U.P. JAL NIGAM, SULTANPUR

E-TENDER – DOCUMENTS ON TURNKEY BASIS FOR SULTANPUR NAGAR PALIKA PARISAD RE-ORGANISATION WATER SUPPLY SCHEME (REMAINING WORKS UNDER AMRUT) IN SULTANPUR CITY

NAME OF WORKS:- Supply of all materials, labours and T&P for laying and jointing of distribution system, making house connections and installation of domestic water metre complete (civil works) and also including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works in Sultanpur city under AMRUT Programme.

Earnest Money	:	Rs. 19,00,000.00 (Rs. Nineteen Lacks only)
Tender Cost	:	Rs. 22,400.00 (Rs. 20,000+GST @12%) (Rs. Twenty Two Thousand Four Hundred only)
Last Date of Bid Submission	**:**	**31-07-2018 up to 15:00 Hrs**
Date of Opening of Bid	**:**	**01-08-2018 at 14:00 Hrs**

EXECUTIVE ENGINEER
ADD. CONST. DIVN.
U.P. JAL NIGAM
SULTANPUR

INDEX

E-TENDER DOCUMENT

Technical & Financial Evaluation - cum - Technical Bid

(PRE - QUALIFICATION BID)

NAME OF WORK:- Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete(civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city under AMRUT Programme.

(ON TURN KEY BASIS)

Cost of works put to tender	:	As per schedule 'G'
Cost of Tender Document (Tender fee)	:	22,400.00 Including taxes (as applicable on date of submission)
Earnest Money	:	Rs. 19.00 Lacs
Time of Completion	:	Twelve Months
Trial run period	:	Four Months
Defects liability period	:	12 months after completion of Trial run
Validity of Bid (Tender)	:	120 Days
E-TENDER SCHEDULE		
Availability of the tender document on the U.P. Govt's e-procurement website https://etender.up.nic.in	:	23.07.2018 by 17:00 hrs.
Date of Pre-Bid Conference	:	26.07.2018 13:00 hrs.
Date of Bid submission End of tender document.	:	31.07.2018 till 15:00 hrs.
Date of opening of Pre- qualification cum technical bid.	:	01.08.2018 at 14:00 hours
Date/time of opening Price Bid through E-Tender procurement solution	:	This information shall be displayed on the website after scruteny of document and approval of Pre- qualification bid.
Place of submission of original EMD & cost of tender document	:	Office of the Excutive Engineer Add. Construction Divisioin, U.P. Jal Nigam, Sultanpur. Upto one day before the opening of prequalification Bid.
Name of Bank & Account No. of Excutive Engineer Add. Construction Divisioin, U.P. Jal Nigam, Sultanpur, In case EMD & FEE is to be deposited in the bank account directly (if Bidder/contractor desires)		Union Bank of India A/c No. 503002010005861 IFSC Code. UBIN0550302
Place of opening of Pre-qualification Bids		Office of Superintending Engineer, Construction Circle, UPJN, Faizabad

SECTION-I

GENERAL

Excutive Engineer Add. Construction Divisioin, U.P. Jal Nigam, Sultanpur. On behalf of Chairman, Uttar Pradesh Jal Nigam (U.P.J.N.) hereby invites bids for the following work on turn-key basis from established independent contractors/contracting firms from India who are having adequate capabilities and experience of similar nature work as required in the bid documents.

1.0 **"**Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete(civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city under AMRUT Programme". On turnkey basis.

1.01 The above scheme is meant to augment Water Supply to Nagar Palika Parisad Sultanpur.

1.02 The Completion period of the works is Twelve months, excluding four months trial run and testing. Twelve months of Defect Liability Period will start After testing and run.

1.03 Applicants are advised to read bid documents carefully and inspect the site of work before quoting the rates.

1.04 The rates must be coted in English.

1.06 U.P. Jal Nigam intends to shortlist the Contractors / Firms who fulfill the minimum qualifying criteria. Financial bid of only those bidders shall be opened who qualify the criteria acording to terms and conditions of bid document

1.07 Chief Engineer (Fzd Zone) U.P. Jal Nigam, faizabad reserves the right to make modification to the design concept and the proposed time of tendering. The decision of the Chief Engineer (Fzd. Zone), Uttar Pradesh Jal Nigam, faizabad will be final & binding.

1.08 Contractors who wish to bid for the works must have the technical know-how, standing experience and proven reputation in design and execution of similar type of works including construction of other associated work. They should be able to show satisfactory evidence of successful completion & satisfactory performance of such type of works.

1.09 The applicant must sign on all pages of the completed Tender Document.

1.10 Responding to bid is entirely the applicant's responsibility and no financial compensation or reimbursement can be expected from U.P. Jal Nigam on such account. Documents, which are received late, will not be considered.

1.11 The applicant firm should not be a B.I.F.R. referred company.

SECTION-II

SCOPE OF WORK

INTRODUCTION

Sultanpur city lies on the National Highway No. 56 Lucknow - Varansi. Sultanpur city is district headquarter. District Sultanpur covers area of 4424 sq. km it is located in Middle –East of the state. Sultanpur district is srrounded By district Ambedkar Nagar and Jaunpur on the East , on the West district Raibarely and Barabanki are situted, on north district Faizabad and the South district Pratapgarh and Amethi . Sultanpur , the district headquater is situted on the bank of river Gomti flowing from west to east along nothren boundery of the town .It is about 60 km from faizabad. The town is well conntected to Lucknow Allahabad faizabad and Varansi through Roads and Rails. Distance of Sultanpur form Lucknow capital of Uttar Pradesh is about 140 km.

DETAILS OF WORKS INCLUDED IN THE SCHEME

The main objective of the sanctioned project is to supply fo proper drinking water to Sultanpur City.**The details of works are as below**:

"Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete(civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city " On turnkey basis.

SCOPE OF WORK UNDER THIS CONTRACT

The scope of work under this contract is:

"Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete(civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city. Following are the components proposed in this scheme.

(A) Civil Works

1. **Zone Wise Ditails of Distribution System**

Sr No	CITY	Provision in AMRUT PROGRAME						
		Type/ Class/ Size of Pipe	Name of Zone					
1.	SULTANPUR	**DI K-7**						
			1A	1B	2A	2B	3	TOTAL (in Mt.)
		450MM	0	0	0	0	0	0
		400MM	0	0	0	0	0	0
		350MM	0	0	0	0	0	0
		300MM	529	172	23	954	0	1678
		HDPE Pipe Grade PN-6/PE-100						
		250MM	404	0	0	47	0	451
		225MM	102	115	109	0	0	326
		200MM	75	83	125	0	0	283
		180MM	976	136	120	352	0	1584
		160MM	147	0	67	764	91	1069
		140MM	407	109	150	156	416	1238
		125MM	388	78	0	105	978	1549
		110MM	35934	20676	15268	6400	18677	96955
		TOTAL	38962	21369	15862	8778	20162	105133

2. **MAKING OF WATER SUPPLY HOUSE CONNCTIONS – 4416 Nos.**
3. **INSTALLATION OF DOMESTIC WATER METER – 1471 Nos**

(B) E/M Works

Automation through SCADA OF 23Nos .T.W. , 05 Nos OHT and 02 Nos ZPS and other related E/M works.

Testing, commissioning and maintenance of work as provided in the contract documents.

The contractors are advised to go through the specifications carefully and acquaint themselves with the nature of work, the difficulties likely to be encountered during the execution of work before tendering their rates. They should make sufficient provision in their rates to overcome such difficulties. The price offered in schedule G should be inclusive of cost of all materials, labour, T&P and all taxes whether levied by Central Govt. or State Govt. or local Authorities during currency of the contract etc as no claim or compensation on these accounts shall be entertained. The rate quoted should also include the maintenance period of the road reinstatement for two years. During maintenance period, the contractor will have to repair the road reinstatement work within a week of receipt of order by letter/e-mail from engineer in charge. No extra payments should be made to contractor for maintaining the roads for two years after the completion of works, the reinstatement of which has been performed by the contractor.The contractor should clearly understand that he will have to make his own arrangements for the T&P, equipments, water for construction & testing and all other accessories that may be required for proper completion of the work.

The scope of work also includes diversion of drains, diversion of traffic, display of caution boards, arrangement of caution lights in the night etc. reinstatement of water pipe line, cleaning of side drain filled by excavated earth etc, as mentioned elsewhere, for which no extra payment shall be made to the Contractor. The Contractor should make sufficient provision for these works in his rates. The contractor should make all arrangement for the safety of Public and Private Property for convenience of public at the time of execution of work.

SECTION-III

INSTRUCTIONS TO THE BIDDERS

Tenders for the above cited work are being invited through E-Tendering system.

1. Along with publication in news papers the Notice Inviting Tender (NIT or E-Tender Notice) for the aforesaid project shall also be available on the e-procurement website "*https://etender.up.nic.in*"and U.P. Jal Nigam's website "*www.upjn.org*".

2. For participating in tenders through the E-Tendering system, it is necessary for bidders to be registered users of the e-procurement website "*https://etender.up.nic.in*" and the bidders should possess valid class-2 /class-3 digital signature certificates (DSC).Subsequent clause 42 and 43 provide guidance regarding registration and DSC for bidders new to this system.

3. Bidders shall bear all costs associated with the preparation and submission of their e-bid and U.P. Jal Nigam will, in no case,be responsible or liable for these costs, regardless of the conduct or outcome of the E-Tender process.

4. This e-tender document shall remain available on the web site *https://etender.up.nic.in* from the download/sale start date and time till the download/sale end date and time of as mentioned in the E-Tender schedule,so as to enable the bidders to view and download the E-TenderDocument.

5. U.P. Jal Nigam requires that **bidders observe the highest standard of ethics during theprocurement and execution of such contracts**. In pursuance to this policy, **U.P. Jal Nigan will reject a proposal for award if it determines that the bidder/contractor has been engaged in corrupt or fraudulent practices in competing for the contract under reference**.

6. **Conflict of Interest** : The bidder/contractor(including all members of a joint venture) shall not be one of the following:

   (a) A firm or an organization which has been engaged by U.P. Jal Nigam to provide consult-ing services for preparation related to procurement for or implementation of this project;

   (b) Any association/affiliates (inclusive of parent firm) of a firm or an organization mentioned in subparagraph (a) above; or

   (c) A firm or an organization who lends, or temporarily seconds its personnel to firms or organizations which are engaged in consulting services for the preparation related to procurement for or implementation of the project, if the personnel would be involved in any capacity of the same project.

   (d) A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to be in a conflict of interest with one or more parties in the bidding process if including but not limited to:

      (a) They have controlling shareholders in common; or

(b) They receive or have received any direct or indirect subsidy from any of them; or

(c) They have the same legal representative for purposes of this bid; or

(d) They have a relationship with each other, directly or through common third parties, that puts them in a position to have access to material information about or improperly influence on the bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or

(e) A Bidder participates in more than one bid in this bidding process

7. Bidder shall not be a registered member of Bar Council.

8. Bidder must be registered with U.P. Jal Nigam in **Class**- "A" Turn key projects category (Water Supply) with class A. The bidders who are not registered with UP Jal Nigam but have experience of similar work may also participate in Bidding Process Provided they will get themselves registered with UP Jal Nigam in appropriate Class before opening of the Pre Qualification bid and Failing which their earnest money will be forfeited in favor of UP Jal Nigam.

9. U.P. Jal Nigam/P.W.D. specifications, I.S. codes, CPHEEO Manual on Water Supply or better shall be followed during execution of work, recording measurements and making payment.

10. The quantities are approximate and can vary to any extent on either side. No extra claim shall be entertained on this account. The contractor will be paid on the basis of the actual measurement of finished item of work, executed by him.

11. The department reserves the right to accept or reject any e-bid or annul the e-bid process or reject all e-bids at any time prior to award of contract,without assigning any reason and without thereby incurring any liability to the affected bidder or bidders.

12. The bidders are advised:-

(a) To visit the site of work so as to study and ascertain local conditions with particular reference to access road and infrastructure facilities, the market availability of materials and their sources, labour (skilled and unskilled) and layout plan of water works etc. and all relevant factors which might affect their rate and to quote rates accordingly.

(b) To read carefully the specifications, terms and conditions, work out their own quantities and rates from the drawing and site conditions before quoting the rates.

(c) Bidders are advised to quote their rates including cost of GST and other taxes.

TENDER FEE, EARNEST MONEY DEPOSIT AND ITS SUBMISSION:

13. Bidders shall have to pay e-tender document fee of Rs. 22,400.00 (Rs. Twenty Two Thousand Four Hundred Only) Including taxes (as applicable on the date

of submission) through demand draft issued by any nationalized bank of India, payable in favour of Excutive Engineer Add. Construction Divisioin, U.P. Jal Nigam, Sultanpur payable at Office of Excutive Engineer Add. Construction Divisioin, U.P. Jal Nigam, Sultanpur upto one day before the opening of prequalification bid.

OR

14. If the contractor desires, He may Deposit the cost of the tender document directly in bank account Union Bank of India A/c No. 503002010005861 IFSC Code- UBIN0550302 of **Excutive Engineer Add. Construction Divisioin, U.P. Jal Nigam, Sultanpur.** In this case, they have to Upload Scanned Copy of the Deposit Reciept Slip with the tender document.

15. Bidders shall furnish, as part of e-bid, an Earnest Money Deposit (EMD) of Rs. 19.00 Lacs (Rs. Ninteen Lacs only) in from of CDR/FDR/NSC/B.G issued by any nationalized bank of India, pledged in favour of **Excutive Engineer Add. Construction Divisioin, U.P. Jal Nigam, Sultanpur**. The EMD shall be valid for a period of 180 days from the date opening of Technical & Financial Evaluation - cum - Technical Bid (Pre-qualification bid).

OR

16. If the contractor desires, He may Deposit the Earnest Money Deposit directly in bank account **(Union Bank of India A/c No. 503002010005861 IFSC Code- UBIN0550302)** of **Excutive Engineer Add. Construction Divisioin, U.P. Jal Nigam, Sultanpur** In this case, they have to Upload Scanned Copy of the Deposit Reciept Slip with the tender document.

17. Original demand draft / banker's cheque for e-tender document fee and CDR/FDR for EMD must be dropped at the Office of the **Excutive Engineer Add. Construction Divisioin, U.P. Jal Nigam, Sultanpur** in a sealed envelope addressed to office of the **Excutive Engineer Add. Construction Divisioin, U.P. Jal Nigam, Sultanpur** superscribed"E-Tender Fee & Earnest Money **"**Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete(civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city" On turnkey basis.

Upto one day before the date and time specified for opening the prequalification bid in e-tender schedule. Bidders may please note very carefully that e-bids without e-tender document fee and EMD in the prescribed form shall be treated as non-responsive and shall be rejected.

18. E-tender document fee is non-refundable.

19. Earnest money of unsuccessful bidders will be returned as promptly as possible after the acceptance of tender, but not later than 180 days after the expiration of the period of bid validity.

20. Successful bidder's EMD if not submitted in the form of BG (Bank Guarantee) will be adjusted against the security money to be deposited at the time of signing of the agreement. In case, the successful bidder furnishes the required security money in full at the time of signing of the agreement, the earnest money submitted with the bid will be returned when the agreement has been signed.

21. No interest will be payable by the U.P. Jal Nigam on the Earnest Money or Security Deposit or any other amount withheld/deducted as per terms of the contract.

THE TENDER DOCUMENT

22. The e-tender document for the e-tender under reference comprises of following two parts :

(A) **PART-I**: **Technical & Financial Evaluation cum Technical Bid** (Pre-qualificationbid). This part will comprise of :

i) **Technical & Financial Evaluation Cum Technical Bid Document**- Instruction to Bidders & Other Details.

ii) **Technical & Financial Evaluation Cum Technical Bid Document** – General Conditions.

iii) **Technical & Financial Evaluation Cum Technical Bid Document** – Technical Specifications.

(i) Fee details – It includes of the cost of tender document and prescribed earnest money in prescribed form. A scanned copy of demand draft or banker's cheque for e-tender document fee and CDR/FDR/NSC /BGfor EMD in PDF format must be uploaded along with Part-I of the e-bid.

(ii) Qualification Details – It includes copies of required documents in PDF format establishing that the bidder is qualified to perform the contract if his/her bid is accepted and the bidder has financial & technical capability necessary to perform the contract and meets the criteria outlined in 'requirements of pre-qualification' and fulfill all the conditions of the contract and elsewhere in the tender.

(B) **PART-II** : **Financial bid / Price bid -** This part will comprise of :

(i) Schedule of Works / Bill Of Quantity (BOQ) – It includes schedule of works / BOQ in .xls format which will be available with the tender document in PDF format but is to be filled in online on the web platform of "*https://etender.up.nic.in*".in directly.

23. **Language of e-bid**: The e-bid prepared by the bidder, as well as all correspondence and documents relating to the e-bid, exchanged by the bidder and the department shall be written either in English or Hindi language. The correspondence and documents in Hindi must be accompanied by embedded/separate Hindi font files. Only English numerals shall be used in the e-bid. If any other language is used, it shall be accompanied by a translation into English/Hindi language, duly signed and certified by bidder, as the true translation, which will be used for interpreting the information.

24. **Currency of e-tender**: All costs/prices/rates cited in e-tender document are in Indian Rupee.

25. **Amendment(s) of e-Tender Document** :

(i) At any time prior to the deadline for submission of e-bid, the department may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, modify the e-tender document by amendment(s). For such amendment(s) written 'Addendum/Corrigendum(s)'shall be issued copy of which shall be simultaneously uploaded on the e-procurement website https://etender.up.nic.in and U.P. Jal Nigam's website www.upjn.org.All such Addendum/corrigendum(s)shall become an integral part of e-tender document. The relevant clause(s) of the e-tender document shall be treated as amended accordingly.

(ii) It shall be the sole responsibility of the prospective bidders to check the website http://etender.up.nic.in regularly for amendment(s), if any, in the e-tender document, failing which the responsibility of any error arising out of such negligence shall rest with the bidder.

(iii) In order to allow prospective bidders a reasonable time to take the amendment(s) into account in preparing their e-bids, U. P. Jal Nigam, at its discretion, may extend the deadline for the submission of e-bids. Such extension(s) shall be uploaded on the e-procurement website http://etender.up.nic.in, and department's website www.upjn.org.

26. **Bid Validity period**: e-bid shall remain valid for 120 days after the actual date of opening of Technical & Financial Evaluation Cum Technical bid. In case, however,the day upto which the bid is to remain valid happens to be a public holiday/is declared public holiday for Govt. offices, the bid shall remain valid for acceptance till the next working day.In exceptional circumstances, the department may solicit the bidder's consent to an extension of the period of e-bid validity. The request and the response thereto shall be made in writing. A bidder may refuse the request without forfeiting his/her e-bid Security (EMD). A bidder granting the request will not be required nor permitted to modify his/her e-bid.

27. **Forfeiture of EMD** : Earnest money deposit shall be forfeited

(i) If the bidder (a) withdraws his/her e-bid during the period of e-bid validity as specified above or (b) does not accept the correction of errors or (c) modifies its e-bid price during the period of e-bid validity.

(ii) In case of a successful bidder, if the bidder fails to sign the contract with the department.

PREPARATION & SUBMISSION OF BID

28. The tender/bid submission module of e-procurement website *https://etender.up.nic.in* shall enable the bidders to submit their duly filled e-bids online in response to this e-tender from the bid submission start date and

time till the bid submission end date and time stipulated in the e-tender schedule.

29. Bidders may please note very carefully that till such time that a fresh agreement is drawn up embodying the agreed conditions, the conditions given in this tender document shall govern the contract.

30. Bidders are required to examine carefully site conditions, all instructions, forms, terms & conditions and specifications in the e-tender document and prepare the tender in accordance with requirements thereof. Failure to furnish all information as per the e-tender document or submission of e-bid not responsive to the e-tender document in every respect will be at the bidder's risk and shall result in rejection of the said e-bid.

31. A bid deviating in any respect from the condition etc. specified in this tender documents or found to be containing terms/conditions other than those in tender documents, shall be taken as a conditional bid and shall be liable for rejection.

32. **Format of e-bid**: The bidder shall prepare one electronic copy of the Technical & Financial evaluation cum Technical bid e-bids Part-I and financial e-bid Part-II each separately.

33. Any corrections in the documents/bank instruments, if required at all, shall be countersigned by the bidder/bank official.

34. The documents designated to be uploaded shall be physically signed at all places indicated.

35. **Signing of e-bid**: The e-bid document shall be digitally signed, at the time of uploading, by the bidder or a person or persons duly authorized to bind the bidder to the contract. All the pages/documents of the e-bid that are to be uploaded shall be digitally signed by the person authorized to sign the e-bid.The individual, physically and digitally signing the tenders and/or other documents, should be either :

    (i) The sole proprietor of the firm or constituted attorney of such sole proprietor.

    (ii) Constituted attorney of the firm, if it is a company under the meaning of Company Law, a scanned copy of the power of attorney should be attached.

    (iii) Managing Director/President/Chairman/Company Secretary in case of a Limited Co. having authorization for committing the company from its Board of Director or as is required under Company Law.

    (iv) President or Secretary in case of registered co-operative society having such power through Law/Bylaws or by special resolution.

Scanned copy of the sole proprietorship declaration/power of attorney/ authorization /resolution / bylaws, as the case may be, must be submitted with Part-I of e-bid. This document shall not be more than one year old as on date of opening of

Technical & Financial evaluation cum Technical bid. It should also contain address and mobile number of authorized person.

36. **Rates**:

(a) The tendered rate/the total bid price shall include supply of all materials, labour, T&P at the site of work, which are required for execution of the item of works as mentioned in 'Part-II Financial Bid - Schedule of Works/BOQ' as per design, drawings and specifications and other terms and conditions mentioned in the tender documents. It shall also include cost of water, fencing, lighting,display of caution boards, arrangement of caution lights in thenight, traffic diversion, diversion and safety andreinstatement of existing water supply lines, sewer lines, drains, telephone/datacables, electric cables, miners, passage to existing buildings, cleaning of "nalis" (side drains in streets) which are obstructed due to execution of work, if required, and reinstatement of all public amenities which are disturbed during execution of work, which may become necessary for complete execution of the works to the satisfaction of the Engineer. No claims, whatsoever, will be entertained on this account later on.

(b) Provision shall be made in the rates for making the layout, construction of level pillars and removal of debris from the alignment and grass etc. for the proper execution of work, construction of a site office and arrangement of a vehicle (Four wheeler) for easy movement of site in charge to Site of work, as no extra payment will be made for these.

(c) The bidder should keep in view the fluctuation in market rates during the time of acceptance of tender and during the entire period of execution of contract. Being a firm tender, no claims, what so ever, will be entertained on this account.

(d) The bidders must tender their rates including GST, other taxes, levies other duties and including cess at prevailing rates.

(e) The bidders should pass on ITC in favour of UP Jal nigam in their tendered rates.

37. Bidder has to quote the total bid price for complete works given in 'Part-II Financial Bid Schedule of Works /BOQ',cost of works put to tender by bidder shall include all essentialities required for proper completion of work, whether clearly mentioned in BOQ or on turn key basis. No extra claims shall be entertained on this account.

38. The submission of a bid shall be taken as an evidence and confirmation that the bidder has acknowledged all the instructions, terms & conditions, specifications and all other provisions of the tender documents and has fully acquainted himself with site conditions and all factors which may influence the preparation of his tender for the work up to the completion.

39. Bids with absurd rates shall be liable to rejection.

40. The contractor shall be liable for all arrangement for the safety of Public and Private Property for convenience of public at the time of execution of work. The

contractor shall be responsible for damage done to any telephone cable and water pipe line etc and will pay to concerned department, the damage & repair charges for the same.

41. For participating in e-bid through the e-tendering system it is necessary for the bidders to be the registered users of the e-procurement website https://etender.up.nic.in. The bidders must obtain a User Login ID and Password by registering themselves with U.P. Electronics Corporation Ltd.,10 Ashok Marg, Lucknow, if they have not done so previously for registration.

42. In addition to the normal registration, the bidder has to register with his/her digital signature certificate (DSC) in the e-tendering system and subsequently he/she will be allowed to carry out his/her e-bid submission activities. Registering the digital signature certificate (DSC) is a one-time activity. Before proceeding to register his/her DSC, thebidder should fist log on to the e-tendering system using the user login option on the homepage with the login ID and Password with which he/she has registered.

    For successful registration of DSC on e-procurement website https://etender.up.nic.in the bidder must ensure that he/she should possess Class-2/Class-3 DSC issued by any certifying authorities approved by Controller of Certifying Authorities, Government of India, as the e-procurement website https://etender.up.nic.in is presently accepting DSC issued by these authorities only. The bidder can obtain user login ID and perform DSC registration exercise above even before e-bid submission date starts. The department shall not be held responsible if the bidder tries to submit his/her e-bid at the moment before end date of submission but could not submit due to DSC registration problem.

43. The bidder can search for active tenders through "search active tenders" link, select a tender in which he/she is interested in and then move it to 'My Tenders' folder using the options available in the e-bid submission menu. After selecting the tender, for which the bidder intends to e-bid, from "My tenders" folder, the bidder can place his/her e-bid by clicking "pay offline" option available at the end of the view tender details form.Beforethis, the bidder should download the e-tender document and price schedule/bill ofquantity (BOQ) and study them carefully. The bidder should keep all the documents ready asper the requirements of e-tender document in the PDF format except the price schedule /bill of quantity (BOQ) which should be in the PDF format.

44. After clicking the 'pay offline' option, the bidder will be redirected to terms and conditions page. The bidder should read the terms & condition before proceeding to fill in the tender fee and EMD offline payment details. After entering and saving the tender fee and EMD details form so that "bid document preparation and submission" window appears to upload the documents as per technical (fee details, qualification details, e-bid form and technical specification details) and financial (e-bid form and price schedule/BOQ)

    schedules/packets given in the tender details. The details of the demand draft or any other accepted instrument which is to be physically sent in original before

opening of technical e-bid, should tally with the details available in the scanned copy and the date entered during e-bid submission time otherwise the e-bid submitted will not be accepted.

45. Next the bidder should upload the technical e-bid documents for fee details (e-tender fee and EMD), Qualification details. Before uploading, the bidder has to select the relevant digital signature certificate. He/she may be prompted to enter the digital signature certificate password (PIN), if necessary. For uploading, the bidder should click "browse" button against each document label in technical and financial schedules/packets and then upload the relevant PDF files already prepared and stored in the bidder's computer.The required documents for each document label of technical (fee details, qualification details, e-bid form and technical specification details) and financial (e-bid form and price schedule/BOQ) schedules/packets can be clubbed together to make single different files for each label.

46. The bidder should click "Encrypt" next for successfully encrypting and uploading of required documents. During the above process, the e-bid documents are digitally signed using the DSC of the bidder and then the documents are encrypted/locked electronically with the DSC's of the bid openers to ensure that the e-bid documents are protected, stored and opened by concerned bid openers only.

47. After successful submission of e-bid document, a page giving the summary of e-bid submission will be displayed confirming end of e-bid submission process. The bidder can take a printout of the bid summary using the "print" option available in the window as an acknowledgement for future reference.

48. The bidders are strongly advised to undergo training regarding submitting of e-tendersat U.P. Electronics Corporation Ltd., 10, Ashok Marg, Lucknow at any working day, which is free of cost. The training given to them regarding submitting of e-tenders is to befollowed strictly while submitting their bids. Notwithstanding the contents ofrelevant paragraphs regarding bid submission / withdrawal, training given by U.P. Electronics Corporation Ltd., regarding submission/withdrawal/re-submission of e-tenders will be final.Responsibility of having adequate knowledge of the process and latest changes incorporated, if any, rests with the bidder and the department shall not, in any manner, be responsible for any error or non-submission/withdrawal of a bid on this account.

49. **Deadline for submission of e-bid:** e-Bid (Part-I&Part-II Financial Bid) must be submitted /uploaded by bidders at e-procurement website *https://etender.up.nic.in* not later than the time specified on the prescribed date.The server time displayed in the Bid management window on the e-procurement website *https://etender.up.nic.in* will be the timeby which the-bid submission activity will be allowed till the permissible date and time scheduled in the e-tender. Once the e-bid submission date and time is over, the bidder can not submit his/her e-bid. The department may, at its discretion, extend this

deadline for submission of e-bid by amending the e-bid document, in which case all rights and obligations of the department and bidders previously subject to the deadline will thereafter be subject to the deadline as extended. Bidders are advised to start bid submission process well in advance so that they can submit their bids in time. Delay in submission of bid due to any reason during e-bid submission process, shall be responsibility of the bidder.

50. **Withdrawal and Resubmission of e-bid** :

(i) At any point of time, a bidder can withdraw his/her e-bid submitted online before the bid submission end date and time. For withdrawing the bidder should first log in using his/her login ID and Password and subsequently by his/her digital signature certificate on the e-procurement website https://etender.up.nic.in. The bidder should then select "My bids" option in the bid submission menu. The page listing all the bids submitted by the bidder will be displayed. Click "View" to see the details of the bid to be withdrawn. After selecting the "bid withdrawal" option the bidder has to click "Yes" to the message "Do you want to withdraw this bid?" displayed in the bid information window for the selected bid. The bidder also has to enter the bid withdrawing reasons and upload the letter giving the reasons for withdrawing before clicking the "Submit" button. The bidder has to confirm again by pressing "OK" button before finally withdrawing his/her selected e-bid.

(ii) No e-bid may be withdrawn after the deadline for submission of e-bids during the period of e-bid validity. If a bidder desires to withdraw his tender before the expiry of the validity period, the department may agree to allow such withdrawal but in such a case the earnest money shall be forfeited. If the department does not allow such withdrawal and accepts the tender and the bidder fails to perform his part of the contract, the earnest money deposited shall be forfeited besides other consequences for breach of the contract.

(iii) The bidder can re-submit his/her e-bid as when required till the e-bid submission end date and time. The e-bid submitted earlier will be replaced by the new one. The earnest money details submitted by the bidder earlier will be used for the revised tender and the new bid summary generated after the successful submission of the revised tender will be considered for evaluation purpose. For resubmission, the bidder should first log in using his/her login ID and Password and subsequently by his/her digital signature certificate on the e-procurement website https://etender.up.nic.in. The bidder should then select "My bids" option in the bid submission menu. The page listing all the bids submitted by the bidder will be displayed. Click "View" to see the detail of the e-bid to be resubmitted. After selecting the "bid resubmission" option, click "Encrypt & upload" to upload the revised e-bids documents.

(iv) The bidders can submit their revised e-bids as many times as required by uploading their e-bid documents within the scheduled date & time for submission of e-bids.

(v) No e-bid can be resubmitted subsequently after the deadline for submission of e-bids. No request for consideration of any alteration in finally submitted offer shall be entertained.

51. In case of any change in Cash assets, Technical staff, Tools & Plants or change in partners, or constitution of a Company, address of communication or telephone nos. etc. after submission of documents the same shall be intimated to the Project Manager, Nagar Karya Ekai, U.P. Jal Nigam, Faizabad immediately.

OPENING OF TECHNICAL& FINANCIAL EVALUATION CUM TECHNICAL BIDS

52. Process of e-bid opening shall take place in the Office of the Superintending Engineer Construction Circle, U.P. Jal Nigam, Faizabad, on the date of opening of Technical & Financial evaluation cum Technical bids (Pre-qualification bids) stipulated in the e-tender schedule, in presence of the bidders'representatives who chose to be present.

53. In the event of the specified date of e-bid opening being declared a holiday for the department, the e-bids shall be opened at the appointed time and place on the next working day.

54. The bidders' representatives who are present shall sign a register evidencing their attendance.

55. The envelopes containing e-tender document fee and EMD and other required documents, received up to the prescribed date and time.

56. The bidders' names and the presence or absence of requisite e-tender document fee and EMD in the prescribed format and other required documents as detailed in clause 15 above, will be announced at the opening.

57. Thereafter 14.00 Hrs.onwards the department will open all Technical & Financial evaluation cum Technical (pre-qualification) e-bids through E-Tender procurement solution (e-procurement website https://etender.up.nic.in) in the presence of bidders' representatives in the Office of the Superintending Engineer, Construction Circle, U.P. Jal Nigam, Faizabad.

58. Technical & Financial evaluation cum Technical (Pre-qualification) e-bids of only those bidders', whose e-tender document fee, EMD and other required documents as detailed in clause 15 above are found in order, shall be accepted.

59. The department will prepare minutes of Technical & Financial evaluation cum Technical (pre-qualification) e-bid opening.

60. **Clarification of e-Bid:** During evaluation of e-bid, the department may, at its discretion, ask the bidder for a clarification of his/her e-bid.The request for clarification shall be in writing. An appropriate reply within the stipulated time shall be obligatory for the bidder.

61. **Evaluation Criteria**: The department will examine all accepted Technical&Financial evaluation cum Technical e-bids to determine they are complete, whether they meet all the conditions of the contract, whether all the required documents have been furnished as detailed in tender document, whether the documents have been properly physically and digitally signed as required, and whether the e-bids are generally in order. Any e-bid or e-bids not fulfilling these requirements shall be rejected.

62. It shall be the discretion of the department to decide as to whether an e-bid fulfils the evaluation criterion mentioned in this e-tender or not. Decision of the department on matter of technical & financial evaluation results will be final and binding to all participants.No enquiry/clarification shall be entertained on the evaluation results neither the department will remain bound to provide any such clarifications on such results.

63. The bidders are advised not to mix financial bid documents with the PDF documents uploaded for technical bid. The e-bids of those bidders who have uploaded financial bid document with the pre-qualification (technical) bid or kept it in envelope of EMD will be out rightly rejected.

OPENING OF FINANCIAL E-BID

64. After evaluation of Technical & Financial evaluation cum Technical (pre-qualification) e-bid, through the evaluation committee, the department shall notify those bidders whose technical e-bids were considered non responsive to the conditions of the contract and not meeting the technical specifications and qualification requirements indicating that their financial e-bids will not be opened. The Department will simultaneously notify the bidders,whose technical e-bids were considered acceptable to the department. The notification may be sent by e-mail provided by bidder.

65. The date, time and place for the opening of financial bids will be uploaded on the e- procurement website https://etender.up.nic.in and communicated to the technically qualified bidders through e-mail provided by the bidder.

66. The financial e-bids of technically qualified bidders shall be opened in the presence of bidders'/their representatives who choose attend. The name of bidders, percentage price quoted will be announced at the meeting.

67. The department will prepare the minutes of the financial e-bid opening.

68. A substantially responsive bid is one which conforms to all the terms conditions and specification of the bidding documents, without material deviation or reservation. A material deviation or reservation is one:-

a) Which affects in any substantial way of the scope, quality or performance of the works?

b) Which limits, in any substantial way inconsistent with the bidding documents, the employer's rights or the bidder's obligations under the contract; or

c) Whose rectification would affect unfairly the competitive position of other bidders presenting substantially responsive bids?

69. If a bid is not substantially responsive, it will be rejected by the Employer, and may not subsequently be made responsive by correction or withdrawal of the non-conforming deviation or reservation.

70. **Correction of Errors**

71.1 Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors. Errors will be corrected by the Employer as follows:

a) Where there is discrepancy between the amounts in figures and in words, the amount in words will govern: and

b) 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. unless in the opinion of the Employer there is an obviously gross misplacement of the decimal point in the unit rate, in which case the line item total as quoted will govern and the unit rate will be corrected.

71.2 The amount stated in the Form of Bid will be adjusted by the Employer in accordance with the above procedure for the correction of errors and with the bidder does not accept the corrected amount of bid, his bid will be rejected and the bid security may be forfeited.

71. The Employer will evaluate and compare only the bids determined to be substantially responsive in accordance with Clause 69 and 70.

72. In evaluating the bids, the Employer will determine for each bid the Evaluated Bid price by adjusting the bid Price as follows;

a) Making any correction for error pursuant to Clause 71.

b) Excluding Provisional sums and the provisions, if any, for Contingencies in the summary of Bill of Quantities, but including Day work, where priced competitively.

c) Marking an appropriate adjustment for any other acceptable variations, deviation or alternative offers submitted.

d) Applying any discounts offered by the bidder for the award of more than one contract wherever applicable.

73. The Employer reserves the right to accept or reject any variation or deviation. Variations, deviations and other factors, which are in excess of the requirements of the bidding documents or otherwise result in the actual of unsolicited benefits to the Employer, shall not be taken into account in bid evaluation.

74. If the bid of the successful bidder is seriously unbalanced in relation to the Engineer's Justification of the cost of work to be performed under the Contract, the Employer may require the bidder to produce detailed price analysis for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation lf the price analysis, the Employer may require that the amount of the performance security set forth in Clause- 84 &

87 be increased at the expense of the successful bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful bidder under the Contract.

75. Upon the furnishing by the successful bidder of a performance security as per Clause-84 & 87, the Employer will promptly notify the other bidders that their bids have been unsuccessful.

CONTACTING THE DEPARTMENT

76. Bidders shall not contact the department on any matter relating to their e-bid, from thetime of the e-bid opening to the time the contract is awarded. If a bidder wishes to bring additional information to the notice of the department, he/she can do so in writing.

77. Any political/administrative pressure by the contractor upon the owner, of canvassing directly or indirectly in favour of his offer, will render his tender liable to rejection. Such tenderer will be debarred from participating in any tender in respect of the works of U.PJal Nigam.

78. In the event of any document/information furnished by the bidder is found to be false or fabricated, along with rejection of the bidder's e-bid and forfeiture of EMD the action for debarring / blacklisting / legal proceeding can also be initiated.

AWARD OF CONTRACT

79. The department will award the contract to the lowest evaluated successful bidder whose bid has been determined to be responsive to all the conditions of the contract and meeting the technical specification and qualification requirement of the bidding document.

80. **Notification of award** :

(i) Prior to the expiration of the period of e-bid validity, the department will notify the successful bidder in writing by letter/e-mail/fax, that his/her e-bid has been accepted.

(ii) The notification of award will constitute the formation of the contract.

81. **Signing of contract**: As the department notifies the successful bidder that his/here-bid has been accepted, the successful bidder shall have to sign the contract agreement with relevant documents and required security. The agreement draft along with other related terms and conditions will be same as furnished in e-tender. Any refusal will not be allowed.

82. Stamp duty charge shall be borne by the tenderer as applicable at the time of award of the contract.The contract agreement will be executed on non judicial stamp paper of the value of Rs. 100/- along with Rs. 2/- Revenue stamp.

83. **SECURITY DEPOSIT**

(a) The Total Amount of security shall be 10% of Contract Price.

(b) Within Twenty days of the notification of award from the Employer the successful bidder shall furnish to the Employer a performance security in the form of a bank guarantee in an amount of FIVE percent of the Contract Price plus any other amount specified by the Employer in case of an unbalanced bid as per Clause-75. The balance amount of performance security (Adjusting the amount of Earnest Money deposited by the bidder) shall be deducted from the payments pursuant to Clause- 60.2 ofVol-II at the rate of 10% of the amount of bill. The forms of Bank Guarantee for performance security provided in Schedule- 4 of the bidding documents shall be used and no other forms shall be acceptable to the employer.

(c) If the performance security is to be provided by the successful bidder in the form of Bank Guarantee. It shall be issued by a Nationalized Bank.

84. All witnesses and securities shall be persons of status and probity and their full names, occupations and addresses shall be stated below their signatures.

85. It is made clear to the Contractors that they are required to submit complete design, drawings in fair along with specifications/choice of vendors as indicated in Tender Documents. However, the structural drawings can be submitted within 15 days from issue of letter of intent.

86. For all the items, plants, equipments (civil, mechanical or electrical) which the Contractor does not manufacturer himself and has to procure from other manufactures vendors for use, supply or installation under this contract the Contractor would submit with his bid, a **list of vendors** from whom such procurement is proposed to be made by him, alongwith complete details and specification, make, rating, capacity etc. for each items, plants and equipments and should be of Standards make and easily available.

The final choice of vendor from whom such procurements would ultimately be made by the Contractor shall rest with the Employer.

LIST OF DOCUMENTS TO BE SUBMITTED OFFLINE

1. A sealed envelope containing the original demand draft / banker's cheque for e-tender document fee and CDR/FDR for EMD along with original copy of the documents specified in clause 15(a) to 15(f) above.

   This envelope shall be addressed to Executive Engineer, Add. Consturction Divison U.P. Jal Nigam, Sultanpur and shall be superscribed "E-Tender Fee & Earnest Money: **""Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete (civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city" On turnkey basis.**

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   This envelope must be dropped in the tender box kept at the Office of the Executive Engineer, Add. Consturction Divison U.P. Jal Nigam, Sultanpur upto one day before the date of opening of prequalification Bid.

LIST OF DOCUMENTS TO BE SUBMITTED ONLINE ON E-TENDERING WEBSITE

(A) Part-I : Technical & Financial evaluation cum Technical(Pre-Qualification)Bid For Technical & Financial evaluation cum Technical Part-I of e-bid,on or before the prescribed date specified in e-tender schedule, please **upload digitally signed scanned notary attested photocopies (in PDF format)** of:

1. Original demand draft / banker's cheque for e-tender document fee and CDR/FDR for EMD.
2. The partnership deed or sole proprietorship declaration or company's registration certificate/ memorandum of association as the case may be.(on non judicial stamp paper of INR 100)
3. The sole proprietorship declaration/power of attorney/authorization/resolution /bylaws, as the case may be, in favour of person authorized to sign the tender documents physically and digitally as described in clause 35 above. It shall not be more than one year old on the date of opening of Technical & Financial evaluation cum Technical bid and shall contain address and mobile number of authorized signatory.
4. Request letter (typed on letterhead of bidder as per Appendix-A).
5. Declaration Form-I A for Earnest Money Deposit (as per Appendix-B).
6. Declaration Form-I B for Affidavit of bid validity (typed on nonjudicial stamp paper of Rs. 100/- and verified by Notary Public as per Appendix-C).
7. Declaration Form No. I C Affidavit (typed on non judicial stamp paper of Rs. 100/-and verified by Notary Public as per Appendix-D)

8. Declaration Form No. II Affidavit for fulfilling the terms & conditions of the contract (typed on non judicial stamp paper of Rs.100/-& verified by Notary Public as per Appendix-E)

9. Application Form (1): General Information of Bidder (as per Appendix-F).

10. Application Form (2): Annual Turnover (as per Appendix-G).

11. Application Form (3,3a& 3b): Details of Contracts of Similar Nature and Complexity taken up during last 5 years (as per Appendix-H).

12. Application Form (4a &4b): Abstract of Contracts of Similar Nature and Complexity (as per Appendix-I).

13. Experience certificate Form-4 (s) in support of bidder's work experience (of each work cited in Form 3 (a)) issued by an officer not below the rank of Executive Engineer of client organization containing Agreement No., Date of start, Date of completion and Value of work done.

14. Registration Certificate issued by Materials Manager, U.P. Jal Nigam, Lucknow..

15. The last Trade Tax assessment order / proof of VAT registration, GST number.

16. PAN card of the firm/Sole proprietor.

17. Application Form (5): Statement of Financial Capability (as per Appendix-K).

18. Audited Balance Sheet counter signed by C.A. for last five financial years clearly indicating turnover and T.D.S.

19. Application Form (6): Litigation History (as per Appendix-L).

20. Application Form (7): Affidavit for List of Staff with bidder (typed on non judicial stamp paper of Rs.10/- & verified by Notary Public as per Appendix-M).

21. Application Form (8): Affidavit for List of Tools and Plants with bidder (typed on non judicial stamp paper of Rs.10/- & verified by Notary Public as per Appendix-N).

22. Character Certificate from District Magistrate concerned on P.W.D. T-4 Format / proof of applying for P.W.D. T-4 certificate from District Magistrate (see Appendix-O).

23. Certificate of Liquid Assets issued by Nationalized/Scheduled bank with in last six months from the date of opening of Technical & Financial evaluation cum Technical bid (as per Appendix-P).

24. Solvency Certificate issued by District Magistrate (on format T-5)/ Nationalized Bank.

25. Affidavit as prescribed should be annexured on non-judicial stamp paper of Rs. 100.00 duly signed by notary for T-6 format.

26. The bidder shall provide a separate table giving details of taxes, duties, levies and other applicable taxes considered by him and included in the prices offered.

Service tax shall not be included in the prices and the owner if applicable against proof of applicability and payment shall pay the same separately.

27. Sufficient justification, financial model and support materials / calculations showing the methods and rates assumed for arriving at these numbers shall support the prices quoted in each of the sub parts {(a) to (k)} of the Price Schedule.

28. Copy of certificate issued by Registrar of firms and societies/deputy director office of partnership/ JV for the work.

PHYSICAL EXPERINCE FOR E/M WORKS

29. Bidders must have Joint ventures for E/M works with E/M contractor and the E/M contractor must be registered in Class 'A' category in PLC/SCADA/Automation.

30. "An Oath certificate" (against this tender) has to be produced on legal paper from the manufacturer/ Authorized Distributor/ Dealer of offered Pump and manufacturer of Automation / SCADA to submit the tenders on their behalf. Accordingly the manufacturers of SCADA and manufacturer/Authorized Distributor/Dealer of pumps are also required to give an undertaking to provide complete technical support in supply, execution and maintenance to the authorized firm and also to undertake that incase the firms fail to fulfill their commitment, manufacturer will own full responsibility to complete and maintain the project.

One similar completed works of **SCADA/Automation of minimum 28 Nos. of Pumping Plant of Minimum 20 H.P. or minimum 690 I/Os.**

or

Two similar completed works of **SCADA/Automation of minimum 18 Nos. of Pumping Plant of Minimum 20 H.P. or minimum 518I/Os.**

Or

Three similar completed works of **SCADA/Automation of minimum 14 Nos. of Pumping Plant of Minimum 20 H.P. or minimum 345I/Os.**

(C) **Part-II : Financial bid /Price bid :** For Financial Part-II of e-bid,on or before the prescribed date specified in e-tender schedule, please upload digitally signed duly filled Schedule of Works / BOQ in PDF format.

Note : If any of the documents mentioned in Part-I sl. 1 to 25 above is uploaded without attestation of notary public, original of the same shall have to be presented by concerned bidderfor verification on the date of opening of Part-I, failing to which the bid shall be rejected.All financial document must be certified by the C.A.

Executive Engineer,
Add. Consturction Divison
U.P. Jal Nigam, Sultanpur

CONVEYANCE , SITE OFFICE AND TESTING LABORATORY :

The tenderer should make sufficient provision in his tendered cost so as to provide the following facilities –

1. The contractor shall arrange one four wheeled vehicles (1 no. MUV) for field Engineers of U.P. Jal Nigam for the Project period which will be deployed on work for supervision. The average run per-vehicles will be 2000 Km. / month.

2. The contractor shall provide a site office and one attendant at water works site for UPJN field Engineers.

3. A testing laboratory comprising of Compressive strength testing machiene, Seieves with shaker, slump cone etc should be provided at site by the contractor for which no extra payment shall be made.

4. The site of the works may be inspected by tenderer or his representative at his own cost before tendering. Tenderer willing to visit the site should contact Executive Engineer, Add. Consturction Divison U.P. Jal Nigam, Sultanpur Phone-05362- 231458, 9473942716

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SECTION-IV

BASIS FOR PREQUALIFICATION OF APPLICANTS :

1. Application for prequalification will be evaluated under the following six heads. The details of minimum qualifying criteria in these heads is given in para 1.1 to 1.6.

i. Financial Standing
ii. Bidder Capacity
iii. Past Experience
iv. Performance Report
v. Registration in U.P. Jal Nigam
vi. Other Requirements

Applicants are required to furnish necessary data, documents, drawing and other particulars along with the application for prequalification, in support of their competence under above heads. Data/documents furnished should be true in all respects. On verification, if it is found at any stage that such data/documents are not true or concerned applicant has attempted to conceal any unfavorable data, his application for tender will be rejected and he may be debarred form tendering in U.P. Jal Nigam.

1.1 FINANCIAL STANDING :

(i) Turn Over:

The minimum average annual turnover should be at least Rs. 570.00 lacs per year during the last 3 year ending dt. 31st March, 2018.

(ii) Solvency Certificate:

The contractor should submit the solvency of minimum Rs. 760.00 lacs.

(iii) Profit Loss:

The firm should not have incurred any loss for more than Two years during last 5 years ending dt. 31st March, 2018 OR the firms should have a positive Net Worth.

(iv) Income Tax Returns :

Tenderer should submit Income Tax return / Income Tax clearance for last 3 year. Balance sheets for last three years must also be submitted.

1.2 BIDDER CAPACITY :

The assessed capacity of the Tenderer, as calculated below, shall not be less than the estimated value of the work put to tender (Rs. 6.47 Crore).

Assessed Capacity = (2 A×N-B)

Where;

A = Maximum value of same type of works executed in any one financial year during the last 5 financial years ending 2018 certified by C.A (same type of works means WTP/STP/ETP/CWR/Pump House will be considered).

N = Number of years prescribed for completion of work upto date price level for which tenders are invited.

B= Value of existing commitments and ongoing works (and the estimated value of work(s) which is likely to be awarded even though the letter of acceptance has not been approved to be completed during the period of the contract.

1.3 **PAST EXPERIENCE:**

3 No. Similar completed work of Rs. 7.60 Cr. Each 40% of estimated cost)
2 Nos. similar completed work of Rs. 9.50 Cr. Each (50% of estimated cost)
1 No. similar completed work of Rs. 15.20 Cr. Each (80% of estimated cost)

a) **Similar Completed works:**

The similar completed work mean Design, Supply, Erection, Construction, Commissioning, Trial Run and Operation and Maintenance Laying of Rising Main, Distribution system with house connection, etc.Proposed by the bidder for this tender.

1.4 **Performance Report :-**

The performance report of works executed by the bidder as submitted for pre-qualification is to be obtained by him from the authorized representative of his client (not below the rank of Executive Engineer or equivalent) in the sealed cover and to be enclosed with pre- qualification bid on prescribed Performa. In case the work executed in joint Venture by the bidder, then the bidder's actual scope of work in the executed project shall only be considered for his qualification purpose. The necessary documents clearly stating the scope of work by each partner in the executed project , shall be submitted by bidder along with the performance reports from client. Before taking the final decision in the matter, the authority competent for pre- qualification may inspect the work of those applicants who pre- qualify or confidentially obtain the report form their client.

Registration in U.P. Jal Nigam:-

The bidder should be registered with U.P. Jal Nigam in Class- 'A' turnkey project (water supply) with class A. The bidders who are not registered with UP Jal Nigam but have experience of similar work may also participate in Bidding Process Provided they will get themselves registered with UP Jal Nigam in appropriate Class before opening of the Pre Qualification bid and Failing which their earnest money will be forfeited in favor of UP Jal Nigam

1.5 **OTHER REQUIREMENTS**

(i) **History of Litigation and Criminal Record**

If any criminal case(s) are pending against Proprietor/ Partner/ Director at the time of submitting the tender, the tender will be summarily rejected. In this respect the Tenderer shall submit an affidavit to the effect that the history of litigation, criminal cases pending against him, furnished by him is true.

In case, it is detected at any stage that the affidavit is false, he will abide by the action taken by U.P. Jal Nigam without approaching any court, whatsoever.

(ii) Even if the tenderer meets all the eligibility and qualification criteria, his tender shall be summarily rejected if it found that he has mislead or made false representation in the form of any of the statements submitted in proof of the eligibility and qualification requirements or if he has a record of poor performance such as absconding from work, works not properly completed as per contract, inordinate delays in completion, blacklisted by any Government/ semi- Government/ Public sector unit /applied for Corporate Debt Restructuring (CDR)or facing recovery proceedings from financia linstitutions or facing winding up proceedings or thoseunder B.I.F.R. during last ten years. An affidavit in this regard shall be submitted by the bidders along with the bid on Rs 100 non judicial stamp paper. In addition to above, even after award of work and/ or during execution of work, it is found that the contractor has/ had produced false/ fake certificates in his Tender, he will be black listed and the work will be taken over by U.P. Jal Nigam after termination of contract.

(iii) **Personnel and T & P :**

Organizational Capability of an applicant will be judged based on data furnished by him in respect of total Minimum Technical personnel available and proposed to be entrusted for the construction of this work as referred in Form- II (A to B).

The minimum strength of technically qualified key personnel alongwith minimum requirements (number / capacity) of construction plant and equipment expected to be deployed at site may be given. The applicant is required to confirm that he has required strength of personnel in his employment and also possesses the required number / capacity of construction plant and equipment in working condition and he would deploy the same in case the job is entrusted to him. The applicant is expected to furnish bio-data of key personnel proposed for the works in the work is awarded to him. The applicant is also expected to deploy adequate supporting staff i.e. Graduate Engineer, one Civil Engineer, Foreman, Supervisor and below and the additional plant and equipment for successful completion of contract in scheduled time.

(iv) Since it is a design and build concept tender, the applicant should give a minimum of three pages explanatory note about his proposed method of execution. The technology proposed shall be proven modern technology and shall be analysed in details to qualify in the tender. The design parameters of important units considered for this tender, should also be proven and supported by relevant

document issued by the client.The bidder should have designed, constructed and commissioned atleast one project of similar nature.

(v) **For The Purpose Of This Particular Contract, Bidders Shall Meet The Following Minimum Qualifying Criteria :**

a) Even though the applicant are pre-qualified, they are subject to be disqualified if they have :
Made untrue or false representations in the form, statements and attachments submitted in proof of the qualification requirements, and / or Record of past poor performance such as abandoning the work, not properly completing the contract, inordinate delays in completion, or financial failures, etc.

(vi) Nominated Sub Contracting is not allowed.

(vii) Joint venture/consortium is allowed in this tender.It is essential for the lead partnerof a joint venture/consortium tobe registered in Class- 'A' turnkey project (water supply) with class A in UP Jal Nigam. The equity of lead partner shall be 51%.

1.6 **JOINT VENTURE/ CONSTORTIUM**

a. Joint ventures/ Consortium must comply with the following requirements: All joint venture/ Consortium must submit the details as per Application Form No VII(A)duly signed by authorised representatives of all the partners. Joint Ventures/ Consortium should be limited to maximum three partners including lead partner. They, at least lead partner should be registered contractor in U.P. Jal Nigam in respective class & category..

b. Following are the minimum qualification requirements:

- The capacity in respect of annual turnover and cash flow may be cumulative subject to condition that the lead partner needs to have minimum 51% of required financial capacity i.e. annual turnover and cash flow requirements. For the other partners should fulfil the balance 49% of required financial capacity. For project implementation experiences of partners, only the number of works can be cumulative not the capacity.
- No change in the formation of a joint venture after pre- qualification is admissible / Permitted.
- Any bid shall be signed so as to legally bind all partners, jointly and severally, and any bid shall be submitted with a copy of the joint venture agreement, as in Application Form VII and VII(A), providing the joint and severally liabilities with respect to the contract.
- The Technical & financial Evaluation of a joint venture does not necessarily pre-qualify any of its partners individually or as a partner in any other joint venture or association. In case of dissolution of a joint venture, each one of the constituent firms may be evaluated if it meets all of the Technical & financial Evaluation requirements, subject to the written approval of the Employer.
- In case of joint venture all the partners shall remain jointly & severally responsible for successful implementation of the contract package. The

partners must also nominate among them, one of the partners as Lead Partner and shall authorise to represent the venture to the Employer. Inter firms' agreement need to include the above terms clearly. The joint Venture need to enclose inter firms' agreement in the prescribed format as specified in the Technical & Financial Evaluation Documents (Form VII A) duly signed by all the partners, along with the submission

QUALIFIED APPLICANTS :

U.P. Jal Nigam will decide which applicants are qualified and will inform them by E-MAIL confirming in writing by registered/ speed post letter. Qualified contractors will be given an invitation to participate in opening of Financial Bid of the tender at the appropriate time.

SCORING METHOD FOR EVALUATION: -

A. Financial Strength –20 Marks
   i. Average annual turnover - 12 Marks.
   ii. Solvency Certificate - 08 Marks
B. Experience in similar works - 20 Marks.
C. Past Performance on works - 40 Marks.

Parameter	Calculation for points	Score			Maximum Marks
1	2	3			4
1. Time Over Run (TOR)					25
	if TOR =	1.00	2.00	3.00	>3.50
(a) Without levy of compensation		25	20	10	0
(b) With levy of compensation		25	10	5	0
(c) levy of compensation not decided.		25	15	5	0

Parameter	Calculation for points	Score	Maximum Marks
1	2	3	4
TOR = AT/ST, Where AT = Actual Time. ST = Stipulated Time			
2. Quality			15
	(i) Very Good	15	
	(ii) Good	10	
	(iii) Fair	5	
	(iv) Poor	0	
D. Personal and Establishment		– 10 Marks	
E. Plant & Equipment		– 10 Marks	

EVALUATION RESULT: -

i. 60% Marks for minimum eligibility criteria

FORMS

APPENDIX – A

(Format forLetter of Application to be typed on the Letterhead of the Applicant/Bidder)

~~~~~~

No. / / Date: …… /…./2018

To,

Executive Engineer,
Add. Consturction Divison
U.P. Jal Nigam,
Sultanpur

Dear Sir,

Being duly authorized to represent and act on behalf of .... (Hereinafter referred to as “the Applicant”), and having reviewed and fully understood all of the Technical & Financial Evaluation information provided, the undersigned hereby apply to be pre-qualified by yourselves as a bidder for Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete(civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city.

It is to submit that up-to-date details of the applicant are as under:

(i) Legal status of the applicant : .... (Sole proprietorship / partnership firm or company or corporation or registered co-op. society)

(ii) Principal place of business : ....

(iii) The place of incorporation or place of registration and nationalityof the Owners/partners/directors : ....

(iv) Address for communication : ....

(v) Telephone / mobile no. : ....

(vi) E-mail ID : ....

1. U.P. Jal Nigam and its authorized representatives are hereby authorized to conduct any inquiries or investigations to verify the statements, documents, and information submitted in connection with this application, and to seek clarification from our bankers and clients regarding any financial and technical aspects. This Letter of Application will also serve as authorization to any individual or authorized representative of any institution referred to in the supporting information, to provide such information deemed necessary and as requested by you to verify statements and information provided in this application, such as the resources, experience, and competence of the Applicant.
2. U.P. Jal Nigam and its authorized representatives may contact the following persons for further information :

General and managerial enquiries		
Please fill Name & Address of Contact-1	Telephone-1	Mobile-1
Please fill Name & Address of Contact-2	Telephone-2	Mobile-2
Personnel enquiries		
Please fill Name & Address of Contact-1	Telephone-1	Mobile-1
Please fill Name & Address of Contact-2	Telephone-2	Mobile-2

Appendix-A Continued….
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Technical enquiries		
Please fill Name & Address of Contact-1	Telephone-1	Mobile-1
Please fill Name & Address of Contact-2	Telephone-2	Mobile-2
Financial enquiries		
Please fill Name & Address of Contact-1	Telephone-1	Mobile-1
Please fill Name & Address of Contact-2	Telephone-2	Mobile-2

3. This application is made with the full understanding that:

   (a) Bids by pre-qualified applicants will be subject to verification of all information submitted for Technical & Financial Evaluation at the time of bidding.

   (b) U.P. Jal Nigam reserves the right to (i) Amend the scope and value of any contracts bid under this project; in such event, bids will only be called from pre-qualified bidders who meet the revised requirements (ii) Reject or accept any application, cancel the Technical & Financial Evaluation process, and reject all applications.

   (c) U.P. Jal Nigam shall not be liable for any such actions and shall be under no obligation to inform the Applicant on the grounds for them.

4. It is hereby declared that I the undersigned have read, examined and understood all the terms and conditions of the tender document for which I have signed and submitted the bid under proper lawful power of attorney.

5. For and on behalf of Applicant it is also certified that all the terms and conditions etc. of the tender document are fully acceptable.

6. The undersigned declares that the statements made and the information provided in the duly completed application/bid are complete, true, and correct in every detail.

Signature : ……

Name : ……..

For and on behalf of : ……...

Seal : …….

APPENDIX-B

(Format for EMD to be typed on plain paper)

~~~~~~

DECLARATION FORM-I A

(EARNEST MONEY)

I/We deposit herewith an Earnest Money for Rs. ..... in the following form as per Clause 14 of Important Notes and Instructions to Bidders of Section-III e-Tender Document

I/We also agree to deposit requisite security money as per relevant clause of this tender document.

The details of deposit of Earnest Money are given below:

Sl.	Description	Amount Rs.	Name of Issuing Bank/Post Office

DATE

……..

Signature: …….

Name : ……

For and on behalf of: ……

Seal : …….
~~~~~~

APPENDIX-C

(Format for affidavit to be typed on non judicialstamp paper worth Rs. 100/- & to be verified by Notary Public)

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DECLARATION FORM-I B

(AFFIDAVIT OF BID VALIDITY)

AGREEMENT FORM

Tender invited by : Executive Engineer,Add. Consturction Divison U.P. Jal Nigam, Sultanpur

Tender for : Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete (civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city" On turnkey basis.

Tender Notice No.&Date:

Name of Bidder : ……..

IN CONSIDERATION of the U.P. JAL NIGAM having treated the bidder to be an eligible person, whose tender may be considered, the bidder hereby agrees to the conditions that the proposal in response to the above invitation shall not be withdrawn within 120 days from the date of opening of Part-ITechnical & Financial evaluation cum Technical bid of the tender, also to the condition that if, thereafter the bidder does withdraw his proposal within the said period, the earnest money deposited by bidder shall be forfeited by U.P. JAL NIGAM and bidder may be debarred from tendering for a period of one year reckoned from the date of opening of the tender at the discretion of the department.

Signed this…… the day of …….. 2017.

Signature : …….

Name : …….

For and on behalf of : ……

Seal : …….

Witness :-

1…….

2……
~~~~~~

APPENDIX-D

(प्रारूप स्वघोषणा शपथ पत्र : रु0 100/- के स्टाम्प पेपर पर नोटरी द्वारा साक्ष्यों की उपस्थिति में सत्यापित करा कर दिया जाए)

यहॉराजपत्रित अधिकारी द्वारा प्रमाणित पासपोर्ट साइज का नवीनतम फोटोग्राफ चस्पा करें

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DECLARATION FORM-I C /शपथ – पत्र

मैं .... पुत्र श्री ....

निवासी (स्थायी पता) ....

(अस्थायी पता) .... का निवासी हूँ।

मै शपथपूर्वक निम्न घोषणा करता हूँ।

1- मैं सम्बन्धित विभाग का 'ए' श्रेणी का पंजीकृत ठेकेदार हूँ। (विभाग द्वारा निर्गत श्रेणी सम्बंधी प्रमाण संलग्न है)। मेरे पास पर्याप्त चल और अचल सम्पत्ति है और व्यवसायिक रुप से मैं उ0प्र0 जल निगम के कार्यों को पूरा करने के लिए सक्षम और समर्थ हूँ। मेरे पास आवश्यक मशीने और उपकरण आदि भी हैं तथा मुझे इस कार्य का पर्याप्त अनुभव है।

2- सम्बन्धित विभाग द्वारा जो Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete(civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city" On turnkey basis. कराने की निविदा निर्गत की गयी है, विभाग द्वारा निर्धारित प्रारुप पर निविदा भर रहा हूँ।

3- मेरे द्वारा दिये जा रहे प्रमाण पत्र, चरित्र प्रमाण पत्र/हैसियत प्रमााण पत्र/आयकर संबंधी अभिलेख/व्यापार कर पजीयन प्रमाण पत्र/बिड सिक्योरिटी प्रमाण पत्र/बिड कैपिसिटी प्रमाण पत्र/जमानत धनराशि आदि का प्रमाण पत्र प्रमाण पत्र तथा अन्य सुसंगत अभिलेख आदि वांछित रुप में निविदा पत्र के साथ संलग्न कर दिये गये हैं।

4- मेरा स्थाई खाता सं0 (PAN).. है। (आयकर विभाग द्वारा प्रदत्त प्रमाण पत्र की प्रति संलग्न है)

5- मेरे विरुद्ध आपराधिक मुकदमों का विवरण निम्न प्रकार है। यहीं पूरा विवरण दिया जाये।

क.मुकदमा नम्बर .... **ख.** धारायें .... **ग.** थाना ....
.

घ. जनपद .... **ङ.** न्यायालय (जहां मुकदमा चल रहा है) ....

6- मैं सम्बन्धित विभाग अथवा राज्य सरकार के अन्य विभागों द्वारा ब्लैक लिस्टेट ठेकेदार की श्रेणी में नहीं आता हूँ। मैं अपराधिक गतिविधियों, माफिया तथा गैंगस्टर गतिविधियों और संगठित अपराध करने की गतिविधियों और असामाजिक कार्यों आदि में लिप्त नहीं हूँ। मैं माफिया और अपराधी नहीं हूँ। मेरा चाल–चलन, कार्य तथा आचरण उत्तम है।

7- मेरे विरुद्ध जनपद में तथा प्रदेश में कोई भी मुकदमा दर्ज नहीं है।

8- यदि ठेका प्राप्त करने के पश्चात मेरे विरुद्ध माफिया गतिविधियों/असामाजिक गतिविधियों व संगठित अपराधिक गतिविधियों में लिप्त होने के बारे में कोई शिकायत प्रमाणित पायी जाती है तो सक्षम अधिकारी को यह अधिकार होगा कि वह मेरा ठेका/अनुबंध निरस्त कर दें। इस पर मुझे कोई आपत्ति नहीं होगी। मेरे द्वारा यदि विभाग/राज्य सरकार के विरुद्ध कोई अपराधिक कृत्य किया जाता है अथवा सरकारी धन का गबन किया जाता तो सक्षम अधिकारी को यह अधिकार होगा कि वह मेरे विरुद्ध अपराधिक मुकदमा नियमों के अन्तर्गत दर्ज करायें।

9- मैं अनुबंध की शर्तों के अनुसार समय से पूरी गुणवत्ता के साथ तथा निर्धारित विशिष्टियों के अनुरुप कार्य पूरा करूँगा और विभाग को पूरा सहयोग प्रदान करूँगा।

10- मेरा कार्य एवं आचरण उत्तम है।

11- मैं शपथपूर्वक घोषणा करता हूँ कि मेरा स्थाई पता और अस्थाई पता निम्न प्रकार है।
क. स्थायी पता .....(यहां पूरा पता दूरभाष, मोबाइल एवं पिनकोड सहित लिखा जाये).....
ख. अस्थायी पता .....(यहां पूरा पता दूरभाष, मोबाइल एवं पिनकोड सहित लिखा जाये).....

12- मैं शपथपूर्वक घोषणा करता हूँ कि उपरोक्त पते पर रहता हूँ तथा विभाग द्वारा प्रदान किये गये कार्य के पूरा होने तक मेरे कियी पते में सामान्यतः कोई परिवर्तन नहीं होगा, यदि अपरिहार्य परिस्थितियों में किसी पते में परिवर्तन होता है तो इसकी सूचना मैं तत्काल सम्बन्धित प्राधिकृत अधिकारी और जिला मजिस्ट्रेट/कलेक्टर को दूँगा।

13- मैं यह भी घोषणा करता हूं कि विभाग के जिस कार्य के लिए मेरे द्वारा ठेका लिया जा रहा है उसके सापेक्ष चल एवं अचल सम्पत्ति का हैसियत प्रमाण पत्र जिला मजिस्ट्रेट /कलेक्टर .....(जनपद का नाम लिखा जाये) .....द्वारा प्राप्त करके वांछित रूप में संलग्न किया जा रहा है। यह भी घोषणा करता हूं कि इन हैसियत प्रमाण पत्र का उपयोग अन्य कार्यो के लिए नहीं किया जायेगा।

14- मैं अपनी पूर्ण जानकारी में पूरे होशो हवास में, स्वस्थ चित्त से, पूरी सत्यनिष्ठा से तथा स्वेच्छा से यह शपथ–पत्र लिख कर दे रहा हूँ। ईश्वर मेरी मदद करें।

दिनांक : .....

शपथी का पूरा हस्ताक्षर

पूरा नाम व पता : .....

