WEST BENGAL MEDICAL SERVICES CORPORATION LTD.

(Wholly owned by the Government of West Bengal)

SwasthyaSathi, GN-29, Sector-V, Salt Lake, Kolkata-700 091.

NOTICE INVITING TENDER DOCUMENTS FOR

Comprehensive Annual Operation & Maintenance (with manpower & consumables) Contract of the Two nos of Sewage Treatment & ETP Plant

- ***Sewage Treatment Plant (of capacity 235KLD) at Deben Mahata Govt. Medical College, Hatuara, Purulia.***
- ***Sewage Treatment & ETP Plant (of capacity 400KLD) at Super Speciality Hospital, Hatuara, Purulia***

(NIT Reference No. :- WBMSCL/NIQ-114/2021, Dated – 10/05/2021)

WEST BENGAL MEDICAL SERVICES CORPORATION LIMITED

(Wholly Owned by the Government of West Bengal)

Registered Office: SwasthyaSathi, GN-29, Sector-V, Salt Lake, Kolkata-700091
Phone: 033-4034-0300 ◊ Email: info@wbmsc.gov.in ◊ website: www.wbmsc.gov.in

NIT Ref No. :WBMSCL/NIQ-114/-2021 Dated : 10/05/2021

Managing Director, West Bengal Medical Services Corporation Limited, SwasthyaSathi, GN-29, Sector-V, Kolkata - 700 091, invites e-tender for the works detailed in the table below

(Submission of Bid through online)

Sl. No.	Name of the work	Earnest Money (Rs.)	Cost of Tender documents (Rs.) (Nonrefundable)	Time of Completion	Name & address of the Office
01.	Comprehensive Annual Operation & Maintenance (with manpower & consumables) Contract of the Two nos of Sewage Treatment & ETP Plant • Sewage Treatment Plant (of capacity 235KLD) at Deben Mahata Govt. Medical College, Hatuara, Purulia. • Sewage Treatment & ETP Plant (of capacity 400KLD) at Super Speciality Hospital, Hatuara, Purulia	24,000/-	NIL	01 (One) year	Managing Director, West Bengal MedicalServices CorporationLimited, SwasthyaSathi Building, GN29, Sector –V, Saltlake,

Eligibility of Contractor: Intending bidders having Trade license in similar nature of job should produce credentials of a similar nature of completed work ofthe minimum value of (i) Rs.4,00,000/-(Rupees Four Lacks) during last 5(Five) years prior to the date of issue of this tender notice or (ii) Two similar nature of completed work, each of the minimum value of Rs.3,00,000/-(Rupees Four Lacks)during last 5(Five) years prior to the date of issue of this tender notice or (iii) One single running work of similar nature which has been completed to the extent of 80% or more and value of which is not less than the Rs.4,00,000/-(Rupees Four Lacks).

Note:

a) For contract value exceeding 2.5 lakh deductions of TDS on GST is mandatory.
b) Quoted rate must be inclusive of GST.
c) Completion certificate should contain
i) Name of work, ii) Name of Agency, iii) Amount put to tender, iv) TenderNo, v) Schedule month and year of commencement and completion as per the work order, vi) actual date of completion, vii) Gross value of the work done as per final bill.

d) Payment will be made after getting the work done certificate & recommendation from the respectiveSite Engineer.

e) The prospective bidders must have the credential(s) of satisfactory completion as a prime agency during the last 5(five) years from the date of issue of this Notice as mentioned in Eligibility criteria under authority of State/ Central Govt., State /Central Govt. undertaking/ Statutory Bodies Constituted under the Statute of the Central / State Govt.

f) Payment certificates in lieu of credentials will not be accepted.

g) Valid up to date clearance of Income Tax return / GST Registration Certificate/ Professional Tax Enrolment/latest Deposit Challan / P.T. (Deposit Challan) / Pan Card / License / Voter ID Card for self-identification to beaccompanied with the Technical Bid Documents, Income Tax Acknowledgement Receipt for latest assessment Year to be submitted.

