control test block, prepared with the appropriate test cement & distilled water. The test blocks shall be prepared and tested in accordance with the requirement of I.S. 4031.
- Where water can be shown to contain an excess of acid alkali, sugar or salt, Engineer-in-charge may refuse to permit its use. As a guide, the following concentration represent the maximum permissible values:-
- To neutralize 200 sample of water, using phenolphthalein as indicator, it should not require more than 2ml of 0.1 normal HCL. The details of test shall be as given in I.S. 3025.
- To neutralized 200 ml sample of water, using methyl orange s indicator, it should not required more than 10 ml of 0.1 normal HCL. The details of test shall be as given in I.S. 3025.
- Percentage of solids, when tested in accordance with the I.S. 025 shall not exceed the following:

I.S. Sieve percentage passing for graded aggregate Designation of normal Size.

	40 mm	20 mm	16 mm	12.5 mm
63 mm	100	-	-	-
40 mm	95-100	100	-	-
20 mm	30-70	95-100	100	-
12.5 mm	-	-	-	-
10 mm	10-35	22-55	30-70	40-85
4.75 mm	0-5	0-10	0-10	0-10
2.36 mm	-	-	-	-

24. CONSTRUCTION SAFETY

I.S. 3696 – Safety code for scaffolds & ladders (Part I & II).

25. MEASUREMENT

I.S.1200 - Methods of measurement of building works.

I.S. 3385 – Code of practice for measurement of civil engineering works.

26. OTHER REQUIREMENTS

In the event that state, city or other Govt. bodies have requirements more stringent than those set forth in this specifications, such requirements shall be considered part of specifications & it shall supersede these specifications where ever applicable.

27. GENERAL

The quality of materials and method and control of manufacture and transportation of all concrete work irrespective of mix. Whether reinforced or otherwise, shall conform to the applicable portions of this specifications.

The Engineer-in-charge shall have the right to inspect the source/s of material/s, the layout & operation of procurement & storage of materials, the concrete batching & mixing equipment, & the quality control system. Such as inspection shall be arranged by the contractor Engineer-in-charge approval shall be obtained, prior to starting of concrete work.

28. MATERIALS FOR STANDARD CONCRETE

The ingredients to be used in the manufacture of standard concrete shall consist solely of a standard type Portland cement, clean sand, natural coarse aggregate, clean water and admixtures, if specifically called for in the drawings or in the specifications.

CEMENT

a) Unless otherwise specified or called for by the Engineer-in-charge/Employer, cement shall be ordinary Portland cement in 50 kg bags. The use of bulk cement will be permitted only with the approval of the Engineer-in-charge, changing of brands or type of cement within the same structure will not be permitted.

b) A certified report attesting to the conformity of the cement to I.S. specifications by the cement manufacture's chemist shall be furnished to the Engineer-in-charge, if demanded.

Contractor will have to make his own arrangements for the storage of adequate quantity of cement. It will be the responsibility of the contractor to ensure adequate and proper storage. Cement in bulk may be stored in bins or silos which will provide complete protection from dampness, contamination & minimize caking and false set (storage under tarpaulins will not be permitted), well away from the outer walls & insulated from the floor to avoid contact with moisture, ground and so arranged to provide ready access damaged or reclaimed or partly set cement will not be permitted to be used and shall be removed from the site. The storage bins & the storage arrangements shall be such that there is no dead storage. No more than 12 bags shall be stacked any tier. The storage arrangements shall be approved by the Engineer-in-charge consignments of cement shall be stored as received & shall be consumed in the order of their delivery.

Cement held in storage for period of 90 days or long shall be tested, should at any time the Engineer-in-charge have reasons to consider that any cement is defective then irrespective of its origin &/or manufacturer's test certificate, such cement shall be tested immediately at a National Test Laboratory/ Approved Laboratory and until the results of such tests are found satisfactory, it shall not be used in any works.

Storage of Aggregates

All coarse and fine aggregates shall be stacked separately in stock piles on the material near the work site in bins properly constructed to avoid inner mixing of different aggregates. Contamination with foreign materials and earth during storage & while heaping the materials shall be avoided. The aggregates must be of specified quality not only at the time of receiving at site but more to at the time of loading into mixer. Rakers shall be used for lifting of the coarse aggregates from bins or stock piles. Coarse aggregates shall be piled in layers not exceeding 1.20 mtrs. In height to prevent coning or segregation. Each layer shall cover the entire area of the stock piles before succeeding layers are started. Aggregates that become segregated shall be rejected. Rejected material after remixing may be accepted, if subsequent tests demonstrate conformity with required gradation.

Specific Gravity

Aggregates having a specific gravity below 2.6 (saturated surface dry basis) shall not be used without special permission of the Engineer-in-charge.

FINE AGREGATE

Fine aggregate except as noted above, and for other than lightweight concrete shall consist of natural or crushed sand to I.S.383 the sand shall be clean, sharp, hard strong, and durable and shall be free from dust, vegetable substance, adherent coating, clay, loan, alkali, organic matter, mica, salt, or other delegations substances, which can be injurious to the setting qualities/strength/durability of concrete.

Machine made sand

Machine made sand will be acceptable, provided the constituent rock/gravel composition shall be sound, hard dense, non-organic, uncoated & durability of concrete.

Screening and Washing.

Sand shall be prepared for use by such screening or through washing, or both, as necessary to remove all objectionable foreign matter while separating the sand grains to the required size fractions. Sand with salt content more than 3 percent will not be permitted to be used unless the same is washed and the slit content is brought within 3% by weight. Fine aggregates conforming to grading zone IV shall not be used unless mix designs &

preliminary tests have shown its suitability for producing concrete of specified strength and workability.

Fineness Modules

The sand shall not have a fineness modules of less than 2.2 or more than 3.2 the fineness modulus is determined by adding the cumulative percentage retained on the following I.S. Sieve sizes (4.75 mm, 2.36 mm, 1.18 mm, 600 micron) and dividing the sum by 100.

COARSE AGGREGATE

Coarse aggregate for concrete except as noted & for other than light weight concrete shall conform to I.S. 383. This shall consist of natural or crushed stone & gravel & shall be clean and free from elongated flaky or laminated pieces adhering coatings, clay lumps, coal residue, clinkers, along, alkali, mica, organic matter or other deleterious matter.

29. PERMISSIBLE LIMIT FOR SOLIDS

Maximum Permissible Limit

- | | |
|---|--|
| a) Organic | 200 mg/1 |
| b) Inorganic | 3000 mg/1 |
| c) Sulphates (as SO ₄) | 500 mg/1 |
| d) Alkali Chloride (as Cl) | 200 mg/1 for plain concrete work & 1000 mg/1 for reinforced concrete work. |
| e) Suspended matter | 2000 mg/1 |
| f) The P.H. value of water shall generally be not less than 6.0 | |

30. REINFORCEMENT BARS

- a. Reinforcement bars shall be arranged by contractor and shall be cold twisted steel bars and high yield strength deformed bars as per as I.S. 1786, as shown and specified on the drawings. Wire mesh or fabric shall be in accordance with I.S. 1560. Substitution of reinforcement will not be permitted except upon written approval from the Engineer-in-charge.
- b. The reinforcement shall not be kept in direct contact with the ground but stacked on top of an arrangement of timber sleepers or the like. Reinforcement shall be coated with cement wash before stacking to prevent scale and rust. Fabricated reinforcement shall be carefully stored to prevent damage, distortion, corrosion and deterioration.
- c. Quality
- d. All steel shall be of Grade 1 quality unless specifically permitted by the Engineer-in-charge. No rerolled material will be accepted. If demanded by the Engineer-in-charge, contractor shall submit the manufacturer's test certificate for steel. Random tests on steel supplied by the contractor may be performed by Employer as per relevant Indian Standards. All costs incidental to such tests shall be at "contractor's expense" steel not conforming to specifications shall be rejected.
- e. All reinforcement shall be clean free from grease, oil, paint, dirt, loose mill scale, loose rust dust, bituminous materials of any other substances that will destroy or reduce the bond. Pitted & defective rods shall not be used. All bars shall be rigidly held in position before concreting. No welding of rods to obtain continuity shall be allowed unless approved by the Engineer-in-charge. If welding is approved the work shall be carried out as per I.S. 2751 according to best modern practices and is directed by the Engineer-in-charge. In all case of important connections, strength of bars welded with special precaution, as specified by the Engineer-in-charge shall be taken in welding of cold worked reinforcing bars & bars other than mild steel.
- f. Laps
- g. Laps & splices for reinforcement shall be as shown on the drawings splices in adjacent bars shall be staggered & the locations of all splices, except those specified on the drawings, shall not be lapped unless the length required exceeds the maximum available lengths of bars at site.
- h. Bending
- i. All bars shall be accurately bend according to the sizes & shapes shown on the detailed working drawings/bar bending schedules. They shall be bent gradually by machine or other approved means reinforcing bars shall not be straightened and bent in manner that will

injure the material bars containing cracks or splits shall be rejected. These shall be bent cold, except bars of over 25 mm in diameter which may be bent hot if specifically approved by the Engineer-in-charge. Bars which depend for their strength on cold working shall not be bent hot. Bars bent hot shall not be heated beyond cherry red colour (not exceeding 654 degree C.) & after bending shall be allowed to cool slowly without quenching. Bars incorrectly bent shall be rejected as such as shall not, in the opinion of the Engineer-in-charge injure the material. No reinforcement shall be bent when in position in the work without approval, whether or not it is partially embedded in hardened concrete. Bars having kinds or bends other than those required by design shall not be used.

j. Fixing

Reinforcement shall be accurately fixed by any approved means and maintained in the correct position shown in the drawings by the use of blocks, spacers, and chairs as per I.S. 2502 to prevent displacement during placing and compaction of concrete. Bars intended to be in contact at crossing point shall be securely bound together at all such point with number 1.6 gauge annealed soft iron wire. The vertical distances between required successive layers of bars in beams or similar members shall be maintained by the provision of mild steel spacer bars at such intervals that the main bars do not perceptibly sag between adjustment spacer bars.

k. Cover to reinforcement

Unless indicated otherwise on the drawings, clear concrete cover for reinforcement (exclusive of plaster or other decorative finish) shall be as follows:-

1. At each end of reinforcement bar not less than 25 mm nor less than twice the diameter of such bar.

2. For a longitudinal reinforcement bars in a column, not less than 40 mm nor less than the diameter of such bar. In the case of columns of minimum dimensions of 200 mm or under, whose reinforcing bars do not exceed 12 mm a cover of 25 mm may be used.

3. For a longitudinal reinforcement bars in a beam, not less than 25 mm nor less than the diameter of such bar.

4. For tensile, compressive, shear or other reinforcement in a slab, not less than 15 mm nor less than the diameter of such bar.

5. For any other reinforcement, not less than diameter of such bar

6. Increased cover thickness may be provided when surfaces of concrete members are exposed to the action of harmful chemicals as the case of concrete in contact with earth faces contaminations with such chemicals, acid, vapor, saline atmosphere, sulphurous smoke (as in the case of steam operated railways), etc. And such increase of cover may be between 15 mm and 50 mm beyond the figure in (1 to 5) above as may be specified by the Engineer-in-charge.

7. For reinforced concrete members totally immersed in sea water, the cover shall be 40 mm more than specified in (1 to 5) above.

8. For reinforced concrete members periodically immersed in sea water, or subject to sea spray, the cover of concrete shall be 50 mm more than that specified in (1 to 5) above.

9. For concrete of grade M-25 and above, the additional thickness of cover specified in (6, 7 & 8) above may be reduced to half. In all such cases the cover should not exceed 75 mm.

10. Projection to reinforcement in case of concrete exposed to harmful surroundings may also be given by providing a dense impermeable concrete with approved protective to the extra cover, mentioned in (6), (7) and (8) above, may be reduced by the Engineer-in-charge to those shown on the drawings.

11. The correct cover shall be maintained by cement mortar briquettes or other approved means reinforcement for footings, grade beams and slabs on sub grade shall be supported on precast concrete blocks as approved by the Engineer-in-charge. The use of pebbles or stones shall not be permitted.

12. The minimum clear distance between reinforcing bars shall be in accordance with I.S. 456 or as shown in drawings.

1. Inspection

- m. Erected & secured reinforcement shall be inspected and approved by Engineer-in-charge prior placement of concrete.
- n. For payment of work done under this item, the actual quantity of steel embedded in concrete as calculated and approved by the Engineer-in-charge, irrespective of the level or the height at which the work is done, shall be taken. The unit rate for reinforcement shall include all wastage, binding wire, etc. for which no separate payment shall be made laps shown in drawings as approved by the Engineer-in-charge and the reinforcement number of chars and space bars to keep the reinforcement in place and approved by the project Engineers shall be measured & paid for.

31. STEEL SHAPES ENCASED IN CONCRETE

Structural steel columns, beams girders and bracings to be encased in concrete shall be unpainted, if so indicated on the drawings. The encasing shall be done in concrete with 10 mm maximum size aggregate & a works cube strength not less than 15 N/sq mm at 28 days unless otherwise specified in drawings. The steel members shall be wrapped with galvanized wire mesh of the size indicated on the drawings. The Galvanized wire mesh shall be kept 20 mm from the edge or surface of the steel member will have a minimum cover of 50 mm unless otherwise indicated on the drawings. When clear cover to steel is more than 75 mm, mild steel bar and concrete with 20 mm coarse aggregate can be used.

32. DESIGN MIX CONCRETE

a) All reinforcement concrete in the works shall be “Design Mix Concrete” as defined in I.S. 456/1978. All “Design Mix Concrete” work to be carried out under these specifications shall be in grades designated as per table shown below:-

33. GRADE OF CONCRETE

Grade Designation	Specified Characteristics Compressive strength at 28 days. N/Sq mm
M 10	10
M 15	15
M 20	20
M 25	25
M 30	30
M 35	35
M 40	40

NOTE NO 1:- The characteristics strength is defined as the strength of materials below which not more than 5% of the test results are expected to fall.

NOTE NO 2:- In the designation of a concrete mix, letter M refers to the mix & the number to the specified characteristics compressive strength of 15 Cm cube at 28 days.

b) This mix shall be designation to produce the grade of concrete having the required workability and characteristics strength not less than appropriate values given in the table above.

34. b) Standard Deviation

Assumed Standard Deviation

Where sufficient test results for a particular grade of concrete are not available, the value of standard deviation given in table below may be assumed:-

35. ASSUMED STANDARD DEVIATION

Grade of concrete	Assumed Standard Deviation N/Sq m
M 10	2.3
M 15	3.5
M 20	4.6
M 25	5.3
M 30	6.0
M 35	6.3
M 40	6.6

36. PROPORTIONING, CONSISTENCY, BATCHING AND MIXING OF CONCRETE.

Proportioning

Aggregate

The proportions which shall be decided by conducting preliminary tests shall be by weight, there proportions of cement, fine and coarse Aggregate means of weight batches conforming to I.S. 2722 capably of controlling the weights within 1% of desired value. Except where it can be shown to the satisfaction of the Engineer-in-charge that supply properly graded aggregate of uniform quality can be maintained over the period of work , the grading of aggregate sizes & blending them in the right proportions. The different sizes shall be stocked in separate stock piles. The grading of coarse and fine aggregate shall be checked as frequently as possible, as determined by the Engineer-in-charge, to ensure maintaining of grading in accordance with the samples used in preliminary mix design. The material shall be stock piled well in advance of use.

Cement

The cement shall be considered by weight, for design mix.

Water

Only such quantity of water shall be added to the cement and aggregates in the concrete mix as to ensure dense concrete specified surface finish, satisfactory workability, consistent with the strength stipulated for each class, be such as not to cause separation of materials of the collection of excessive free water on the surface of the concrete.

Definition of water/Cement Ratio.

The water cement (W/C) ration is defined as the weight in the mix (including the surface moisture of the aggregates) divided by the weight of cement in the mix.

water/Cement Ratio

The actual water cement ration to be adopted shall be determined in each instance by contractor and approved by the Engineer-in-charge.