APPENDIX-E-1

(Format to be typed on non judicial**stamp paper worth Rs. 100/- and to be verified by Notary Public**)

~~~~~~

DECLARATION FORM-II

Should my/our offer is accepted, I/We hereby agree to abide and fulfill the terms & conditions annexed here to and within 10 days of the date of receipt of an information of acceptance of my/our offer from the Executive Engineer,Add. Consturction Divison U.P. Jal Nigam, Sultanpur

I/We shall communicate in writing my/our acceptance of such offer and shall also execute an agreement embodying the conditions here to attached. I/We also agree that the drawings, specifications, terms and conditions set forth in the offer from the Executive Engineer, Add. Consturction Divison U.P. Jal Nigam, Sultanpur

Together with its acceptance thereof in writing by me/us shall form part of the agreement?

I/We further agree that in the event of my/our failure to convey my/our acceptance of the offer from the said Project Manager within 10 days (Ten days) of its receipt as above, the Project Manager may withdraw the offer and forfeit the earnest money deposited by me/us.

Date : The.......... day of ....2018.

Bidder

SIGNATURE& SEAL
NAME
ADDRESS

Witness:

SIGNATURE
NAME
ADDRESS

The accompanying tender is hereby accepted by me on behalf of U.P. Jal Nigam.

Signature of the Officer
By whom accepted
~~~~~~

APPENDIX-E-2

(To be filled in at the time of agreement by successful bidder non judicial **stamp paper worth Rs. 100/**)

~~~~~~

FORM OF AGREEMENT- FORM -III

THIS INDENTURE made on the …… day of ………. 2017 between.. (hereinafter called the Contractor) which expression shall, where the context so admits or implies be deemed to include his/her heirs, executors and administrators of the one part, AND the Managing Director of U.P. Jal Nigam (hereinafter called the M.D.) which expression shall, where the context so admits or implies, include his successors and assigns of the other part. WHEREAS the said M.D. required the execution of certain works for ……………………………………… (hereinafter called the said works which said works are more particularly described in the drawing and specifications hereto annexed AND ALSO requires the provisions of the necessary materials there for and have caused the necessary drawings and specification and schedules of rates to be prepared and the contractor has delivered to the said M.D.a tender for the execution of the said works and the provision of the said materials AND WHEREAS the M.D. has accepted such tender subject to the provisions and conditions hereto attached. NOW THIS IDENTURE WITNESSETH as follows:

In consideration of the covenant, for the payment by and on behalf of the said M.D., here in after contained, the contractor hereby covenants with the M.D. that he will supply all necessary material, labour, T&P etc. and execute and complete the work in a thoroughly sound and workmanlike manner, and afterwards maintain for the requisite periodstated in the said conditions, all the works set out in the said specifications and schedule of rates hereto attached, signed by the contractor, and as explained in the said drawings hereto attached, and in accordance, in every respect, with the requirements, stipulations hereto attached.

In consideration of the covenants by the contractor hereinafter contained the said M.D. hereby covenants with the contractor to pay to him for the execution, completion and maintenance of the work as afore said according to the rates given in the schedule of rates hereto attached, and at the times and in the manner and subject to the additions and deductions set out, and declared in the said conditions hereto attached.

IT IS HEREBY AGREED AND DECLARED that all the provisions of the said conditions, drawings, specifications and schedules of rates marked …G & I... andhereto attached shall be as binding upon the Contractor and upon the said M.D. as if the same had been repeated herein and shall be read as part of these presents.

In witness where of the parties hereto have affixed their signatureson the……....day of ....2018.

Witness: Signature & Seal of Contractor

Signed on behalf of the M.D. by

Witness:

Designation of Officer (U.P.Jal Nigam)
~~~~~~

APPENDIX-F

(Format for General Information to be typed on plain paper.All individuals/firms and each partner of joint venture applying for Technical & Financial Evaluation are requested to complete the information in this form. Nationality information should be provided for all owners or applicants who are partnership or individually owned firms. Where the Applicant proposes to use named subcontractors for critical components of the works, the following information should also be supplied for the specialist subcontractor(s), together with a brief description of their specialized input.)

~~~~~~

APPLICATION FORM (1) :General Information of Bidders

1.	Name of firm	
2.	Head office address	
3.	Telephone / Mobile No.	
4.	Contact Person	
5.	Fax No.	
6.	E-mail ID	
7.	Place of incorporation / registration	
8.	Year of incorporation / registration	

Nationality of Owners/Partners/Directors		
Sl.	Name	Nationality
1. 2.		

Signature & Seal of Applicant
~~~~~~

APPENDIX-G

FORM- VII :FINANCIAL

(All the information to be provided as per status as on 31st March, 2018)

All individual firms and all partners of a joint venture are requested to complete the information in this form. The information supplied should be the annual turnover of the Applicant (or each member of a joint venture), in terms of the amounts billed to clients for each year for work in progress or completed.

Use a separate sheet for each partner of a joint venture.

Applicants should not be required to enclose testimonials, certificates, and publicity material with their applications; they will not be taken into account in the evaluation of qualifications.

Assets and Liabilities at close of business

1.	**Cash (a)** **Cash (b)** **Cash (c)**	**In hand** **Deposited in banks named below** **Elsewhere – (State where)**	

Name of Bank	**Location**	**Deposit in Name of**	**Amount**

2.	**Deposits with bids or otherwise as guarantees (due within 90 days)**	

Deposit with : (Name and Address)	**For what**	**When Recoverable**	**Amount**

3.	**Account receivable (i.e. due within 90 days) from Completed contracts exclusive of claims not approved for payment**	

Name and Address of Owner	**Name Contract**	**Amount of Contract**	**Amount Receivable**

Have any of the above been assigned, sold or pledged?

It so, state amounts to whom and reason.

4.	**Sums earned on uncompleted contracts (due on monthly Estimated) as shown by Engineer's or Architect's estimate.** **(a) Amount received after deduction retention (due within 90 days)** **(b) Retention to date due upon completion of contract**	

Designation of Contract and Name, Address of Owner	**Amount Contract**	**Gross Amount Earned including last approved Estimate**	**Amount previously received**	**Retention Date Amount Due**	**Amount now due on Monthly Estimate exclusive of Retention**

Have any of the above been assigned, sold or pledged?

It so, state amounts to whom and reason.

5.	**Uncompleted Contracts; Sums earned since last approved Estimate to date of this questionnaire.**	

Designation of Contract and Name, Address of Owner	**Amount Contract**	**Gross Amount Earned including latest Estimate (including Retention)**	**Amount Earned since last Estimate**	**Date next Estimate is due**

Have any of the above been assigned, sold or pledged?

It so, state amounts to whom and reason.

6.	Account receivable not from construction contracts (due on within 90 days)	

Receivable From Name and Address	For What	When due	Amount

What amount, if any is past due?

7.	(a) Stocks and Bonds	At Present market value	
	(b) Building and Loan	At present with drawl value	
	(c) Life Insurance;	At cash surrender value (for an individual or partnership only)	

8.	Other quick Assets (due within 90 days)		
	Not including :	Real estate, loans, furniture Fixtures, equipment, mortgages Receivable, stock of materials	
		Notes receivable	

9.	**Notes Payable**	**(a) To Banks, regular**	
		(b) To Banks for certified cheques	
		(c) To others for equipment obligation	
		(d) To others exclusive	

TOTAL ASSETS

To whom: Name and Address	What Security	When Due	Amount

10.	**Account Payable**	**(a) Not past due**	
		(b) Past due	

To whom: Name and Address	For What	Data Payable	Amount

11.	**Other Liabilities**	
	Description	**Amount**

TOTAL CURRENT LIABILITIES

INFORMATION REGARDING FINANCIAL CAPACITY OF THE

Sl. No.	Details	Amount Rs. In Lacs.	Remarks
1.	Solvency		A Banker's Certificate may pleased be attached
2.	Annual Turnover for the last five years		
3.	Price of biggest job carried out		

CONTRACTOR

DETAILS STATEMENT "A"

Name of Contractor &Address :-_____

_____

Sr. No.	Year.	Annual Turnover in (Lakhs)	Up-dated cost of work 2017-2018 Annual Turnover (Lakhs)	Remarks.
1	2013-14			
2	2014-15			
3	2015-16			
4	2016-17			
5	2017-18			

Certified that the above information is true and correct to the best of my knowledge and belief. In support of the annual turnover shownabove I.T.C. certificates in attached herewith.

Signature of Contractor.

Note :- 1. The cost may be updated by 10% per year (Compounded) and no supporting detailed computation may be furnished.

Factor for updating the cost of each year to bring the cost to 2017-2018.

Year	Cost of work	Factor.
2013-14		x1.464
2014-15		x 1.331
2015-16		x 1.210
2016-17		x 1.100
2017-18		x 1.000

DETAILS STATEMENT "B"

Information and Certificate for works carried out and to be done during next three years (2018-2019 to 2020-2021)

Name of Contractor &Address :-

_____

_____

_____

Sr No	Name of work	Year of Commencement of work	Amount of contract.	Amount of work remaining to be executed as on 31/03/2018	Amount to be spent during the next three year of the application.			Total Amount	Remarks
					Year 2018-2019 i.e.1.4.18 to 31.3.19	Year 2019-2020 i.e.1.4.19 to 31.3.20	Year 2020-2021 i.e.1.4.20 to 31.3.21		
1	2	3	4	5	6	7	8	9	10

Certified that the above information is true and correct to the best of my knowledge and belief.

Signature of Contractor

For the assessment of bid capacity, prospective bidders should submit information about the works carried out by them in last five years as well asprogramme of balance work in the prescribed statement (Details Statement A) attachedherewith duly signed by Executive Engineer-in-charge of work.

The bid capacity will be calculated in the following manner.

Bid Capacity = (A x N x 2) – B

Where, A = Maximum value of Civil Engineering works executed in any one yearduring the last five years. (Updated to the current C.S.R. level), which will take intoaccount the completed and on going works.

Cost of completed works in earlier years shall be given additional weightage of10% per year as illustrated below to bring it to current price level.

Sl. No.	**Year**	**Cost of work executed**	**Derived annual cost of works at current price level.**
1	**2013-14**		**1.464**
2	**2014-15**		**1.33**
3	**2015-16**		**1.21**
4	**2016-17**		**1.10**
5	**2017-18**		**1.00**

B = Value of the existing commitments and works (ongoing) to be completed in theperiod stipulated of the completion of the work in the present tender. (Allcertificates to be provided, shall be countersigned by Engineer-in-charge of thework not below the rank of Executive Engineer)

N = Number of years prescribed for completion of the work for which bids are invited. (20 **Months)**

APPENDIX-G

FORM- VII(A) :Joint Venture Summary

Names of all partners of a joint venture
1. Lead partner
2. Partner
3. Partner

Total value of annual construction (and/or equipment, goods or services which apply to this contract) turnover, in terms of work billed to clients, in Rs. Crores .at the end of the period reported.

Annual turnover data (construction only; Rs. In Crores)			
Partner	**Year 1**	**Year 2**	**Year 3**
1. Lead partner			
2. Partner			
3. Partner			
Total			

Signature & Seal of Applicant

APPENDIX-G

FORM- VII(B) :Joint Venture Agreement on non judicial stamp paper worth Rs. 100/-

To,

Executive Engineer,
Add. Consturction Divison
U.P. Jal Nigam,
Sultanpur
Mo. 9473942716, Phone-05362-231458

The undersigned of this declaration of cooperation are by means of attached Powers of Attorney legally authorized to act with regard to Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete(civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city" On turnkey basis.

They hereby declare:

1. **That they will legalize a Joint Venture Agreement in case that a Contract for the Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete(civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city" On turnkey basis.**

. .

is awarded to their group;

2. **that they have nominated _____** [*name of the lead partner*] **as the Sponsor Firm of the group for the purpose of this Bid;**
3. **That they authorized Mr./Ms. _____** [*name of the person who is authorised to act as the Representative on behalf of the Joint Venture*] **to act as the Bidder's Representative in the name and on behalf of their group.**
4. **Joint venture agreement conforming their association for jointly and severally responsibility with their percentage of the contract value.**
5. **Joint venture shall be jointly and severally responsible for meeting all technical and commercial conditions and proper work of tender.**
6. **That this Joint Venture is an association constituted for the execution of**. " Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete(civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city" On turnkey basis.
7. **That if the Employer accepts the Bid of this Joint Venture, it shall not be modified in its composition or constitution until the completion of Contract without the prior consent of the Employer;**
8. **That while the lead partner shall remain overall responsible for successful implementation of the total contract, each partner's share of the responsibility, stated as percentage of the total contract amount, shall be as follows:**

Name of Partner	Primarily Responsible to complete components of Contract (as percentage of the contract amount)
1. Lead Partner	
2. Partner	
3. Partner	
Total	

8- That if during currency of the work joint venture/ consortium dissolves, the U.P. J.N. shall have full right to forfeit the security money, payments due with U.P.J.N. and retain the equipments, T&P, scaffolding, shuttering etc. for completion of the balance work as per provision of the agreements.

Note: The above mentioned responsibility shall not absolve the total responsibility to complete the Contract as a member of the joint Venture.

Give names and positions of the proposed Joint Venture Representatives, as well as organization's names and addresses:

1.	Name:	Signature:
	Position:	Date:
	Representative of: (Organisation's Name)	

2.	Name:	Signature:
	Position:	Date:
	Representative of: (Organisation's Name)	

3.	Name:	Signature:
	Position:	Date:
	Representative of: (Organisation's Name)	

Witness: Signature & Seal of Contractor

Signed on behalf of the Chairman by

Witness:

Designation of Officer(U.P. J.N.)

Witness:

Signature & Seal of Applicant

APPENDIX-H

Form(3): Particular Experience Record

Name of Applicant or partner of a joint venture/consortium

To pre-qualify, the Applicant shall be required to pass the specified requirements applicable to this form, as set out in the "Technical & Financial Evaluation Instructions to Applicants".

On a separate page, using the format of Form (3a), and (3b) as applicable, the Applicant is requested to list all contracts of a similar nature and complexity to the contract for which the Applicant wishes to qualify and undertaken during the last 5 (Five) years. The partners of a joint venture should provide details of similar contracts. Such details should be submitted using forms 3a and 3b respectively for each contract completed or under execution, by the Applicant or by **each partner of a joint venture.** The applicants must submit the performance report (completion certificate) in support of their work experience obtained from the authorized representative of client containing Agreement No., date of start, date of completion and value of work done**.**

Where the Applicant proposes to use named subcontractors for critical components of the works, **the information in the same forms should also be supplied for each specialist subcontractor.**

Applicants are required to enclose evidence documents for work in progress or completed. Use of copy of certificates is recommended with signature of applicant for authentication.

*Any work done as a subcontractor will not be considered for eligibility**. Even though a work of diversified nature is undertaken and completed by a joint venture, the specific work carried out by each of the partners in the joint venture will only be considered as his eligibility. This should be supported by documentary evidence, such as copy of joint venture agreement, clearly defining responsibility and certificate of completion from the employer.***

Signature & Seal of Applicant

FORM – 3 (A)

Form(3A): Details of Contracts of Similar Nature and Complexity

Name of Applicant

Use a separate sheet for each contract.

1.	Number of contract	
2.	Name of contract	
3.	Country	
4.	Name of employer	
5.	Employer address & phone nos.	
6.	Nature of works and special features relevant to the contract for which the Applicant wishes to pre qualify	
7.	Contract role (check one) ıtractor	
8.	Value in specified currencies at completion, or at date of award for current contracts, Total Contract Amount:: Rs Sub-Contract Amount (if the role was sub contractor): Rs Responsible Contract Amount (if the role was partner in a joint venture): Rs Total Contract Value : Rs _____ Percentage of share _____ %	
9.	Date of award	
10.	Date of completion	
11.	___ Months	

12. **Details of works in each contract**								
Sr. No.	*Particulars of Contract with name of Deptt. and office*	Details of work						Amount of contract (in Rs. Lacs)
		WTP No./ capacity	RCC OHT / CWR No./ capacity	Rising r main pipe Type, dia & length	Rising main / Dist. System D.I., & G.I. pipe dia & length	Intake well Nos/Dia.	Building work	
1.	2.	3.	4.	5.	6.	7.	8.	9.

Signature & Seal of Applicant

APPLICATION FORM (3b)

Form(3A):Abstract of Contracts of Similar Nature and Complexity

"

Name of Applicant or partner of a joint venture

Sr.	Particulars of Contract with name of Deptt. and office	Details of work						Amount of contract (in Rs. Lacs)
		WTP with Technology, No./ capacity	RCC OHT / CWR No./ capacity	Rising r main pipe Type, dia & length	Rising main / Dist. System D.I., & G.I. pipe dia & length	Intake well Nos/Dia.	Building work	
1	2	3	4	5	6	7	8	9

Note: Please attach certified copy of the certificate of experience in support of above details issued by the Govt Deptt. / Public sector under taking by an authority not below the rank of Project Manager or authorised rank for the work cost.

Signature & Seal of Applicant

APPENDIX-I

FORM 4(a): ABSTRACT OF CONTRACT

(TO BE TYPED ON PLAIN PAPER)

Summary Sheet: Current Contract Commitments / Works in Progress

Name of Applicant or partner of a joint venture

Applicants and each partner to an application should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

Name of contract/Department	*Value of outstanding work (current In Rs. Crores)*	*Estimated completion date*
1.		
2.		
3.		
4.		
5.		
6.		

NOTE : IF REQUIRED PLEASE ADD ADDITIONAL SHEETS

Signature & Seal of Applicant

APPLICATION FORM (4)b

Summary Sheet: Works Tendered

Name of Applicant or partner of a joint venture

Sl. No.	Name of Department/Address of Correspondence/Telephone no.	Name of work	Estimated cost of work, Rs. In lacs	Position in the bidding	Remarks, if any
C1	C2	C3	C4	C5	C6

Signature & Seal of Applicant

FORM-IV: PERFORMANCE/ EXPERINCE REPORT FOR WORKS COMPLETED

Part – I

1. Name of the Contractor
2. Name of work
3. Agreement No.
4. Name of Division in which the work was executed
5. Total Scope of work
6. Name of partner done the following work
    a) Process design
    b) Construction of civil work
    c) E&M work
    d) PLC SCADA System
    e) Operation and Maintenance work
7. Estimated Cost put to tender (contractual amount)
8. Tendered Cost
9. Gross amount of final bill/ work done till date
10. Stipulated date of start/ completion
11. Actual date of completion
12. date of commissioning.
13. Amount of compensation levied for delay, if any
14. Amount of reduced rate items, if any
15. Did the contractor go for arbitration
16. if yes, total amount claimed & amount awarded

Quality of work (grade as Very Good/ Good/ Satisfactory/ Poor)

Signature of client (EE)

Full Designation

Seal

Signature of client (SE)

Full Designation

Seal

APPENDIX-K

FORM - V

(Format to be typed on plain paper)

Name of Applicant or partner of a joint venture		
*Applicants, including each partner of a joint venture, should provide financial information to demonstrate that they meet the requirements stated in the **Instructions to Applicants**. Each applicant or partner of a joint venture must fill in this form. If necessary, use separate sheets to provide complete banker information. A copy of the audited balance sheets and statement of profit and losses should be attached.*		
Banker	Name of banker	
	Address of banker	
	Telephone	Contact name and title
	Fax	E-mail

Summarize actual assets and liabilities in INR equivalent (at the rates of exchange current at the end of each year) for the previous five years.. Based upon known commitments summarize projected assets and liabilities in INR equivalent for the next two years.

Financial information Rs.in Crore	*Actual:* *previous five years*				
	1.	2.	3.	4.	5.
1. Total assets					
Current assets					
Total liabilities					
Current liabilities					
Sales					
Ordinary Profits					
Profits before taxes					
Profits after taxes					

Specify proposed sources of financing to meet the cash flow demands of the Project, net of current commitments for other contracts (Instructions to Applicants, para. 4.6).

Source of financing	*Amount (Rs. in Crore)*
1.	
2.	
3.	
4.	

Attach audited financial statements for the last five years (for the individual applicant or each partner of a joint venture).

Firms owned by individuals, and partnerships, may submit their balance sheets certified by a registered accountant, and supported by copies of tax returns.

Applicants are be requested to submit a bank reference letter from a reputable commercial bank to the effect that such bank certifies the financial capability of the applicants to meet their financial obligation to perform the said contract and considers to issue a specific line of credit when and if the contract is awarded to the applicants.

Signature & Seal of Applicant

APPENDIX-L

(Format for Litigation History to be typed on plain paper.)

APPLICATION FORM (6) :Litigation History

Sl. No.	Name of Deptt. with which dispute arose. Address with Tel. No. and e-mail addressof Deptt.	Agreement No./ cost of work	Date of start of work	Schedule date of completion of work	Date of start of Dispute
1	2	3	4	5	6

Nature of Dispute	Total Cost of Disputed work	Dispute pending under		Present of Position of Dispute	
		Arbitration	Court	Settled with Cost & Date	Under Progress
7	8	9	10	11	12

Signature & Seal of Applicant

APPENDIX-M

(Format for affidavit to be typed on Rs. 10/- non-judicial stamp paper duly verified by the Notary Public)

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APPLICATION FORM (7) :List of Staff with firm

I/we …………………………………… S/o ………………………………………….. Partners / Authorised person of M/s ………………………….., applicant for pre-qualification hereby declare that following person(s) is/are in my/our regular employment on the post and from the dates mentioned against them.

Sl. No.	Name and Address	Technical Qualification	Post held regular	Date of Employment	Details of experience
1. 2. 3. …					

I/we understand that ONE Graduate and ONE Diploma Engineers in Civil Engineering, having at least 5 years experience, will have to be deployed by us on the work throughout, in case we are entrusted with the execution of the work in question.

I/we further understand that in the event of non-presence of such Engineers, the U.P. Jal Nigam shall deduct @ Rs. 40000/- (Rs. Forty thousand only) for Graduate Engineer or Rs. 25000/- (Rs. Twenty five thousand only) for Diploma Holder as the case may be, per month from our bills, which will not be refundable.

I/we further understand that the decision of Executive Engineer regarding presence/absence of my/our Engineer from the work shall be final and binding upon us.

Signature & Seal of Applicant
~~~~~~

APPENDIX-N

(Format for affidavit to be typed on Rs. 10/- non-judicial stamp paper duly verified by the Notary Public)

~~~~~~

APPLICATION FORM (8) :List of Tools & Plants with firm

I/we …………………………………… S/o ………………………………………….. Partners / Authorized person of M/s ………………………….., applicant for pre-qualification hereby certify that I/we possess the following machinery, tools and plants, centering and shuttering, all in good working conditions.

Particulars of Machinery Tools, Plants centering and shuttering	Total No.	Estimated Cost (Rs.)	Approximate age in years and months	Nos. to be used on work under this bid

I/we undertake that above machineries and centering & shuttering material will remain in good working condition and in useable form throughout the currency of work.

I/we further undertake, that if, there is any reduction in the equipment, below the limit required for pre-qualification, I/we will inform Executive Engineer / Ambedkarnagar Engineer, U.P. Jal Nigam to whom application for pre-qualification is being made, within 3 days of its occurrence and arrange to make it up within another one week, failing which, U.P. Jal Nigam will be free to impose any penalty that it may deem fit, which will be final and binding upon me/us.

Signature & Seal of Applicant
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APPENDIX-O

(प्रारूप चरित्र प्रमाण – पत्र)

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PWD (T-4)

कार्यालय जिला मजिस्ट्रेट ....

<u>चरित्र प्रमाण – पत्र</u>

1. आवेदक का नाम श्री/श्रीमती ....

2. पिता/पति का नाम श्री ....

3. आयु ....

4. शैक्षिक योग्यता ....

5. व्यवसाय ....

6. पता : अ) स्थाई पता दूरभाष सहित ....

   ब) अस्थाई पता दूरभाष सहित ....

7. अपराधिक मुकदमों का विवरण ....

   (व्यक्ति के विरुद्ध जनपद में दर्ज मुकदमों, अपराधिक गतिविधियों और असमाजिक कार्यों का विवरण दिया जाये। यदि किसी न्यायालय में अपराधिक मुकदमा चल रहा है तो उसका विवरण भी दिया जाये। यदि लोक निर्माण विभाग अथवा राज्य सरकार के अन्य विभागों द्वारा ब्लैक लिस्टैड किया गया हो तो उसका विवरण भी दिया जाये। माफिया/गैंगस्टर गतिविधियों एवं संगठित अपराधों में लिप्त व्यक्तियों के बारे में विषेष रुप से जाँच करने के बाद ही प्रमाण पत्र निर्गत किया जाये और इसका उल्लेख इस कालम में अवश्य किया जाये।

8. सामान्य ख्याति ....
....

9. <u>**प्रमाण पत्र**</u> :

मेरे द्वारा श्री .... के कार्य और आचरण तथा चरित्र के सम्बन्ध में पूरी तथ्यात्मक जानकारी कर ली गई है। इनके विरुद्ध अपराधिक मुकदमों की सूचना भी पुलिस से प्राप्त की गई है। सभी तथ्यों की जानकारी के पश्चात मैं प्रमाणित करता हूँ कि श्री .... का कार्य और आचरण तथा चरित्र उत्तम है और इनके लोक निर्माण विभाग में अथवा राज्य सरकार के किसी विभाग में ठेकेदार का कार्य करने पर सामान्यतः आपत्ति प्रतीत नहीं होती है।

दिनांक : ....

हस्ताक्षर
जिला मजिस्ट्रेट/कलेक्टर
(मुहर सहित)

नोट :– 1. जिला मजिस्ट्रेट/कलेक्टर द्वारा यह प्रमाण पत्र अपने स्वयं के हस्ताक्षर से निर्गत किया जायेगा।
~~~~~~

2. प्रमाण पत्र देने के पूर्व वह आवश्यकतानुसार वरिष्ठ अधीक्षक/पुलिस अधीक्षक/तहसीलदार/एस0डी0एम0/अपर जिलाधिकारी अथवा किसी अन्य अधिकारी से जाँच कराकर रिपोर्ट प्राप्त कर सकते हैं।
3. सम्बन्धित व्यक्ति से स्वघोषणा शपथ–पत्र भी ले सकते हैं।
4. यह प्रमाण पत्र सामान्यतः दो वर्ष के लिए मान्य होगा। यदि इससे पूर्व कोई अपराधिक घटना होती है अथवा प्रार्थी के विरुद्ध कोई अपराधिक मुकदमा आदि दर्ज होता है या वह किसी संगठित अपराध में या माफिया गतिविधियों में या असामाजिक गतिविधियों में पकड़ा जाता है तो पुलिस का यह उत्तरदायित्व होगा कि इसकी सूचना वह जिला मजिस्ट्रेट/कलेक्टर तथा सम्बन्धित विभाग के अधिकारियों को दें और प्रमाण पत्र तत्काल निरस्त किया जायेगा।
5. इन प्रमाण पत्रों की प्रविष्टि जिलाधिकारी कार्यालय में तथा वरिष्ठ पुलिस अधीक्षक/पुलिस अधीक्षक कार्यालय में एक अलग रजिस्टर में विधिवत अंकित की जायेगी और निर्गत प्रमाण पत्र की एक प्रमाणित फोटो प्रति रजिस्टर में अवष्य रखी जायेगी।
6. इस प्रमाण पत्र के निर्गत करने अथवा निरस्त करने के सम्बन्ध में अन्तिम निर्णय सम्बन्धित जिला मजिस्ट्रेट/कलेक्टर का होगा।
7. निर्गत प्रमाण पत्र की एक कार्यालय प्रति वरिष्ठ पुलिस अधीक्षक/पुलिस अधीक्षक कार्यालय में अवश्य रखी जायेगी और एक अलग रजिस्टर में प्रविष्टि अंकित की जायेगी जिससे रिकार्ड रहे।
8. सम्बन्धित व्यक्ति द्वारा पासपोर्ट साइज का अपना नवीनतम फोटोग्राफ चरित्र प्रमाण पत्र के उपर चस्पा किया जायेगा।

APPENDIX-P

(Format for Liquid Assets to be typed on Letterhead of issuing Bank. It shall not be more than 6 months old as on date of opening of P.Q. Bid)

~~~~~~

This is to certify that dealings of M/s ..………………………………………………….. who have been dealing with us for last …………………...…..……………… years are satisfactory. On the basis of information available with us we assess their Liquid Assets not less than Rs……….. ……………..Lacs.

Date : …………..