h) The contractors who have been delisted of debarred by any government department shall not be eligible in anyway.

i) Joint venture will not be allowed to participate in the above NIT.

j) A prospective bidder participating in a single job either individually or as partner of a firm shall not be allowed toparticipate in the same job in any other form.

k) A prospective bidder shall be allowed to participate in a single job either in the capacity of individual or as a partnerof a firm. If found to have applied severally in a single job, all his applications will be rejected for thatjob.

l) Where there is a discrepancy between the unit rate & the line item total resulting from multiplying the unit rate by thequantity, the unit rate quoted shall govern.

m) Prevailing safety norms has to be followed so that LTI (Loss of time due to injury) is zero.

n) No mobilization /secured advance will be allowed.

o) Agencies shall have to arrange land for erection of Plant & Machineries, storing of materials, labour shed, laboratoryetc. at their own cost and responsibility.

p) Constructional Labour Welfare Cess @ 1 % (one percent) of the cost of construction will be deducted from every bill of the selected agency. GST, Royalty & all other Statutory Levy / Cess will have to be borne by the contractor. As the rates in the Schedule of rate are inclusive of GST &Cess as stated above.

q) In connectionwith the work, Arbitration will not be allowed. The Clause No. 25 of 2911(ii) is to be considered as deleted clause vide gazette notification no 558/SPW-13th December, 2011.

r) The work is of URGENT in nature and agency entrusted for it shall have to complete the work within stipulated time without any failure.

s) Refund of EMD: The Earnest Money of all the unsuccessful bidders, deposited online, shall be refunded inaccordance with the Memorandum of the Finance Department vide No. 3975-F(Y) dated 28th July, 2016.(Refer “Annexure-I” in Bidders Guideline).

t) Penalty for suppression / distortion of fact.Submission of false document by tenderer is strictly prohibited & if found action may be referred to theappropriate authority for prosecution as per relevant IT Act with forfeiture of earnest money forthwith.

u) The Earnest Money may be forfeited if ; -
   i) If the Bidder withdraws the Bid during the period of Bid validity.
   ii) In case of successful Bidder, if the Bidder fails to execute formal agreement within the stipulated time period.
   iii) During scrutiny, if it is come to the notice of tender inviting authority that the credential or any other document which were uploaded & digitally signed by the Bidder are incorrect /manufactured / fabricated.

v) The successful Bidder shall have to execute Formal Agreement with Managing Director, West Bengal Medical Services Corporation Limited within 7(Seven) days from the issuance of Provisional Work order.

w) Bank guarantee shall be accepted for the purpose of the security.

1. In the event of e–filing, intending bidder may download the tender documents from the website: http://https://wbtenders.gov.in directly with the help of Digital Signature Certificate.NecessaryEarnest Money will be deposited by the bidder electronically online through his net banking enabled bank account, maintained at any nationalized bank by generating NEFT/RTGS challan from the e-tendering portal and also to be documented through e-filing.

   As per G.O. No. 1592 – F(Y) dated. 20.03.2014 of the Finance Dept.of Govt. of West Bengal, in case of e–tendering, EMD/Bid security will have to be submitted as soft copy (scanned copies of the originals) along with the tender for instruments and in case of deposit of money it should compulsorily be deposited on – line by the bidders. The L1 bidder will submit the hard copy of the documents to the tender inviting authority with his acceptance letter of the LOI within specified time as mentioned in the letter of acceptance. Failure to submit the hard copy with the acceptance letter within the time period prescribed for the purpose may be construed as an attempt to disturb the tendering process and dealt with accordingly legally including blacklisting of the bidder.

2. Both Technical bid and Financial Bid are to be submitted concurrently duly signed digitallyin the website https://wbtenders.gov.in

3. Dully filled in copies of **Section – II (Forms I to IV)**&**FORM-A in Section- III**in prescribed proforma with proper dated signature in the relevant spaces to be uploaded electronically.

   Documents in support of the information furnished in Forms Section-II (Form I to IV), must be attached/uploaded for evaluation and the file number & page number has to be indicated in the respective column of the Form.