Proportioning by water/cement ratio

The w/c ratio specified for use by the Engineer-in-charge shall be maintained contractor shall determine the water content of the aggregates as frequently as directed by the Engineer-in-charge as the work progress and as specified in I.S. 2386 (Part III) & the mount of the mixing water added at the mixer shall be adjusted as directed by the Engineer-in-charge so as to maintain the specified w/c ratio. To allow for the variation in their moisture content, suitable adjustments in the weights of aggregates shall also be made.

12 b) Consistency & Slump

Concrete shall be of a consistency & workability suitable for the conditions of the job. After the amount of water required is determined, the consistency of the mix shall be maintained throughout the progress of the corresponding parts of the work and approved tests e.g. slump tests, compacting factory tests in accordance with I.S. 1199 shall be conducted from time to time to ensure the maintenance of such consistency.

The following tabulation gives a range of workability which shall generally be used for various types of construction unless otherwise instructed by Engineer-in-charge.

WORKABILITY OF CONCRETE		
Placing Condition	Degree of workability	Value of workability
Concrete of shallow Sections with vibration	very low	20-10 seconds, vee bee time or 75-80 compacting factor
concrete of lightly reinforced sections with vibration	low	10-5 seconds, vee bee time or 80-85 compacting factor
concrete of lightly reinforced sections with vibration or heavily reinforced with vibrations	Medium	5-2 seconds, vee bee time or 85-95 compacting factor or 25-75 mm slump for 20 mm aggregate.
Concrete of heavy reinforced sections without vibrations	High	above 92, compacting factor or 75-125 mm slump for 20 mm aggregate

b) Batching & mixing of concrete

1. The proportions of the materials for the concrete mix as established by the preliminary test for mix design shall be allowed for all the concrete in the works & shall not be changed except when specifically permitted by the Engineer-in-charge.
2. The concrete may be produced by weight batching the ingredients may be preferred by the contractor. Mixer & the weight batcher shall be maintained in clean & serviceable condition, the accuracy of the weight batcher shall be maintained in clean & serviceable condition, the accuracy of the weight batcher shall be periodically be checked. Both mixer and the weight batcher shall be set up at a level on firm base and the hopper shall be loaded evenly. The needle shall be adjusted to zero when the hopper is empty. Fine & coarse aggregates shall be weighted separately.
3. Each time the work stops the mixer shall be cleaned out and when next commencing the mixing, the first batch shall have 10% additional cement to allow for striking in the drum.

SAMPLING AND TESTING CONCRETE IN THE FIELD

a) Facilities required for sampling materials and concrete in the field, if the Engineer-in-charge so desire shall be provided by the Contractor at no extra cost. The following equipment with operator shall be made available at Engineer-in-charge request (all must be in serviceable condition).

Cast iron cube moulds 15 cm size	- 6 Nos.
Slump cone complete with tamping	- 1 Set
Laboratory balance to weight upto 5 Kgs with Sensitivity of 10 gm	- 1 Set
I.S. Sieve for coarse & fine Aggregates	- 1 Set
A set of measures from 5.1 to 11	- 1 set
Electric oven with thermostat upto 120 Deg .C	- 1 No.
Pycnometer	- 1 No.
Calibrated glass jar 1 litre capacity	- 2 Nos.
Glass flasks & metal containers	- As required
Laboratory balance of 2 Kg capacity and of sensitivity of 1 gm.	- 1 no.

Sampling & strength test of concrete

1. Samples from fresh concrete shall be taken as per I.S. 1199-1959 and cubes shall be made cured and tested at 28 days in accordance with I.S. 516-1959.
2. In order to get a relatively quicker idea of the quality of concrete optional tests on beams for modulus of rapture at 72 plus or minus 2 hours or at 7 days or compressive strength tests at 7 days may be carried out in additional to 28 days compressive strength tests. For this purpose, the value give in table below may be taken for general guidance in the case of concrete made with ordinary Portland cement. In all cases, the 28 days compressive strength specified shall be the criterion for acceptance or rejection of the concrete. If, however, from tests carried out in particular job over a reasonable long period it has been established to the satisfaction of the Engineer-in-charge that a suitable ratio between 28 days compressive strength and the modulus of ruptures at 72 plus or minus 2 hours or 7 days or compressive strength, providing the expected strength values at the specified early age are consistently met.

OPTIONAL: TESTS REQUIRED OF CONCRETE

Grade of concrete	Compressive strength on 15 cm cubes, min. 7 days N/Sq. mm.	modulus of beam test, 72 plus or minus 2 hours N/Sq. mm	Rupture min at 7 days N/Sq. mm
M 10	07.0	1.2	1.7
M 15	10.0	1.5	2.1
M 20	13.5	1.7	2.4
M 25	7.0	1.9	2.7
M 30	20.0	2.1	3.0
M 35	23.5	2.3	3.2
M 40	27.0	2.5	3.4

Frequency of Sampling

A random sampling procedure shall be adopted to ensure that each concrete batch shall have a reasonable chance of being tested; that is, the sampling should be spread over the entire period of concreting and cover all mixing units.

Frequency

The minimum frequency of sampling of concrete of each grade shall be in accordance with the following:-

Quantity of concrete in the work, Cum	Number of samples
01-5	1
06-16	1
37. 16-30	38. 3
39. 31-50	40. 4
41. 51 - and above	42. 4 plus on additional samples for each additional 50 cum or part thereof

At least one sample shall be taken from each shift. However random sampling will also be done to ensure quantity work is being done.

d) Test Specimen

Three test specimens shall be made from each sample for testing at 28 days. Additional cubes may be required for various purposes such as to determine the duration of concrete at 7 days or at the time of striking the frame work or to determine the duration of curing or so check the testing error. Additional cubes may also be required for testing cubes by accelerated methods as described in IS. 9013 -1978. The specimen shall be tested as described in IS.0516 - 1959.

e) Test Strength of Sample

The test strength of the sample shall be the average of the strength of three specimens. The individual variation should not be more than plus or minus 15% of the average.

CONSISTENCY

Slump test shall be carried out as demanded by Engineer-in-charge and invariably from the same batch of concrete from which the test cubes are made slump tests shall be done immediately after sampling.

CHAPTER IV
FORM OF AGREEMENT

This Agreement made the _____ day of 200____ between Messer _____ (herein after called "the Employer") of the one part & Messer _____ of the second part _____ (herein after called "the contractor") of the other part whereas the Employer is desirous that certain works should be _____ constructed , viz _____ and has accepted a Tender Submitted by the contractor for constructions, completion & maintenance of such work.

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:-

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the conditions of contract herein after referred to.
2. The following documents shall be deemed to form, and to be read, and construed as part of the Agreement, Viz:-
 - a). the said Tender Document & Appendix thereto.
 - b). Instructions to Tenderers & Notice Inviting Tender.
 - c). Letter of acceptance dated.
 - d) The conditions of contract (including special conditions).
 - e). The specifications.
 - f). The bill of Quantities.
 - g). the schedules.
3. In consideration of the payment to be made by the Employer to the contractor, the contractor hereby covenants with the Employer to construct, complete and maintain the works in conformity in all respects with the provisions of the contract.
4. The Employer hereby covenants to pay the contractor in consideration of the construction, completion & maintenance of the work, the contract price at the times and in the manner prescribed in the contract.

IN WITNESS whereof the parties hereto have caused their respective common seals to be hereunto affixed (or have hereunto set their respective hands and seals) on the day and year first above written.

Signed by _____
for & on behalf of the contractor in the
presence of

Signature _____

Name _____

Address _____

Occupation

Signed by _____
for & on behalf of the Employer in the
presence of

Signature _____

Signature _____

Address _____

Occupation

BILL OF QUANTITIES

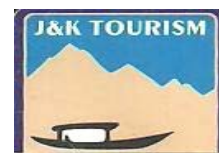
Name of work:- Repairs and Renovation of Tourist Hut-set No-3 at Lake View Resort Gatha.					
Adv. Cost :- 4.50 lacs		Ref. To NIT No. 04 of 09/2016 s. No 3		Item rate to be quoted by the contractor	
S. No	Description	Unit	Qty	Rate in Figure	Rate in words
1	Finishing wall with water proofing cement paint of required shade old work one or more coat applied @ 2.20 kg per 10 sqm	sqm	115.24		
2	Painting with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade one or more coat on old work .	sqm	242.20		
3	Polishing on wood work with French spirit polishing of approved brand and manufacture with one or more coats on old work.	sqm	70.45		
4	Finishing walls with textured exterior paint of required shade old work one or more coats applied @ 1.82 ltr/10 sqm	sqm	26.95		
5	Providing and laying vitrified floor tiles 8 mm thick of size 600 x 600mm with water absorption less than 0.8% and conforming to IS:15622 of approved make in all colour and shade laid on 20 mm thick cement mortar 1:4 mix (1 cement: 4 coarse sand) including grouting the joints with white cement and matching pigments etc complete	sqm	37.15		

6	Providing and fixing prelamated wooden flooring 12 mm thick of cargo/Armstrong make fixed on 3mm thick base of foam sheet with quick set tile adhesive.	sqm	42.40		
7	Providing and fixing PVC wall panelling 3 mm thick of approved colour and make including all fittings	sft	1277.00		
8	Providing and fixing of wash basin with fixing assosaries set of size 460x580x210mm with full pedestal of jaquar make code No. SLS-WHT-6801, 6301	no	2.00		
9	Providing and fixing couple closet bowl-WC with PP seat cover , hinges , assosaries set of size 650x375x800 with flushing sisterns and fittings of Jaquar Make code no . ARS-WHT-39951P-39201	no	2.00		
10	Providing and fixing of C.P brass bib cock long body 15 mm nominal bore of Jaquar make of approved quality Code No CON-107KN	no	4.00		
11	Providing and fixing of C.P brass bib cock straight line model 15 mm nominal bore of Jaquar make with wall flange code No. FLR-5047N	no	2.00		
12	Providing and fixing CP angle valve for wash basin mixer , gyser point of 15 mm dia of Jaquar make	no	6.00		
13	CP Jet of Jacquar make	no	2.00		

Note: Any typographical error in respect of unit, Qty, or nomenclature the same shall be corrected and paid as per estimate.

Signature of the Contractor

**Executive Engineer
Bhadarwah Dev. Authority**



BHADERWAH DEVELOPMENT AUTHORITY

BHADARWAH.

TENDER DOCUMENT FOR

*Repairs and Renovation of
Restaurant Block, Shopping
Kiosks, Booking Counter and
Painting to outer Chain Link
Fencing and railing around Lilly
Pools at Lake View Resort Gatha.*

*Chief Executive Officer
Bhadarwah Dev. Authority*

SALE AND ISSUE OF TENDER DOCUMENT

FOR

Repairs and Renovation of Restaurant Block, Shopping Kiosks, Booking Counter and Painting to outer Chain Link Fencing and railing around Lilly Pools at Lake View Resort Gatha.

*Reference to NIT No: 04of 09/2016
S. No 04*

Issued to	
Registration Card No:	
Cost of Document	
Received Vide Receipt No:	
Dated:	

Signature of the issuing Authority

*Executive Engineer
Bhaderwah Development Authority
Bhaderwah (Doda)*

CONTENTS

1. Chapter I Notice Inviting Tender
2. Chapter II General Conditions of Contract
3. Chapter III Special Conditions & General Specifications of Contract
4. Chapter IV Bill of Quantity and Preamble.

MEMORANDUM

I/We tender for the execution of _____

_____ and the work specified under written memorandum within the time specified in such memorandum at the rates specified in the attached schedule of quantities and in accordance, in all respects, with the specifications, design and instructions in writing, referred in the condition of contract and with such materials as are provided for, and in all other respects in accordance with such conditions so far as possible and applicable.

Name of the Employer	Chief Executive Officer, Bhaderwah Development Authority, Bhaderwah
General Description	
Earnest Money	
Amount	
CDR No:	
Dated:	
Name of Bank:	
Security Deposit	10% of the value of work
Defects Liability period	One year from the date of handing over
Time of Completion	____ Days from the three days after award of allotment or actual date of start which ever is earlier
Refund of security	50% on virtual completion of work & balance on expiry of defects liability period. One year from the date of completion and handing over of the project to the Authority

Should this tender be accepted in whole or in part, I/we hereby agree:-

- i. To abide by all terms and provisions of the said conditions annexed here to and all the terms and provisions contained in the Notice Inviting Tenders, so far as applicable and/r in default thereof to forfeit & pay to the Employer, or their successors the sum of money mentioned in the said conditions.
- ii. To execute all the works referred to in the tender documents upto the terms and conditions contained or referred to therein and to carry out such deviations as may be ordered upto a maximum of 50% (fifty percent) of the tendered value at the rates quoted in the tender documents.

A sum of Rs. _____ lacs (Rupees _____) is hereby forwarded in the shape of C.D.R. pledged to the C.E.O, Bhaderwah Development Authority, Bhaderwah, Doda, as earnest money. If, I/We, fail to commence the work specified in the above memorandum. I/we agree that the said Employer or their successors in office shall without prejudice to be at their right of remedy & at liberty to forfeit the said Earnest money absolutely. Otherwise the said earnest money shall be retained by the Employer.

Date: the _____ day of _____ 2016.

Signature of Contractor,
Before submission of tender

Witness _____

Contractor

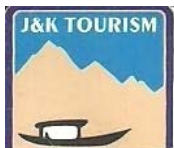
Letter of Acceptance

The above tender for the sum of Rs. _____ (Rupees
_____ only) submitted by
_____ is hereby accepted by me the Chief Executive
Officer, Bhaderwah Development Authority, Bhaderwah, District Doda, J&K State.

The _____ Day of _____ 2016.

Signature of Employer

Contractor



GOVERNMENT OF JAMMU AND KASHMIR
OFFICE OF THE CHIEF EXECUTIVE OFFICER,
BHADERWAH DEVELOPMENT AUTHORITY
BHADERWAH, DISTRICT DODA.



NOTICE INVITING TENDER
NIT No: 04 OF 09/2016

For and on behalf of the Governor of Jammu and Kashmir, Chief Executive Officer Bhadarwah Development Authority invites sealed item rates tender affixed with Rs 6/- revenue stamps from the reputed, approved, and eligible Contractors/Firms registered with State Govt./ CPWD/Irrigation/BRO/MES/NHPC/PSU or any other Govt. agency for the below mentioned works. The work is to be executed in accordance with the terms and conditions, Drawings, specifications, and design prescribed in tender document.

S. No	Name of work	Approx. Cost (Rs. In Lacs.)	Earnest Money (Rs in Lacs)	Time of Completion	Cost of Tender Documents (in Rupees)	Last Date for receipt of application and issue of Tender Documents	Class of Contractor
1	Repairs and Renovation of Tourist Hut-set No-1 at Lake View Resort Gatha.	4.50	0.09	20 days	500.00	15.9.16	A,B,C & D.
2	Repairs and Renovation of Tourist Hut-set No-2 at Lake View Resort Gatha.	4.50	0.09	20 days	500.00	15.9.16	A,B,C & D.
3	Repairs and Renovation of Tourist Hut-set No-3 at Lake View Resort Gatha.	4.50	0.09	20 days	500.00	15.9.16	A,B,C & D.
4	Repairs and Renovation of Restaurant Block, Shoping Kiosks, Booking Counter and Painting to outer Chain Link Fencing and railing around Lilly Pools at Lake View Resort Gatha.	4.55	0.091	20 days	500.00	15.9.16	A,B,C & D.

Other relevant information: - Position of AAA : Accorded
Position of funds : demanded
Position of TS : Under process

Terms & Conditions:

1. The tender Documents can be had from the office of the Chief Executive Officer, Bhadarwah Development Authority, Bhadarwah, District Doda, J&K, against payment of specified cost (non refundable) in cash or by bank draft or the same can be downloaded from our official website www.bhadarwahheavens.com from 09-09-2016 to 15-09-2016 and the cost of tender document of specified amount (non refundable) shall be accompanied with the tender of dated up 15-09-2016.