SIGNATURE OF MANAGER OF THE BANK

Seal of the Bank
~~~~~~

PWD-T-5

कार्यालय जिला मजिस्ट्रेट.....

.....

राजपत्रित अधिकारी द्वारा प्रमाणित पासपोर्ट साइज कानवीनतम फोटोग्राफचस्पा किया जाये

हैसियत प्रमाण – पत्र

1. **प्रार्थी का नाम (व्यक्ति/फर्म/संस्था का नाम)**.....
.....
2. **पिता/पति का नाम श्री**.....
3. **पता :– (अ) स्थाई पता दूरभाष सहित**.....
.....

(ब) अस्थाई पता दूरभाष सहित.....
.....
4. **व्यवसाय**.....
5. **सम्पत्ति का विवरण** :– जिला मजिस्ट्रेट/कलेक्टर के द्वारा चल/अचल सम्पत्ति/हैसियत के सम्बन्ध में पूरा विवरण निम्नप्रकार से दिया जाये।

(अ) अचल सम्पत्ति :–जमीन/भूखण्ड/मकान/दुकान/व्यवसायिक प्रतिश्ठान/उद्योग धन्धे आदि का पूरा विवरण। यह सम्पत्ति ठेकेदार के नाम है अथवा किसी अन्य व्यक्ति के नाम से है, इसका स्पश्ट उल्लेख किया जाये। इस सम्बन्ध में सक्षम अधिकारी द्वारा निर्गत प्रमाण –पत्र संलग्न किया जाये। सम्पत्ति का मूल्यांकन/बाजार मूल्य तथा सम्पत्ति अथवा किसी वित्तीय संस्था में मार्गेज हो तो उसका विवरण भी दिया जायेगा।

(ब) चल सम्पत्ति :–मोटर वाहन/निर्माण कार्यों में प्रयुक्त मषीनों तथा अन्य चल सम्पत्ति का पूरा विवरण दिया जाये। यह सम्पत्ति ठेकेदार के नाम है अथवा अन्य किसी व्यक्ति के नाम से है, इसका स्पश्ट उल्लेख किया जाये। इस सम्बन्ध में सक्षम अधिकारी द्वारा निर्गत प्रमाण–पत्र संलग्न किया जाये। सम्पत्ति का मूल्यांकन/बाजार मूल्य कितना है। सम्पत्ति बैंक अथवा किसी वित्तीय संस्था में मार्गेज हो तो उसका विवरण भी दिया जाये।

6. बैक अथवा वित्तीय संस्था में कोई धनराषि हो तो इसके लिए बैंक का नाम/खाता संख्या एवं उसमें रखी धनराषि का विवरण दिया जाये। इसके लिए बैंक अथवा वित्तीय संस्था द्वारा निर्गत प्रमाण–पत्र संलग्न किया जाये।

7. हैसियत प्रमाण–पत्र के लिए हैसियत के रूप में यदि बैंक में जमा धनराषि दर्षायी जाती है तो वह धनराषि कम से कम तीन माह पहले से बैंक में जमा होनी चाहिए और कार्य पूरा होने तक बैंक में अवष्य जमा रहनी चाहिए

8. प्रार्थी का पैन नम्बर ..... है।

मेरे द्वारा श्री (यहाँ व्यक्ति/फर्म/संस्था आदि का नाम लिखा जाये)..... ..... की चल और अचल सम्पत्ति के बारे में तथ्यों की जानकारी कर ली गई है और उसका विवरण उपरोक्तानुसार दिया गया है।

मैं प्रमाणित करता हूँ कि मेरी जानकारी में उपरोक्त सभी तथ्य सही है और तथ्यात्मक रिपोर्ट के आधार पर यह प्रमाण –पत्र निर्गत किया जा रहा है।

दिनांक.....

हस्ताक्षर

जिला मजिस्ट्रेट/कलेक्टर

(मुहर सहित)

नोट :–

1. जिला मजिस्ट्रेट/कलेक्टर द्वारा यह प्रमाण –पत्र अपने स्वंय के हस्ताक्षर से निर्गत किया जायेगा। उसके स्थान पर किसी अन्य अधिकारी द्वारा प्रमाण–पत्र निर्गत नहीं किया जायेगा।
2. प्रमाण–पत्र देने के पूर्व वह अवष्यकतानुसार तहसीलदार/एस0डी0एम0/अपर जिलाधिकारी/बैंक अधिकारी अथवा किसी अन्य अधिकारी से जाँच कराकर रिपोर्ट प्राप्त कर सकते है।
3. सम्बन्धित व्यक्ति से स्वघोशण षपथ–पत्र भी ले सकते है।
4. यह प्रमाण–पत्र सामान्यः दो वर्शो के लिए मान्य होगा। यदि इससे पूर्व कोई महत्वपूर्ण विक्रय आदि होता है अथवा सम्पत्ति में परिवर्तन होता है या कमी आती है तो सम्बन्धित व्यक्ति का यह उत्तरदायित्व होगा कि इसकी सूचना वह जिला मजिस्ट्रेट/कलेक्टर तथा सम्बन्धित विभाग के अधिकारियों को देगा और प्रमाण–पत्र में संषोधन जारी किया जायेगा।

5. इस प्रमाण–पत्रों की प्रविश्टि जिलाधिकारी कार्यालय में एक अलग रजिस्टर में विधिवत अंकित की जायेगी और निर्गत प्रमाण–पत्र की एक प्रमाणित फोटो प्रति रजिस्टर में अवष्य रखी जायेगी।
6. इस प्रमाण–पत्र के निर्गत करने अथवा निरस्त करने के सम्बन्ध में अन्तिम निर्णय सम्बन्धित जिला मजिस्ट्रेट/कलेक्टर का होगा।
7. सम्बन्धित व्यक्ति द्वारा पासपोर्ट साइज का अपना नवीनतम फोटोग्राफ जो राजपत्रित अधिकारी द्वारा प्रमाणित हो, हैसियत प्रमाण –पत्र के ऊपर निर्धारित स्थान पर चस्पा किया जायेगा।

PWD-T-6

शपथ– पत्र

राजपत्रित अधिकारी द्वारा प्रमाणित पासपोर्ट साइज कानवीनतम फोटोग्राफचस्पाकिया जाये

मैं..... पुत्र श्री .....

निवासी.....

(स्थाई पता).....

.....

(अस्थाई पता).....

.....

1. मैं निवासी हूँ। मैं षपथपूर्वक निम्न घोशण करता हूँ।

   मैं उ0 प्र0 जल निगम विभाग का ए/बी/सी/डी श्रेणी का पंजीकृत ठेकेदार हूँ। (विभाग द्वारा निर्गत श्रेणी सम्बन्ध प्रमाण–पत्र संलग्न किया जाये) मेरे पास पर्याप्त चल और अचल सम्पत्ति है और व्यवसायिक रूप से मैं लोक निर्माण विभाग में कार्यों को पूरा करने के लिए सक्षम और समर्थ हूँ। मेरे पास आवष्यक मषीने और उपकरण आदि भी है तथा मुझें इस कार्य का पर्याप्त अनुभव है।

2. उ0 प्र0 जल निगम विभाग द्वारा जो (कार्य का विवरण लिखा जाये)..... ..... कराने की निविदा निर्गत की गई है उसके लिए मैं विभाग द्वारा निर्धारित प्रारूप पर निविदा भर रहा हूँ।

3. मेरे द्वारा दिये जा रहे प्रमाण–पत्र/चरित्र प्रमाण–पत्र/हैसियत प्रमाण–पत्र/आयकर प्रमाण–पत्र/व्यापार कर प्रमाण–पत्र/बिड सेक्योरिटी प्रमाण–पत्र/बिड कैपिसिटी प्रमाण –पत्र/जमानत धनराषि आदि का प्रमाण–पत्र तथा अन्य सुसंगत अभिलेख आदि वांछित रूप में निविदा पत्र के साथ संलग्न कर दिये गये है।

4. मेरा पैन नम्बर .....है। (आयकर विभाग द्वारा प्रदत्त प्रमाण –पत्र संलग्न किया जाये)।

5. मेरे विरूद्ध अपराधिक मुकदमों का विवरण निम्नप्रकार है। यहाँ पूरा विवरण दिया जाये।

   1 मुकदमा नम्बर.....
   2 धारायें.....
   3 थाना .....
   4 जनपद .....
   5 न्यायालय (जहाँ मुकदमा चल रहा है).....

6. मैं उ0 प्र0 जल निगम विभाग अथवा राज्य सरकार के अन्य विभागों द्वारा ब्लैक लिस्टेट ठेकेदार की श्रेणी में नहीं आता हूँ। अपराधिक गतिविधियों, माफियां तथा गैंगस्टर गतिविधियों और संगठित अपराध करने की गतिविधियों और असामाजिक कार्यों आदि में लिप्त नहीं हूँ। मैं माफियां और अपराधिक नहीं हूँ। मेरे चाल–चलन, कार्य तथा आचरण उत्तम है।

7. मेरे विरूद्ध जनपद में तथा प्रदेष में कोई भी मुकदमा दर्ज नहीं है।

8. यदि ठेका प्राप्त करने के पश्चात् मेरे विरूद्ध माफियां गतिविधियों/असमाजिक गतिविधियों एवं संगठित अपराधिक गतिविधियों में लिप्त होने के बारे में कोई षिकायत प्रमाणित पाई जाती है तो सक्षम अधिकारी को यह अधिकार होगा कि मेरा ठेका/अनुबन्ध निरस्त कर दें। इस पर मुझे कोई आपत्ति नहीं होगी। मेरे द्वारा यदि विभाग/राज्य सरकार के विरूद्ध कोई अपराधिक कृत्य किया जाता है अथवा सरकारी धन का गबन किया जाता है तो सक्षम अधिकारी को यह अधिकार होगा कि वह मेरे विरूद्ध अपराधिक मुकदमा नियमों के अन्तर्गत दर्ज कराये।

9. मैं अनुबन्ध की षर्तों के अनुसार समय से, पूरी गुणवत्ता के साथ तथा निर्धारित विषिश्टियों के अनुरूप कार्य पूरा करूंगा और विभाग को पूरा सहयोग प्रदान करूंगा।

10. मेरा कार्य एवं आचरण उत्तम है।

11. मैं षपथपूर्वक घोशणा करता हूँ कि मेरा स्थाई पता और अस्थाई पता निम्नप्रकार हैः–

(अ) स्थाई पता (दूरभाष सहित).....

.....

(ब) अस्थाई पता (दूरभाष सहित).....

.....

(यहाँ पूरा पता दूरभाश सहित एवं पिनकोड सहित लिखा जाये)

12. मैं शपथपूर्वक घोषणा करता हूँ कि मैं उपरोक्त पते पर रहता हूँ तथा विभाग द्वारा प्रदान किये गये कार्य का पूरा होने तक मेरे किसी पते में सामान्यतः कोई परिवर्तन नहीं होगा। यदि अपरिहार्य परिस्थितियों में किसी पते में परिवर्तन होता है तो इसकी सूचना तत्काल अधिषासी अभियन्ता, लोक निर्माण विभाग और जिला मजिस्ट्रेट/कलेक्टर को दूंगा।

13. मैं यह भी घोशणा करता हूँ कि विभाग के जिस कार्य के लिए मेरे द्वारा ठेका लिया जा रहा है उसके सपेक्ष चल एवं अचल सम्पत्ति का हैसियत प्रमाण–पत्र जिला मजिस्ट्रेट/कलेक्टर (जनपद का नाम लिखा जाये)..... द्वारा प्राप्त करके मूलरूप से संलग्न किया जा रहा है। यह भी घोशणा करता हूँ कि इस हैसियत प्रमाण–पत्र का उपयोग अन्य कार्यों के लिए नहीं किया जायेगा।

14. मैं अपनी पूर्ण जानकारी में पूरे होषो–हवाष में, स्वस्थचित्त पूरी सत्यनिश्ठा एवं स्वेच्छा से यह षपथ –पत्र लिखकर दे रहा हूँ। ईष्वर मेरी मदद करें।

दिनांक.....

शपथी का पूरा हस्ताक्षर
पूरा नाम
पता

नोट :–

1. यह स्वघोशण शपथ –पत्र रू0 100/– (रू0 एक सौ) के स्टाम्प पेपर (नॉन ज्यूडीसियल) पर नोटरी द्वारा साक्ष्यों के उपस्थिति में सत्यापित कराते हुए दिया जायेगा।
2. असत्य शपथ–पत्र देना एक संगीन और संज्ञेय अपराध है।
3. सम्बन्धित व्यक्ति द्वारा पासपोर्ट साइज का अपना नवीनतम फोटोग्राफ जो राजपत्रित अधिकारी द्वारा प्रमाणित हो, षपथ–पत्र के ऊपर निर्धारित स्थान पर चस्पा किया जायेगा।

UTTAR PRADESH JAL NIGAM

TECHNICAL& FINANCIAL EVALUATION CUM TECHNICAL BID

DOCUMENT- GENERAL CONDITIONS

INDEX

69.5 Resumption of work

SECTION – 1

GENERAL CONDITION OF CONTRACT

1. DEFINITIONS

In the contract (as hereinafter defined) the following words and expressions shall have the meanings hereby assigned to them, except where the context otherwise requires:

A)

(i) "Owner" means the U.P. Jal Nigam represented through its Chairman, Managing Director, U.P. Jal Nigam, Lucknow & Chief Engineer (Faizabad Zone), Faizabad.

(ii) "Employer" means the Executive Engineer,Add. Consturction Divison U.P. Jal Nigam, Sultanpur

(iii) "Engineer/Engineer-in-charge" means the person appointed by the U.P. Jal Nigam to act as Engineer for the purposes of the Contract and Executive Engineer,Add. Consturction Divison U.P. Jal Nigam, Sultanpur or any other competent person appointed by the U.P. Jal Nigam and notified to the Contractor to act in replacement of the Engineer.

(iv) "Contractor" means the person whose Tender has been accepted by the Employer and the legal successors in title to such person, but not (except with the consent of the Employer) any assignee of such person.

(v) "Sub-Contractor" means any person named in the Contract as a Sub-Contractor for a part of the works or any person to whom a part of the works has been subcontracted with the consent of the Engineer and the legal successors in title to such person, but not any assignee of any such person.

(vi) "Engineer's Representative" means any Executive Engineer,Add. Consturction Divison U.P. Jal Nigam, Sultanpur and the person appointed from time to time by the Engineer under sub clause 2.2

B)

(i) "Contract" means these conditions Vol- I (Part-I, II and II) and vol- II the specifications, the Drawings, the Bill of Quantities, the Tender, the Letter of Acceptance, the Contract Agreement (if completed) and such further documents as may be expressly incorporated in the Letter of Acceptance or Contract Agreement (if completed).

(ii) "Specification" means the specification of the Works included in the Contract and any modification thereof or addition thereto made under clause 51 or submitted by the Contractor and approved by the Employer.

(iii) "Drawings" means all drawing, calculations and technical information of a like nature provided by the Engineer to the Contractor under the Contract and all drawings, calculations, samples, technical information of a like nature submitted by the Contractor and approved by the Employer.

(iv) "Bill of Quantities" means the priced and completed Bill of Quantities forming part of the Tender.

(v) "Tender" means the Contractor's priced offer to the Employer for the execution and completion of the Works and the remedying of any defects therein in accordance with the provisions of the Contract, as accepted by the Letter of Acceptance. The word "Tender" is synonymous with "Bid" and the words "Tender-Documents" with "bidding documents".

(vi) "Letter of Acceptance" means the formal acceptance by the Employer of the Tender.

(vii) "Contract Agreement" means the Contract Agreement (if any) referred to in Sub-Clause 9.1.

(viii) "Appendix to Tender" means the appendix comprised in the form of Tender annexed to these conditions.

C)

(i) "Commencement Date" means the date upon which the Contractor receives the notice to commence issued by the Employer pursuant to Clause 41.

(ii) "Time for Completion" means the time for completing the execution of and passing the tests on Completion of the Works or any section or part thereof as stated in the Contract (or as extended under clause 44) calculated from the commencement date.

D)

(i) "Test of Completion" means the tests specified in the Contract or otherwise agreed by the Engineer and the Contractor which are to be made by the Contractor before the Works or any section or part thereof are taken over by the Employer.

(ii) "Taking over Certificate" means a certificate issued pursuant to clause 48.

E)

(i) "Contract Price" means the sum stated in the Letter of Acceptance as payable to the Contractor for the execution and completion of the Works and the remedying of any defects therein in accordance with the provisions of the Contract.

F)

(i) "Works" means the Permanent Works and the temporary Works or either of them as appropriate.

(ii) "Permanent Works" means the Permanent Works to be executed (including plant) in accordance with the contract.

(iii) "Temporary Works" means all temporary works of every kind (other than Contractor's Equipment) required in or about the execution and completion of the Works and the remedying of any defect therein.

(iv) "Plant" means machinery, apparatus and the like intended to form or forming part of the Permanent Works.

(v) "Contractor's Equipment" means all appliances and things of whatsoever nature (other than temporary works) required for the execution and completion of the works and the remedying of any defects therein, but does not include plant, materials or other things intended to form of forming part of the Permanent Works.

(vi) "Section" means a part of the works specifically identified in the Contract as a Section.

(vii) "Site" means the places provided by the Employer where the works are to be executed and any other places as may be specifically designated in the contract as forming part of the Site.

G)

(i) "Cost" means all expenditure properly incurred or to be incurred whether on or off the Site, including overhead and other charges properly allocable thereto but does not include any allowance for profit.

(ii) "Day" means calendar day.

(iii) "Writing" means any hand-written, typewritten, or printed communication including telex, cable and facsimile transmission.

1.1 **<u>Notices, Consents, Approvals, Certificates and Determinations</u>**

Wherever in the contract provision is made for the giving or issue of any notice, consent, approval, certificate or determination by any person, unless otherwise specified such notice, consent, approval, certificate or determination shall be in writing and the words "notify", "certify" or "determine" shall be construed accordingly. Any such consent, approval, certificates or determination shall not unreasonably be withheld or delayed.

ENGINEER AND ENGINEER'S REPRESENTATIVE

2.1 Engineer's Duties and Authority

a) The Engineers shall carry out the duties specified in the contract.

b) The Engineer may exercise the authority specified in or necessarily to be implied from the contract, provide, however, that if the Engineer is required, under the terms of his appointment by the Employer, to obtain the specific approval of the Employer before exercising any such authority, provided further that any requisite approval shall be deemed to have been given by the Employer for any such authority exercised by the Engineer.

c) Except as expressly stated in the contract, the Engineer shall have no authority to relieve the Contractor of any of his obligation under the contract.

2.2 Engineer's Representative

a) The Engineer's representative shall be appointed by and be responsible to the engineer and shall carry out such duties and exercise such authority as may be delegated to him by the Engineer under sub-clause 2.3.

b) Duties of the Engineer's Representative: The duties of the representative of the Engineer are to check, inspect and continuously supervise the work and to test any material to be used or workmanship employed in connection with the works. He shall furnish the drawings and information to the Contractor, recommend and pass the interim certificates and taking over certificates after thorough checking and inspection and recommend extra works required and extensions of time.

Engineer's representative is entitled to issue approval for or acceptance of any work or material or failure to disapprove any

work or material by the representative of the Engineer thereafter to disapprove such work or material and to order removal or modification thereof. If the Contractor is dissatisfied with any decision of the Representative of the Engineer, he can refer the matter to the Engineer who shall there upon confirm his decision which shall be final and binding to the Contractor.

2.3 Engineer's Authority to Delegate

The Engineer may from time to time delegate to the Engineer's Representative any of the duties and authorities vested in the Engineer and he may at any time revoke such delegation. Any such delegation or revocation shall be in writing and shall not take effect until a copy thereof has been delivered to the Employer and the Contractor.

Any communication given by the Engineer's Representative to the Contractor in accordance with such delegation shall have the same effect as though it had been given by the Engineer, provided that:

a) Any failure of the Engineer's Representative to disapprove any work, materials or plant shall not prejudice the authority of the Engineer to disapprove such work, materials or plant and to give instructions for the rectification thereof;

b) If the Contractor questions any communication of the Engineer's Representative he may refer the matter to the Engineer who shall confirm, reverse or vary the contents of such communication.

2.4 Appointment of Assistants

The Engineer or the Engineer's Representative may appoint any number of persons to assist the Engineer's Representative in the carrying out of his duties under sub-clause 2.2. He shall notify to the Contractor the names, duties and scope of authority of such persons. Such assistant shall have no authority to issue any instruction to the Contractor save in so for as such instruction may be necessary to enable them to carryout their duties and to secure their acceptance of materials, plant or workmanship

as being in accordance with the contract and any instructions given by any of them for those purpose shall be deemed to have been given by the Engineer's Representative.

2.5 <u>Instructions in Writing</u>

Instruction given by the Engineer shall be in writing, provided that if for any reason the Engineer considers it necessary to given any such instruction orally, the Contractor shall comply with such instruction. Confirmation in writing of such oral instruction given by the Engineer whether before or after the carrying out of the instruction shall deemed to be an instruction within the meaning of this sub-clause provided further that if the Contractor, within 7 days, confirms in writing to the Engineer any oral instruction of the Engineer and such confirmation is not contradicted in writing within 7 days by the Engineer, it shall be deemed to be an instruction of the Engineers.

The provisions of this sub-clause shall equally apply to instruction given by the Engineer's Representative and any assistant of the Engineers or the Engineer's Representative appointed pursuant to sub-clause 2.

2.6 Engineer to Act Impartially

Wherever, under the contract, the Engineer is required to exercise his discretion by:

a) Giving his decision, opinion or consent, or

b) Expressing his satisfaction or approval

c) Determining value, or

d) Otherwise taking action, which may affect the rights and obligations of the Employer or the Contractor.

He shall exercise such discretion impartially within the terms of the Contract and having regard to all circumstances. Any such decision, opinion, consent, expression of satisfaction, or approval, determination of value or action may be opened up, reviewed or revised as provided in clause 67.

Assignment of Contract and Sub-Contracting

3.1 Assignment of Contract

The Contractor shall not without the prior consent of the Employer (which consent, notwithstanding the provisions of sub-clause 1.5, shall be at sole discretion of the Employer), assign the contract or any part thereof, or any benefit or interest therein or there under, otherwise than by;

a) A change in favour of the Contractor's bankers of any money due or to become due under the contract, or

b) Assignment to the Contractor's insurers (in cases where the insurers have discharged the Contractor's loss or liability) of the Contractor's right to obtain relief against any other party liable.

4.1 Subcontracting

The Contractor shall not subcontract the whole of the works except where otherwise provided by the contract; the Contractor shall not subcontract any part of the works without the prior consent of the Employer. Any such consent shall not relieve the Contractor from any liability or obligation under the contract and he shall be responsible for the acts, defaults and neglects of any Sub-Contractor, his agents, servants or workmen as if they were the acts.

Provided that the Contractor shall not be required to obtain such consent for:

a) the provision of labour or
b) the purchase of materials which are in accordance with the standards specified in the contract, or
c) the subcontracting of any part of the works for which the Sub-Contractor is named in the contract.

4.2 Assignment of Sub-Contractor's Obligations

In the event of Sub-Contractor having undertaken towards the Contractor in respect of the work executed, or the goods, materials, plant or services supplied by such Sub-Contractor any continuing obligation extending for a period exceeding that of the Defects Liability period under the contract, the Contractor shall at any time after the expiration of such period, assign to the Owner, at the Owner's request and cost, the benefit of such obligation for the un-expired duration thereof.

CONTRACT DOCUMENTS

5.1 Languages and Law

a) The language is English

b) The Law is that in-force in India / Uttar Pradesh.

5.2 Priority of Contract Documents

The several documents forming the contract are to be taken as mutually explanatory of one another, but in case of ambiguities or discrepancies the same shall be explained and adjusted by the Engineer who shall thereupon issue to the Contractor instruction thereon and in such event, unless otherwise provided in the contract, the priority of the documents forming the contract shall be as follows:

1. The Contract Agreement (if completed);
2. The Letter of Acceptance;
3. The Tender;
4. The Condition of Contract;
5. The Specification;
6. The Drawings;
7. The Priced Bill of Quantities;
8. Any other Documents forming part of the contract.

6.1 Custody & Supply of Drawing & Documents

The drawings shall remain in the sole custody of the Engineer, but two copies thereof shall be provided to the Contractor free of charge. The Contractor shall make at his own cost any further copies required by him. Unless it is strictly necessary for the purpose of the contract, the drawings, specification and other documents provided by the Employer or the Engineer shall not, without the consent of the Engineer, be used or communicated to a third party be the Contractor. Upon issues of the Defect Liability Certificate, the Contractor shall return to the Engineer all Drawings. Specification and other documents provided under the contract.

The Contractor shall supply to the Engineer four copies of all drawings, Specification and other documents submitted by the Contractor and approved by the Employer in accordance with clause 7, together with a reproducible copy of any material which cannot be reproduced to an equal standard by photocopying. In addition the Contractor shall supply such further copies of such drawings, specification and other documents as the Engineer may request in writing for the use of the Employer.

6.2 <u>One Copy of Drawings to be kept on Site</u>

One copy of the Drawings, provided to or supplied by the Contractor as aforesaid, shall be kept by the Contractor on the site and the same shall at all reasonable times be available for inspection and use by the Engineer and by any other person authorized by the Engineer in writing.

6.3 <u>Disruption of Progress</u>

The Contractor shall give notice to the Engineer, with a copy to the Employer, whenever planning or execution of the works is likely to be delayed or disrupted unless any further drawing or instruction is issued by the Engineer within a reasonable time. The notice shall include details of the drawing or instruction required and of why and by when it is requested and of any delay or disruption likely to be suffered if it is late.

6.4 <u>Delays and Cost of Delay of Drawings</u>

If, by reason of any failure or inability of the Engineer to issue, within a time reasonable in all the circumstances, any drawing or instruction for which notice has been given by the Contractor in accordance with sub-clause 63, the Contractor suffers delay and / or incurs costs then the Engineer shall, after due consultation with the Employer and the Contractor, determine;

a) Any extension of time to which the Contractor is titled under clause 44, and

b) The amount of such costs which may be added to the Contract Prices, and shall notify the Contractor accordingly with a copy to the Employer.

6.5 Failure by Contractor to Submit Drawings

If the failure of inability of the Engineer to issue any drawings or instruction is caused in whole or in part by the failure of the Contractor to submit drawings, specification or other documents which he is required to submit under the contract, the Engineer shall take such failure by the Contractor into account when making his determination pursuant to sub-clause 6.4.

7.1 Supplementary Drawings and Instructions

The Engineer shall have authority to issue to the Contractor, from time to time, such supplementary Drawings and instructions as shall be necessary for the purpose of the proper and adequate execution and completion of the works and the remedying of any defect therein. The Contractor shall carry out and be bound by the same.

Permanent Works Designed by Contractor

Where the Contractor expressly provides that part of the Permanent Works shall be designed by the Contractor, he shall submit to the Engineer for approval;

a) Such drawing, specifications, calculation and other information as shall be necessary to satisfy the Engineer as to the suitability and adequacy of that design, and

b) Operation and maintenance manuals together with drawings of the Permanent Works as completed, in sufficient detail to enable the Employer to operate, maintain, dismantle, reassemble and adjust the Permanent works incorporating that design. The works shall not be considered to be completed for the purposes of taking over in accordance with clause 48 until such operation and maintenance manuals, together with drawings on completion, have been submitted to and approved by the Employer.

7.2 Responsibility Unaffected by Approval

Approval by the Employer, in accordance with sub-clause 7.1 shall not relieve the Contractor of any of his responsibilities under the Contract.

GENERAL OBLIGATIONS

8.1 Contractor's General Responsibilities

The Contractor shall, with due care and diligence, design (to the extent provided for by the contract), execute and complete the works and rectify any defects therein in accordance with the provisions of the contract. The Contractor shall provide all Superintendence, Labour, Materials, Plant, Contractor's Equipment and all other things, whether of a temporary or Permanent nature, required in and for such design, execution, completion and remedying of any defects, so far as the necessity for providing the same is specified in or is reasonably to be inferred from the Contract.

The Contractor shall promptly notify the Employer and the Engineer of any error, omission, fault or any other defect in the design of or specifications for the works which he discovers when reviewing the Contract Documents or in the or in the process of execution of the works.

8.2 Site Operations and Methods of Construction

The Contractor shall take full responsibility for the adequacy, stability and safety of all site operation and methods of construction. Provided that the Contractor shall not be responsible (except as stated here or as may be otherwise agreed) for the design or specification of Permanent Works, or for the design or specification of any temporary works not prepared by the Contractor. Where the contract expressly provides that part of the permanent works shall be designed by the Contractor, he shall be fully responsible for the part of such works, notwithstanding any approval by the Employer.

9.1 Contract Agreement

The Contractor shall, if called upon so to do enters into and execute the Contract Agreement, in the form annexed to these conditions with such modification as may be necessary.

10.1 Performance security

The Contractor shall provide security for his proper performance of the contract, to the Employer within 20 days after the receipt of the letter of Acceptance. The performance security shall be TEN percent of contract

price. Part of the performance security in the form of a Bank-Guarantee shall be FIVE percent of the contract price and the balance amount of the performance security (after adjusting the Earnest Money deposited by the bidder) shall be recovered from the monthly payment, making a deduction at the rate of ten percent of the bill amount pursuant to clause 60.4. The performance security in the form of Bank Guarantee shall be issued by a Schedule Bank of India. When providing such security to the Employer, the Contractor shall notify the Engineer of so doing. The cost of complying with the requirements of this clause shall be borne by the Contractor.

11.1 <u>Inspection of Site</u>

Contractor is advised to make his own investigations also desires as he will be responsible for the interpretation and correctness even incase; such dates regarding hydrological and subsurface conditions are provided by the Employer.

The Contractor shall be deemed to have inspected and examined the site and its surrounding and information available in connection there with and to have satisfied himself (so far as is practicable, having regard to considerations of cost and time) before submitting his Tender, as to:

a) The form and nature thereof, including the sub-surface conditions.

b) The hydrological and climatic conditions,

c) The extent and nature of work and materials necessary for the execution and completion of the works and the remedying of defect therein and

d) The means of access to the site and the accommodation he may require and, in general, shall be deemed to have obtained all necessary information, subject as above mentioned, as to risks, contingencies and all other circumstances which may influence or affect his Tender.

11.2 <u>Access of Data</u>

Data made available by the Employer in accordance with sub-clause 11.1 shall be deemed to include the followings, and are open for inspection at

the office of Executive Engineer, Add. Consturction Divison U.P. Jal Nigam, Sultanpur

(a) Site Plan : Sheet

(b) Alignment of the Proposed Distribution System : Sheet

(c) Proposed Site Plan of Water Works : Sheet

site at, Nagar Palika Parishad Sultanpur City.

11.3 Cost of Additional Data

A set of detailed information pursuant to clause 11.2 can be obtained from the office of Executive Engineer, Add. Consturction Divison U.P. Jal Nigam, Sultanpur at a cost of Rs. One Thousand only by making payments through Cash or Demand Draft in favour of "Executive Engineer,Add. Consturction Divison U.P. Jal Nigam, Sultanpur

12.1 Sufficiency of Tender

The Contractor shall be deemed to have satisfied himself into the correctness and sufficiency of the Tender and of the rates and prices stated in the Bill of Quantities, all of which shall, except insofar as it is otherwise provided in the Contract, cover all his obligations under the Contract (including those in respect of the supply of goods, materials, plant or services or of contingencies for which there is a provisional sum and all matters and things necessary for the proper execution and completion of the works and the remedying of any defects therein).

12.2 Adverse Physical Obstructions or Conditions

If, however, during the execution of the works the Contractor encounters physical obstructions or physical conditions, other than climatic conditions on the site, which obstructions or conditions were in his opinion, not foreseeable by an experienced Contractor, the Contractor shall forthwith give notice thereof to the Engineer, with a copy to Employer. On receipt of such notice, the Engineer shall, if in his opinion such obstruction or conditions could not have been reasonably foreseen

by an experienced Contractor, after due consultation with the Employer and the Contractor, determines

a) any extension of time to which the Contractor entitled under clause 44,

b) the amount of any cost which may have been incurred by the Contractor by reason of such obstructions or conditions having been encountered which shall be added to the contract price. Subject of the consent of the Owner and shall notify the Contractor accordingly with a copy to the Employer. Such determination shall take account of any instruction which the Engineer may issue to the Contractor in connection therewith, and any proper and reasonable measures acceptable to the Engineer which the Contractor may take in the absence of specific instruction from the Engineer.

13.1 <u>Work to be in Accordance with Contract</u>

Unless it is legally or physically impossible, the Contractor shall execute and complete the works and remedy any defects therein in strict accordance with the contract to the satisfaction of the Engineer.

The Contractor shall comply with and adhere strictly to the Engineer's instructions on any matter, whether mentioned in the contract or not, touching or concerning the works. The Contractor shall take instruction only from the Engineer or, subject to the provisions of clause 2, from the Engineer's Representative.

14.1 <u>Program to be Submitted</u>

The time limits fixed for execution of the work and completion of contractual obligations carry most importance. These shall be as follows:

a) the Employer would notify the successful bidder through "Letter of Acceptance" that his bid has been accepted.

b) the successful bidder shall establish his site office and mobilize his manpower, equipments, tools and plants etc. so as to bring himself

in date of issue of "Letter of Acceptance" leading to the issue of "Order to Proceed".

c) **Time of Completion**

The Contractor shall construct, complete the works including final clear up final inspection, correction of all defect, testing, commissioning and trial run for four months of the work after the contract time of twelve (12) calendar months form date of order to proceed. The defect liability for 12 months shall start after trial run period is over. During defect liability the contractor shall maintain the water supply scheme. After works are completed and commissioned satisfactorily, the employer will issue to the Contractor, a written "Certificate of Completion". The date of issue of completion certificate shall mean the date of start of trial run period of FOUR continuous months.

d) Further, the progress of work at any stage during the period of execution shall be proportionate to the time elapsed. The work shall generally proceed as per bar chart mutually agreed upon between the two parties to this contract and the following progress would be achieved by the Contractor, as a minimum at the ends of periods specified.

S. No.	Times elapsed from the date of order to proceed		Work done and paid as a percentage of contract price
1.	Three months	:	25%
2.	Six months	:	45%
3.	Nine months	:	75%
4.	Twelve months	:	90%

e) **Trial run period:**

After the date of issue of completion certificate, the works shall be run and maintained by the Contractor at no extra cost for a trial run period of FOUR (4) continuous months. During this period, all manpower material (other than electricity) Tools & Plants, etc. shall be provided by

the contractor. After satisfactory completion of trial run period, the employer will issue the Contractor, a written "Certificate of Final Acceptance". Date of issue of Final Acceptance Certificate shall mean the date of start of twelve (12) months defect liability period.

f) Defect Liability Period

During defect liability and maintenance period of 12 months the contractor shall be responsible for any defect in the building, plant rectify the defects to the entire satisfaction of Engineer-in-charge.

During this period the contractor shall also perform Maintenance of Water Supply Scheme by deploying appropriate manpower etc.

This period of TWELVE (12) months shall commence from the date of issue of Final Acceptance Certificate. After satisfactory completion of aforesaid period, the employer will issue to the Contractor a written "certificate of satisfactory performance / taking over".

g) For the guidance of Contractor the owner's proposed implementation, schedule for the works under this contract can be shown to be contractor by 17.00 P.M. at the office of the Executive Engineer,Add. Consturction Divison U.P. Jal Nigam, Sultanpur which may be adhered by the Contractor in general. The Contractor shall also provide in writing his schedule of programme and a detailed description of the arrangements and methods which the Contractor proposes to adopt for the timely execution of the works.

h) The Contractor's programme for implementation shall be approved by the Engineer. The Contractor shall not be allowed to amend or alter, time frames specified for various activities in the approved implementation schedule.

i) The time within which the program for completing the works under construct shall be submitted by the Contractor shall be 30 days from the date of Letter of Acceptance.

14.2 <u>Revised Programme</u>

If at anytime it appear to the Engineer that the actual progress of the works does not conform to the programme to which consent has been given under sub-clause 14.1, the Contractor shall produce, at the request of the Engineer, a

revised programme showing the modification to such programme necessary to ensure completion of the works within the time for completion.

14.3 Cash flow Estimate to be Submitted

The Contractor shall within 30 days after the date of the Letter of Acceptance, provide to the engineer for his information a detailed cash flow estimate, in quarterly periods, of all payments to which the Contractor will be entitled under the contract and the Contractor shall subsequently supply revised cash flow estimates at quarterly intervals, if required to do so by the Engineer.

14.4 Contractor not Relieved of Duties or Responsibilities

The submission to and consent by the Engineer of such programmes or the provision of such general description or cash flow estimates shall not relieve the Contractor of any of his duties or responsibilities under the contract.

15.1 Contractor's Superintendence

The Contractor shall provide all necessary superintendence during the execution of the works and as long thereafter as the Engineer may consider necessary for the proper fulfilling of the Contractor's obligations under the contract. The Contractor, or a competent and authorized Representative approved by the Engineer, which approval may at any time be withdrawn, shall give his whole time to the superintendence of the works. Such authorized Representative shall receive, on behalf of the Contractor, instruction from the Engineer, or subject to the provisions of clause 2, from the Engineer's Representative.

If approval of the Representative is withdrawn, by the Engineer, the Contractor shall, as soon as is practicable having regard to the requirement of replacing him as here in after mentioned, after receiving notice of such withdrawal remove the Representative from the works and shall not thereafter employ him again on the works in any capacity and shall replace him by another Representative approved by the Engineer.

15.2 Language Ability of Contractor's Representative

If the Contractor's authorized Representative is not, in the opinion of the Engineer, fluent in English, the Contractor shall have available on site at all times a competent interpreter to ensure the proper transmission of instructions and information.

16.1 Contractor's employees

The Contractor shall provide on the site in connection with the execution and completion of the works and the remedying of any defects therein.

a) Only such technical assistants as are skilled and experienced in their respective callings and such foremen and leading hands as are competent to give proper superintendence of the works, and

b) Such skilled, semi-skilled and unskilled labour as necessary for the proper and timely fulfilling of the Contractor's obligation under the contract.

16.2 Engineer at Liberty of Object

The Engineer shall be at liberty to object to and require the Contractor to remove forthwith from the works any person provided by the Contractor who, in the opinion of the Engineer, mis-conducts himself, or is incompetent or negligent in the proper performance of his duties, or whose presence on site is otherwise considered by the Engineer to be undesirable and such person shall not be again allowed upon the works without the consent of the Engineer. Any person so removed from the works shall be replaced as soon as possible.

16.3 Language Ability of Superintending Staff

A reasonable proportion of Contractor's superintending staff shall have a working knowledge of English otherwise, the Contractor shall have available on site at all times a competent interpreter to ensure the proper transmission of instruction and information.

16.4 Employment of Local Personnel

The Contractor is encouraged to the extent practicable and reasonable, to employ staff and labour from local area.

17.1 Setting – Out

The Contractor shall be responsible for;

a) the accurate setting-out of the works in relation to original points, lines and levels of reference given by the Engineer in writing,

b) the correctness, subject as above mentioned, of the position, levels, dimensions and alignment of all parts of the works, and

c) the provision of all necessary instruments, appliance and labour in connection with the foregoing responsibilities.

If, at any time during the execution of the works, any error appears in the position, levels, dimensions or alignment of any part of the works, the Contractor, on being required so to do by the Engineer, shall at his own cost rectify such error to the satisfaction of the Engineer.

The checking of any setting-out or of any line or level by the Engineer shall not in any way relieve the Contractor of his responsibility for the accuracy thereof and the Contractor shall carefully protect and preserve all bench-marks, sight-rails, pegs and other things used in setting-out the works.

18.1 Bore-holes and exploratory excavation

If, any time during the execution of the works, the Engineer requires the Contractor to make bore-holes or to carry out exploratory excavation, the Contractor will carry out the same and it will be treated that, an item or a Provisional Sum in respect of such work is already included in the Bill of Quantities.

19.1 Safety, Security and Protection of the Environment

The Contractor shall, throughout the execution and completion of the works and the remedying of any defect therein shall ;

a) have full regard to the safety of all person entitled to be upon the site and keep the site (so far as the same are not completed or occupied by the Employer) in an orderly state appropriate to the avoidance of danger to such persons, and

b) provide and maintain at his own cost all lights, guards, fencing warning signs and watching, when and where necessary or required by the Engineer or by any duly constituted authority, for the protection of the works or for the safety and convenience of the public or others, and

c) take all reasonable steps to protect the environment on and off the site and to avoid damage or nuisance to persons or the property of the public or others resulting form pollution, noise or other causes arising as a consequence of his methods of operation.

19.2 Employer's Responsibilities

If under clause 31 Employer shall carry out work on the site with his own workmen he shall, in respect of such work;

- Have full regard to the safety of all persons entitled to be upon the site, and
- Keep the site in an orderly state appropriate to the avoidance of danger to such persons.

If under clause 31 the Employer shall employ other Contractors on the site he shall require them to have the same regard for safety and avoidance of danger.

20.1 Care of works

The Contractor shall take full responsibility for the care of the works and materials and plant for incorporation from the commencement date until the date of issues of the Taking Over Certificate for the whole of the works, when the responsibility for the said care shall pass to the Employer, provided that;

a) it the Engineers issue a Taking Over Certificate for any section or part of the Permanent works the Contractor shall cease to be liable for the care of that section or part from the date of issue of the Taking Over Certificate, when the responsibility for the care of that section or part shall pass to the Employer, and

b) the Contractor shall take full responsibility for the care of any outstanding works and materials and plant for incorporation therein which he undertakes to finish during the Defects Liability Period until such outstanding works have been completed pursuant to clause 49.

20.2 Responsibility to Rectify Loss or Damage

If any loss or damage happens to the works, or any part thereof, or materials or plant for incorporation therein, during the period for which the Contractor is responsible for the care thereof, from any cause whatsoever, other than the risks defined in sub clause 20.4 the Contractor shall at his own cost rectify such loss or damage so that the Permanent Works confirm in every respect with the provision of the contract to the satisfaction of the Engineer. The Contractor shall also be liable for any loss or damage to the works occasioned by him in the course of any operations carried out by him for the purpose of complying with his obligations under clauses 49 and 50.

20.3 Loss or Damage due to Employer's Risks

In the event of any such loss or damage happening from any of the risks defined in sub-clause 20.4, or in combination with other risks, the Contractor shall, if

and to the extent required by the Engineer, rectify the loss or damage and the Engineer shall determine an addition to the contract price in accordance with clause 52 and shall notify the Contractor accordingly, with a copy to the Employer. In the case of a combination of risks causing loss or damage any such determination shall take into account the proportional responsibility of the Contractor and the Employer.

20.4 <u>Employer's Risks</u>

The Employer's risks are:

c) insofar as they directly affect the execution of the works in the country where the permanent works are to be executed:

1) war and hostilities (whether war be declared or not), invasion, act of foreign enemies;

2) rebellion, revolution, insurrection or military or usurped power, or civil war;

3) ionizing, radiation's, or contamination by radioactivity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radioactive toxic explosive or other hazardous properties of any explosive nuclear assembly or nuclear component thereof

4) pressure waves caused by aircraft or other aerial devices traveling at sonic or supersonic speeds;

5) riot, commotion or disorder, unless solely restricted to the employees of the Contractor or of his Sub-Contractors and arising from the conduct of the works;

- loss or damage due to the use of occupation by the Employer of any section or part of the permanent works, excepts as may be provided for in the contract;
- loss or damage to the extent that it is due to design of the works other than any part of the design provided by the Contractor or for which the Contractor is responsible; and
- any operation of the forces of nature (insofar as it occurs on the site which an experienced Contractor);

6) could not have reasonably foreseen, or

7) could reasonably have foreseen, but against which he could not reasonably have taken at least one of the following measure;

- prevent loss or damage to physical property from occurring by taking appropriate measures, or
- insure against

21.1 <u>Insurance of Works and Contractor's Equipment's</u>

The Contractor shall, without limiting his or the Employer's obligations and responsibilities under clause 20 insure;

a) the works, together with materials and plant for incorporation therein, to the full replacement cost

b) an additional sum of 15 per cent of such replacement cost, to cover any additional costs of and incidental to the rectification of a loss or damage including professional fees and the cost of demolishing and removing any part of the works and of removing debris of whatsoever nature.

if being understood that such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.

c) the Contractor equipment and other things brought onto the site by the Contractor for a sum sufficient to provide for their replacement at the site.

21.2 <u>Scope of Cover</u>

The insurance in paragraphs (a) and (b) of sub-clause 21.1 shall be in the joint names of the Contractor and the Employer and shall cover:

a) The Employer and the Contractor against all loss or damage from whatsoever cause arising other than as provided in sub-clause 21.4, from the first working day after commencement date until the date of issue of the relevant certificate of completion in respect of the works or any section or part thereof as the case may be, and

b) The Contractor for his liability:

1. during the Defects Liability Period for loss or damage arising from a cause occurring prior to the commencement of the Defects Liability Period, and

2. for loss or damage occasioned by the Contractor in the course of any operation carried out by him for the purpose of complying with his obligations under clause 49 and 50.

21.3 Responsibility for amount not Recovered

Any amounts not insured or not recovered from the insures shall be borne by the Employer or the Contractor in accordance with their responsibilities under clause 20.

21.4 Exclusion

There shall be no obligation for the insurances in sub-clause 21.1 to include loss or damage caused by the risks listed under sub clause 20.4 paras (a) (1) to (4) as mentioned below:

a) War, hostilities (where war be declared or not), invasion, act of foreign enemies.

b) Rebellion, revolution, insurrections, or military or usurped power, or civil war,

c) Ionizing radiations, or contamination by radioactivity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radioactive toxic explosive, or other hazardous properties of any explosive nuclear assembly or nuclear component thereof.

d) Pressure waves caused by aircraft or other aerial devices traveling at sonic or supersonic speeds.

22.1 Damage to persons and Property

The Contractor shall, except if and so far as the contract provides otherwise, indemnify the Employer against all losses and claims in respect of:

a) death of or injury to any person, or

b) losses of or damage to any property (other than the works),

Which may arise out of or in consequence of the execution and completion of the works and the remedying of any defect therein, and against all claims, proceedings damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto, subject to the exceptions defined in sub clause 22.2

22.2 Exceptions

The ‘exception’ referred to in sub clause 22.1 are

a) The permanent use or occupation of land by the works or any part thereof,

b) The right of the Employer to execute the works or any part thereof, on, over, under, in or through any land,

c) damage to property which is the unavoidable result of the execution and completion of the works, or the remedying of any defects therein, in accordance with the contract,

d) Death of or injury to persons or loss of or damages to property resulting from any act or neglect of the Employer his agents servants or other Contractor, not being employed by the Contractor, or in respect of any claims, proceedings, damaged, costs, charges and expenses in respect there of or in relation thereto or, where the injury or damage was contributed to the Contractor, his servants or agents, such part of the said injury or damage as may be just and equitable having regard to the extent of the responsibility of the employer, his servants or agents or other Contractors for the injury or damage.

22.3 Indemnity by Employer

The employer shall indemnify the Contractor against all claims, proceedings, damages, costs, charges and expenses in respect of the matters referred to in the exceptions defined in sub-clause 22.2.

23.1 Third party insurance (including Employer's property)

The Contractor shall, without limiting his or the Employer's obligations and responsibility under clause, 22 insure in the joint names of the Contractor and the Employer against liabilities for death of or injury to any person (other than as provided in clause 24) or loss of or damage to any property, (other than the Works) arising out of the performance of the Contract, other than the exception defined in paragraphs (a), (b) and (c) or sub-clause 22.2.

23.2 Minimum Amount of Insurance

Such insurance shall be for at least Rs. 10,00,000/- per occurrence with number of occurrences unlimited.

23.3 Cross Liabilities

The insurance policy shall include a cross liability clause such that the insurance shall apply to the Contractor and to the Employer as separate insured.

24.1 Accident or Injury to Workmen

The Employer shall not be liable for or in respect of any damages or compensation payable to any workman or other person in the employment of the Contractor or any subcontractor, other than death or injury resulting from any act or default of the Employer, his agents or servants. The Contractor shall indemnify and keep indemnified the Employer against all such damages and compensation, other than those for which the Employer is liable as aforesaid, and against all claims, proceedings, damages, costs, charges, and expenses whatsoever in respect thereof or in relation thereto.

24.2 Insurance against Accident to Workmen

The Contractor shall insure against such liability and shall continue such insurance during the whole of the time that any persons are employed by him on the works. Provided that, in respect of any persons employed by any subcontractor, the Contractor's obligations to insure as aforesaid under this sub-clause shall be satisfied if the subcontractor shall have insured against the liability in respect of such persons in such manner that the Employer is indemnified under the policy, but the Contractor shall require such subcontractor to produce to the employer when required, such policy of insurance and the receipt for the payment of the current premium.

25.1 Evidence and Terms of Insurances

The Contractor shall provide evidence to the Engineer as soon as practicable after the respective insurance's have been taken out but in any case prior to the start of work at the site that the insurance's required under the contract have been effected and shall, within 84 days of the commencement date provide the insurance policies to the Engineer, the Contractor shall notify the Employer of so doing. Such insurance policies shall be consistent with the general terms agreed prior to the issue of the Letter of Acceptance. The Contractor shall affect

all insurances for which he is responsible with insurers and in terms approved by the Employer.

25.2 Adequacy of Insurances

The Contractor shall notify the insurers of change in the nature, extent or programme for the execution of the works and insure the adequacy of the insurances at all times in accordance with the terms of the contract and shall, when required, produce to the Engineer the insurance policies in form and the receipt for payment of the current premiums.

25.3 Remedy on Contractors failure to insure

If the Contractor fails to effect and keep in force any of the insurances required under the contract, or fails to provide the policies to the Engineer within the period required by sub-clause 25.1, then and in any each case the Engineer may effect and keep in force any such insurance and pay any premiums as may be necessary for that purpose and from time to time deduct the amount so paid from any monies due or to become due form the Contractor or recover the same as a debt due form the Contractor

25.4 Compliance with policy condition

In the event that the contract or the Employer fails to comply with conditions imposed by the insurance policies effected pursuant to the contract, each shall indemnify the other against all losses and claims arising form such failure.

25.5 Source of Insurance

The Contractor shall be entitled to place all insurance relation to the contract (including, but not limited to, the insurance referred to in clause 21, 23 and 24).

26.1 Compliance with Statutes, Regulations

The Contractor shall conform in all respects, including by the giving of all notices and the paying of all fees, with the provisions of:

a) any national or state stature, ordinance, or to the law, or any regulation, or bye-law of any local or other duly constituted authority in relation to the execution and completion of the works and the remedying of any defects therein, and

b) the rules and regulations of all public bodies and companies whose property or rights are affected or may be affected in any way by the works. and the Contractor shall keep the Employer indemnified against penalties and liability of every kind for breach of any such provisions.

Provided always that the Employer shall be responsible for obtaining any planning, zoning or other similar permissions required for the works to proceed and shall indemnify the Contractor in accordance with sub-clause 22.3.

27.1 Fossils

All fossils coins, articles of value or antiquity and structures and other remains or things of geological or archeological interest discovered on the site shall, as between the Employer and the Contractor, be deemed to the absolute property of the Employer. The Contractor shall take reasonable precautions to prevent his workmen or any other persons from removing or damaging any such article or things and shall, immediately upon discovery thereof and before removal, acquaint the Engineer of such discovery and carry out the Engineer's instructions for dealing with the same. If, by reason for such instruction, the Contractor suffers/delay and/or incurs costs then the Employer shall, after due consultation with the owner and Contractor, determine:

a) any extension of time to which the Contractor is entitled under clause 44, and

b) the amount of such costs, which shall be added to the contract price, and shall notify the Contractor accordingly with a copy to the Employer.

28.1 Patent Rights

The Contractor shall save harmless and indemnify the Employer from and against all claims and proceedings for or on account of infringement of any patent rights, design trademark or name or other protected rights in respect of any Contractor's Equipments, Materials or Plant used for or in connection with or for incorporation in the works and against all damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto, except where such infringement results from compliance with the design or specification provided by the Engineer.

28.2 Royalties

Except where otherwise stated, the Contractor shall pay all tonnage and other royalties, rent and other payments or compensation, if any, for getting stone, sand, gravel, clay or other materials required for the works.

29.1 Interference with Traffic and Adjoining Properties

All operations necessary for the execution and completion of the works and the remedying of any defects therein shall, so far as compliance with the requirements of the contract permits, be carried on so as not to interfere unnecessarily or improperly with:

a) the convenience of the public, or

b) the access to use and occupation of public or private roads and footpaths to or of properties whether in the possession of the Employer or of any other person.

The Contractor shall save harmless and indemnify the Employer in respect of all claims, proceedings, damages, costs, charges and expenses whatsoever arising out of, or in relation to, any such matters insofar as the Contractor is responsible therefore.

30.1 Avoidance of Damage to Roads

The Contractor shall use every reasonable means to prevent any of the roads or bridges communicating with or on the routes to the site form being damaged or injured by any traffic of the Contractor or any of his sub-contracts and, in particular, shall select routes, choose and use vehicles and restrict and distribute loads so that any such extraordinary traffic as will inevitably arise from the moving of Materials, Plant, Contractor's Equipment or Temporary Works from and to the site shall be limited, as far as reasonably possible, and so that no unnecessary damage or injury may be occasioned to such roads and bridges.

30.2 Transport of Contractor's Equipment or Temporary Works

Save in so far as the contract otherwise provides, the Contractor shall be responsible for and shall pay the cost of strength any bridges or altering or improving any road common with or on the routes to the site to facilitate the movement of Contractor's equipment or temporary works and the Contractor shall indemnify and keep indemnified the Employer against all claims for damage to any such road or bridge caused by such movement, including such claims as may be made directly against the Employer, and shall negotiate and pay all claims arising solely out of such damage.

30.3 Transport of Materials or Plant

If, notwithstanding sub-clause 30.1, any damage occurs to any bridge or road communicating with or on the routes to the site arising form the transport of materials or plant, the Contractor shall notify the Engineer with a copy to the Employer, as soon as he becomes aware of such damage or as soon as he receives any claims from the authority entitled to make such claim. Where under any law or regulation the hauler of such materials or plant is required to indemnify the road authority against damage the Employer shall not be liable for any costs, charges or expenses in respect thereof or in relation thereto. In other cases the Employer shall negotiate the settlement of and pay all sums due in respect of such claims and shall indemnify the Contractor in respect thereof and in respect of all claims, proceedings, damages, costs, charges and expenses in relation thereto. Provided that if and so far as any such claim or part thereof is, in the opinion of the Engineer, due to any failure on the part of the Contractor to observe and perform his obligations under sub-clause 30.1, then the amount , determined by the Engineer, after due consultation with the Engineer and the Contractor, to be due to such failure shall be recoverable from the Contractor by the Engineer and may be deducted by the Engineer form any monies due or to become due to the Contractor and the Engineer shall notify the Contractor Employer shall notify the Contractor whenever a settlement is to be negotiated and where any amount may be due from the Contractor, the Employer shall consult with the Contractor before such settlement is agreed.

30.4 Waterborne Traffic

Where the nature of the works is such as to require the use by the Contractor of water borne transport the foregoing provision of this clause shall be constructed as though "road" including a lock, dock, sea wall or other structure related to a waterway and vehicle' included craft, and shall have effect accordingly.

31.1 Opportunities for other Contractor

The Contractor shall, in accordance with the requirements of the Engineer, afford all reasonable opportunities for carrying out their work to:

a) any other Contractors employed by the Employer and their workmen,

b) the workmen of the Employer, and

c) the workmen of any duly constituted authorities who may be employed in the execution on or near the site of any work not included in the contract or of any contract which the Employer may enter into in connection with or ancillary to the works.

31.2 Facilities for other Contractors

If, however, pursuant to sub-clause 31.1 the Contractor shall, on the written request of the Engineer

a) make available to any such other Contractor, or to the Employer or any such authority, any roads or ways for the maintenance of which the Contractor is responsible, or

b) permit the use, by any such, of temporary works or Contractor's Equipment on the site, or

c) provide any other service whatsoever nature for any such,

d) the Engineer shall determine an addition to the contract price in accordance with the clause 52 and shall notify the Contractor accordingly, with a copy to the Employer.

32.1 Contractor to keep Site Clears

During the execution of the works the Contractor shall keep the site reasonably free from all unnecessary obstruction and shall store or dispose of any Contractor's Equipment and surplus materials and clear away and remove from the site any wreckage, rubbish or Temporary Works no longer required.

33.1 Clearance of site on Completion

Upon the issue of any Taking-Over Certificate the Contractor shall clear away and remove form the part of the site to which such Taking-Over Certificated relates all Contractor's Equipments', surplus material, rubbish and Temporary Works of every kind, and leave such part of the site and works clean and in a workmanlike condition to the satisfaction of the Engineer. Provided that the Contractor shall be entitled to retain on site, until the end of the defects liability period, such material, Contractor's Equipment and Temporary works as are required by him for the purpose of fulfilling his obligation during the Defects Liability Period.

LABOUR

34. Engagement of Staff and Labour

The Contractor shall, unless otherwise provided in the contract, make his own arrangements for the engagement of all staff and labour, local or other, and for their payment, housing, feeding and transport.

34.1 Rates of Wages and Conditions of Labour

The Contractor shall pay rates of wages and observe conditions of labour not less favorable than those established for the trade or industry where the work is carried out. In the absence of any rates of wages or conditions of labour so established, the Contractor shall pay rates of wages and observe conditions of labour which are not less favorable than the general level of wages and conditions observed by other employer whose general circumstances in the trade or industry in which the Contractor is engaged are similar.

34.2 Employment of Persons in the Service of others

The Contractor shall not recruit or attempt to recruit his staff and labour from amongst persons in the service of the employer or the engineer.

34.3 Repatriation of Labour

The Contractor shall be responsible for the return to the place where they were recruited or to their domicile of all such persons as he recruited and employed for the purposes of or in connection with the contract and shall maintain such persons as are to be so returned in a suitable manner until they shall have left the site or in the case of persons who are not nationals of and have been recruited outside India shall have left India.

34.4 Housing for Labour

Save insofar as the contract otherwise provides the Contractor shall provide and maintain such accommodation and amenities as he may consider necessary for all his staff and labour, employed for the purposes of or in connection with the contract, including all fencing, water supply (both for drinking and other purpose), electricity supply, sanitation, cook-houses, fire prevention and firefighting equipment, air conditioning, cookers, refrigerators, furniture and other requirements in connection with such accommodation or amenities. On completion of the contract, unless otherwise agreed with the employer, the Temporary camps/housing provided by the Contractor shall be removed and the site reinstated to its original conditions, all to the approval of the Engineer.

34.5 Supply of Water

The Contractor shall, so far as is reasonably practicable, having regard to local conditions, provide on the site and adequate supply of drinking and other water for the use of his staff and labour.

34.6 Alcoholic Liquor or Drugs

The Contractor shall not, otherwise than in accordance with the Statutes, Ordinance and Government Regulations of orders for the time being in force, import, sell, give, barter, or otherwise dispose of any alcoholic liquor or drugs, or permit or suffer any such importation, sale, gift, barter or disposal by his Sub-Contractors, agents staff or labour.

34.7 Arms and Ammunition

The Contractor shall not give, barter, or otherwise dispose of to any person or persons any arms or ammunition of any kind or permit or suffer the same as aforesaid.

34.8 Festivals and Religious Customs

The Contractor shall in all dealing with his staff and labour have due regard to all recognized festivals, days of rest and religious and other customs.

34.9 Disorderly Conduct

The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst his staff and labour and for the preservation of peace and protection of persons and property in the neighborhood of the works against the same.

35.1 Returns of labour and Contractor's Equipment

The Contractor shall, if required by the Engineer, deliver to the Engineer a return in detail, in such form and at such intervals as the Engineer may prescribe, showing the staff and the numbers of the several classes of labour from time to time employed by the Contractor on the site and such information respecting Contractor's Equipment as the Engineer may require.

35.2 Records of Safety and Health

The Contractor shall maintain such records and make such reports concerning safety; health and welfare of persons and damage to property as the Engineer may form time to time prescribe.

35.3 Reporting of Accidents

The Contractor shall report to the Engineer details of any accident as soon as possible after its occurrence. In the case of any fatality or serious accident, the Contractor shall, in addition, notify the Engineer immediately by the quickest available means.

MATERIALS, PLANT AND WORKMANSHIP

36.1 Quality of Materials, Plant and Workmanship

All materials, Plant and workmanship shall be:

a) of the respective kinds described in the contract and in accordance with the engineer's instruction, and

b) subjected from time to time to such tests as the Engineer may require at the place of manufacture, fabrication or preparation, or on the site or at such other place or place as may be specified in the contract, or at all or any of such places.

The Contractor shall provide such assistance, labour, electricity, fuels, stores, apparatus and instruments as are normally required for examining, measuring and testing any materials or plant and shall supply samples of materials, before in corporation in the works, for testing as may be selected and required by the Engineer.

The Contractor is encouraged, to the extent practicable and reasonable, to use plant and materials from sources within India.

36.2 Cost of Samples

All samples shall be supplied by the Contractor at his own cost of the supply there off is clearly intended by or provided for in the contract.

36.3 Cost of Tests & Third Party Inspection

The cost of making any test shall be borne by the Contractor if such test is

a) Clearly intended by or provided for in the contract, or

b) particularized in the contract (in 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 he purposes which it was intended to fulfill) in sufficient detail to enable the Contractor to price or allow for the same in his tender.

c) for third party inspection and testing for quality assurance of pipe line and treatment plant functioning from expert agencies or subject specialist.

36.4 Cost of Tests not provided for

If any test required by the Engineer which is

a) not so intended by or provided for, or

b) (in the case above mentioned) not so particularized, or

c) (though so intended or provided for) required by the Engineer to be carried out at any place other than the site or the place of manufacture, fabrication or preparation of the materials or plant tested,

Shows the material, plant or workmanship not to be in accordance with the provisions of the contract to the satisfaction of the Engineer, then the cost of such test shall be borne by the Contractor, but in any other case sub-clause 36.5 shall apply.

36.5 Engineer's Determination where Tests not provided for

Where, pursuant to sub-clause 36.4 applies the Engineer shall, after due consultation with the Employer, Owner and the Contractor, determine:

a) any extension of time to which the Contractor is entitled under clause 44, and

b) the amount of such costs, which shall add to the contract price, and shall notify the Contractor accordingly, with a copy to the Employer.

37.1 Inspection of Operations

The Engineer, and any person authorized by him, shall at all reasonable times have access to the site and to all workshops and places where materials or plant are being manufactured, fabricated or prepared for the works and the Contractor shall afford every facility for and every assistance in obtaining the right to such access.

37.2 Inspection and Testing

The Engineer shall be entitled, during manufacture, fabrication or preparation to inspect and test the materials and plant to be supplied under the contract. If materials or plant are being manufactured, fabricated or prepared in workshops or places other than those of the Contractor, the Contractor shall obtain permission for the Engineer to carry out such inspection and testing in those workshops or places. Such inspection or testing shall not release the Contractor form any obligation under the Contractor.

37.3 Dates for Inspection and Testing

The Contractor shall agree with the Engineer on the time and place for the inspection or testing of any materials or plant as provided in the contract. The Engineer shall give the Contractor not less than 24 hours notice of his intention to carry out the inspection or to attend the tests. If the Engineer, or his duly authorized representative, does not attend on the date agreed, the Contractor may, unless otherwise instructed by the Engineer, proceed with the tests, which shall be deemed to have been made in the presence of the Engineer. The Contractor shall forthwith forward to the Engineer duly certified copies of the test readings. If the Engineer has not attended the tests, he shall accept the said readings as accurate.

37.4 Rejection

If, at the time and place agreed in accordance with sub-clause 37.3, the materials or plant are not ready for inspection or testing or if, as a result of the inspection or testing referred to in this clause, the Engineer determines that the materials or plant are defective or otherwise not in accordance with the contract, he may reject the materials or plant and shall notify the Contractor thereof immediately. The notice shall state the Engineer’s objection with reasons. The Contractor shall then promptly make good the defect or ensure that rejected materials or plant comply with the contract. If the Engineer so requests, the tests of rejected materials or plant shall be made or repeated under the same terms and conditions. All costs incurred by the Employer by the repetition of the tests shall, after due consultation with the Employer and the Contractor be determined by the Engineer and shall be recoverable from the Contractor by the Engineer and may be deducted from any money due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly, with a copy to the Employer.

37.5 Independent Inspection

The Engineer or Owner may delegate inspection and testing of material or plant to an independent Agency. Any such delegation shall be effected in accordance with sub-clause 2.4. The Contactor shall remain open the works for inspection to any third party, which may be authorised to inspect/test the works of the contractor as designated by the Engineer or the Owner. Notice of such appointment shall be given by the Engineer to the Contractor.

38.1 Examination of work before covering up

No part of the works shall be covered up or put our of view without the approval of the Engineer and the Contractor shall afford full opportunity for the Engineer to examine and measure any such part for the works which is about to be covered up or put out of view and to examine foundations before any part of the works is placed thereon. The Contractor shall give notice to the Engineer whenever any such part of the works or foundation is or are ready or about to be ready for reexamination and the Engineer shall, without unreasonable delay, unless he considers it unnecessary and advises the Contractor accordingly, attend for the purpose of examining and measuring such part of the works, or of examining such foundation.

38.2 Uncovering and Making Openings

The Contractor shall uncover any part of the works or make openings in or through the same as the Engineer may from time to time instruct and shall reinstate and make good such part. If any such part has been covered up or put out of view after compliance with the requirement of sub-clause 38.1 and is found to be executed in accordance with the contract, the Engineer shall, after due consultation with the Employer and the Contractor, determine the amount of the Contractor costs in respect of such of uncovering, making openings in or through, reinstating and making good the same, which shall be added to the contract price, and shall notify the Contractor accordingly, with a copy to the Employer. In any other case all costs shall be borne by the Contractor

39.1 Removal of Improper Work, Materials or Plant

The Engineer shall have authority to issue instruction from time to time, for:

a) the removal from the site, within such time or times as may be specified in the instruction, of any materials or plant which, in the opinion of the Engineer, are not in accordance with the contract.

b) the substitution of proper and suitable materials or plant, and

c) the removal and proper re-execution, not withstanding any previous test thereof or interim payment therefore, of any work which in respect of

   1. materials, plant or workmanship, or
   2. design by the Contractor or for which he is responsible,

is not in the opinion of the Engineer, in accordance with the contract.

39.2 Default of Contractor in Compliance

In case of default on the part of the Contractor in carrying out such instruction within the time specified therein or, if none, within a reasonable time, the Contractor shall be liable to pay compensation at the rate of one percent or such smaller amount as the owner may decide, on the amount of the estimate cost of that section of the work for every day not exceeding ten days, while his failure, to do so shall continue, and in case if any such failure the Employer shall be entitled to employ and pay other persons to carry to the same and all costs consequent thereon or incidental thereto shall, after due consultation with the Employer and the Contractor by the Employer, and may be deducted by the Employer from any money due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly, with a copy to the Employer.

SUSPENSION

40.1 Suspension of Work

The Contractor shall, on the instruction of the Engineer, suspend the progress of the works or any part thereof for such time and in such manner as the Engineer may consider necessary and shall, during such suspension, properly protect and secure the works or such part thereof so far as is necessary in the opinion of the Engineer. Unless such suspension is

a) otherwise provided for in the contract, or

b) necessary by reason of some default of or breach of contract by the Contractor or for which he is responsible, or

c) necessary by reason of climatic conditions on the site, or

d) necessary for the proper execution of the woks or for the safety of the works or any part thereof (save to the extent that such necessity arises from any act or default by the Engineer or the Employer or from any of the risks defined in sub-clause 20.4) Sub-clause 40.2 shall apply

40.2 Engineer's Determination following suspension

Where, pursuant to sub-clause 40.1, this sub clause applies the engineer shall, after due consultation with the employer and the Contractor, determine

a) any extension of time to which the Contractor is entitled under clause 44,

b) no cost claims or any compensation, whatsoever due to this prolonged period of work shall be allowed to the Contractor.

40.3 Suspension lasting more than 84 days

If the progress of the works or any part thereof is suspended on the written instructions of the Engineer and if permission to resume work is not given by the Engineer within a period of 84 days from the date of suspension then, unless such suspension is within paragraph (a), (b), (c) or (d) of sub-clause 40.1, the Contractor may give notice to the Engineer requiring permission, within 28 days from the receipt thereof, to proceed with the works or that part thereof in regard to which progress is suspended. If, within the said time, such permission is not granted, the Contractor may, but is not bound to, elect to treat the suspension, where it affects part only of the works, as an omission of such part under clause 51 by giving a further notice to the Engineer to that effect, or, where it affects the whole of the works, treat the suspension as an event of default by the Employer and terminate his employment under the Contractor in accordance with the provision of sub-clause 69.1, whereupon the provision of sub clauses 69.2 and 69.3 shall apply.

COMMENCEMENT AND DELAYS

41.1 Commencement of Works

The Contractor shall commence the works as soon as is reasonably possible after the receipt by him of notice to this effect from the Engineer, which notice shall be issued within the time stated the Letter of Acceptance.

Thereafter, the Contractor shall proceed with the works with due expedition and without delay.

42.1 Possession of site and Access thereto

Save insofar as the contract may prescribe:

a) the extent of portions of the site of which the Contractor is to be give possession from time to time, and

b) the order in which such portions shall be made available to the Contractor

and subject to any requirement in the contract as to the order in which the works shall be executed, the U.P. Jal Nigam will, with the Employer's notice to commence the works, give to the Contractor possession of .

c) so much of the site, and

d) such access as, in accordance with the contract, is to be provided by the Employer