4. i) On selection of RTGS/NEFT as the payment mode, the e-Procurement portal will show a pre-filled challan having the details to process RTGS/NEFT transaction.

ii) The bidder will print the challan and use the pre-filled information to make RTGS/NEFT payment using his Bank account.
iii) The EMD of the bidders disqualified at the technical evaluation will be refunded through an automated process to the respective biddres' bank accounts from which they made the payment transaction.

5. 4. The Financial Offer of the prospective Tenderer will be considered only if the Tenderer qualifies in the Technical Bid. The decision of the **Managing Director, WEST BENGAL MEDICAL SERVICES CORPORATION LIMITED** will be final and binding on all concerned and no challenge against such decision will be entertained.

6. In case of inadvertent typographical mistake found in the Specific Price Schedule of Rates i.e. Bill of Quantity (BOQ), the same will be treated as to be so corrected as to conform with the prevailing relevant Schedule of Rates and/or Technically Sanctioned Estimate.

7. Running payment for work may be made to the executing agency as per availability of fund. The executing agency may not get a running payment unless the gross amount of Running Bill stands at least **25% (twenty-five percent)** of the tendered amount. Provisions in Clause(s) 7, 8& 9 contained in W.B. Form No. 2911(ii) so far as they relate to quantum and frequency of payment is to be treated as superseded.

8. Bids shall remain valid for a period not less than 120 (one hundred twenty) days after the dead line date for Financial Bid submission.

9. Important Information:

DATE AND TIME SCHEDULE:

Sl. No.	Particulars	Date & Time
1	Date of uploading of NIeT Documents (online)(Publishing Date)	12/05/2021 at 09.00 AM
2	Tender documents download start date (online)	12/05/2021 at 10.00 AM
3	Bid proposal submission start date (online)	19/05/2021 at 09.00 AM
4	Technical & Financial Bid proposal Submission end date(online)	25/05/2021 at 12.00 PM
5	Bid opening date of Technical evaluation (online)	27/05/2021 at 12.00 PM
6	Bid opening date of Financial proposal	To be notified later

10. Cost of Tender Documents: **NIL** (As per Notification of the Secretary, Public Works Department, CRC Branch, Government of West Bengal vide No. 199-CRC/2M-10/2012 dated: 21/12/2012 communicated by the Technical Secretary, Public Works Department, Government of West Bengal that the intending tenderers shall not have to pay the cost of tender documents for the purpose of participating in e-tendering.)

11. Earnest Money: The amount of Earnest Money is to be submitted Online through his net banking enabled bank account, maintained at any nationalized bank by generating NEFT/RTGS challan from the e-tendering portal and also to be documented through e-filing. The process of deposit of earnest money through offline instruments like Bank Draft, Pay Order etc. will be stopped for e–tender procurement of this office wef. 01.09.2016.

Once the financial bid evaluation is electronically processed in the e-Procurement portal, EMD of the technically qualified bidders other than that of L1 and L2 bidders will be refunded through an automated process to the respective bidders' bank accounts from which they made the payment transaction. If the L1 bidder accepts the LOI and the same is processed electronically in the e-Procurement portal, EMD of the L2 bidder will be refunded through an automated process to his bank account from which he made the payment transaction.

The earnest money of the successful bidder (being converted to security deposit) deposited, will remain under the custody of the department till satisfactory completion of the work in full including extended quantity if ordered for. Besides this, necessary percentages shall be deducted from the progressive bids **so as to make it 3% (Ten percent) of the value of work billed for. [as per memorandum No. 201-F(Y), date 18th Jan'21]**

12. The Bidder, at his own responsibility and risk is encouraged to visit and examine the site of works and its surroundings and obtain all information that may be necessary for preparing the Bid and entering into a contract for the work as mentioned in the Notice Inviting Tender, before submitting the offer with full satisfaction. The cost of visiting the site shall be at his own expense.