2. **The technical qualification of the bidder should contain the following documents:-**
 - (i) *Attested copy of registration card duly renewed for the current financial year.*
 - (ii) *Sales tax clearance certificate issued by the Sales Tax Department ending last year with PAN and TIN No.*

3. The tender should be addressed to the Chief Executive Officer, Bhadarwah Development Authority, and sent under Registered post which should reach in the office of the Chief Executive Officer Bhadarwah Development Authority on or before **19.9.2016 up to 2 pm.**

4. The tender will be opened by the authority level tender opening committee headed by Chief Executive Officer , Bhadarwah Dev Authority, at Bhadarwah in his office chamber **on 20/9/2016 at 11.00 am** in presence of the contractors or their authorized representatives who may like to be present.

5. The tender must be accompanied by earnest money in the form of Call Deposit Receipt for amount shown against the each work of any scheduled bank pledged to the Chief Executive Officer Bhadarwah Development Authority without which no tender shall be entertained.

6. The earnest money will be released to the unsuccessful tenderers after 28 days from the date of acceptance of tender and in the case of successful tenderer it will be accounted towards security deposit. The earnest Money may be forfeited if the tenderer withdraws the tender after tender opening during the period of validity. No duplicate document shall be issued in lieu of reportedly issued and lost document.

7. As soon as acceptance of the tender is communicated to the successful tenderer, the contract shall be complete and binding on him. The successful tenderer shall execute an agreement with the Bhadarwah Development Authority within 7 Days after the issuance of the letter of intent to him. The expenses on that account and incidental charges shall be borne by the tenderer. Failure to execute such an agreement shall not, however, prevent the contract from being enforced against him. The date of start of work shall be reckoned after seven days from the date of issue of allotment letter or actual start of work whichever is earlier.

8. In case of failure of the contractor to execute the work in part or in full the act shall amount to breach of contract. A registered notice or notice sent through a special messenger to the contractor for breach of contract shall be sufficient for authority to wind up or cancel his contract. In case contractor avoids receiving the notice or deliberately gives wrong address for communication where it becomes practically difficult to deliver the notice, the same shall be pasted on the entry gate of his known address in presence of a witness and the notice shall be treated as service notice to the contractor. His earnest money will be forfeited and he will be blacklisted for future. The BDA will be at liberty to get the left over work executed at his risk and cost. Any additional amount involved for such execution may be recovered from other claims/ resources of the contractor.
9. Misconduct or Misbehavior if any observed during the tender opening process with any officer/ official shall be dealt in terms of the enlistment & registration of contractors rules in the PWD and may result in recommendation for cancellation of registration card issued by any department.
10. The tenders shall be valid for at least 120 days from the date of opening. In the event of successful tenderers failing, declining or delaying the execution of the agreement, the Authority shall, without prejudice to any other remedy available to it under any law, for the time being in force in the state, be entitled to forfeit the earnest money in full or in part and impose such penalty as may be determined by the Authority.
11. The tenders on plain paper/ telegraphic tenders/ conditional tenders shall be rejected. Tenderers are advised to quote complete item rates (including material carriages & incidentals) against the advertised Bill of quantities. Tenders written in pencil shall be rejected. Tenders should be clearly written and writing sealed with transparent tape.
12. The tenders accepted will be checked by the Authority for any arithmetical errors. Errors will be corrected by the Authority as follows:
 - where there is a discrepancy between the rates in figures and in words, the rates in words will govern; and
 - Where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern.
 - The amount stated in the tender will be adjusted by the Authority in accordance.
13. The Authority reserves the right to itself to accept or reject any tender or part thereof or allot the contract to any contractor in full or in part without assigning any reason thereof.
14. In case of any dispute arising at any time between the tenderer and the Authority regarding interpretation of any of the terms and conditions of this notice, the same shall be referred to an officer of the Government as the concerned Minister In-charge may nominate for arbitration under the law for arbitration for the time being in force in the state. The decision thereon of the Arbitrator shall be final, conclusive and binding on the parties. During

arbitration case the Authority will not withhold the payment of undisputed items nor will the contractor stop the work till decision of the Arbitration.

15. Any clarification required by the tenderer in regard to the technical points etc. mentioned in the tender or the annexure hereto or otherwise pertaining to the works may be sought from the consultant or Executive Engineer, Bhaderwah Development Authority, Bhaderwah on any working day.
16. The tenderer may in his own interest inspect and examine the site and its surroundings, as also means or access to site and satisfy him-self before tendering as to the nature of ground, climatic conditions, the form and nature of site, by making prior appointment with the Executive Engineer, BDA, Bhadarwah well in time.
17. The following requirements should be adhered to:
 - The tender document should be signed and dated on each page by the tenderer or his duly authorized agent.
 - The tender document should be accompanied by a certified true copy of Power of Attorney of the signatory to the document. The Power of Attorney should include the power to agree to refer disputes to arbitration.
18. Tenderer shall not be entitled to any cost, charges or expenses incurred by them, or incidental to, or in connection with the preliminary investigations, surveys and preparation of design or submission of tender etc. In case the tender submitted by the tenderer is not accepted, tender document will not be returned to him.
19. The tender submitted by an individual shall be signed with his full name and his complete address shall be recorded thereon. If it is submitted by a firm, it shall be signed by a member of the firm who is duly authorized to enter into the contract. He shall sign his own name and give the name and address of each member of the firm and shall furnish power of Attorney along with the tender.
20. No foreign exchange shall be made available to the tenderer in connection with the execution of the work.
21. The work shall be carried out strictly according to the terms and conditions, specifications, design, drawing and plans described in Annexures. Where specifications do not cover any item, the specifications, terms and conditions of State PWD in force shall be made applicable.
22. Immediately after the communication of the acceptance of the tender, the contractor shall submit for approval the proposed methodology and program of construction backed with equipment and material planning and deployment duly supported with broad calculations and quality management plan proposed to be adopted justifying their capability of execution and completion of the work as per technical specifications and within stipulated period of

completion. No payment shall be made to the contractor on any account until such a programme has been submitted and approved.

23. No extra shall be paid for such arrangement; if the Executive Engineer, at any time during execution of the work is of the opinion that the contractor will or may fall behind the schedule of programme, a revised programme will be required to be submitted with added men, machines and working shifts.
24. All other terms and conditions if not covered but in vogue in State PWD shall hold good and form part of this NIT.
25. After opening the tenders, if the tendered amount works out 10% below the advertised cost extra security deposit 10% of the Adv. Cost shall have to be deposited by the lowest tenderer before allotting the work..
26. The contractor/firm shall be paid for the actual quantity of work executed and as measured at the site at the rate accepted by the deptt. The Deptt; reserves the right to increase or decrease any item or items of work. Any claim by the firm/Agency on this account shall not be entertained. The rates quoted shall hold good for any increase/decrease in quantity.

Executive Engineer
Bhadarwah Dev. Authority

No: BDA/2016-17/_____

Dated: _____

Copy to the:-

1. Secretary to Government, Tourism Department, J&K Govt. Civil Secretariat, Srinagar for information.
2. The District Development Commissioner, Doda for information.
3. Director Tourism Jammu for favour of information.
4. Additional District Development Commissioner Doda for information.
5. Sub Divisional Magistrate Bhadarwah for information.
- 6-7 Chief Executive Officer Bhadarwah Development Authority Bhadarwah/Kishtwar Dev. Authority for information.
8. Executive Engineer R&B Div. Bhadarwah.
- 9-10 President Contractor Association Bhadarwah/Doda for information.
11. Publicity Manager BDA for uploading of NIT 04 of 09/2016 on our official website. The process of downloading should be stopped on 15-09-2016
12. Notice Board
13. Office file

CHAPTER II **GENERAL CONDITION OF CONTRACT**

1. DEFINITION:

- The ‘Contract’ means the documents forming the tender and acceptance thereof, the formal agreement executed between Employer, and the contractor; and instructions & drawings issued from time to time. These above mentioned documents shall be treated as complementary to one another.
- In the contract the following expression shall, unless the context otherwise requires, have the meanings hereby respectively assigned to them:
 - “Authority” shall mean Bhaderwah Development Authority (BDA).
 - “Chief Executive Officer” shall mean Chief Executive officer, Bhaderwah Development Authority, Bhaderwah.
 - “Executive Engineer” shall mean Executive Engineer, BDA.
 - “PWD” shall mean Public Works Department of Govt. of J&K.
 - The expression ‘Works’ or ‘Work’ shall mean all works to be executed by the contractor in accordance with designs, drawings, plans & specifications described in this contract document.
 - The ‘Site’ shall mean the land and or other places on into or through which work is to be executed under the contract & shall also mean any adjacent land, path or street which may be allotted or used for the purpose of carrying out the contract.
 - The ‘Contractor(s)’ shall mean the individual or the firm or the company whether incorporated or not, undertaking the works & shall include the legal representative of such individual or the person composing such firm or company, or the successors of such firm or company and the permitted assigns of such individuals or firm or of company.
 - The ‘Employer’ means Chief Executive Officer, Bhaderwah Development. Authority, Bhaderwah, District Doda, Jammu.
 - ‘Engineer-in-Charge’ means Executive Engineer, BDA or any other person who may be deputed to the site of work from time to time by the Authority and authorized in writing for any purpose in relation to, or in connection with this contract.
 - ‘Plant’ and ‘equipment’ shall mean plant, machinery equipment, pipe work services & all other things to be provided, erected, installed, commissioned and maintained in accordance with the Contract.
 - ‘Temporary Works’ means all temporary works of every kind required in or about the execution completion and maintenance of the works and Plant.
 - ‘Approved’ means approved in writing including subsequent written confirmation of verbal approval and ‘approval’ means approval in writing including as aforesaid.
 - “Drawing” shall mean the drawings referred to in the specifications and any modification of such drawings approved in writing by the consultant/Executive Engineer with consent of the CEO and such other drawings as may from time to time be furnished in writing by the consultant/Executive Engineer with the approval of the Chief Executive officer.
- “Notice in writing or Written Notice” shall mean a notice or a communication in writing, typed or printed sent either under registered post or ordinary post to the last known private or business address or delivered personally by hand to the contractor.
- “Virtual Completion” Shall mean when the Work under this contract is in the opinion of the Executive Engineer fit for use and taken over by the Authority, after removal of scaffolding, plants, surplus materials and rubbish and cleaning of dirt from works and site including testing etc, complete in accordance with regulations in force.

- The terms “Bill of Quantities” and “Schedule of Prices” wherever they occur in this Contract shall be treated as synonymous & interchangeable

Singular & Plural	Words importing the singular only also include the plural and vice versa where the context requires.
Reading or Notes	The marginal headings of notes shall not be deemed to be part thereof or be taken into consideration in the interpretation or construction of various clauses or of the Contract.
Works include plant	The term “Works” shall be deemed to include “Plant” and “Equipment” as here in Equipment above defined wherever the context so requires but NOT vice versa.

2. Duties & Power of Engineer-in- Charge

The duties of the Engineer-in-Charge is to watch and supervise the works and to examine any materials to be used or workmanship employed connected with the project.

3. Assignment:

The Contractor shall not assign the contract or any part thereof or any benefit or interest therein or there under (other than a charge in favour of the contractor’s Bankers) of any amount due or to become due under this contract without the prior written consent of the Employer.

4. Sub-Let:

The Contractor shall not sub-let the whole or part of the Works, except where otherwise provided in the contract, the contractor shall not sub-let any part of the works without the prior written consent of the Employer (which shall not be unreasonably withheld) but such consent if given shall not relieve the contractor and he shall be responsible for the acts, defaults and negligence of any sub-contractor, his agents, servants or workmen as fully as if they were acts, defaults or neglects of the contractor his agents, servants and workmen. Provided always that, the provision of labour on a piece work basis, raw materials for the construction of works and items of plant/Equipment shall not be deemed to be sub-letting under this clause.

5. Documents, Mutually or Explanatory

The several documents forming the part of contract are to be taken as mutually explanatory of one and other and in case of ambiguities or discrepancies, the same shall be brought to the notice of the Engineer-in-Charge the order of procedure shall be

- Drawings & instruction issued to the Contractor.
- Schedule of Quantity Specifications.
- Special conditions on Contract and Notice Inviting Tender.
- General conditions of Contract.
- The Engineer-in-Charge who shall there upon issue to the Contractor instructions directing in what manner the work is to be carried out.

6. Drawings:

The drawings are detailed to contain the specification as also the procedure for instructions. The Contractor shall give adequate notice to the Engineer-in-charge of any further drawings or specification that he may require for the execution of the works, under the Contract, well in advance for execution. This shall not however be an excuse for delay in completion of any work.

7. One copy of the Drawings to be Kept at site:

One copy of the Drawings shall be kept by the Contractor at site and the same shall be available for inspection & use by the Engineer-in-charge, or by any other persons authorized by the Engineer-in-charge in writing. One copy shall be signed & kept on records so as to confirm contractor’s acceptance of having quoted for the works under reference.

8. Drawings Instructions.

The Engineer-in-Charge shall have full power and authority to supply to the contractor, from time to time during the progress of the works such further drawings and instructions as shall be, necessary for purpose of the proper and adequate execution and maintenance of the works and the Contractor shall carry out and be bound by the same.

9. Contract Agreement:

The Contractor shall when called upon so to enter into & execute a contract agreement in the form annexed with such modifications as may be necessary.

10. Inspection :

The Contractor shall inspect and examine the site and its surroundings & of site. shall satisfy himself before submitting his tender as to the nature of the ground and sub-soil the form and nature of the site and quantities and nature of the work and materials necessary for the completion of the works and the means of access to the site, the accommodation he may require & in general shall himself obtain all necessary information as to risk contingencies & other circumstances which may influence or affect his tender.

11. Sufficiency of Tender

The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the work and of the rates & prices stated in the priced schedule of the prices if (any), which rates and prices shall except in so far as it is obstruction, otherwise provided in contract cover all his obligations under the contract and all his matters and things necessary for the proper completion and maintenance of the works.

a). of complying with any instructions, which the Engineer-in-charge may issue to the Contractor in connection therewith and

b). of any proper reasonable measures approved by the Engineer-in-charge which the Contractor may take in the absence of specific instructions from the Engineer-in-Charge.

12. Works to Satisfaction of the Engineer- in-Charge:

Save in so far as it is legally or physically impossible, the contractor shall execute, complete and maintain the works in strict accordance with the contract to the satisfaction of the Engineer-in-charge and shall adhere strictly to the instructions and directions issued by Engineer-in-Charge on matters as refer to above.

13. Completion Schedule:

Immediately after the communication of the acceptance of his tender the Contractor shall, submit to the Engineer-in-Charge, for approval a Programme of execution outlining the proposed operations and order of completion of various activities in multiple working shifts giving sufficient details to demonstrate to the Authority the adequacy of the programme to complete the work within the time prescribed under this contract. No payment shall be made to the contractor/firm on any account until such a programme is submitted and approved. The submission to an approval by the furnishings of such particulars shall not relieve the contractor of any of his duties or responsibilities under the contract.

If the Engineer-in-Charge at any point of time during execution is of the opinion that the work under this contract will or may fall behind the schedule of programme, he may direct for added operations, method, equipment, the number of labours and working shifts so that the time lost is made up.

14. Contractor's Superintendence:

The Contractor shall give or provide all necessary Superintendence During the execution of the works and as long there after as the Engineer-in-charge may consider necessary for the proper fulfilling of the Contractor's obligations under the contract. The contractor or a competent and authorized agent or representative approved in writing by the Engineer-in-charge (such approval may at any time be withdrawn) is to be constantly on the works & shall give his whole time to the superintendence of the same. If such approval

shall be withdrawn by the Engineer-in-charge the Contractor shall as soon as is practicable (having regards to the requirement of replacing him as here in after mentioned) after receiving written notice of such withdrawal remove the agent from the site and shall not thereafter employ him again on the site in any capacity and shall replace him by another agent approved by the Engineer-in-Charge. Such authorized agents or representative shall receive on behalf of the Contractor instructions from the Engineer-in-Charge. Contractor shall provide at his own expense cost of hutments/dwelling units for his workers etc. and all such expenses shall deemed to have been taken care of in there quoted rates for the above works.