as may be required to enable the Contractor to commence and proceed with the execution of the works in accordance with the programme referred to in clause 14, if any, and otherwise in accordance with such reasonable proposals as the Contractor shall, by notice to the Engineer with a copy to the Employer, make. The Employer will, from time to time as the works proceed, give to the Contractor possession of such further portions of the site as may be required to enable the Contractor to proceed with the execution to the works with due dispatch in accordance with such programme or proposals, as the case may be.

42.2 Failure to give Possession

If the Contractor suffers delay and/or incurs costs from failure on the part of the U.P. Jal Nigam to give possession in accordance with the terms of sub-clause 42.1, the Employer shall, after due consultation with the owner and the Contractor, determine:

a) any extension of time to which the Contractor is entitled under clause 44, and

b) the amount of such costs, which shall be added to the contract price, and shall notify the Contractor accordingly, with a copy to the Engineer.

42.3 Way leaves and facilities

The Contractor shall bear all costs and charges for special or temporary way leaves required by him in connection with access to the site. The Contractor shall also provide at his own cost any additional facilities outside the site required by him for the purposes of the works.

43.1 Time for Completion

The whole of the works shall be completed, within thirty months in accordance with the provision of clause 48, calculated from the commencement date, or such extended time as may be allowed under clause 44.

44.1 Extension of Time for Completion

In the event of

a) the amount or nature of extra additional work, or

b) any cause of delay referred to in these conditions, or

c) exceptionally adverse climatic condition, or

d) any delay, impediment or prevention by the U.P. Jal Nigam, or

e) other special circumstances which may occur other than through a default of or breach of contract by the Contractor for which he is responsible,

being such as fairly to entitle the Contractor to an extension of the time for completion of the works, or any section or part thereof, the Employer shall, after due consultation with the owner and Contractor, determine the amount of such extension and shall notify the Contractor accordingly.

44.2 Contractor to Provide Notification and Detailed Particular

Provided that the Employer is not bound to make any determination unless the Contractor has

a) within 28 days after such event has first arisen notified the Employer with a copy to the Engineer, and

b) within 28 days, or such other reasonable time as may be agreed by the Employer, after such extension of time to which he may consider himself entitled in order that such submission may be investigated at the time.

44.3 Interim Determination of Extension

Provided also that where an event has a continuing effect such that it is not practicable for the Contractor to submit detailed particulars within the period of 28 days referred to in sub-clause 44.2 (b), he shall nevertheless be entitled to an extension of time provided that he has submitted to the Engineer interim particulars at intervals of not more than 28 days and final particular within 28 days of the end of the effects resulting from the event. On receipt of such interim particular, the Employer shall, without undue delay, make an interim determination of extension of time and, on receipt of the final particulars, the Employer shall review all the circumstances and shall determine an overall

extension of time in regard to the event. In both such cases the Employer shall make his and shall notify the Contractor of the determination, with a copy to the owner. No final review shall result in a decrease of any extension of time already decrease of any extension of time already determined by the Employer.

45.1 Restriction on Working Hours

Subject to any provision to the contrary contained in the contract, none of the works shall, save as hereinafter provided, be carried on during the night or on locally recognized days of rest without the consent of the Engineer, except when work is unavoidable or absolutely necessary for the saving of life or property or for the safety of the works, in which case the Contractor shall immediately advise the Engineer provided that the provisions of this clause shall not be applicable in the case of any work which it is customary to carry out by multiple shifts. In case the circumstance require to carry the work in night or on locally recognized holidays or days of rest, the Contractor shall necessarily obtain the permission of Engineer before carrying out such work.

46.1 Rate of Progress

If for any reason, which does not entitle the Contractor to an extension of time the rate of progress of the works or any section is at any time, in the opinion of the Engineer, too slow to comply with the time for completion and/or programme pursuant to clause 14.1, the Engineer shall so notify the Contractor who shall thereupon take such steps as are necessary, subject to the consent of the Engineer, to expedite progress so as to comply with the time for completion. The Contractor shall not be entitled to any additional payment for taking such steps. If, as a result of any notice given by the Engineer under this clause, the Contractor considers that it is necessary to do any work at night or on locally recognized days of rest, he shall be entitled to seek the consent of the Engineer to do so. Provided that if any steps, taken by the Contractor in meeting his obligations under this clause, involve the owner in additional supervision costs, such costs shall, after due consultation with the owner and the Contractor, be determined by the Employer and shall be recoverable from the Contractor by the Employer, and may be deducted by the Engineer from any money due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly with a copy to the Employer.

47.1 Liquidated Damages for Delay

If the Contractor fails to comply with the time for completion in accordance with clause 43.1, and/or program pursuant to clause 14.1 for the whole of the works or, if applicable any section, within the relevant time prescribed by clause 14.1, then the Contractor shall pay to the Employer at the following rates as liquidated damages for such default and not as a penalty (which sum shall be the only money due from the Contractor for such default) for every day or part of a day which shall elapse between the relevant time for completion or pursuant to clause 14.1 and the date stated in a Taking-Over Certificate of the whole of the works or the relevant section.

For first 10 days	@ 0.05% of contract price per day
For next 15 days	@ 0.10% of contract price per day
For next 20 days	@ 0.15% of contract price per day
For next 25 days	@ 0.20% of contract price per day

Provided always that the entire amount of compensation to be paid under this clause shall not exceed TEN percent of contract price. The Engineer may, without prejudice to any other method of recovery, deduct the amount of such damages from any money due or to become due to the Contractor. The payment or deduction of such damages shall not relieve the Contractor from his obligation to complete the works, or from any other of his obligations and liabilities under the contract.

47.2 Reduction of Liquidated Damages

If, before the time for completion of the whole of the work or, if applicable, any section, a Taking-Over Certificate has been issued for any part of the works or of a section, the liquidated damages for delay in completion of the remainder of the works or of that section shall for any period of delay after the date stated in such Taking-Over Certificate and in the absence of alternative provisions in the contract, be reduced in the proportion which the value of the part so certified bears to the value of the whole of the works or section, as applicable. The provision of this sub-clause shall only apply to the rate of liquidated damages and shall not affect the limit thereof. In case of any dispute arising in the matter of liquidated damages the decision of the Chief Engineer shall be final.

48.1 Taking-Over Certificate

When the whole of the works have been substantially completed and have satisfactorily passed any tests on completion prescribed by the contract, the Contractor may give a notice to that effect to the Engineer, with a copy to the

Employer, accompanied by a written undertaking to finish with due expedition any outstanding work during the Defects Liability Period. Such notice and undertaking shall be deemed to be a request by the Contractor for the Engineer to issue a Taking-Over Certificate in respect of the works. The Engineer in consultation with the Employer shall, within 21 days of the date of delivery of such notice, either issue to the Contractor, with a copy to the Employer, a Taking-Over Certificate, stating the date on which, in his opinion, the works were substantially completed in accordance with the contract, or give instruction in writing to the Contractor specifying all the work which, in the Engineer's opinion, is required to be done by the Contractor before the issue of such certificate. The Engineer shall also notify the Contractor of any defect in the works affecting substantial completion that may appear after such instruction and before completion of the works specified therein. The Contractor shall be entitled to receive such Taking-Over Certificate within 21 days of completion, to the satisfaction of the Engineer, of the works so specified and remedying any defects so notified.

48.2 Taking Over of Sections or Parts

Similarly, in accordance with the procedure set out in sub-clause 48.1, the Contractor may request and the Engineer shall issue a Taking-Over Certificate in respect of:

a) any section in respect of which a separate time for completion is provided in Tender

b) any substantial part of the permanent works which has been both completed to the satisfaction of the Engineer and , otherwise than as provided for in the contract occupied or used by the U.P. Jal Nigam,

c) any part of the permanent works which the U.P. Jal Nigam has elected to occupy or use prior to completion (where such prior occupation or use is not provided for in the contract or has not been agreed by the Contractor as a temporary measure).

48.3 Substantial Completion of Parts

If any part of the permanent works has been substantially completed and has satisfactorily passed any tests on completion prescribed by the contract, the Engineer may issue a Taking-Over Certificate in respect of that part of the permanent works before completion of the whole of the works and upon the issue of such certificate, the Contractor shall be deemed to have undertaken to

complete with due expedition any outstanding work in that part of the permanent works during the defects Liability Period.

48.4 Surfaces Requiring Reinstatement

Provided that a Taking-Over Certificate given in respect of any section or part of the permanent works before completion of the whole of the works shall not be deemed to certify completion of any ground or surfaces requiring Reinstatement, unless such Taking-Over Certificate shall expressly so state.

48.5 Prevention from Testing

If the Contractor is prevented from carrying out the tests on completion by a cause for which the Employer or the Engineer or other Contractor employed by the Employer are responsible, the Employer shall be deemed to have taken over the works on the date when the tests on completion would have been completed but for such prevention. The Engineer shall issue a Taking-Over Certificate accordingly. Provided always that the works shall not be

deemed to have been taken over if they are not substantially in accordance with the contract.

If the works are taken over under this sub-clause the Contractor shall nevertheless carry out the tests on completion during the Defects Liability Period. The Engineer shall require the tests to be carried out by giving 14 days notice.

DEFECTS LIABILITY

49.1 Defects Liability Period

In these conditions the expression "Defects Liability Period" shall mean the Defects Liability Period of 12 months, calculated from the date of issue of certificate of Final Acceptance as defined in sub-clause 14.1

49.2 Completion of Outstanding Work and Remedying Defects

To the intent that the works shall, at or as soon as practicable after the expiration of the Defects Liability Period, be delivered to the Employer in the condition required by the contract, fair wear and tear excepted, to the satisfaction of the Engineer, the Contractor shall:

a) complete the work, if any, outstanding on the date stated in the Taking-over Certificate as soon as practicable after such date and

b) execute all such work of amendment, reconstruction, and remedying defects, shrinkages or other faults as the Engineer may, during the

Defects Liability Period or within 14 days after its expiration, as a result of an inspection made by or on behalf of the Engineer prior to its expiration, instruct the Contractor to execute.

49.3 Cost of Remedying Defects

All work referred to in clause 49.2 shall be executed by the Contractor at his own cost if the necessity thereof is, in the opinion of the Engineer, due to:

a) the use of materials, plant or workmanship not in accordance with the contract, or

b) where the Contractor is responsible for the design of part of the permanent works, any fault in such design, or

c) the neglect or failure on the part of the Contractor to comply with any obligation, expressed, on the Contractor's part under the contract.

If in the opinion of the Engineer, such necessity is due to any other cause, he shall determine and addition to the contract price in accordance with clause 52 and shall notify the Contractor accordingly, with a copy to the Employer.

49.4 Contractor failure to carry out Instruction

In case of default on the part of the Contractor in carrying out such instruction within a reasonable time, the Employer shall be entitled to employ and pay other persons to carry out the same and if such work is work which, in the opinion of the Engineer, the Contractor was liable to do at his own cost under the contract, then all costs consequent thereon or incidental thereto shall, after due consultation with the Employer and the Contractor, be determined by the Engineer and shall be recoverable from the Contractor by the Employer and may be deducted by the Employer from any money due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly, with a copy to the Employer.

49.5 Extension of Defects Liability

The provision of this clause shall apply to all replacements or renewals of plant carried out by the Contractor to remedy defects and damages as if the replacements and renewals had been taken over on the date they were completed. The Defects Liability Period for the works shall be extended by a period equal to the period during which the works cannot be used by reason of a defect or damage. If only part of the works is affected the Defect Liability

Period shall be extended only for that part. In neither case shall the Defect Liability Period extend beyond one year from the date of taking over.

When progress in respect of plant has been suspend under clause 40, the Contractor's obligations under this clause shall not apply to any defect occurring more than one year after the time for completion established on the date of the Letter of Acceptance.

50.1 Contractor to Search

If any defect shrinkage or other fault in the works appears at any time prior to the end of the Defects Liability Period, the Engineer may instruct the Contractor, with copy to the Employer, to search under the direction of the Engineer for the cause thereof. Unless such effect, shrinkage or other fault is one for which the Contractor is liable under the contract, the Engineer shall, after due consultation with the Employer and the Contractor, determine the amount in respect of the costs of such search incurred by the Contractor, which shall be added to the contract price and shall notify the Contractor accordingly, with a copy to the Employer. If such defect, shrinkage or other fault is one for which the Contractor is liable, the cost of the work carried out in searching as aforesaid shall be borne by the Contractor and he shall in such case remedy such defect, shrinkage or other fault at his own cost in accordance with the provision of clause 49.

ALTERATIONS, ADDITIONS AND OMISSIONS

51.1 Variations

The Engineer shall make any variation of the form, quality or quantity of the works or any part thereof that may, in his opinion, be necessary and for the purpose, or if for any other reason it shall, in his opinion, be appropriate, he shall have the authority to instruct the Contractor to do and the Contractor shall do any of the following:

a) increase or decrease the quantity of any work included in the contract,

b) omit any such work

c) change the character or quality or kind of any such work,

d) change the levels, lines, position and dimensions of any part of the works,

e) execute additional work of any kind necessary for the completion of the works,

f) change any specified sequence or timing of construction of any part of the works.

No such variation shall in any way vitiate or invalidate the contract, but the effect, if any, of al such variations shall be valued in accordance with clause 52. Provided that where the issue of an instruction to vary the works is necessitated by some default of or breach of contract by the Contractor or for which he is responsible, any additional cost attributable to such default shall be borne by the Contractor.

51.2 Instruction for Variations

The Contractor shall not make any such variation without an instruction of the Engineer. Provided that no instruction shall be required for increase or decrease in the quantity of any work where such increase or decrease is not the result of an instruction given under this clause, but is the result of the quantities exceeding or being less than those stated in the Bill of Quantities.

52.1 Valuation of Variations

All variations referred to includes clause- 51.1 & 51.2 and any addition to the contract price which are required to be determined in accordance with clause 52 (for the purposes of this clause referred to as “Varied Work”), shall be valued at the rates and prices set out in the contract if, in the opinion of the Engineer, the same shall be applicable. If the contract does not contain any rates or prices applicable to the varied work, the rates and prices in the contract shall be used as the basis for valuation so far as may be reasonable, failing which, after due consultation by the Employer with the Engineer and the Contractor, suitable rates or prices shall be agreed upon between the Employer and the Contractor. In the event of disagreement the Employer shall fix such rates or prices as are, in his opinion, appropriate and shall notify the Contractor accordingly, with a copy to the Engineer. Until such time as rates or prices are agreed or fixed, the Engineer may determine provisional rates or prices to enable on-account payments to be included in certificates issued in accordance with clause 60 (complete).

52.2 Power of Engineer to Fix Rates

Provided that if nature or amount of any varied work relative to the nature or amount of the whole of the works or to an apart thereof, is such that, in the opinion of the Engineer, the rate or price contained in the contract for any item of the works is, by reason of such varied work, rendered inappropriate or inapplicable, then after due consultation by the Employer with the Engineer and the Contractor, a suitable rate or price shall be agreed upon between the Employer and the Contractor. In the event of disagreements the Employer shall fix such other rate of price as is, in his opinion, appropriate and shall notify the Contractor accordingly, with a copy to the owner until such time as rates or prices are agreed or fixed the Engineer may determine provisional rates or prices to enable on account payments to be included in certificates issued in accordance with clause 60. Provided also that no varied work instructed to be done by the Engineer pursuant to clause 51 shall be valued under sub-clause 52.1 or under this sub clause, within 14 days of the date of such instruction and, other than in the case of omitted work, before the commencement of the varied work, notice shall have been given either;

a) by the Contractor to the Engineer of his intention to claim extra payment or a varied rate or price, or

b) by the Engineer to the Contractor of his intention to vary a rate or price.

In the event of a dispute, the decision of Chief Engineer shall be final.

52.3 Variations Exceeding 15 percent

If, on the issue of the certificate of completion for the whole of the works, it is found that as a result of:

a) all varied works valued under sub clause 52.1 and 52.2 and

b) all adjustment upon measurement of the estimated quantities set out in the Bill of Quantities, excluding provisional sums, day work,

but not from any other cause, there have been addition to or deduction from the contract price which taken together are in excess of 15 percent of the “Effective Contract Price” (which for the purposes of this sub-clause shall mean the contract price, excluding provisional sums and allowance, for day works, if any) then and in such event (subject to any action already taken under any other sub-

clause of this clause), after due consultation by the Engineer with the employer and the Contractor, these shall be added to or deducted from the contract and the Engineer or, failing agreement, determined by the Engineer having regard to the Contractor site and general overhead costs of the contract. The Engineer shall notify the Contractor of any determination made under this sub-clause, with a copy to the Employer. Such sum shall be based only on the amount by which such additions or deduction shall be in excess of 15 percent of the Effective Contract Price.

52.4 Day Work

The Engineer may, if in his opinion it is necessary or desirable, issue an instruction that any varied work shall be executed on a day work basis. The Contractor shall then be paid for such varied work under the terms set out in the day work schedule included in the contract and at the rates and prices affixed thereto by him in the Tender.

The Contractor shall furnish to the Engineer such receipts or other vouchers as may be necessary to prove the amount paid not before ordering materials, shall submit to the Engineer quotations for the same for his approval.

In respect of such of the works executed on a day works basis then Contractor shall, during the continuance of such work, deliver each day to the Engineer an exact list in duplicate of the names, occupation ad tie of all workmen employer on such work and a statement, also in duplicate, showing the description and quantity of all materials and Contractors Equipment used thereon or therefore other than Contractor's requirement which is included in the percentage addition in accordance with such day work schedule. One copy of each list and statement will, if correct, or when agree, be signed by the Engineer and returned to the Contractor.

At the end of each month the Contractor shall deliver to the Engineer a priced statement of the labour, materials and Contractor's equipment, excepts aforesaid, used and the Contractor shall not be entitled to any payment unless such lists and statements have been fully and punctually rendered. Provided always that if the Engineer considered that for any reason the sending of such

lists or statements by the Contractor, in accordance with the foregoing provision, was impracticable he shall nevertheless be entitled to authorize payment for such work, either as day work, on being satisfied as to the time employed and the labour, materials and Contractor's equipment used on such work, or at such valued therefore as shall, in his opinion be fair and reasonable.

PROCEDURE FOR CLAIMS

53.1 Notice of Claims

Notwithstanding any other provision of the contract, if the Contractor intends to claims any additional payment pursuant to any clause of these conditions or otherwise, he shall give notice of his intention to the Engineer, with a copy to the Employer, within 28 days after the event giving rise to the claim has first arisen.

53.2 Contemporary Records

Upon the happening of the event referred to in sub-clause 53.1, the Contractor shall keep such contemporary records as may reasonably be necessary to supports any claim, he may subsequently wish to make, without necessarily admitting the Employers liability, the Engineer shall on receipt of a notice under sub clause 53.1, inspect such contemporary record and may instruct the Contractor keep any further contemporary records as are reasonable and may be material to the claim of which notice has been given. The Contractor shall permit the Engineer to inspect all records kept pursuant to this sub clause and shall supply him with copies thereof as and when the Engineer so instructs.

53.3 Substantiation of Claims

Within 28 days, or such other reasonable time as may be agreed by the Engineer, of giving notice under sub clause 53.1, the Contractor shall send to the Engineer an account giving detailed particulars of the amount claimed and the grounds upon which the claims is based. Where the event giving rise to the claim has a continuing effect, such account shall be considered to be an interim account and the Contractor shall, at such intervals as the Engineer may reasonable require, send further interim accounts giving the accumulated amount of the claim and any further grounds upon which it is based. In case where interim accounts are sent to the Engineer, the Contractor shall send a

final account within 28 days of the end of the effect resulting form the even. The Contractor shall, if required by the Engineer so to do, copy to the Employer all accounts sent to the Engineer pursuant to this sub clause.

53.4 Failure to Comply

If the Contractor fails to comply with any of the provision of this clause in respect of any claim which he seeks to make, his entitlement to payment in respect thereof shall not exceed such amount as the Chief Engineer or any arbitrator or arbitrators appointed pursuant to sub clause 67.3 assessing the claim considers to be verified by contemporary records (whether or not such records were brought to the Engineers notice as required under sub clauses 53.2 and 53.5).

53.5 Payment of Claims

The Contractor shall be entitled in any interim payment certified by the Engineer pursuant to clause 60 such amount in respect of any claim as the Engineer, after due consultation with the Employer and the Contractor, may consider due to the Contractor provided that the Contractor has supplied sufficient particular to enable the Engineer to determine the amount due. If such particulars are insufficient to substantiate the whole of the claim, the Contractor shall be entitled to payment in respect of such part of the claim as such particulars may substantiate to the satisfaction of the Engineer. The Engineer shall notify the Contractor of any determination made under this sub clause, with a copy to the Employer.

CONTRACTOR'S EQUIPMENT, TEMPORARY WORKS AND MATERIALS

54.1 Contractor's Equipment, Temporary Works & Materials; Exclusive Use for the Works

All Contractor's Equipment, Temporary Work and materials provided by the Contractor shall, when brought onto the site, be deemed to be exclusively intended for the execution of the works and the Contractor shall not remove the same or any part thereof, except for the purpose of moving it from one part of the site to another without the consent of the Engineer. Provided that consent shall not be required for vehicles engaged in transporting any staff, labour, Contractor's Equipment, Temporary Works, Plant Material to or from the site.

54.2 Employer not Liable for Damage

The Employer shall not at any time be liable, save as mentioned in clauses 20 and 65, for the loss of or damage to any of the Contractor's Equipment Temporary Works or Materials.

54.3 Customs Clearance

The Employer will use his best endeavours in assisting the Contractor, where required, in obtaining clearance through the customs of Contractor's equipment, materials and other things required for the works.

54.4 Re-exports of Contractor's Equipment

In respect of any Contractor's Equipment which the Contractor has imported for the purposes of the works, the Employer will use his endeavors to assist the Contractor, where required, in procuring any necessary government consent to the re-export of such Contractor's Equipment by the Contractor upon the removal thereof pursuant to the terms of the Contract.

54.5 Conditions of Hire of Contractor's Equipment

With a view to securing, in the event of termination under clause 63, the continued availability for the propose of executing the works, of any hired Contractor's equipment, the Contractor shall not bring on to the site any hired Contract equipment unless there is an agreement for the hire thereof (which agreement shall be deemed not to include an agreement for hire purchase) which contains a provision that the owner thereof will, on request in writing made by the Employer within 7 days after the date on which any termination has become effective, and on the Employer undertaking to pay all hire charges in respect thereof from such date, hire such Contractor's equipment to the Employer on the same terms in all respects as the same was hired to the Contractor save that the Employer shall be entitled to permit the use thereof by any other Contractor employed by him for the purpose of executing and completing the works and remedying any defects therein, under the terms of the said clause 63.

54.6 Costs for the Purpose of Clause 63

In the event of the Employer entering into any agreement for the hire of Contractors equipment pursuant to sub clause 54.5, all sum properly paid by the Employer under the provision of any such agreement and all costs incurred by him (including stamp duties) in entering into such agreement shall be deemed, for the purpose of clause 63, to be of the cost of execution and completing the works and the remedying of any defect therein.

54.7 Incorporation of Clause in Subcontracts

The Contractor shall, where entering into Subcontract for the execution of any part of the works incorporate in such subcontract (by reference or otherwise) the provision of this clause in relation to Contractor's Equipment, Temporary Works or materials brought on to the site by the Subcontractor.

54.8 Approval of Materials not implied

The operation of this clause shall not be deemed to imply any approval by the Engineer of the materials or other matters referred to therein nor shall it prevent the rejection of any such materials at any time by the Engineer.

MEASUREMENT

55.1 Quantities

The quantities set out in the Bill of Quantities are the estimated quantities for the works, and they are not to be taken as the actual and correct quantities of the works to be executed by the Contractor in fulfillment of his obligation under the Contract.

56.1 Works to be Measured

The Engineer shall, except as otherwise stated, ascertain and determine by measurement the value of the works in accordance with the Contract and the Contractor shall be paid that value in accordance with clause 60. The Engineer shall, when he requires any part of the works to be measured, give reasonable notice to the Contractors authorized agent who shall:

a) forthwith attend or send a qualified Representative to assist the Engineer in making such measurement, and

b) supply all particular required by the Engineer.

Should the Contractor not attend, or neglect or omit to send such Representative, then the measurement made by the Engineer or approved by him shall be taken to be the correct measurement of such part of the works. For

the purpose of measuring such permanent works as are to be measured by records and drawings, the Engineer shall prepare records and drawings as the work proceeds and the Contractor, as and when called upon to do so in witting, shall, within 14 days, attend to examine and agree such records and drawings with the Engineer and shall sign the same when so agreed. If the Contractor does not attend to examine and agree such records and drawing they shall be taken to be correct. If, after examination of such records and drawings the Contractor does not agree the same or does not sign the same as agreed they shall nevertheless be taken to be correct, unless the Contractor within 14 days of such examination, lodges with the Engineer notice of the respects in which such records and drawing are claimed by him to be incorrect. On receipt of such notice, the Engineer shall review the records and drawings and either confirm or vary them.

57.1 Method of Measurement

The works shall be measured net, not-with-standing any general or local custom, except where otherwise provided for in the Contract in accordance with relevant B.I.S. code: No.- **IS : 1200** with the latest amendments.

57.2 Breakdown of Lump Sum Items

For the purposes of statements submitted in accordance with sub-clause 60.1, the Contractor shall submit to the Engineer, within 28 days after the receipt of the Letter of Acceptance, a breakdown for each of the lump sum items contained in the Tender. Such breakdown shall be subject the approval of the Engineer.

PROVISIONAL SUMS

58.1 Definition of "Provisional Sum"

"Provisional Sum" means a sum included in the Contract and so designated in the Bill of Quantities for the execution of any part of the works or for the supply of goods, materials, plant or services, or for contingencies, which sum may be used, in whole or in part, or not at all, on the instructions of the Engineer. The Contractor shall be entitled to only such amount in respect of the work, supply or contingencies to which such provisional sums relate as the Engineer shall determine in accordance with this clause. The Engineer shall notify the

Contractor of any determination made under this sub-clause, with a copy to the Employer.

58.2 Use of Provisional Sums

In respect of only Provisional Sum the Engineer shall have authority to issue instruction for the execution of work or for the supply of goods, materials, plants or services by:

a) the Contractor in which case the Contractor shall be entitled to an amount equal to the value thereof determined in accordance with clause 52.

b) a subcontractor, as hereinafter, in which case the sum to be paid to the Contractor therefore shall be determined and paid in accordance with sub clause 59.4

58.3 Production of Vouchers

The Contractor shall produce to the Engineer all quotations, invoices, voucher and accounts or receipts in connection with expenditure in respect of Provisional Sums, except when works is valued in acceptance with rates or prices set out in the Tender.

SUBCONTRACT

59.1 Nominated Subcontracting is not allowed in this tender.

60.1 Monthly Statements

The contractor shall submit a statement in two copies to the Engineer as the end of each month, in a tabulated form approved by the Engineer, showing the amounts to which the contractor considers himself to be entitled. The statement shall include the following items as applicable which shall be taken into account in the sequence listed;

a) the estimated contract value of the temporary and permanent works executed up to the end of the month in question, determined in accordance with sub-clause 56.1, at base unit rates prices, price;

b) the actual value certified for payment for the temporary and permanent works executed up to the end of the previous month, at base unit rates and prices;

c) the estimated contract value at base unit rates and prices of the temporary and permanent works for the month in question, obtained by deducting (b) from (a);

d) the value of any variations executed up to the end of the month in question, less the amount certified in the previous interim payment certificate pursuant to clause 52;

e) any amount to be with held under the provisions of sub-clause 60.4, determined by applying the percentage set forth sub-clause 60.4due under paragraphs 60.1 (c), and (d);

f) any amounts to be deducted as repayment of the advance under the provisions of sub-clause 60.7; and

g) any other sum, to which the contractor may be entitled under the contract.

60.2 Monthly Payments

The said statement shall be approved or amended by the Engineer in such a way that, in his opinion, it reflects the amounts due to the contractor in accordance with the contract, after deduction, other than pursuant in clause 47, of any sums which may have become due and payable by the contractor to the Employer. In case where there is a difference of opinion as to the value of any items, the Engineer's view shall prevail. Upon receipt of the monthly statement referred to in sub-clause 60.1 the Engineer shall pay the amounts due to the contractor at the earliest and shall herein called "Interim Payment".

Provided that the Engineer shall not be bound to make any payment under this sub-clause if the net amount thereof, after all retention's and deductions, would be less than Rs. Five Lacs.

Notwithstanding the terms of the clause or any other clause of the contract, no amount will be paid by the Engineer until the performance security has been provided by the contractor and approved by the Employer.

60.3 Place of Payment

Payment to the contractor by the Engineer shall be made in the Indian currency in which the contract price is payable, through an account payee cheque of scheduled bank at Ambedkarnagar / Greater Noida / Noida.

60.4 Performance Security

An amount equal to TEN percent of the amounts due determined in accordance with the procedure set out in sub-clause 60.1(e) shall be deducted the Engineer in the first and following interim payment certificates pursuant to clause 10.1.

60.5 Payment of Performance Security

Upon the expiration of the Defect Liability Period for the works the Performance Security shall be paid by the Engineer to the contractor along with return of the bank guarantee. Provided that, in event of different Defects Liability Periods being applicable to different sections or parts of the permanent works pursuant to clause 48, the expression "expiration of the Defects Liability Period" shall, for the purposes of this sub-clause, be deemed to mean the expiration of the latest of such periods.

Provided also that if that such time, there shall remain to be executed by the contractor any work ordered, pursuant to clauses 49 and 50, in respect of the works. The Engineer shall be entitled to withhold payment until completion of such work of so much of the balance of the performance security as shall, in the opinion of the Engineer, represent the cost of the work remaining to be executed.

60.6 Mobilization Advance Payment

1. The Engineer-In-Charge / Employer shall make advance payment to the Contractor equal to a maximum of 10% but in two equal installment against an unconditional Bank Guarantee of the Public Sector Bank or any Bank which is equivalent to Public Sector Bank according to R.B.I., after duly verification by the Bank.
2. First Installment will be given at the time of finalization of Contract Agreement.
3. The second installment of mobilization advance will be released to the Contractor when 70% of money given in first installment is utilized by the Contractor. Contractor shall the evidence against the use of money on Material / equipment T&P etc. or advance payment given by the contractor to the different vendors / Designers / Testing Lab / Surveyor etc. The second installment will be released only after verification of actual work done on site at the request of the contractor.

4. Interest money will be recover in the form of simple interest at the rate of 8% per annum date of issue of mobilization advance to the date of complete recovery (on reducing balance of mobilization advance.)

5. The advance payment will be repaid as follows :

Percentage of work Completed	**Amount to be deducted**
First 20%	5% of Bill Amount.
From each bill, thereafter upto 80% of work.	100% recovery should be made on the prorate basis from each bill upto 80% of work.

It is to make clear that the amount deducted will comprises of proportionate amount of mobilization advance and the amount of interest accrued upto the date of payment.Rest of the conditions for mobilization advance will be as per letter no. 208/pra-1/2005-0373/16 dated 01.02.2016.

6. The validity of Bank Guarantee against the mobilization advance should be equals to the Contract Agreement period defect liability period). These options will also be valid.

a) If the Contractor gives a new Bank Guarantee after first year and at the interval of one year after first year, then the Older Bank Guarantee will be refunded after the verification of new Bank Guarantee.

b) The Contractor may give Bank Guarantee equivalent to Total Mobilization advance money in more than one B.G.C. but upto maximum of 5). These BG can be released in installment in parallel with the recovery of advance.

7. If Contractor request for the recovery more than the proportional money in the starting then his request will be consider.

60.7 Correction of Certificates

In any previous interim payment which has been made by him, and shall have authority, if any works is not being carried out to his satisfaction, to omit or reduce the value of such work in any interim payment certificate.

60.8 Statement at Completion

Not later than 84 days after the issue of the certificate of completion in respect of the whole of the works, the contractor shall submit to the Engineer a statement at completion with supporting documents showing in detail, in the form approved by the Engineer;

a) the final value of all works done in accordance with the contract up to the date stated in such Taking-Over Certificate;

b) any further sums which the contractor considers to be due; and

c) an estimate of amounts, which the contractor considers will become due to him, under to contract.

Estimated amounts shall be shown separately in such statement at completion. The Engineer shall certify payment in accordance with sub-clause 60.2..

60.9 Final Statement

Not later than 56 days after the issue of the certificate of Satisfactory Performance / Taking-Over pursuant to sub-clause 62.1 the contractor shall submit to the Engineer for consideration a draft of final statement with supporting documents showing in details, in the form approved by the Engineer.

a) the value of all work done in accordance with the contract; and

b) any further sums which the contractor considers to be due to him under the contract.

If the Engineer disagrees with or cannot verify any part of the draft of final statement, the contractor shall submit such further information as the Engineer may reasonably require and shall make such changes in the draft as may be agreed between them. The contractor shall then prepare and submit to the Engineer the final statement as agreed (for the purpose of these conditions referred to as the “Final Statement”).

If, following discussions between the Engineer and the contractor and any changes to the draft final statement which may be agreed between them, it becomes evident that a dispute exists, the Engineer shall issue to the Employer an interim payment certificate for those parts of the draft of Final Statement which are not in dispute. The dispute shall then be settled in accordance with clause 67, the final statement shall be agreed upon settlement of the dispute.

60.10 Discharge

Upon submission of the final statement, the contractor shall give to the Employer, with a copy to the Engineer, a written discharge confirming that the total of the Final Statement represents full and final settlement of all money due to the contractor arising out of or in respect of the contract. Provided that such

discharge shall become effective only after payment due under The Final Certificate issued pursuant to sub-clause 60.12 has been made and the performance security referred to in sub-clause 10.1 has been returned to the contractor.

60.11 Final Certificate

Within 28 days after receipt of the final statement, and the written discharge, the Engineer shall issue to the Employer (with a copy to the Contractor) a Final Certificate stating.

a) The amount which, in the opinion of the Engineer, is finally due under the contract, and

b) After giving credit to the Employer for all amounts previously paid by the Engineer and for all sums to which the Employer is entitled under the Contract, other than clause 47, the balance, if any, due from the Employer to the contractor or from the contractor to the Employer as the case may be.

The final payment will be made by the Engineer after the approval of Final Certificate by the Employer.

60.12 Cessation of Employer's Liability

The Employer shall not be liable to the contractor for any matter or thing arising out of or in connection with the contract or execution of the works, unless the contractor shall have included a claim in respect there of in his Final Statement and (except in respect of matters of things arising after the issue of the Taking-Over Certificate in respect of the whole of the works) in the Statement at completion referred in sub-clause 60.9

CERTIFICATES AND PAYMENT

61.1 Approval only by Defects Liability Certificate

Only the Defects Liability Certificate, referred to in clause 62, shall be deemed to constitute approval of the works.

62.1 Defects Liability Certificate

The contract shall not be considered as completed until a Defects Liability Certificate shall have been signed by the Engineer and delivered to the Employer, with a copy to the contractor, setting the date on which the contractor shall have completed his obligations to execute and complete the works and

remedy any defects therein to the Engineer's satisfaction. The Defect Liability Certificate shall be given by the Engineer within 28 days after the expiration of the Defects Liability Period, or, if different Defects Liability Periods shall become applicable to different sections or parts of the Permanent Works, the expiration of the latest such period, or as soon thereafter as any works instructed, pursuant to clauses 49 and 50, have been completed to the satisfaction of the Engineer. Provided that the issue of the Defects Liability Certificate shall not be a condition precedent to payment to the contractor of the Performance Security in accordance with the conditions set out in sub clause 60.5.

62.2 Unfulfilled Obligations

Notwithstanding the issue of the Defects Liability Certificate the contractor and the Employer shall remain liable for the fulfillment of any obligation incurred under the provision of the contract prior to the issue of the Defects Liability Certificate which remains unperformed at the time such Defect Liability Certificate is issued and, for the purposes of determining the nature and extent of any such obligation, the contract shall be deemed to remain in force between the parties to the contract.

REMEDIES

63.1 Default of Contractor

It the Contractor is deemed by law unable to pay his debts as they fall due, or enters into voluntary or involuntary bankruptcy, liquidation or dissolution (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), or becomes insolvent, or makes an arrangement with or assignment in favour of, his creditors, or agrees to carry out the Contract under a committee of inspection of his creditors, or if a receiver, administrator, trustee or liquidator is appointed over any substantial part of his assets, or if, under any law or regulation relating to reorganization, arrangement or readjustment of debts, proceedings are commenced against the Contractor or resolutions passed in connection with dissolution or liquidation or if any steps are taken to enforce any security interest over a substantial part of the assets of the Contractor, or if any act is done or event occurs with respect to the Contractor or his assets which, under any applicable law has a substantially similar effect to any of the foregoing acts or events or if the Contractor has contravened sub clause 3.1 or

has an execution levied on his goods or if the Engineer certifies to the Employer, with a copy to the Contractor that in this opinion, the Contractor.

a) has repudiated the Contract or

b) without reasonable excuse has failed

   1. to commence the Works in accordance with sub-clause 41.1,
   2. to proceed with the Works, or any section thereof within 28 days after receiving notice pursuant to sub-clause 46.1, or

c) has failed to comply with a notice issued pursuant to sub-clause 37.4 or an instruction issued pursuant to sub-clause 39.1 within 28 days after having received it, or

d) despite previous warning from the Engineer, in writing, is otherwise persistently or flagrantly neglecting to comply with any of his obligations under the Contract, or

e) has contravened sub-clause 4.1

Then the Employer may, after giving 14 days notice to the Contractor, enter upon the Site and the Works and expel the Contractor therefrom without thereby voiding the contract or releasing the Contractor from any of his obligation or liabilities under the Contract, or affecting the rights and powers conferred on the Employer or the Engineer by the Contract, and may himself complete the Works or may employ any other Contractor to complete the Works. The Employer or such other Contractor may use for such completion so much of the Contractor's Equipments, Plants, Temporary Works and materials which have been deemed to be reserved exclusively for the execution of the Works, under the provisions of the Contract, as he or they may think proper, and the employer may, at any time, sell any of the said Contractors equipment. Temporary Works and unused Plant and materials and apply the proceeds of sale in or towards the satisfaction of any sums due or which may become due to him from the Contractor under the contract.

63.2 Valuation at Date of Expulsion

The Engineer shall, as soon as may be practicable after any such entry and expulsion by the Employer, fix and determine exparte or by or after reference to the parties or after such investigation or enquiries as he may think fit to make or institute, and shall certify :

a) what amount (if any) had, at the time of such entry and expulsion been reasonably earned by or would reasonably accrue to the Contractor in respect of Works then actually done by him under the Contract, and

b) the value of any of the said unused or partially used materials, any Contractor's Equipment and any Temporary Works.

63.3 Payment after Expulsion

If the Employer shall enter and expel the Contractor under this clause, he shall not be liable to pay to the Contractor any further amount (including damages) in respect of the Contract until the expiration of the Defects Liability Period and thereafter until the costs of execution, completion and remedying of any defects, damages for delay in completion (if any) and all other expenses incurred by the Employer have been ascertained and the amount thereof certified by the Engineer. The Contractor shall then be entitled to receive only such sum (if any) as the Engineer may certify would have been payable to him upon due completion by him after deducting the said amount. If such amount exceeds 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.

63.4 Assignment of Benefit of Agreement

Unless prohibited by law, the Contractor shall, if so instructed by the Engineer within 14 days of such entry and expulsion referred to in sub-clause 63.1, assign to the materials or services and / or for the execution of any Work for the purposes of the Contract, which the Contractor may have entered into.

64.1 Urgent Remedial Work

If by reason of any accident, or 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 Defects Liability Period, any remedial or other Work is, in opinion of the Engineer, urgently necessary for the safety of the Works and the Contractor is unable or unwilling at once to do such Work the Employer shall be entitled to employ and pay other persons to carry out such Work as the Engineer may consider necessary. If the Work or repair so done by the Employer is Work which, in the opinion of the Engineer, the Contractor was liable to do at his own cost under the Contract, then all costs consequent thereon

or incidental thereto shall, after due consultation with the Employer and the Contractor, be determined by the Engineer and shall be recoverable from the Contractor by the Employer, and may be deducted by the Employer from any money due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly, with a copy to the Employer. Provided that the Engineer shall, as soon after the occurrence of any such emergency as may be reasonably practicable, notify the Contractor thereof.

SPECIAL RISKS

65.1 No Liability for Special Risks

The contractor shall be under no liability whatsoever in consequence of any of the special risks referred to in sub clause 65.2 whether by way of indemnity or otherwise, for or in respect of:

a) destruction of or damage to the works, save to work condemned under the provisions of clause 39 prior to the occurrence of any of the said special risks, or

b) destruction of or damages to property, whether of the Employer or third parties, or

c) injury or loss of life

65.2 Special Risks

The Special risks are:

a) The risks defined under paragraph sub para (1) to (V) of sub clause 20.4.

65.3 Damage to Works by Special Risks

If the works or any materials or plant on or near or in transit to the site, or any of the contractor's equipment, sustain destruction or damage by reason of any of the said special risks, the contractor shall be entitled to payment in accordance with the contract for any permanent works duly executed and for any material or plant so destroyed or damaged and, so far as may be required by the Engineer or as may be necessary for the completion of the works, to payment for:

a) Rectifying any such destruction or damage to the works, and

b) Replacing or rectifying such materials or contractors equipment

and the Engineer shall determine an addition to the contract Price in accordance with clause 52 (which shall in the case of the cost of replacement of contractor's equipment's include the fair market value thereof as determined by the Engineer) and shall notify the contractor accordingly, with a copy to the Employer.

65.4 Projectile, Missile

Destruction, damage, injury or loss of life caused by the explosion or impact, whenever and whenever occurring, of any mine, bomb, shell, grenade, or other projectile, missile, munitions, or explosive of war, shall be deemed to be a consequence of the said special risks.

65.5 Increased Costs arising from special risks

Save to the extent that the contractor is entitled to payment under any other provision of the contract, the Employer shall repay to the contractor any costs of the execution of the works (other than such as may be attributable to the cost of reconstructing work condemned under the provisions of clause 39 prior to the occurrence of any special risk) which are howsoever attributable to or consequent on or the result of or in any way whatsoever connected with the said special risks, subject however to the provisions in this clause hereinafter contained in regard to outbreak of war, but the contractor shall, as soon as any such cost comes to his knowledge forthwith notify the Engineer thereof.

The Engineer shall, after due consultation with the Employer and the contractor, determine the amount of the contractor costs in respect thereof which shall be added to the contract Price and shall notify the contractor accordingly, with a copy to the employer.

65.6 Outbreak of War

If, during the currency of the contract, there is an outbreak of war, whether war is declared or not, in any part of the world which, whether financially or otherwise, materially affects the execution of the works, the contractor shall, unless and until the contract is terminated under the provisions of this clause, continue to use his best endeavours to complete the execution of the works. Provided that the Employer shall be entitled, at any time after such outbreak of war to terminate the contract by giving notice to the contractor and upon such notice being given, the contract shall, except as to the rights of the parties under

this clause and to the operation of clause 67 terminate, but without prejudice to the rights of either party in respect of any antecedent breach thereof.

65.7 Removal of Contractor's Equipment on Termination

If the contract is terminated under the provisions of sub-clause 65.6, the contractor shall, with all reasonable dispatch, remove from the site all contractors Equipment and shall give similar facilities to his subcontractors to do so.

65.8 Payment if Contract Terminated

If the contract is terminated as aforesaid, the contractor shall be paid by the Employer, insofar as such amounts or items have not already been covered by payments on account made to the contractor, for all work executed prior to the date of termination at the rates and prices provided in the contract and in addition:

a) the amounts payable in respect of any preliminary items referred to in the Bill of Quantities, so far as the work or service comprised there in has been carried out or performed, and a proper proportion of any such items which have been partially carried out or performed.

b) the cost of materials, plant or goods reasonably ordered for the works which have been delivered to the contractor or of which the contractor is legally liable to accept delivery, such materials, plant or goods becoming the property of the Employer upon such payments being made by him.

c) a sum being the amount of any expenditure reasonably incurred by the contractor in the expectation of completion the whole of the works insofar as such expenditure has not been covered by any other payments referred to in this sub-clause.

d) any additional sum payable under the provisions of sub-clause 65.3 and 65.5.

e) such proportion of the cost as may be reasonable, taking into account payments made or to be made for work executed, or removal of contractor's Equipment under sub-clause 65.7 and, if required by the contractor, return thereof to the contractor's main plant yard in his country of registration or to other destination, at no greater cost.

Provided that against any payment due from the Employer under this sub-clause, the Employer shall be entitled to be credited with any outstanding balances due from the contractor for advances in respect of contractor's

Equipment, materials and plant and any other sums which, at the date of termination, were recoverable by the Employer's from the contractor under the terms of the contract. Any sums payable under this sub-clause shall, after due consultation with the Employer and the contractor, be determined by the Engineer who shall notify the contractor accordingly, with a copy to the Employer.

RELEASE FROM PERFORMANCE

66.1 Payment Event of Release from Performance

If any circumstance outside the control of both parties arise after the issue of the Letter of Acceptance which renders it impossible or unlawful for either party to fulfill his Contractual obligations, or under the law governing the Contract the parties are released from further performance, then the sum payable by the Employer to the Contractor in respect of the work executed shall be the same as that which would have been payable under clause 65 if the Contract had been Terminated under the provisions of clause 65.

SETTLEMENT OF DISPUTES

67.1 Engineer's Decision

If a dispute of any kind whatsoever arises between the Employer and the Contractor in connection with, or arising out of, the Contract or the execution of the Works, whether during the execution of the Works or after their completion and whether before or after repudiation or other termination of the Contract, including any dispute as to any opinion, instruction, determination, certificate or valuation of the Engineer, the matter in dispute shall , in the first place be referred in writing to the Chief Engineer, with a copy to the other party. Such reference shall state that it is made pursuant to this clause. No later that the eighty-fourth day after the day on which he received such reference the Chief Engineer shall give notice of his decision to the Employer and the Contractor. Such decision shall state that it is made pursuant to this Clause.

Unless the Contract has already been repudiated or Terminated, the Contractor shall, in every case, continue to proceed with the Works with all due diligence

and the Contractor and the Employer shall give effect forth with to every such decision of the Engineer unless and until the same shall be revised, as hereinafter provided, in an amicable settlement or an arbitral award.

If either the Employer or the Contractor be dissatisfied with any decision of the Chief Engineer, or if the Chief Engineer fails to give notice of his decision on or before the eighty-fourth day after the day on which he received the reference, then either the Employer or the Contractor may, on or before the seventieth day after the day on which he received notice of such decision, or on or before the seventieth day after the day on which the said period of 84 days expired, as the case may be, give notice to the other party, with a copy for information to the Engineer, of his intention to commence arbitration, as hereinafter provided, as to the matter in dispute. Such notice shall establish the entitlement of the party giving the same to commence arbitration, as hereinafter provided, as to such dispute and, subject to sub-clause 67.4 no arbitration in respect thereof may be commenced unless such notice is given.

If the Chief Engineer has given notice of his decision as to a matter in dispute to the Employer and the Contractor and no notice of intention to commence arbitration as to such dispute has been given by either the Employer or the Contractor on or before the seventieth day after the day on which the parties received notice as to such decision from the Chief Engineer, the said decision shall become final and bindings upon the Employer and the Contractor.

67.2 Amicable Settlement

Where notice of intention to commence arbitration as to a dispute has been given in accordance with sub-clause 67.1, arbitration of such dispute shall not be commenced unless an attempt has been made by the parties to settle such dispute amicably. Provided that, unless the parties otherwise agree, arbitration may be commenced on or after the fifty-sixth day after the day on which notice of intention to commence arbitration of such dispute was given, whether or not any attempt at amicable settlement thereof has been made.

67.3 Arbitration

Any dispute in respect of which :

a) The decision, if any, of the Engineer has not become final and binding pursuant to sub/clause 67.1, and

b) Amicable settlement has not been reached within the period stated in sub/clause 67.2,

Shall, on the initiative of either party, be referred to the arbitration. The arbitration will be open as per the prevailing arbitration act and law. The Contractor will suggest three names out of the Working / Retired Chief Engineer (Level-1/Level-II) of U.P. Jal Nigam. The employer shall also give his consent on either one or all of the above names. The Managing Director U.P. Jal Nigam will appoint any one of the above mutually agreed person as Sole arbitrator.

Unless the contract has already been repudiated or terminated, the Contractor in every case, continue to proceed with the works with all due diligence and the Contractor and Engineer shall give effect forthwith to every such decision of the Engineer unless and until the same shall be revised as here-in-after provided, in an amicable settlement or arbitration award.

Arbitration may be commenced prior to or after completion of the Works, provided that the obligations of the Employer, the Engineer and Contractor shall not be altered by reason of the arbitration being conducted during the progress of the Works.

67.4 Failure to Comply with Engineers Decision

Where neither the Employer nor the Contractor has given notice of intention to commence arbitration of a dispute within the period stated in sub-clause 67.1 and the related decision has become final and binding, either party may, if the other parts fails to comply with such decision, and without prejudice to any other rights it may have, refer the failure to arbitration in accordance with sub-clause 67.3. The provision of sub-clauses 67.1 and 67.2 shall not apply to any such reference.

NOTICES

68.1 Notices to Contractor

All certificates, notices of instruction to be given to the Contractor by the Employer or the Engineer under the terms of the Contractor shall be sent by post, cable, telex or facsimile transmission to or left at the Contractor's principle place of business or such other address as the Contractor shall nominate for that purpose.

68.2 Notice to Employer and Engineer

Any notice to be given to the Employer or to the Engineer under the terms of the Contract shall be sent by post cable, telex or facsimile transmission to or left at the respective addresses nominated for that purpose in these documents.

a) Employer : Executive Engineer,
Add. Consturction Divison
U.P. Jal Nigam, Sultanpur

b) Engineer / Engineer-in-charge : Executive Engineer,
Add. Consturction Divison
U.P. Jal Nigam, Sultanpur
Ph. 05362-231458 Mo.-9473942716

68.3 Change of Address

Either party may change a nominated address to another address in the country where the Works are being executed by prior notice to the other party, with a copy to the Engineer, and the Engineer may do so by prior notice to both parties.

DEFAULT OF EMPLOYER

69.1 Default of Employer

In the event of the Employer

a) becoming bankrupt or, being a company, going into liquidation, other than for the purpose of a scheme of reconstruction or amalgamation.

b) giving notice to the Contractor that for unforeseen reasons, due to economic dislocation, it is impossible for him to continue to meet his Contractual obligations.

The Contractor shall be entitled to terminate his employment under the Contract by giving notice to the Employer, with a copy to the Engineer. Such termination shall take effect 14 days after the giving of the notice.

69.2 Removal of Contractor's Equipment

Upon the expiry of the 14 days' notice referred to in sub-clause 69.1, the Contract shall, not with standing the provisions of sub-clause 54.1, with all reasonable dispatch, remove from the Site all Contractor's Equipment brought by him thereon.

69.3 Payment on Termination

In the event of such termination the Employer shall be under the same obligation to the Contractor in regard to payment as if the contract had been terminated under the provision of clause 65.

69.4 Contractor's Entitlement to Suspend Work

Without prejudice to the Contractor's entitlement to terminate under sub-clause 69.1 the Contractor may, if the Engineer fails to pay Contractor the amount due within 56 days after the expiry of the time stated within which payment is to be made, subject to any deduction that the Employer is entitled to make under the Contract, after giving 28 days' prior notice to the Employer, with a copy to the Engineer, suspend work or reduce the rate of work.

If the Contractor suspends work or reduces the rate of work in accordance with the provision of this sub-clause and thereby suffers delay or incurs cost the Engineer shall, after due consultation with the Employer and the Contractor determine.

a) any extension of time to which the Contractor is entitled under Clause 44, and

b) the amount of such costs, which shall be added to the Contract Price, and shall notify the Contractor accordingly with copy to the Employer.

69.5 Resumption of Work

Where the Contractor suspends work or reduces the Rate of Work, having given notice in accordance with sub-clause 69.4, and the Employer subsequently pays the amount due, the Contractor's entitlement under sub-clause 69.1 shall, if notice of termination has not been given, lapse and Contractor shall resume normal working as soon as reasonably possible.

CHANGES IN COST AND LEGISLATION

70.1 Subsequent Legislation

If, after the submission of bid, there is a statutory variation in the taxes or duties or a new taxes or levy imposed by the Government which causes additional or reduced cost, such additional or reduced cost shall after due consultation with the Employer and the Contractor, determined by the Engineer and shall be reimbursed to or deducted from the Contractor, by the Department. The above shall be applicable for plants, equipment and items manufactured or supplied by the Contractor. The bidder shall mention in his bid the prevailing rates of taxes and duties duly supported by documentary proof in respect of such plants, equipment and items.

71 Local Taxation/Law/Liability

Change in Law:

Any change in law, the Contractors hall pass on such benefits to the Employer, if earned on account of decrease in cost resulting from change in the Laws of the Country (including the introduction of new Laws and there peal or modification of existing Laws), viz., Taxes, duties, Deemed Export Benefits, etc.,. If required by the Employer, the Contractor shall furnish the documentary evidence to support the benefits that are to be passed onto the Employer

Limitation of liability : The contractor's liability under this contract shall be limited upto the total contract value.

71.1 The price bid by the Contractor shall include all customs duties, import duties business taxes, income and all other taxes that may be levied in accordance to the laws and regulation in being in the Employer's country on the Contractor's

Equipment, Plant, materials and supplies (permanent, temporary and consumable) acquired for the purpose of the Contract and on the services performed under the Contract. Nothing in the Contract shall relieve the Contractor form his responsibility to pay any tax that may be levied in the Employer's country on profits made by him in respect of the Contract.

71.2 The Works Contract Tax, if any, on the completed items of work of this Contract levied by Government or any other statutory body shall be payable by the Contractor.

71.3 The Stamps Duty, on the Contract Agreement levied by Govt. or any other statutory body shall be paid by the Contractor.

72. Income Taxes on Staff

The Contractor's staff, personnel and labour will be liable to pay personal income taxes in the Employer's country in respect of such of their salaries and wages as are chargeable under the laws and regulations for the time being in force, and the Contractor shall perform such duties in regard to such deduction thereof as may be imposed on him by such laws and regulations.

73. Bribes

If the Contractor, or any of his SubContractors, agents or servants gives or offers to give to any person any bribe, gift, gratuity or commission as an inducement or reward for doing or forbearing to do any action in relation to the contract or any other contract with the Employer, or for showing or forbearing to show favour or dis-favour to any person in relation to the Contract or to any other contract with the Employer, then the Employer may enter upon the Site and the Works and expel the Contract and the provisions of clause 63 hereof shall apply as if such entry and expulsion has been made pursuant to that clause.

74. Termination of contract for employer's Convenience

The Employer shall be entitled to terminate the Contract at any time for the Employer's convenience after giving 56 days prior notice to the Contractor, with a copy to the Engineer. In the event of such termination, the Contractor.

a) shall proceed as provided in sub-clause 65.7 ; and

b) shall be paid by the Employer as provided in sub-clause 65.8

75. Restriction on Eligibility

a) Any Plant, supplies or materials which will be incorporated in the Works, as well as the Contractor's Equipment, shall have its origin in eligible source.

b) Such Plant, supplies material or Contractor's Equipment shall be transported by carries from eligible source unless exempted by the Engineer in writing, on the basis of potential costs or delays.

c) Surety, insurance and banking services shall be provided by insurers and bankers from eligible source.

76. Joint and Several Liability

Joint venture is not allowed.

77. Details to be Confidential

The contract shall treat the details of the Contract as private and confidential, save insofar as may be necessary for the purpose thereof and shall not publish or disclose the same or any particular thereof in any trade or technical paper or elsewhere without the previous consent in writing of the Employer or the Engineer. If any dispute arises as to the necessity of any publication or disclosure for the purpose of the Contract the same shall be referred to the decision of the Employer whose award shall be final.

78. Non Exercise of Contractors Liability to Pay Compensation

In any case in which any of the powers conferred upon the Engineer hereof shall have become exercisable and the same shall not be exercised the non-exercise thereof shall not constitute a waiver of any of the conditions here of such power shall not withstanding be exercisable in the event of any future case of default by the Contractor for which by any clause or clauses hereof he is declared liable to pay compensation amounting to the whole of his security deposit and the liability of the Contractor for past and future compensation shall remain unaffected. In the event of the Employer putting in force either of the power (a) or (b) vested in him under the preceding clause, he may, if he so desires, take possession of all or any tools, plant materials and stores in or upon the works or the site thereof or belonging to the Contractor, or procured by him and intended to be used for the execution of the work or any part thereof paving or allowing for the same in account at prevailing market rates such rates to be certified by

the Engineer whose certificates thereof shall be final, otherwise the Engineer may be notice in writing to the Contractor or his other authorized agents require him to remove such tools, plants, materials or stores from the premises (within a time to be specified in such notice) and in the event of the Contractor failing to comply with any such requisition, the Engineer may remove them at the Contractor's expense or sell them by auction or private sale on account of the Contractor and at his risk in all respects and the certificate of the Engineer as to the expenses of any such removal, and the amount of the proceeds and expense of any such sale shall be final and conclusive against the Contractor.

79. No compensation for the alteration in or reduction of work to be carried out

If at any time after the commencement of the work the Utter Pradesh Jal Nigam through the Chief Engineer / Employer shall for any reason whatsoever not require the whole work there of as specified in this contract to be carried out the Employer shall give notice in writing of the fact the Contractor and upon the receipt of such notice in writing the works under this contract shall cease and the Contractor shall have no claim to any profit or advantage, which he might have derived from the execution of the works in full, but which he did not derive in consequence of the full amount of the works not having been carried out neither shall he have any claim for compensation by reason of any alternations having been made in the original specifications, drawings and instructions which shall involve any curtailment of the work as originally contemplated.

80. Employment of Maintenance Gang

The Contractor will employee necessary maintenance gang and staff during the entire maintenance period for immediate repairs of any defect that may be notices or brought to his notice during the period of maintenance i.e. 12 months after completion of works stated elsewhere in the contract. If the Contractor fails to attend the site even after pointing out by the engineer in charge and any expenditure in this connection incurred by engineer shall be recoverable.

81. Contractors Address for Official Correspondence

Contractor while submitting tender should give his address on which all official correspondence may be addressed to him. If a registered letter is received back undelivered with whatever remark, it will be considered to have been delivered to him. Contractor shall intimate at once the change in address if any.

82. Date of Dispatch of Letter

Sufficient time will be given to Contractor for his replies or action but if letters are received by the Contractor late or are lost, the Contractor for the purpose of this Bond will treat the date of dispatch of letter as date of receipt. The Contractor is supposed to keep in constant touch with the office of the engineer and Contractor will also provided facility for receiving a copy of the letter at site office.

83. Date of Completion

The date of completion, trial run period and maintenance period given in the tender documents are to be adhered unless otherwise specified.

84. Quantities in the Schedule not Guaranteed

The quantities given in the schedule are approximate only and payment will be made on actual "NET" measurements taken during and after completion of the works. The measurement and quantities desired to be completed will mean the finished sizes of the respective items of works after all the final dressing and shaping, cutting and finishing have been done. No claim or payment for the materials purchased or bought by the Contractor but not used at site shall be admissible.

85. Provision of Law Deemed Inserted

Each and every provision of law required by law to be inserted in the contract document shall be deemed to be inserted and the contract document shall be read and enforced as though it were included.

86. Certificates of Tax Deduction to be Issued

The Engineer will issue on demand certificate in respect of tax deducted by him during the financial year such as trade tax, income tax etc. The tax so deducted will be deposited in SBI or treasury or any authorized bank at Sultanpur as office of Engineer situated.

Any increased in rates, prevalent by law, but not intimated to department will responsibility of Contractor and the Contractor will settle the issues after final payment is done by the employer / engineer and employer will not be responsible in any way.

87. Fencing and Watching

The Contractor shall be responsible for fencing of all excavations works and material at site in good and sufficient manner, so as to prevent accidents by night as well as by day. He shall also be responsible for lighting up in proper and sufficient manner at nights, the portion of works which are open or under construction and he shall always maintain sufficient number of watchmen on duty when his staff is not actually working and shall make his rate sufficiently comprehensive to slow for these duties. The Contractor shall be fully responsible and indemnify Govt. on any other person or persons in case of accident caused by the negligence of such precautions. The rates quoted by the Contractor should cover all such charges and no extra payment will be made.

88. Pumping During Construction

The Contractor shall provide all applications, pumps and engines, sufficient suction and delivery pipes. Valves, fastening, fuel, lubricant, cotton wastes etc. all labour skilled and unskilled and necessary electric or any other powers to run pumping plant for dealing with rain flood or drainage water encountered during the construction of works. The diversion and other works may be required to be carried out as per site conditions and Contractor shall make his rates sufficiently comprehensive to cover the cost of such works.

89. Site Office

On acceptance of the tender the Contractor will provide immediately temporary office accommodation and display room along with toilet at site exclusively for the use of Engineer or his representatives who will supervise the works. The Temporary shelter will provide for adequate furnishings (including desert cooler facility during summers) suitable for the status of Engineer. Contractor may remove these works, on completion of project.

90. Inspection and Checking of Works

In pursuance of clause 16 and 17, the materials collected and construction, installation and maintenance shall be checked from time to time by the

Engineer-in-charge or his authorized representative and the representative of the Contractor shall as certain from the Engineer or his representative from time to time as to part or portion he wishes to check over and pass. Contractor will provide all facilities for access to the work to be checked or measured and will help in carrying out the job. But such approval shall in no way relieve the Contractor of any of his responsibilities which not end until the whole work is actually completed and the maintenance period has expired as defined in clause.

Instruction on inspection will be usually given in writing and Contractor shall keep an inspection register where the Inspecting Authority may give remarks and Contractor will follow them and compliance will be reviewed. However, in case of verbal instruction, Contractor may confirm it in writing but in no case he will overlook them.

91. Employed / Retired Personnel / Jal Nigam Personnel

The Contractor shall not recruit or attempt to recruit his staff and labour from amongst persons of any category who are in the service of U.P. Jal Nigam, or any other Govt. Deptt. or State Corporation / Boards.

92. Order of Preference of specification

All materials equipment as per IS specification (BIS) should bear ISI MARK. The water Supply Pipes to be Supplied at the site shall be purchased by a firm Certified by CROWN agency.The materials Must be tested before supply at the site By CROWN/CIPET agency.

The order of preference of specification shall be:

- ISI (BIS)
- JAL NIGAM
- CPWD
- MES
- PWD
- MANUAL ON WATER SUPPLY – GOVERNMENT OF INDIA

The latest code or their amendments shall be used.

93. Soundness of Works