13. The intending Bidders should clearly understand that whatever may be the outcome of the present invitation of Bids, no cost of Bidding shall be reimbursable by the Department. The Managing Director, WEST BENGAL MEDICAL SERVICES CORPORATION LIMITED reserves the right to reject any or all the application(s) for purchasing Bid Documents and/or to accept or reject any or all the offer(s) without assigning any reason whatsoever and is not liable for any cost that might have been incurred by any Tenderer at the stage of Bidding.

14. The intending bidders are required to quote the rate online only. No offline tender will be entertained.

15. If more than one Bidder quoted same rate and which are found lowest at the time of opening, such similar multiple rates will not be entertained / accepted. Lowest offer will be ascertained by sealed bid amongst the lowest bidders.

16. Contractor shall have to comply with the provisions of (a) the contract labour (Regulation Abolition) Act. 1970 (b) Apprentice Act. 1961 and (c) minimum wages Act. 1948 and any other notification thereof or any other laws relating thereto and the rules made and order issued there under from time to time.

17. During the scrutiny, if it comes to the notice of the tender inviting authority that the credential(s) and/or any other paper(s) of any bidder is / are incorrect/ manufactured/fabricated, that bidder(s) will not be allowed to participate in the tender and that application will be rejected outright.

18. The Managing Director, WBSMCL reserves the right to cancel the N.I.T. or issue corrigendum notices to the NIT due to unavoidable circumstances and no claim in this respect will be entertained.

19. List of "Technically Qualified Bidders" will be published in the web portal only. Financial Bid will be opened within a short period after such publication. Therefore, Bidders are requested to view the tender status on a regular basis.

20. In case of any objection regarding prequalifying an Agency, that should be lodged to the ManagingDirector, WEST BENGAL MEDICAL SERVICES CORPORATION LIMITED within 1(one) day from the date of publication of the list of qualified agencies and beyond that time schedule no objection will be entertained.

21. Before issuance of the work order, the tender inviting authority may verify the credential(s) and/or other document(s) of the lowest tenderer, if found necessary. After verification, if it is found that the document(s) submitted by the lowest tenderer is/are either manufactured or false, the work order will not be issued in favour of the said Tenderer.

22. If any discrepancy arises between two similar clauses on different notifications, the clause as stated in later notification will supersede former one in following sequence;-
    a) Notice Inviting Tender
    b) Special Terms and Conditions
    c) Financial Bid
    d) Schedule of Works (as per Annexure 'A')

    All works covered in the clause appearing hereinafter shall be deemed to form a part of the appropriate item or items of works appearing in the work schedule whether specifically mentioned in any clause or not and the rates quoted shall include all such works unless it is otherwise mentioned that extra payment will be made for particular works.

Intending tenderers are required to submit online attested/self-attested photocopies of valid enlistment renewal certificate, valid partnership deed (in case of partnership firm), current Professional Tax Deposit Challan / Professional Tax Clearance Certificate, PAN Card, Trade License from the respective Municipality, Panchayet etc. (in case of S & P Contractors only), [Non statutory documents]

In case of Registered Unemployed Engineers' Co-operative Societies and Registered Labour Cooperative Societies, attested photocopies of documents of credentials showing satisfactory completion of a single work in any Government Department commencing on or after 01.04.2009 of value not less than 40% of the Estimated Cost of the work applied for, 'Certificate of Registration' from the respective Assistant Registrar of Co-operative Societies, Professional Tax Deposit Challan / Professional Tax Clearance Certificate, PAN Card, must be submitted online. Payment certificates in lieu of credentials will not be accepted. [Non statutory documents]

The intending tenderer is required to quote the rate in figures as well as in words as **percentageabove / below than or at par** with the relevant price schedule of rates.

Conditional / incomplete quotation will not be entertained.
Issuance of work order as well as payment will depend on availability of fund and no claim whatsoever will be entertained for delay of Issuance of work order as well as payment, if any. Intending tenderers may consider this criterion while quoting their rates.