15. Contractor's Employees

The Contractor shall provide and Employ on the site in connection with the execution & maintenance of the works, only such technical assistants as are skilled & experienced in their respective callings and such sub-agents, foremen and dealing hands as competent to give proper supervision to the work they are required to supervise, and such technical assistant will be in sufficient numbers for each areas of works to be handled either in one area or field or both, contractor shall before start of work give a list of their technical staff and their nature of duties to the Engineer-in- Charge. Such skilled, semi-skilled and unskilled labour as is necessary for the proper and timely execution & maintenance of the works. Where required by the law or regulation of local or other authority, such personnel shall be duly licensee from the competent authority to practice their trades, professions and callings.

16. The Engineer-in-Charge shall be at liberty to object to and require the contractor to remove forthwith from the works any person employed by the contractor in or about the execution or maintenance of their works who in the opinion of the Engineer-in-Charge misconducts himself or is incompetent or negligent in the proper performance of his duties or whose employment is otherwise considered by the Engineer-in-Charge to be undesirable and such person shall not be again employed upon the works without the written permission of the Engineer-in-Charge. Any person so removed from the works shall be replaced without delay by the competent substitute approved by the Engineer-in-Charge.

17. The Contractor shall if required by the Engineer-in-Charge deliver returns in such form and at such intervals as the Engineer-in-Charge may prescribe showing the details of supervisory staff and the numbers of he several classes of labour, from time to time, employed by the contractor on the site.

18. Setting out of the works:

The Contractor shall be responsible for the true and proper setting out of the works and for the correctness of the position, levels, dimensions and alignment of all necessary parts of the works and for the provision of all necessary instruments appliances and labour in connection herewith. If at any time during the progress of the works an error shall appear or arise on the position, levels, dimensions or alignment of any part of the works, the contractor on being required to do so by the Engineer-in-Charge shall at his own expenses rectify such error to the satisfaction of the Engineer-in-Charge or his representative unless such error is based on incorrect data supplied in writing by the Engineer-in-Charge in which case the expense of rectifying the same shall be borne by the employer. The checking of any line or level by the Engineer-in-charge shall not in any way relieve the Contractor of his responsibilities for the correctness thereof and the Contractor shall carefully protect and preserve all bench marks sight rails, pegs and other things used in setting out the works.

19. Lighting, Watch and Ward.

The Contractor shall in connection with the works provide & maintain at his own cost all lights, guards, fencing, watch and ward, when and where necessary or required by the Engineer/in-Charge or by the authority for the protection of the works or for the safety and convenience of the public and others.

20. Care of Works/Plant Equipment.

From the commencement to the completion of the work, the contractor shall, take full responsibility for the care thereof, of Temporary works and Constructional plant and in case any damage loss or injury shall happen to the works/plants/Equipment or to any part thereof or to any Temporary work or constructional plant from any cause what-so-ever shall, at his own cost repair and make good orders and conditions, and in connection in every respect with the requirements of the Engineer-in-Charge/instructions.

21. Damage to persons and property:

If the contractor or his workers or servants break, deface, injure or destroy any part of the structure or other property in the vicinity of the works, belonging to any person in or on which they may be working, such structures, road, road kerbs, embankments, fence enclosure, water pipes, cables, drains, electrical or telephone posts or wires, trees, grass or grasslands, or cultivated ground contiguous to the premises on which the work or any part of it is being executed, shall make the same good at his own cost and in default, the Engineer-in-Charge shall cause the same to be made good and deduct the cost thereof from any sums that may be due to the contractor under this contract or from his security deposit.

22. Overtime/ Multiple Shifts

Contractors shall also not charge for any overtime/ Multiple Shift working incurred wholly or partly for uncompleted works etc. or for works which may have to be got done urgently as per the requirements of the Engineer-in-Charge or also as per the drawings supplied from time to time.

23. Third party Insurance

Before commencing the execution of the works, the contractor (but without limiting his obligations & responsibilities under relevant clause hereof) shall insure against any damage, loss or injury which may occur to any person (including any employee of the Employer) by or arising out of the execution of the works or temporary work or in the carrying out of the contract.

24. Accident or injury to workmen.

The Employer shall not be liable for in respect of any damages or compensation to workmen/labors in respect to or in consequence of any accident or injury to any workman or other person in the employment of the contractor save and except an accident or injury resulting from any act or default of the employer his agents or servants & the contractor shall indemnify & keep indemnified the Employer against all such damages and compensation (save & except as aforesaid) and against all claims demands, proceedings, costs charges & expenses what-so-ever in respect thereof or in relation thereto.

25. Insurance against Accident etc. workmen.

The contractor shall insure against such liability against an insures approved by the employer (such approval shall not be unreasonably withheld and to workmen shall contain such insurance during the whole of the time that person are employed by him on the work and shall when required to the employer such policy of insurance and the receipt for payment of the current premium provided always that in respect of any persons employed any sub-contractor the contractor & obligation to insure as aforesaid under this sub-clause shall be satisfied if the sub-contractor shall have insured in such manner that the Employer is indemnified under the policy but the contractor is to produce to the Employer when required such policy of insurance and the receipt for payment of the current premium.

26. Giving of Notice and payment of fees.

The Contractor shall give all notices and pay all fees required to be given or paid by National or State Statute Ordinance or other Law or any Regulation or Bye-Law of any local or other duly constituted authority in relation to the execution of the works and by the rules and Regulations of all public bodies and companies whose property and rights are affected or may be affected any way by the works or any temporary works.

27. Compliance with statues any Regulations etc.

The Contractor shall confirm in all respects with the provisions of any such statutes ordinance or law as aforesaid and the Regulations or Bye-Laws of local or other duly constituted authority which may be applicable to the works or to any temporary works and with such rules and regulations of public bodies and companies as aforesaid and shall keep the employer indemnified against all penalties and liabilities of every kind for breach of any such statute ordinance or law Regulation or Bye-Law.

28. Supply of plant material and labour.

Except where otherwise specified, the Contractor shall at his own expense supply and provide all the Constructional plant, Temporary and for Permanent works/plant/equipment labour (including the supervision of thereof) transport to or from the site and about the works and other things or every completion and maintenance of works/plant/equipment.

29. Clearance of site on completion.

On the completion of the Works the Contractor shall clear away and remove from the site all constructional plant, surplus materials, rubbish and Temporary works of every kind and leave the whole of the site and works clean and in a workman like condition to the satisfaction of the Engineer-in-charge.

30. Labour.

The Contractor shall make his own arrangement for engagement of all labour, local or otherwise and also provide for the transport, housing, feeding and payment thereof.

- The Contractor shall provide on the site to the satisfaction of the Engineer-in-charge water for the use of the Contractor's staff and work people.
- The Contractor shall in all dealings with labour in his employment have due regards to all recognized days of rest, religious festivals, & other customs.
- In the event of any outbreak of illness of an epidemic nature, the contractor shall comply with and carry out such regulations orders and requirements as may be made by the Government or the local medical or sanitary authorities for the purpose of dealing with and overcoming the same.
- The Contractor shall at all times take all reasonable precautions to prevent any unlawful riotous or disorderly conduct by or amongst his employees and for the preservation of peace and protection of persons and property in the neighborhood of the works against the same.
- The Contractor shall be also responsible for observance by his sub-contractors of the foregoing provisions.
- The Contractor shall employ labour in sufficient number to maintain the required rate of progress & of quality to ensure a workmanship of a degree required by the specification and to the satisfaction of the Engineer-in-charge. He shall be responsible at his own cost, for all recruiting, transport, welfare, sanitary and other accommodation, provision of necessary passports or permits for all personnel and employee required for this contract.
- The Contractor shall remain liable for the payment of all wages under Wages Act 1936, Minimum Wages Act, 1948, Employee's liability Act, 1936, Workmen's Compensation Act, 1923, Insurance, Provident Fund, Family Pension etc. or any other Act or enactments relating thereto and rules framed there under from time to time. In the interest of the work and its completion target, the contractor shall have to work in more than one shift & no liability in respect of any excess cost arising there from shall be borne by the Employer. The contractor may employ female labours if he chooses but he shall not employ in connection with the works any person who has not completed the minimum age as per law locally applicable.
- The Contractor shall comply fully with local laws dealing with the employment of person including where applicable the Indian Employment of children Act, 1938. The Indian Workmen's Compensation Act, 1923, the Factories Act, 1948, the minimum Wages Act,

1948, Contract Labour (Regulations & Abolition) Act, 1970, and any statutory amendment or re-enactment thereof for the time being in force.

- The Contractor during the progress of the works shall provide, erect and maintain at his own expense and to approved standards and scales all necessary temporary sanitary accommodation required for his workmen on the site in connection with the execution of works. The planning, sitting and erection of these buildings shall be approved by the Engineer-in-Charges & such temporary accommodation shall at all times during the progress of the works be kept tidy and in a clean and sanitary condition to the entire satisfaction of the Engineer-in-charge & at the contractor's expense. The contractor shall conform to the sanitary requirements of local medical & health authorities and at all times adopt such precautions as may be necessary to prevent soil pollution of the site.
- The Contractor shall at his own expense carry out all anti-material or other ailments, instructions given to him by the Engineer-in-charge or by any local authority including the filling up of barrow pits.
- The Contractor shall at his own expense carry out all instructions issued to him by the Engineer-in-Charge to effect a proper disposal of soil and other conservancy work in respect of the contractor's workmen or employees on the site. He shall also conform to the sanitary requirements of the local Medical and Health authorities.
- The Contractor will not at any time do, cause or permit any nuisance on the site or adjoining area or do anything which shall cause unnecessary disturbance or inconvenience to the owners, tenants or occupiers of other properties near the public generally and will secure the efficient protection of all land, river lakes and sea areas against pollution. The Contractor shall attend children of labourers and shall provide for its maintenance and upkeep.
- The Contractor shall provide and maintain upon the works sufficient, proper and efficient life-saving appliance and first aid equipment to the approval of the Engineer-in-charge and in accordance with the requirements of I.L.O Convention No.62. The appliance and equipment shall be for use at all times.
- The Contractor shall organize his operations in a workman like manner and take all necessary precautions to provide safety and prevent accidents on the site to both persons and property, more so if they will be working in proximity to working machinery of existing plants in operation. The Engineer-in-charge shall have the power in requiring the contractor to adopt from time to time such measures as they may consider necessary to ensure the above requirements. The Employer /Engineer-in-charge shall not be responsible for any consequence resulting from violation of safety requirements. In particular the Contractor shall ensure compliance with the following safety codes:-
 - IS: 3696 (Pt. I) - Safety code for scaffolds and ladders pt.I
 - IS: 3696 (Pt. II) - Do- Pt. II – Ladders
 - IS: 4130 (Pt. III) - Safety code for demolition work
 - IS: 4014 (Pt. II) - Code of practice for steel Tubular Scaffolding (Pt. II)- Safety Regulations for scaffolding.
- All statutory laws on labour in vogue from time to time shall be complied with & all basic amenities provided for & by the contractor shall indemnify the Authority against all claims what-so-ever on this.

31. Return of Labour.

The contractor shall if required by the Engineer-in-charge deliver to the Engineer-in-charge Representative or at his office a Return in details in such form and at such intervals as the Engineer-in-charge may prescribe showing the number as the several classes of labour from time to time employed by the Contractor on the site and such information regarding constructional plan as the representative may require.

32. Quantity of Materials and Workmanship and tests.

All materials and workmanship shall be of the representative kinds described in the contract & in accordance with Engineer-in-charge, and shall be subject from time to time to such test as the Engineer-in-charge may direct at the place of manufacture, of fabrication or on the site or at all or any of such places. The contractor shall provide such assistance instruments, machines, labor and materials as are normally required for examining, measuring and testing the quantity of any work & the quality or weight of any material incorporation in the works for testing as may be selected as required by Engineer-in-charge.

33. Cost of samples.

All samples shall be supplied by the Contractor at his own cost, if the supply thereof is clearly intended by or provided for in the specification or Bill of Quantities, but if not then at the cost of the Employer.

34. Cost of tests.

The cost of making any test shall be borne by the Contractor if such test is clearly intended by or provided for in the specification and (in the cases only of a test under load or of a test to ascertain whether the design of any finished or partially finished work is appropriate for the purpose which it was intended to fulfill) particularized in the specification in sufficient detail to enable the contractor to price or allow for the same in his tender.

35. Access to site.

The employers or any other person authorized by them shall at all times have access to the works and to the site and to all workshops and places where work is being prepared or from where materials, manufactured articles or machinery are being obtained for the work and contractor shall afford every facility for and every assistance in or in obtaining the right to such access.

36. Examination of work before covering up.

No work shall be covered up or put out of view without the approval of the Engineer-in-charge or their representative to and the contractor shall afford full opportunity for the Engineer-in-charge or afford full opportunity to examine and measure any work their representative to examine and measure any work which is about to be covered up or put out of view and to examine foundation before permanent work is placed thereon. The Contractor shall give due notice to the Engineer-in-Charge Representative whenever any such work of foundation is or are ready about to be ready for examination.

37. Uncovering and making openings.

The Contractor shall uncover any part or parts of the works or make openings in or through the same as the Engineer-in-charge may from time to time direct and shall reinstate & make good such part or part to the satisfaction of the Engineer-in-charge. If any part or parts have been recovered by or put out of view after compliance with the requirements of above sub-clause and foundation to be executed in accordance with the contract the expenses of uncovering making openings in or through reinstating and making good the same shall be borne by the Employer but any other case all such expenses shall be recoverable from him by the Employer from may deducted by the Employer from any monies due or which may become due to the contractor.

38. Removal of Improper work and materials.

The Engineer-in-charge shall during the progress of the work have power to order in writing from time to time.

- a). The removal from the site within such time or times as may be specified in the order of any materials which in the opinion of the Engineer-in-charge are not in accordance with the contract.
- b). the substitution of proper and suitable materials.
- c). The removal and proper re-execution (not withstanding and previous test thereof or interim payment thereof) of any work which in respect of materials or workmanship is not, in the opinion of the Engineer-in-charge in accordance with the contract.

39. Default of Contractor

In case of default on the part of the contractor in carrying out such order the employer shall be entitled to employ and pay other persons to carry out the same and all expenses consequent thereon or incidental thereto shall be borne by the contractor and shall be recoverable from him by the Employer from any amount due or which may become due to the contractor.

40. Suspension of work.

The Contractor shall, on the written order of the Engineer-in-charge suspend the progress of the works or any part thereof for such time or times and in such manner as the Engineer-in-charge consider necessary and shall during such suspension properly protect and secure the work so far as is necessary in the opinion of the Engineer-in-charge. The extra cost incurred by the contractor in giving effect to the Engineer-in-charge instruction under this clause shall be borne and paid by the employer, unless such suspension is

- a). otherwise provided for the contract or
- b). necessary for the proper execution of the work or any reason of weather conditions affecting the safety or quantity of the works or by some default on the part of the contractor.
- c). necessary for the safety of the works or any part thereof, provided that the contractor shall not be entitled to recover any such extra cost unless he gives notice in written of his intentions to claim to the Engineer-in-charge within 28 days of the Engineer-in-charge order. The Engineer-in-charge shall settle & determine the extra payment to be made to the contractor in respect of such claim as the Engineer-in-charge shall consider fair & reasonable.

41. Suspension more 90 days.

If the progress of the works or any part thereof is lasting suspended on the written order of the Engineer-in-charge for more than 90 days the contractor may serve a written notice on the Engineer-in-charge requiring permission within 28 days from the receipt thereof to proceed with the works or part thereof in regard to which progress is suspended and if such permission is not granted within that time the contractor by the further written notice so served may (but is not bound to) elect not to execute part of the works, as an omission of such part or where it affects the whole works, as an abandonment of the contract by the Employer.

42. Commencement works.

The contractor shall commence the works on site within the period contained in the Tender after the receipt by him of an order in writing to this effect from the Employer and shall proceed with the same with due expedition except as may be expressly sanctioned or ordered by the Employer or be wholly beyond the contractor's control.

43. Extension of time for completion.

Should the amount of extra or additional work of any kind or other special circumstances of any kind what so ever which may occur be such as fairly to entitle the contractor of the extension of the time for the completion of the work, & the Employer on the recommendation of the Engineer-in-charge, shall consider the grant of such or any extension of time for completion. Engineer-in-charge shall determine the amount of such extension provided that this is due to work or other special circumstances that have arisen or as soon thereafter as is practicable delivered to the Engineer-in-charge representative full and detailed particulars of any claim to extension of time to which he may consider himself entitled in order that such claim may be investigated at the time.