All civil works should be water tight, sound in construction, neat surfaced, devoid of bubble pits, and honeycombing, dimensions suitable for aesthetic requirements with proper colour / Asian Apex Ultima with wall putty/ paints etc. As required.

The Contractor will use concrete mixers and vibrators invariably in concrete works. Contractor will as certain bearing capacity of soil also before going on for construction of different units. Hand missing of concrete shall be avoided but in unavoidable circumstances 10% extra cement shall be used with no extra payment. The Contractor will study the drawings for equipment and the erections so that proper foundations are made before hand and digging / breaking / making holes in constructed portion is avoided.

94. Photographs, Records

The Contractor must allow sufficient margin in his tendered rates the cost of taking photographs etc. during and after construction of each unit. Contractor will be asked to maintain records and photographs of defective work before and after repairs, if so required.

95. Architectural View

Contractor will provide design and drawing for sound and suitable structures. However, he will provide due care for the aesthetic sense as well and design should include the environment of nearby area and religious city sculpture as well. The area nearby may develop as tourist spot.

96. Completion Drawings

Before the final completion certificate is issued, the Contractor shall furnish to the owner, four sets of the drawings of the work as actually completed in sufficient details to enable the maintenance agency to maintain, dismantle, reasonable and adjust all parts and modify, if need be in future.

Work shall be treated completed only after receipt of such drawings duly signed by Contractor.

97. Operating and Maintenance Manuals

The Contractor shall furnish to the owner on or before the completions of works, size sets of the operation and maintenance instruction together with the detailed drawings of spares, units and other sketches to enable the staff of maintenance agency to carry out trouble free maintenance. The Contractor will also submit six copes of the maintenance manual of the works. The works shall only be considered if these manuals and are handed over. The Contractor will provide information about the source of spares etc.

98. Manufacturer’s Warranties

The Contractor shall deliver to the engineer in respect of all plants, machinery and equipment’s procured by him for the purpose of this contract from other

manufacturers all the manufacturers instruction manual and warranties and guarantees with the owner named as beneficiary. In addition, for all equipment and machinery bearing an manufacturer's warranty that extends for a longer period of time than the Contractors guarantee, the Contractor shall secure and deliver the warrantees and guarantees to the engineer in the same manner.

99. <u>Certificates of Completion, Final Acceptance and Taking Over</u>

99.1 Certificate of Completion

Upon written notice from the Contractor that the entire work required by the contract documents, including testing and commissioning of works is complete and that all submissions required from him are made, and after the Contractor has delivered the bonds, certificate of inspection, guarantees, warranties, releases and other documents all or bylaw, the engineer will make a final inspection and the owner will notify the Contractor in writing of any particulars in which this inspection reveals that the work is defective or deficient and will also notify the Contractor in writing of any deficiencies in the submission and other documents required of him. The Contractor promptly shall make such correction as are necessary to remedy all defects or deficiencies. After the Contractor has completed any such correction to the satisfaction of the owner, the owner will issue a written certificate of completion of the work and file any notice of the completion required by law or otherwise.

99.2 Obligation under the contract

The issue of above certificate or release of final payment of performance security do not relieve the Contractor of his obligation under the contract for any faulty, deceitful or fraudulent act or work which may show up in the works or in parts thereof in the course of time, whether or not the works or part thereof have been approved by the engineer or his representative or his assistant who jointly or separately have obligation to the owner. Such matters, without regard to time elapsed shall be subject to arbitration's.

99.3 Works to be handed over

After satisfactory completion of works and maintenance, the Contractor shall be responsible for handing over the entire works in running condition to NPP Faizabad as advised by the Engineer.

100. No Deviation in Tender Conditions

Bidders shall submit offers, which comply fully with the requirements of the bidding documents including the basic technical designs indicated in the

drawing and specification, condition of the bidding documents would not be deviated. Any bids introducing their own condition and or amending those of the bidding documents, would be treated as unresponsive and shall be liable to be rejected.

101. Alteration

The tendered must tender in general in accordance with the requirements of these specifications, but he shall be at liberty to put up suggestions for alternation as well. The items in these specification or schedule must, however under no circumstances be altered to suit these alternation or modifications and shall be submitted only as addendum and forward along with the tender which if approved in whole or part will be embodied in the contract at the time of acceptance and shall be binding on the tendered.

102. Time of Completion of Work (including trial run)

Twenty sixteen months from the date of start given excluding extension of time approved.

103. Time of Trial Testing Of Completed Works

FOUR months after date of completion.

104. Time of Defect Liability of Works after Successful Trial Runs

12 months after the date of end successful trial and testing run.

105. Time of Refund of Performance Security

28 days after successful completion of defect liability period and period specified as maintenance period for reinstatement of roads carried out by contractor

106. Legal document of agreement with collaborator defining the onus of main Contractor and Collaborator for correctness of the work and performance guarantees duly notarized.

107. Legal document of agreement showing company structure with power of attorney duly notarized.

108. Bid to be submitted in Tender Documents issued by U.P. Jal Nigam. No correction/change in the Tender Document should be done.

109. In case of any ambiguity in the Tender Document, which got left unattended to, even after pre-submission meeting, the conditions in favor of the Owner will prevail.

111. Any change in information submitted by the tenderer in respect of this tender shall be communicated to the department at the earliest. With holding of such information will lead to disqualification of the tenderers for this job.

SECTION – 2

SCHEDULE OF SUPPLEMENTARY INFORMATIONS

SCHEDULE – 1

LETTER SUBMITTING TENDER

(TO BE SUBMITTED WITH EARNEST MONEY)

TO

Executive Engineer,
Add. Consturction Divison
U.P. Jal Nigam,
Sultanpur

Sir,

I/We hereby tender for ( ) and, if this tender is accepted, undertake to execute the works viz. as shown in the drawings and prescribed in the specification deposited in the office of the Executive Engineer,Add. Consturction Divison U.P. Jal Nigam, Sultanpur with such variations by way of alteration of additions to and omissions from work and methods of payment as per provided for in the conditions of contract for the sum…… …… (Rupees) ……..…… only.

I/we have also completed the price list of the items in schedule …….. (Annexed) in words and figures for which I/we agreed to execute the work.

I/we agree to keep the offer in this tender valid for a period of 120 days mentioned in the tender notice and not to modify the whole or any part of it for any reason within the above period. If the tender is withdrawn by me/us for any reason what so ever, the Earnest Money deposited by me/us will be forfeited by the U.P. Jal Nigam.

I/we hereby distinctly and expressly declare and acknowledge that before the submission of my/our tender I/we have carefully followed the instruction in the tender documents and that I/we have made such examination of the contract documents and of the plants specifications and quantity, and of the location where the said work is to be done, and such investigation of the work required to be done sand in regard to the materials required to be furnished as to enable

me/us thoroughly understand the intention of the same and the requirements, covenants agreements stipulations and restrictions contained in the contract and in the said plans and specifications and distinctly agree that I/we will not hereafter make any claim or demand upon U. P. JAL NIGAM based upon or arising out of any alleged misunderstanding or misconception mistake on my/our part of the said requirements, stipulations, restrictions and conditions.

I/we enclose a Demand Draft/F.D.R./Deposit at call receipt/Bank Guarantee for Rs. …….lacs for the work of Rs. ……. towards earnest money not to bear any interest.

If my/our tender is not accepted, this sum shall be returned to me/us when intimation is sent to me/us of rejection or at the expiration of 30 days from the date of expiry of validity of this tender, which ever earlier, if my/our tender is accepted, the earnest money shall be returned to me/us on my/our entering into agreement bond duly furnishing performance security deposit. If upon intimation being given to me/us by the U. P. Jal Nigam of performance security deposit defined in Tender Document then I/we agree to the forfeiture of the earnest money. Any notice required to be served on me/us if delivered to me/us personally or forwarded by post to me/us (registered) or left at my/our address given herein, such notice shall if sent by post, be deemed to have been served on me/us at the time when in due course of post it would be delivered at the address to which is sent.

I/we fully understand that the written agreement (to the entered into between me/us and the U. P. Jal Nigam) shall be the foundation of the rights of both the parties and contract shall not be deemed to be complete until agreement has first been signed by me/us and then by the proper office authorized to enter into contract on behalf of the U. P. Jal Nigam.

I/we are professionally qualified, and my/our qualification is given below:-

NAME	QUALIFICATIONS AND EXPERIENCE

I/we am/are also registered in class……by ……. A copy of the Registration certificate is enclosed. I/we understand that you are not bound to accept the lowest or any bid you receive.

I/we will employed the following technical staff for supervising the work and will see that they will be always available at site during working hours personally checking all items of work and paying extra attention where necessary.

Sl. No.	Name and address of member of Technical staff proposed to be employer	No. of years with my/our company	Qualifications	Total years experience	Remarks

Address with phone No. **Signature of Contractor/Tenderer**

Dated the …… day of …… 2018

Signature of Witness :

Name and address :

Occupation :

The above tender is hereby accepted by me on behalf of the U. P. Jal Nigam.

Date:

For and behalf

of

U. P. Jal Nigam

SCHEDULE – 2

TENDERER'S / CONTRACTOR'S CERTIFICATE

I/we hereby declare that I/we, have perused in detail and examined closely the specifications in the tender documents. I/we agree to be bound by and comply with all such specifications for this agreement, which I/we shall execute with the U. P. Jal Nigam.

Date: Name of the tenderer or contractor

Address of tenderer or Contractor

CERTIFICATE

I/we hereby declare that I/we have inspected the location of the proposed work before quoting my/our rates. I/we have also inspected lanes and difficulties likely to be encountered due to water main, telephone, electric cable/poles etc. and the queries and borrow areas satisfied myself/ourself regarding the quality, quantity, availability and transport facilities for earth, stone, sand, cement, flyash etc. through the net work of available roads and paths ways required for the work.

Signature of Contractor

SCHEDULE – 3

SAMPLE FORM

BANK GUARANTEE FOR EARNEST MONEY (UNCONDITIONAL)

Whereas:_____
_____
_____[name of Bidder] (hereinafter called "the Bidder") has submitted his bid dated _____ (Date) to execute Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete(civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city" On turnkey basis.excluding its trial run for 4 months and maintenance for 12 months defect liability period (hereinafter called "the Bid").

KNOW ALL MEN by those presents that We _____ _____ [Name of Bank] of _____ [Name of Country] having registered office at _____(hereafter called "the Bank") are bound unto Executive Engineer,Add. Consturction Divison U.P. Jal Nigam, Sultanpur (U.P) ON BEHALF OF OWNER (hereinafter called "the Executive Engineer" in the sum or Rupees _____ for which payment well and truly to be made to the said Executive Engineer the Bank binds himself, his successors and assignee by those presents.

SEALED with the Common Seal of the said Bank this _____ day of _____ 2017

THE CONDITIONS of this obligation are:

(1) If the bidder withdraws or modifies his Bid during the period of bid validity specified in the form of Bid.

(2) If the Bidder having been notified of the acceptance of his Bid by the Executive Engineer during the period of bid validity:-

(a) Fails or refuses to execute the Form of Agreement in accordance with the Instructions to Bidders.

(b) Fails or refuses to furnish the Performance Security in accordance with the Instructions to Bidders.

We undertake to pay to the Executive Engineer up to the above amount upon receipt of his first written demand, without the Executive Engineer having to substantiate his demand, provided that in his demand the Executive Engineer, will note that the amount claimed by him is due to him owing to occurrence the of one or both of the two conditions, specifying the occurred condition or conditions. This Guarantee will remain in force up to and including the date, 148 days after the deadline for submission of bids as stated in the Instructions to Bidders or as it may be extended by the Executive Engineer, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this Guarantee should reach the Bank not later than the above date.

DATE _____SIGNATURE OF THE BANK _____

WITNESS _____ SEAL _____

(Signature, Name and Address)

Tele No.- **Fax No. -**

SCHEDULE – 4

SAMPLE FORM

BANK GUARANTEE FOR PERFORMANCE SECURITY (UNCONDITIONAL)

(TO BE USED BY ALL SCHEDULE BANKS)

TO: Executive Engineer, Add. Consturction Divison U.P. Jal Nigam, Sultanpur

1. In consideration of the U. P. Jal Nigam (hereinafter called the Nigam) having agreed to exempt _____ (hereinafter called the said contractor(s)) from the demand under the terms and conditions of the tender notice No. _____ date _____ made between _____ (hereinafter called the said tender) of security deposit for contract on production of a Bank Guarantee for Rs. _____ (Rs. _____) only _____ (Herein after referred to as the Bank) do hereby undertake to pay to the Nigam an amount not exceeding Rs. _____ against any loss or damages caused to or would be suffered by the Nigam by reason of any breach by the said contractor(s) of any of the terms and conditions contained in the said contract.
2. We _____ (bank) do hereby undertake to pay the said sum of Rs. _____ payable under this guarantee and without any argument merely on a demand by the U. P. Jal Nigam.

   Any such demand made on the Bank shall be conclusive as regards the amount due and payable by shall be restricted to an amount not exceeding Rs. _____

3. We _____(bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said contract and that it shall continue to be enforceable till all the dues of the U. P. Jal Nigam under or virtue of the said contract have been fully paid and its claim satisfied or discharged or till the Engineer or authorized officer of the U. P. Jal Nigam certifies that the terms and conditions of the said contract have been fully and properly carried out by the said contractor(s) and accordingly discharges the Guarantee. Unless demand or claims under this guarantee is made on us in writing on or before the _____ we shall be discharged from all liability under this guarantee, thereafter.

4. We _____ (bank) further agree with the U. P. Jal Nigam that the U. P. Jal Nigam shall have the liberty without our consent and without affecting in any manner out obligations hereunder to vary any of the terms and conditions of the said contract or to extend time for performance by the said contractor(s) from time to time and to forebear or enforce any of the terms and conditions relating to the said contract and we shall not be relieved from out liability by reasons of any such variations, or extension being gained in the said contractor(s) or for any forbearance act or commission on the part of the U. P. Jal Nigam or any indulgence by the U.P. Jal Nigam or the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would but for this provisions have effect of so relieving us.

We _____(bank) lastly undertake not to revoke this guarantee during its currency except with the consent of the U.P. Jal Nigam in writing.

Dated the _____ day of _____ 2018

Name of Bank _____

Address _____
_____
_____

Tele No.- **Fax No. –**

SCHEDULE – 5

TO: Executive Engineer,Add. Consturction Divison U.P. Jal Nigam, Sultanpur .

Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete(civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city and other related works

Gentleman:

In accordance with the provision of the conditions of Contract, Sub-Clause ("Advance Mobilization Loan") of the above-mentioned Contract, _____ _____Name and Address of Contractor) (hereinafter called "the Contractor") shall deposit with Executive Engineer, Add. Consturction Divison U.P. Jal Nigam, Sultanpur a bank guarantee to guarantee his proper and faithful performance under the said clause of the contract in an amount of _____(amount of guarantee)* _____ (in words).

We, the _____ (bank or financial institution), as instructed by the Contractor, agree unconditionally and irrevocably to guarantee as primary obligator and not as surety merely, the payment to Executive Engineer, Add. Consturction Divison U.P. Jal Nigam, Sultanpur on his first demand without whatsoever right of objection on our part and without his first claim to the Contractor in the amount not exceeding _____ (amount of guarantee)* _____ (in words).

We further agree that no change or addition to or other modification of the terms of the Contract or of the works to be performed there under or of any of the Contract documents which may be made between Employer or his authorized representative and the Contractor shall in any way release us from liability under this guarantee and we hereby waive notice of any such change addition or modification.

This guarantee shall remain valid and in full effect from the date of the advance mobilization loan under the Contract until the Executive Engineer,Add. Consturction Divison U.P. Jal Nigam, Sultanpur

receives full repayment of the same amount from the contractor.

Yours truly,

SIGNATURE AND SEAL_____

Name of Bank / Financial Institution: _____

Address:_____

_____

Tele No.- **Fax No. -**

Date: _____

_____

*An amount to be inserted by the bank or financial institution representing amount of the Advance Payment.

SCHEDULE – 6

UNDERTAKING FROM CONTRACTOR IF CONTRACTOR FURNISHES BANK GUARANTEE

If the Bank guarantee as produced by us hereby is accepted by U. P. Jal Nigam. I/we undertake to renew the same at least one month before the date of expiry of the bank guarantee, in the case the contract is not performed to the satisfaction of Engineer within the stipulated period, and if we fail to do so, we agree that Employer will recover the entire amount in cash from our bill or any other payment due to us without any notice. This procedure will remain in force till we receive in writing from the Employer that the Bank Guarantee in no longer required to be extended.

This is further undertaken that the Bank Guarantee will not be got released, until the Employer's written permission to get it released whether or not the time of Bank Guarantee expires and if time is due to expire, I/we shall be bound to renew the same and shall inform the Employer.

Signature of Contractor

SCHEDULE – 7

GUARANTEES

We guarantee that:-

(a) We will replace/repair free of cost all component/section of the 'Works', the plant and equipment which fails to comply with the specification or amendment to such specification as referred to in our specification attached to our tender, including their wear and tear expected, until the completion of the maintenance period.

(b) All the plants and equipments will be reliable and as per specified standards.

(c) All the plants will be of a type which has been provided in service to be suitable for the duty required by the specifications and will have been manufactured and tested in accordance with the appropriate standard specifications approved by the Engineer.

(d) We accept and abide by the clause relating to satisfactory performance of Primary Treatment Works, paid pipe lines, qualify of treated under water and all Electrical and Mechanical Works.

Signature _____

In the capacity of _____

_____

Witness _____

Occupation _____

Address _____

_____

Date: _____

SCHEDULE – 8

SAMPLE FORM OF AGREEMENT

(Lump Sum-cum-item rate contract)

This Agreement made on the _____ day of _____ 2018…….ON BEHALF OF THE U.P. Jal Nigam (hereinafter called the Employer) of the part and _____ of_____(herein after called the contractor) of the other "Part Where as the Employer is desirous that the works should be executed by the Contractor. Viz. _____ and has accepted a Tender by the Contractor for the execution and completion of such works and the remedying of any defects therein.

Now this Agreement witness 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 hereinafter referred to.
2. The following documents shall be deemed to form and be read and construed as part of this agreement, viz:
   - (i) The Letter of Acceptance
   - (ii) The Tender Document (Volume – I)
   - (iii) The Tender Document (Volume - II)
   - (iv) The Tender Document (Volume – III)
   - (v) The Tender Document (Part-II)
   - (vi) The Specifications
   - (vii) The Drawings, and
   - (viii) The Priced Bill of Quantities.
3. In consideration of the payments to be made by the U.P. Jal Nigam to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the U.P. Jal Nigam to execute and complete the works and remedy and defects therein conformity in all respects with the provisions of the Contract.

4. The U.P. Jal Nigam hereby covenants to pay the Contractor in consideration of the execution and completion of the works and the remedying of defects therein the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

In Witness whereof the parties here to have caused this agreement to be executed the day and year before written

The Common Seal of _____was here unto affixed in the presence of:

or

Signed, Sealed and Delivered by the said _____ in the presence of:

Binding Signature of Executive Engineer Witness:
ON BEHALF OF U. P. JAL NIGAM _____ Witness:

Binding Signature of Contractor _____ Witness:

SCHEDULE – 9

Details of Plant and Equipment immediately available with the tenderer for use on this work

Sl. No.	Name of equipment	No. of Units	Kind or make	Capacity	Age & Condition	Present Location

Signature of Tenderer

SCHEDULE – 10 (a)

Details of Technical Personnel with the Tenderer for deploying on this work

Sl. No.	Designation	Name	Qualification	Relevant Professional Experience and details of work carried out	Major Role and Responsibilities

Signature of Tenderer

SCHEDULE – 10 (b)

Details of Project Management Personnel with the Tenderer for deploying on this work

Sl. No.	Designation	Name	Qualification	Relevant Professional Experience and details of work carried out	Major Role and Responsibilities

Note:

1. Project Management Personnel should have specialization/exposure in Institutional/organizational management with skills in Negotiations and Conflict resolution, preferably with experience of similar type of works.

SCHEDULE – 11

LIST OF SPECIFICATION / DRAWING

Sl. No.	Drg. No.	Description

Signature of Tenderer

SCHEDULE – 12

CONTRACT DRAWING & INSTRUCTION MANUALS

1. The Contractor shall submit the List of Contract drawing in accordance with specification
   (a) Contractors Tender Drawings
   (b) Detailed Drawings
   (c) Cabling & Wiring Diagram & Schedules
   (d) Approved Detailed Drawings
   (e) Approved Cabling & Wiring Diagram and Schedules
   (f) Record Drawings

2. The Contractor shall submit Instruction manuals in accordance with specification.

SCHEDULE – 13

STANDARD

Important standards applicable to this tender are stated in the specification. Tenderer shall complete the list below stating standards applicable to equipment for which they are tendering:

Specification No.	Subject	

Signature of Tenderer

SCHEDULE – 14

CONTRACTOR'S DRAWINGS, DETAILS AND INSTRUCTION MANUALS

The greatest emphasis is placed on the early production of the drawings. Tenderers are to bear this in mind and to offer the shortest time for the submission of these details, reducing wherever possible the mandatory limits set out below. All periods are from the date of issue of the Letter of Acceptance.

(i) Detailed Drawings

Detailed drawings shall be made available to the Engineer's Representative with design calculations within one months of the date of acceptance in ten copies.

(ii) Wiring Diagrams

Requirements are as for detailed drawings item (i) above.

(iii) Drawings of parts and components

Submission prior to delivery in triplicate

(iv) PERT Net Work and Bar Chart

Detailed, PERT programmes and Bar Chart of the works shall be submitted within two weeks.

SCHEDULE – 15

TENDER DRAWING AND PUBLICATIONS

The tenderer shall here insert a list of drawings, publications, copies of type test certificates and other literature illustrating the equipment offered in his tender. One copy of each item listed shall be attached with each copy of the tender.

Title	Reference	

Signature of Tenderer

SCHEDULE – 16

NAMES OF MANUFACTURERS, PRINCIPAL SUB-CONTRACTORS AND PLACES OF INSPECTION

The contractor shall insert the names and addresses at the time of tendering.

This information shall be binding on the contractor and shall not be departed from without the written consent of the Engineer's Representative.

Item	Manufacturer/Sub-contractor's Name	Place of Inspection

Signature of Tenderer

SCHEDULE – 17

ALTERNATIVE AND ADDITIONAL PLANT

The contractor shall list below any alternative and/or additional plant/material which he wishes to offer besides his first offer and shall show the net effect of such alternatives and/or additions on the Tender sum. The items in this schedule are not to be totaled nor carried forward to the tender amount.

Item No.	Specification reference	Description	Tenderer's spec. reference	Increase	Increase

Signature of Tenderer

SCHEDULE – 18

SCHEDULE OF TECHNICAL PARTICULARS

INSTRUCTIONS FOR PREPARATION OF SCHEDULE:

The Schedule of technical particulars shall indicate factually the Contractor's proposals at the time of tendering and all the section of the works the plant and the equipment shall comply with these particulars unless the Contractor has obtained prior approval of the Engineer's Representative for any deviations.

The Contractor shall also be responsible for notifying the Engineer's Representative immediately of any amendment in detail which may be necessary, when the contractor carries out detailed design following the award of the Contract.

The Contractor if he feels necessary shall make amendments which may be appropriate to the printed from the Schedule of particulars, and if he thinks necessary, provide information in addition to that called for in Schedule, but shall not omit any of the particulars so called for.

All the details of the material the plant and Equipment shall be given in the Tenderer's accompanying specification full details will be called for the successful Contractor.

In view of the different types of plants which the Tenderers are likely to offer, a printed schedule of particulars for plant details has not been drawn up. However, the Tenderers must submit a full and factual resume such as manufacturers names, power requirements, Loading, dimensions, specification, etc.

The Tenderer shall sign and date the declaration given below:-

We, the undersigned hereby declare that all the technical particulars given by us in the schedule shall be binding on us and will not be varied in any respect except as provided for under the terms of the contract. We further agree that the approval or otherwise by the owner or the Engineer or the said particulars shall in no way relieve us of any of out obligations and responsibilities under the Contract.

Signature of Tenderer

…..……

Date: …….

SCHEDULE – 19

STAFF AND LABOUR TO BE PROVIDED DURING MAINTENANCE PERIOD

We undertake to provide the following staff and labour on the site of work for the duties of maintenance and renovation, instruction and advice, and repairs of defects during the Maintenance Period.

Such men being on the works during the normal daily periods for a 48 hours / week and being on a reasonable period of recall to deal with any emergencies arising outside those periods.

Signature of Tenderer / Contractor

SCHEDULE – 20

DEVIATIONS FROM SPECIFICATIONS

The contractor shall state briefly any deviations from specifications contained in his main offer. If the deviations are discussed in the covering letter, then reference to the letter shall be made below:

Item or Clause	Deviation	Covering letter page

Signature of Tenderer / Contractor

SCHEDULE – 21

SPARE PARTS, ACCESSORIES AND TOOLS

All tenders shall set out below their recommendations for spare parts, which they consider to be adequate for five years operation of the works and tools and other accessories which they advise the Employer to purchase. Besides above, tool box as recommended by the manufacturer of the plant shall be supplied by the contractor before the final acceptance certificate is issued.

The price of spare parts shall be included in tender price for comparison and evaluation of tenders.

The Employer reserves the right to order any or all of the types listed in the schedule at the time of commissioning the works and the price inserted in the schedule will be used as a basis for determining appropriate prices. The Employer also reserves the right to vary the quantity of item.

Sl. No.	Item	Description	No.	Unit cost (in Rs.)	Total cost (in Rs.)
1	2	3	4	5	6

Signature of Tenderer

SCHEDULE – 22

GENERAL INFORMATION OF BIDDERS

"Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete(civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city" On turnkey basis."

"ON TURN KEY BASIS"

All Individual firms applying for Technical & Financial Evaluation cum Technical bid are requested to complete the information in this form. Nationality information should be provided for all owners or applicants who are partnerships or individually owned firms.

Signature & Seal of Applicant

SCHEDULE – 23

SCHEDULE OF PAYMENT

Sl. No.	Description	Payment
1	2	3
1	**Payment forDistribution systems and rising mains.**	
	a) As completed and tested with bill submitted (after testing)	90%
	b) After Testing and commisioning,	5%
	c) After satisfactory trial run of 4 months.	5%

SCHEDULE – 24

LITIGATION HISTORY

Sl. No.	Name of Deptt. With which dispute arose. Address with Tel. No. and E-mail address of Deptt.	Tender/ Cost of work	Date of start of work	Schedule date of completion of work	Date of start of Dispute	Nature of Dispute	Total cost of Dispute work	Dispute pending under		Present of position of Dispute	
								Arbitration	Court	Settled with cost & date	Under Progress
1	2	3	4	5	6	7	8	9	10	11	12

Signature & Seal of Applicant

UTTAR PRADESH JAL NIGAM

TECHNICAL & FINANCIAL EVALUATION CUM TECHNICAL BID

DOCUMENT- TECHNICAL

SPECIFICATIONS

INDEX

U.P. JAL NIGAM

Notice

1. Sealed Tenders in duplicate will be received upto ..... 20..... by the Executive Engineer.

   Division, for the Follwing work :

   .....

2. That the work shall be completely funished to the satisfaction of the Executive Engineer within.....calender months from the date of the receipt of the order to commence the work.

3. The amount of Security to be deposited by the tenderer for the due performance of all the Conditions of the Contract shall be a sum of Rs. ..... to be deposited with the Executive Engineer.

4. That all bills shall be liable to the deduction of a percentage of ten including security deposits.

5. Bank forms of Tenders and all other particulars regarding the proposed contract and nature of the security deposit required in case of the accepted Tender may be obtained at the office of the Executive Engineer at..... everyday (Sundays and other holidays excepted) during office hours; the charge in cash for each set of three complete form suplied is Rs.

6. Each Tender must be accompanied by a deposit of Rs. ..... only as earnest money, which should be deposited in Division in favour of the Executive Engineer, ... Division U.P. Jal Nigam..... .....Government currency notes must in no case be enclosed.

7. The Tenders will be opend at.....on..... by the Executive Engineer, or his authorized agent at his office at

8. Authority is reserved to reject any or all of the Tenders received and no explanation mat be demanded of the cause of the rejection of his Tender by any person making a Tender.

9. The deposit of the successful candidates which accompanies the Tender will be forfeited in case he declines to sign the Agreement of contract and deposit the security within..... days of being called upon to do so after the acceptence of his Tender.

10. Tender form skilled and experienced contractors who can submit proof of having successfully carried out similar work will be considered.

11. Tender form are not transferable.

Dated 20

The

Executive Engineer
Division,
U.P. Jal Nigam
.....

U.P. JAL NIGAM

Lump Sum-Cum-Item Rate Contract

GENERAL RULES AND DIRECTION FOR THE GUIDANCE OF TENDERERS

1. All workd proposed to be executed will be notified in a form of invitation to tender for the same either posting the said invitation on a board hung up in the office of the Executive Engineer, or by public advertizement, such invitation to be signed by the Executive Engineer.

   The form will contained and setforth the following:

   (a) The dates for submitting and opening tenders,

   (b) The time allowed for carrying out the work.

   (c) The amount of earnest money to be deposited with the tender, it must be clearly understood that no interest will be payable on any earnest money.

   (d) The amount of the security to be deposited by the seccessful tendered.

   (e) The percentage.if any to be deducted from bills

   copies of the specifications, drawing, schedule of rate and other documents affecting the work will be opend for inspection at the office of the Executive Engineer at during.....office hours.

2. In the event of the tender being submitted by a firm it must be signed separately by each member thereof or in the event of the absence of any partner it must be signed on his behalf by a person holding a power of attorney authourising him to do so or in the case of a company the tender should be executed in the manner laid down in the said Company's Articles of Association.

3. Receipts for payments made on account of work executed by a firm or Company must be signed by some persone or persons having authourity to give effectual receipt for such Firm or company.

4. Any person who submits a tender shall fill up the usual printed from stating at what rate he is willing to undertake each item of the work. Tenders which propose any alteration in the work specified in said form of invitation to tender, or in time allowed for carrying out the work which contain any other condition of any short whatsoever will be liable to rejection. Tenders shall have the name and number of the work of which they refer outside the envelope.

   The printed form mentioned above is obtainable form the office of the executive Engineer at..... upon payments of Rs. .....

5. The Executive Engineer or his duly authorized will open tenders at..... in the presence of any tenderer who may be present at the time and will enter the amount of the several tenders in a comparative statement in a suitable form. In the event of a tender being accepted a reicpt for the earnest money forwarded therewith shall thereupon be given to the contractor who shall thereupon for the purpose of identification, sign copies of the specification and other documents mentioned in rule 9 in the event of a tender being rejected the earnest money forwarded with such unaccepted tender shall thereupon be returned to the tenderer making the same.

6. The Executive Engineer shall have the right to rejected all or any of the tenders without giving any reason for the same.

7. The person or persons whose tender is accepted shall sign an agreement embodying the conditions of contract thereto within.....days after receiving written notice from the Executive Engineer that his tender has been accepted and shall pay for all stamps and legal expenses incident thereto and shall deposit in cash or Government securities endorsed to the Executive Engineer,..... ..... Division U.P. Jal Nigam, ... a sum amounting to Rs. .....

   as security for the due performance of the contract. Such Government securities to be accepted at their market value. In the event of failure by the said tenderer to sign the agreement of contract or to deposite the said security within..... .....mentioned aforesaid, after being called upon to do so by the Executive Engineer.

   .....Division, U.P. Jal Nigam.....the whole

   amount of the earnest money deposited as aforesaid shall be fortefied to the Chairman and the transaction affected by the tender shall cease and determine.

8. The receipt of an accountant or clerk for any money paid by the contractors will not be considered as any acknowledgement of payment of the Executive Engineer and the Contractor shall be responsible for seeing that he procures a receipt signed by the Executive Engineer.

9. The contract documents shall include the following.

   (i) Agreement and conditions of contract.

   (ii) Specification of work.

   (iii) Schedule of quantities and rates with total.

   (iv) Drawings.

10. Convassing either before or after seals are brocken, will tender the offer inilligible for consoderation.

Dated 20

The

Executive Engineer
Division,
U.P. Jal Nigam
.....

UTTAR PRADESH JAL NIGAM

Lump Sum-Cum-Item Rate Contract

TENDER FOR WORKS

I/We hereby tender for the work specified in the underwritten memorandum within the time specified in such memorandum at the rates given in the Schedule of rates hereto attached and in accordance in all respect with the specifications and drawings which said specifications and drawing have been prepared by the Executive Engineer of the.....
.....Division, U.P. Jal Nigam.....
and have been inspected and understood be me/us and such other written instruction and as may be given from time to time for the due carrying out of the said work and with such materials as are provided for by and in all other respects in accordance with the conditions hereto attached.

MEMORANDUM

(a) General description,

(b) Estimate cost. Rs. .....

(c) Earnest money,Rs. .....

(d) Security money (including earnest money). Rs. .....

(e) Percentage to be deducted from bill. Rs. Percent. .....

(f) Time allowed for the work from date of written order to commence .....

calender months.

Should this tender be accepted I/We hereby agree to abide by and fulfill all the terms and provisions of the said conditions of contract annexed hereto and within

days from the time when called upon to do so execute a contract embodying the conditions hereto attached and also deposit the said security with the Executive Engineer.

Division, U.P. Jal Nigam for the due performace of the said contract.

The sum
has been deposited in a Government treasury and the deposit receipt in herewith forwarded. The full amount of which is to be absolutely forfeited to the said Governor or His successor in Officer should I/We not when called upon to do so by the Executive Engineer, Division , U.P. Jal Nigam day execute the said contract and deposit the full amount of security deposit specified in the above memorandum, and in the event of such default the transaction affected this tender shall cease and determine.

Dated the day of 20

Witness :

Address:

Occupation

Contractor

The accompanying tender is hereby accepted by me on behalf of the Chairman of Uttar Pradesh Jal Nigam subject to the current financial year's allotment.

Dated the day of 20

Signature of the officer by whom accepted.....

Designation

Note-This form is not filled in by tenderer

U.P. JAL NIGAM

FORM OF AGREEMENT

Lump Sum-Cum-Item Rate Contract

THIS INDENTURE made the

day of

20 between

hereinafter called the contractor which expression shall where the context so admits or implies deemed to include his heirs, executors and administrator of the one part AND the Chairman Uttar Pradesh Jal Nigam hereinafter called the Chairman which expression shall where the contrctor so admits or implies be deemed to include his successor-in-office and assigns of the other.

WHEREAS the said Chairman requires the execution of certain work for

hereinafter called the said work which said work are more particularly described in the drawing and specification hereto annexed. AND ALSO requires the provision of the necessory matter therefore and have caused the necessary drawing and specifications and schedules of rates to prepared by and the contractor has delivered to the said Chairman a Tender for the execution the said works and the provisions of the said materials AND WHEREAS the Chairman has accepted such Tender subject to the provisions and condition hereto attached : NOW THIS INDENTURE WITHNESSETH as follows : In consideration of the covenant for the payment by and on behalf of the said Government hereinafter contained the contractor hereby covenants with the Chairman that he will supply all necessary materials and execute and complete in a thoroughly sound and workman like manner and afterwards maintain for the requisite period stated in the said Conditions all the works set out said specification and schedules of rates hereto attached, signed by the contractor, and as explained in the said drawing hereto attached and in accordance in every of respect, with the requirments, stipulation and conditions hereto attached.

In consideration of the covenant by the contractor hereinafter contained the said Chairman hereby covenant with the contractor to pay to him for the execution, completion and maintenance of the work as aforesaid according to the rates given in the schedules of rates hereto attached, and at the times and in the manner and subject to the additions and deductions set out and declared in the said conditions hereto attached.

IT IS HEREBY AGREED AND DECLARED that all the provisions of the said conditions drawing, specifications and schedules of rates of marked.

and

hereto attached shall be as binding upon the contractor and upon the said Chairman as if the same has been repeated herein and shall be read as part of these presents.

it witness whereof the parties hereto have affixed their signature.

the day of 20.....

Contractor

Witness :

Witness :

Signed of behalf of the chairman by

Witness :

Witness :

Designation of the officer

Lump Sum-Cum-Item Rate Contract

CONDITIONS OF CONTRACT

1. **Interpretation:-** In these conditions and in the specification which are hereto attached the term. "The CHIEF ENGINEER" shall mean the Chief Engineer, Uttar Pradesh Jal Nigam, Government of Uttar Pradesh.

   "The EXECUTIVE ENGINEER" shall mean the Executive Engineer,..... Division, U.P. Jal Nigam..... hereinafter called the Engineer.

   "WORK" OR "WORKS", where used in these conditions and specifications shall unless there be something either in the subject or context repugnant to such construction, be constructed and taken to mean "Work" by or by virtue of the contract contractor to be executed whether temporary or permanent and whether original, altered, substituted or additional.

2. **'Time" for completion of work:-** The time allowed for carrying out the work shall be reckoned from the date of the receipt of the written order to commence the work.

3. **Contractor's liability to pay compensation :-** The work shall be stipulated throughout the period of the contract by proceeded with all the due diligence (time being deemed to be the essence of the contract) and the contractor shall pay as compensation an amount equal to one percent or such smaller amount as the Chief Engineer (whose decision is writing shall be final) may decided , on the amount of the estimated cost of the whole work, that is to pay Rs..... for every day the work remain uncommenced, to unfinished after the proper dates. And further to ensure good progress during the execution of the work the contractor shall be bound to complete one fourth of the whole of the works before one-fourth of the whole timed allowed under this contract as elapsed, one-half of the works before one-half of such time has elapsed and three-fourths of the works before three-fourth of such time has elapsed. In the event of the contractor failing to comply with this condition he shall be liable to pay as compensation an amount equal to one percent of such smaller amount as the Chief Engineer (whose decision in writing shall be final) may decide on the said estimated cost of the whole work for every day that the due quantity of works remain incomplete PROVIDED ALWAYS that the entire amount of the compensation to be paid under the provision of the clause shall not exceed ten percent of the estimated cost of the works.

4. **Rights of breach of contract :-** In any case in which under any clause or clauses of these conditions the contractor shall have rendered himself liable to pay compensation amounting to the whole of the security deposit (whether deducted in one sum or deducted in instalment) the Engineer on behalf of the Chairman, Jal Nigam shall have power to adopt any of the following course as he may deem best suited to the interest of the Government.

   (a) To rescind the contract (of which rescission notice in writing to the contractor under the hand of the Engineer shall be conclusive evidence) and in which case the security deposit of the contractor together with such sum or sums die him under the contract shall stand forfeited and be absolutely at the disposal of the said Chairman, or

   (b) Determine the contract and call in another contractor or employ daily labour to dismantle bad work if necessary (the bad work to be certified by the Engineer whose decision shall be final and to renew and complete the said works and pay the cost of such contractor for daily and labour and price of materials required for such dismantling, renewing and completion out of the said security deposit, or such sum or sums as may be due to the contractor under this contract, and if such cost be more the amount made up of the security money and the sums due to the contractor under this contract the difference between it and the sum made up by the security money and the balance due to the contractor as aforesaid shall be a debt due from the said contractor to the said Chairman

to the event of either of the above course being adopted by the Engineer the Contractor shall have no claim to compensation of any loss sustained by him by reason of his having purchased or procured the material, or entered into any agreements or made any advances on account of or with a view to the execution of the work or the performance of the contract. And in case the contract shall be rescind under the provision aforesaid, the Contractor shall not be entitled to recover or be paid any sum for any work therefore actually performed under this contract, unless and untill the Engineer shall have certified inwriting the performance of such work and the value so certified.

5- **Non-exercise of contractor liability to pay compensation :-** In the case in which any of the powers conferred upon the Engineer by Clause 4 thereof shall have become exercisable and the same shall not be exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such power shall not withstanding exercisable in the event of any future case of default by the contractor for which by any clauses hereof he is declared liable to pay compensation amounting to the whole of his security deposit and the liability of the Contractor for past and future compensation shall remain unaffected. In the event of the Engineer putting in force either of powers (a) or (b) vested in him under the preceding clause, he may, if he so desires, take possession of all or any tools, plant materials and store in or upon the work or the site thereof belonging to the Contractor, or procured by him and intened to be used for the execution of the work or any part thereof paying or allowing for the same in account at prevailing market rates suchorates to be certified by the Engineer whose certificates thereof shall be final, otherwise the Engineer may be give notice in writing to the Contractor or his other authorised agents require him to remove such tools, plant, material or stores from the premises (within a time to be specified in such notice and) in the event of the Contractor failing to comply with any such requisition, the Engineer may remove them at the contractor's expense or sell them by auction or private sale on account of the contractor and at his risk in all respects, and certificate of the Engineer as the expenses of any such removal, and the amount of the proceeding and expense of any such sale shall be final and conclusive against the Contractor.

6. **Extension of Time:-** If the Contractor shall desire an extension of time for completion of the work on the ground of his having been unavoidably hindered in its execution or no any other ground, he shall apply in writing to the S.E. through the Engineer within

days after the date of hindrance on account which the desire such extension as aforesaid, and the engineer shall, if in his opinion S.E. (Which shall be final) reasonable grounds be shown therefore authorize such extension of time, if any, as may, in his opinion of S.E. be necessary or proper.

7- **Engineer's Certificate of Completion :-** On completion of the work the Contractor shall be furnished with a certificate by the Engineer of such completion. But not such certificate shall be given not shall the works be considered to be complete untill the works shall have been measured up by the Engineer whose measurement shall binding and conclusive against the Contractor and the Contractor shall have removed from the premises on which the work has been executed all scaffolding, surplus material and rubbish and ercleaned of all dirt and debris in, upon or about the premises of which he may have has possession for the purpose of the executing the said work, If the Contractor shall fail to comply with the requirement or his clause as to remove scaffolding, surplus materials and rubbish and clearing of all and debris on or before the date fixed for the completion of the works the Engineer may at the expense of the same as he thinks fit and clean off such dirt and debris as aforesaid and the contractor shall forth with pay the amount of all expenses so incurred and shall have no claim in respect of any such scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof aforesaid expenses.

8- **Payments:-** On measurement of the works done for the convenience of the Contractor interim payments shall ordinarily be made monthly but final payment shall not be made

untill the whole of the work shall have been completed and a certificate for the Completion of the work given AND I shall be lawful for the said Engineer to deduct a sum equal to percent of the said payments, such or sums sun to be held in deposit as a further security for the due performance of the conditions of this contract, PROVIDED ALWAYS that the Engineer in refuse to advance such payments if in his opinion the progress of the 'work' or the conduct the Contractor is not satisfactory or the Contractor has in may other ways done or neglected to anything so as to make in doubtful whether the work will be completed by him in accordance with contract, But all such interim payments shall be regarded as payments by way of advance again the final payments only and not as payments for work actually done an completed and shall not preclude the requiring of bad, unsound and imperfect or unskilful work to be removed and take away on re-constructed or re-erected or be considered as an admission of the due performance of the contract or any part thereof in any respect of the occurring of any claim nor shall it conclude determine or effect in any way the powers of the Engineer under these conditions or any of them as to the final settlement and adjustment of the account or otherwise, or in any way very of effect this contract. The final bill shall be submitted by the contractor within one month of the date fixed for the completion of the work otherwise the Engineer certificates of the measurement (due notice having been given before-hand to the Contractor of the date of such measurement) and of the total amount payable for the works accordingly shall be final and binding on all parties.

9- **Bill to be submitted or prescribed form :-** The contractor shall submit all bills on the prescribed forms to be had on application at the office of the Engineer and the charge in the bill shall always be entered at the rates given in the schedule of Rates hereto attached or in the case of extra work ordered in pursuance of these condition an not mentioned or provided for in tender, at the rates hereinafter to be agree upon.

10- **Stores Supplied by the Government :-** All the material that may be supplied form the Engineer's stores or may be provided by the Engineer such materials will (be charged for the rates specified in the schedule of Rates market hereto annexed) shall be used by the Contractor for the purpose of this contract only and the value of the full quantity of material so supplied may be set-off or deducted from any sums them due or thereafter to become due to the Contractor under this contract or otherwise or against or from the security deposit.

11- **Material and plant of Contractor :-** All material brought by the Contract upon the site of the work shall be deemed to be the property of the Chairman and shall not on any account be removed from the site of the works during the execution of the work and shall at all times be open to inspection by the Engineer. The Engineer on the completion of the works or upon the stoppage of the works as provided for in clauses 14 of this contract shall have an option of taking over any such unused material at prevailing market rates, with the provision that the price allowed to the Contractor shall not exchanged the amount originally paid by for the same as he (the Engineer) shall desire upon giving a notice in writing under his signature and within days of the completion of the work to that effect and all material not so taken over by the Engineer shall cease to be the property of the Chairman the Contractor shall have no claim for compensation on account of any such materials as aforesaid which are not so taken over by the said Engineer unused by him (the contractor) or for wastage in or damage to any such materials.

12- **Works to be executed in accordance with specification:-** The contractor shall execute the whole and every part of the work in a most substantial and workman like manner both as regards material and otherwise in every respect in strict accordance with the specifications. The contractor shall also confirm exactly, fully, and faithfully to be drawing and instruction in writing relating to the work signed by the Engineer.

13- **Alteration in specifications of drawing:-** The Engineer shall have power to make any alterations in or additions to the original specifications, drawings and instruction that

may appears to him to be necessary or advisable during the progress of the work and the Contractor shall be bound to carry out the work in accordance with any instructions witch may be given to him in writing signed by the Engineer and such alteration shall not invalidate this contract and any additional work which the Contractor may be directed to do in the manner above specified as part of the work of the carried out by the contractor on the same condition in all respect on which he agreed to do the main work, and at the same rates as are specified in the Schedule of Rates marked for the such work. The time for the completion of the work shall be extended if applied for by the contractor in writing, In the proportion that the additional work, bears to the original contract work, for the certificate of the Engineer shall be conclusive as to such extension. And of the additional work includes any class of work for which no rate is provided in this contract then such class of work shall be carried out at work being be agreed upon between the Engineer and contractor in writing prior to the work being taken in hand. The basis for fixing such rates shall ordinarily be the U.P. Jal Nigam Schedule of Rates for the district.

PROVIDED ALWAYS that if the contractor shall commence work or incure any expenditure in regard thereto before the rates shall have been determinated as lastly therein before mentioned, then and in such case he shall only be entitled to be paid in respect of the rates as aforesaid according to such rate or rates as shall be final.

14- **No compensation for alteration in or reduction of work to be carried out:-** If any time after the commencement of the work the Chairman of U.P. Jal Nigam through the Chief Engineer shall for any reason whatsoever not require the whole thereof as specified in this contract to be carried out, the Engineer shall give notice in writing of the fact to the contractor and upon the receipt of such notice in writing of the work under this contract shall cease and the contractor shall have no claim to any payments or compensation whatsoever on account of any profit or advantage, which he might have derived from the execution of the work in full but which he did not derive in consequence of the full amount of the works not having been carried out, neither shall be have claim for compensation by reason of any alterations having been made in the original specification drawing which shall involve any curtailment of the work as originally contemplated.

15- **Action and compensation payable in case of bad work:-** If it shall appear to the Engineer for his subordinate incharge of the work that any work has been executed with imperfect or unskilled workmanship or with material of any inferior description or that any material or articles provided by the Contractor of the execution of the work of unsound or of a quality inferior to that contracted for or otherwise not in accordance with the contract, the contractor shall on demand in writing from the Engineer specifying the work, materials or article complained of, forthwith rectify, remove. demolish and reconstruct the work so specified in whole or in part, as the case may require or as the case may be remove the material or in whole or article so specified and provide other proper and suitable materials or articles at his own proper charge and cost in and the event of his failing to do so within a period to be specified by the Engineer in his demand aforesaid then the contractor shall be liable to pay compensation at the rate of one percent of such smaller amount as the Chief Engineer (whose decision in writing shall be final) may decide, on the amount of the estimate cost of the whole work for every day not exceeding then days while his failure to do so shall continue, and in case of any such, failure the Engineer may rectify, remove demolish and reconstruct the works, or remove and replace with others, the materials or articles complained of as the case may be, at the risk and expense in all respects of the contractor and such expense may be deducted from such sum as may be due to the contractor or may become due to him and from his security deposit. A certificate by the Engineer as to the amount of the expenses incurred shall be final and binding upon the contractor.

16- **Work to be open is inspection:-** All work under or in course of execution or executed in pursuance of this contract shall at all times be open to the inspection of the Engineer and his subordinates and the contractor shall at times during the usual working hours and at all other times of which reasonable notice of the intension of the Engineer or his

subordinate to visit the works shall have been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing, present for that purpose, Orders given to the contractor's agent shall be considered to have the same force as if they have been given to the contractor himself, Verbal order shall not be considered as binding on either party until they are confirmed in writing signed by the Engineer.

17. **Notice to be given before work is covered up:-** The contractor shall give not less than five day's notice in writing to the Engineer, or his duly authorized assistant incharge of the work before covering up or otherwise placing beyond the reach of measurement of any work, in order that same may measured, and correct dimensions thereof be taken before the same is so covered up or place beyond the reach of measurement, and shall not cover up or place beyond the reach of measurement any work without the consent in writing of the Engineer of his duly authorized assistant incharge of the work and in any work shall be covered up or place beyond the reach of measurement without such notice having been given or consent obtained, the same shall be uncovered at the contractor's expense, or in default thereof no payment or allowance shall be made for such work of the materials with which the same was executed.

18. **Contractor liable for damage done and imperfection:-** In the contractor or his work people or servants shall break, deface, injure or destroy ant part of a building in which they may be working or any building road, fence, enclosure or grassland or cultivated ground contiguous to the premises on which the work or any part of the it is being executed, or it any damage shall happen to the work while in progress from any cause whatever or any imperfections become apparent in it within.....months after the final certificate of its completion shall have been given by the Engineer as aforesaid the contractor shall make the same good at his own expense, or in default the Engineer may causes the same to be made good by other workman and deduct the expense (or which the certificate of the Engineer shall be final) from any sums that may be then or at any time thereafter may become due to the contractor or from his security deposit.

19. **Contractors to supply labour, plant, ladders, scaffolding:-** The contractor shall supply at his own cost all labour, skilled and unskilled and all things necessary (expert such special things, if any, as many in accordance with the specifications be supplied from the Engineer's stores) such as plants, tools, appliance, implements, ladders, cordage, tackle, scaffolding shoring, structing, pumps, boilers, fuel, oils, packing, derricks, boring tools, winches and power as well as all other apparatus and temporary work requisite or proper for the proper execution of the work, whether original, altered or substituted and whether inducted in the specification or other documents forming part of the contract of referred in these conditions, or not, which may be necessary for the purpose of satisfying or complying with the requirement of the Engineer as to any matter as to which under these conditions he is entitled to be satisfied, or which is entitled to require , together with carriage hereto for and from the work. The contractor shall also supply without charge the requisite number of persons with the means and things necessary for the purpose of setting out the works, and counting, weighing and assisting in the measurement and examination at any time and from time to time, of the work done, or materials supplied by him, Failing his so doings the same may be provided by the Engineer at the expenses and risk of the contractor and the expenses (of which the certificate of the Engineer shall be final) may be deducted from any money due to the contractor under this contract or from his security deposit. The contractor shall also provide at his own expense all necessary fencing and lights required to protect the public from accident and shall assume all liability for and indemnity the Chairman against all actions or suits arising out or in connection with the carrying out of the work whether such actions are brought by members of the public neighbouring owners, or workmen employed on the work save only actions for permanent interference with easement to which the site may be subject at law or in equity or otherwise arising out of the Chairman's title to the site. The contractor

shall in carrying out the works confirm to the statutory and other legal enactment applicable to them and give all notices and pay all fees payable to local authorities and others in respect of them. The contractors shall be responsible for the adequacy, strength and safety of all shoring, structing, curbing, bonding brickwork, masonry, concrete, permanent or temporary, matters and things furnished by him for the purpose of this contract.

20. **Female Labour:-** No female labour shall be employed within the limits of a cantonment.,

21. **Words not to be sublet without sanction:-** This contract of any part thereof shall not be assigned or sublet without the written approval of the Chief Engineer. And if the contractor shall assign or sublet his contract or attempt so to do or become insolvent or commence any insolvency proceedings or make any composition with his creditors, or attempt so to do or, if any bribe, gratuity, gift, loan, prequilite reward or advantage, pecuniary or otherwise, shall either directly or indirectly be given, promised or offered by the contractor or any of his servants or agents to ,any public officer or person in the employ of Government in any way relating to his office of employment or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Chief Engineer may thereupon by notice in writing rescind the contract and the security deposit shall there upon stand forfeited and be absolutely at the disposal of the said Chairman and the same consequences shall ensure as if the contract had been rescinded under clause 4, thereof , and in addition the contractor shall not be entitled to recover or be paid any work that has already been performed under this contract.

22- **Sum Payable be way of compensation:-** All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to the use of the said Chairman without reference to the actual loss or damage sustained, and whether or not damage shall have sustained.

23- **Work to be under direction of Engineer:-** All works to executed under the contract shall be executed under the direction and subject to the approval in all respects of the Engineer for the time being who shall be entitled to direct what point or points and in what manner they are to be commenced and from time to time carried on.

24- **Decision of the Chief Engineer to be final:-** Except where otherwise specified in this contract the decision of the Chief Engineer for the time being shall be final, conclusive and binding or parties to the contract upon all questions relating to the meaning of the specifications, drawing and instructions here in before mentioned and to the quality of workmanship or materials used on the work, or as to any other question, claim right matter or things whatsoever, in any way arising out of or relating to the contract drawing, specifications, estimates instructions, order or these conditions or otherwise 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 the sooner determination thereof the contract.

25- **Actions where no specification:-** In the case of any class of work which there is no mentions in the specification such work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer.

26- **Contractor to employ competent agents and foreman:-** During the execution the works and untill the work is taken over by the order of the Engineer, the contractor shall employ competent agents and such foreman as may be necessary for the proper execution of the "works" (and when work is carried on day and night there shall be a foreman incharge of each shift) who shall be engaged constantly on the works to ensure proper managements and efficient control.

27- **Receipt of and powder as to security Money:-** (a) The Chairman has received from the contractor the sum of Rs..... the receipt of which is hereby acknowledged. The said sum together with the sum made up of the..... percentage described in clause 8 of this contract shall be held as

security for due performance of all the conditions and stipulations of this contract and the Engineer is empowered to deduct from time to time from each security money ; all or any sum of sums which may become due from the contractor as liquidated damages for the breach of any or all the convenants or provisions of this contract. If not confiscated under the provisions of this contract the security money or such balance thereof as may be left after making the deduction aforementioned will be returned to the contractor after..... month after the final certificate of the completions of the works shall have been given by the Engineer and after the Examiner shall have satisfied himself that all the terms of contract have been duly and faithfully carried out by the contractor.

(b) Fixed deposit receipts of the Nationalized Banks shall accepted as security provided that all such fixed deposit receipt must be issued in the name of the Uttar Pradesh Jal Nigam and that they will be accepted as security on the conditions that Jal Nigam will hold the deposit as the risk of the depositor and will not be liable in the event of the loss of the security due to failure of the Bank or to any other cause and that if the security is lost the loss will fall on the depositor who will have to deposit fresh security

28- **Compensation of workmen:-** (a) In every case in which by virtue of the provisions of sections 1.2, sub section(1) of the Workmen's compensation Act. 1923 Jal Nigam is obliged to pay compensation to a workman employed by the contractor or by any subcontractor from him in the execution of the said work. Jal Nigam will recover from the contractor the amount of the compensation so paid; and, without prejudice to the right of Jal Nigam under section 12, sub section(2) of the said Act, Jal Nigam shall be at liberty to recover such amount or any part thereof any deducting it either from the earnest money deposited by the contractor or to his credit under clause 27 of these conditions or from any other sum due by Jal Nigam to the contractor whether under this contractor or otherwise.

(b) Jal Nigam Shall not be bound to contest any claim made against it under section 12, sub section(1) of the said Act, except on the written request of the contractor and upon his giving to Jal Nigam full security for all costs for which Jal Nigam might become liable inconsequence of contesting the claim.

Signed by the Contractor

Signed on behalf of the Chairman of Uttar Pradesh Jal Nigam

Designation of the Officer

GENERAL SPECIFICATIONS

1.0 GENERAL ARRANGEMENTS & SETTLING OUT THE WORKS :

The contactor will establish the necessary bench marks and levels, and he must set out the work and shall be held responsible for its correctness and it shall be incumbent on him to dismantle, remove and rebuild at his own expenses any work not correctly set out.

The contractor shall make provision in his rates to provide all pegs, plates, pillars lines boning rods, sight rails and templates required for setting out the work and shall give such assistance as may be required by the Engineer or his authorized representative in checking the work before, during and after the execution of the work.

2.0 ERECTION & CHECKING OF WORKS :

The contractor shall provide and supply and include in his rates for all labour, machinery, engines, pumps, timbering, shoring, strutting, drain pipes, culverts, rails, tools, tackles, implements, staging, scaffolding, planking, centering, piling, moulds, profiles, templates, timber, boning rods, posts, sight rails and setting materials, all fencing and lighting etc. necessary both for proper execution of works and for the safety and convenience of the public during the progress of the work and maintenance and all temporary plants and appliances and permanent materials of any and every kind whatsoever, although the same may not be included in the description aforesaid, or any of them become, proper or necessary for, or incidental to the full and complete execution of the several works in all their parts or may have been omitted, or otherwise referred to in these specification or in the annexed schedules, or shown in the drawings.

As materials are collected and the construction of any section of the works is completed, it will be checked over and passed by the Engineer or his authorized representative but such approval shall in no way relieve the contractor of his responsibility which will not end until the whole works is actually commissioned and the defect liability period has expired as defined in the scope of work.

3.0 TEST:

During the progress of the work & during the period of maintenance the Contractor shall carryout such tests as in the opinion of the Engineer or his authorized representative are necessary to determine that the materials supplied comply with the conditions or in actual use. The tests to be carried out shall be as described in Sch. ‘E’ & or as may be required by the Engineer. The rates in Schedule ‘G’ shall include cost of such tests.

4.0 SAMPLES:

As the work proceeds the Contractor shall submit samples of materials for approval as may be required by the Engineer and all deliveries at the site shall not below the standard of the samples, A list of such samples as are required in the first instance is given in schedule 'C'.

5.0 WANT OF KNOWLEDGE:

The Contractor must carefully go through the conditions, specifications and items of contract and examine the necessary drawings before tendering and in case of any obscurity he should apply to the Engineer for its elucidation/clarification as no excuse for want of knowledge for non compliance with any part of portion of the specification or terms of contract shall be considered. He is also advised to see the site of work before tendering to make him self familiar with the conditions there in.

6.0 OCTROI:

Octroi charges on all materials brought by the Contractor for the work from out side the municipal limit shall be paid by him to the municipal board in accordance with municipal schedule of rates in force at the time the materials cross the municipal barrier. The Contractor shall consult the municipal schedule of rates and make an allowance for the same in his rate. No claim on account of its shall be entertained.

7.0 FIRM TENDERS:

Firm rates shall be quoted by the Contractor for each item in the schedule 'G' Tenders shall remain good and open for acceptance for a period of 120 days from the date, they are opened.

The Contractor shall, before tendering, consider the fluctuation in rates of materials and labour from time to time and shall make sufficient provision for the same in his rates as no excuse for allowing any increase in the rates tendered by him on this account will be entertained later on.

8.0 MATERIALS:

8.1 FIRST CLASS BRICKS: (M-100)

Bricks shall have a uniform deep cherry red or copper colour, shall be thoroughly burnt but not over burnt, and regular in shape. Their edges must be Straight Square and the two bricks must emit a clear ringing sound on being struck with each other. They must be free from cracks, chips, flows and stones or lumps of any kind. The bricks shall comply with the I.S. – 1077 and shall be tested as per IS-3495.

8.2 STONE BALLAST:

Stone ballast shall consist of crushed stone and shall be hard, strong, dense, durable, clean, of proper gradation and free from weather effect. It shall be generally cubical in shape. As far as possible, soft, thin, flaky or elongated or laminated pieces shall be avoided. For RCC work it hould not contain any materials which might effect the reinforcement. The grading and test requirements should comply with the I.S. – 383.

8.3 TIMBER:

Timber to be used in shuttering works shall be from the heart of a sound tree of natural growth, the sapwood being entirely removed. It shall be uniform in substance, straight in fiber, free from large, loose and dead knots, flaws, shakes, decay, rot, fungi and insect attacks and from any other damages of harmful nature which will effect the strength, durability, appearance or its usefulness for the purpose for which it is required. The colour should be uniform as far as possible. The other requirements of timber shall comply with the PWD specification No. 1.5 (material) part-I.

8.4 STEEL:

The steel for RCC shall be high yield strength deformed bars of Grade Fe 415 conforming to IS -1786 -1985 with its latest amendments the placement of reinforcement shall be as per IS 456-2000.

8.5 PORTLAND CEMENT:

The cement shall be OPC 43 grade confirming IS8112 , OPC 53 garde confirming IS12269 and PPC confirming IS1469 (Part I).

8.6 SAND:

The sand shall consist of natural sand, crushed stone or crushed gravel or a combination of any of these. it should be hard, durable, clean and free from adherent coating and organic matter and shall not contain any clay. The fine sand which shall be used for plaster and brick work shall have F.M. as 1.25 and the coarse sand for cement plaster/ brick work shall have F.M. as 2.0 and for cement concrete 2.5 to 3.2. All materials which shall be brought and used at site shall confirm to I.S. - 383.

8.7 SUNDRY MATERIALS:

Certain other materials not particularly mentioned or described herein may be required for the works and these if not specifically mentioned shall comply with the description set out in standard specifications of PWD, LSGED (now U.P. Jal Nigam) or ISI for the respective materials and these specifications in so far as they are applicable shall be deemed to be incorporated in this contact.

9.0 WATER SUPPLY FOR WORK AND DRINKING PURPOSE AND FACILITIES TO LABOUR:

The contractor shall make his own arrangement in regard to water required for the execution and tests of the works and shall also arrange for a supply of drinking water to his employees and labour.

He shall bear all charges in this connection and include in his rates a sufficient amount to cover such charges. All such facilities as are required to be provided for the labourers under the labour welfare rules in force shall also be made available by the contractor at his own cost.

Minimum reasonable sanitary conditions are to be maintained in and around the labour camps and at the site or work. As soon as one or more labour in trenches or at site get wounded or hurt due to accident or carelessness immediate proper medical-aid shall be provided by the contractor to them. However, if it is felt by the engineer that proper medical aid has not been provided to them, it shall be incumbent upon the contractor to follow the instruction of the engineer for proper medical-aid. A first-aid box should be maintained by the contractor during execution period of the work. If proper medical facility is not provided by the contractor, same shall be done by the department & cost shall be debited to the contractor's account.

10.0 NOTICE BOARD TO BE DISPLAYED:

Notice boards shall be supplied and fixed in suitable positions by the contractor where the roads have been opened out for the construction of the culverts or sewers and the traffic has to be diverted. Such boards shall display in big letter in BLACK AND WHITE or in RED AND WHITE colours such warnings as ROAD CLOSED DRIVE SLOW, - WORK AHEAD MEN ON WORK etc. Such caution boards be fixed at suitable points in the neighbor-hood of the work or well before diversion where other roads join or cross the road opened out, so that traffic may have sufficient warning to avoid the blocked road by taking any alternative routes or by using the diversion provided by the contractor. No extra payment shall be made to the contractor on this account. The caution boards shall be painted such that the warning or notices glow in the night also to avoid accident or jamming of traffic.

11.0 BARRICADING:

The contractor shall provide necessary barricading in portion the excavation is done for laying of sewer lines. The barricading shall consist of ballies and G.I. sheet duly painted red and white in colour as per direction and approval of E/I. The contractor shall also

make arrangement in proper warnings like providing fencing, danger flags, night warning light and watch and ward etc.. Safety code for excavation work I.S. 3764-1966 shall be rigidly followed.

12.0 TIP FOR SURPLUS EARTH OR RUBBISH:

The contractor shall remove from the works all surplus earth after refilling of trenches, wastes of construction process, spoil and rubbish found on the alignment of works. He shall include in his rates sufficient sum to cover the charges required for carting and disposal at suitable places as directed by Engineer incharge.