If any tenderer withdraws his offer before acceptance or refuse within a reasonable time without giving any satisfactory explanation for such withdrawals, he shall be disqualified from submitting tender to WEST BENGAL MEDICAL SERVICES CORPORATION LIMITED for a minimum period of 1(one) year.

Tax and other deductions shall be made as below:
i) GST will be deducted as applicable.

ii) Cess @ 1% (One Percent) of the cost of construction works will be deducted from the bills of the contractors on all contracts awarded on or after 01.11.2006 in pursuance with G.O. No. 599A/4M-28/06 dated 27.09.2006.
iii) 2% (Two percent) Income Tax of the cost of construction work will be deducted from the bill.
iv) Security Money deposit @ 1% (One Percent) will be deducted from the progressive bills in addition to the earnest money to make a total deposit of 3%(Ten Percent) of the value of work executed.

- Modification in the West Bengal Form No.: 2911/2911(i)/2911(ii)Clause 17 of CONDITIONS OF CONTRACT of the Printed Tender Form shall be substituted by the following vide Govt. Notification No 5784-PW/PW/L&A/2M-175/2017 dated 12.09.2017:

'Clause 17 - If the contractor or his workmen or servants or authorized representatives shall break, deface, injure, or destroy any part of building, in which they may be working, or any building, road, road-curbs, fence, enclosure, water pipes, cables, drains, electric or telephone posts or wires, trees, grass or grassland or cultivated ground contiguous to the premises, on which the work or any part of it is being executed, or if any damage shall happen to the work from any cause whatsoever or any imperfection become apparent in it at any time whether during its execution or within a period of three months or one year or three years or five years, as the case may be (depending upon the nature of the work as described in the explanation appended hereto) hereinafter referred to as the Defect Liability Period, from the actual date of completion of work as per completion certificate issued by the Engineer-in-Charge, the contractor shall make the same good at his own expense, or in default, the Engineer-in-Charge may cause the same to be made good by other workmen and deduct the expense (of which the certificate of the Engineer-in-Charge shall be final and binding on all concerned) from any sums, whether under this contract or otherwise, that may be then, or at any time thereafter become due to the contractor from the Government or from his security deposit, either full, or of a sufficient portion thereof and if the cost, in the opinion of the Engineer-in-Charge (which opinion shall be final and conclusive against the contractor), of making such damage or imperfection good shall exceed the amount of such security deposit and/or such sums, it shall be lawful for the Government to recover the excess cost from the contractor in accordance with the procedure prescribed by any law for the time being in force.-
Provided further that the Engineer-in-Charge shall pass the "Final Bill" and certify thereon, within a period of thirty days with effect from the date of submission of the final bill in acceptable form by the contractor, the amount payable to the contractor under this contract and shall also issue a separate completion certificate mentioning the actual date of completion of the work to the contractor within the said period of thirty days. The certificate of the Engineer-in-Charge whether in respect of the amount payable to the contractor against the "Final Bill" or in respect of completion of work shall be final and conclusive against the contractor . However, the security deposit of the work held with the Government under the provision of clause 1 hereof shall be refundable to the contractor in the manner provided here under:-

(a) For work with three months Defect Liability Period:
    i) Full security deposit shall be refunded to the contractor on expiry of three months from the actualdate of completion of the work.
(b) For work with one year Defect Liability Period:
    i) Full security deposit shall be refunded to the contractor on expiry of one year from the actual dateof completion of the work.
(c) For work with three years Defect Liability Period:
    i) 30% of the security deposit shall be refunded to the contractor on expiry of two years from the actual date of completion of the work;
    ii) The balance 70% of the security deposit shall be refunded to the contractor on expiry of threeyears from the actual date of completion of the work;
(d) For work with five years Defect Liability Period:
    i) No security deposit shall be refunded to the contractor

ii) for 1s t 3 years from the actual date of completion of the work;
iii) 30% of the security deposit shall be refunded to the contractor on expiry of four years from theactual date of completion of the work;
iv) The balance 70% of the security deposit shall be refunded to the contractor on expiry of fiveyears from the actual date of completion of the work;