44. Execution of works of Repairs etc.

To the intent that the works shall at or as soon as practicable after the expiry of the defect liability period be delivered upon the Employer in a good and perfect condition (fair wear and tear excepted) to the satisfaction of the Engineer-in-charge. The contractor shall exercise all such work of repair amendment reconstructions, rectification, and making good

of defects, imperfections, shrinkage or other defaults as may be required of the contractor in defect liability period or within fourteen days after its expiry as result of an inspection made by or on behalf of the Engineer-in-charge prior to its expiry.

45. Remedy on contractor's failure to carry out work have required.

If the contractor fails to do any such work as aforesaid required by, the Employer shall be entitled to carry out such work by his own workman or other contractor & such work which the contractor should have carried out at the contractor's own cost, he shall be entitled to recover from the contractor the cost thereof or may deduct the same from any dues or that may become due to the contractor.

46. Variations.

No alterations, amendments, omissions, additions or other variation of the works/plants/equipment under the contract (here-in-after referred to as variations) shall be made by the contractor, except as ordered in writing by the Engineer-in-charge, who shall have full power subject to the provisions herein after contained, to instruct the contractor in writing to make such variation as the Engineer-in-charge consider proper and necessary and the contractor shall carry out such variations without prejudice to the contract, as through the said variations formed part of the contract.

If in the opinion of the contractor complying with any such variation would prevent his obligations or guarantees under the contract he shall promptly notify the Engineer-in-charge who shall decide forth with whether the variation shall be carried out as ordered. If the Engineer-in-charge confirms his previous instructions the contractor obligations & guarantees shall be modified to such extend as may be justified & notified by the Engineer-in-charge & considered by the Employer for acceptance on the recommendations of the Engineer-in-charge.

47. Valuation of variations.

The value (if any) of all variations shall be added to or deducted from the contract price as appropriate. The Engineer-in-charge shall ascertain and determine this in accordance with the rates & prices in the schedule of Prices/Bill of Quantities, so far as the same may be applicable & recommended by the Engineer-in-charge for the consideration of the employer for acceptance. In other cases, reasonable prices shall be fixed by the consideration of Employer for acceptance.

48. Notice to Contractor.

In the event of the Engineer-in-charge requiring any variations as reasonable and proper notice shall be given to the contractor as the same will enable him to make his arrangements there of and in cases where goods and materials are already prepared or any design drawings or patterns made or work done that required to be altered a reasonable sum in respect thereof shall be allowed by the Engineer-in-charge.

49. Plant etc. to be exclusive use on the works.

All constructional plant, temporary works and materials provided by the contractor shall when brought on to the site be deemed to be exclusively intended for the use on the works construction and completion of the works and the contractor shall not remove the same or any part thereof (save for the purpose of moving it from one part of the site of another) without the previous consents in writing of the Engineer-in-charge (which shall not be unreasonably withheld).

50. Clearance of site completion.

On completion of the works the contractor shall remove from of the site all the said constructional plant and temporary works remained there on and any un-used materials.

51. Quantities.

The quantities set out in the bill of quantities are the estimated quantities of the work but they are not to be taken as the actual & correct quantities of the works to be executed by the contractor in fulfillment of his obligations under the contract.

52. Works to be measured.

The Engineer-in-charge shall accept as otherwise stated ascertain and determine by measurement the value in accordance with the contract. He shall, when he requires any part or part of the works to be measured, give notice to the contractor's authorized agent or representative who shall, forthwith attend or send a qualified agent to assist Engineer-In-charge representative in taking such measurements and shall furnish all particulars required by either of them should the contractor not attend or neglect or omit to send such agent then measurement made by the Engineer-in-charge or approved by him shall be taken to be correct measurement of the work. For the purpose of measuring such permanent work as is to be measured by record drawings the Engineer-in-charge shall prepare record drawings, month of such work and the contractor as and when called upon to do so in writing shall within 14 days attend to examine and agree any such record drawings with the Engineer-in-charge shall sign the same when so agreed and if the contractor does not so attend to examine and agree any such record drawing they shall be taken to be correct. if after examination of such record drawings the contractor does not agree the same or does not sign the same as agreed they shall never-the-less be taken to be correct unless the contractor within 14 days of such examination lodge with the Engineer-in-charge, notice in writing in this respect in which such record drawings are claimed by him to be incorrect.

All measurement shall be from drawings executed at site and shall be checked in compliance (as per drawings), before measurement are done, all to the requirement of the Engineer-in-charge.

53. Method of measurements.

Where works have to be measured for any purpose whatsoever it shall be in accordance with IS 1200 unless otherwise specifically indicated in the contract and under the specific chapters.

54. Payment on account and Retention.

The contractor may at intervals specified in the Tender document claims for payments of advances on account of work done and materials delivered at the site in accordance with the contract. Such claims which shall be computed as under:-

55. Works:

Full value of the work executed on site to the satisfaction of the Engineer-in-charge less the deduction indicated in the tender which shall constitute the security deposit such deductions shall constitute to be effected from every interim valuation, unless otherwise stipulated.

56. Materials:

The percentage (%) indicated in the tender of the value of any non perishable materials which in the opinion of the Engineer-in-charge are in accordance with the contract and have been brought on site in connection herewith & adequately stored and protected against damage by any cause whatsoever, but which have not at the time of the advance being claimed been incorporated in the works scaffolding, props, formwork, sand, metal & constructional plant or machinery shall not qualify for such advances.

For the purpose of evaluating the works and materials as above the Engineer-in-charge shall prescribe & the contractor shall furnish such returns & documents as may be called for.

i) Any sums due from the contractor on account of stores or any such other things provided by the Employer shall be deducted from the first or subsequent advance.

The Engineer-in-charge shall from time to time recommend the amount which the contractor is entitled; payment "on account" shall be made there after on the recommendation of the Engineer-in-charge with in the period indicated in the tender.

ii) Any certificate for interim payment may be modified or corrected by subsequent interim certificate or by final certificate and no certificate of the Engineer-in-charge in respect of an advance payment shall of itself be conclusive evidence that the work which relates are in accordance with the contract

Contractor shall submit only commutative bills every time. Rates claimed shall be on the basis of work done at site and as approved by the Engineer-in-charge.

iii). Relevant updated measurements with the bill only shall be considered.

57. Final Bill.

As soon as possible after the works/plant/equipment have been completed and successfully commissioned, but not later than 2 months from certified completion date, the contractor shall forward certified final account to the Engineer-in-charge. This shall include reconciliation of all materials or things issued by the Employer. No claims will be entertained after receipts of the final bill.

The Engineer-in-charge shall check & certify the final quantities admissible on the final bill. The contractor shall be entitled to be paid this amount on the recommendation of the Engineer-in-charge, less the percentage indicated in the tender as security for performance during the defect liability period, and the value of all payments made on account against interim certificates, and any other amounts payable to the Employer & any other deductions required by law.

The amount retained from the final bill towards security for the performance during the maintenance period shall be released by the Employer on the issue of the maintenance certificate by the Engineer-in-charge. The security deposit shall be released along with the payment of the final bill.

The final bill shall be submitted by the contractor in a form approved & in the manner prescribed by the Engineer-in-charge.

58. Recovery of sums.

Whenever under the contract any sum of money shall be recoverable from or payable due by the contractor, the same may be deducted from any sum then due or may become due to the contractor, under the contract with the Employer.

59. Forfeiture.

If the contractor shall become bankrupt or have a receiving order made against him or shall present his petition in bankruptcy or shall make an arrangement with or assignment in favors of his creditors or shall agree to carry out the contract under a committee of inspection of his creditors or (being a corporation) shall go into liquidation (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) or if the contractor shall assign the contract without the consent in writing of the Engineer-in-charge, shall have an execution levied on his goods or if the Engineer-in-charge shall certify in writing to the Employer that in his opinion the contractor.

a). has abandoned the contract or

b). without reasonable excuse has failed to commence the works or has suspended the progress of the works for 28 days after receiving from the Engineer-in-charge written notice to proceed or

c). has failed to remove materials from the site or to pull down & replace work for 30 days after receiving from the Engineer-in-charge written notice that the said materials or work has been considered & rejected by the Engineer-in-charge under these conditions or

d). is not executing the works in accordance with the contract or is persistently or flagrantly neglecting to carry out his obligations under the contract of

e). has to the detriment of good workmanship or in defiance of the Engineer-in-charge instructions to the contrary sub-let any part of the contract

then the Employer may after giving 14 days notice in writing to the contractor enter upon the site & the work & expel contractor their from without there by avoiding the contract or releasing the contractor from any part of his obligations or liabilities under the contract or affecting the rights & powers conferred by the Employer on the Engineer-in-charge by the contract and may himself complete the works or may Employ any other contractor to complete the works & Employer or such other contractor may use for such completion so

much of the constructional plant temporary works and materials which have been deemed to be reserved exclusively for the execution of the works under the provision of the contract as he or they may think proper & the Employer may at any time sell any of the said constructional plant, temporary works and unused materials and apply the proceeds of sale in or which may become due to him from the contractor under the contract.

60. Payment after forfeiture.

If the Employer shall enter and expel the contractor under this clause he shall not be liable to pay to the contractor any money on account of the period of defective liability & thereafter until the cost of completion & maintenance damages for delay in completion (if any) all other expenses incurred by the employer have been ascertained and the amount thereof certified by the Engineer-in-charge the contractor shall then be entitled to receive only such sum or sums (if any) as the Engineer-in-charge may recommend and would be taken as due to him upon due completion by him after deducting the said amount. But if such amount shall exceed the sum which would have been payable to the contractor on due completion by him then the contractor shall upon demand pay to the employer the amount of such excess and it shall be deemed a debt due by the contractor to the employer and shall be recoverable accordingly.

61. Urgent repairs.

If by reason of any accident of failure or other event occurring to in or in connection with the works or any part thereof either during the execution of the works or during the period of defect liability, any remedial or other work or repair shall in the opinion of the Engineer-in-charge be urgently necessary for security and the contractor is unable or unwilling at once to do such work or repair as the contractor was liable to do at his own expense under the contract, all costs and charges properly incurred by the employer in so doing, on the demand be paid by the contractor to the Employer from any dues or which may become due to the contractor, provided, always that the Engineer-in-charge shall as soon after the occurrence as of any such urgency as may be reasonable practicable notify to the contractor thereof in writing.

62. Arbitration.

Except where otherwise provided in the contract all questions and disputes, relating to the meaning of specifications, designs, drawing and instructions herein before mentioned and as to the quality of workmanship or materials used on the work or as arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, order or those conditions concerning the works, or the execution or failure to execute the same whether arising during the progress of the work or after the completion or abandonment thereof shall be referred to arbitration under the provision of the Arbitration Act, 1940 or any statutory modification or re-enactment thereof and the rules made there under and for the time being in force such arbitration shall be conducted by two arbitrators, who in turn shall nominate an umpire before the arbitration. In case the arbitrators fail to arrive at a decision, the matter shall be referred to the umpire whose ruling shall be final and binding on both the parties to the dispute.

63. EXTRA ITEMS.

Rates of extra items if admissible shall be derived on the following basis

a). From nearest similar item of the tender.

b). Contractor shall submit his item rates (within fifteen days of being asked to execute such an item) along with necessary analysis of men & materials used therein and the proof thereof for the work to be executed at site, 10% over and above these rates shall only be considered towards his overheads and profits as certified by the Engineer-in-charge and the same shall become payable on recommendations of Engineer-in-charge.

64. Issue of Materials Employer.

The Engineer-in-charge may at this option issue such as are listed all other by materials for the work & temporary works shall be provided by the contractor at his own cost. If the Engineer-in-charge issues any of the materials listed above the contract price payable to the contractor shall stand reduced by the values of the materials issued by the Engineer-in-charge such values being calculated at the rates specified against each of the materials listed. The contractor shall not deal with such materials in any matter except for in execution of this contract.

65. Price Escalation:

No price escalation whatsoever shall be allowed in respect of any material or wages used or employed in connection with the execution of the works. All duties, taxes, octroi, turnover tax & service etc. shall be borne by the Contractor.

66. Site order Book.

A site order book shall be maintained by the Engineer Incharge at the site of works in which instructions shall be entered and communicated to the Contractor by the Engineer -In-charge as and when necessary. These orders shall be signed in token of receipt and complied with by the Contractor and nothing shall be written by him in reply. If the Contractor desires to represent any matter entered in the said order book, he may do so by a separate communication.

67. Error.

For any typographical error or omissions in the tender documents the interpretation given by the Executive Engineer Bhaderwah Development Authority, Bhaderwah will be final and binding on the contractor.

68. Other conditions

- Latest relevant BIS specifications shall govern this contract and work shall be carried out strictly in accordance with them.
- Time is the essence of this contract. The contractor is expected to work in more than one shifts and nothing extra shall be paid for the same.
- The employer shall not supply any material, however the contractor shall have to support the quality soundness of material by relevant tests as and when warranted under relevant BIS codes.
- In case of delay a penalty of 1/2% of the contract value per day subject to a maximum of 10% of the contract value shall be imposed on the contractors on liquidated damages. The decision of the Employer in this matter shall be final, conclusive and binding on the contractor.
- The architectural and other drawings shall, all times, be properly correlated for executing any work. Samples shall be prepared for approval before starting any items of work specified by the Engineer-in-charge including verifying and getting the layout approved etc.
- Rates quoted for the items in all individual sections shall be valid for carrying out the item of work at any place, any level and at any height.
- Collection and stacking of materials shall include all leads and lifts. The rates quoted by the Contractor shall hold well irrespective of the source from which the materials are brought so long as they confirm to the specifications, and as approved by the Engineer-in-charge.
- The contractor shall be personally responsible for watch and ward and handling, storing of all materials handed over to him by the Engineer-in-charge or brought by him to the site. Nothing extra shall be paid to him for this.
- When required by the Engineer-in-charge, the contractor shall supply for the purpose of testing, samples of any materials to be used in the works as per specifications. The contractor shall provide all such samples at his own cost including suitable packages to contain them, to the Engineer-in-charge. All the expenditure on account of packing of

samples, conveyance, handling & delivery up to the testing charges and fees to be paid in this respect shall be borne by the contractor including cost of all materials and samples.

- Contractors shall submit once every fortnight, a detailed report of the following;
- Materials procured, consumed & balance at site for previous week as well as expected deliveries during next fortnight.
- List of equipment and machinery at site, stand by as well as those under repair and equipment scheduled to arrive during next fortnight.
- Skilled –unskilled labour and supervisors working at site during past week expected increase in next fortnight.
- Steps proposed for speeding up the progress of work in the next week.
- Five photographs of the sites - four sets.
- Contractor must appoint full time responsible Site Engineer conversant with the nature of works and attend all site meetings etc.
- The contractor shall make his own arrangements for storage of any constructional material.