13.0 QUANTITIES IN THE SCHEDULE NOT GUARANTEED:

The quantities given in the schedule of rates are approximate and may vary up to any extent on either side. The payment will be made on the basis of actual 'NETT' measurements taken during construction and after completion of work. It is, therefore, important that the contractor orders the exact quantities of materials required after working out his own quantities as he will not be paid for any materials ordered but not used on the works.

14.0 STANDARD DETAILED SPECIFICATIONS:

The certain clause of these specification reference is made to the Indian standard specification and PWD detailed specification (Part I building and Part II sanitary) or LSGED / Jal Nigam specifications. The former are publications issued by the Bureau of Standards and may be obtained through Indian Standard Institutions Delhi / Kanpur and the later (PWD specifications) published by the Govt. of U.P./ jal Nigam and may be consulted in the office of the Engineer-In-charge or may be obtained from the Superintendent Printing and stationery, U.P. Allahabad / U.P. Jal Nigam, Lucknow. Where no reference has been made to any of the contract regarding any work it is deemed that it shall comply with relevant I.S. codes, PWD detailed specifications or LSGED / U.P. Jal Nigam specification / CPHEEO Manual of sewerage and sewage treatment, ministry of Urban Development Govt. of India.

15.0 EMPLOYMENT/REMOVING OF CONTRACTOR EMPLOYEES:

The contractor shall employ, for the execution of the work only such persons as are careful, skilled and experienced in their trades and cells. The engineer shall have full powers to ask the contractor to remove immediately from the work any persons employed by the contractors on the execution of the work who in the opinion of the engineer misconduct or are incompetent in the proper performance of their duties or are otherwise undesirable.

16.0 TIME OF WORKING:

The contractor will be required to see that the usual hours of work 8 AM to 6 PM are adhered too. No work shall be done in the night without the prior permission of engineer except when it is absolutely necessary for the saving of life or property or for the safety of work in which case the contractor shall immediately inform such reasons to the engineer.

17.0 SMALL AND SCATTERED WORK:

The contractor may be required to carry out works in small quantities and at scattered locations. The contractor shall be paid only at rates tendered in bill of quantities. No claim for any extra payment on ground of small works or of scattered nature shall be entertained.

18.0 PHOTOGRAPHS & RECORDS:

The contractor must allow sufficient margin in his rates to cover the cost of photographs that may be felt necessary either before or during the works, by the engineer. The contractor shall also supply sufficient number of copies as desired by the engineer.

SECTION – 1

GENERAL SPECIFICATIONS (CIVIL WORK)

General

1.1 The tenderer should submit the bid along with hydraulic design (with calculation) size of various units, flow diagram, specification and relevant drawings.

1.2 The tenderer may undertake soil investigation or any other site investigation that are necessary for his / her satisfaction.

1.3 The surge analysis for feeder main/ Rising Main is to be done by the Contractor & Surge protection devise should be provided if necessary.

1.4 All RCC structures are to be designed as per latest relevant IS Codes.Proper earthquake analysis of over head and above ground structures should be carried out. While designing these structures under seismic conditions, guidelines laid under relevant IS Code should be followed.

1.5 While designing retaining walls and other such structures, effect of sub-soil water, possible surcharge and seismic effect of retained earth-mass is to be considered.

1.6 Bearing capacity of soil at various site has to be tested by the contractor from I.I.T., or any other Govt. Engineering College as suggested by Engineer-in-charge in various structural design. If bearing capacity is found more than 8 T/m^2, the design shall be based on 8 T/m^2. No extra payment shall be made for variation in bearing capacity

1.7 The contractor shall make own arrangements for power supply for construction purposes and for testing purposes however department shall assist him for obtaining such power connection.

1.8 The bidder / contractor shall ascertain himself the depth of water table at various places of construction site and shall make his rates comprehensive enough to make suitable arrangement for dewatering in order to keep the site dry during construction and design the structure for uplift. No extra payment will be made for dewatering including dewatering equipments and consumables used for dewatering work.

SPECIFICATION FOR CIVIL WORKS

1.2.0 GENERAL:

The printed conditions U.P. Jal Nigam lump-sum-cum Rate contract can be seen during office hours from 10 A.M. to 5 P.M. on any working day. The same is not being enclosed with the Tender. The same shall be signed at the time of agreement and will be incorporated in the contract bond to form the part of agreement.

Note :Where not specified Central Public Works Department specification / relevant IS specifications shall be applicable.

1.2.1 Earth Work

The conditions / specifications laid down hereunder will hold good whether the excavation is to be carried out over areas for leveling, foundations of structures, trenches for pipes or cables or any other type of work which involves earth work like leveling or forming / embankments etc.

1.2.1.1 Earth work in excavation includes site-clearing activities like removal of shrubs, loose stones, rubbish of all kinds, interfering with the works and with complete removal of roots.

1.2.1.2 The products of the above cleaning operations shall be removed from the site, dumped, staked at a place or places, burnt or otherwise disposed of as directed by the Engineer-in-charge.

1.2.1.3 A permanent base line and cross lines shall be established to serve as reference grid using MS plates, pegs, pins set in concrete or brick masonry pillars where they will be free from disturbances.

1.2.1.4 A permanent bench mark or marks as required necessary for the works connected to the nearest bench mark shall be established for reference.

1.2.1.5 Excavations shall be carried out in all types of soil like topsoil, silt sand, gravel, soft murram, clay, kankar.

1.2.1.6 All excavations shall be strictly done true to line, level, grade or slope as the case may be as shown in the drawings/ directed by the Engineer-in-charge.

1.2.1.7 Sides and bottoms of excavation shall be cut sharp and true. Under cutting shall not be permitted. Earth sides of excavation shall not be used in lieu of frame work for placement of concrete unless authorized in special case, by the Engineer where limitation of space for larger excavation necessitate such decision.

Excavation whose sides are required to be maintained at a steeper slope than the stable slopes, will be required to be properly shored and strutted.

Negligence on account of this leading to any mishap will be entirely the responsibility of the Contractor.

1.2.1.8 Drainage in the vicinity of excavation

The Contractor shall control the grading in the vicinity of all excavations so that the surface of the ground will be properly sloped to prevent surface water running into excavated areas during construction. Arrangements shall be made for preventing rain and other extraneous liquids entering the excavated parts. Seepage water shall be directed to flow away from the trenches by gravity. If any pumping is required to keep the trench and the exposed areas dry for further work the same shall be done.

1.2.1.9 The rates quoted by the contractor shall be deemed to be inclusive of all the above costs or charges for stipulations stated above.

1.2.1.10 Excavated material shall not be deposited within 1.5 meters from the top edge of the excavation.

1.2.1.11 The contractor shall remove the excavated materials to spoil heaps on the site or transport the same to a place as directed by the Engineer-in-charge.

1.2.1.12 If the bottom of the excavation is left exposed by the contractor and in the opinion of the Engineer-in-charge it has become deleteriously affected by atmospheric changes or affected by water then the contractor shall remove at his own cost such portions of the affected foundations and shall make good by filling with lean concrete as directed by the Engineer-in-charge.

1.2.1.13 Where excavations are made in excess of the depths required as shown in the drawings or as directed by the Engineer-in-charge, the contractor shall at his own expense fill up to the required level with lean concrete or well compacted sand as decided by the Engineer-in-charge.

1.2.1.14 Loose, soft or bad soil encountered in excavations at the required depth on Engineer-in-charge’s direction shall be excavated to the firm bed and the difference of levels between the required level and the firm bed shall be filled up or dealt with as directed by the Engineer-in-charge.

1.2.1.15 Any obstacle encountered during excavation shall be reported immediately to the Engineer-in-charge and shall be dealt with as instructed by him. It shall be applicable for any antiques / treasure found during excavations.

1.2.1.16 Any public utility services / facilities like water supply lines sewers, telephone / electric cables poles etc., met with during excavations shall not be damaged and no disruption is caused to the utility service on account of damages caused by the contractor. Such facilities shall be properly supported in their original positions by giving slings suspension beams etc.

1.2.1.17 The contractor shall not undertake any concreting or construction work of any nature on the excavated surfaces until approval for the same is given by the Engineer-in-charge.

1.2.1.18 The contractor shall be solely responsible for the protection of adjoining properties from damages that may be on account of excavation close to the properties whether the property belongs to government or to a private party.

1.2.1.19 The contractor shall make all arrangements for proper warning like providing fences, danger flags, barricading, night warning lights, watch and ward etc. to caution the public as well as the labourers engaged by him about the danger that may be involved by excavation of trenches, pits, foundations etc. Safety code for excavation work **IS 3764-1966** shall be rigidly followed unless instructed otherwise by the Engineer-in-charge.

1.2.1.20 Any useful material obtained during excavation shall be stacked as directed by the Engineer-in-charge and will be the property of the employer. The decision of the Engineer-in-charge in this regard shall be final and binding on the contractor.

Any material used by the contractor out of the excavated stuff in lieu of his own materials shall be charged to the contractor at the agreed rates. The rates quoted shall include back filling of excavated materials.

1.2.1.21 <u>EXCAVATION IN TRENCHES AND CABLE DUCTS</u>

1.2.1.21.1 Excavation as required for manholes, other overflow structures, cross drainage works, extra depths for joints of pipes shall be carried out as shown in the drawings / directed by the Engineer-in-charge.

1.2.1.21.2 For deep foundation necessary shoring and strutting shall be executed as directed by the Engineer-in-charge. If additional slopes are to be provided where vertical cut are not possible the same shall be executed without any additional cost. The rates quoted shall be deemed to be inclusive of all such extra work.

1.2.1.21.3 The trench shall be kept perfectly dry by preventing the extraneous water entering the pits and also wherever necessary by pumping at the cost of the contractor. No additional cost of dewatering shall be payable.

1.2.1.21.4 The trench after laying, jointing and testing of pipes / cables are to be back filled. The trenches shall be filled with the excavated material if found suitable as directed by the Engineer-in-charge. The suitable and unsuitable soils shall be separately stacked and no intermixing shall be allowed.

1.2.1.21.5 All bad and unsuitable soil and surplus soil shall be transported and disposed of as directed by the Engineer-in-charge within plot boundary. Boulders, sharp objects, brickbats, roots of trees, rubbish, rubble etc. shall not be used for back filling. The back filling shall be done very carefully so as not to damage the pipes / cables or disturb the alignments / levels of the pipes / cables. The back filling shall be done in layers on both sides of the pipes, watered, consolidated by ramming to a dense layer. The thickness of each layer shall not be more than 15 cms. Special care shall be taken to avoid unequal pressures and to not disturb the pipe.

1.2.1.21.6 In case the excavated material is not suitable or falls short of requirement the back fill soil shall be taken from borrow pits approved by the Engineer-in-charge. The rates quoted by the contractor shall be deemed to be inclusive of all such works.

1.2.1.22 Road Cutting

Whenever a pipe or cable or any other work has to cross a road or they have to be executed along a road and within the road width either in the centreor on either sides of the road, the existing road surface shall be dug, spoil removed and stacked separately so as to reuse the usable material. The road surfaces shall be brought to the their original shape and grades by making use of the excavated material after back filling the trenches.

1.2.1.23 Back Filling

1.2.1.23.1 Back filling of earth around liquid retaining structures and pipes shall be done only after the water tightness test is done to the satisfaction of the Engineer.

1.2.1.23.2 Care shall be taken to see that unsuitable soil does not get mixed up with the material proposed to be used for filling.

1.2.1.23.3 The soil to be used for back filling shall have the prior approval of the Engineer.

1.2.1.23.4 Backfill shall be places in successive horizontal layers of loose material not more than 20 cm thick. The material shall be brought to within + or -2% of the optimum moisture content as described in IS 2720 (part VIII) after adjusting the moisture content, the

layers shall be thoroughly compacted with such equipment as may be required to obtain a density equal to or greater than 95% of maximum laboratory dry density.

1.2.1.23.5 Successive layers of filling shall not be placed until the layer under construction has been thoroughly compacted to satisfy the requirements laid down in the requirements.

1.2.1.24 Filling and Embankment

1.2.1.24.1 The area where filling or embankment is to be carried out shall be cleared from loose material and the virgin soil shall be exposed. All shrubs and vegetation with roots are cleared. All soft patches shall be removed and filled with selected soil and consolidated. Exposed soil shall be consolidated properly to obtain 95% of maximum laboratory dry density of the soil.

1.2.1.24.2 Approved filling material shall be uniformly spread in layers not exceeding 15 cms in loose depth. All clods, lumps etc. shall be broken before consolidation.

1.2.1.24.3 Successive layers of filling shall not be placed until the layer under construction has been thoroughly compacted to satisfy the requirements laid down in these specification.

2.1.24.4 The contractor shall give the samples of the earth he proposes to use for back filling to be tested if required or directed by the Engineer along with the desired characteristics of the soil.

1.2.1.24.5 Only earth having plasticity index less than 20 shall be used.

1.2.1.24.6 Soils having laboratory maximum dry density of less than 1500 kg per cubic meter shall not be used.

1.2.1.24.7 If the layer fails to meet the required density it shall be reworked or the materials shall be replaced and method of compaction altered as directed by the Engineer to obtain the required density.

1.2.1.24.8 If any test indicates less than the specified degree of compaction the Engineer-in-charge may require all fill placed subsequent to the latest successfully tests to be removed and compacted and compaction procedure to be done once again to obtain satisfactory density.

1.2.1.24.9 The contractor shall perform all necessary tests to determine optimum moisture content and the degree of compaction. He shall furnish the results to the Engineer-in-charge.

1.2.1.24.10 Prior to rolling the moisture content of the material shall be brought to within + or - 2% of the optimum moisture content as described in IS 2720 (part VIII). The moisture content shall preferably be on the wet side for potentially expansive soils. After adjusting the moisture content as described in this clause the layers shall be thoroughly compacted by means of roller till 95% of maximum laboratory dry density is obtained.

1.2.0.24.11 If the layer fails to meet the required density it shall be reworked or the materials shall be replaced and method of compaction altered as directed by the Engineer to obtain the required density.

1.2.1.24.12 The embankment shall be finished to the alignment levels and grades, cross sections, dimensions shown in the drawings or as directed.

1.2.1.24.13 If sand filling is specified in the tender for filling the trenches, plinth or foundations the sand used shall be hard, free from inorganic materials and deleterious materials and approved by the Engineer. Filling shall be carried out in layers not exceeding 15 cms in loose depth and flooded and tamped till it meets the approval of the Engineer.

1.2.1.24.14 The contractor shall perform all necessary tests to determine optimum moisture content and the degree of compaction. He shall furnish the results to the Engineer in-charge.

1.2.1.25 Shoring / Strutting / Timbering

1.2.1.25.1 When the depth of foundation or pipe trench is great and the soil is soft and generally for depths more than 1.5 mtrs stepping, sloping and or paneling and strutting of sides shall be done as directed by the Engineer. The decisions regarding the positions and depths at which and what type of precautions are to be provided shall be decided by the Engineer.

1.2.1.25.2 It shall be the responsibility of the contractor to take all necessary precautions or steps to prevent the sides of trenches from collapse. The contractor shall be responsible to make good any losses or damages caused to execute works, life and property due to his negligence.

1.2.1.25.3 Deep excavations shall be inspected after every rain, storm, or other hazards and if necessary the precautions required shall be augmented.

1.2.1.25.4 Planking and strutting shall be either “Close” or “Open” type depending upon the nature of the soil surcharge and depth of excavation etc.

1.3.0 IMPORTANT NOTE

1.3.1 The bottom of excavations shall be trimmed to the required levels and when carried below such levels, by error, shall be brought to level by filling with lean concrete of grade 1:4:8 or as specified, at the contractor's cost.

1.3.2 The contractor shall be responsible for assumptions and conclusions that he may make regarding the nature of materials to be excavated and the difficulty in making and maintaining the required excavations and performing the work required as shown on the drawing and in accordance with these specifications. Cofferdams, sheeting, shoring, bracking, and draining, de-watering etc. shall be furnished and installed as required and the cost thereof shall be included in the rate quoted for the item of excavation. The contractor shall be held responsible for any damage to any part of the work and property caused by collapse of sides of excavations. Materials may be salvaged if it can be done with safety for the work and structures as approved by the Engineer-in-charge. However, no extra claim shall be entertained for material not salvaged or any other damage to contractor's property as a result of the collapse. He shall not be entitled to any claim for re-doing the excavation as a result of the same.

1.3.3 The excavation for foundations has to be carried out carefully creating least disturbance to the founding stratum. A concrete layer should blend the founding stratum immediately after exposure so that it does not loose its strength on exposure to air and water.

1.3.4 Where excavation requires bracing, sheeting or shoring etc. the contractor shall submit to the Engineer, drawings showing arrangement and details of proposed installation and shall not proceed until he has received approval from the Engineer-in-charge.

1.3.5 The contractor shall have to constantly pump out the water collected in pits due to rain water, springs etc. and maintain dry working conditions.

1.3.6 For the purpose of excavation in earthwork all types of soil including kankar, moorum, and shingle and boulders upto 300mm size without binding matrix are included.

1.3.7 All excavated material obtained as a result of over excavation for which payment shall not be made, shall also be transported and disposed off as directed and at places shown by the Engineer-in-charge at no extra cost to the owner within plot boundary.

1.3.8 All excavated materials obtained from excavation shall remain in the owner's property. The useful portion as decided by the Engineer-in-charge, shall be separated from the useless ones and deposited in regular stacks at places indicated and as directed by the Engineer-in-charge within plot boundary.

1.3.9 In order to keep the area free, stacking of any excavated earth by the sides of areas of excavation shall not be allowed. Earth shall be transported immediately after excavation to the different areas as directed by Engineer-in-charge. Only earth for back filling purposes should be allowed to be deposited at 1.5m away from the excavated edge or as directed by Engineer-in-charge.

1.3.10 In no case the excavated soil shall be stacked upto a distance of 1.5m from the edge of excavation or one-third the depth of excavation whichever is more.

1.3.11 I.S. Codes :

Some of the important relevant applicable codes for this section are:

a. IS : 1200 (PART-1)	-	Method of measurement of building and civil engineering work part-I earthwork.
b. IS : 3764	-	Safety code for excavation work
c. IS : 4701	-	Code of practice for earthwork on canals

1.4.0 PLAIN CEMENT CONCRETE

General

Aggregate shall be of inert materials and should be clean, dense, hard, sound durable, non-absorbent and capable of developing good bond with mortar. Coarse aggregate shall be of hard broken stone of granite or similar stone, free from dust, dirt and other foreign matters.

The stone ballast shall be of 20mm size or less and all should be retained in a 5mm square mesh and well graded such that the voids do not exceed 42 percent.

Fine aggregate shall be of coarse sand consisting of hard, sharp and angular grains and shall pass through screen of 5mm square mesh. Sand shall be of standard specifications clean and free from dust, dirt and organic matters. Fine aggregate may also be crushed stone.

Cement shall be fresh Ordinary Portland Cement of grade 43/ grade 53 with standard ISI specifications and shall have the required tensile and compressive stresses and fineness. Water shall be clean and free from alkaline and acid matters and suitable for drinking purpose.

Stone aggregate and sand shall be mixed by volume with boxes. Cement need not be measured by box, one bag of cement (50 kg) should be considered as 1/30 cum (1.2 cu ft.). Size of measured box may be 30cm x 30cm x 38cm or 35cm x 35cm x 28cm

equivalent to content of new bag of cement. All materials shall be dry.

For foundation concrete or lean concrete 1:2:4, 1:3:6, 1:4:8 etc. stone ballast of 20-40 mm size may be used.

Approximate quantity of water required for cement may be taken 30% by weight of cement plus 5% by weight of total aggregate. For concrete compacted by mechanical vibrators the quantity of water shall be reduced by 20%.

Mixing shall be of machine mixing with hopper type concrete mixer. Hand mixing shall not be permitted.

1.4.1 Machine Mixing :

Stone ballast, sand and cement shall be put into the cement concrete mixer to have the required proportion. For concrete of 1:2:4 proportion first four boxes of stone ballast, then two boxes of sand and then one box of cement shall be put into the C.C. Mixer, the machine shall then be revolved to mix materials dry and then water shall be added gradually to the required quantity, 25 to 30 litres of water per bag of cement to have the required water cement ratio.

The mixing shall be through to have a plastic mix of uniform colour. It requires 1.5 to 2 minutes rotation for through mixing. Mixed concrete shall be unloaded on a masonry platform or on a sheet iron. Output of concrete mixer is 15 to 20 mix per hour.

Regular slump test should be carried out to control the addition of water and to maintain the required consistency.

Form work centering and shuttering shall be provided as required as per standard specifications before laying concrete to confine to support or to keep the concrete in position.

Concrete shall be laid gently (not thrown) in layers not exceeding 15cm and compacted by mechanical vibrating machine until a dense concrete is obtained. (For important work mechanical vibrating should be used).

For thick or mass concrete immersion type vibrators and for thin concrete surface vibrators should be used for compacting concrete.

Over vibration which will separate coarse aggregate from concrete should be avoided. After removal of the form work in due time the concrete surface shall be free from honey combing, air holes or any other defect.

Concrete shall be laid continuously, if laying is suspended for rest or for the following

day the end shall be shuttered and vibrated to achieve dense concrete and made rough after de-shuttering for further jointing.

When the work is resumed, the previous portion shall be roughened, cleaned and watered and a grout of neat cement shall be applied and the fresh concrete shall be laid. For successive layer the upper layer shall be laid before the lower has set.

After about 2 hours laying when concrete has begun to harden it shall be kept damp by covering with wet gunny bags or wet sand for 24 hours, and then cured by flooding with water making mud walls 7.5 cm high or by covering with wet sand or earth and kept damp continuously for 15 days. If specified, curing may be done by covering concrete with special type of water proof paper as to prevent water escaping or evaporating.

1.4.1.1 Plain cement concrete shall be provided for leveling course, foundations, pipe bedding or at other places wherever indicated in the drawings / directed by the Engineer-in-charge.

1.4.1.2 The proportion of the concrete, size of the aggregate shall as specified in the drawings and technical specifications approved by Engineer-in-charge.

1.4.1.3 While placing concrete directly on the soil for foundations etc. all the loose material shall be removed. The surfaces shall be trimmed and well consolidated.

1.4.1.4 The materials, specifications, mixing, placing of concrete, compaction, curing, removal of the form work, shall all be done as specified for reinforced cement concrete.

1.4.1.5 The rates quoted shall include supply of all materials, labour, tools and plant, water, mixing platforms, curing, supplying, erecting and dismantling of all form work as required.

1.5.0 BRICK MASONRY

General

All bricks shall be of first class of standard specification or best locally available approved by Engineer-in-charge made of good brick earth thoroughly burnt, and shall be of deep cherry red or copper colour.

Bricks shall be regular in shape and their edges should be sharp and shall emit clear ringing sound on being struck and shall be free from cracks, chips, flaws and lumps of a kind.

Bricks shall be fully soaked in clean water by submerging in a tank for a period of 6 hours immediately before use. Soaking shall be continued till air bubbling is ceased.

Bricks shall be well bonded and laid in English bond unless otherwise specified. Every course shall be truly horizontal and wall shall be truly in plumb. Vertical joints of consecutive course shall not come directly over one another, vertical joints in alternate course shall come directly over one another. No damaged or broken bricks shall be used. Closers shall be of clean-cut bricks and shall be placed near the ends of walls but not at the other edge.

Selected best shaped bricks shall be used for face work. Mortar joints shall not exceed 6 mm in thickness and joints shall be fully filled with mortar. Bricks shall be laid with frogs upward except in the top course where frogs shall be placed downward. Brickwork shall be carried out not more than 1.2m height at a time. When one part of the wall has to be delayed, stepping shall be left at an angle of 45^0. Corbelling or projections where made should not be more than ¼ brick projections in one course. All joints should be raked and faces of wall cleaned at the end of each day's work.

The brickwork shall be kept wet for a period of at least 10 days after laying. At the end of day's work the tops of wall shall be flooded with water by making small weak mortar edging to contain at least 2.5cmdeep water.

These specifications deal with all types of brickwork required for buildings, manholes, drains, retaining walls or any construction made out of bricks.

1.6.0 MATERIALS

1.6.1 Bricks

Bricks used for the construction of brick masonry shall be sound, hard, and rectangular in shape and size and well burnt of uniform deep red, cherry or copper colour and shall conform to **IS 1077**.

The bricks shall be brought from approved brick kilns. The bricks shall be free from cracks, chipping flaw, stones or lumps of any kind. The bricks shall not show any signs of efflorescence and shall be homogeneous in texture. They should emit a clear metallic sound on being struck and shall have a minimum compressive strength of 10 N/sq. mm equivalent to 100 kg/cm^2.

They shall not absorb water more than specified in the Indian Standard Specifications, of its dry weight when soaked in cold water for 24 hours.

1.6.2 Mortar

The proportion of the cement mortar used for the masonry work shall be as specified on the various drawings for different places/ types of construction, specification for each part of the work.

For cement mortar cement shall be fresh OPC grades 43 of ISI standard specification. Sand shall be sharp, clean and free from organic and foreign matters. For rich mortar coarse or medium sand should be used and for weak mortar local fine sand may be used. Proportion of cement sand mortar may be 1:3 to 1:6 as specified.

Materials of mortar shall be measured to have the required proportion with measuring box and first mixed dry to have a uniform colour in a clean masonry platform and then mixed by adding clean water slowly and gradually to have workable consistency and mixed thoroughly by turning at least three times. Fresh mixed mortar shall be used, old and stale mortar shall not be used and mortar for one hour' work only shall be mixed with water so that the mortar may be used before setting starts.

Sharp coarse sand is mixed with the required quantity of cement for the preparation of the mortar. Mortar shall be prepared in accordance with **IS 2250**.

The sand used for the masonry mortar shall meet the requirements as specified in **IS 2116**. Sand for masonry mortars. Sand and cement of required proportions are mixed in small quantities in a dry state first and then water is added to make the mortar of required consistency suitable for the type of work it is required as directed by the Engineer. No left over mortar shall be used and therefore only that much quantity of mortar that can be consumed within 30 minutes shall be mixed in batches.

1.6.3 Construction

The brick masonry shall be constructed as per the Indian standard code or practice for Brick Work : **IS – 2212**. The thickness of the joints shall not be thicker than those specified in para 5.4 of the above code of practice.

The bricks shall be thoroughly soaked in water before using them on the work for at least six hours and all the air bubbles shall come out during soaking process. The soaked bricks shall be stacked on wooden planks/platforms so as to avoid sticking of the earth and other materials onto the surfaces of bricks.

Bricks required for construction in mud mortar or lime mortar shall not be soaked. Brickwork shall be laid in English bond unless otherwise specified. Half bricks shall not be used except when needed to complete the bond. Each course shall be perfectly straight and horizontal.

The masonry shall be true to plumb in case of vertical walls and in case of battered construction the batter or slope shall be truly maintained. The level of the course completed shall be checked at every one-metre interval or less as required.

The bricks shall be laid frogs upwards. While laying the bricks they shall be thoroughly bedded and flushed in mortar and well tapped into position with wooden mallets and superfluous mortar shall be removed.

No part of the structure shall be raised more than one meter above than the rest of the work. In case it is unavoidable the brick work shall be raked back at an angle of not more than 45 degrees so a to maintain a uniform and effectual bond, but raking shall not start within 60cms from a corner.

In cases of construction of buttresses, counter forts, returns they are built course by course carefully bound into the main walls.

At all junctions of walls the bricks at alternate courses shall be carried into each of the respective walls so as to thoroughly unite both the walls together. The brickwork shall not be raised more than 14 courses per day.

All the beds and joints shall be normal to the pressures applied upon them i.e. horizontal in vertical walls, radial in arches and at right angles to the face in battered retaining walls.

Vertical joints in alternate courses shall come directly one over the other and shall be truly vertical. Care shall be taken to ensure that all the joints are fully filled up with mortar, well flushed up where on pointing is proposed. The joints in faces, which are plastered or painted, shall be squarely raked out to a depth not less than 12mm, while the mortar is still green. The raked joints shall be well brushed to remove the loose particles and the surfaces shall be cleaned with a wire brush so as to remove any splashes of mortar sticking to the surfaces during the construction.

All iron fixtures, pipes, bolts, conduits, sleeves, hold fasts etc. which are required to be build into the walls shall be embedded in cement mortar or cement concrete as shown in the drawings / indicated in the specifications / directed during the execution by the Engineer as the work proceeds and no holes be left for fixing them at a later date unless authorized by the Engineer.

1.6.4 Curing

Green work shall be protected from rain by covering the work suitably. Masonry work as it progresses shall be thoroughly kept wet by watering on all the faces for at least 7 (seven) days after completion of the parts of the work. Proper watering cans, flexible

pipes, nozzles shall be used for the purpose. The top of the masonry work shall be kept flooded at the close of the day's work by constructing filets of mortar 40mm high all around the edges of the top course.

In case of fat lime mortar curing shall start two days after construction of masonry and shall continue for seven days. No additional payment is admissible for curing and the rates quoted are deemed to be inclusive of the cost of curing.

1.6.5 Scaffolding

Double scaffolding sufficiently strong so as to withstand all loads that are likely to come upon it and having two sets of vertical supports shall be provided. Where two sets of vertical supports are not possible the inner end of the horizontal supporting pole shall rest in a hole provided in a header course only. Only one header for each pole shall be left out. Such holes, however shall not be permitted in pillars under one meter in width or immediately near the skewbacks of arches. Such holes shall be filled up immediately after removal of the scaffoldings. Safety Code for Scaffolds and Ladders, **IS 3696** (Parts I and II) shall be followed.

1.6.6 Plastering

Cement mortar used for plastering shall be of the mix preparations and thickness as specified on the drawings or bill of quantities or particular specifications for the various different parts of the works. The materials used i.e. cement, sand and water shall be of the same quality and of the same specifications as indicated for plain and reinforced cement concrete works according to the specifications and approved by the Engineer. Sand for plaster shall meet the specifications as laid down in **IS 1542** specification for sand for plaster.

The surfaces that are to be applied with plaster shall be thoroughly cleaned to remove dust, dirt, loose particles, oil, soil, salts etc. that may be sticking to the surfaces. The surfaces shall be washed clean and watered properly for 4 hours before applying plaster. Plaster shall not, in any case, be thinner than specified. It shall have uniform specified thickness. When smooth finishing is required the cement plastering shall be floated over with neat cement within 15 minutes after application of the last coat of plastering. The plaster shall be protected from the sun and rain by such means as the Engineer-in-charge may approve.

The plastered surfaces shall be cured for 4 (four) days. Construction joints in plastering shall be kept at places approved by the Engineer. When the thickness of the plaster specified is to be made up in more than one layer the second layer shall be applied only

when the lower coat is still green. Wherever specified approved brands of additives like water proofing compounds shall be added in specified quantities as recommended by the manufacture of the compound, or as directed by the Engineer.

Whenever scaffolds are necessary for plastering they shall be provided as specified for scaffolds. Stage scaffolding shall be provided for ceiling plaster.

To ensure even thickness and true surface, patches of plaster about 15cms x 15cms shall be first applied both horizontally as vertically two mtrs apart. Plastering shall be done from top to bottom and care shall be taken to avoid joints on continuous surface.

Sand face plaster shall consist of first layer of 13mm average thick cement plaster in cement mortar 1:4 (one part cement and four parts coarse sand). A second layer 7mm average thick in cement mortar 1:1 (one part cement and one part coarse sand) shall be applied. After the application of final coat, the surface shall be finished with the application of sponge rubber or as directed to obtain a uniform sand particle surface finish.

In case any other finish like rough cast finish or dry dash finish is specified in the drawings the same shall be provided as directed by the Engineer.

Surfaces which are to be plastered shall be roughened while they are still green or raked so as to give proper bond between the surface and plaster.

All corner junctions shall be truly vertical or horizontal as the case may be and carefully finished. Rounding or chamfering for corners shall be carried out with proper templates to the required size and shapes.

The work shall be tested frequently with a straight edge and plumb bob. At the end of the day the plaster shall be left cut clean to line. The next day when plastering is started the edge of the old work shall be scrapped, cleaned and wetted with cement slurry. At the end of the day the plastering shall be closed on the body of the wall and not nearer than 15cm to any corner.

Curing shall be started as soon as the plaster has hardened sufficiently not to be damaged when watered. The plaster shall be kept wet for at least 10 days. Any defective plaster shall be cut in rectangular shape and replaced.

Different proportion of mortar which may be used for plastering.

Cement, sand mortar 1:3, 1:4, 1:5, 1:6

For ceiling plastering 1:3 cement mortar with fine sand is generally used to give smooth finish.

1.7.0 REINFORCED CEMENT CONCRETE WORK

1.7.1 General

Steel reinforcement bars shall be of T.M.T. steel of standard specifications and shall be free from corrosion, loose rust scales, oil, grease, paint, etc. the steel bar shall be round and capable of being bent (double over) without fracture. Bars shall be hooked and bend accurately and placed in position as per design and drawing and bound together tight with 20 SWG annealed steel wire at their point of intersection.

Framework and shuttering shall be made with ply or steel plate close and tight to prevent leakage of mortar, with necessary props. Bracing's and wedges, sufficiently strong and stable and should not yield on laying concrete and made in such a way that they can be slackened and removed gradually without disturbing the concrete. For slab and beam small camber should be given in centering, 1 cm per 2.5 m with a maximum of 4 cm. Centering should not be removed before 14 days in general (4 days for RCC columns, 10 days for roof slab, and 14 days for beams).

Proportion of cement concrete : Cement concrete shall be of M- 20 for slab, beams and lintels and columns unless otherwise specified.

Materials for concrete : The stone aggregate shall usually be 20mm to 6mm gauge unless otherwise specified. For heavily reinforced concrete members as in the case of ribs of main beams the maximum size of aggregate should usually be restricted to 5mm less than the minimum clear distance between the main bars or 5mm less than the minimum cover to the reinforcement whichever is smaller.

Mixing is done in the same manner as in PCC.

Before laying the concrete, the shuttering shall be clean, free from dust, dirt and other foreign matter. The concrete shall be deposited (not dropped) in its final position.

In case of columns and wall it is desirable to place concrete in full height if practical so as to avoid construction joints but the progress of concreting in the vertical direction shall be restricted to one metre. Care should be taken that the time between mixing and placing of concrete shall not exceed 20 minutes so that the initial setting process is not interfered with. During the winters concreting shall not be done if the temperature falls below 4^0 C.

Concrete shall be compacted by mechanical vibrating machine until a dense concrete is obtained. The vibration shall continue during the entire period of placing concrete. Compaction shall be completed before the initial setting starts, i.e. within 30 minutes of addition of water to the dry mixture. Over vibration, which will separate coarse

aggregate from concrete, shall be avoided. After removal of the form work in due time, the concrete surface shall be free from honey combing, air holes or any other defect.

Concrete shall be laid continuously, if laying is suspended for rest or for the following day the end shall be shuttered and vibrated to achieve dense concrete and made rough after de-shuttering for further jointing. When the work is resumed, the previous portion shall be roughened, cleaned and watered and a grout of neat cement shall be applied and the fresh concrete shall be laid. For successive layer the upper layer shall be laid before the lower has set.

1.7.3 Standards

Following Indian Standards as revised most recently along with amendments will be followed for the works included in the contract.

I.S. 269 Ordinary and low heat Portland cement

I.S. 383 Coarse and fine aggregates from natural sources for concrete

I.S. 456 Code of practice for plain and reinforced concrete

I.S. 516 Methods of test for strength of concrete

I.S. 1199 Methods of sampling and analysis of concrete

I.S. 2386 Methods of test for aggregates for concrete (Part I to VI).

I.S. 3414 Code of practice design and installation of expansion and contraction joints in building Standards on special subjects have been mentioned elsewhere in this para and also shall be followed.

1.8.0 FORMS, FALSEWORK OR CENTERING

1.8.1 Definitions

"Forms, formwork or shuttering" shall include all temporary moulds for forming the concrete to the required shape, together with any special lining that may be required to produce the concrete finish specified.

"Falsework or centering" shall consist of furnishing, placing and removal of all temporary construction such as forming, props and struts required for the support of forms.

1.8.2 Materials – only Timber shuttering

All timber used for forms, falsework and centering shall be sound wood, well-seasoned and free from loose knots, shakes, large cracks, and warping and other defects. Before

use on the work, it shall be properly stacked and protected from injury from any source. Any timber, which becomes badly warped or cracked prior to the placing of concrete, shall be rejected.

All shuttering from all outside surfaces shall be made in such a way that a smooth surface and straight edges will be formed. Irrespective of nature or position, all joints in sheeting shall be sufficiently tight to prevent leakage of liquids from concrete.

For shuttering in special position shall submit to the Engineer dimensioned drawings of all the components parts and give details to the manner in which it is proposed to assemble or use them. Steel shuttering will only be permitted if it is sturdy in construction and if the manner of its use is approved by the Engineer. Struts and props shall, where required by the Engineer, be fitted with double hardwood wedges or other approved devices so that the moulds may be adjusted and the device locked before the concrete is cast. Where concrete surface is to be plastered ply shuttering is to be provided.

1.8.3 Forms

All forms shall be of merine plywood of approved brand such as Anchor / Swastik or mild steel or other material approved by the Engineer and shall be fabricated and prepared water tight and of sufficient rigidity to prevent distortion due to pressure of the concrete and other incidental loads that may arise due to the construction operations. Forms shall be constructed and maintained so as to prevent warping and the opening of joints due to shrinkage of the timber.

All forms shall be set and maintained true to the line designated until the concrete is sufficiently hardened. Forms shall remain in place for periods, which shall be specified hereinafter. When forms appear to be unsatisfactory in any way, either before or during the placing of concrete, the Engineer shall order to stop the work until the defects have been corrected.

All formwork shall be approved by the Engineer-in-charge before concrete is placed within it. The contractor shall be required to submit copies of his calculations of the strength and stability of the formwork or false work but not withstanding the Engineer’s approval of these calculations nothing shall relieve the contractor of his responsibility for the safety or adequacy of the formwork.

Formwork shall be true to line and braced and strutted to prevent deformation under the weight and pressure of the unset concrete, constructional load, wind and other forces.

The deflection shall not exceed 3mm. Beam bottom shall be erected with an upward camber of 2mm per meter of the span. The formwork for a column may be erected to the full height of the column.

One side shall be left open and shall be built up in sections as placing of the concrete proceeds. Before placing the concrete, bolts and fixings shall be in position and cores and other devices, used for forming openings, holes, chases, recesses and other cavities shall be filled to the formwork. No holes shall be cut in any concrete unless approved. An approved mould oil or other material shall be applied to faces of formwork in contact with unset concrete to prevent adherence of the non-staying concrete. Such coating shall be insoluble in water, non-staying and non-detrimental to the concrete and shall not be flaky or removed by wash water.

Tolerance in finished concrete

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

a. **Sectional dimensions** - 5mm

b. **Plumb** - 1 in 1000 of height

c. **Levels** - 3mm before any deflection has taken place

The tolerances given above are specified for local aberration in the finished concrete surface and should not be taken the tolerance for the entire structure taken as a whole.

1.8.4 Falsework & Centering

The contractor shall supply detailed plans for falsework or centering if specifically asked for by the Engineer at least 14 days in advance of the time the contractor begins construction of the falsework. Not withstanding the approval by the Engineer of any design for falsework submitted by the contractor, the contractor shall be solely responsible for the strength, safety and adequacy of the falsework or centering.

All falsework shall be designed and constructed to provide the necessary rigidity and to support the loads from the weight of green concrete and shuttering and incidental construction loads.

Falsework or centering shall be founded upon a solid footing safe against undermining and protected from softening.

Falsework, which cannot be founded on satisfactory footing, shall be supported on piling which shall be spaced, driven and removed in a manner approved by the Engineer. The Engineer may require the contractor to employee screw jacks or hardwood wedges to make up any settlement in the formwork either before or during the placing of concrete. Props of the upper storey shall be placed directly over those in the storey immediately below.

Falsework shall be set to give the finished structure the required grade and camber specified on the plans.

1.8.5 Formwork and Construction joints

Where permanent or temporary joints are to be made in horizontal or inclined members, stout stopping off boards shall be securely fixed across the mould to form a water tight joint. The form of the permanent construction joint shall be as shown on the drawings. Temporary construction joints shall have blocks of timer at least 75mm thick, slightly tapered to facilitate withdrawal and securely fixed to the face of the stopping off board. The area of the key or keys so formed shall be at least 30% of the area of the member. The blocks shall be kept back at least 50mm, from the exposed face of the concrete.

Where reinforcement passes through the face of a construction joint the stopping off board shall be drilled so that the bars can pass through, or the board shall be made in sections with a half round indentation in the joints faces for each bar so that when placed, the board is a neat and accurate fit and no grout leaks from the concrete through the bar holes or joints.

1.8.6 Removal of Forms & Falsework

In the determination of the time for the removal of forms, falsework and housing, consideration shall be given to the location and character of the structure, the weather and other conditions influencing the settings of the concrete and the materials used in the mix.

Forms shall be removed in such a manner as not to injure the concrete and no formwork shall be removed before the concrete has sufficiently set and hardened. The minimum periods which shall elapse between the placing and compacting of normal Portland cement concrete for the various parts of the structures are given in the following table, but compliance with these requirements shall not relieve the contractor of the obligation to delay the removal of the form if the concrete has not be sufficiently hard.,

In normal circumstances, generally where the temperature are above 20^0 C and where ordinary cement is used, form may be struck after the expiry of following periods,

according to the relevant clauses of **IS 456**.

a. Walls columns and vertical sides of beams 2 days

b. Slabs – soffit

1. Spanning upto 4.5m 7 days

2. Spanning over 6.0m 14 days

c. Beams and arches – soffit

1. Spanning upto 6.0m 14 days

2. Spanning over 6.0m 28 days

Where sulphate resistant cement is used, manufacturer instruction are to be followed.

The Engineer may modify these requirements taking into account the type of cement and method of compaction used and contractor shall obtain the Engineers written approval for any decrease in time of striking the formwork given above. The contractor shall notify the Engineer when he proposes to strike any formwork and formwork shall be struck in the presence of the Engineer or his representative.

1.8.7 Reuse of Forms

Only mild steel formwork of best quality or marine plywood formwork shall be used for concerning purpose. These shuttering shall not be reused unless it is properly scraped cleaned and repaired. So that it gives a plane, even, fair and dense concrete surface.

1.8.8 Materials

Water

Water used for cement concrete mortar plaster, grout, curing or washing of sand shall be clear and free from injurious amounts of Oil, Acid, Alkali, Organic matter or other harmful substances in such amounts that may impair the strength or durability of the structure.

Potable water shall generally be considered satisfactory for mixing and curing concrete. In case of doubt regarding development of strength, the suitability of water for making concrete shall be ascertained by compressive strength and initial setting time specified in the **IS 456: 2000** Code of Practice of Plain and Reinforced concrete. The Engineer-in-charge may require the contractor to get the water tested from an approved laboratory at his own expense and in case the water contains any salts or an excess of acid, alkali, any injurious substances etc., the Engineer-in-charge may refuse its use.

1.8.9 Aggregate

General

Coarse and fine aggregates for concrete shall conform in all respects to **IS : 383** – Specification for Coarse and Fine Aggregates from Natural Sources for Concrete. Aggregates shall be obtained from a source known to produce satisfactory material for concrete. Aggregate shall consist of naturally occurring sand and gravel or stone, crushed or uncrushed or a combination thereof. They shall be chemically inert, hard strong, dense, durable, clean and free from veins and adherent coating and of limited porosity. Flaky and elongated pieces shall not be used. Whenever required by the Engineer-in-charge the aggregates shall be washed by the contractor before use in the work.

The source of aggregates shall be approved by the Engineer-in-charge and shall not be changed during the course of the job without his approval. The contractor at his owns expense shall promptly remove rejected aggregates from the work site.

Deleterious Materials

Aggregates shall not contain any harmful material, such as iron pyrites, coal, mica, shale, clay, alkali, soft fragments, sea shells, organic impurities etc., in such quantities as to affect the strength or durability of the concrete and in addition to the above, for reinforced concrete, any material which might cause corrosion of the reinforcement. Aggregate which are chemically reactive with the alkalis of cement shall not be used.

The maximum quantities of deleterious materials in the aggregate as determined in accordance with **IS : 2386** (Part-II) Methods of Test for Aggregates for Concrete, shall not exceed the limits given in Table I of **IS : 383**.

The sum of the percentages of all deleterious materials shall not exceed five. Deleterious materials also include materials passing 75 micron IS sieve.

Coarse Aggregates

Coarse aggregates is aggregate most of which is retained on 4.75 mm **IS : sieve**.

These may be obtained from crushed or uncrushed gravel or stone and may be supplied as single sized or graded aggregates as given in table II of **IS : 383**.

The Engineer-in-charge may allow graded aggregates to be used provided they satisfy the requirements and table IV of **IS : 383**.

Fine Aggregates

Fine aggregate is aggregate most of which passes 4.75 mm IS sieve but not more than 10% passes through 150 micron IS sieve. These shall comply with the requirements of grading zones I, II and III as given in Table III of **IS : 383**. Fine aggregate conforming to grading zone IV shall not be normally used in reinforced concrete unless tests have been made by the contractor to ascertain the suitability of the proposed mix proportions and approved by the Engineer-in-charge.

Fine aggregates shall consist of natural sand resulting from natural disintegration of rock and which streams or glacial agencies, have deposited, or crushed stone sand or crushed gravel sand.

Sampling and Testing

In case of doubt the Engineer-in-charge may require the contractor to carry out tests, at the contractor's expense, in accordance with :

IS : 516	-	Method of Test for Strength of Concrete
IS : 2386	-	Methods of Test for Aggregate for Concrete

Storage of Aggregate

The contractor shall at all times maintain at the site of work such quantities of aggregates as considered by the Engineer-in-charge to be sufficient to ensure continuity of work.

Each type and grade of aggregate shall be stored separately on hard firm ground having sufficient slope to provide adequate drainage of rain water. Any aggregate delivered to site in a wet condition or becoming wet at site due to rain shall be kept in storage for at least 24 hours to obtain adequate drainage, before it is used for concreting, or the water content of mix must be suitably adjusted as directed by Engineer-in-charge.

1.9.0 Cement General

Cement used in manufacturing of PSC pipes shall be as per relevant BIS for PSC pipe manufacturing, whereas for other civil work Gr. 43/53 cement conform to relevant BIS shall be used. However, the cement shall be procured by the contractor from the vendor, which has been approved by the Engineer.

1.9.1 Structural Steel

Structural (TMT) steel shall conform to **IS : 226** & **IS : 2062, IS :3370, Part- I to IV** or its latest amendment**.**

Electrodes for welding shall conform to **IS : 814** or **IS : 815** or equivalent.

All bolts and nuts shall conform to **IS : 1367**. All materials shall be of new and unused stocks. Manufacturer's test certificate shall be made available to the Engineer-in-charge when called for.

1.9.2 Storage

The steel reinforcement and structural steel shall be stored in steel yard in such a way as to prevent deterioration and corrosion, preferably at least 150 mm above ground by supporting on wooden or concrete sleepers.

1.9.3 Proportioning of Concrete

The determination of the water cement ratio, and proportions of aggregates to obtain the required strength shall be made from preliminary tests by designing the concrete mix as per IS 10262:2009.

Controlled concrete shall be used on all concrete work complying with all the requirements of **IS : 456**, or latest amendments. Cube tests shall be carried out by the contractor on the trial mixes before the actual concreting operation starts. Based on the strength of the concrete mix sanction for its use has to be obtained from Engineer-in-charge.

If during the execution of the works it is found necessary to revise the mix because of the cube tests showing lower strengths than the required one due to inconsistency of quality of material or otherwise, the Engineer-in-charge shall ask for fresh trial mixes to be made by the contractor. No claim to alter the rates of concrete work shall be entertained due to such change in mix variation, as it is the contractor's responsibility to produce the concrete of the required grade.

Great care shall be exercised when mixing the actual works concrete using the proportions of the selected trial mix. The final concrete mix shall have the same proportions of cement, fine and coarse aggregates and water as that of the approved selected mix.

Where the weight of cement is determined be accepting the manufacturer's weight per bag, a reasonable number of bags should be weighed separately to check the net weight. Proper control of mixing water is deemed to be of paramount importance. If mixes with automatic addition of water are used, water should be either measured by volume in calibrated buckets, tins or weighed. All measuring equipment shall be maintained in a clean serviceable condition and their accuracy periodically checked and certified and the Engineer-in-charge's approval obtained.

The Engineer-in-charge may require the contractor to carry out moisture content tests in both fine and coarse aggregates. The amount of the added water shall then be adjusted to compensate for any observed variation in the moisture contents. For the determination of moisture content **IS : 2386** shall be referred to.

No substitution in material, used on the work or alteration in the established proportions shall be made without additional tests to show that the quality and strength of concrete are satisfactory. No alternations shall be permitted without the prior sanction of the Engineer-in-charge.

1.9.4 Mixing of concrete

The mixing of concrete shall be strictly carried out in an approved hopper type of mechanical concrete mixer. The mixing equipment shall be capable of combining the aggregates, cement and water within the specified time into a thoroughly mixed and uniform mass, and of discharging the mixture without segregation. The entire batch shall be discharged before recharging. Mixing periods shall be measured from the time when all of the solid materials are in the mixing drum, provided that all of the mixing water shall be introduced before one fourth of the mixing time has elapsed.

The mixing time in no case shall be less than two minutes. The mixer speed shall not be less than 14 or more than 20 revolutions per minute.

Mixing shall be continued until there is a uniform distribution of the materials and the mass is uniform in colour and consistency. Hand mixing of concrete shall not be permitted at all.

1.9.5 Grades of Concrete

The different grades of concrete specified shall conform to the strengths as required by **IS : 456** or its latest amendments.

Standard deviation shall be calculated as stated in **IS : 456**. The acceptable criteria for concrete shall be as stated in **IS : 456**.

The assumed standard deviation as given in table 6 of **IS: 456.** has to be followed and are given here under.

Grade of Concrete N /mm^2	**Assumed Standard Deviation**
M 10	2.3
M 15	3.5
M 20	4.6
M 25	5.3

In order to get quick ideas of quality of concrete the optional tests are conducted as stipulated in 14.1.1 of IS : 456.

1.9.6 Controlled Concrete

Controlled concrete shall be used on all concreting works except where specified otherwise.

The mix proportions for all grades of concrete shall be designed to obtain strengths corresponding to the values specified in table 1 below for respective grades of concrete.

Table 1

Grade	**Specified characteristic compressive Strength at 28 days (N/mm^2)**
M 20	20
M 25	25
M 30	30

The maximum water cement ratio for all controlled concrete works shall be as specified in **IS : 456.** Preliminary tests as specified in the IS code and required by the Engineer-in-charge shall be carried out sufficiently ahead of the actual commencement of the work with different grades of concrete made from representative samples of aggregates and

cement expected to be used on the job to ascertain the ratios by weight of cement, of total quantity of fine and coarse aggregates and the water cement ratio required to produce a concrete of specified strength and desired workability.

The minimum cement content for each grade of concrete shall be as per IS : 456 (Latest Revision). If the requirement of cement is found to be more than that specified below then such excess quantities of cement shall be used and for which no extra payment shall be made.

At least 4 (four) trial batches are to be made and 7 test cubes taken for each batch noting the slump on each mix. These cubes shall then be properly cured and two cubes for each mix shall be tested in a testing laboratory approved by the Engineer-in-charge at 7 days and others at 28 days for obtaining the ultimate compressive strength. The test reports shall be submitted to the Engineer-in-charge. The cost of mix design and testing shall be borne by the contractor.

On the basis of preliminary test reports for trial mix, a proportion of mix by weight and water cement ratio will be approved by the Engineer-in-charge, which will be expected to give the required strength, consistency and workability and the proportions so decided for different grades of concrete shall be adhered to, during all concreting operations. If however at any time the Engineer-in-charge feels that the quality of material, being used has been changed from used for preliminary mix design, the contractor shall have to run similar trial mixes to ascertain the mix proportions and consistency.

The mix once approved must not be varied without prior approval of the Engineer-in-charge. However, should the contractor anticipate any change in the quality of future supply of materials than that used for preliminary mix design, he shall inform the same to the Engineer-in-charge and bring fresh samples sufficiently ahead to carry out fresh trial mixes. The Engineer-in-charge shall have access to all places and laboratory where design mix is prepared. Design mix will indicate by means of graphs and curves etc. the extent of variation in the grading of aggregates which can be allowed. In designing the mix proportions of concrete, the quantity of both cement and aggregate shall be determined by weight. All measuring equipment shall be maintained in clean and serviceable condition and their accuracy periodically checked.

To keep the water cement ratio to the designed value, allowance shall be made for the moisture contents in both fine and coarse aggregates and determination of the same shall be made as frequently as directed by the Engineer-in-charge. The determination of moisture contents shall be according to **IS : 2386** (Part III).

1.9.7 Strength Requirements

Ordinary Portland cement conforming to **IS : 8112(OPC 43 grade) or IS:12269(OPC 53 grade)** is used the compressive strength requirements for various grades of concrete shall be as shown in Table – 3. Where rapid hardening Portland cement is used the 28 days compressive strength requirements specified in table – 3 shall be met in 7 days. The strength requirement specified in Table-3 shall apply to both controlled concrete and ordinary concrete.

Table – 3

Strength Requirement Of Concrete

Grade of concrete As per IS : 456- 2000	**Min. compressive strength conducted in Accordance with IS : 516 (in kg/cm^2)**		
	For 15 cm cube specimens at 7 days	**For 15 cm cube specimens at 28 days**	
	Work Test	**Preliminary**	**Work Test**
M 20	135	260	200
M 25	170	320	250
M 30	200	380	300

Other requirements of concrete strength as may be desired by the Engineer-in-charge shall be in accordance with Indian Standard **IS : 456** (latest revision). The acceptance of strength of concrete shall be as per clause 5.4 :Sample size and Acceptance criteria: of **IS : 456** (latest revision) subject to stipulations and / or modifications state elsewhere in this specification, if any.

Concrete work found unsuitable for acceptance shall have to be dismantled and replace to the satisfaction of the Engineer-in-charge by the contractor free of cost to the owner. No payment for the dismantled concrete, the relevant formwork and reinforcement, embedded fixtures, etc. wasted in the dismantled portion shall be made.

In the course of dismantling if any damage is done to the embedded items or adjacent structures, the same shall also be made good free of charge by the contractor to the satisfaction of the Engineer-in-charge. If the water quantity has to be increased in special

cases, cement also is increased proportionately to keep the ratio of water to cement same as adopted in trial mix design for each grade of concrete. No extra payment for the additional cement will be made.

1.9.8 Workability

The workability of concrete shall be checked at frequent intervals by slump test. Where facilities exist and if required by the Engineer-in-charge, alternatively the Compacting Factor. Test in accordance with **IS : 1199** shall be carried out.

The degree of workability necessary to allow the concrete to be well consolidated and to be worked into the corners of formwork and round the reinforcement to give the required surface finish shall depend on the type and nature of the structure and shall be based on experience and tests. The limits of consistency for structures are as specified in Table 4 below.

Table 4

Limits Of Consistency

Placing Conditions	**Degree of Workability**	**Values of Workability**
1	**2**	**3**
Concreting of shallow section with vibrations	Very low	20-10 second veebee Time or 0.75-0.80 compacting factor
Concreting of lightly reinforced sections with vibration	Low	10-5 seconds veebee Time or 0.80-0.85 Compacting factor
Concreting of lightly reinforced sections without vibration or heavily reinforced section with vibration	Medium	5-2 seconds veebee Time or 0.85-0.92 Compacting factor Or 25-75 mm slump for 20mm aggregate
Concreting of heavily reinforced sections without vibration	High	Above 0.92 Compacting factor or

		75-125mm slump for 20mm aggregate

1.9.9 Workmanship-All workmanship shall be according to the latest relevant standards. Before starting a pour the contractor shall obtain the approval of the Engineer-in-charge. He shall obtain complete instructions about the material and proportion to be used, slump, workability, quantity of water per unit of cement number of test cubes to be taken, finishing to be done, any admixture to be added etc.

1.9.10 Transportation and Pouring

The concrete mixer shall be as close to the place of concreting as possible but not as also as to produce vibration and disturbance to the shuttering and reinforcements. It shall be located at such a position that time lapse for transportation of unloaded concrete mix from the mixer to the place of deposition of concrete is minimum.

When there is a difference in level between the unloading platform of concrete from the mixer to the actual place of deposition of concrete the concrete shall be transported manually as by means of builders hoist / crane or concrete pump to the actual level of concreting depending on requirement as approved by Engineer-in-charge.

Chutes for transporting the concrete shall not normally be used. The Engineers express permission shall be taken for transporting by means of chutes. If use of chutes are permitted then the concrete shall be again thoroughly mixed by using spades manually before placing the concrete in the moulds / shuttering to avoid segregation of concrete. It shall be ensured that initial setting of the concrete shall not take place and the mix of the concrete is as good as that of freshly poured concrete delivered directly into the moulds / shuttering. It shall be ensured that the drop of concrete is not from an excessive height and that the vibration and deposition of concrete are simultaneously carried out.

Before placing concrete, all equipment for mixing and transporting the concrete shall be cleaned and all debris shall be removed from the place to be occupied by

the concrete. All form and soil surfaces shall be finished to desired levels and shall be thoroughly wetted immediately prior to placing of concrete.

No concrete shall be placed until the Engineer-in-charge has approved the excavation, formwork and the reinforcement. The competent formwork maker and steel fixer shall be in attendance during concreting operation.

Concrete shall be handled from the place of mixing to the place of final deposit as rapidly as practicable by methods which will prevent the segregation or loss of any of

the ingredients. If segregation does occur during transport, the concrete shall be re-mixed before being place. The concrete shall be placed and compacted before setting commences and shall not be subsequently disturbed.

To ensure bond and water tightness between old concrete surface and the concrete to be placed the surface should be cleaned and roughened by 'initial green cut' by wire brushing or chipping. The initial green cutting may be done after six hours of placing concrete in order to facilitate the work. Applying cement slurry and/or proper chemicals after thoroughly watering the old concrete surface and removing all loose particles should be done for bonding of old and new concrete. The old concrete walls / members shall be given a shear key of 50 x 65mm deep. This key shall also be thoroughly cleaned with wire brush in green stage before next lift pouring to avoid percolation of works.

1.9.11 Placing of concrete in slabs and beams

Concrete in slabs shall be placed in one continuous operation for each span unless otherwise directed. Longitudinal construction joints if required by reason of the width to be placed shall be located as shown on the drawings or as directed by the Engineer.

Concrete in the stem and slab to T-beam and for deflector beams and tie beams shall be placed in one continuous operation and shall be deposited uniformly for the full length of the beam and brought up evenly in horizontal layers.

Where the size of the member is such that it cannot be made in one pour, transverse vertical construction joints shall preferably be located within the area of contraflexure. For continuous spans, where required by design considerations the Engineer shall approve the concrete placing sequence.

1.9.12 Placing of concrete in culverts and trenches

In general, the base slab or footings of the culverts shall be placed and allowed to set before the remainder of the culvert is constructed. In this case suitable provision shall be made for bonding the side walls to the culvert base, preferably by means of raised longitudinal keys so constructed as to prevent as far as possible, the percolation of water through the construction joint.

Before concrete is placed in the side wall, the culvert footing shall be thoroughly cleaned of all the shavings, sticks, sawdust or other extraneous material and the

surface carefully chipped and roughened in accordance with the method of bonding construction joints.

In the construction of culverts / trenches less than 1.2m in height the concrete in the wall shall be placed and allowed to set before the top slab is placed. In this case appropriate keys shall be left in the side walls for anchoring the cover slab.

1.9.13 Depositing concrete under water

Concrete shall not be deposited in water, except with the approval of the Engineer and under his supervision. Concrete deposited in water shall be of grade 20 with 10 percent excess cement. To prevent the segregation it shall be carefully placed in a compact mass, in its final position by means of a tremie or other approved method and shall not be disturbed after being deposited.

Concrete shall be placed in the horizontal layers not more than 300mm thick. When less than a complete layer is placed in one operation it shall be terminated in a vertical bulkhead. Each layer shall be placed and compacted before the initial set of the proceeding layer takes place so that no cold joint is formed.

Unless otherwise approved, concrete shall be placed in single operation to the full thickness of slabs, beams and similar members and shall be placed in horizontal layers not exceeding 1 m deep in walls, columns and similar

members. Concrete shall be placed continuously until completion of the part of the work between construction joints or as directed by Engineer-in-charge.

1.9.14 Concreting floors

Concreting in floors shall be done in a chess board pattern, allowing sufficient time to elapse before the adjacent band is casted. The panel size is restricted to 75m in reinforced concrete slab.

Concreting shall not be started unless the electrical conduits or any other piping wherever required is laid by the concerned agency. The civil contractor shall afford all the facilities and maintain co-ordination of work with other agencies engaged in electrical and such other works as directed by the Engineer-in-charge.

Before concreting, the contractor shall provide, fabricate and lay in proper position all inserts, anchor bolts, pipes etc. (Which are required to be embedded in concrete members) as per relevant drawings and direction of Engineer-in-charge.

Where concrete is placed on soil it shall be placed only on firm undisturbed ground. Any concrete that is placed on a well-compacted fill shall have the prior approval of the Engineer-in-charge. Concrete shall not be placed in standing water on sub grade or in foundation excavations.

1.9.15 Compaction

Concrete during and immediately after depositing shall be thoroughly compacted. The compaction shall be done by mechanical vibration subject to the following provision :

a. The vibration shall be internal unless special authorization of other methods is given by the Engineer or as provided herein.

b. The Engineer shall approve the type and design of vibrators. They shall be capable of transmitting vibration to the concrete at frequencies of not less than 4,500 impulses per minute.

c. The intensity of vibration shall be such as to visibly affect a mass of concrete of 25mm slump over a radius of at least 0.5m.

d. The contractor shall provide a sufficient number of vibrators to properly compact each batch immediately after it is placed in the forms.

e. Vibrators shall be manipulated so as to thoroughly work the concrete around the reinforcement and embedded fixtures, and into the corners and angles of the forms.

Vibrations shall be applied at the point of deposit and in the area of freshly deposited concrete. The vibrators shall be inserted into and withdraw on out of the concrete slowly. The vibration shall be of sufficient duration and intensity to thoroughly compact the concrete but shall not be continued so as to cause segregation. Vibration shall not be continued at any point to the extent that localized areas of grout are formed.

Application of vibrators shall be at points uniformly spaced and not further apart than twice the radius over which the vibrations is visibly effective.

f. Vibration shall not be applied directly or through the reinforcement to sections or layers of concrete which have hardened to the degree that the concrete ceases to be plastic under vibration. It shall not be used to make concrete flow in forms over distances so great as to cause segregation and vibrators shall not be used to transport concrete in the forms.

g. Vibration shall be supplemented by such rodding / spading as is necessary to ensure smooth surfaces and dense concrete along form surfaces and in corners and location impossible to reach with the vibrators.

The whole process starting from the mixing of concrete to the placing and compacting shall not take more than 20 minutes and the process shall be completed before the initial setting takes place.

1.9.16 Curing

Curing shall be accomplished in accordance with **IS : 456** by keeping the concrete covered with a layer of sacking canvas, hessien or similar absorbent materials and kept constantly wet for at least seven days from the date of placing of concrete unless otherwise specified. The approval of the Engineer-in-charge shall be obtained for the method of curing the contractor proposes to use on the work. In very hot weather precaution shall be taken to see that temperature of wet concrete does into exceed 38^0 C while placing.

Heavy loads shall not be placed on or moved across over the floor slabs until curing is complete. Care shall be taken to prevent floor surfaces from being marred during curing period. Concrete placed in trenches or excavations shall be protected from falling earth during and after placing.

1.9.17 Consistency

The consistency of concrete shall be frequently checked by means of a slump test performed as per the relevant Indian Standard by the Engineer. The maximum and minimum slump for each class of concrete shall be as directed by the Engineer, and any concrete as represented by the slump test which fails to comply with these directions shall be removed from the site and disposed off at the contractors cost.

1.9.18 Concrete finish tolerances

The following tolerances shall be permitted in the finished concrete work.

a. In the cross section dimensions of columns and beams (including T-beams) not more than 5 mm.

b. In dimensions other than cross-sectional dimensions of columns and beams – not more than 9 mm.

c. In any surface the irregularity shall not exceed 9 mm measured from 3 m long straight edge.

d. No member shall be out of line by more than 6mm.

e. No column or wall shall be out of plump by more than 6 mm or if battered out of batter by more than 6mm.

1.9.19 Construction Joints

Construction joints shall, in general, conform to the relevant clauses of IS : 3370, Part I.

They shall be made in the positions as specified or elsewhere as approved. Such joints shall be truly vertical or horizontal as the case may be, except that in an inclined or curved member the joint shall be strictly at right angles to the axis of the member.

Construction joints shall be rebated to an approved profile and an approved water-stop shall be inserted in the joints when specified.

When the work is to be interrupted the concrete shall be rebated at the joint to such shape and size as may be required by the Engineer-in-charge or as shown on the drawing. All vertical construction joints shall be made with stop boards, which are rigidly fixed and slotted to allow for the passage of the reinforcing steel. If desired by the Engineer-in-charge, keys and / or dowel bars shall be provided at the construction joints. In the case of water retaining structures, water stop of approved material shall be provided if specified on the drawing or desired by the Engineer-in-charge. Construction joints shall be provided in position as shown or described on the drawings. Where it is not described the joints shall be in accordance with the following :

In a column the joint shall be formed about 75mm below the lowest soffit of the beams framing into it.

Concrete in a beam shall be placed throughout without a joint. A joint in a suspended floor slab shall be vertical at the middle of the span and at right angle to the main reinforcement.