Explanation :

The word 'work' means and includes building work, road work, drain work, sanitary and plumbing work and/or any other work contemplated within the scope and ambit of this contract. For

i) The work of patch repair or patch maintenance, annual operation &maintenance in nature or a combination, thereof, the Defect Liability Period ofthe work shall be three months from the actual date of completion of the work.

ii) Thorough Bituminous Surfacing work with bituminous thickness less than 40 mm, Repair & Rehabilitation of anyroad / bridge / culvert / building / Sanitary & Plumbing work, the Defect Liability Period of the work shall be oneyear from the actual date of completion of the work;

iii) Extension of building / bridge / culvert, Construction of new flexible pavement up to bituminous level which hasbeen designed for a period of 3 years or more, Widening and strengthening of flexible pavement designed for aperiod of 3 years or more, Improvement of riding quality / Strengthening of flexible pavement designed for aperiod of 3 years or more; Providing only mastic asphalt layer over existing bituminous surface withoutproviding bituminous profile corrective course / bituminous base course, the Defect Liability Period of the work shall be three years from the actual date of completion of the work;

iv) Construction of new building / new bridge / new culvert, Reconstruction of building / bridge / culvert includingconstruction of approach roads for bridge / culvert, Construction of rigid pavement, Reconstruction of rigidpavement, Construction of new flexible pavement covered by mastic work which has been designed for a periodof 5 years or more, Widening and strengthening of flexible pavement covered by mastic work which has beendesigned for a period of 5 years or more, Improvement of riding quality / Strengthening of flexible pavementcovered by mastic work which has been designed for a period of 5 years or more, the Defect Liability Period ofthe work shall be five years from the actual date of completion of the work;

Successful Tenderers will be required to obtain valid Registration Certificate &Labour License fromrespective Regional Labour Offices where construction work by them are proposed to be carried outas per Clauses u/s 7 of West Bengal Building & other Construction Works' Act, 1996 and u/s 12 ofContract Labour Act.
Power of Attorney holders are not allowed to sign Tender Documents unless otherwise approved bythe Government.

Clause-25 of the conditions of contract of the West Bengal Form No. 2911/2911(ii) may be treatedto be omitted and there is no provision for arbitration for resolution of disputes that may arise out ofthe contracts to be entered into by the Department with the contractors for the purpose of carryingout execution of public works as per G.O No. 558/SPW dated 13-12-2011 of P.W.D.

Successful tenderers will be required to observe the following conditions strictly:

a. Employees' Provident Fund and Miscellaneous Provisions Act, 1952 and Employees StateInsuranceAct,1948 should be strictly adhered to wherever such Acts become applicable.

b. Minimum wages to the workers shall be paid according to the rates notified and/or revised by theState Government from time to time under the Minimum Wages Act, 1948 in respect ofscheduled employments, within the specified time as per law. Payment of bonus, whereverapplicable, has to be made.
c. Adequate safety and welfare measures must be provided as per the provisions of the Building andother Construction Workers' (Regulation of Employment & Conditions of Service) Act, 1996 readwith West Bengal Building and Other Construction Workers (Regulation of Employment andConditions of Service) Rules, 2004.
d. All liabilities arising out of engagement of workers are duly met before submission of bills forpayment.

If there is any violation of any or all the relevant above criterion during execution of the job, itwillrender the concerned agencies ineligible for the work then and there or at any subsequent stage
as may be found convenient.

Sd/-
Managing Director
West Bengal Medical Services Corporation Limited

INSTRUCTION TO BIDDERS

SECTION–I

1. General guidance for e-Tendering

Instructions/Guidelines for tenders for electronic submission of the tenders online have beenannexed for assisting the contractors to participate in e-Tendering.

1. **Registration of Contractor**
   Any contractor willing to take part in the process of e-Tendering will have to be enrolled &registered with the Government e-Procurement system, through logging on to https://wbtenders.gov.in the contractor is to clickon the link for e-Tendering site as given on the web portal.