CHAPTER III
SPECIAL CONDITIONS AND TECHNICAL SPECIFICATIONS

1. The work shall be carried out according to this Specification, whether specifically mentioned or not. No extra in any form will be paid unless it is definitely stated as an item in the Schedule of Quantities. Wherever the specifications are not given or ambiguous, the relevant Indian Standard and further amendments/CPWD specifications will be considered as final and binding.
2. The work shall be carried out simultaneously with the electrical, sanitary and other services and in cooperation with the contractors for the above services. The work shall be carried on till it is completed satisfactorily along with the completion of essential portions of other services. The Building contractor shall keep the other contractors informed well in advance of the proposed programme of the work and shall give adequate notice to enable them to carry out their part of the work so that the building work is not hindered. The contractor shall further cooperate with the other contractors, in respect of any facilities required by them e.g. making holes in shuttering for sanitary pipes, electric conduits, fan hooks etc. However, nothing extra shall be admissible to him for such reasonable assistance and facilities afforded to other contractors, and the Building contractor shall be deemed to have taken those factors into consideration while quoting his rates.
3. The work shall be related to the drawings, which the contractor is presumed to have studied. Nothing extra will be paid for any item on account of its shape, size, location or other difficult circumstances, even if the schedule makes no distinction, as long as the item is shown in the drawings.
4. The sources of materials stated in the specifications are those from which materials are generally available. However, materials not conforming to specifications shall be rejected even if they come from the stated sources. The contractor should satisfy himself that sufficient quantity of material of acceptable specification is available from the stated or other sources and should tender accordingly.
 “Schedule” – shall mean the schedule of quantities.
 “Approved”, “allowed”, “accepted” – shall mean approval of the Engineer in charge in writing.
 “Required” means as instructed by the Engineer in charge.
5. The contractor, without extra charge shall fulfill the requirements of these specifications, i.e. the item rates quoted shall be deemed to have taken these specifications into account.
6. Drawings, Instructions, and Measurements:-
 All work shall be done according to the drawings and instructions of the Engineer in charge and the Contractor shall arrange to test materials and/or portions of the works at his own cost in order to prove their soundness and sufficiency. If after any such test and in the opinion of the Engineer in charge any work or portion of work is found to be defective or unsound, the Contractor shall pull down and re-execute the same at his own cost. Defective materials shall be removed from the site.
7. Clearing the site:-
 The site described and shown on the plans with 6 meters all around the building, shall be cleared of all obstructions, loose stones and materials, rubbish of all kinds as well as brushwood. All holes or hollows, whether originally existing or produced by removal of loose stone or brushwood shall be carefully filled up with earth well rammed and leveled off as directed. Also, the Contractor shall dress the site 6 metres all round the building after completion maximum cutting or filling being 30 cms. No extra shall be paid for this.
8. Trees:-

No trees shall be cut without permission. If any trees have to be cut, this shall form an extra item. For the purpose of the specification, a tree shall be defined as a growth which is more than 3 m high and whose diameter of the trunk at the base is not less than 30 cms.

9. Setting out and making profiles.

Masonry pillars will be erected at suitable points in the area to serve as benchmarks for the execution of the work. These benchmarks shall be connected with permanent benchmark approved by the Engineer-in-charge. Necessary profiles with pegs, bamboos and strings or “Bhurjis” shall be made to show the correct formation level before the work is started. The contractor shall supply labour and material for setting out and making profiles and “Bhurjis” for the work at his own cost. The profiles and “Bhurjis” shall be maintained during the execution of work.

10. Materials

Water

Water shall be from Municipal main or sweet tank or well. Water storage accommodation for the water shall be of sufficient size and as directed by Engineer-in-charge. The Government does not guarantee the supply of water. The contractor shall make his own arrangements for supply of water. In case the Government agrees to supply, the contractor shall pay the cost of water at the rates fixed by the Government.

Murrum

It shall be got from approved quarries. It shall be granular and gritty. It shall be free from dust, all rubbish, and any organic materials as well as clods of black cotton soils. The materials shall be got approved prior to its use in road construction.

The material shall be stacked on a level ground. If the item is only for supplying of murrum, then it shall be measured in cum. The rate shall include digging the murrum, supplying at site, conveying with all lead and lift and stacking the same at site as directed by the Engineer. The rate shall also include all tolls, duties, fees, royalties etc.

Sand

The sand shall be from a river or nallah or sea. It shall be clear, sound, properly graded, free from organic material; silt, clay etc. and it shall be well graded.

Stone

The stone shall be hard, sound, durable, and free from decay and weathering. No round or oblong pebbles shall be allowed. The stone shall be tested for abrasion value. Before the material is put to use the same shall have to be got approved from the Engineer-in-charge.

Earth

For filling and terracing shall be free from all rubbish organic or vegetable growth including roots, weeds etc. All clods shall be first broken down.

Portland cement

Cement shall comply with the Indian Standard specification and shall be of Indian or other make to be approved by the Engineer-in-charge, when stored in bags these shall be raised 30 cms. Above the ground and stacked in rows of 10 bags high, 0.6m clear from the walls.

11. Items of work

• Plain Cement Concrete

- i) Mixing: - All proportions shall be by volume, except cement, which shall be proportioned by weight unless otherwise specified. Mixing shall be done in a mechanical mixer as required for reinforced concrete work. However, in special case, hand mixing may be allowed by Engineer-in-charge when the following procedure shall be adopted. The several materials shall be accurately gauged in boxes and thoroughly mixed on a water-tight platform of adequate size, by being turned over at least thrice dry till the colour is uniform and then twice wet. Water shall be added gradually and no more than necessary to sufficiently wet the materials, only that much concrete shall be mixed which

can be used within half an hour. Each stack shall however not be larger than consuming one bag of cement. All such stacks shall be placed distinct from each other. In case hand mixing is allowed, the contractor shall put in 10% more cement than specified without extra charges.

ii) Protection: All plain and reinforced cement concrete shall be adequately protected. Newly placed concrete shall be protected by approved means from frost, sun, dust, storms and hot spells. Concrete placed below the ground shall be protected from falling earth during and after placing. Concrete placed in ground having deleterious salts shall be kept free from contact at least for three days, or as otherwise instructed, thereafter. Approved means shall also be taken to protect immature concrete from damage by debris, excessive loading, vibration, abrasion, floatation due to sub soil water and other influences that may impair the strength and durability of the concrete. This shall apply to all items of cement concrete. No extra charge shall be allowed for this.

iii) Laying:- concrete shall be laid in horizontal layers of not more than 150mm thick and gently rammed.

iv) Curing:- After laying, the concrete shall be kept wet for fifteen days. If cast in hot weather, it shall be covered with gunny bags, which shall be kept constantly wet. Other work on concrete shall not start until after three days of laying the concrete.

- Measurement

In cubic meter of exact length, breadth and depth as ordered by the Engineer in charge or as shown on the drawings. This shall be inclusive of any centering or shuttering required to complete the item.

- Joints in Cement Concrete

All longitudinal and transverse joints shall be confirm the details shown in Architectural drawings and/or as directed by Engineer-in-charge.

All joints shall be constructed true to the line with their faces perpendicular to the surface. Joints shall not vary more than 6mm from a true line or from their designated position.

The joints shall be formed by inserting the web of a “T” or any other suitable device with oiled surfaces into the concrete, when the concrete is stiff enough to receive the inserting device.

The “T” iron or any other device adopted shall be taken out carefully in such a way that it will not slump and close the slot.

- Transverse Expansion Joints.

Transverse Expansion Joints shall be of the premoulded type and shall be constructed at right angles to the centerline of the pavement and shall extend to the full width of the pavement. The spacing of the joints shall be 27m for pavement 10cm to 15cm thick and 36m for pavement 20cms thick or more and 10m for pavements below 10 cm thick.

- Transverse Contraction Joints

Transverse Contraction Joints shall be formed by a groove or cleft in the top of the slab. The groove shall be 13mm wide at the surface and 10mm wide at the bottom. It shall extend vertically downwards from the top to a depth equal to $\frac{1}{4}$ (one fourth) the depth of the pavement, track, runway etc. at the thinnest part of its section. The joints shall be located at 6m or 5.4m intervals depending on whether the expansion joint spacing is 36 or 27 m respectively.

- Transverse Construction Joints

Transverse Construction Joints shall be made at the end of each day's run or where unavoidable interruption or more than 30 minutes occur in the concreting operations.

Transverse Construction Joints shall be plain butt joints and formed so as to make a slab at least 3m in length. If this is not possible, the joints shall be formed at the preceding Transverse expansion or construction joint location. The exposed face of the joint shall be

- painted with approved quality bitumen before concreting the adjacent bay. The spacing of subsequent Transverse Contraction Joints shall be measured from the Transverse Contraction Joints last placed.
- Expansion Joints at structures:
Expansion joints shall be formed around all structure and features projecting though, into, or against the pavement. Such joints shall be 13mm wide and shall be of the premoulded type.
 - Arrangement of Transverse Joints:-
The Transverse Joints on each side of a longitudinal joint shall be of the same type and shall be in line with each other and not staggered.
 - Longitudinal Joints.
Longitudinal Joints shall be plain butt joints like Transverse Construction Joints.
 - Installation of Transverse Expansion Joints
The joints shall be set to the required line and grade and shall be held in the required position, during the placing and finishing of the concrete by securing stacks or other suitable device. It shall be ensured that the concrete pressure will not disturb their alignment. The joints shall be vertical and no joint shall deviate more than 6mm in the horizontal alignment either way from a straight line. The installing device shall have a length 6mm less than the required width of the slab and shall be cut to the required depth. The lower and the top edges shall be cut to conform to the prescribed cross section of the base and the crown of the slab respectively. The joint assembly shall be tested to determine whether it is firmly supported. Any assembly not firmly supported shall be reset.
 - Filling of Joints.
 - A. Expansion Joints.
 - (a) Pre-moulded joint filler: It shall conform to I.S.1838-1961, the thickness shall be 20mm or 25mm as specified and shall be maximum available standard length.
During the casting of the slab the pre moulded joint filler shall be placed accurately in position against the finished end of concrete slab. The filler shall remain 20mm below the top surface of the pavement and shall extend upto the sub-grade.
 - (b) Sealing compound: After the curing period is over, the joint portion above filler board shall be cleaned thoroughly as directed by Engineer-in-charge. The joints shall be filled with hot applied scaling compound Grade A (Normal) for concrete construction other than those which are subject to spillage of kerosene or other heavy petroleum oils and grade B (jet fuel resistant) for concrete constructions of runways for jet aircrafts conforming to ISI 834-1961.
 - B. Filling of contraction, construction and dummy joints:
These shall be done as per para A (b) above.
Measurement: Length and Depth of the joint shall be measured correct to a cm and width correct to 3mm.
Rate: The rate shall be taken in per cm depth, per cm width, per meter unit and it shall include the cost of materials and labour involved in all the operations described above.

12. QUALITY

All materials for incorporation into the works shall be of the best quality of their respective kinds as specified herein and shall be obtained from sources and suppliers approved by the Engineer-in-charge or their representative and shall comply strictly with the test prescribed herein after or where the tests are not laid down in this specification, with the requirements of the latest issue of the relevant Indian Standard by the Engineer-in-charge.

13. INSPECTION AND TESTING

All materials before being incorporated into the works shall be subjected to inspection and testing as provided in the conditions of contract and else where in the specifications. The cost of all samples for all tests required by these specifications of the approved standards shall deemed to be included in the contract rates.

No materials shall be used in the woks unless those have first been approved by the Engineer-in-charge of the owners.

14. **SAMPLES**

Samples of all materials proposed to be used in the works and to be supplied by the contractor, may be called for at any time by the Engineer-in-charge or their Representative.

15. **INDEPENDENT TEST ANALYSIS**

Independent test & analysis of any of the materials may be made from time to time by a testing house or analyst appointed by the Engineer-in-charge or their representative in order to check the supplier's works tests and analysis. The contractor shall be at his own expense supply and deliver to a Testing house or Analyst such materials as may be directed by the Engineer-in-charge or their representatives. The cost of all successful tests on actual basis, and all other costs shall be borne by the contractor. However, the testing of concrete cubes shall be governed by the specific terms set out herein after in these specifications.

16. **BRICK WORK**

The contractor shall furnish all labour , materials, tools & applications with services necessary to complete brick work masonry & floor tiling etc. in accordance with the drawings and as specified herein.

- **Mortar Preparation**

Cement mortar for brick work shall generally be as specified herein, namely in proportion of one of cement with 6 of sand by volume, or as indicated otherwise. Mortar shall be prepared by mixing cement & sand in specified proportion in the site. The mortar shall be used with in half an hour of mixing. No hand mixing is permitted.

- **MATERIALS**

Bricks shall be table moulded, of uniform size, shape and colour & must be well burnt so as to give a clear ringing sound when struck. They shall be clean, whole & free from flaws, cracks, stone or lump of any kind, especially lime. They shall have sharp edges and angles and even surfaces and shall be sound and hard to resist compression. They shall be from a source approved by the Engineer-in-charge. No brick after immersion in water for 24 hours shall absorb more than 15% of its weight. Where specifically agreed upon bricks shall be of the best quality locally available.

- **WORKMANSHIP**

All bricks shall to be used to kept soaked in water for at least 2 hours prior to use. The work shall set out by the contractor. No. brickbats shall be used for the work except where required to complete a standard bond.

All joints in brick work shall be uniformly laid. Each layer of brick work shall be laid plump & level with correct break of joints. No mortar joint shall exceed 15 mm in thickness.

The work shall be kept wet for at least 7 days after laying the last course.

Brick work shall not be raised more than 10 courses a day unless otherwise approved by the Engineer-in-charge.

Brick work shall be uniformly raised panel wise all round & no part shall be raised more than 1 meter above another, at any time. The contractor shall provide all necessary openings for doors, windows or such other services and shall embed all cuttings & fixtures(if separately paid for) at no extra cost 115 mm & 20 mm brick walls shall be

built fair faced on one side only. All other walls of greater thickness shall be built without exception with fair face to both sides.

Where specifically indicated 115 mm or thinner brick work shall be executed in one of the following ways.

With R.C. Stiffeners

Brick work be carried out in panels measuring 1.5 m x 1.5m with R.C.C. (1:2:4) verticals of 12 cm x 12 cm & horizontal stiffeners 12 cm x 8 cm, both reinforced with 4 Nos. 5 mm dia bars laid in 1:2:4 concrete properly filled in and cured. Such R.C.C. work shall not be measured separately but will be included in the rate for brick work.

- Reinforcement brick work

Such brick shall be in cement mortar 1:4. the Joint shall be increased suitable to embed the reinforcement, which shall be laid at every fourth course, consisting of hoop iron 25 mm wide 1.5 m thick with holes punched at every 15 cm the joints shall be well filled in and reinforcement properly surrounded with mortar & cured for not less than ten days. Care shall be taken to see that proper cover is provided to the reinforcement & the work laid continuously to ensure that no portion of the mortar attains initial set before mortar in adjoining portion is laid in position.

- Mode of payment shall be on the basis of codes of practice.

- In lieu of hoop iron, the Engineer may direct the use of mesh or M.S. bars as reinforcement.

17. STONE MASONRY

- Stones shall be set level, plumb with uniform joints set in full set bed of mortar, with joints filled.

- All stone to be well wetted, except in frostily weather, before setting and large stone to be set with a derrick rack out mortar joints when setting.

- Utmost care shall be taken during construction that the surface of the stones is not spoilt by concrete or mortar dropping on the stones and drying. The surface of the stones be immediately cleaned with water if any concrete or mortar does on fall the stone faces.

- Stones for masonry shall be best hard stone locally obtainable from approved quarries. The masonry, whenever required shall be composed generally of large stones clean flat bedded properly selected for their places and carefully laid, with a suitable proportion of smaller stones & chips to fill up interstices. The whole work shall be hand set and solidly bedded in and surrounded with mortar on every side except the face. There shall be no hollows or dry portions in work nor pinning in the face. The face stone shall be flat-bedded, shall tail back and be bound well into the body of the wall and shall not be of a height greater than either the breadth of face or length of the tail through-stones, covering the whole width or thickness of the wall or 60 cm long where the walls are horizontal and vertical. The face of the wall shall be strictly straight. The masonry shall be shaded from the sun & well moistened for at least three days after completion.

- Stone masonry shall be random, polygonal, or squared rubble either un-coursed or brought up to course, all as indicated.

- The rate for stone work shall include the cost of the following:-

- Selecting proper stones, breaking of boulders etc. in case the wall is to be constructed from stones available at site.

- Scaffolding if necessary.

- Raking out joints.

18. RUBBLE/BRICK PACKING

SCOPE OF WORK

The contractor shall furnish all labour materials tools & services necessary to complete all "packing" in the accordance with the drawings and as specified herein.

- **MATERIALS**

The rubble stone shall be sound, hard and durable. They shall have at least one dimension equal to the thickness of rubble packing and shall in any case, not be less than 15 cm in any direction. The stone shall be carefully hand-packed with longer side of each stone (which in no case shall be less than thickness of rubble packing) placed vertically with the smaller face of the two ends at the top. All interstices stone chips & the surface shall be made of uniform with the sand; the surface shall be formed to such stops as directed by the Engineer-in-charge. The rubble packing shall be thoroughly consolidated and sprinkled with water, if required by the Engineer-in-charge. The depth of the rubble packing shall be taken as consolidated depth. The concrete for flooring shall be laid over the rubble packing only after the Engineer-in-charge issue the order to that effect.