In forming a joint, concrete shall not be allowed to slope away to a thin edge. The contractor well in advance of pouring shall plan the locations of construction joints which shall be approved by Engineer-in-charge.

Construction joints in foundation of equipment shall not be provided without specific concurrence of the Engineer-in-charge.

Before fresh concrete is placed the cement skin of the partially hardened concrete shall be thoroughly removed and surface made rough by hacking, sand blasting, water jetting, air jetting or any other method as directed by the Engineer-in-charge. The rough surface shall be thoroughly wetted for about two hours and shall be dried and coated with 1:1 freshly mixed cement sand slurry immediately before placing the new concrete. The new concrete shall be worked against the prepared surface before the slurry sets. Special care must be taken to see that the first layer of concrete placed after a construction joint is thoroughly rammed against the existing layer. Old joints during pour shall be treated with freshly made cement sand slurry only after removing all the loose materials.

Expansion Joints

Permanent expansion joints in structures shall be provided at maximum interval of 30m or wherever directed. When joints are to be filled with joint filling materials as stipulated the permanently exposed edges of joints shall be sealed with an approved sealing compound. The acceptance criteria shall be in accordance with **IS 3370** (Part I).

1.9.20 Finishing Concrete

On striking the formwork, all blowholes and honeycombing observed shall be brought into the notice of Engineer-in-charge. The Engineer-in-charge may, at his discretion allow such honeycombing or blowholes to be rectified by necessary chipping and packing or grouting with concrete or cement mortar. If mortar is used, it shall be 1:2 mix or as specified by Engineer-in-charge. However, if honeycombing or blowholes are of such extent as being undesirable, the Engineer-in-charge may reject the work totally and his decision shall be binding. No extra payment shall be made for rectifying these defects. All burrs and uneven faces shall be rubbed smooth with the help of carborundum stone.

The surface of non-shuttered faces shall be smoothened with a wooden float to give a finish equal to that of the rubbed down shuttered faces. Concealed concrete faces shall be left as from the shuttering except that honey combed surface shall be made good as detailed above. The top faces of slabs not intended to be surfaced shall be leveled and floated to a smooth finish at the levels or falls shown on the drawings or elsewhere. The floating shall not be executed to the extent of bringing excess fine material to the surface. The top faces of slabs intended to be covered with screed, granolithic or similar faces shall be left with a rough finish.

1.9.21 Work in Extreme Weather

Dependence shall not be placed on salt or other chemicals for the prevention of freezing.

Calcium chloride shall not be used as an accelerator except with the approval of the Engineer. Recommendation given in relevant clauses of **IS : 456** shall be strictly adhered to.

1.9.22 Loading of the Structures

No concrete structures shall be loaded until the concrete is at least 28 days old and only then with the approval of the Engineer and subject to such conditions as he may lie down.

1.9.23 Testing and Acceptance criteria of concrete

The sampling of concrete, making the test specimens curing and testing procedures etc. shall be in accordance with **IS : 1199**, **IS : 3085** and **IS : 516** the size of specimen being 15cm cubes. Normally only compression tests shall be performed in accordance with **IS : 516**.

For each grade of concrete and for each 8 hours or portion thereof the following samples shall be taken :

At least six specimen shall be taken from the first 15.0m or part thereof and three of these shall be tested at 7 days and the remaining at 28 days. Four additional specimens shall be taken from each additional 15.0m of concrete or portion thereof of which 2 specimens shall be tested at 7 days and the remaining at 28 days.

To control the consistency of concrete from every mixing plant slump tests and / or compacting factor tests in accordance with **IS : 1199** shall be carried out by the contractor every two hours or as directed by the Engineer-in-charge. Slumps corresponding to the test specimens shall be recorded for reference.

The acceptance criteria of concrete shall be in accordance with **IS : 456- 2000**. Payment for concrete which is normally unacceptable as per the criteria laid down in **IS : 456- 2000** but which has been accepted by the Engineer-in-charge shall be made at a reduced rate prorate to the strength obtained.

Concrete work found unsuitable for acceptance shall have to be dismantled and replacement is to be done as per specification by the contractor. No payment for the dismantled concrete, the relevant formwork and reinforcement embedded fixtures etc. shall be paid.

In the course of dismantling if any damage is done to the embedded, items or adjacent structures the same shall be made good, free of charge by the contractor to the satisfaction of the Engineer-in-charge.

1.9.24 Load Test of Structures

The Engineer-in-charge may instruct for a load test to be carried out on any structure if in his opinion such a test is deemed necessary for any of the following reasons :

1. The works site made concrete test-cube failing to attain the specified strength, as per the criteria laid down in **IS : 456-2000**.

2. Suspected overloading during construction of the structure under review.

3. Shuttering being prematurely removed and not as per the specification.

4. The concrete being improperly cured.

5. Visible deficiencies of the concrete.

If the results of the load test were unsatisfactory, the Engineer-in-charge may instruct the contractor to demolish and reconstruct the structure or part thereof at the contractor's cost.

The load test of structures shall be carried out as per the relevant clauses **IS : 456-2000**.

1.9.25 Special methods of Concreting

Should the contractor propose to use special methods of concreting not included in this specification, such as pumping concrete or using vacuum moulds he shall obtain the Engineer's approval before commencing work and comply with any subsequent specification made by the Engineer for this special method of concreting. Contractor is advised to use modern techniques in adopting methods of laying / finishing concrete in raft / walls etc. e.g. in raft use of any other acceptable and proven method will be welcomed. The contractor may elaborate same on while quoting the offer.

1.9.26 Concrete For Water Retaining Structures

1.9.27 Materials for construction

Materials for concrete viz. cement, sand aggregate, water etc. shall be as per the specifications of reinforced concrete works described in section 4. However, supersulphated cement shall be used when ground water contain sulphates more than the permissible limit as indicated in **IS : 456-2000**.

1.9.28 Design

The design of the structure shall be based as per **IS : 3370** (part I to part IV) code of practice for concrete structures for storage of liquids.

1.9.29 Aggregate

Maximum size of the aggregate shall be 20mm for thickness of the section upto 400 mm. Above this limit 40 mm size aggregate may be used with the approval of Engineer-in-charge.

1.9.30 Controlled Concrete

Controlled concrete of grade not weaker than M-20 is to be used in the structures with

minimum quantity of cement in the concrete mix to be not less than 360 kg/cum for the reinforced concrete worked. The design should be such that the resultant concrete is dense and impervious. The mix of concrete should be fully compacted. The use of needle-type of internal vibrator is recommended.

1.9.31 Cover

Cover to the reinforcement shall be as stated in the drawing.

1.9.32 Admixtures

Admixtures such as super plastisizer may be added to improve the workability only with the permission of the Engineer-in-charge.

1.9.33 Joints

The maximum spacing between the partial contraction joints shall be not more than 7.5m and between the full contraction joint 15.0m. Alternatively temporary short gaps of width 0.5m in walls be left out to be filled in, after the concrete has hardened on sides. Vertical joint shall be avoided by casting a lift of approximately 1.0m deep, in continuous operation, for circular structures.

1.9.34 Shuttering Scope

Formwork shall be composed of steel and / or best quality shuttering wood of non-absorbent type. Timber shall be free of knots and shall be of medium grain as far as possible. Hard woods shall be used as caps and wedges under or over posts. Marine plywood or shuttering equivalent shall be used where specified to obtain smooth surfaces for exposed concrete work. Struts shall generally be mild steel tubes, strong salballis. Bamboo's, small diameter ballis etc. shall not be used unless approved by the Engineer-in-charge in specific cases.

General Requirement

If it is so desired by the Engineer-in-charge the contractor shall design and prepare, before commencement of actual work, the drawings for formwork and centering and get them approved by the Engineer-in-charge. The formwork shall conform to the shape, lines and dimensions as shown in the drawings.

The centering shall be true, rigid and thoroughly braced both horizontally and diagonally. The forms shall be sufficiently, strong to carry without undue deformation, the dead weight of the concrete at the time of casting as well as working load. Where the concrete is vibrated, the formwork shall be strong enough to withstand the effects of vibration without appreciable deflection, bugging distortion of loosening of its components. The joints in the formwork shall be sufficiently tight to prevent any leakage of mortar. The formwork shall be such as to ensure a smooth uniform surface free from honeycombs, air bubbles, bulges, fins and other blemishes, any blemish or defect found on the surface of the concrete must be brought to the

notice of the Engineer-in-charge immediately by the contractor and rectified, free of charge, as directed by him. To achieve the desired the desired rigidity, tie bolts, spacer blocks, tie wires and clamps as approved by the Engineer-in-charge shall be used but they must in no way impair the strength of concrete or leave stains or marks on the finished surface. Where there are chances of these fixtures being embedded only mild steel or concrete of adequate strength shall be used. Bolts passing completely through liquid retaining walls / slabs for the purpose of securing and aligning the formwork should not be used. For exposed interior and exterior concrete surfaces or beams, column and walls, plywood or other approved forms, thoroughly cleaned and tied shall be used. Rigid care shall be exercised in ensuring that all columns are plum and true and thoroughly cross braced to keep them so. All floor and beam centering shall be crowned not less than 8mm in all directions for every 5m span. Temporary openings for cleaning inspection and for pouring concrete shall be provided at the base of vertical forms and at other places where they are necessary and as may be directed by the Engineer-in-charge. The temporary openings shall be so formed that they can be conveniently closed when required and must not leave any mark on the concrete.

Cleaning and Treatment of forms

All forms shall be thoroughly cleaned of old concrete, wood shavings, saw dust, dirt and dust sticking to them before they are fixed in position. All rubbish, loose concrete, chipping, shavings, sawdust etc., shall be scrupulously removed from the interior of the forms before the concrete is poured. Along with wire brushes, brooms etc. compressed air jet and / or water jet shall be kept handy for the cleaning, if so directed by the Engineer-in-charge.

Before shuttering is placed in position, the form surface in contract with concrete shall be treated with approved form removing non-staining oil or composition. Care shall be taken that the soil or composition does not come in contact with reinforcing steel or existing concrete surfaces. They shall not be allowed to accumulate at the bottom of the shuttering.

The formwork shall be so designed and erected that the forms for slabs and the sides of beams, columns and walls may be removed first, leaving the shuttering to the soffits of beams and their supports in position. Re-propping of beams shall not be done except with the approval of the Engineer-in-charge, and props can be reinstated in anticipation of abnormal conditions, if formwork for column is erected for the full height of the columns, one side shall be left open and built up in sections, as placing of concrete proceeds. Wedges, spacer bolts clamps or other suitable means shall be provided to allow accurate adjustment of the formwork and to allow it to be removed gradually without jarring the concrete.

Pipe inserts to be laid at the time of concreting

For pipes to be laid in the walls during concrete, relevant drawings shall be followed. Openings

shall be provided in the shuttering plates at suitable positions. It is to be noted here that special shuttering plates for this purpose may have to be used, and the number of uses of shuttering material for working out the rate shall be calculated accordingly.

Removal of forms

The contractor shall record on the drawings or in other approved manner, the date on which the concrete is placed in each part of the work and the date on which the formwork is removed there from and have this record checked and counter signed by the Engineer-in-charge. The contractor shall be responsible for the safe removal of the formwork but the Engineer-in-charge may delay the time if he considers it necessary. Any work showing signs of damage through premature removal of formwork for loading shall be entirely reconstructed by the contractor without any extra cost to the owner.

Forms for various types of structural components shall be removed before the minimum periods specified below (table 5) which shall also be subject to the approval of the Engineer-in-charge. Engineer at his discretion may extend this maximum period for removal of formwork and contractor shall retain the formwork for a longer period as desired by the Engineer-in-charge at no extra cost to the owner.

Table 5

Minimum Period for Removal of Formwork

Part of structure	Temperature in degrees Celsius (80^0C)				
	Above 40^0 Days	Days	40^0 to 20^0 Days	20^0 to 5^0 Days	Below 5^0
1	2	3	4	5	
A. OPC Concrete					
1. Column and walls	2	1	1	Do not remove form. Until site cured test cylinder / cubes develop 50% of 28 days strength	
2. Beams sides	3	2	3		
3. Slabs 125mm thick or less	10	7	8	Do not removeform Until site cured test	
4. Slabs over 125mm thick and soffit of minor beams	18	14	16	Cylinder / cubes develop 50% of days	
5. Soffit of main beams	24	21	22	strength	

Note: for Portland Puzzolona Cement the removal time should be suitably increased over the time given for ordinary Portland Cement, as directed by the Engineer-in-charge.

Reuse of forms

Before reuse all forms shall be thoroughly scrapped, cleaned, joints, etc. examined and when necessary, repaired and inside surface treated as specified herein before. Formwork shall not be used / reused, it declared unfit or unserviceable by the Engineer-in-charge.

Classification of formwork

a. Ordinary

These shall be used in places where ordinary surface finish is required and shall be composed of steel and / or approved good quality seasoned wood.

b. Plywood

These shall be used in exposed surfaces, where specially good finish is required and shall be made mostly of approved brand of heavy quality shuttering / marine plywood to produce a perfectly level, uniform and smooth surface.

Ordinary formwork shall be used for all under ground structures and 'plywood' formwork shall be used for all structure above ground.

Part of structure	**Temperature in degrees Celsius (80^0C)**				
	Above 40^0		**40^0 to 20^0**	**to 20^0 to 5^0**	**Below 5^0**
1	**Days 2**		**Days 3**	**Days 4**	**Days 5**
B. Rapid Hardening Portland Cement concrete					
1. Columns and walls	1	1.5	1		
2. Beams sides	2	1	1	Do not remove forms until site	
3. Slab 125mm thick or less	7	4	5	Cylinder / cubes Develop 50% or 28 strength	
4. Slab over 123mm thick and soffit of minor Beams	12	8	9		
5. Soffit of main 14 beams	10	12			

Acceptance of formwork and finished concrete shall be true to shape, lines, levels, plumb and dimensions as shown on drawings. All embedded fixtures shall be correct type and in correct position as shown in drawing. Finished concrete surface shall be free from blemishes like honeycombs, air bubbles, fins etc. Exposed decorative concrete surfaces shall be free from rust, stains grease and mould oil stains, etc. and

shall have uniform pleasing appearance to satisfaction of the Engineer-in-charge. If desired, the finished concrete shall conform in all respects to the accepted sample.

Where exposed surface of concrete can be effectively sealed to prevent loss of water the periods specified for temperature above 40^0 C can be reduced to those for the temperature range of 20^0 to 40^0 C subject to approval of the Engineer-in-charge. Before removing any formwork, the contractor must notify the Engineer-in-charge well in advance to enable him to inspect the concrete, if he so desires.

Tolerance in finished concrete

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

For

a.	Sectional dimensions	=	+ 5mm
b.	Plumb	=	1 in 1000 of height
c.	Levels	=	+3mm before any deflection has taken place

This tolerance given above are specified for local aberration in the finished concrete surface and should not be taken as tolerance for the entire structure taken as a whole for the setting and alignment of formwork which should be as accurate as possible and true to shape required to the entire satisfaction of the Engineer-in-charge. Any error, within the above tolerance limits, or if noticed in any lift of the structure after stripping of forms, shall be corrected in the subsequent work to bring back the surface of the structure to its true alignment.

1.9.35 Curing

Curing etc. of the structures shall be exactly same as for reinforced concrete structures.

1.9.36 Vertical joints

All vertical joints shall extend full height of the wall in unbroken alignment.

1.9.37 Removal of Shuttering

Removal of the formwork shall confirm of **IS 456-2000**. Bolts and fasteners passing completely through liquid retaining slabs for the purpose of securing and aligning the formwork should not be used unless effective precautions are taken to ensure the water tightness after the removal of pipes or other fittings. Puddle flange in concreting shall

be placed at correct positions, before concreting and verified by the Engineer-in-charge.

1.9.38 Water Tightness

The test for water tightness of the structure shall be carried out as per clause 10 of **IS : 3370** part 3.

1.10.0 Pipe Laying

1.10.1 General

The specification given under this clause shall cover guide lines for providing all types of pipes for water supply, sewerage, rising mains, plumbing, interconnecting pipes in water wastewater treatment units etc

The diameters and types of pipes shall be as described in the bill of quantities / drawings. The pipes shall include all types of pipe viz. stoneware, concrete, plastic metal and asbestos pipes. Metal pipes shall include cast iron, steel and of different pressure classification as specified.

The specials and fittings like valves shall also be of the same materials, types and pressure grading to match the pipes and as specified in the bills of quantities / drawings. All the materials shall be confirming to the relevant Indian Standards.

The work includes transportation of pipes from the stores to the site of work road cutting and remaking, excavation of trenches in all types of soil, lowering of pipes into the trenches, caulking the joints with necessary spun yarn soaked in bitumen and cement slurry providing concrete bedding where specified, aligning to line and grade jointing, with 1:2 cement and coarse sand including excavation of earth below invert level of pipe for bedding, testing, back filling of trenches to meet the requirement of Indian Standards codes of practices in a best workmanlike manner.

The rates quoted shall be deemed to be inclusive of all costs of materials, transportation, costs of labour, tools and plant for all the operations involved in the completion of the works.

1.10.2 Materials

The pipes and specials shall conform to the Indian Standard Specifications (latest issue

/ revision) as detailed below :

IS : 458-1971 Concrete pipes with or without reinforcement

IS : 651-1980 Salt glazed stone ware pipes and fittings

IS : 780-1984 Sluice valves (50-300mm size)

IS : 784-1978 Prestressed concrete pipes

IS : 1239 Mild steel tubes, tubular and other wrought steel fittings (part I & II)

IS : 1536-1976 Centrifugally cast (spun) iron pressure pipes for gas, water and sewage

IS : 1537-1976 Vertical cast iron pressure pipes for water, gar and sewage

IS : 1538-1976 Cast iron fittings for pressure pipes for water, gas and sewage (part I-XXIII)

IS : 1592-1900 Asbestos cement pressure pipes

IS : 2906-1984 Sluice valves for water works purposes (350 to 1200mm size)

IS : 3006-1979 Chemical resistant salt glazed stone ware pipes and fittings

IS : 3076-1985 Low density polyethylene pipes for potable water supply

IS : 4984-1987 High density polyethylene pipes for potable water supply

IS : 4985-1988 Unplasticised HDPE pipes for portable water supplies

IS : 1948-1961 Aluminum doors, windows and ventilators

1.10.3 Construction

For earthwork and excavations of trenches the specifications given in section 4.1 Earthwork shall be followed.

1.10.4 Transportation of pipes

The transportation of pipes from the stores to the site of works has to be done in such a way that pipes are not damaged while handling and during transportation.

Light pipes and pipes of smaller diameter shall be handled manually. Heavy pipes shall be loaded and unloaded using lifting tackles like chain pulley blocks and shear legs. The pipes shall be protected against impact, shocks etc. Pipes shall not be allowed to fall freely on to the ground and hard surfaces so as to cause cracks in pipes. Transportation of pipes and stacking by the side of the trenches shall also be done in such a way that it causes minimum inconveniences to the traffic.

Lowering of the pipes into the trenches shall be done equally carefully so that the pipes are not damaged and also the trenches and bedding for pipes are not disturbed and damaged. Smaller and lighter pipes can be lowered using rope slings and shall not be dropped onto the trench bottom

.

1.10.5 Stacking of Pipes

the pipes shall be laid out along the side of the trenches, each pipe in its position for laying with an extra pipe after every 20 nos. to allow for cutting. When the trench crosses a road or place where such distribution is inadmissible, the pipes shall be stacked in piles at each end in sufficient numbers to fill in the length.

1.10.6 Transfer of levels to trench bottom

Permanent benchmarks have been established at convenient and frequent interval all along the pipe alignment for carrying the levels to the place of laying of the pipes with the help of Survey of India benchmarks. The contractor may get the same checked if he so wishes as he will be solely responsible for the accuracy of levels. Using boning rods and sight rails shall transfer the levels. The lowering of pipes shall not be commenced until the Engineer has checked levels and permits the lowering of pipes.

Heavy pipes shall be lowered into the trenches by means of shear lags, chain pully blocks and tackle. During the operation any pipe that is allowed to fall into the trench shall be condemned and removed from the site immediately. Care shall be taken while lowering the pipe into the trench. The Engineer-in-charge for damage examines each pipe which is laid in the trench. Cracked, broken in damaged pipes shall not be allowed to be used in the works. For any damage done due to the negligence of the contractor, the contractor will have to replace the pipe free of cost otherwise the department will collect twice the cost of the pipe from the contractor.

1.10.7 Cleaning of pipes

The pipes shall be checked for absence of cracks and damaged parts of pipe ends. The pipes shall also be cleaned to remove all dirt and soil and other foreign materials before lowering into the trenches. After jointing it shall be ensured that the extra jointing materials are removed. It shall also be ensured that no foreign material enters the pipes after they are laid by covering the pipe ends suitably.

1.10.8 The specified jointing materials shall be used and methods of jointing the pipes of different materials viz. Stoneware, concrete, cast iron, steel, plastic pipes etc. shall be followed as indicated in the bill of quantities, drawings, directions of the Engineer. For flanged joints necessary gaskets / packing material, bolts and nuts shall be provided without any extra cost. The gaskets / packing materials shall be of full diameter and have approved quality.

1.10.9 Normally the pipes are laid from downstream towards, upstream, the spigot end lacing upwards. The spigot end shall be pushed home to the full depth of the socket.

1.10.10 The pipes shall be prevented from floating in case pipe trenches being flooded by properly loading the pipes with back filling material. However the back filling shall not be done above the joints till the pipes are tested and the Engineer permits the back filling.

1.10.11 The bedding of the pipes where specified shall be as detailed in the bill of quantities, drawings, direction of the Engineer. The locations of the bedding the thickness of the bedding the width of the bedding, material specifications and proportion of mix shall all be as indicated in the bill of quantities / drawings, direction of the Engineer.

1.10.12 The manholes on the gravity sewers shall be at locations as shown in the drawings. Normally they are located at the junctions of sewers, where the diameters of pipes, direction of pipes, grades of pipes change and also on straight lengths at specified intervals to facilitate cleaning operations. The sizes of the machines depend upon the diameters of pipes, depths of pipes, number of junction etc. and are given in the drawings. They shall be located as directed by the Engineer.

The material specifications viz. brick masonry or concrete the proportion of the concrete, mortar for masonry and plastering shall be as indicated in the typical drawings of manholes. The dimensions and thicknesses of masonry concrete plaster etc. shall be as specified in the typical drawings for manhole chambers as well as access shafts in case of deep manholes.

FRC manhole cover of specified weight and thicknesses and type as specified in the typical drawing for manholes / bill of quantities shall be provided and fixed as directed by the Engineer.

1.10.13 For laying and jointing of pipes the following codes of practices shall be followed unless otherwise stated.

IS : 783-1985 Code of practice for laying concrete pipes

IS : 2685-1971 Code of practice for selection, installation and maintenance of sluice valves

IS : 3114-1985 Code of practice for laying cast iron pipes

IS : 4111- Code of practice for ancillary structures in sewerage system – manholes etc. (Part I to IV)

IS : 4127-1983 Code of practice for lying of glazed stone ware pipes

IS : 5822-1986 Code of practice for laying have welded steel pipes for water supplies

IS : 6530-1972 Code of practice for laying asbestos cement pressure pipes

IS : 7634-1975 Code of practice for plastic pipe work for potable water supplies

(Part I to III)

IS : 12288-1987 Code of practice for use and laying of Ductile Iron Pipe.

IS : 4984-1995 Code of practice for High Density Polyethylene pipes for Potable water supply.

1.10.14 Thrust blocks

In case of rising mains / pressure pipes, at changes of directions of pipes thrust blocks to resist unbalanced forces shall be provided as indicated in the drawings. The dimensions, material specifications shall be as specified in the drawings / bill of quantities.

1.10.14 Valve Chambers

Chambers / masonry pits to protect the valves or other special fittings on the pipelines shall be constructed as shown in the drawing. The dimensions and materials specifications cover shall be as indicated in the drawing / bill or quantities.

1.10.15 Back filling

Back filling of the trenches shall not be commenced till the pipes are tested for hydraulic pressure and till the Engineer gives approval for filling of the trenches. Back filling of the trenches shall be done with approved back fill material free from boulders sharp objects, rubbish. The filling shall be carried out in layers not more than 150mm thick. The filled up material shall be well watered and consolidated, taking proper care to see that the pipes are not disturbed.

1.10.16 Obstruction to traffic

The contractor shall be deemed to have knowledge about the condition of roads and areas where he has to lay the pipe. He shall make his own studies about the widths of roads particularly narrow, winding and steeply sloping roads to assess the difficulties he may have to face during excavation, stacking of pipes and materials, tools and plant during execution.

He shall make all the necessary arrangements for the diversion of traffic with least inconvenience to the public. He shall erect warning signals day and night and provide necessary barricades to avoid accident. Any damages caused to the public / private property shall be made good at his own cost. He shall also be responsible to pay an compensation to any person subjected to injuries or death due to his negligence in providing necessary safety precautions.

1.10.17 Hydraulic testing of pipes

Each section of the pipe shall be tested for water tightness of the pipeline as per relevant IS specification (latest amendment). To prevent disturbance of the alignment and grade

after the pipes have been laid it is desirable to back fill the pipe upto the top, keeping atleast 90cms of pipe open at the joints. However this is not feasible in case of pipes of short lengths such as stoneware and concrete pipes. Where concrete encasement of concrete cradles have been provided partial covering of the pipes is not necessary.

In case of concrete and stoneware pipes with cement mortar joints pipes shall be filled with water three days after the joints have been made. The pipes shall be kept filled with water for atleast about a week before commencement of the application of the pressure to allow for the absorption of the water by the pipe walls.

The pipes are tested by plugging upper end of the pipe with a provision for an air outlet pipe with a stopcock. The water is filled through a funnel connected at the lower end provided with a plug.

After the air has been expelled through air outlet the stopcock is closed and the water level in the funnel is raised to two meters above the invert level of the upper end. Water level in the funnel is noted after 30 minutes and the quantity of water required to restore the original water level in the funnel is determined. The pipeline under pressure is then inspected while the funnel is still in position. There shall not be any leaks in the pipe line or the joints leakage in 30 min. determined by measuring the replenished water in the funnel shall not exceed 15milliliters in the smaller diameter and 60 milliliters in larger diameter per cm. Diameter of pipe for 100mtr length of pipe.

Any sewer or part thereof that does not meet the above requirements shall be emptied and repaired, or re-laid as required and tested again.

For concrete RCC pipes of more than 600 mm diameter the permissible quantity of water replenished can be increased by 10% for each additional 100mm of pipe.

Air Testing

Air testing can be permitted particularly in large diameter pipes when the required quantity of the water is not available for testing. It is done by subjecting the stretch of pipe to an air pressure of 100mm of water by means of a hand pump. If the pressure is maintained at 75mm the joints shall be assumed to be watertight. In case the drop is more than 25 mm the leaking joints shall be traced and suitably treated to ensure water tightness. The exact point of leakage can be detected by applying soap solution to all the joints on the pipeline and looking for air bubbles.

1.10.18 All the arrangements for the tests required for supply of water, pipe specials, fittings for blanking of the pipe ends, instruments, labour, tools and plant etc. shall be arranged by the contractor himself at his own cost. The rate quoted

by the contractor for laying and jointing of the pipes shall be deemed to be inclusive of the cost of testing of pipes.

1.10.19 The contractor shall be bound to follow the instructions of the Engineer regarding the test procedure, test pressure, lengths of sections for testing etc. the tests shall be carried out only in the presence of the Engineer.

1.10.20 As soon as the streach of pipe is laid and tested. A double disc or solid or closed cylinder, 75mm less in dimension than the internal diameter of the pipe shall be run through the section to ensure that it is free from any obstruction.

1.11.0 Painting

Following should be provided :-

i) Interior - Oil bound distemper.

ii) Exterior - Apex (or Asian Paints) or equivalent.

iii) Interior of Clear Water reservoir & OHT - Food grade Epoxy

All the following guidelines generally apply for painting all types of surfaces like wood, metal, masonry surfaces etc. All paints and painting materials shall only be of the quality approved by the Engineer and of approved makes.

The colour shall be of the approved shade being of the approved shade only **IS : 5807-**

1978 colours for ready mixed paints and enamels shall be followed to specify the colours.

Paints shall have a high covering capacity and be fluid enough for even spreading in a thin coat and dry quickly.

Painting shall form a tough, durable film without showing brush marks or cracks /

shivering.

Paints shall be applied as per manufacturer specification and direction of the Engineer. The surface to be painted shall be prepared as stipulated by the manufacturer of the paint. It should be clean and dry. Using wire brushes to the complete satisfaction of the Engineer.

Painting shall not be commenced till the employee approves the surface. The number of coats of paint shall be applied as specified in the bill of quantities / drawings / direction of the Engineer.

If a primer coat is specified it shall be applied with approved primer and allowed to

completely dry before applying the coats of paint. In no case a second coat of paint shall be applied until the previous coat has completely dried. The previous coat shall be allowed to dry at least 24 hours or as specified by the manufacturer.

The painting shall be done only in dry weather and when the work is perfectly free from dust, rust scales and moisture.

The paint shall be mixed thoroughly if necessary with thinner as specified to bring it to the required consistency. The batch of paint that shall be mixed shall be only that much as it can be completely used and not left over for the next working period / shift. Proper brushes shall be used for painting and rags or inferior quality of brushes shall not be used for painting.

Each coat shall be evenly covered over by using brushes. The paint shall be applied first using vertical strokes. Next coat shall be passed over at right angles to the previous coat without leaving any brush marks. The painted surface shall look uniform and evenly coated.

The paints, thinners, varnishes, oils shall be brought to the site in sealed containers as sold by the approved manufacturers of approved brands. As a general rule, it is safer to use primer, filler, undercoating and finishing paints made by the same manufacturer. All materials for painting shall be stored preferably in well-ventilated rooms free from excessive heat, spark or flame or direct rays of sun.

The containers shall be kept always closed except when using. Materials, which have become stale or fat due to improper and long storage shall not be used or mixed usable stuff.

After each days work the brushes shall be cleaned using mineral turpentine or any other thinner ensuring that the paint is completely removed from the heel of the brush. The following Indian Standards are applicable and shall be followed unless otherwise specified.

IS : 104-1979 Ready mixed paint, brushing, zinc chrome, priming

IS:124(partI,II,III) Ready mixed paint, brushing, finishing, semigloss for general purpose

IS : 157-1950 Ready mixed paint, brushing, acid and alkali resistant, lead free for general purposes

IS : 158-1981 Ready mixed paint, brushing, bituminous, black, lead free, acid alkali, water and heat resistant for general purposes

IS : 159-1981 Ready mixed paint, brushing, acid resisting for protection against acid fumes, colour as required

IS : 168-1973 Ready mixed paint, air drying, semi-gloss/matt, for general purposes

IS : 430-1972 Paint remover, solvent type non-inflammable

IS : 431-1972 Paint remover, solvent type flammable IS 104-1979

Ready mixed paint, brushing, zinc chrome, priming

IS : 2339-1963 Aluminum paint for general purposes in dual containers

IS : 5411-1972 Plastic emulsion paints (Part I and II)

IS : 5660-1970 Ready mixed paint, brushing and aluminum red oxide primer

Payment:

The rates quoted shall be deemed to be inclusive of all labour, materials, scaffolding, cleaning of the area/removing of the stains/dropping of paint after painting operations etc. No additional payment shall be admissible.

1.12 Painting

Materials

Distemper dry of required colour and shade shall be obtained ready mixed as per **IS : 427-1965**. Distemper dry. It shall be in the form of fine dry homogeneous powder form free from odour of putrefaction as such and when mixed with water.

Distemper oil bound of required colour and shade shall be obtained in ready mixed form conforming to **IS : 428-1969**. Distemper oil bound the material shall be in the form of a homogeneous paste free from odour of putrefaction as such and when mixed with water.

Acrelic smooth exterior paint of approved brand shall be applied on all exterior suface of buildings.

Workmanship

The finish to be provided with white or colour washing, distempering or painting etc., the number of coats to be applied, and any special process or treatment to be adopted shall be as indicated in the bill of quantities / drawings / directed by the Engineer.

No finish shall be executed until a sample of the finish to the required colour and the Engineers approves shade. Where more than one coat is required the Engineer shall approve each coat before subsequent coat is applied.

The colour shall be of even shade over the whole surface, shall not be of patchy appearance or badly applied.

Surfaces of doors, windows, floors, articles of furniture etc. shall be protected from being splashed upon. They shall also be cleared after the work is completed. No damage shall be caused to them and incase any damage is caused they shall be made good by the contractor at his own cost.

Necessary scaffolding or suspended platforms, or ladders, stage scaffoldings `shall be provided. For such ladders / scaffolding, protective gunny bag sacking shall be tied to prevent scratches to the flooring or walls to which they come into contract.

The surfaces to which white or colour wash is to be applied shall be cleaned thoroughly to remove all dust, dirt, mortar drops, grease and other foreign matter before the white or colour wash is applied.

All depressions holes etc. shall be filled in with mortar or putty, plaster of pans and the surface is smoothened before application of the white / colour washes / distempers to the surfaces.

The lime wash shall be prepared by slaking the lime at site and shall be mixed and stirred with about 5 liters of water per 1 kg. of unslaked lime to make a thin cream. This shall be allowed to stand for a period of 24 hours and shall then be screened through clean coarse cloth.

1 kg. of gum dissolved in hot water shall be added to every one cubic mtr. of lime cream. About 1.3kg. of common salt dissolved in hot water shall also be added for every 10 kg. of lime for making the coating hard and rub resistant. A small quantity of ultra marine blue (upto 3 gram per kg. of lime) shall also be added to the last two coats of white wash. The whole solution shall be stirred thoroughly before use.

Colour wash shall be prepared by adding mineral colour not affected by lime, gradually to the base wash prepared as for white wash and stirred well till a required tint is obtained.

Sufficient quantity of colour wash shall be prepared so as to be adequate for completing the work in one operation to avoid any difference in shades.

White wash shall be applied with brushes to the specified number of coats. The operation of each coat shall consist of a stroke of a brush given from top to bottom,

another from bottom to top over the first stroke. Similar one stroke horizontally from right and another from left before it dries. Each coat shall be allowed to dry before the next coat is applied. No portion of the surface shall be left out initially to be patched up later.

White washing on ceiling shall be done prior to that on walls. The finished dry surface shall not show any signs of cracking and peeling and the white wash shall not come off readily on the hand when rubbed.

For colour wash the first base coat shall be of white wash and subsequent coats of colour wash solution in full number of coats and the Engineer shall approve the shades so obtained shall be approved by the Engineer.

Wherever distempering is specified whether dry or oil bound distemper the surfaces shall be prepared so as remove all the dirt, grease, mortar dropping and all rubbish and shall be made smooth if required by filling up all depressions by putty, plaster of paris, cement mortar etc. and sand papered and dust wiped off. Subsequent coats shall be applied as recommended by the manufacturer after mixing the distemper as specified by them.

The various coats shall be applied only after the previous coats are thoroughly dried.

Distemper shall be applied only in dry weather with double bristled distemper brushes.

The first coat shall always be of lighter colour than that required finally and the subsequent coat shall be applied only after the previous one is thoroughly dried for atleast 24 hours or as suggested by the manufacturer.

For cement paint the surfaces shall be prepared as indicated for white and colour wash. Before applying the surfaces shall be wetted thoroughly to control surface suction. The surfaces shall be moist and not dripping wet. Surfaces which readily absorb moisture shall be wetted in one operation not more than one hour before the application of the cement paint. Surface which absorb moisture slowly shall be wetted in at least two operations not less than 30 minutes apart. The cement paint solution shall be prepared as recommended by the manufacturer and kept stirred frequently in the container to prevent segregation. The lids of the cement paint drums shall be tightly closed when not in use as the cement paint rapidly becomes air set. Curing shall be carried out with water using a fog spray two or three times a day. Curing shall also be done between coats and for at least for two days after final coat is applied. Cement paint shall be applied with relatively short stiff hog or fibre bristles.

The paint shall be brushed in uniform thickness and shall be free from excessive brush marks. The laps shall be well brushed. On external plastered and concrete surfaces cement paints shall be vigorously scrubbed on in such a way as to work the paint into the voids and provide a continuous paint film free from pin holes and other opening. The finished surface shall present an even and uniform shades without patches, paint drops etc.

1.13 Doors, windows, grills, rolling shutters etc.

The items under this clause cover doors, windows, grills, rolling shutters, collapsible gates etc. normally required to be provided in a building used whether for residential, office, laboratory or industrial purpose.

Doors and windows shutter and window mesh to check the brides shall be of aluminum as specified in the bill of quantities / drawings or as directed by the engineer. The sizes of the above items and locations of the same shall be as shown in the drawings.

All the doors (except rolling shutters) windows (glazed +mesh) & ventilators to be provided of Aluminum and rolling shutters made if 18 gauge M.S. sheet of approved make.

They shall be provided with all necessary fittings will be ISI marked like hold fasts, hinges, locking arrangements stoppers, eyes and hooks, tower bolts, handles, fixing lugs etc. of sizes and quality grade as specified.

They shall be provided in complete form including painting, glazing, fixing in position true to level and plumb, steel rolling shutters shall be of approved make and shall conform to **IS : 6248-1979**. Metal rolling shutters and rolling grills.

The builders hardware shall all be as per relevant Indian Standards.

1.14.0 Structural steel fabrication work

1.14.1 General

Structural steel fabrication work shall include all types of steel structural work required for installation of platforms for operation and installation of equipment where rolled steel sections are joined together either by bolting or riveting or welding as specified in the drawings / bill of quantities / directed by the engineer. It shall also include fabrication and installation of air vessels / pressure vessels etc. Covers for

ducts for electrical panels along with their seating arrangements are also classified under this heading unless they are provided separately under a different heading.

1.14.2 Materials

Structural steel that is used for fabrication shall be conforming to any of the following grades of steel as specified to each of the works.

IS 226-1975 Structural steel (standard quality)

IS 1977-1975 Structural steel (ordinary quality)

IS 2062-1980 Weld able Structural steel (fusion quality)

Whenever steel is supplied by the contractor, he shall on demand produce the test certificates from the manufacturer.

The welding rods used for fabrication shall conform to **IS 814-1974** (part I &II).

The fasteners like bolts, nuts etc. shall conform to **IS 1367**.

Rivets shall conform to **IS 1148-1982**. Plain washers shall conform to **IS 2016-1967**.

Spring washers shall conform to **IS 3063-1972**.

1.14.3 Fabrication

All the shop drawings shall be prepared by the contractor and submitted in advance of at least 15 days to the engineer for his approval. The drawings shall be submitted in triplicate. The fabrication work shall not be taken in hand until the shop drawings are approved by the engineer. Approval of the shop drawings however shall not relieve the contractor of his responsibility of correct conformation to the approved drawings shall be given to the contractor for going ahead with the fabrication work.

In the shop drawings to be submitted by the contractor standards symbols as described in the **IS 813-1961** shall be followed.

Fabrication work shall be carried out as laid down in **IS 800-1984** Code of practice for general construction in steel.

Welding shall be carried out in accordance with the following specifications as applicable :

IS : 803-1976 Code of practice for design fabrication and erection of vertical mild steel cylindrical welding oil storage tanks

IS : 816-1969 Code of practice for use of metal are welding for general construction in mild steel.

IS : 822-1970 Code of practice for manual arc welding of mild steel

IS : 9595-1980 Recommendation metal are welding of carbon radiographic tests are required to be carried out as directed by the engineer incase of pressure vess

IS : 818-1968 Code of practice for safety and health requirements in electric and gas welding and culling operations.

IS : 3016-1982 Code of practice for fire precautions in welding and cutting operations

IS : 7205-1973 Safety code for erection of structural steel work

The sanctions shall be fixed absolutely vertical or to the specified angle as shown in the drawings / as desired / directed by the engineer.

All connections like angle bracket, cleats, gusset plates, anchor bolts, bearing plates shall all be fixed as shown in the drawings. This shall also include all labour costs, materials and equipment required for all fabrication hoisting, erection and satisfactory completion of the item of work.

The supply of materials include all structural members like rolled sections, plates, brackets rivets, bolts and nuts and welds.

The steel work shall be painted as specified in the drawings, described in the bill of quantities or as directed by the engineer, unless otherwise provided for in the bill of quantities separately, the rate quoted for the item is inclusive of all costs for painting like cost of paint, cost of labour, scaffolding etc. Welding work shall be done generally using electric arcs welding. Where public electricity is not available, generators shall be arranged by the contractor himself.

Gas welding shall not be allowed to be resorted to for welding. Under special circumstances if in the opinion of the engineer it cannot be avoided, gas welding can be done with the prior permission of the engineer. However gas welding shall not be used criteria for consideration.

All arrangements shall be made by the contractor for access for inspection by the engineer or his representative to the workshop where the welding work is being carried out and necessary equipment like gauges, measuring instruments etc., shall be made available to the inspecting personnel.

Painting work shall not be started without the express approval of the engineer and the painting shall be started only after his inspection and approval of the works after carrying out surface preparations.

All holes shall be carefully marked and welded. Holes shall have their axis perpendicular to the surfaces bored through. Hole through two or more members shall be truly concentric. Holes shall not be formed by welding process.

All the temporary connections of parts / assembly shall be done in the following ways :

For welded structures : Tack welding fasteners, devices, fixtures.

For riveted and bolted structures joining shall be done by adequate number of bolts. If tack welding is permitted by the Engineer, same shall be removed after the work is completed.

For the riveted structure in which holes are to be drilled after assembly appropriate fixtures shall do joining.

Welded joints shall be free from defects that would impair the service performance of the construction. All the welds shall be free from incomplete penetration, incomplete fusion, slag inclusion, burns, unwelded crators undercuts and cracks in the welded metal, porosity etc. All the defects shall be rectified as directed by the Engineer. Defective portions shall be removed to he sound metal and re-welded. Caulking shall not permit rectification of the welds by caulking.

All welds shall be cleaned of slag and other deposits after completion.

1.14.4 Payments

In the case of rolled sections lengths shall be measured correct to length and weight calculated on the basis of standard weight per meter indicated in IS Handbook for structural rolled sections, limited to the lengths shown on the drawings. The weights shall be calculated upto 0.1 kg. weight of steel plates shall be calculated separately on the basis of actual shape and thickness provided allowing 5% for wastage or cut outs. In case of bolted work, the weights of bolts, nuts, washers shall be added in full and no deductions shall be made for bolt holes.

In case of riveted work only the weight of the rivet heads shall be added and no deduction shall be made or the rivet holes. No increase in weight small be permissible in welded work due to welding.

The cost of electricity for are welding / gas for gas welding shall not be paid separately. The rates quoted for fabrication work shall be deemed to be inclusive of such costs and also cost of testing where required to be carried out as directed by the Engineer or as specified.

1.15.0 Damp Proofing

Damp proofing course where specified shall be provided as described below:

1. Two coats of hot tar shall be applied over the well cleaned surface of walls where DPC is to be provided.

2. Over the coat of bitumen cement concrete in proportion of 1:1 ½:3 shall be laid to the thickness specified on drawings.

3. After the concrete is fully cured, a layer of mixture of hot bitumen and coarse sand in a proportion of 7:3 shall be laid.
Thickness of the layer shall be 6mm.

1.16.0 Measurement and Payment

The item shall include all the material, labour, tools and plant required to complete the item in a best workmanship manner.
Rate shall be per sqm of the completed item.

Expansion Joints & Construction Joints

1.17 General

The item of providing expansion joints in concrete includes all the material, labour, tools and plants necessary to completing the item in best workmanlike manner.

1.18.1 Material

The material to be used in the joints shall be ribbed HDPE water stop or approved copper / metal sheet flashing of specified width approved by the engineer, bitumen impregnated fiber board as filler conforming to **IS 10566** and approved sealant material (in case of movement joint only).

1.18.2 Joints in floor

Joints in floor shall be provided as specified on drawings.

In case of HDPE water stops to be provided horizontal position flat footed HDPE water stops shall be used.

The water stops shall be provided in such a way the half the portion of water stop (width wise) is embedded in the concrete and half remains exposed for next concrete.
Steel reinforcement shall not be discontinued where construction joints in floor are provided

1.18.3 Joints in Walls

1.18.3.1 Movement Joints

Movement joints shall be provided in the walls at position shown on drawings. Water stops shall be kept in position with the help of bitumen impregnated fiber board filler.

Concrete shall be laid in such a way that half the portion of water stop remains exposed for next concreting.

1.18.3.2 Construction Joints

Construction joints shall be provided between two lifts of concrete as shown on drawings.

A groove shall be formed around exposed portion the HDPE water stop for proper jointing.

Care shall be taken during concreting to keep the water stop in vertical position.

In no case shall be water stop be punctured or nailed with the binding wire to keep it in position. Whenever required to be jointed the water stop shall be welded in T, x or L pattern or lapped as per the instruction of engineer.

1.18.4 Measurement and Payment

Separate rates shall be quoted for movement joints and construction joints.

The rates shall be quoted inclusive of all the material, labour and tools and plant.

Mode of measurement shall be per running meter of the joint.

1.18.5 Recommended makes (for water stops only)

1. FIXOSTOP
2. CHEMPLAST
3. CALIPLAST
4. JYOTIPOLYMER
5. DURON

1.19 Sluice valves / Butterfly Valves

1.19.1 Specifications for Sluice Valves/ Butterfly Valves

The sluice valves shall be of DI conforming to **IS 780, IS 2906** and IS **14846** for valves or relevant code with latest amendment. The sluice valve shall have flanges on both ends. The valve rating shall not be less than PN 1.0. Sluice valves should have stainless steel AISI / 3 IG spindle and stainless steel AISI / 304 seat rings and for check rating stainless steel AISI/304 seat rings.

Valves should be suitable for working pressure of 6kg/sq.cm (seat test) and body tested to 9 kg/sqm.cm.

Flanged drilled to **IS – 1538** part IV and VI.

Air Valves

The air valves to be fixed at proper places shall be of best available quality. Single chamber DI DUUJET Air Valve with body cover ductile Iron of grade GGG-40 shall used. The material body of Air Vave should be Ductile Iron. All the internal parts such as float, shell etc. all cover bolts should made of austenitic alloy steel and Gasket should be made of EPDM. The Valve should be with electrostatic powder coating both inside and outside. The valves should be vacuum tight and 100% leak proof with face-to-face dimension. The valve should be with stand successfully against the pressure PN-1.0 as per required specifications.

1.19.1.1 M.S. Pipe / M.S. Specials and Gap Pieces

M.S. specials and gap pieces would be fabricated from M.S. plates of minimum thickness 12 mm (as per relevant IS specification) by electric resistance welding.

The welded steel gap pieces and specials shall conform to IS : 3589- 1981. Some of the important specifications for the same would be as below :

i) Materials

The mild steel plates used for fabrication of specials and gap pieces shall conform to IS : 226- 1975 and IS : 2062- 1984. The welding electrodes used would conform to IS : 814 (Part-II) 1974.

The M.S. gap pieces and specials shall be required to withstand an internal test pressure of 6kg/cm^2 and external pressure caused due to overburden according to varying depths in various reaches as per L-Section and other stresses caused during fabrication, handling, deformation when not under pressure, stresses due

to self weight, stresses due to the weight of water and its tractive forces etc. and their various combination.

ii) Manufacture

The M.S. specials and gap pieces would be fabricated as per provisions made in IS : 3589-1981.

They would be fabricated by electric resistance welding, to be carried out in accordance with provisions made in IS : 816-1969.

Necessary anti-corrosive coatings on external and internal surfaces of the M.S. specials and gap pieces would be provided by lining and out coating with concrete or cement mortar of suitable mix so as to make it impervious using mesh reinforcement. All other exposed metallic surfaces including nuts, bolts etc. would be rendered anticorrosive by application of anticorrosive paints.

Dimensions of specials would conform to the specifications given for C.I. specials in IS : 1538 (Parts I to XXIII)- 1976.

iii) Tests

The ladle, analysis of the steel used in M.S. specials and gap pieces when made in accordance with IS : 228 (Part III)- 1972 and IS : 228 (Part-IX)- 1975, shall not show sulphur and phosphorous in amounts exceeding 0.06 percent each.

The welded joints shall be tested in accordance with procedure laid down in IS : 3600 (Part-I)- 1973. One test specimen taken from at least one field joint out of any ten shall be subjected to test.

iv) Workmanship

The specials and gap pieces shall be clearly finished and reasonably free from scale. They shall be reasonably straight free from cracks, surface flaws, laminations and other defects.

1.19.2 Test on Sluice Valves

1 Shop Test

1.1 Operational check

All valves shall be tested at the factory for smooth, trouble free operation and operating torque requirements by operating between fully closed position three times.

1.2 Hydraulic Test

The hydrostatic tests shall consist of :

a) Application of the pressure equal to 1.5 times the maximum working pressure specified in this section with both ends closed and valve fully open, for ten minutes. No leakage of water should occur through the metal, flanged joints or valve packing gland, nor should any permanent deformation of any part occur.

b) The pressure shall then be reduced to the working pressure and the wedge gate lowered thus closing the valve. The stipulated pressure shall then be maintained for 5 minutes.

1.19.3 Check valves and Piping

1 Shop Test

Application of pressure equal to 1.5 times the specified maximum working pressure with both ends closed for 10 minutes. No leakage of water should occur through metal and joints and no permanent deformation for any part should occur.

2 Field Test

Operation check to be carried out after installation and before commissioning.

SECTION – 2

LAYING & JOINTING OF DISTRIBUTION SYSTEM

2.1 DETAILED SPECIFICATIONS FOR WATER PIPE LINE WORKS

TECHNICAL GENERAL SPECIFICATIONS

All the works as mentioned in schedule 'G' and other works pertaining to the unit shall be executed in confirmation to the relevant latest edition of Indian Standard Code specification published by Bureau of Indian Standard. If a case arises where Indian Standard Codes are silent, the current relevant specifications published by different Engineering departments shall be followed in the order viz

1. Jal Nigam/L.S.G.E.D. Specifications
2. Uttar Pradesh Public Works Department
3. Uttar Pradesh Irrigation Department
4. Central Public Works Department
5. Indian Water Works Association Standards.
6. Central Government Public Health Engineering Organisations' Manuals etc.
7. Due to the technological development if a case arises where all India Standards are silent, and International Standard shall be followed.

2.2 EXTENT OF WORK

The contract provides for the supply, laying and jointing of all AC/PVC pipe line for distribution system & specials and all other appurtenant works as per schedule 'G'

2.3 LIMIT OF CONTRACT

The contract shall be deemed to be complete after all the works have been tested and handed over to the Nagar Nigam Ayodhya and with stood a defects liability period of 12 months after the date of commissioning and passage of 4 months trial run period without developing any defects etc. It will be wholly contractor's responsibility to replace the whole or part of pipelines and fittings/chambers at his own cost, if any irreparable defect or damage due to failure of pipe, fittings, specials and other materials occurs or the work is found to be of inferior quality beyond acceptance in the opinion of Engineer In charge even after execution & during the maintenance period. **If contractor fails to hand over the works within in the stipulated time of trial & run with defect liability period, his security money shall be forfeited.**

2.4 EXCAVATION OF TRENCHES

The excavation in trenches shall be carried out in accordance with the detailed specifications laid down in U.P.J.N.'s detailed specifications, which can be seen in the office at any working day during office hours before filling in the tender, and the

contractor's rate shall include all such works as detailed there in as well as all timbering, shoring and shuttering works, as this shall not be paid extra.

The rate shall be good for excavation in all types of strata and no separate claim in this connection shall be entertained. The contractor shall be liable for any damage done to any adjacent property or to any of the works in partiality or completely by settlement or movement of trenches which in the opinion of the Engineer attributable to any of the excavation/ trench work timbering and refilling included in this contract or not withstanding such settlement may be allowed to have been caused by the construction of any kind of subsoil water during progress of pumping. The contractor shall also be responsible for all slips and shall not be paid extra for their removal. He shall also make good all damages due to slips, etc., and complete all the works. The contractor's lump-sum rates should therefore also include refilling of trenches in layers including watering and ramming and disposal of surplus earth any where, as desired by Engineer without creating any nuisance or complaint and without any extra claim what so ever. The trenches should be so dug that the pipe may be laid to the required gradient and at the required depth to give one meter clear cover. Additional width & depth should be provided at positions of joints, flanges, fittings for proper jointing. Trench width should not be less than 60 cm. plus inner dia of pipe. The rates should also Include for refilling of trenches including watering & ramming & disposal of surplus earth etc. complete. The rates of excavations shall be inclusive of display of flags, caution boards, fencing,

lighting, watering, etc. lead shall be from the centreof area of excavation to the centreof heap and lift is to be measured from the mean ground level to the bottom of the excavation.

2.5 DISMANTLING AND TEMP. REINSTATEMENT OF ROADS

The permission for dismantling of roads shall be obtained by the contractor and its charges will be paid to the concerned department by U.P. Jal Nigam and all correspondence on demand shall be done by U.P. Jal Nigam but dismantling work shall be done by the contractor and its charges shall be taken in the tendered cost.

2.6 CUSHIONS ALL ROUND THE PIPES

To avoid damage to the HDPE pipes due to kankar/boulders and other sharp object, if at all encounter in field then sand or alluvial soil cushion or screened earth free from all above unwanted objects shall be provided which shall be laid under the above pipe lines in thickness ½ of the outer dia of pipe or 15 cm. whichever is maximum.

No extra payment shall be paid to contractor

2.7 JOINTING OF PIPES AND FITTINGS

2.7.1 D.I. DETACHABLE FLANGED JOINTS

It shall consist of two D.I. flanges, D.I. collar and two rubber rings with a set of nut bolts. For jointing, a flange, a rubber ring and a collar should be slipped to the first pipe In that order, a flange and a rubber ring shall be introduced from the jointing of the next pipe. After aligning the both pipes and keeping the collar centrally placed. Joints of the flanges shall be tightened with nut and bolts.

2.7.2 SUPPLY & FIXING OF VALVES AND FITTINGS

2.7.2.1 Plain ended C.I. valves confirming to I.S. 2906-1984 and I.S.I. marked fittings and specials confirming to I.S.-5531-1977 (part 1 to 3) shall be supplied and fixed as per method described above and relevant IS Codes/Manual on water supply & treatment-1993 or its latest edition.

2.7.2.1 D.I. flanged specials and fittings like tee, bends tapers, etc. confirming to I.S. 1538-1976/84 or its latest amendments part 1 to 24 shall be supplied and jointed as per methods told above. Supply and fixing of D.I. D/F, Sluice Valve I.S.I. marked will confirm to IS 780-1984 tested to 10 kg./cm^2. Underground fire hydrant ' (sluice valve type) shall be supplied and fixed as per IS: 909-1975 or its latest amendment. Selection, installation and maintenance of sluice valve shall confirm to specification laid down in IS 2685-1971 or its latest amendment. Reflux valves shall confirm to IS 5312-1969 or its latest amendment. Supply and fixing ball valves horizontal plunger type shall confirm to IS 1703-1977. Air valves as required in schedule 'G' shall confirm to relevant IS codes.

2.8 TRENCH PREPERATION :

The trenches bed should be free from any rock projections, hard object such as flints, or tree roots, etc. If Kanker/boulder mixed soil is met, a with layer of sand or alluvial earth (or screened earth) equal to ½ dia of the pipe or 15 cm. whichever Is maximum shall be provided under and above HDPE pipes. Sand/earth cushions shall not be paid extra. Depth of trenches should be such as to provide minimum one meter cover td the pipe. The width of trench shall be minimum 60 cm. plus the inner dia of pipe for proper laying of pipeline.

2.9 LAYING AND JOINTING

Pipes shall be laid end to end in already prepared trenches and using solvent cement, socket and spigot joint shall be made. The socket in the form of injection molded fittings shall be used and glued to pipes with solvent cement. Full load should be done only after 48 hours of jointing. Contractor shall be solely responsible for pipe lines to be made 100% leak proof during work and for a maintenance period of one year after the date of commissioning.

2.10 PRESSURE TESTING OF AC/PVC PIPES

Pressure testing of DI K-7/HDPE/AC/PVC pipes shall not be done until otherwise desired by the Engineer In charge. However, pipelines shall be tested against any leakage by the contractor in a Manner as SPECIFIED in relevant IS code or as the Manual on water supply and treatment. Prior to testing care should be taken to evacuate any entrapped air and slowly raising the system to appropriate test pressure. After about one hour has elapsed a measured quantity of water shall be pumped to bring the pressure back to test pressure, if there is a loss of pressure during the test. The quantity of water required to restore the test pressure of 30 M. for 24 hours should not exceed 1.5 litres per 10mm of nominal dia for a length of 1 Km.

Contractor shall include in his rates sufficient margin for testing and repair of subsequent leakages of joints, fitting and specials during work and after commissioning of pipe line and also during maintenance period of one year. During maintenance period contractor will also include material cost for repairing of pipe line as well as cost of repair of public places due to excavation.

2.11 LAYING AND JOINTING OF D.I. PIPES AND FITTINGS FOR DISTRIBUTION SYSTEM/RISING MAINS

Supply of DI K-7/HDPE/AC/PVC pipe of required size and class as per schedule G and index plan shall confirm to IS code or its latest amendment with its latest revision. Jal Nigam specifications/ Manual on water supply & treatment 1993 or its latest edition.

2.12 INTERCONNECTIONS

Suitable interconnections shall be made as per direction of Engineer-In-charge with the existing main for equitable distribution of flow in the distribution system. Details of works to be executed are given in Schedule 'G'. The extent of this work is subject to change on either side as per requirement & satisfaction of Engineer.

2.13.1 <u>OTHER ITEMS</u>

No extra payment shall be made to the contractor for:

a). Inter connection done in any running line.

b). Emergency work carried out in night hour to efficient start of water supply during day hours.

c). Material used during maintenance period for repair of leakage and other repairs.

d). Control of traffic, proper sign boards and lighting arrangement for working in night.

2.13.2 Contractor will manage all arrangement for material at his own cost. In this regards he will give letter for inspection of materials to department. All expenses shall be born by the contractor. Material will be only supplied by the contractor after satisfactory inspection by the department.

2.13.3 Senctional testing of pipe line should be done by the contractor while testing of pipe line.

SECTION – 3

IMPLEMENTATION OF METERING

Detailed Technical Specifications

1. **Scope:**

Supply of dry dial, inferential type, Multi Jet, Magnetically coupled, class 'B' water meters complete with tubular strainer, brass nuts and nipples conforming to IS-779 1994 and ISO 4064 1993 standard with EEC/ MID Approval and marking, shall be with protection class of IP68 and with facility for wireless AMR compatibility with 5 years warranty.
(AMR compatibility means that meter can be up-graded to AMR platform at some additional cost if needed, in the future. AMR compatibility does not add cost to the meter)

2. Technical Specifications for domestic water meter:-

2.1 Applicable Standards:

Water meter are straight reading type domestic water meters, inferential type, multi jet, magnetically coupled, having dry dial, Class 'B' conforming to IS-779: 1994 with up to date amendments AND ISO 4064 standard with EEC/MID approval and marking having super dry register with protection class of IP 68 and shall have facility for wireless AMR (Automated Meter Reading) compatibility for up-gradation to AMR in the future.
The meters shall be supplied complete with brass nuts and brass nipples. Strainer & sealing shall be provided as per relevant IS provision.

2.2 Material of construction:

a) The body of the meter shall be of Brass. The firm shall specifically mention in the offer, the metal used in manufacturing. Material that come in contact with the water supply shall withstand 2 ppm (parts per million) of chlorine residual in the water supply and shall be resistant to corrosion.

b) The water meter and accessories shall be manufactured from materials of adequate strength and durability. The materials, which come in contact with the potable water, shall not create a toxic hazard, shall not support microbial growth, and shall not give rise to unpleasant taste or discoloration in the water supply. However, the spindle and bearings inside the hydraulic chamber shall be made of polished stainless steel with hard metal tip/ sapphire.

c) The internal pressure cup shall be made of Engineering plastic. The lower case of the meter shall be painted with thermal painting externally. The painting materials should be safe for human uses and not affect human health.

d) Variation in weight of the meter will be permissible to ± 5% of the weight indicated by the bidder in his technical bid.

e) Each meter should be supplied in separate individual box with its accessories and test certificates and Warranty card for free repair/ replacement for duration of 5 years. The no. of individual boxes of meters shall not exceed 30 nos in each cartoon.

f) The meters proposed should possess successful Lifecycle/ Endurance Test Certificate as per ISO 4064- 1993 from Fluid Control Research Institute, Kerala. The Lifecycle certificate should not be more than 2 year older that the date of notification of Tender.

2.3 Markings On The Body Of The Meter:

(a) Marking on dial/ cap.

i. Class "B"
ii. Multijet
iii. Magnetic Type
iv. As per ISO: 4064-1993
v. EEC/ MID Mark and approval no.
vi. Make/Brand
vii. Model Name

vii. Sl.No.
ix. Year of Manufacture

(b) Embossing/ engraved on meter body

i. Size in mm
ii. Direction of flow of water on both sides of the body of meter

2.4 The Register and Register Shield :-

The Register shall be designed in such a way that if the Register protective glass is broken for a reason or another the Register cannot be removed from its place. The Register protective cover shall be made of **mineral glass and shall have a thickness of not less than 5mm and shall pass specified tests.**

Shock glass is defined as the ability of the cover protection glass to withstand, without damage, a free fall of a metal ball weighing 27.2 grams from a vertical distance of not less than 70 cm and window subject to clear veibility till end of warranty period.

The Register should have facility to externally mount AMR communication module for upgradation to AMR in the future.

2.5 Register or Registration Box :-

A] It shall be of straight reading type.
B] The Register shall register in cubic meter units.
C] The Register reading should be less than 1KL when supplied.
D] The Register shall consist of a row of at-least 4 in-line consecutive digits to denote maximum reading of 9999 KL.
E] Another three digits or pointers shall register flows in litors and should be of a different colour.
F] The Register should be of closed type.
G] The Register must be suitable for test on an electronic test bench.
H] The register cover shall be made of copper backed 5mm thickness mineral glass cover (required to maintain IP 68 protection class under 1 m water column for 48 hours.)
I] Meter will be provided with monolithic plastic seal with copper wire.
J] The register should be compatible for remote reading. The remote reading feature must be able to be added without taking out the meter from the pipe or dismantling the meter.

2.6 Pressure and Temperature :-

The working pressure shall not be less than 16 bar and shall conform to the testing in accordance with ISO 4064. The meter shall be capable to operate in an ambient temperature of up to 50 ^{0}C.

2.7 Pressure Loss :-

The pressure loss through the water meter shall not be greater than 1 bar at Qmax.

2.8 Conformance to Meter Testing:-

The water meter shall be tested for conformance to accuracy, pressure tightness and head loss according to ISO-4064.

Contractor

SCHEDULE ‘A’

NAME & PLACE OF WORK

Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete(civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city” On turnkey basis.

PURPOSE OF WORK

TO PROVIDE WATER SUPPLY IN THE REMAING AREA OF NAGAR PALIKA PARISHAD SULTANPUR AMRUT PROGRAMME

WORKS TO BE INCLUDED IN THIS METHOD

Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete(civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city” On turnkey basis DETAILS OF WORKS ARE GIVEN IN SCHEDULE “G”.

EXCUTIVE ENGINEER CONTRACTOR

SCHEDULE 'B'

NAME & PLACE OF WORK

Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete(civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city" On turnkey basis

I HAVE VISITED THE SITE AND QUOTING THE RATES AS PER SITE CONDITION.

SIGNATURE OF	SIGNATURE .....
EXCUTIVE ENGINEER	NAME OF CONTRACTOR .....
	ADDRESS .....

SCHEDULE 'C'

NAME & PLACE OF WORK

Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete(civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city" On turnkey basis.

(A) DESIGN AND DRAWINGS TO BE SUBMITTED BY THE CONTRACTOR WITH THE TENDERS FOR RCC STRUCTURE

.

(i) Properties and constitution of cement concrete proposed to be used for different portions of work.

(ii) Size of aggregate that will be used.

(iii) Details of any specials treatment proposed or any special/water/proofing compound proposed to be used.

(B) DESIGN AND DRAWINGS TO BE SUBMITTED BY THE CONTRACTOR:

(i) Design, drawing and reinforcement schedule of all Foundation/ beams/columns/slabs of the buildings.

(ii)

(C) COMPLETION DRAWING:

On completion of the work the contractor shall submit to the Executive Engineer three bound set.

(i) Completion plan of Distribution system and related works.

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

Signature of

EXCUTIVE ENGINEER

Signature .....

Name of contractor .....

Address .....

SCHEDULE 'D'

NAME & PLACE OF WORK

Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete(civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city" On turnkey basis.

SAMPLE TO BE SUPPLIED BY THE CONTRACTOR

On demand to be delivered either at the site of work or the office the Engineer

S. No.	Name of Material	Qty Unit
1.	Medium fine sand	As specified by U.P. P.W.D./
2.	Coarse sand	UPJN investigating agency/Lab
3.	Bharat koop stone grit/jhansi stone grit	" "
4.	Brick ballast	" "
5.	Bricks	" "
6.	Cement	" "
7.	Steel	" "
8.	Snowcem and white/colour washing materials	" "
9.	Paint	" "
10.	Varnish	" "
11.	Other material required for completion of work	" "

Or any other sample if required by the Engineer form time to time. Contractor should note that no payment shall be made for all above samples. Therefore, contractor should quote rates in schedule "G" taking into account cost of all such samples.

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

Signature of
EXCUTIVE ENGINEER

Signature .....
Name of contractor .....
Address .....

SCHEDULE 'E'

NAME & PLACE OF WORK

Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete(civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city" On turnkey basis.

Test to be carried out the contractor at his own expenses as per direction of Engineer-In-Charge for time as follows:

(1)

(a) Sieve analysis of sand
(b) Test of sand for silt and clay content.
(c) Test of water (Chemical) to be used for construction work.
(d) Slump test for concrete mix.
(e) Uniformity co-efficient of coarse aggregate.
(f) Test for compressive strength of concrete cubes.
(g) Test of cement
(h) Test of steel

In Case of any such defects, as mentioned above, the contractor shall either rectify the defect to the satisfaction of the Engineer or even reconstruct the faulty part of the structure at his own cost.

(2) The structural safety and soundness of the structure shall be wholly and solely the responsibility of the contractor.

(3) The contractor shall bear all costs of carrying out the above tests and other tests as desired by the Engineer.

Signature of	Signature .....
EXCUTIVE ENGINEER	Name of contractor .....
	Address .....

SCHEDULE – F

(TIME OF COMPLETION)

The complete work as specified herein shall be completed in all respects, passed to the satisfaction of Engineer and tested as per latest U.P. Jal Nigam/U.P PWD or I.S. specification/codes and provisions in manual of water supply on the subject within 12 calendar months from the date of written order to the contractor for commencement of the work .

The contractor shall maintain the scheme for twelve months after completion of works no payment shall be made for expenditure incurred during maintenance period. Security money will be released after successful maintenance period.

SCHEDULE 'H'

RATES OF ITEMS WHICH ARE NOT TAKEN IN SCHEDULE "G"

Engineer shall have power to ask for performing the works (Not in schedule 'G') pertaining to main work in writing. Any additional work given under this schedule done by the contractor in this manner shall be paid on the basis of following schedule after the approval of the competent authority. However, for other extra works, items of schedule 'G' not specifically covered in schedule 'H' Rates quoted in schedule 'G' will be followed proportionately.

If a case arises where no analysis is available with the payment of such additional work shall be done on the basis of current market value assessment mutually agreed upon the approval by the competent authority. These types of additional works shall be taken up for actual execution only after the approval of the competent authority. In case any work is done by the contractor without getting proper approval, it will be on won risk.

I/We have read, understood and accept for compliance, the above mentioned in-striation and conditions of this schedule and have taken these factors in to account while quoting rates in schedule 'G'

Signature .....

Name of Contractor .....

Address.....

SCHEDULE 'I'

(1) All specials and fittings as per requirement of the work shall be supplied by the contractor at his own cost.

1. The tested I.S.I. mark of T.M.T. bars of SAIL, TATA or Rastriya Ispat Nigam Ltd. for reinforcement & cement, sand, stone grit arrange by the contractor on his own cost. Cement of brand ACC, Prism or J.P. will be used for construction.
2. The proper account of the all materials shall be kept by contractor in any bound register.