2. **Digital Signature certificate (DSC)**
   Each contractor is required to obtain a class-I, class-II or Class-III Digital SignatureCertificate(DSC) for submission of tenders, from the approved service provider of the NationalInformation's Centre(NIC) on payment of requisite amount details are available at the WebSite stated in Clause-2 of Guideline to Bidder DSC is given as a USB e- Token.

3. The contractor can search & download NIT & Tender Documents electronically from computer once he logs on to the website mentioned in Clause 2 using the Digital Signature Certificate.This is the only mode of collection of Tender Documents.

4. **Participation in more than one work**
   A prospective bidder shall be allowed to participate in the job either in the capacity ofindividual or as a partner of a firm. If found to have applied severally in a single job all hisapplications will be rejected for that job.

5. **Submission of Tenders**
   General process of submission:- Tenders are to be submitted through online to the websitestated in Cl. 2 in two folders at a time for each work, one in Technical Proposal & the other isFinancial Proposal before the prescribed date & time using the Digital Signature Certificate(DSC). The documents are to be uploaded virus scanned copy duly Digitally Signed. Thedocuments will get encrypted (transformed into non readable formats).

6. **Eligibility to Participate**
   i. Bidders must have valid trade license without which no bidder will be allowed to participate.
   ii) Bidder must have valid PAN, ESI, EPF registration without which no bidder will be allowed toparticipate.
   iii) Bidders not fulfilling the eligibility criteria need not to participate and in the event of theirparticipation without being fulfilling the eligibility criteria, their bids will summarily be rejected.

A. Technical proposal

The Technical proposal should contain scanned copies of the following in two covers (folders)

A-1.Statutory Cover file Containing

i) Earnest money (EMD) as prescribed in the NIT against each of the serial of work in favour of the Managing Director, West Bengal Medical Services Corporation Limited.

ii) Tender form No. 2911(ii) &NIT(Properly upload the same Digitally Signed).The rate will bequoted in the BOQ. Quoted rate will be encrypted in the B.O.Q. under Financial Bid. In case ofQuoting any rate in 2911(ii) the tender is liable to summarily rejected).

A-2. Non statutory / Technical Documents

i) Professional Tax(PT) deposit receipt challan for the financial year 2017-18,ProfessionalTax clearance certificate, Pan Card, Income Tax Return, Certificate of provisionalregistration ofGSTINand valid Trade Licence.
ii) Registered Deed of partnership Firm/ Article of Association & Memorandum
iii) Registration Certificate and Clearance Certificate issued by the Assistant Register of CooperativeSociety (ARCS) bye laws are to be submitted by the Registered labour Co-OperativeSociety/ Engineer's Co operative Society.
iv) Requisite Credential Certificate for completion of at least one similar nature of workunderthe authority of State/ Central Govt. having a magnitude of at least 40(forty)percent of the Estimated amount put to tender during the last 3(three) years prior tothe date of issue of this NIQ is to be furnished in applicable cases.
v) Valid Service Tax Registration should possess by the tenderer.
vi) Individual deposit Challan (upto date) of Employees' Provident Fund & Employees' StateInsurance.

Note:- Failure of submission of any of the above mentioned documents will render thetender liable to be rejected for both statutory & non statutory cover.

THE ABOVE STATED NON-STATUTORY/TECHNICAL DOCUMENTS SHOULD BE ARRANGE IN THEFOLLOWING MANNER

Click the check boxes beside the necessary documents in the My Document list and then click thetab

"Submit Non Statutory Documents" to send the selected documents to Non-Statutory folder. NextClick the tab "Click to Encrypt and upload" and then click the "Technical" Folder to upload theTechnical Documents.