- **MEASUREMENT**

It shall be as per IS: 1200

19. **BRICK SOLING**

Where the soling is required to be provided with brick it shall conform to the following specifications.

Brick shall be of the quality indicated and shall be laid flat or on edge as indicated. The brick touching each other. Soling shall be closely packed leaving no interstices or gaps. Appropriate fillet shall be used to make up for dimensions which are part of a whole brick. After the soling is complete whole surface shall be subjected to consolidation by a light roller. Where indicated the joints shall be in cement mortar.

20. **REINFORCED CONCRETE AND ALLIED WORKS**

These specifications cover the general requirements for concrete to be used on jobs using on-site production facilities including requirements in regard to the quality, handling, storage of ingredients, proportioning, batching, mixing and testing of concrete and also requirements in regard to the quality, storage, bending and fixing of reinforcement. This also covers the transportation of concrete from the mixer to the place of final deposit and the placing, curing, protecting, repairing and finishing of concrete.

21. **APPLICABLE CODE AND SPECIFICATIONS**

MATERIALS

01. I.S. 269 - Specification for ordinary, rapid hardening & low heat Portland cement.
02. I.S. 455 - Specification for Portland blast furnace slag cement.
03. I.S. 1489 - Specification for Portland-Pozzolona cement.
04. I.S. 4031 - Method of physical test for hydraulic cement.
05. I.S. 650 - Specification for standard sand for testing of cement
06. I.S. 383 - Specification for coarse and fine aggregate for use in mass concrete.
07. I.S. 515 - Specification for natural & manufactured aggregate for use in mass

CONCRETE

08. I.S. 2386 - Method of test for aggregate for concrete. (part I to VIII)
09. I.S. 516 - Method of test for strength of concrete.
10. I.S. 3025 - Method of sampling and test (physical & chemical) for water used in
11. I.S. 432 - Specifications for mild steel and medium tensile steel bars & drawn (Part I&II) steel wire fabric for concrete reinforcement.
12. I.S. 1139 - Specification for hot rolled mild steel and medium tensile steel deformed bars for concrete reinforcement.
13. I.S. 1566 - Specification for plain hard drawn steel fabric for concrete reinforcement.
14. I.S. 1785 - Specification for cold twisted steel bars for concrete reinforcement.
15. I.S. 1786 - Specification for cold twisted steel bars for concrete reinforcement.
16. I.S. 2090 - Specification for high tensile steel bars used in prestressed concrete.
17. I.S. 303 - Plywood for general purpose.
18. I.S. 4990 - Specification for plywood for concrete shuttering work.
19. I.S. 1629 - Rules for grading of cut size of timber.
20. I.S. 2645 - Specification for integral cement water proofing compounds.

EQUIPMENT

01. I.S. 1791 - Specification for batch type concrete mixers.
02. I.S. 2438 - Specification for roller pan mixer.
03. I.S. 2506 - Specification for concrete vibrators, immersion type.
04. I.S. 2506 - Specification for creed board concrete vibrator.
05. I.S. 2514 - Specification for concrete vibrating table.
06. I.S. 3366 - Specification for pan vibrator.

07. I.S. 4656 - Specification for form vibrator for concrete.
 08. I.S. 2722 - Specification for portable swing weight batchers for concrete (single and double bucket type)
 09. I.S. 2750 - Specification for steel scaffoldings.

CODES OF PRACTICE

01. I.S. 456 - Code of practice for plain and reinforced concrete.
 02. I.S. 1343 - Code of practice for prestressed concrete.
 03. I.S. 457 - Code of practice for general construction of plain and reinforced concrete for dams and other massive structures.
 04. I.S. 3370 - Code of practice for concrete structures for storage of liquids.
 05. I.S. 3935 - Code of practice for composite construction.
 06. I.S. 3201 - Criteria for the design and construction of precast concrete trusses.
 07. I.S. 2204 - Code of practice for construction of reinforced concrete shell roof
 08. I.S. 2210 - Criteria for the design of R.C.C. shell structures and folded plates.
 09. I.S. 2751 - Code of practice for welding of mild steel structure and folded plates
 10. I.S.2502 - Code of practice for bending and fixing of bars for concrete reinforcement.
 11. I.S. 3558 - Code of practice for immersion vibrations for consolidating concrete.
 12. I.S. 3414 - Code of practice for design & installation of joints in buildings.
 13. I.S. 4054 - Code of practice for steel tubular, scaffolding.
 14. I.S. 2571 - Code of practice for laying in-situ cement concrete flooring.

22. SCREENING AND WASHING

a. Crushed rock shall be screened and or washed for the removal of dirt or dust coating, if so demanded by Engineer-in-charge.

b. Grading.

Coarse aggregates shall be either in single size or graded, in both case, the grading shall be within the following limits.

I.S. Sieve percentage passing for single sized designation aggregate of normal size.

	40 mm	20 mm	16 mm	12.5 mm	10 mm
63 mm	100	-	-	-	-
40 mm	85-100	100	-	-	-
20 mm	0-20	85-100	100	-	-
16 mm	-	-	85-100	100	-
12.5 mm	-	-	-	85-100	100
10 mm	0-5	0-20	0-30	0-45	85-100
4.75 mm	-	0-5	0-5	0-10	0-20
2.36 mm	-	-	-	-	0-5

Percentage by weight of aggregates.

S.No.		Uncrushed	Crushed
1.	Materials finer than 75 million I.S. Sieve.	3.00	3.00
2.	Coal and lignite	1.00	1.00
3.	Clay lumps	1.00	1.00
4.	Soft fragments	3.00	-
5.	Total of all the above substance	5.00	5.00

23. WATER

• Water used for both mixing and curing shall be free from injurious amounts of deleterious materials. Potable waters are generally satisfactory for mixing and curing concrete.

• In case of doubt, the suitability of water for making concrete shall be ascertained by the compressive strength and initial setting time test specified in I.S.456. The sample of water taken for testing shall be typical of the water proposed to be used for concreting, due account being paid to seasonal variation. The sample shall not receive any treatment before testing other than that envisaged in the regular supply of water proposed for use in concrete. The sample shall be stored in a clean container previously rinsed out with similar water.

- Average 28 days compressive strength of at least 3 Nos. Cm concrete cubes prepared with water proposed to be used shall not be less than 90% of the average strength of three similar concrete cubes prepared with distilled water.
- The initial setting time of test block made with the appropriate test cement and water proposed to be used shall not be less than 30 minutes and shall not differ more than plus/minus 30 minutes from the initial setting time of control test block, prepared with the appropriate test cement & distilled water. The test blocks shall be prepared and tested in accordance with the requirement of I.S. 4031.
- Where water can be shown to contain an excess of acid alkali, sugar or salt, Engineer-in-charge may refuse to permit its use. As a guide, the following concentration represent the maximum permissible values:-
- To neutralize 200 sample of water, using phenolphthalein as indicator, it should not require more than 2ml of 0.1 normal HCL. The details of test shall be as given in I.S. 3025.
- To neutralized 200 ml sample of water, using methyl orange s indicator, it should not required more than 10 ml of 0.1 normal HCL. The details of test shall be as given in I.S. 3025.
- Percentage of solids, when tested in accordance with the I.S. 025 shall not exceed the following:

I.S. Sieve percentage passing for graded aggregate Designation of normal Size.

	40 mm	20 mm	16 mm	12.5 mm
63 mm	100	-	-	-
40 mm	95-100	100	-	-
20 mm	30-70	95-100	100	-
12.5 mm	-	-	-	-
10 mm	10-35	22-55	30-70	40-85
4.75 mm	0-5	0-10	0-10	0-10
2.36 mm	-	-	-	-

24. CONSTRUCTION SAFETY

I.S. 3696 – Safety code for scaffolds & ladders (Part I & II).

25. MEASUREMENT

I.S.1200 - Methods of measurement of building works.

I.S. 3385 – Code of practice for measurement of civil engineering works.

26. OTHER REQUIREMENTS

In the event that state, city or other Govt. bodies have requirements more stringent than those set forth in this specifications, such requirements shall be considered part of specifications & it shall supersede these specifications where ever applicable.

27. GENERAL

The quality of materials and method and control of manufacture and transportation of all concrete work irrespective of mix. Whether reinforced or otherwise, shall conform to the applicable portions of this specifications.

The Engineer-in-charge shall have the right to inspect the source/s of material/s, the layout & operation of procurement & storage of materials, the concrete batching & mixing equipment, & the quality control system. Such as inspection shall be arranged by the contractor Engineer-in-charge approval shall be obtained, prior to starting of concrete work.

28. MATERIALS FOR STANDARD CONCRETE

The ingredients to be used in the manufacture of standard concrete shall consist solely of a standard type Portland cement, clean sand, natural coarse aggregate, clean water and admixtures, if specifically called for in the drawings or in the specifications.

CEMENT

a) Unless otherwise specified or called for by the Engineer-in-charge/Employer, cement shall be ordinary Portland cement in 50 kg bags. The use of bulk cement will be permitted only with the approval of the Engineer-in-charge, changing of brands or type of cement within the same structure will not be permitted.

b) A certified report attesting to the conformity of the cement to I.S. specifications by the cement manufacture's chemist shall be furnished to the Engineer-in-charge, if demanded.

Contractor will have to make his own arrangements for the storage of adequate quantity of cement. It will be the responsibility of the contractor to ensure adequate and proper storage. Cement in bulk may be stored in bins or silos which will provide complete protection from dampness, contamination & minimize caking and false set (storage under tarpaulins will not be permitted), well away from the outer walls & insulated from the floor to avoid contact with moisture, ground and so arranged to provide ready access damaged or reclaimed or partly set cement will not be permitted to be used and shall be removed from the site. The storage bins & the storage arrangements shall be such that there is no dead storage. No more than 12 bags shall be stacked any tier. The storage arrangements shall be approved by the Engineer-in-charge consignments of cement shall be stored as received & shall be consumed in the order of their delivery.

Cement held in storage for period of 90 days or long shall be tested, should at any time the Engineer-in-charge have reasons to consider that any cement is defective then irrespective of its origin &/or manufacturer's test certificate, such cement shall be tested immediately at a National Test Laboratory/ Approved Laboratory and until the results of such tests are found satisfactory, it shall not be used in any works.

Storage of Aggregates

All coarse and fine aggregates shall be stacked separately in stock piles on the material near the work site in bins properly constructed to avoid inner mixing of different aggregates. Contamination with foreign materials and earth during storage & while heaping the materials shall be avoided. The aggregates must be of specified quality not only at the time of receiving at site but more to at the time of loading into mixer. Rakers shall be used for lifting of the coarse aggregates from bins or stock piles. Coarse aggregates shall be piled in layers not exceeding 1.20 mtrs. In height to prevent coning or segregation. Each layer shall cover the entire area of the stock piles before succeeding layers are started. Aggregates that become segregated shall be rejected. Rejected material after remixing may be accepted, if subsequent tests demonstrate conformity with required gradation.

Specific Gravity

Aggregates having a specific gravity below 2.6 (saturated surface dry basis) shall not be used without special permission of the Engineer-in-charge.

FINE AGREGATE

Fine aggregate except as noted above, and for other than lightweight concrete shall consist of natural or crushed sand to I.S.383 the sand shall be clean, sharp, hard strong, and durable and shall be free from dust, vegetable substance, adherent coating, clay, loan, alkali, organic matter, mica, salt, or other delegations substances, which can be injurious to the setting qualities/strength/durability of concrete.

Machine made sand

Machine made sand will be acceptable, provided the constituent rock/gravel composition shall be sound, hard dense, non-organic, uncoated & durability of concrete.

Screening and Washing.

Sand shall be prepared for use by such screening or through washing, or both, as necessary to remove all objectionable foreign matter while separating the sand grains to the required size fractions. Sand with salt content more than 3 percent will not be permitted to be used unless the same is washed and the slit content is brought within 3% by weight. Fine aggregates conforming to grading zone IV shall not be used unless mix designs &

preliminary tests have shown its suitability for producing concrete of specified strength and workability.

Fineness Modules

The sand shall not have a fineness modules of less than 2.2 or more than 3.2 the fineness modulus is determined by adding the cumulative percentage retained on the following I.S. Sieve sizes (4.75 mm, 2.36 mm, 1.18 mm, 600 micron) and dividing the sum by 100.

COARSE AGGREGATE

Coarse aggregate for concrete except as noted & for other than light weight concrete shall conform to I.S. 383. This shall consist of natural or crushed stone & gravel & shall be clean and free from elongated flaky or laminated pieces adhering coatings, clay lumps, coal residue, clinkers, along, alkali, mica, organic matter or other deleterious matter.

29. PERMISSIBLE LIMIT FOR SOLIDS

Maximum Permissible Limit

- | | |
|---|--|
| a) Organic | 200 mg/1 |
| b) Inorganic | 3000 mg/1 |
| c) Sulphates (as SO ₄) | 500 mg/1 |
| d) Alkali Chloride (as Cl) | 200 mg/1 for plain concrete work & 1000 mg/1 for reinforced concrete work. |
| e) Suspended matter | 2000 mg/1 |
| f) The P.H. value of water shall generally be not less than 6.0 | |

30. REINFORCEMENT BARS

- a. Reinforcement bars shall be arranged by contractor and shall be cold twisted steel bars and high yield strength deformed bars as per as I.S. 1786, as shown and specified on the drawings. Wire mesh or fabric shall be in accordance with I.S. 1560. Substitution of reinforcement will not be permitted except upon written approval from the Engineer-in-charge.
- b. The reinforcement shall not be kept in direct contact with the ground but stacked on top of an arrangement of timber sleepers or the like. Reinforcement shall be coated with cement wash before stacking to prevent scale and rust. Fabricated reinforcement shall be carefully stored to prevent damage, distortion, corrosion and deterioration.
- c. Quality
- d. All steel shall be of Grade 1 quality unless specifically permitted by the Engineer-in-charge. No rerolled material will be accepted. If demanded by the Engineer-in-charge, contractor shall submit the manufacturer's test certificate for steel. Random tests on steel supplied by the contractor may be performed by Employer as per relevant Indian Standards. All costs incidental to such tests shall be at "contractor's expense" steel not conforming to specifications shall be rejected.
- e. All reinforcement shall be clean free from grease, oil, paint, dirt, loose mill scale, loose rust dust, bituminous materials of any other substances that will destroy or reduce the bond. Pitted & defective rods shall not be used. All bars shall be rigidly held in position before concreting. No welding of rods to obtain continuity shall be allowed unless approved by the Engineer-in-charge. If welding is approved the work shall be carried out as per I.S. 2751 according to best modern practices and is directed by the Engineer-in-charge. In all case of important connections, strength of bars welded with special precaution, as specified by the Engineer-in-charge shall be taken in welding of cold worked reinforcing bars & bars other than mild steel.
- f. Laps
- g. Laps & splices for reinforcement shall be as shown on the drawings splices in adjacent bars shall be staggered & the locations of all splices, except those specified on the drawings, shall not be lapped unless the length required exceeds the maximum available lengths of bars at site.
- h. Bending
- i. All bars shall be accurately bend according to the sizes & shapes shown on the detailed working drawings/bar bending schedules. They shall be bent gradually by machine or other approved means reinforcing bars shall not be straightened and bent in manner that will

injure the material bars containing cracks or splits shall be rejected. These shall be bent cold, except bars of over 25 mm in diameter which may be bent to if specifically approved by the Engineer-in-charge. Bars which depend for their strength on cold working shall not be bent hot. Bars bent hot shall not be heated beyond cherry red colour (not exceeding 654 degree C.) & after bending shall be allowed to cool slowly without quenching. Bars incorrectly bent shall be recent be such as shall not, in the opinion of the Engineer-in-charge injure the material. No reinforcement shall be bent when in position in the work without approval, whether or not it is partially embedded in hardened concrete. Bars having kinds or bends other than those required by design shall not be used.

j. Fixing

Reinforcement shall be accurately fixed by any approved means and maintained in the correct position shown in the drawings by the use of blocks, spacers, and chairs as per I.S. 2502 to prevent displacement during placing and compaction of concrete. Bars intended to be in contact at crossing point shall be securely bound together at all such point with number 1.6 gauge annealed soft iron wire. the vertical distances between required successive layers of bars in beams or similar members shall be maintained by the provision of mild steel spacer bars at such intervals that the main bars do not preceptly sag between adjustment spacer bars.

k. Cover to reinforcement

Unless indicated otherwise on the drawings, clear concrete cover for reinforcement (exclusive of plaster or other decorative finish shall be as follows:-

1. At each end of reinforcement bar not less than 25 mm nor less than twice the diameter of such bar.

2. For a longitudinal reinforcement bars in a column, not less than 40 mm nor less than the diameter of such bar. In the case of columns of minimum dimensions of 200 mm or under, whose reinforcing bars do not exceed 12 mm a cover of 25 may be used.