3. The safety and proper storage of materials is full responsibility of contractor.

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

Signature .....

Name of Contractor .....

Address .....

SCHEDULE ‘J’ (CIVIL WORK)

NAME OF WORK :

Supply of all materials, labour and T&P for laying and jointing of distribution system, making of house connections and installation of domestic water metre complete(civil works) including automation through SCADA of Tube Wells, OHTs, ZPS and other related E&M. Works for different Zones of Sultanpur city” On turnkey basis.

Sl. No.	Name of work	Percentage of payment
1	As per above	As per item wise actual and detailed measurements.

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

Signature .....

Name of Contractor .....

Address .....

SCHEDULE 'J-1' (E/M)

(Terms and Procedures of Payment)

The following shall be the breakup for the running payments of Execution of Reorganization of Water Supply Scheme on the basis of schedule "G"

S.No.	Description of work	Payment	
A	**Pumping Plant, Voltage Stabilizer, Chlorinating Plant & Internal wiring**		
1.	After supply of material at respective site	**70%**	Of Pumping Plant cost
2	After installation, commissioning, testing and 3 months test & trial run	**20%**	
3	After successful completion of operation & defect liability period of 18/24 months	**10%**	
B	**SCADA Automation**		
1	After supply of material at respective site	**70%**	Of SCADA/ AUTOMATION
2	After installation, commissioning, testing and 3 months test & trial run	**20%**	
3	After successful completion of operation & defect liability period of 12 months	**10%**	
C	**Separate Contract Bond shall be made for Operation & Maintenance for 5 years**		
1	After 1 year successful running & maintenance of the scheme	20%	5 Year O&M Cost
2	After 2 year successful maintenance Of the scheme	20%	
3	After 3 year successful maintenance Of the scheme	20%	
4	After 4 year successful maintenance Of the scheme	20%	
5	After 5 year successful maintenance Of the scheme	20%	

Note	Payment for Electricity charges & chlorination shall be made by Jalkal Vibhag, Nagar Nigam, Ayodhya Faizabad
	Old Machinary and Equipments have to be maintained by Jalkal Vibhag, Nagar Nigam, Ayodhya Faizabad
	Staff deputed during execution of work, trial run & defect liability period shall be borne by firm.

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

Signature.....

Name of Contractor.....

Address.....

SCHEDULE 'K'

CONSTRUCTION AND CONDITIONS BEFORE QUOTING RATES

Tenders are advised to visit the site themselves with the work and Tenders must read and understand the relevant specifications and standards in this tender.

Tenders must quote rates for executing these works against items of schedule "G" tenders and as well as in works in English or Hindi only in the works only.

Tenders must quote the rates taking the account of the liabilities and arrangements during execution such as Trade tax, probable pipe escalation and stamp duty.

Tenders quoted by the contractor in schedule "G" must also include arrangement of water supply for labour arrangement of all labours, materials and for the safety at site of day and night including diversion of traffic, making bye pass passages for traffic etc complete. It should also include the cost of maintenance for twelve colander months from date of handling over after cleaning the whole site.

In general, the quantities mentioned against items are on the basis of the estimate may vary to any extent on either side for which no extra claim shall be entertained.

Tenderers must also take in account all the conditions and instructions as detailed in the tender elsewhere.

Tender what so ever due to any entrees in labour rates, railway, highway transport, rates duties of all type, taxes shall be entertained after the tender has been tenderers are advised to account for these while quoting the rates.

The conditions, alteration, correction or imposing of conditions other than those shall make the tender liable for rejection.

Tender writing shall be accepted and if it is unavoidable written matter shall be and signed and written in fresh.

The payment shall be made to contract or as per terms and conditions of schedule "G"

All works are to be tested after construction as per IS provisions or as per instructions of Engineer-in-charge. The expenses towards testing should be included in the rates

On completion of the work, the contractor is requested to submit completion of the time of final bill comprising detailed drawings of the executed works.

As the work in whole is to be executed by the contractor and maintained by him for rate Tender months he has to take over all guarantee for the successful functioning of the therefore, he is advised to undertake detailed survey work of the alignment to himself with the site conditions and the nature of work.

Tenderers are advised to quot their rates carefully in all parts of schedule “G”. It may be considered part wise. Work may be allotted part wise to different tenderers or whole work to one tenderer.

I/We have read, understood and accept for compliance, the above mentioned instructions and conditions of this schedule and have taken these factors in to accent while quoting rates in schedule “G”.

Signature .....

Name of Contractor .....

Address.....

SECTION- 5

E-TENDER FOR

AUTOMATION THROUGH SCADA OF 23 NOS T.W.,05 NOS OHT AND 02 NOS. ZPS AND OTHER RELATED E/M WORKS FOR SULTANPUR TOWN UNDER AMRUT PROGRAMME.

Terms and conditions for E/M works

1. Joint ventures are allowed E/M works.

(a) Bidders must have Joint ventures for E/M Works with E/M contractor and the E/M contractor must be registered in Class-'A' category in PLC/ SCADA/Automation.

(b) "An Oath certificate" (against this tender) has to be produced on legal paper from the manufacturer/Authorized Distributor/ Dealer of Automation/SCADA to submit the tenders on their behalf. Accordingly the manufacturers of SCADA and manufacturers/ Authorized Distributor/ Dealer of SCADA are also required to give an undertaking to provide complete technical support in supply, execution and maintenance to the authorized firm and also to undertake that in case the firms fail to full fill their commitment, manufacturer will own full responsibility to complete and maintain the project.

PHYSICAL EXPEPERINCE FOR E/M WORKS:

(a) One similar completed works of automation for **24 nos** pumping Plant having **capacity 5 HP to 75 HP**

Or

One work of Supply & Execution of PLC/SCADA for minimum **576** I/O's

(b) Two similar completed works of automation for **15 nos** pumping Plant having capacity **5 HP to 75 HP**

or

Two work of Supply & Execution of PLC/SCADA for minimum **360** I/O's

(c) Three similar completed works of automation for **12 nos** pumping Plant having capacity **5 HP to 75 HP**

or

Three work of Supply & Execution of PLC/SCADA for minimum **288** I/O's

Note:- The similar completed works means PLC/SCADA automation works in any filed and does not include civil works.

2. The following information for qualifying criteria should also be given by the bidder which is also compulsory without which the tender will not be considered:

a) Bidder has to submit the detailed catalogue of the quoted items/instruments and same catalogue must be available on company website.

b) Bidder has to submit copies for certificate of CE/UL, CE & UL, CE & BIS as applicable on various products as mentioned in schedule G or in technical tender document along with the bid failing which offer will not be considered.

c) Bidder has to highlight the technical specification in the catalogue as per our technical specifications against each and every item.

d) Bidder has to submit QAP after award of contract & inspection and testing will be performed as per QAP.

e) All material is subject to third party inspection mandatory by National/International reputed organization like PDL,LLYDS, RITES, TATA PROJECTS etc. & charges related to that will be borne by bidder/ supplier the report of third party inspection should be submitted before dispatch of material .

f) Type test mentioned in the technical specification sheets against each and every item are mandatory, and bidder has to submit type test copy from National/International labs. Type test shall be directly from the manufacturer.

g) Bidder should have inspection facility traceable to National/International standard.

h) Bidder has to mention the make, out of the make approved by Chief Engineer (E/M) (list enclosed) & complete model no. Of quoted items/instruments in the following table which they are offering. If make of any item is not mentioned in the list approved by CE, bidder has to quote make as per tender specification & specifications has to comply by the catalogue attached.

SI	Quoted Items	Make	Complete offered/quoted Model No.	Detailed Catalogue/Datasheet of the quoted items are attached (Yes or No)	Technical specifications as per tender document on datasheet are highlighted (Yes or No)
1	CE& UL approved manufacturer's RTU/PLC in IP 65 panel for tube well suitable to communicate with GSM based modem unit with CPUY and power supply with analog and digital parameter and features as specified, one for e4ach tube well & OHT to Store and transmit data GSM backbone. RTU/PLC transfer data at multiple stations as specified in tender technical specification sheet.				
2	**Copy of CE & UL approval Attached/Not Attached for above item**				
3	CE& UL approved manufacturer' s RTU/PLC in IP 65 panel/Master Control Room PLC with Redundant CPU & Power supply at MCS as per spec mentioned in technical specification of tender document.				
4.	**Copy of CE& UL approval Attached/Not Attached for above item**				
5	Full development version of required TAGS SCADA software suitable for digital and analog input/output featured with customization of requirement as per spec mentioned in technical specifications of tender document.				

6	G.S.M/G.P.R.S. based wireless communication modem for RTU/PLC capable to transfer and gather date from remote sites to control stations all accessories included with signal enhancer antenna made for pumping plant as specified in tender technical specification sheet.`				
7	**CE/UL approved manufacturer's 7" HMI touch screen suitable to communicate with PLC/RTU,** for local & control of process parameters as specified in technical specification of tender document				
8	**Copy of CE/UL approved attached/not attached for above item**				
9	**CE/UL approved manufacturer's industrial grade Ethernet switch**				
10	**Copy of CE/UP approved attached/not attached for above item**				
11	**CE/UL approved manufacturer's surge protector for all AC control supplies of all equipment**				
12	**Copy of CE/UL approved attached/not attached for above item**				
13	**Auto phase reversal unit/** automatic transfer switch with inbuilt time delay & enclosure (confirming to I.E.C.-60947-1 and I.E.C.-60947-6-1) as specified in technical specification of tender document				
14	CE/UL approved manufacturer's intelligent Smart energy meter with memory real time clock and 1 serial port integrated with R.T.U				
15	**Copy of CE/UL approved attached/not attached for above item**				
16	**Motorized Actuator**				
17	**IP 65 protection control panel with soft starter**				
18	**Copy of IP 65 protection approval attached/not attached for above item**				
19	**Sluice valves with actuator**				
20	**CE/UL approved manufacturer's Sub soil water level transmitter/ hydro static type level transmitter** for submersible specified in tender technical specification sheet				

21	**Copy of CE/UL approved attached/not attached for above item**				
22	**CE/UL approved manufacturer's smart pressure transmitter** as per specifications specification sheet.				
23	**Copy of CE/UL approved attached/not attached for above item**				
24	CE/UL approved Electromagnetic flow meter (up to 350mm) suitable to measure the water discharge to be fitted. In delivery line as specified as per specifications mentioned in technical bid documents.				
25	**Copy of CE/UL approved attached/not attached for above item**				
26	**CE/UL approved manufacturer's ultrasonic flow meter(above 350mm)** suitable to measure the water discharge to be fitted in delivery line as specified as per specifications mentioned in technical bid documents.				
27	**Copy of CE/UL approved attached/not attached for above item**				
28	**CE/UL approved manufacturer's Radar type level transmitter** for overhead tank & CWR as specified in tender technical specification sheet**.**				
29	**Copy of CE/UL approved attached/not attached for above item.**				
30	**CE/BIS approved manufacturer's large video screen** with latest configuration of cubes/ controller/wall management software as per specification of 50"each with required matrix as mentioned in technical spec.				
31	**Copy of CE/UL approved attached/not attached for above item**				
32	**Desktop/PC** as per spec mentioned in technical bid documents				
33	**CE/UL approved manufacturer's UPS** as per spec mentioned in technical bid document for LVS & computers as per site requirement				
34	**Copy of CE/UL approval attached/not attached for above item**				
35	**Security surveillance IP camera for MCS**				
36	**CE/&BIS approved manufacturer's industrial grade LCD monitor with**				

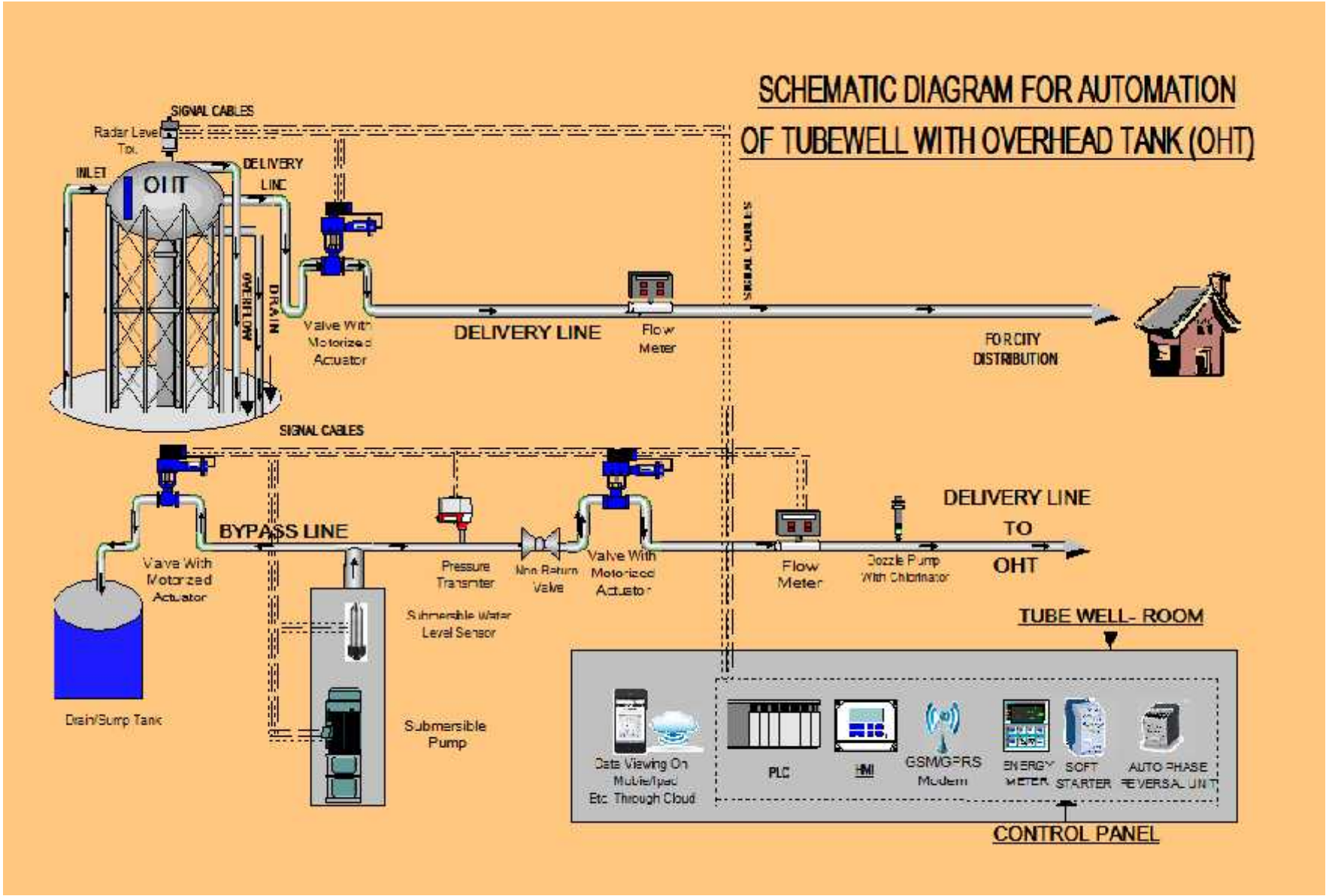
	latest configuration as per specification of size 65”				
37	**Copy of CE& BIS approval attached/not attached for above item**				
38	**CE& UL approved manufacturer’s field gateway agent for transferring data form MCS to control room**				
39	**Copy of CE& UL approval attached/ not attached for above item**				
40	**CE/UL approved manufacturer’s** Firewall for network protection				
41	**Copy of CE/UL approval attached/not attached for above item.**				
42	**CE/UL approved manufacturer’s** LIGHTNING SURGE PROTECTOR FOR ETHERNET Communication protection.				
43	**Copy of CE/UL approval attached for above item.**				

TECHNICAL SPECIFICATION FOR AUTOMATION THROUGH SCADA OF 23 NOS T.W.,05 NOS OHT AND 02 NOS. ZPS AND OTHER RELATED E/M WORKS FOR SULTANPUR TOWN UNDER AMRUT PROGRAMME.

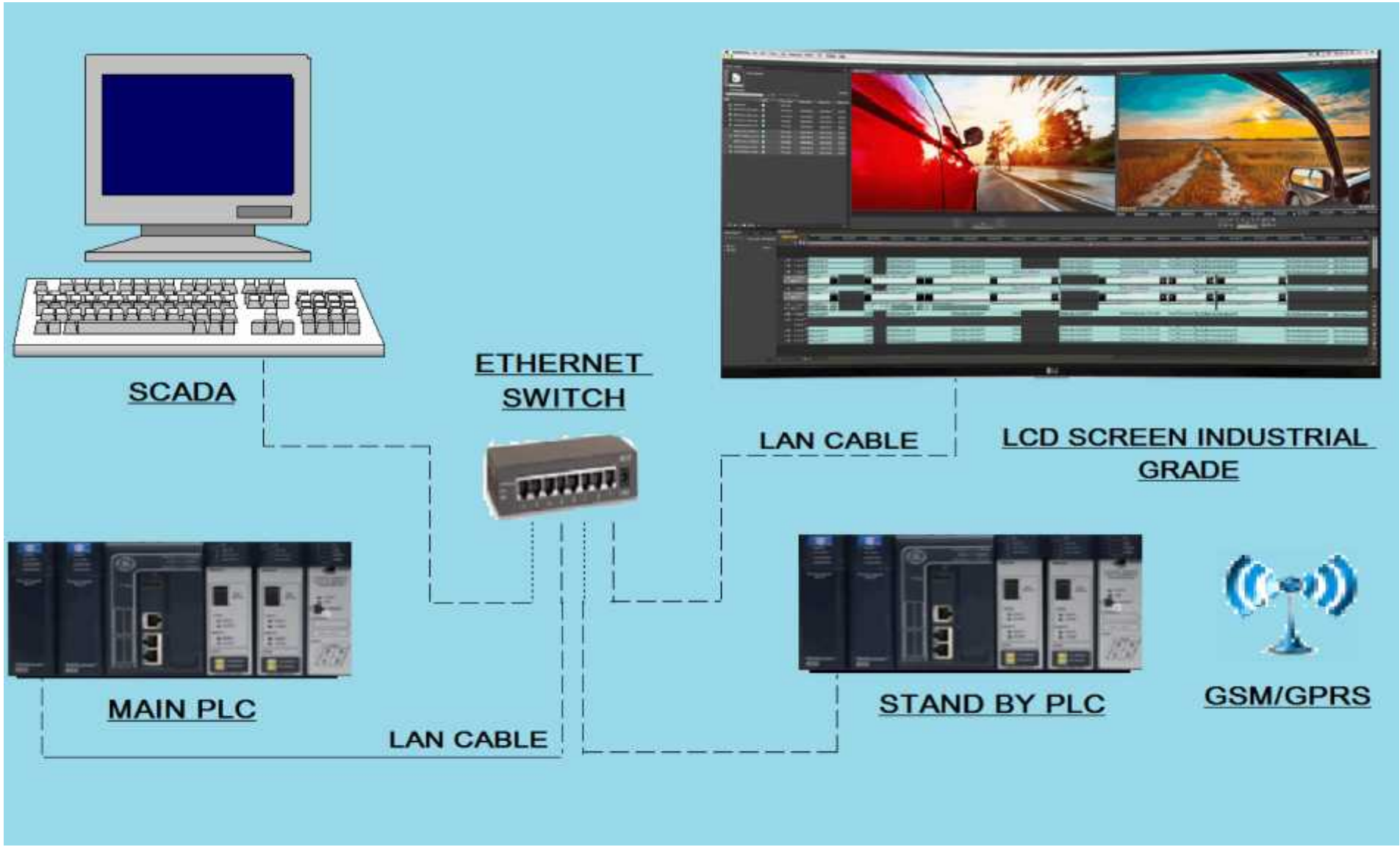
SCOPE OF WORK

The scope of work includes design, supply, installation, commissioning and maintenance for 5 years of SCADA Automation of **SULTANPUR TOWN** Water Supply consisting of automation through SCADA of 23 no t.w.,05 no OHT and 02 nos. ZPS and other related E/M works. The work include providing redundant PLC's / RTU's to collect the data and transmitting it on GSM/GPRS backbone to MCS to be installed at **SULTANPUR NAGAR PALIKA PARISHAD**. The work also include supply of electromagnetic / ultrasonic flowmeter, smart pressure transmitters, ultrasonic water level sensors, depth sensors, valve actuators, Ph-TDS-Chlorine on line analyzer, smart **energy meters**, HMI, web based Mobile app for viewing all parameters on real time, for tube wells and, for delivery line for distribution outlet at OHT's**,** auto-phase reversal relays are to be installed in each soft starter. The quantities mentioned in schedule "G" are amended up to that limit as per capacity & quantity of the soft starters. Supply of all equipments and connected hardware & software for MCS like DLP based Large Video Screens with suitable control desks, latest version of PCs for MCS rooms & Large Industrial grade LCD monitors for MCS room, industrial grade UPS and connected 32 bit SCADA software & hardware, cabling and related licenses if required so, complete in all respect.

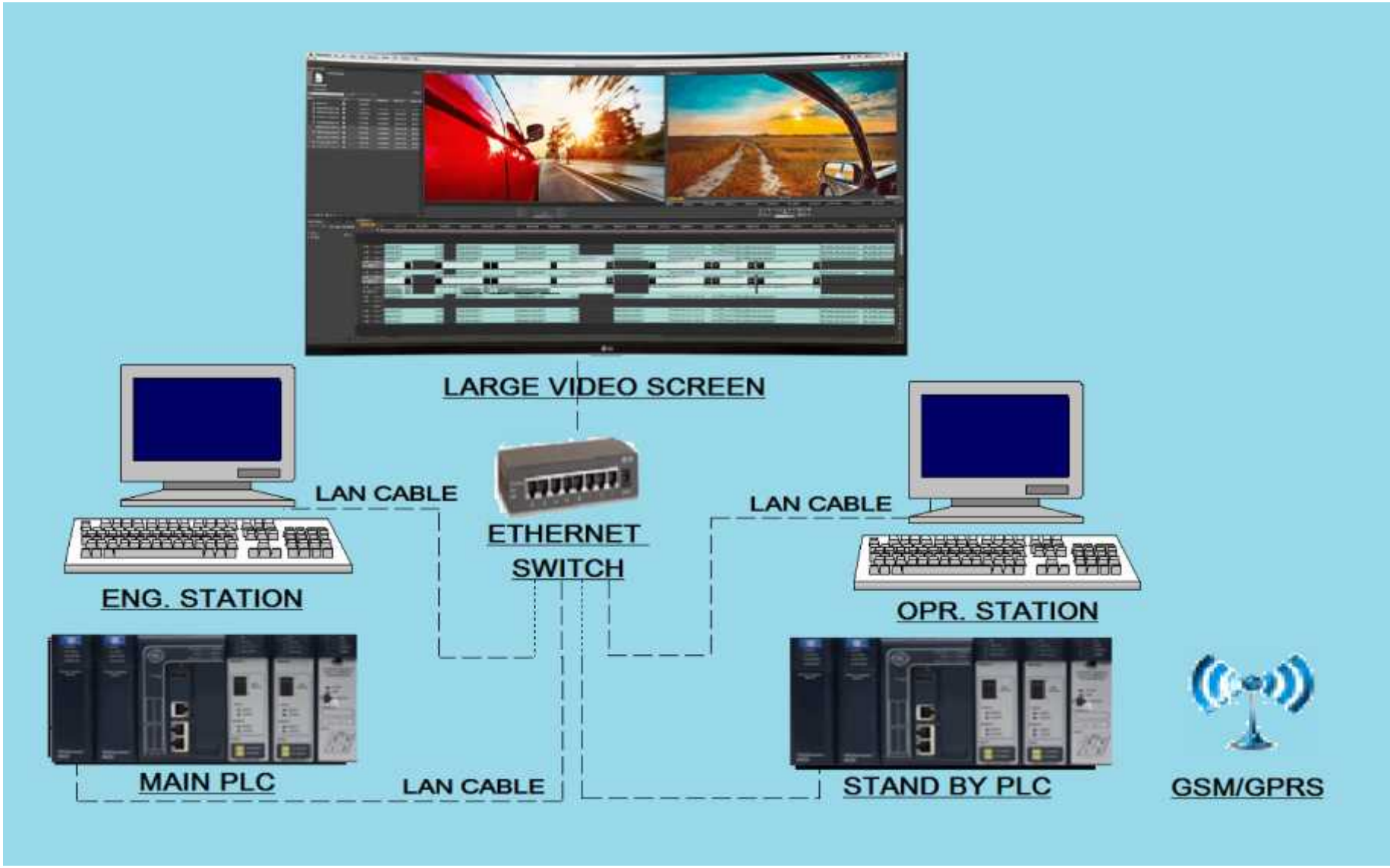
CONCEPT as shown in diagram



Local Control Station (LCS) Room



Main control Station (MCS) ROOM



LVS ROOM

System Architecture (Industrial Internet Based & viewed through mobile apps for increased Local & Remote Visibility)

DESIGN PARAMETERS: -

➢ General:

- Proposed automation system shall be designed, manufactured, installed and tested to ensure the high standards of operational reliability. Instruments mounted in field and on panels shall be suitable for continuous operation. **All electronic components shall be adequately rated and circuits shall be designed so that change of component characteristics shall not affect plant operation.**
- All equipment shall be new of proven design, reputed make and shall be suitable for continuous operation. Electronic instruments shall utilize solid-state electronic components, integrated circuits, micro controllers etc., and shall be of proven design. The equipment/ instruments such as flow meter, level sensor, underground depth sensors etc. should as per site requirement and in tune with realistic conditions of site such as head, pressure etc.
- For transmitting instruments, the output signal shall be 4-20 mA DC linear having two/three or four wire system.
- Unless otherwise stated, overall accuracy of all measurement systems shall be ± 0.25% of measured value and repeatability shall be ±0.5%.
- Unless otherwise specified, the normal working range of all indicating instruments shall be between 30% and 80% of the full-scale range.
- **The instruments shall be designed to permit maximum inter-changeability of parts and ease of access during inspection and maintenance & must be compatible so that the system of similar or dissimilar technologies are added on in future, MCS must be capable to integrate all these addition like Additional Tube well, Automated meter reading (AMR) or automation of distribution network,& billing etc.**
- The instruments shall be designed to work at the ambient conditions of temperature, humidity, and chlorine contamination that may prevail. The instruments shall be given enough protection against corrosion.
- All field instruments and cabinets/panel mounted instruments shall have tag plates/ name plates permanently attached to them.
- The performance of all instruments shall be unaffected for the ±10% variation in supply voltage and ±5% variation in frequency simultaneously.

❖ Special Instruction to the bidder

1. **Bidder has to mention the complete model no. of quoted items / instruments in their bid documents which they are offering to us.**
2. **Bidder has to submit the detailed catalogue of the product offered and same catalogue must be available on company website.**
3. **Bidder has to highlight the technical Specification in the catalogue as per our technical Specification against each in every item. In case if there is any deviation, bidder has to clearly confirm the same otherwise it will be assumed that bidder confirms to all the specifications in the tender.**
4. **All material is subject to third party inspection mandatory by National/International reputed organizations like PDIL, LLOYDS, RITES, BHEL, TATA PROJECTS etc as well as by client / UP Jal nigam & charges related to that will be borne by bidder/supplier.**
5. **Type test mentioned in the technical specification sheets against each and every item are mandatory and bidder has to submit type test copy from National / International Labs. Type test shall be directly from the manufacturer.**
6. **Bidder has to submit QAP after award of contract & inspection and testing will be performed as per QAP.**
7. **Bidder should have inspection facility traceable to national/ International standard.**

1:-Technical Specification for SCADA at MCS

➢ Architecture

The SCADA architecture shall provide the following:
1. Client / Server architecture based on TCP/IP networking
2. Standalone single server operation.
3. Additional servers for client load sharing and remote locations.
4. Permanent Standby Server designed to be placed outside corporate firewalls providing a read-only
access to the server while ensuring corporate security.

5. Fully automated data transfer between servers to provide complete server redundancy. This transfer shall include configuration, real-time data, historic data and event lists. Database updates shall be on an incremental basis with tuneable parameters
6. A stable fully distributable architecture providing as per engineering station.
7. Where multiple servers are deployed, the system shall be capable of being configurable from a
single client.
8. Hot Backup Redundancy shall be provided at Main Control Room PLC. SCADA System shall be
provided as below :

- Engineering cum Operator Work Station loaded with Runtime & Development SCADA Server & Logic Developer.
- Operator work Station, loaded with Runtime SCADA Server.

9. Forced changeover between main and standby allowing seamless changeover without shutting down.
10. Clients to connect to a synchronizing server as soon as the configuration and current data in the
database has synchronized. Incomplete data sets as per clients request on event or trend provide
indications that the synchronization is still in progress to ensure that conclusions are not drawn
from incomplete data sets.
11. Configurable compression of data communications between client/server and server/server to
allow optimisation of communications performance over WAN networks.
12. Change reporting on Client/Server and Server/Server links rather than polled communication to
permit operation on WAN networks.
13. Capable of operating Client/Server and Server/Server links over low to medium speed channels
depending upon database size.
14. Application shall be native 32-bit and 64-bit versions and supported on Windows® Server and
Workstation operating systems including Windows 2000, Windows XP, Windows 2000 Server,
Windows 2003 Server, Windows 7 (32 and 64 bit) and Windows Server 2008 R2 and later.

➢ Database

The SCADA database shall be of true database design and optimized for real-time SCADA operation. The database shall be object oriented and organized in a hierarchical structure.
Templates of Standard configuration shall support multiple object types including, but limited to:

- Point/ Tag objects
- PLC or RTU objects
- Mimics or Graphic display objects
- Trend objects
- Schedules
- Link objects

The SCADA database shall allow users to extend the database scheme to store custom data, in either the configuration or data stream. These changes can be performed online without need for server restart.

➢ Operator Interface

1. SCADA software shall provide the ability to support multiple local and remote display clients.
2. Display facilities shall be available via LAN, WAN and dial-up connection.
3. Rich Clients shall support database management and configuration changes.
4. Rich Clients shall support multiple monitors (multi-head display), allow logon for all heads from a single location. The system should also provide navigation facilities such that displays on each head can be controlled from any head. (yoking)
5. Integrated Web Sever capability shall be available, providing all display and operational facilities of the Rich Client without the need for additional software to be installed.
6. Web Clients shall allow users to view Mimics, Trends, Database Objects, Reports as well as perform control functions using a standard web browser.
7. Changes made to the SCADA server shall require no additional steps to be performed in order for those changes to be available to Rich Clients and Web Clients.
8. Rich Client shall be configurable to connect to one, or multiple server systems
9. Full function display clients shall automatically fail-over & reconnect to a redundant server node when server change-over occurs.
10. Look and feel shall be provided by the SCADA system operator interfaces, including provision for “favourites lists”.

➢ Mimics / Graphics

SCADA system Mimics shall support a wide range of graphical facilities. Scalable Vector Graphics are required in order to permit operation of the SCADA system with different resolution clients operating simultaneously. Fixed resolution bitmap graphics are not acceptable.

Mimics shall be multi-layered, object oriented and permit mimics to be embedded in other mimics.

24-bit Colour shall be supported on mimics as standard.

Mimics shall support the ability to specify OPC data source information to display directly on the mimic. This permits data from other systems to be seamlessly integrated in to the SCADA display.

Objects embedded and displayed on any mimic shall be viewable through both the full function client and web client displays.

➢ Start-up

The SCADA system shall start-up unattended, and without compromising system security.

➢ Configuration

The SCADA software shall provide full seamless On-line configuration of all database parameters including but not limited to:

- Communication channels
- PLCs
- Points /Tags
- Sequences
- Schedules
- Alarm redirection
- Mimics / Graphics
- Trends/ Graphs
- Reports

All aspects of the look and feel of the SCADA system, including default field values, shall be configurable. It is not acceptable for colour regimes, communication parameters and other aspects of the system to be hard-coded.

It shall be possible to add user defined fields to the SCADA database. These fields should be accessible both internally and externally to the SCADA system; being exposed via OPC, ODBC, OLE Automation, XML/SOAP, etc.
The SCADA server shall provide detailed diagnostics concerning its internal operation. The diagnostics shall be available through capture to a log file as well as online locally on a server and remotely via Telnet and Web interface.

Stored configuration records should be maintained in the historic database for a configurable time period, support redundant SCADA server configurations and allow access from standard database interfaces such as queries and simple mechanisms for displaying and filtering the configuration records.

➢ Alarm Management

The alarm system shall provide facilities where actions can be triggered by alarms. These facilities shall be provided as a built- in integrated part of the system and include, but not be limited to the following:

- Configuration criteria for alarm actions
- Escalate Alarm priority
- Delivery of Alarm to user via SMS
- Delivery of Alarm to user via E-Mail
- Trigger other actions including sequences

Where a full function Rich Client is connected to multiple SCADA systems, alarms from all systems shall be combined and filtered, based on user privilege and areas of responsibility.

Consequential alarms to allow one (or more) alarms to be suppressed as the result of another alarm occurring. Suppressed alarms will be received and processed by the SCADA Server and recorded in the event journal for future auditing, however the operator shall not be forced to take an action on an alarm where the cause is known.

➢ Event Journal

The system shall provide, as a built in feature and without the requirement for custom or external software, facilities for event logging. These facilities shall be separate from the alarm list and include the capability to insert user comments at any place in the event list.

➢ Historical Data

The SCADA system shall provide a built in data historian with the following facilities as standard features.

These shall be provided without the addition of external software modules:

– Time-series relational data base
- ODBC/SQL interface to historical (Trend) data.
- Historical data to be stored with time stamp, point quality, Alarm status
- Historic storage is t6o be based on configurable criteria including time between samples, alarm state change
- Compression capability

➢ System Security & Access

The SCADA system shall provide a high level of inherent security. To this end the SCADA software shall provide security access down to data point level, and support individual Users, User Groups and a matrix of system capability and access to any level of the SCADA database.

Full function Rich & Web client interfaces shall require explicit administrative configuration to valid Connection to the SCADA server.

The SCADA system security shall provide the ability to be integrated with Windows domains to

Authenticate logon attempts against a trusted domain.

➢ Open Connectivity

To provide easy access for customized reports and external data manipulation the SCADA software shall provide inherent OPC and ODBC database connectivity without the need for additional software options or modules. Integration with desktop Microsoft products is essential.

➢ Reports

An integrated reporting package shall be able to generate, print and export reports:

- Triggered by SCADA events
- On user demand
- On time schedules

Reports shall be able to be generated in a number of formats including:

- HTML for viewing via Web interface
- CSV format
- M.S office® suite format

Generated reports shall be able to be:

- E-mailed to assigned user

➢ Standard Drivers

The SCADA system shall provide native support for fully integrated Wide Area SCADA PLC
protocols. This shall include the capability for supporting all protocols in redundant SCADA server configurations and support redundant communication paths.
Apart from PLC and RTU communication drivers, the system shall also support as standard the Following drivers:

- SMS (with TAP and UCP service) to mobile phones
- A full function system is required including calendar based rosters
- SNP- monitoring of network devices such as routers, computers, UPS etc.
- NTP – time sever monitoring and alarming
- ODBC – query data from other databases
- Windows Performance Monitoring
- OPC-DA driver

Capacity Description	Size
Number of SCADA I/O Device Subsystem servers	for --------- TUBELS
Number of SCADA Cluster servers for Trending, Alarm and Reporting	for ---------- TUBELS
Number of SCADA Client Stations	for ----------TUBELS
Number of field devices	for ---------- TUBELS
Physical I/O tags being read/written to field controllers	Unlimited and demonstrable to >1000000
Internal I/O tags within the SCADA networked system	Unlimited
Alarm tags	> 100000
Analog trend tags	> 20000
Average refresh time on a graphic display	< 1s
Average recall time for historical trend values	< 5s per day of data

2:- Common Technical Specification for PLC System

➢ Processor

- The processors must have an internal non-volatile memory to store application and data.
- It must be possible to connect a PC (programming terminal) or a human – machine interface
- The range must provide processors with at least 3 built – in Ethernet ports featuring a web server complaint with various operating system: minimum is Windows, IOS, and android.
- Embedded web server must provide CUP diagnostic, including **detailed information on Ethernet system networking.**
- The Embedded web server must be customizable by the user to display application variables and advanced diagnostics features. Each processor should have a savable real – time clock which manages

1. The current date and time

2. The date and time of the last application shut-down. The date and time should be managed
even when the processor is switched off for 20 days.

- The processors must be equipped with ground connection contacts without additional cabling.

- The PLC must be able to load the program with the use of the memory cartridge.

- Possible to add modules or add remote I/O islands in the configuration without interrupting the
running process.

➢ Operating system

The operating system (OS) must be capable of multitasking with up to 4 periodic tasks and more than 60 event or I/O tasks.

Physical input can be program to prohibit any modification or downloading of the program.

Outputs can be set to fall back position when the PLC switches to STOP mode via channel by channel parameter entry.

Able to **set breakpoints and watch point** in application to check all system and data when executing application for debugging. System must also provide Step-by-Step running feature to execute all operations one by one in the application. Engineering tool must provide a trending tool embedded to display variables at a minimum of **1ms sampling rate**

➢ Memory

Application memory execution can be done on through embedded or removable memory.

No battery supply is needed for non-volatile backup.

The processor must provide minimum up to 32 MB of on board non-volatile memory

Feature to store the program, comments and symbols in the PLC. The "empty terminal" functionality must be possible whichever IEC language is used. It must be also possible to use the memory extension to back up files (production data, recipes, etc.)

➢ Communication

Synchronized and unsynchronized drops with PLC scan can be **managed over standard and open Ethernet communication.**

Must provide exchanges of variables:

- Explicit exchanges (via function blocks integrated in the application)

- Implicit exchanges (Using cyclical variables generated by the single declaration of the device)
  Dedicated function blocks should be available.

The PLC must be accessible via Ethernet (from a remote site) using a standard Internet browser or any other platform (android, iOS). These functions must not require any prior configuration or special software. In addition, the use of these functions must have no effect on the PLC scan time.

A device must be reconfigured automatically after replacement

The PLC must have serial links which support various types of communication: Modbus or open protocols.

➢ Standards and certifications

The PLC must conform to the main national and international standards covering electronic equipment for industrial control systems & FOLLOWING TYPE TEST REPORTS to be provided by the vendors

- CE marking according EN 61131-2
- Be compliant with IEC – 62443 standards
- **Cyber Security Achilles Level 2 or equivalent.**

Description of Type Test	**Test Std.**
Electromagnetic Compatibility (EMC)	
Electrostatic Discharge Immunity	IEC 61000-4-2
Radio-frequency, Electro Magnetic Field Immunity	IEC 61000-4-3
Surge Immunity	IEC 61000-4-5
Immunity to conducted disturbance by RF Field	IEC 61000-4-6
Environmental & Climatic Tests	
Dry Heat	IEC 68-2-2
Cyclic Damp heat	IEC 68-2-30
Steady State Damp Heat	IEC 68-2-78
Change of Temp.	IEC 68-2-14

The system MUST be Achilles level 2 or equivalent certification for cyber security.

The system must be able to secure communication between PLC and engineering workstation / SCADA providing authentication and integrity of data

The internal firmware of the CPU must be digitally signed and encrypted

The integrity of the firmware must be checked before any application download and at start-up of the system

The integrity of the engineering software must be checked on demand
The system provides an access control list for each protocol and each connected IP address
Any modification of the operating mode of the system (Run / Stop / Program modifications) must be authenticated real time memory Integrity Control.

- **Environment**
  - Standards CSA C22.2 No 142, UL 1604, UL 508, Resistance to conducted disturbances, induced by radio frequency fields
  - EN/IEC 61131-2: 2007
  - Marine specification (LR, ABS, DNV, GL)
  - 1 kV for Ethernet line conforming to EN/IEC 61000-4-4

PLC – Specifications (At Main Control Room)

Sr. No.	Description	Specification
1	PLC Make	ANY INTERNATIONAL MAKE MEETS THE FOLLOWING REQUIRMENT & APPROVED IN UP JAL NIGAM
2	PLC Type	HOT Redundant PLC
3	Data Exchange	through high speed link of 1 Gbps
4	Operational Voltage	24V DC
5	Specification	Local indication using LED
6	CPU	16-bit Dual core processor
7	Programming Memory & Data Memory	32 MB ON board memory
8	Clock	Real time clock (RTC)
9	Communication	Serial (1 - RS 232, 1 - RS232/RS485) (GSM, GPRS, Data call, Satellite, Radio modem, serial, Ethernet)
10	Communication port	1 no RS 232/RS 485 1 Nos 10/100 base Ethernet port, 1 Nos USB Port
11	Ethernet Services	FTP Server, SNMP, DHCP Client, IEC VAR Access, Modbus TCP Server/Client
12	Web Services	Web Server
13	Operating temperature	-10 to 55 deg C.
14	Storage temperature	-40 to 70 deg C
15	Humidity	5- 95 % Non-condensing
16	Vibration	3 gn (vibration frequency: 8.4...150 Hz) on panel mounting
17	Shock Resistance	15gn for 11 ms
18	Operating Altitude	0 – 2000m

The hardware is a unique blend of rugged industrial I/O, real-time multi-tasking software and powerful communication capabilities. It shall be a locally intelligent unit having local memory and processor installed at a respective control and monitoring location in the water network; this can be a pumping station or a tube well station. The Redundant PLC hardware shall be programmable in SFC, IL, LD, ST & FBD.

The high performance modular Redundant PLC must be designed to log all the pumping station parameters with time stamping in its NON-VOLATILE memory at the defined logging interval.

The PLC shall be battery backed-up so as to maintain the parameters during power failure.
The PLC shall be designed to have communication compatibility for wireless mode viz. for GSM, GPRS, and Radio, satellite or wired mode viz. Telephone and serial to transmit data and receive commands remotely.

PLC SPECIFICATIONS FOR TUBEWELL/ PUMPING STATION

Shall have following minimum specifications:-

1	Input/outputs	
2	Digital Input	24
3	Operational Voltage	24V DC
4	Specification	Local indication using LED
5	Analog Input ranges	0-10VDC, 0-5VDC, 4-20mA, 0-20 mA
6	Resolution	16 bits
7	Digital Output	16
8	Relay type	Relay/transistor Output
9	Operational Voltage	24V DC
10	Specification	Local indication using LED
11	CPU	16-bit Dual core processor
12	Programming Memory & Data Memory	Minimum 1 MB ON board memory
13	Clock	Real time clock (RTC)
14	Analog to digital converter	12/16-bit Resolution
15	Communication port	Dual LAN Ports 10/100/1000 MB Ethernet port 1 no Serial Port
16	Operating temperature	-10 to 55 deg C.
17	Storage temperature	-40 to 70 deg C
18	Humidity	5- 95 % Non-condensing
19	Vibration	3 gn (vibration frequency: 8.4...150 Hz) on panel mounting
20	Shock Resistance	15gn for 11 ms
21	Operating Altitude	0 – 2000m

- Should Support for communications protocols, including PROFINET, Modbus TCP/IP
- Advance cyber security with Achilles Level 2 certification

➢ **IO Descriptions**

Digital Inputs with following feature

* Input voltage range 24 VDC, Input current (max): 7mA @ 24 VDC/ channel
* On off delay times: 1.6 ms
* Confirming to IFC 61131-2 type I

* Input impedance 4.7 k ohm
* Response time 50 usec
* filtering time 1 usec
* Execution Time for 1 kinst. 0.7 msec and 0.3 for event and periodic

- **Analog Inputs**

* Input Scan time: 500 ms Min.
* Input Type: 4-20 mA DC, 0-10 VDC.

- **Analog Outputs**

* Output Type: PID Controlled.
* Output Level: 4-20 mA DC, 0-10 VDC

3:- TECHNICAL SPEC OF CLOUDE APP. INTERFACE

The online data shall be available for real time monitoring with the help of a cloud App supporting iOS/ Android or any other web browser like internet explorer. This data shall be encrypted for protection & up to 100 clients shall be able to log on simultaneously for one site.

4:- Technical specification for Soft Starter

The soft- starter shall be developed and qualified in accordance with international standards, particularly with the standard dedicated to soft-starter EN / IEC 60947-4-2. The starter must be CE marked under the harmonized standard EN / IEC 60947-4-2.

Description

The operating principle of the Soft-starter should not simply take ground on a limitation of motor current during the transitional phases or on a voltage ramp but on a torque control motor. The Soft-starter should provide a torque ramp during the acceleration phase. Thus, it can control the torque during the starting period and if necessary provide a motor torque constant throughout the acceleration phase. For pumping applications, the deceleration will be on torque a ramp.

- All Soft-starter sizes will have the same control board. That control board must be identical for all applications.
- All Soft-starters shall be equipped with means for measuring motor current to ensure protection.
- The measurements of the current will be active when the Soft-starter is by-passed (embedded by-pass for all sizes).
- The Soft-starter should have a separate power control.
- The terminals of the board control shall be of plug type for easy maintenance.
- Soft Starter should control 3-phase output with Programmable display.

- The Soft-starter will handle the by-pass itself: manage the closure of the by-pass at end of acceleration time and open that by-pass at end of stop sequence. That function must be compatible with the types of stop: freewheel, ramp

- The access to the settings can be locked by code. The monitoring parameters should remain accessible.

➢ Environment

- The maximum relative humidity will be 95% without condensation or dripping water according to standards IEC60947-4-2.

- The storage temperature can be between -25 ° C to + 70 °

➢ Electrical characteristics of the Soft-starter

- The Soft-starter will automatically adapt itself to the frequency of the mains 50 or 60 Hz with a
  tolerance of + / -10%.

- Outputs: the Soft-starter must have at least 2 relays with a NO/NC contact Maximum switching capacity on inductive load: 2 A at 250 Vac and 30 Vdc.

➢ Protections

- The starter will include the management of Motor PTC probe.
- The starter will calculate continuously the motor overheating from the real current value (the current) must be measured and not estimated). Several classes of thermal protection will be proposed following the standard EN/IEC60947-4-2: Classes 10, 20, 30.The calculation of the thermal protection must be active even when the Soft-starter is not power energized.
- The starter shall be protected against thermal overload, over & under voltage.
- Dry run protection for pump motor.
- Protection against reverse-phase network, the loss of phases on mains or on motor.
- The protections will always be maintained even the Soft-starter is by-passed internal or self.

➢ Communication

- The starter will include a multipoint serial link to be connected directly to a Modbus network. The starter shall be able to be connected to Ethernet and other networks and communication bus option.
- The communication shall provide access to the control, adjustment and monitoring of the Soft-starter.

➢ Display

- The starter shall have a display and programming push buttons.
- The following information must be accessible on the display

- Motor current (by phase)
- Motor state
- Current status (acceleration, deceleration, running).
- Operating time.
- The last fault occurred
- Fault history
- I/O status

5:- Technical Specification of Large Video Screen- Laser Type for Master Control Room (M.C.S)

➢ Qualification Requirements

1. The Indian Manufacturing unit should be certified for the following quality management System ISO9001:2008,ISO14001:2004 and BS OSAS 18001:2007
2. The cubes, controllers and the associated software should be from the same manufacturer to ensure seamless integration.
3. The product should be BIS Approved.
4. Matrix required – Configuration of Large Video screen as below as per tubels/ pumping stations etc

Nos. of Tube well/ pumping station	Matrix Required
<25	1 X 1
25-60	2 X 1
60-100	3 X 1
100-150	2 X 2
>150	2 X 3

The system is required to display the HMI Screen to the operator. The system shall be completing with display wall with 50" Diagonal Laser based Rear projection system as per site requirement. Each cube should have minimum specification as below:

➢ Cube:

1. Cube & controller: should be from the same manufacturer.
2. Resolution :1920x 1080 resolution of chip
3. Light Source type: Nichia Laser light source, Individual cube should be equipped with at least 3 laser banks and each laser bank should have minimum 8 diodes.
4. Light Source Redundancy-System should be able to Illuminate all the laser banks at the same time ,system should not be Blank(No image) screen due to failure of any diode in any laser bank
5. Brightness: Minimum 2200 lumens
6. Control-IP based control to be provided

7. Remote-IR remote control should also be provided for quick access
8. Brightness Uniformity: ≥ 98 % and control should be IP based and IR remote control should also be provided for quick access.
9. Contrast Ratio: Min 1800:1 or better
10. Screen to screen gap: ≤ 0.2 mm
11. Screen should have an anti-reflective glass backing to prevent bulging.
12. It should have Control BD I/P terminals –1X-Digital DVI ,1X-HDMI,1X-Analog Dsub-15, 1X-Analog RGBHV,
    HD Base-T X 1, Display Port X 1
13. Cooling: Inside cube should be by means of a heat pipe only. Pump based cooling involving hazardous liquids is not acceptable.
14. Source redundancy: System should be able to switch to HDMI input if primary DVI input is not available and system should also automatically switch back to primary DVI input from HDMI input as soon as the primary DVI input is available again.
15. Auto Colour Adjustment Function: Provide auto colour adjustment function with sensor based and should have the facility to be switched on or off as per user requirement.
16. Maintenance Access: Rear.
17. Cube Size: Each cube should not be less or more than 50" diagonal size.
18. Redundant Power Supply – Should be inbuilt in the cube. External Power supplies are not acceptable
19. The Projection engine should be IP6X certified to prevent entry of dust.

➢ Video Wall Controller

1. Controller: Controller to control Video wall in a matrix (1 x 2) outputs, inputs along with software's
2. Chassis: 19” Rack mount
3. Processor: Single Quad Core Intel® Core™ i7 Quad Core 3.4 GHz processor) or better and supports 64-bit Operating System Windows 7 with RAM capacity of 16 GB or more with HDD 500 GB or more
4. Net Working: Dual Port Gigabit Ethernet.
5. Power Supply: 1+1(Redundant Hot Swappable).
6. Cooling: Advanced proven cooling mechanism.
7. Input/Out Put Support: DVI/HDMI/USB/ LAN/ VGA/SATA port.
   Accessories: DVD +RW, Keyboard and mouse.
8. Voltage: 100-240V @ 50/60 Hz.
9. Redundancy Support: Power Supply, HDD, LAN port & Controller.
10. Scalability: Display multiple source windows in any size, any M
11. Operating temperature: 10°C to 40°C , 80 % humidity

➢ Video Wall Management

1. Display and Scaling: Display multiple sources anywhere on display up to any size.
2. Input Management: All input sources can be displayed on the video wall in freely resizable and movable windows and should save and load desktop layouts from Local or remote machines.
3. Layout management: It should support all Layouts from Video, RGB, DVI, Internet Explorer, Desktop and Remote Desktop Application and Multiple view of portions or regions of Desktop, Multiple Application can view from single desktop.
4. Control Functions: Brightness /contrast / saturation/ Hue/ Filtering/ Crop / rotate.

5. Formats: DVI /RGB/Component and NTSC/ PAL/SECA Other Features: Remote Control over LAN, Remote management, alarm management& multiple concurrent clients.
6. Cable Management: Cube Health Monitoring, Pop-Up Alert Service and graphical User Interface.
7. It should be able to provide an error message in three sections a) Problem area b) Error Module Location c) Error Module image.
8. Should be able to control & monitor individual cube, multiple cubes and multiple video walls.
9. Provide video wall status including Source, light source ,temperature, fan and power information
10. Should provide a virtual remote on the screen to control the video wall
11. Input sources can be scheduled in " daily", "periodically" or "sequentially" mode per user convenience
12. System should have a quick monitor area to access critical functions of the video wall.
13. User should be able to add or delete critical functions from quick monitor area.
14. Automatically launch alerts, warnings, error popup windows in case there is an error in the system.

6:-Technical specifications for Instruments and Cabling

A)-Electromagnetic Type OR Ultrasonic Flowmeter

Special Note- In case of bidder supplying ultrasonic flowmeter then it should be clamped on type without any requirement of periodic gel application.

- **SPECIFICATIONS OF ELECTRO MAGNETIC FLOW METER**

Electrical

Power Supply	: 24 VDC
Option	: 90 V AC to 265 V AC, 50/60 Hz
Power consumption	: 35 W (max.)
Output	: a) 4-20 mA Isolated (Max. Load 800 Ohms). b) 2 SPDT Relay. Programmable relay function Max. rating 2A at 230 Vac for non-inductive Load. c) Pulse output: 24 VDC Pulse Isolated (min. Load 150 Ohms) Option Frequency output of 0 to 1 KHz full scale
Accuracy	: ± 1% of flow rate
Repeatability	: ± 0.1 % of F.S.D
Time constant	: 0.8 to 8 seconds adjustable
Minimum conductivity	: 0.5 μ /cm (Micro Siemens/centimeter)
Input impedance	: 10 giga ohms
Full scale velocity	: 0.5 m/s to 10 m/s
	Display : 16 x 2 Alphanumeric LCD, in multiple -Engg. units
Data Entry	: 2 Hall Effect Switches
Flow data	: Bi-directional Flow with separate totalizers

for forward and reverse flow
: Empty Pipe Detection with Low flow Cut off Diagnostics
: Built in with Data retention in case of power failure.
Password protection

Enclosure

Housing material	: Cast Aluminum
Paint	: Polyurethane
Cable entry	: M 16 (3 No.) suitable for cable diameter from 4.5 mm to 10mm
Controller mounting	: Integral with sensor or Wall mounted
Ambient Temperature	: - 20 deg. C to + 60 deg. C
Protection	: IP 67

Sensor

Nominal Bore	: 10 NB to 600 NB
Meter Lining	: Rubber
Electrode Material	: SS 316
Metering pipe Flanges	: Low carbon steel, ASA 150 # flanges
Metering Pipe Material	: SS 304
Sensor Body Material	: Sheet Steel
Protection	: IP 68
Process Temperature	: + 80 deg. C
Process Pressure	: Up to Size 200 NB: 16 bars Sizes above 200 NB: 10 bar
Certification	: CE certified, RoHS from DNV & FM approval FM Certified

- **SPECIFICATIONS OF ULTRASONIC FLOW METER**

- Switchover should be automatic between Pulse Doppler and Transit time according to varying fluid conditions such as concentration of particles and/or air bubbles and flow velocity
- With Built-in surge arrester
- Graphic LCD with back light display device
- Fully configurable on keyboard by menu driven software
- Case Protection: IP67
- Accuracy: 0.5% or better
- Response time: 0.2 sec for Pulse Doppler and 0.5 sec for Transit time
- Resistant to air bubbles: Measurement unaffected with air bubbles even up to 15% at 1 m/s speed
- Power supply: 100 to 240 V, 50/60 Hz

- Output: Analog output: 4 to 20 mA DC Digital output: +total, -total, alarm, acting range, flow/total switch, Mechanical relay contact: 1 point, Transistor open collector: 2 points
- Low flow cut off: 0 to 5 m/s configurable
- Complete with detector & 10-meter-long signal cable & acoustic coupler
- Case Material: Aluminum alloy
- Ambient temperature for flow meter -20 to +60 º C.
- By directional range- forward and reverse range configurable independently
- Certification: EMC as per EN-61326 & EN- 61000, CE certified

B) - Technical specification of Smart Pressure transmitter

- Range as per site requirement

✓ Working Principle	:	Micro - Capacitance Silicon sensor
✓ Type	:	Smart Microprocessor based, 2 wire
✓ Output (HART protocol)	:	4 – 20 mA DC with Digital Communication
✓ Power Supply	:	10.5 – 45 V DC
✓ Field Communication Hand-Held	:	Adjustment through push buttons on LCD" or HART Calibrator OR Remotely by PC Possible
✓ Span & Zero Adjustment	:	Local & Remote
✓ Accuracy	:	0.065 % of calibrated Span
✓ Drift / Stability	:	±0.1 % of URL for 10 years
✓ Ambient Temp	:	- 40^{o}C to 85^{o}C
✓ Process Temp. Limits	:	- 40^{o}C to 100^{o}C
✓ Humidity	:	0 to 100 % RH
✓ Load Impedance	:	577 ohm at 24 V DC
✓ Diagnostic	:	Self indicating feature
✓ Supply voltage effect	:	Less Than 0.005% of calibration span per volts
✓ Temperature effect	:	Less than ± 0.05% of span per 100 C
✓ Zero Elevation & suppress min allowable span	:	Anywhere within the range limits maintaining
✓ Turn on time	:	Less Than 10 sec
✓ Damping	:	0.06 to 32 sec (configurable)
✓ Vibration effect any axis	:	Better than ± 0.2 % of span per g at 200 Hz in
✓ Response Time	:	Less Than 150 msec
✓ Over Range Pressure Times	:	Capable of withstanding over pressure up to 3
✓ Update Time	:	Better than 50 msec
✓ Housing coating	:	Die cast aluminium alloy finished with polyester
✓ Protection class	:	IP 67
✓ Wetted Parts	:	SS 316
✓ Flange material	:	SS 316

- ✓ Diaphragm material : SS 316L
- ✓ Process Connection : G ½" male
- ✓ Electrical connection : ½ NPT
- ✓ Mounting Brackets : Provided (SS)
- ✓ Turndown Ratio : 100: 1

C)-Technical specification of sub soil water level transmitter for SUBMERSIBLE PUMP

The "Hydro bar" series are submersible level transmitters with a cable to measure the level in waterworks, deep wells, underground tanks, concrete bunkers, etc.
All transmitters are fully temperature compensated, and are equipped with strong flush mounted diaphragms which are laser welded, this results in a perfect long-term stability.

Measuring ranges	: 0.1 bar to 10 bar
Output signal	: 4-20 mA, 2-wire
Adjustment	: Zero and span internally (not for FR type)
Overall accuracy	: 0,2% of adjusted span, temperature compensated
Power supply	: 13 to 40 V DC
Electrical connection	: M20 x1.5
External load (max.)	: 550 Ohm/24 V to 1400 Ohm/40 V DC
Protection grade	: IP68 (cable/SS tube) IP66 (electr. housing)
Process temperature	: -10°C to +70°C
Temperature sensitivity	: +/- 0,015%/K
Wetted parts	: AISI 316L (standard)
Material cable	: Polyethylene (PE)
Measuring sensor	: SS 316 with strong diaphragm for long life & long term stability (<0.1%/year)
Certification	: ISO 9001-2008, Bureau Veritas & DNV

D) - Technical Specification of Radar Type Level Transmitter For OVER HEAD TANK

A **Radar** type level transmitter is being specified for continuous monitoring of the water level at the LCS & MCS and for the logical operation of the pumps based on water level at the overhead tank/Bore well.

- ➢ **F U N C T I O N A L / P H Y S I C A L**

Type: 6" horn configuration
Measurement: Pulse burst radar @ 26 GHz
Measured Variable: Level, determined by the time-of-flight of radar pulse reflections
Span: 15 inches to 40 feet (380 mm to 12.2 m) measured from threads
Output: 4 to 20 mA with HART: 3.8 mA to 20.5 mA useable (per NAMUR NE43)
Resolution: Analog 0.01 mA
Loop Resistance: 591 ohms @ 24 VDC and 22 mA
Diagnostic Alarm Selectable: 3.6 mA, 22 mA **(meets requirements of NAMUR NE 43)**, or HOLD last output

Diagnostic Indication Meets requirements of NAMUR NE107
Damping Adjustable: 0-45
Keypad: 4-button menu-driven data entry
Display Display:2-line 16-character display
Digital Communication HART Version 7–with Field Communicator, AMS, or FDT
DTM (PACTware™), EDDL
Power (Measured at instrument terminals) HART: General Purpose (Weather proof)/Intrinsically Safe/Explosion-proof: 11 VDC minimum
Housing Material: IP67/die-cast aluminum A413 (<0.6% copper)
Cable Entry 1⁄2" NPT
SIL 1 Hardware (Safety Integrity Level):
Functional Safety to SIL 1 in accordance with IEC 61508

- **E N V I R O N M E N T**

Operating Temperature with LCD viewable: -20° to +70° C
Electromagnetic Compatibility Meets CE requirement Meets CE Requirements: EN 50081-2, EN 50082-2
Surge Protection: Meets CE Requirements: EN 61326 (1000 volts)
Shock/Vibration: ANSI/ISA-S71.03 Class SA1 (Shock); ANSI/ISA-S71.03 Class VC2 (Vibration)
Reference Conditions: Reflection from ideal reflector at +20° C
Linearity: ±0.3 inch (8 mm) or 0.1% of tank height (whichever is greater)
Measured Error ±0.3 inch (8 mm) or 0.1% of tank height (whichever is greater)
Resolution: 0.1 inch or 2.5mm
Repeatability: ±0.2 inch (5 mm) or 0.05% of tank height (whichever is greater)
Response Time: <2 seconds (configuration dependent)
Initialization Time :< 30 seconds
Ambient Temperature Effect: 0.05% per 10° C

E) - SMART Energy Meter

Sr. No.	Description	Specification
1	Type	True RMS Microcontroller based design, 2W 1 4W/3 3W Balance & unbalanced operation
2	Accuracy class	1/ 0.5
3	Cut out size	92 x 92 mm Bezel: 96 x96 x mm
4	Suitable for	Multi parameter monitoring
5	Display	Seven Segment display
6	Casing	Compact 96 x 96 DIN enclosure
7	Key Pad	4 Functional keys to scroll through display pages for system values and programming parameter.
8	Auxiliary Supply	100-240V AC 50 Hz /110-240V DC
9	Voltage Input	Up to 480V (field configurable)
10	Current rating	5A or 1A AC (field configurable)
11	CT overload capacity	4000% of rating for 1 sec., 2000% for 4 sec., 120% continuous
12	Operating P.F.	ZERO LAG to UNITY to ZERO LEAD

13	Communication	RS 485 output port Standard MODBUS for all power parameters including harmonics. It should be possible to monitor real time vector chart using software.
14	Operating Temperature	0 to 55OC
15	Storage temperature	-200C to +700C
16	Humidity	90% RH, non-Condensing

F)-Actuator:

All gate valve along with motorized Actuators as per "Schedule -G" shall be supplied by the
Tenderer. The installation of gate valves with actuators is responsibility of the SCADA Vendor.

- All the valves shall be operated by an electro mechanical actuator, comprising of motorized gear train and screw assembly which drives the valve stem. The actuator shall be supplied with the following accessories.
- 3 phases, 415 V, + 10%, 50 Hz. + 5%, A.C. squirrel cage induction motor.
- Reduction gear unit.
- Torque switch mechanism complete with set of torque switches.
- Limit switch mechanism complete with set of limit switches.
- Hand wheel for manual operation.
- Hand-auto changeover lever with suitable locking arrangement.
- Local control switch / push buttons.
- The actuator shall be suitable for operation in the climate conditions and power supply conditions given in the specification. The actuator shall be capable of producing not less than 1½ time the maximum required torque and shall be suitable for at least 15 minutes continuous operation.

➢ Valve operational requirements:

- The operation of valves must be sequential w.r.t the pump operation. As the pump starts,
  the valve shall start to open and reach 70% opening (identified by a limit switch) only after the complete pressure / full pump speed is reached, does the valve open 100%; the operation of this valve shall be based on time sequence w.r.t start time of respective pump.

➢ Actuator Specifications

Sr. No.	Description	Specification
1	Type	Three phase rotary / linear, multi turn /quarter turn
2	Enclosure	Standard/Flameproof version
3	Output speed	10-426 RPM
4	Output torque max.	30 MKG
5	Locking system	Self-locking
6	Drive kW/HP	0.75/1 to 2.2/3
7	Drive Speed	1500/3000

8	Maximum Axial Thrust Capacity	12000 kgs
9	Output shaft designs	As per DIN 3210
10	Mechanical stopper	Adjustable
11	Coupling to suit	Butterfly valves, dampers
12	Gear reduction ratio	100:1 (max)
13	Type of gear box	Spur gear/worm gear
14	Supply Conditions	
	a. Rated voltage	415 VAC ± 10%
	b. Rated frequency	50 Hz ± 5%
	c. Combined variation	± 10%
	d. NO. of Phases	3 Phase (4 wire)
15	Reference Standards	I. S. 325, IEC34, VDE 0530,BS 2613
16	Type of motor	TEFC (Totally Enclosed Fan Cooled, Squirrel cage, induction.) / TESC (Totally Enclosed Surface Cooled) for IP 67 / 68
17	Drive Frame Size	80/90
18	Rotor Class	KL 60
19	Protection	IP 67 as per IS 13947 Part I 1993
20	Class of Insulation	Class 'F' with temperature rise restricted to class 'B'
21	Duty cycle	As per IS 325 - S1 continuous (S4 – Modulating as a special case) OR (S2 - 15 / 30 min as a special case.)
22	Method of starting	DOL - Direct on line with suitable actuator panel
23	Reference ambient temp	50° C
24	Motor paint	corrosion proof epoxy resin paint
25	Motor duty	S1 Duty motor suitable for
		3 Nos. of consecutive starts in hot condition
		8 Nos. of starts distributed over 15 minutes
26	Travel Switches	1 NO + 1 NC
27	Micro Switch	
	a. Torque Switches	1 NO + 1NC
	b. Travel / Torque Switches	2 NO + 2 NC

➢ Actuator Panels

- wall mounting type
- non compartmentalized
- dust and vermin proof, IP 66 protection
- 1.5mm CRCA sheet, powder coated with Siemens grey shade, 2mm CRCA sheet door
- Mounting plate 2.5mm CRCA sheet
- 415 V , 50 Hz
- size 500mm(W) x 700 mm(H) x 250 mm (D)
- single door, bottom gland plate, earthing terminal

➢ Isolation Transformer

- Primary: 0-380V-440V-470V
- Secondary: 0-230V

- Capacity: 300 VA
  Insulation: 2.5 Kv
- Rated Temperature: 55 deg. C
- Frequency: 50 Hz, with required DIN rail mounted glass fuse type 4 sq. mm screw terminals and with extended bottom mounting angle; in output side to provide wago make push in type terminals 4 sq mm rating.

G)-Uninterruptible Power Supply (UPS) with 45 minutes batteries backup on full load (Single Phase 5-10 kVA as per site requirement)

- **Technical Specifications**

Input	Nominal Voltage		200/208/220/230/240 Vac (single phase)	
	Voltage Range		100 ~ 300Vac(full load) *	
	Current Harmonic Distortion		<5%(full load)	
	Power Factor		>0.99(full load)	
	Frequency		40 ~ 70Hz	
	Electrical Connection		Terminal block	
Output	Voltage		200/208/220/230(default)/240 Vac (single phase)	
	Voltage Harmonic Distortion		≤ 2% (linear load)	
	Voltage Regulation		±1%(static); ± 2% (typical)	
	Frequency		50or60 ± 0.05Hz	
	Overload Capability		106 ~ 110%:10 minutes; 111~ 125%:5minutes;126 ~150%:30seconds	
	Electrical Connection		Terminal block	
	Crest Factor		3:1	
Battery & Charger	Nominal Voltage		192VDC	240VDC
	Charger Current		Standard Charger (Built-in): 4A (adjustable) Extended Charger Internal: 4A (maximum) and External: In steps of 4A	
	Electrical Connection		Delta standard cable	
Display	LED		AC input, Battery, Bypass, Fault	
	LCD(Multi-Language)		Input/Output/Bypass(voltage,frequency),Loadingandbatterylevel ,RemainingruntimeAbnormalmessageandintelligent self diagnosis	
Interface	Standard		RS232 x1,SNMPslotx1, Smart slot x1,Parallel portx1	
	Management Peripherals	SNMP Slot	SNMP card, Mod bus card, Relay I/O control card, Enviro Probe, SNMP hub	
		Smart Slot	Mini SNMP card, Mini Mod Bus card, Mini relay I/O control card, USB card, TVSS card	

Conformance	Safety		CE,TUV, EN62040-1-1
	EMC		CISPR22 Class A, EN50091-2, IEC 61000
Others	Parallel Redundancy		1+1redundancy
	Remote Control		REPO(Remote Emergency Power Off); ROO(Remote On/Off)
	Common Battery Installation		Feasible
	Optional Accessories		Rail kit; Maintenance bypass box; External battery pack; Internal charger board; External charger box; External charger board; Dust filter
Overall	Efficiency	Online Mode	92%(full load)
		ECO Mode	96%(full load)
	Temperature		0 ~ 40°C
	Relative Humidity		0 ~ 95%(non-condensing)
	Audible Noise		54d BA(atone meter)

H) Control panel with HMI & switch gear

- Control panel enclosure should be from CE/UL/TUV/CSA/LLOYDS REGISTER certified, Make- Rittal only
- Drawing and test report should be submitted with panels.
- MCCB should be at least 25KA capacities.
- Type 2 coordination should be followed
- Dimension shall be min 600mm (W)x1600mm(H)x500mm (D)
- Enclosure must be IP54
- Sealing gasket must be Neoprene (liquid foam must not be used)
- Mounting plate must be 3mm in thickness
- 1.5mm CRCA sheet, powder coated with Siemens grey shade, 2mm CRCA sheet door Mounting plate 2.5mm CRCA sheet
- Panel should be modular construction type on a frame which should be having 9-fold profile.
- Mounting plate should be adjustable & removable
- Bottom gland plate shall be in three parts
- Locking system must be three-point locking type

➢ HMI Specification

- Minimum 7” wide 800X480 Pixel LCD display with back-lit to display.
- Inbuilt Ethernet, USB miniport, USB type A for report generation, data lodging, 485 Port embedded.

- 64000colors
- Luminance :450cd/m^2
- Real Time Clock
- Front panel: IP65
- Touch Screen
- Facility to connect printer directly
- Serial and parallel printing option
- Make: -Proface/Schneider/Allen Bradley/ABB/Fuji

I: -Technical Specification of Desktop / PC FOR MCS / LCS

Processor: 7th Generation Intel® Core™ i5-7400 processor (6MB Cache, up to 3.50 GHz)
Operating System: Windows 10 Home 64bit English
Monitor: 22" LED
Memory: 8GB, DDR4, 2400MHz
Hard Drive: 1TB 7200 rpm Hard Drive
Video Card: Intel® HD Graphics 630 with shared graphics memory
Optical Drive: Tray load DVD Drive (Reads and Writes to DVD/CD)
Data transfer rates up to 3,600 KB/s (CD read/write)
Data transfer rates up to 10,800 KB/s (DVD read/write)

Ports & Slots

1. Power on button
2. 2. 5-in-1 Multi-Card Reader
3. Audio combo jack
4. (2) USB 3.0 ports
5. Tray Load Optical drive
6. Air vent
7. Line in/out and microphone port
8. VGA port
9. HDMI port
10. (4) USB 2.0 ports
11. Expansion card slots
12. Power supply unit
13. Security-cable slot
14. Network port
15. Padlock rings

Wireless: 802.11n + Bluetooth 4.0, M.2, 1x1
Networking
Interface: M.2
Transmission standards: 802.11 b/g/n
Single band: 2.4 GHz
LAN: 1000BASE-T
Technology: Realtek RTL8161
Data transfer speeds: up to 10/100/1000 Mb/s
Transmission standards: 1000BASE-T Ethernet

Power: 65W External Power Adapter, 180W Internal PSU

J: - Cable

Following types of cables shall be supplied, laid and terminated as per instructions provided.
Copper 1.5Sq.mm control cables from REMOTE TERMINAL UNIT panel to field sensors.
Control cables for Aux. Supply to transducers
GSM/GPRS cable between MCS/REMOTE TERMINAL UNIT and modems
Any other cables required for the job.
Control cables shall be of 1100Volts grade, Tinned annealed electrolytic solid copper conductor, PVC insulated, extruded PVC inner sheathed, and overall PVC sheathed conforming to IS1554-I/1988.
Communication cable if used anywhere shall be twisted pair multi-core 1.0 Sq mm, Braided &
Aluminum Foil Shielded & Screened as per Belden standards.

INSTALLATIONSPECIFICATIONS (General)

- **Cable Installation Specifications**
  - The contractor shall follow all the ISI rules & regulations.
  - Cable shall generally be installed interchange sand buried in ground except for some short run in trays below the floor. Cables are laid on tray sand risers shall be neatly dressed and clamped at an interval of 1500mm and 900mmfor horizontal and vertical cable runs.
  - The clearance between electrical power & data cables must be maintained 6" min. throughout the route.
  - The crossing of electrical power & STP cable shall be at 90°only.
  - The shield of cable must not be removed up to cable entry to I/O.
  - The twist of cable must be maintained up to final termination.
  - The insulation twist shield shall not be damaged while pulling the cable.
  - The termination and connection of cables shall be done strictly in accordance with drawing sand /or directed by the Engineer. The work shall include all clamping, glanding, fitting, fixing, tapping, crimping and grounding as required.
  - The vendor shall perform all drilling, cutting on the gland plate and any other modification required and plugging the extra holes. The vendor shall provide on control cable cores at all terminations. Termination and connections shall be carried out in such a manner as to avoid strain on the terminals.
  - The vendor shall supply the required cable glands of suitable type and size. Cable glands shall be of heavy duty, tinned brass, and single/double compression type complete with necessary armor, clamp and tapered washer etc. Cable gland shall match with the size of different control cables. They shall provide stand leak proof terminations.
  - The vendor shall make every effort to minimize wastage during erection work. In any case, the wastage shall not exceed 2.5%for total quantity of cable supplied.

- General Installation
  - The transducers shall be mounted on bakelite sheet of suitable size and then they shall be mounted in the panels.
  - Phasing out NO/NC contacts in panels for breaker auxiliary switch for on/off indications, along with necessary wiring.
  - Phasing out of spare NO/NC contacts in panels for "Auto Trip" indication with necessary wiring.
  - Installation, earthling, testing and commissioning of REMOTE TERMINAL UNIT panel along with necessary wiring for above mentioned points.
  - Supplying, installation, testing and commissioning of hardware, peripherals etc.
  - Supplying, installation, testing, customization of software's.
  - Submission of cable schedules, wiring schedules, test reports, final "AS BUILT" drawings etc.
  - Handing over the system as a whole after becoming fully operational to the Enigma.
  - Although it may not be specified here, but all other work required for successful installation, testing and commissioning shall be in vendor's scope.
- Installation of instruments
  - Flow meters if asked for shall be installed according to the recommended practices to ensure full bore arrangement; installation shall be carried out with all necessary fittings and fixtures by piping vendor; supply, testing and performance guarantee of the flow meter to CUSTOMER shall be a part of the contract of SCADA Vendor; the installation which shall be kept under the scope of piping vendor, shall in any case be carried out under the supervision of SCADA vendor.
  - Instruments like Level transmitter shall be installed by SCADA Vendor, only according to accepted standards and specifications.
  - Valves shall be provided by CUSTOMER and shall be installed and in operating condition; SCADA Vendor shall install their Actuators suitably selected to operate the valves according to the logic desired by client.
  - Necessary loop power supply for operation of instruments like Valve etc shall be provided by CUSTOMER.

ADDITONAL TECHNICAL SPECIFICATIONS

- Miscellaneous Field Equipment:
- Instrumentation Cables:
- i. Cables for 24 V DC signals & 4-20 mA DC signals : 660 V/1100 V annealed, tinned, high conductivity 1.0 sq.mm stranded copper conductor, extruded PVC insulated two/three cores twisted into pair/traid, laid up collectively, individual pair/ traid shielded and overall shielded with aluminum Mylar tape, ATC drain wire run continuously in contact with aluminium side of the tape, inner sheathed with extruded PVC, armored with galvanized steel wire, overall sheathed with extruded FRLS PVC conforming to IS 1554, BS:5308 & IEC:189 Part II.

- ii. Cables for 230 V AC/ 110 V DC signals: 660V/1100 V grade multicore cables, multi stranded high conductivity annealed 1.5 sq.mm. stranded tinned copper conductor, extruded PVC insulated, inner sheathed with extruded PVC, armored with galvanized steel wire, overall sheathed with extruded FRLS PVC conforming to IS 1554, BS: 5308 & IEC: 189 Part II.
- Cabinets for Field Instruments:
- i. It shall be fabricated from cold rolled steel with powder coating sheet of minimum 2 mm thick and shall be suitable for wall mounting or pedestal mounting as required.
- ii. The cabinet shall be properly painted from inside by white paint and from outside by paint shade RAL 7032.
- iii. The cabinet shall conform to IP-54 protection and shall have built- in locking facility.
- The cabinet shall be earthed properly. A steel plate/pipe, as per the requirement, shall be provided in the cabinet for mounting the instrument and accessories.
- Mounting:
- i. All equipment on front of panel shall be mounted flush or semi flush. In case of semi-flush mounting, only flange or bezel shall be visible from the front. Equipment shall be mounted such that removal and replacement can be accomplished individually without interruption of service to adjacent equipment. Equipment mounted inside the panel shall be so located that terminals and adjacent devices are readily accessible without the use of special tools. Terminal markings shall be clearly visible.
- ii. Cut-outs and wiring for free issue items, if any, shall be according to corresponding equipment manufacturer's drawing. Cut-outs, if any, provided for future mounting of equipment shall be properly blanked-off. Wherever required, panels shall be matched with other panels in the control room in respect of dimensions, colour, appearance and arrangement of equipment on the front.
- Earthing for Instruments:
- The panel shall be equipped with an instruments earth bus securely fixed along the inside base of panel. All metallic cases of relays, instruments and other panel mounted equipment and cable shields, shall be connected to the instrument earth bus. Looping of earth connections which would result in loss of earth connection to other devices when the loop is broken shall not be permitted. However, looping of earth connections between equipment to create alternative paths to earth bus shall be provided. A separate instrumentation earth bar mounted on insulating supports (a ‘clean’ earth) shall be provided within the panels. Instrumentation and control cable screens shall be connected to this earth. Earth for instruments shall be separate from electrical station earth.

- Frame Earthing:
  All metal parts other than those forming part of an electrical circuit shall be connected to a copper earth bar run along the inside bottom of the panel. The minimum section of the earth bar shall be 25 mm x 3mm. Connection of the earth bar to the station earth shall be carried out by Contractor.
- Space Heater:
- Space heaters of adequate capacity shall be provided inside control panels to prevent moisture condensation on the wiring and panel mounted equipment when the panel is not in operation. The heaters shall operate on 230/110 V AC. Heaters inside the panels shall not be mounted close to the wiring or any panel mounted equipment. The operation of heaters shall be controlled by thermostats.
- Interior Lighting and Receptacles:
- Each panel shall be provided with either a fluorescent or filament lighting fixture rated for 230V, 1 phase, 50 Hz supply for the interior illumination of the panel during maintenance. The illumination lamp shall be operated by door switch as well as manual switch. Each panel shall be provided with 230V, 1 phase, 50 Hz, combined 5 amps and 15 amps, 3 pin receptacles with a switch and neon indicating. The receptacle with switch shall be mounted inside the panel at a convenient location.
- Voltage Level and Power Supply Units Voltage levels for control schemes and power supply for instruments shall be limited to regulated 24 V DC.
- Labels:
- All the equipment mounted on the front facia of control panel as well as equipment mounted inside the panels shall be provided with individual labels with equipment designation engraved. The labels shall be mounted directly below the respective equipment. Also the panel shall be provided at the top with a label engraved with panel designation.
- i) Switches and Miniature Circuit Breakers (MCBs): Each control panel shall be provided with necessary arrangement for receiving, distributing, isolating and protecting of DC and AC supplies for various control, signaling, lighting and space heater circuits. The incoming and sub-circuits shall be separately provided with Miniature Circuit Breakers (MCBs). Potential circuits for relaying and metering also shall be protected by MCBs.
- Terminal Blocks:
- Terminal blocks shall be 660V grade, 20 amps rated, one-piece molded, complete with stud type terminals, washers, nuts and lock nuts and identification markings. Terminal block design shall include a white fiber marking strip with clear plastic, hinged terminal covers. Markings on the terminal strips shall correspond to wire numbers on the wiring diagrams. All spare contacts and terminals of the panel mounted equipment and devices shall be wired to terminal blocks. There shall be a minimum clearance of 250 mm between the first row of terminal blocks and the associated cable gland plate. Also, the clearance between two rows of terminal blocks shall be a minimum 250 mm. Panel internal wiring shall not be looped directly from

instrument to instrument. The same shall be looped through the panel terminal block only. If accidental short circuiting of certain wires is likely to result in malfunction of equipment, such as closing or tripping of a breaker or positive and negative wires, these wires shall not be terminated on adjacent terminal blocks.

- Cable Supports
- All external cables shall present a neat appearance and shall be suitably braced, placed in toughing clipped or laced to prevent effects of vibration.
- Terminal Identification
- Every terminal and test plug shall be uniquely identified within the terminal cabinet by means of a terminal number. Appropriate labels shall be used to permit quick and unambiguous identification of each terminal and test plug.
- Painting of Control Panel:
- All sheet steel work shall be phosphated in accordance with the following procedure:
- Oil, grease, dirt and swarf shall be thoroughly removed by emulsion cleaning. Rust and scale shall be removed by trickling with clean water followed by final rinsing with dilute dichromate solution. The control panel shall be powder coated with thickness of coating of minimum 60 microns shall be provided. QA test certificate shall be furnished for thickness adhesion and hardening of powder coating.
- Service: For Automatic operation and monitoring of pumps
- Type: Free standing
- Construction: Prefabricated and modular construction
- Sheet Material: Cold rolled sheet steel
- Sheet thickness: 2 mm for all the sides, 3 mm for gland and mounting plate
- Internal Lighting: Required
- Cable Entry: Bottom
- Access: Front and Rear
- External Colour of the panel: RAL 7032
- Internal colour of the panel: Glossy white / RAL 7032
- **Inspection and Testing Requirements**
- To ensure that a well-engineered and contractually compliant system is delivered by the Contractor, the following tests shall be performed.
- a) Site Acceptance Test (SAT).
- b) Site Acceptance Tests (SAT): Site Acceptance Testing activities shall include the following:
- Pre-Commissioning/Commissioning checks and tests for Instrumentation Systems
- The Contractor shall carryout the pre-commissioning/commissioning checks and tests listed below and submit the report of the same to Engineer's Representative. The pre-commissioning /commissioning checks listed below are indicative and the Contractor shall prepare and submit for approval by the Engineer's Representative the pre-commissioning /commissioning program proposed by him. If during the pre-commissioning/commissioning checks and tests itis found that a instrument needs re-calibration then the instrument shall be re- calibrated

by the Contractor at no extra cost to the purchaser and the test reports of the re-calibration shall be submitted to the Engineer's Representative for approval/record.

WARRANTY (INCLUDING COMPREHENSIVE MAINTENANCE) OF 5 YEARS

WARRANTY:

It is an essential part of the contract that the tenderer shall provide warranty of the system for 2 years. During the warranty as well as maintenance period following maintenance will be required to be carried out by the contractor.

1. Keeping up and replacement of the any component or subcomponents of the Automation system for proper operation of the system.

2. Repairing/replacement of all defective Automation components and sub-components of the euipments installed at MCS / LCS / Tubewells as per the requirement to ensure proper operation of the system 24x7 days.

3. It is mandatory for the contractor to submit a monthly performance / maintenance report for each system to the concerned project officer of UPJN.

4. The Comprehensive Maintenance shall be carried out by the firm himself or their authorized dealer / service center of the firm. In case the firm fails to fulfill its commitments to keep the spare parts necessary for repairs or not able to provide round the clock service as per the requirement of the contract, to provide water supply to the population, the firm is liable to be banned from further service and his contract may be terminated by giving 7 days written notice. New firm may be awarded the contract for the remaining period at their risk and cost and the additional burden, if any, shall be recovered from the firm's security deposit or any outstanding deposit anywhere in the department, for which only the firm shall be responsible.

SCHEDULE 'J'

(Terms and Procedures of Payment)

The following shall be the breakup for the running payments of Execution of Reorganization of Water Supply Scheme on the basis of schedule "G"

S.No.	Description of work	Payment	
A	**SCADA/Automation**		
1	After supply of material at respective site	**70%**	Of SCADA/ AUTOMATION
2	After installation, commissioning, testing and 3 months test & trial run	**20%**	
3	After successful completion of operation & defect liability period of 12 months	**10%**	
B	**<u>Separate Contract Bond shall be made for Operation & Maintenance for 5 years</u>**		
1	After 1 year successful running & maintenance of the scheme	20%	5 Year O&M Cost
2	After 2 year successful maintenance Of the scheme	20%	
3	After 3 year successful maintenance Of the scheme	20%	
4	After 4 year successful maintenance Of the scheme	20%	
5	After 5 year successful maintenance Of the scheme	20%	
Note	Payment for Electricity charges & chlorination shall be made by Jalkal Vibhag, Nagar Palika Parisad, Sultanpur.		
	Old Machinary and Equipments have to be maintained by Jalkal Vibhag, Nagar Palika Parisad, Sultanpur .		
	Staff deputed during execution of work, trial run & defect liability period shall be borne by firm.		

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

Signature.....

Name of Contractor.....

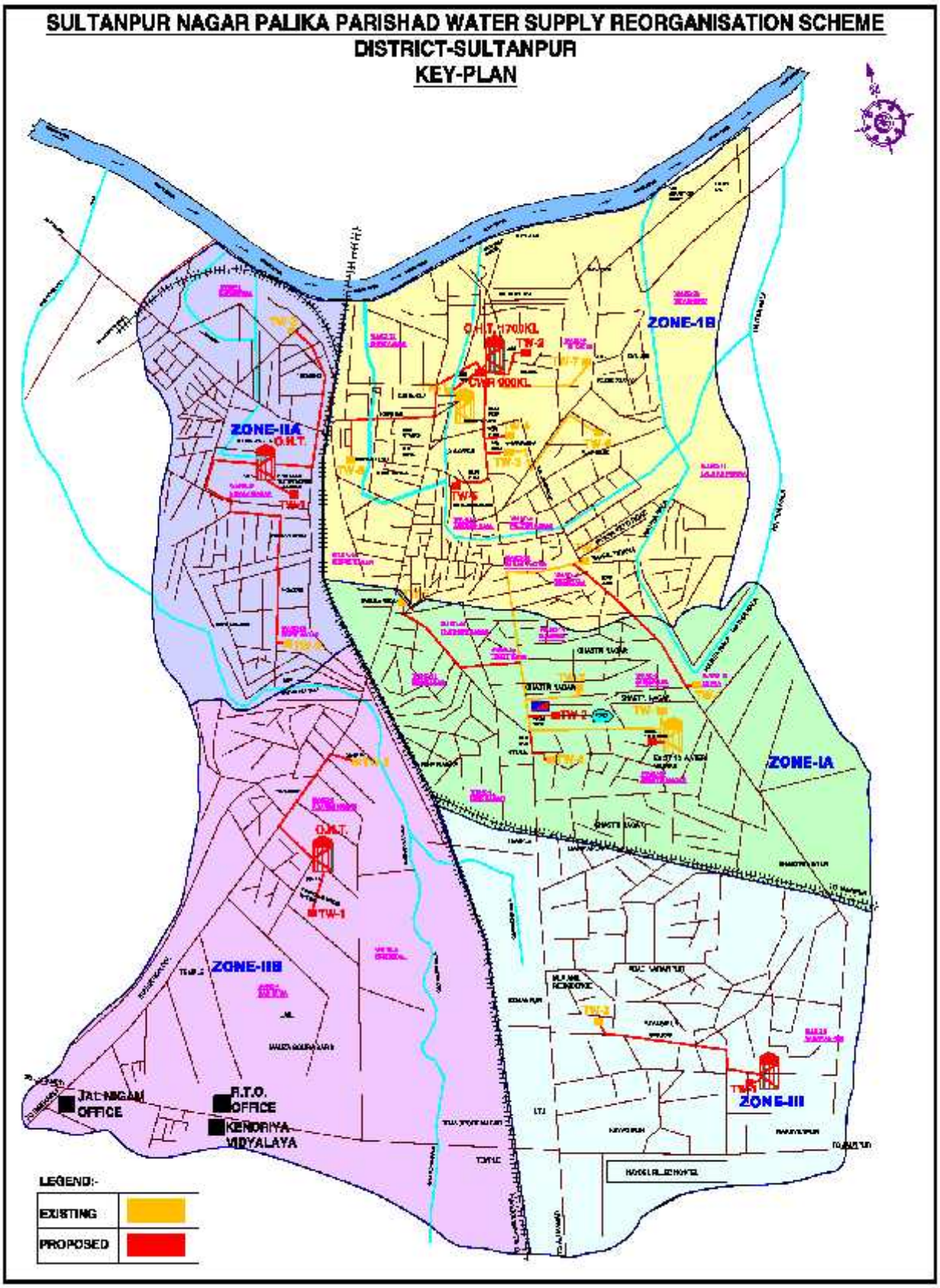
Address.....

Map of Uttar Pradesh

SULTANPUR NAGAR PALIKA PARISHAD WATER SUPPLY REORGANISATION SCHEME

DISTRICT-SULTANPUR

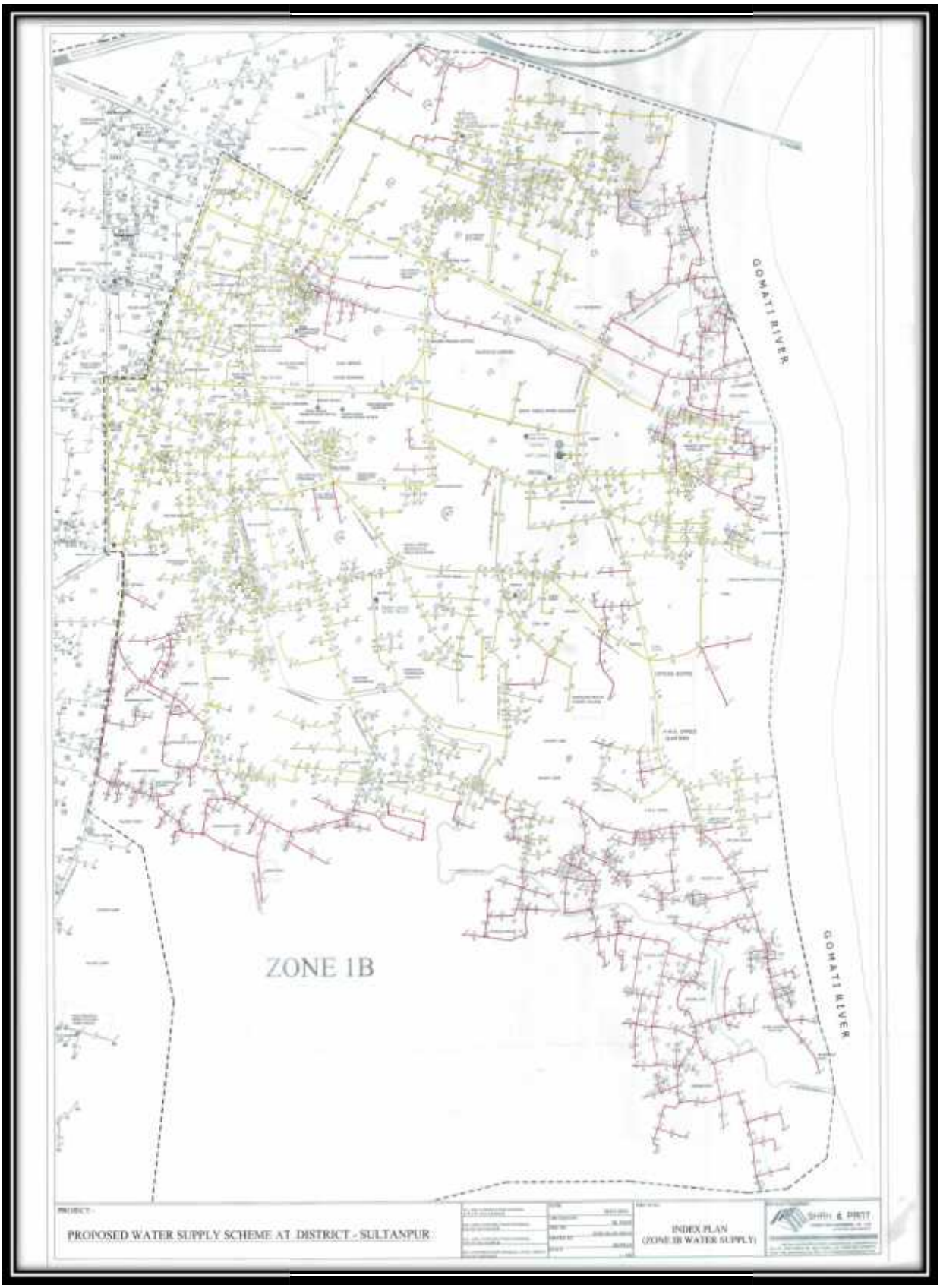
KEY-PLAN



PROJECT:

PROPOSED WATER SUPPLY SCHEME AT DISTRICT - SULTANPUR

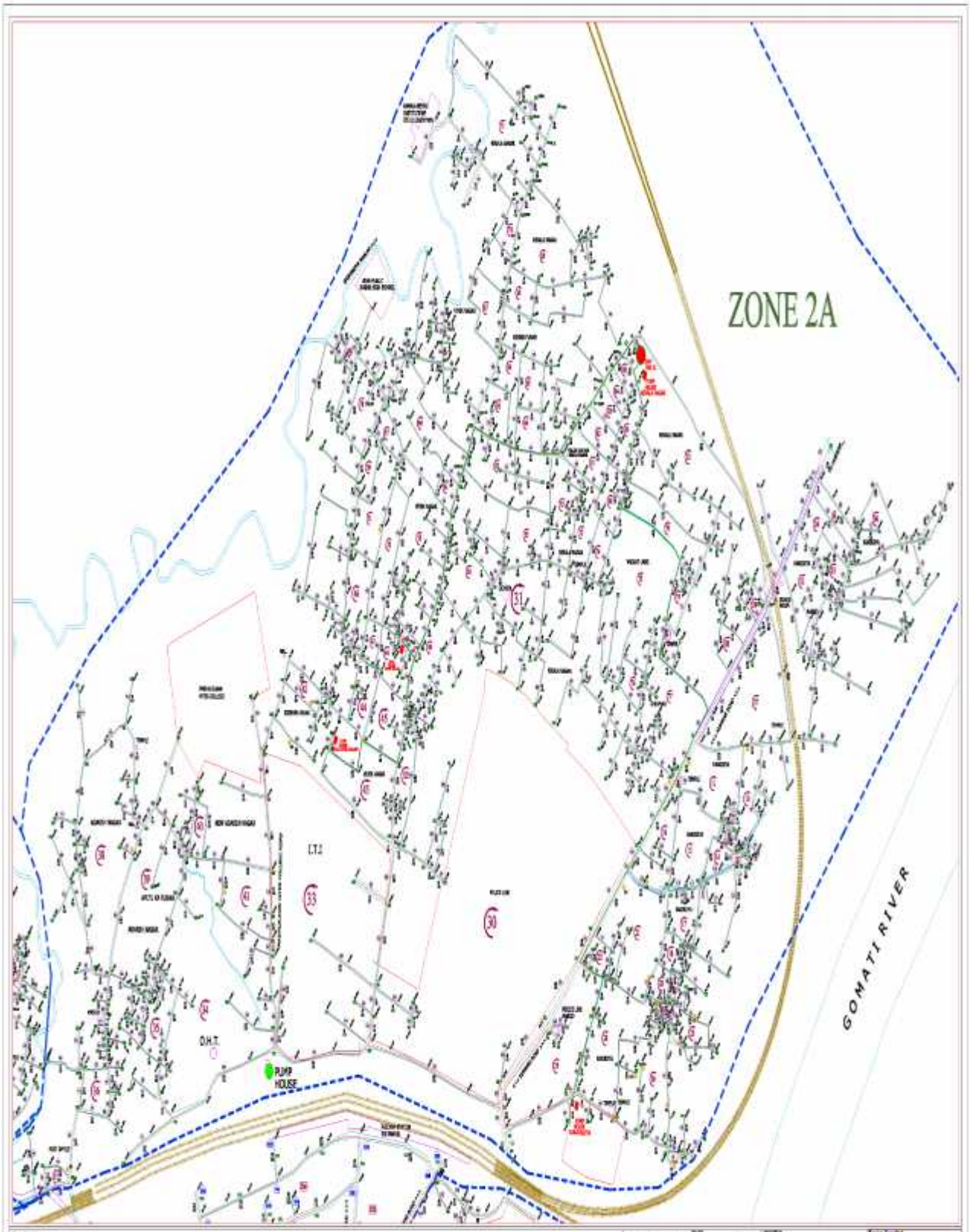
INDEX PLAN
(ZONE 1A WATER SUPPLY)



PROJECT :-

PROPOSED WATER SUPPLY SCHEME AT DISTRICT - SULTANPUR

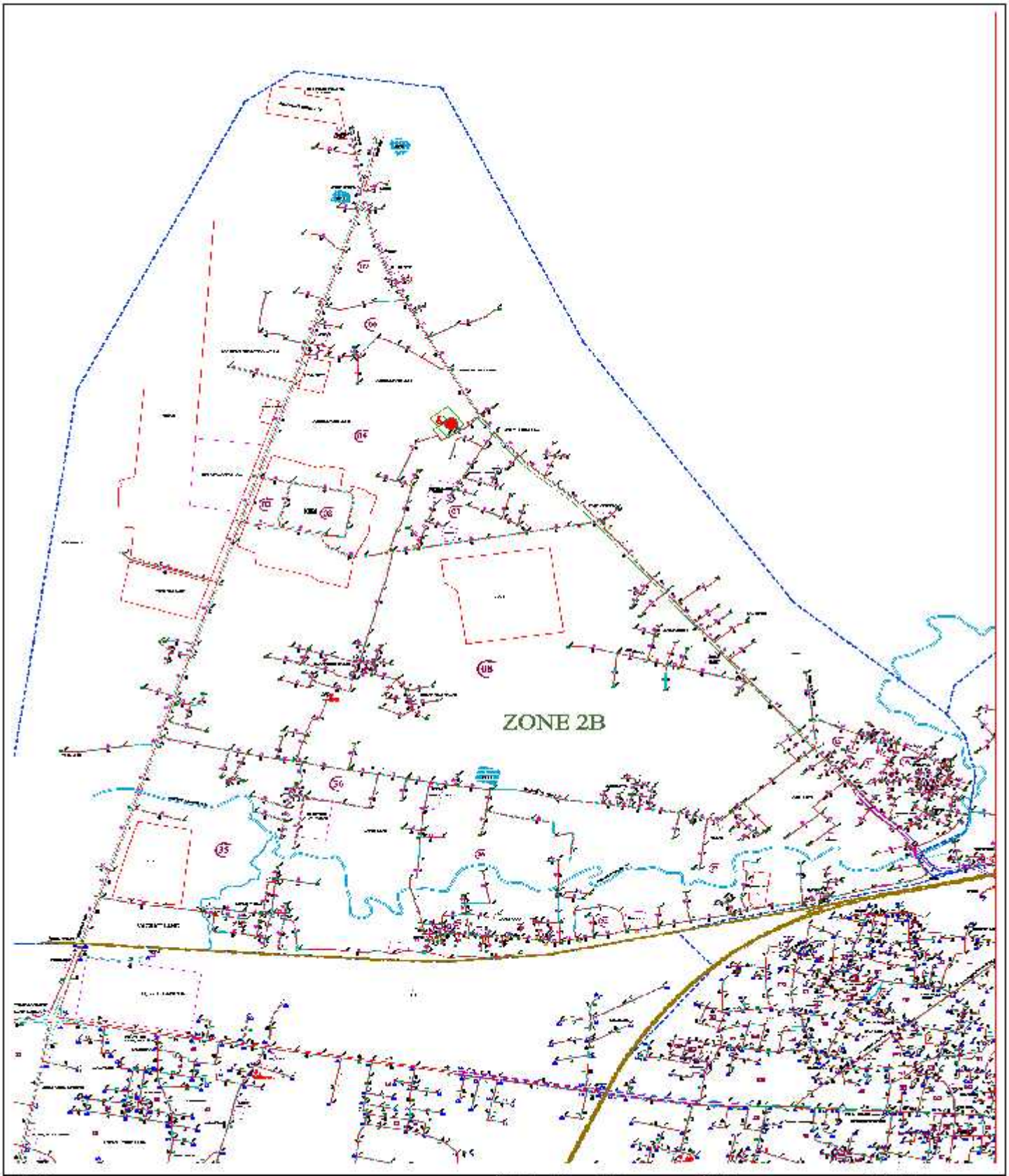
INDEX PLAN
(ZONE 1B WATER SUPPLY)



PROJECT:-

PROPOSED WATER SUPPLY SCHEME AT DISTRICT - SULTANPUR

INDEX PLAN
(ZONE 2A WATER SUPPLY)

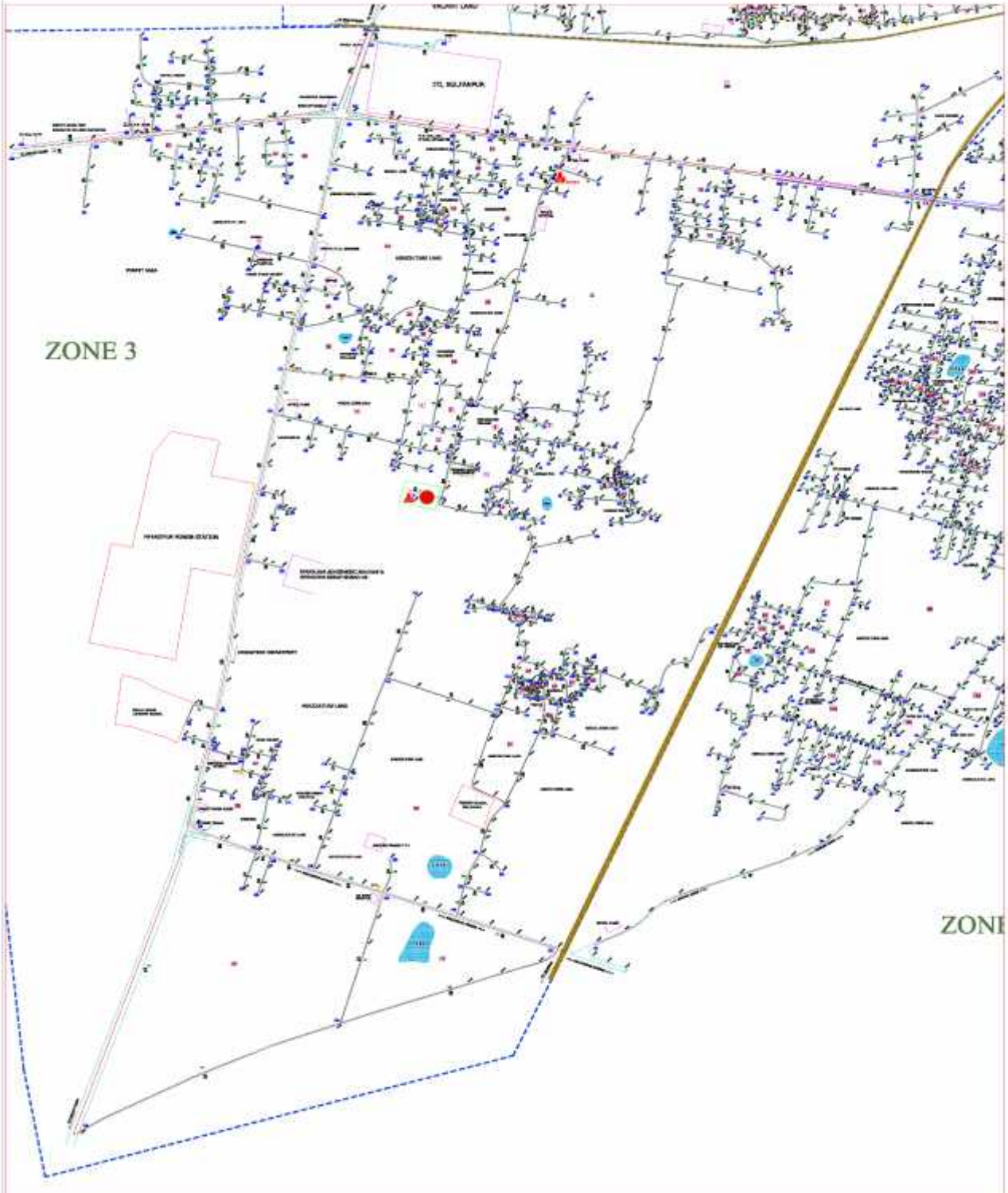


PROJECT:

PROPOSED WATER SUPPLY SCHEME AT DISTRICT - SULTANPUR

INDEX PLAN
(ZONE 2B WATER SUPPLY)

SHAH & PATEL



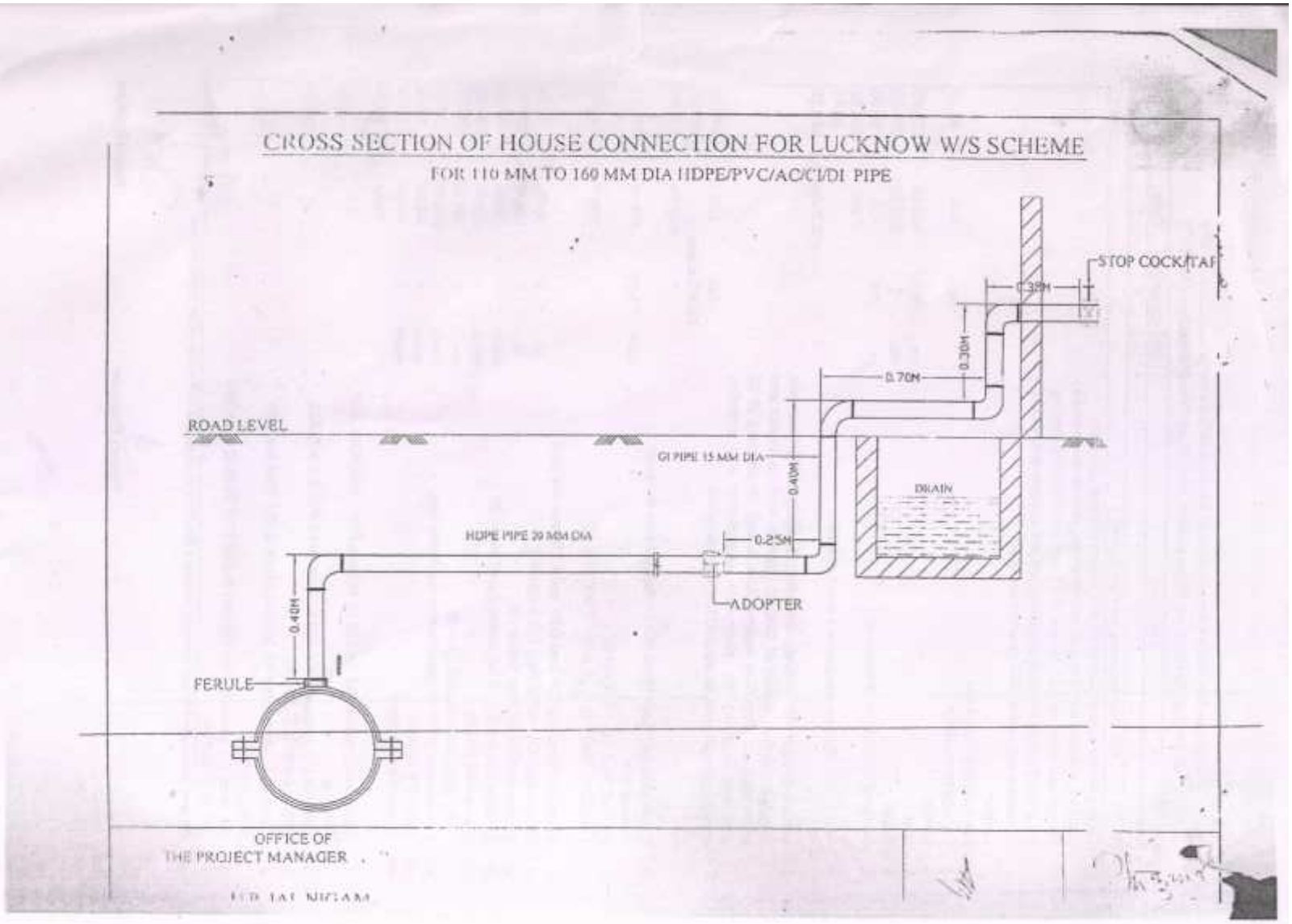
PROJECT:-

PROPOSED WATER SUPPLY SCHEME AT DISTRICT - SULTANPUR

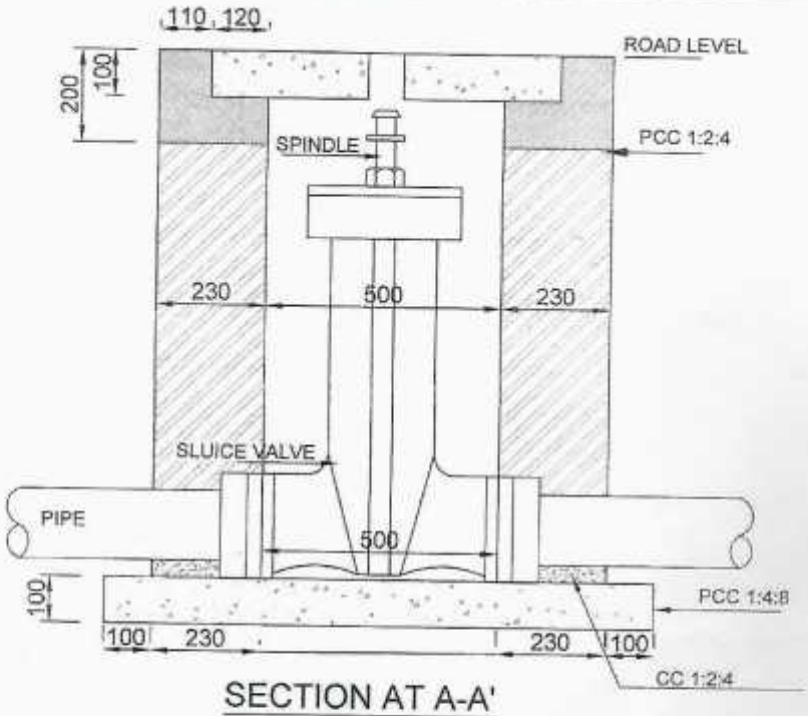
INDEX PLAN
(ZONE III WATER SUPPLY)

CROSS SECTION OF HOUSE CONNECTION FOR LUCKNOW W/S SCHEME

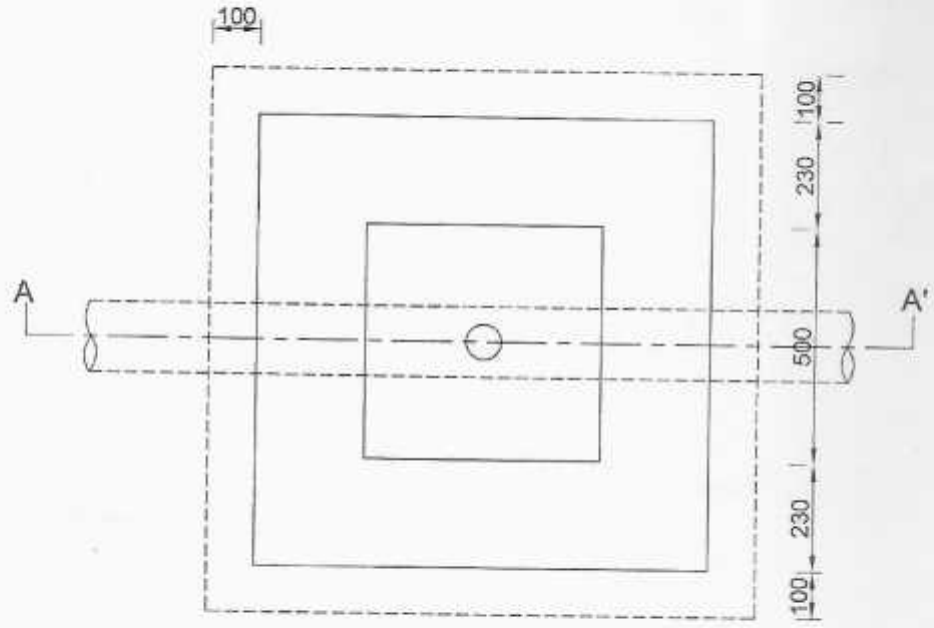
FOR 110 MM TO 160 MM DIA HDPE/PVC/AC/CI/DI PIPE



OFFICE OF
THE PROJECT MANAGER



SECTION AT A-A'



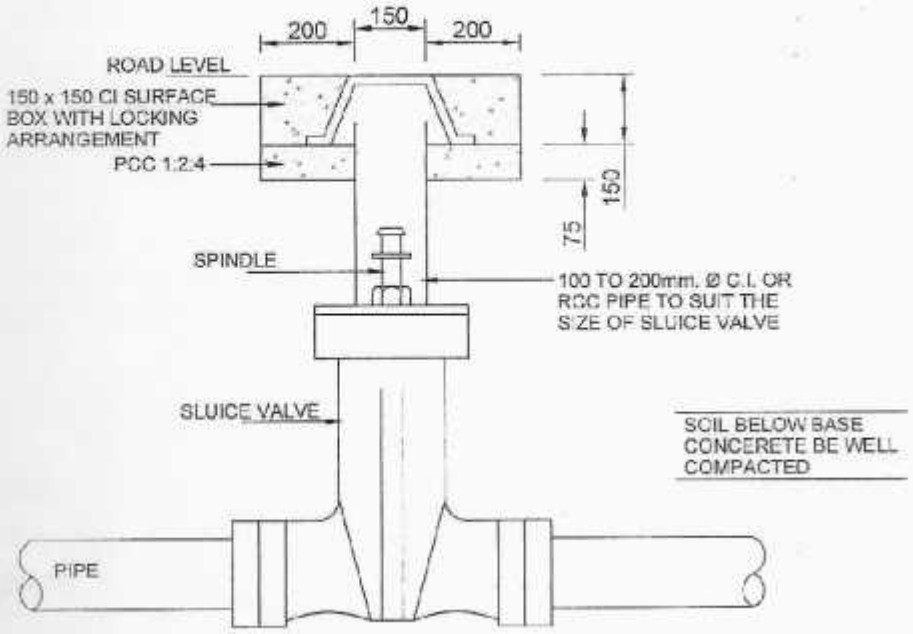
PLAN

DRAWING D-4

U. P. JAL NIGAM

TYPE DESIGN :

MASONARY TYPE SLUICE VALVE CHAMBER



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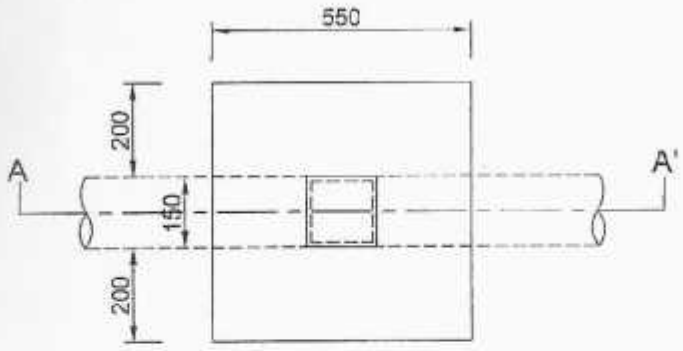


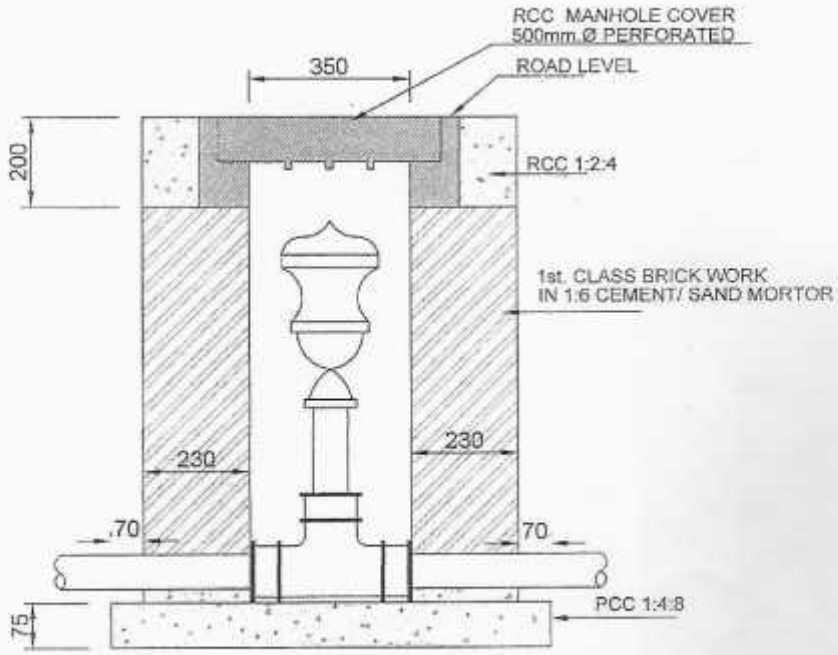
PLAN

DRAWING D-13

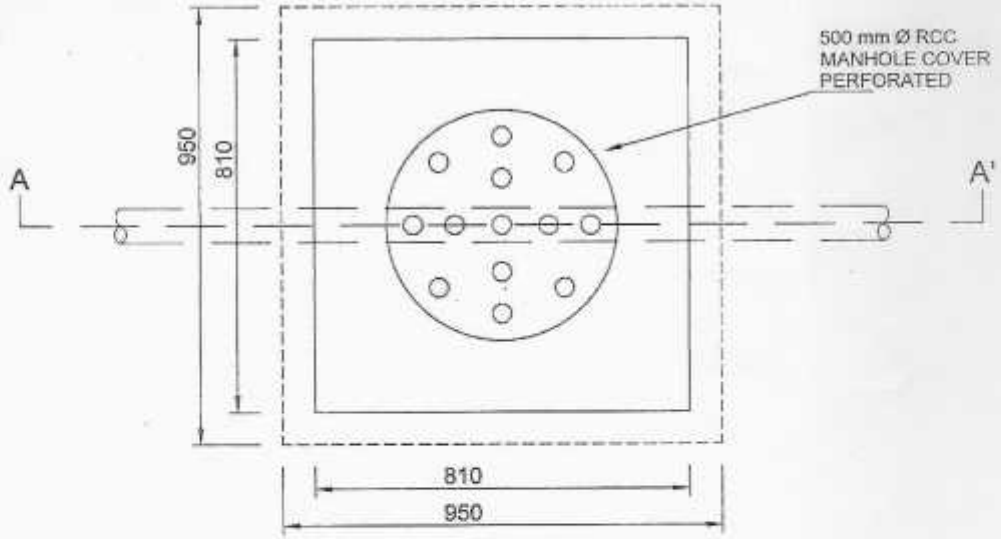
U. P. JAL NIGAM

TYPE DESIGN :

SURFACE BOX TYPE SLUICE VALVE CHAMBER



SECTION AT A-A'



PLAN

DRAWING D-6

U. P. JAL NIGAM

TYPE DESIGN :

CHAMBER FOR AIR VALVE