3. For a longitudinal reinforcement bars in a beam, not less than 25 mm nor less than the diameter of such bar.

4. For tensile, compressive, shear or other reinforcement in a slab, not less than 15 mm nor less than the diameter of such bar.

5. For any other reinforcement, not less than diameter of such bar

6. Increased cover thickness may be provided when surfaces of concrete members are exposed to the action of harmful chemicals as the case of concrete in contact with earth faces contaminations with such chemicals, acid, vapor, saline atmosphere, sulphurous smoke (as in the case of stream operated railways), etc. And such increase of cover may be between 15 mm and 50 mm beyond the figure in (1 to 5) above as may be specified by the Engineer-in-charge.

7. For reinforced concrete members totally immersed in sea water, the cover shall be 40 mm more specified in (1 to 5) above).

8. For reinforced concrete members periodically immersed in sea water, or subject to sea spray, the cover of concrete shall be 50 mm more than that specified in (1 to 5) above).

9. For concrete of grade M-25 and above, the additional thickness of cover specified in (6, 7 & 8) above) may be reduced to half. In all such cases the cover should not exceed 75 mm.

10. Projection to reinforcement in case of concrete exposed to harmful surroundings may also be given by providing a dense impermeable concrete with approved protective to the extra cover, mentioned in (6), (7) and (8) above, may be reduced by the Engineer-in-charge to those shown on the drawings.

11. The correct cover shall be maintained by cement mortar briquettes or other approved means reinforcement for footings, grade beams and slabs on sub grade shall be supported on precast concrete blocks as approved by the Engineer-in-charge. the use of pebbles or stones shall not be permitted.

12. The minimum clear distance between reinforcing bars shall be in accordance with I.S. 456 or as shown in drawings.

1. Inspection

- m. Erected & secured reinforcement shall be inspected and approved by Engineer-in-charge prior placement of concrete.
- n. For payment of work done under this item, the actual quantity of steel embedded in concrete as calculated and approved by the Engineer-in-charge, irrespective of the level or the height at which the work is done, shall be taken. The unit rate for reinforcement shall include all wastage, binding wire, etc. for which no separate payment shall be made laps shown in drawings as approved by the Engineer-in-charge and the reinforcement number of chars and space bars to keep the reinforcement in place and approved by the project Engineers shall be measured & paid for.

31. STEEL SHAPES ENCASED IN CONCRETE

Structural steel columns, beams girders and bracings to be encased in concrete shall be unpainted, if so indicated on the drawings. The encasing shall be done in concrete with 10 mm maximum size aggregate & a works cube strength not less than 15 N/sq mm at 28 days unless otherwise specified in drawings. The steel members shall be wrapped with galvanized wire mesh of the size indicated on the drawings. The Galvanized wire mesh shall be kept 20 mm from the edge or surface of the steel member will have a minimum cover of 50 mm unless otherwise indicated on the drawings. When clear cover to steel is more than 75 mm, mild steel bar and concrete with 20 mm coarse aggregate can be used.

32. DESIGN MIX CONCRETE

a) All reinforcement concrete in the works shall be “Design Mix Concrete” as defined in I.S. 456/1978. All “Design Mix Concrete” work to be carried out under these specifications shall be in grades designated as per table shown below:-

33. GRADE OF CONCRETE

Grade Designation	Specified Characteristics
	Compressive strength at 28 days. N/Sq mm
M 10	10
M 15	15
M 20	20
M 25	25
M 30	30
M 35	35
M 40	40

NOTE NO 1:- The characteristics strength is defined as the strength of materials below which not more than 5% of the test results are expected to fall.

NOTE NO 2:- In the designation of a concrete mix, letter M refers to the mix & the number to the specified characteristics compressive strength of 15 Cm cube at 28 days.

b) This mix shall be designation to produce the grade of concrete having the required workability and characteristics strength not less than appropriate values given in the table above.

34. b) Standard Deviation

Assumed Standard Deviation

Where sufficient test results for a particular grade of concrete are not available, the value of standard deviation given in table below may be assumed:-

35. ASSUMED STANDARD DEVIATION

Grade of concrete	Assumed Standard Deviation N/Sq m
M 10	2.3
M 15	3.5
M 20	4.6
M 25	5.3
M 30	6.0
M 35	6.3
M 40	6.6

36. PROPORTIONING, CONSISTENCY, BATCHING AND MIXING OF CONCRETE.

Proportioning

Aggregate

The proportions which shall be decided by conducting preliminary tests shall be by weight, there proportions of cement, fine and coarse Aggregate means of weight batches conforming to I.S. 2722 capably of controlling the weights within 1% of desired value. Except where it can be shown to the satisfaction of the Engineer-in-charge that supply properly graded aggregate of uniform quality can be maintained over the period of work , the grading of aggregate sizes & blending them in the right proportions. The different sizes shall be stocked in separate stock piles. The grading of coarse and fine aggregate shall be checked as frequently as possible, as determined by the Engineer-in-charge, to ensure maintaining of grading in accordance with the samples used in preliminary mix design. The material shall be stock piled well in advance of use.

Cement

The cement shall be considered by weight, for design mix.

Water

Only such quantity of water shall be added to the cement and aggregates in the concrete mix as to ensure dense concrete specified surface finish, satisfactory workability, consistent with the strength stipulated for each class, be such as not to cause separation of materials of the collection of excessive free water on the surface of the concrete.

Definition of water/Cement Ratio.

The water cement (W/C) ration is defined as the weight in the mix (including the surface moisture of the aggregates) divided by the weight of cement in the mix.

water/Cement Ratio

The actual water cement ration to be adopted shall be determined in each instance by contractor and approved by the Engineer-in-charge.

Proportioning by water/cement ratio

The w/c ratio specified for use by the Engineer-in-charge shall be maintained contractor shall determine the water content of the aggregates as frequently as directed by the Engineer-in-charge as the work progress and as specified in I.S. 2386 (Part III) & the mount of the mixing water added at the mixer shall be adjusted as directed by the Engineer-in-charge so as to maintain the specified w/c ratio. To allow for the variation in their moisture content, suitable adjustments in the weights of aggregates shall also be made.

12 b) Consistency & Slump

Concrete shall be of a consistency & workability suitable for the conditions of the job. After the amount of water required is determined, the consistency of the mix shall be maintained throughout the progress of the corresponding parts of the work and approved tests e.g. slump tests, compacting factory tests in accordance with I.S. 1199 shall be conducted from time to time to ensure the maintenance of such consistency.

The following tabulation gives a range of workability which shall generally be used for various types of construction unless otherwise instructed by Engineer-in-charge.

Placing Condition	WORKABILITY OF CONCRETE	
	Degree of workability	Value of workability
Concrete of shallow Sections with vibration	very low	20-10 seconds, vee bee time or 75-80 compacting factor
concrete of lightly reinforced sections with vibration	low	10-5 seconds, vee bee time or 80-85 compacting factor
concrete of lightly reinforced sections with vibration or heavily reinforced with vibrations	Medium	5-2 seconds, vee bee time or 85-95 compacting factor or 25-75 mm slump for 20 mm aggregate.
Concrete of heavy reinforced sections without vibrations	High	above 92, compacting factor or 75-125 mm slump for 20 mm aggregate

b) Batching & mixing of concrete

1. The proportions of the materials for the concrete mix as established by the preliminary test for mix design shall be allowed for all the concrete in the works & shall not be changed except when specifically permitted by the Engineer-in-charge.
2. The concrete may be produced by weight batching the ingredients may be preferred by the contractor. Mixer & the weight batcher shall be maintained in clean & serviceable condition, the accuracy of the weight batcher shall be maintained in clean & serviceable condition, the accuracy of the weight batcher shall be periodically be checked. Both mixer and the weight batcher shall be set up at a level on firm base and the hopper shall be loaded evenly. The needle shall be adjusted to zero when the hopper is empty. Fine & coarse aggregates shall be weighted separately.
3. Each time the work stops the mixer shall be cleaned out and when next commencing the mixing, the first batch shall have 10% additional cement to allow for striking in the drum.

SAMPLING AND TESTING CONCRETE IN THE FIELD

a) Facilities required for sampling materials and concrete in the field, if the Engineer-in-charge so desire shall be provided by the Contractor at no extra cost. The following equipment with operator shall be made available at Engineer-in-charge request (all must be in serviceable condition).

Cast iron cube moulds 15 cm size	- 6 Nos.
Slump cone complete with tamping	- 1 Set
Laboratory balance to weight upto 5 Kgs with Sensitivity of 10 gm	- 1 Set
I.S. Sieve for coarse & fine Aggregates	- 1 Set
A set of measures from 5.1 to 11	- 1 set
Electric oven with thermostat upto 120 Deg .C	- 1 No.
Pycnometer	- 1 No.
Calibrated glass jar 1 litre capacity	- 2 Nos.
Glass flasks & metal containers	- As required
Laboratory balance of 2 Kg capacity and of sensitivity of 1 gm.	- 1 no.

Sampling & strength test of concrete

1. Samples from fresh concrete shall be taken as per I.S. 1199-1959 and cubes shall be made cured and tested at 28 days in accordance with I.S. 516-1959.
2. In order to get a relatively quicker idea of the quality of concrete optional tests on beams for modulus of rapture at 72 plus or minus 2 hours or at 7 days or compressive strength tests at 7 days may be carried out in additional to 28 days compressive strength tests. For this purpose, the value give in table below may be taken for general guidance in the case of concrete made with ordinary Portland cement. In all cases, the 28 days compressive strength specified shall be the criterion for acceptance or rejection of the concrete. If, however, from tests carried out in particular job over a reasonable long period it has been established to the satisfaction of the Engineer-in-charge that a suitable ratio between 28 days compressive strength and the modulus of ruptures at 72 plus or minus 2 hours or 7 days or compressive strength, providing the expected strength values at the specified early age are consistently met.

OPTIONAL: TESTS REQUIRED OF CONCRETE

Grade of concrete	Compressive strength on 15 cm cubes, min. 7 days N/Sq. mm.	modulus of beam test, 72 plus or minus 2 hours N/Sq. mm	Rupture min at 7 days N/Sq. mm
M 10	07.0	1.2	1.7
M 15	10.0	1.5	2.1
M 20	13.5	1.7	2.4
M 25	7.0	1.9	2.7
M 30	20.0	2.1	3.0
M 35	23.5	2.3	3.2
M 40	27.0	2.5	3.4

Frequency of Sampling

A random sampling procedure shall be adopted to ensure that each concrete batch shall have a reasonable chance of being tested; that is, the sampling should be spread over the entire period of concreting and cover all mixing units.

Frequency

The minimum frequency of sampling of concrete of each grade shall be in accordance with the following:-

Quantity of concrete in the work, Cum	Number of samples
01-5	1
06-16	1
37. 16-30	38. 3
39. 31-50	40. 4
41. 51 - and above	42. 4 plus on additional samples for each additional 50 cum or part thereof

At least one sample shall be taken from each shift. However random sampling will also be done to ensure quantity work is being done.

d)) Test Specimen

Three test specimens shall be made from each sample for testing at 28 days. Additional cubes may be required for various purposes such as to determine the duration of concrete at 7 days or at the time of striking the frame work or to determine the duration of curing or so check the testing error. Additional cubes may also be required for testing cubes by accelerated methods as described in IS. 9013 -1978. The specimen shall be tested as described in IS.0516 - 1959.

e) Test Strength of Sample

The test strength of the sample shall be the average of the strength of three specimens. The individual variation should not be more than plus or minus 15% of the average.

CONSISTENCY

Slump test shall be carried out as demanded by Engineer-in-charge and invariably from the same batch of concrete from which the test cubes are made slump tests shall be done immediately after sampling.

**CHAPTER IV
FORM OF AGREEMENT**

This Agreement made the _____ day of 200____ between Messer _____ (herein after called “the Employer”) of the one part & Messer _____ of the second part _____ (herein after called “the contractor”) of the other part whereas the Employer is desirous that certain works should be _____ constructed , viz _____ and has accepted a Tender Submitted by the contractor for constructions, completion & maintenance of such work.

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:-

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the conditions of contract herein after referred to.
2. The following documents shall be deemed to form, and to be read, and construed as part of the Agreement, Viz:-
 - a). the said Tender Document & Appendix thereto.
 - b). Instructions to Tenderers & Notice Inviting Tender.
 - c). Letter of acceptance dated.
 - d) The conditions of contract (including special conditions).
 - e). The specifications.
 - f). The bill of Quantities.
 - g). the schedules.
3. In consideration of the payment to be made by the Employer to the contractor, the contractor hereby covenants with the Employer to construct, complete and maintain the works in conformity in all respects with the provisions of the contract.
4. The Employer hereby covenants to pay the contractor in consideration of the construction, completion & maintenance of the work, the contract price at the times and in the manner prescribed in the contract.

IN WITNESS whereof the parties hereto have caused their respective common seals to be hereunto affixed (or have hereunto set their respective hands and seals) on the day and year first above written.

Signed by _____
for & on behalf of the contractor in the presence of

Signature _____

Name _____

Address _____

Occupation

Signed by _____
for & on behalf of the Employer in the presence of

Signature _____

Signature _____

Address _____

Occupation

BILL OF QUANTITIES

Name of work:- Repairs and Renovation of Restaurant Block, Shopping Kiosks, Booking Counter and Painting to outer Chain Link Fencing and railing around Lilly Pools at Lake View Resort Gatha.					
Adv. Cost: 4.55 lacs		Ref to NIT : NIT No 04 of 09/2016 S. No 4		Item rate to be quoted by the tenderer	
S. No	Description	Unit	Qty	Rate in figure	Rate in words
1	Applying priming coat with ready mixed pink or grey primer of approved brand and manufacturer on wood work (hard and soft wood)	sqm	334.56		
2	Applying priming coat with ready mixed red-oxide zinc chromate primer of approved brand and manufacture on steel galvanised iron/steel work	sqm	154.00		
3	Distempering with oil bound washable distemper of approved brand and manufacture to give an even shade ne or more coat on old work.	sqm	290.00		
4	Finishing wall with water proofing cement paint of required shade old work one or more coat applied @ 2.20 kg per 10 sqm	sqm	283.00		
5	Painting with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade one or more coat on old work .	sqm	358.12		
6	Polishing on wood work with French spirit polishing of approved brand and manufacture with one or more coats on old work.	sqm	377.49		
7	Finishing walls with textured exterior paint of required shade old work one or more coats applied @ 1.82 ltr/10 sqm	sqm	212.96		

8	Painting on steel work with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade one or more coat on old work.	sqm	2017.00		
9	Marble work gang saw cut (polished and machine cut for wall lining (Veneer work) in cement mortar 1:3 (1cement :3 coarse sand) including pointing with white cement mortar 1:2 (1white cement :2 marble dust) with an admixture of pigments to match the marble shade (16mm thick) Raj Nagar plain white marble /Udhayapuri green marble /zebra black marble .	sqm	40.48		
10	Providing and laying interlocking precast cement concrete coloured tiles of thickness not less than 60--70 mm in footpath & courtyard jointed with neat cement slurry mixed with pigment to match the shade of the tile laid over a bed of cement mortar 1:4 mix (1cement: 4 coarse sand) and finishing complete. including carriage of material from source up to site of work complete.	sft	624.00		

Note: Any typographical error in respect of unit, Qty, or nomenclature the same shall be corrected and paid as per estimate.

Signature of the Contractor

**Executive Engineer
Bhadarwah Dev. Authority**