Sl. No.	Category Name	Sub Category Description	Details
A.	CERTIFICATES	CERTIFICATES	1.Certificateregistration of GSTIN. 2. PAN 3. P. Tax (Challan) (2018-19 to 2020-21) 4. Latest IT Receipt 5. IT-Return for last three years 6. Trade Licence
B.	Company Details	Company Details -I	1. Proprietorship Firm (Trade Licensein civil works) 2. Partnership Firm (Partnership Deed, Trade License in civil works) 3. Society (Society Registration copy, Trade License in civil works) 4. Registration Certificate from ARCS
C.	Credential(in applicable cases)	Credential 1 Credential 2	Documents of Credentials as per Notification No. 03-A/PW/O/10C-02/14Dated :12.03.2015 **For –1st call of NIeT** (i) Intending tenderers should produce credentials of a similar nature of work of theminimum value of 40% of the estimated amount put to tender during 5(Five) yearsprior to the date of issue

			of this tender notice;or, (ii) Intending tenderers should produce credentials of 2(Two) similar nature of work,each of the minimum value of 30 % of the estimated amount put to tender during5(Five) years prior to the date of issue of this tender notice;or (iii) Intending tenderers should produce credentials of one single running work ofsimilar nature which has been completed to the extent of 80% or more and value ofwhich is not less than the desire value at (i) above; Incase of running works, only those tenderers who will submit the certificate ofsatisfactory running work from the concerned Executive Engineer, or equivalentcompetent authority will be eligible for the Tender. In the required certificate it will beclearly stated that the work is in progress satisfactorily and also that no penal actionhas been initiated against the executed agency, i.e. the tenderer. **For – 2nd call of NIeT** (i) Intending tenderers should produce credentials of a similar nature of work of theminimum value of 30% of the estimated amount put to tender during 5(Five) yearsprior to the date of issue of this tender notice;or, (ii) Intending tenderers should produce credentials of 2(Two) similar nature of work,each of the minimum value of 25 % of the estimated amount put to tender during5(Five) years prior to the date of issue of this tender notice;or (iii) Intending tenderers should produce credentials of one single running work ofsimilar nature which has been completed to the extent of 75% or more and value ofwhich is not less than the desire value at (i) above; In case of running works, only those tenderers who will submit the certificate ofsatisfactory running work from the concerned Executive Engineer, or equivalentcompetent authority will be eligible for the Tender. In the required certificate it will beclearly stated that the work is in progress satisfactorily and also that no penal actionhas been initiated against the executed agency, i.e. the tenderer. **For – 3rd call of NIeT** (i) Intending tenderers should produce credentials of a similar nature of work of theminimum value of 20% of the estimated amount put to tender during 5(Five) yearsprior to the date of issue of this tender notice;or, (ii) Intending tenderers should produce credentials of one single running work ofsimilar nature which has been completed to the

			extent of 70% or more and value ofwhich is not less than the desire value at (i) above; In case of running works, only those tenderers who will submit the certificate ofsatisfactory running work from the concerned Executive Engineer, or equivalentcompetent authority will be eligible for the Tender. In the required certificate it will beclearly stated that the work.Payment Certificate will not be treated as Credential.
D.	Financial (If necessary)	Work in hand	1. Authenticated
		Payment certificate – 1 Payment certificate - 2	Only payment certificates notthe TDS certificate.
	2017-2018	P & L and Balance sheet	Profit & Loss and Balancesheet
	2018-2019	P & L and Balance sheet (with annexure)	Profit & Loss and Balance sheet
	2019-2020	P & L and Balance sheet (with annexure)	Profit & Loss and Balance sheet

Opening of Technical proposal:-

i) Technical proposals will be opened by the **Managing Director, West Bengal Medical Services Corporation Limited**and his authorized representative electronically from the web site stated using theirDigital Signature Certificate.

ii) Intending tenderers may remain present if they so desire.

Opening ofFinancial proposal:-

i) The financial proposal should contain the following documents in one cover(folder) i.e. Bill ofquantities (BOQ) the contractor is to quote the rate in the manner (Above/ Below/ At per) onlinethrough computer in the space marked for quoting rate in the BOQ.

ii) Only downloaded copies of the above documents are to be uploaded virus scanned & DigitallySigned by the contractor.

The eligibility of the Bidder will be ascertained on the basis of document submitted / uploaded &digitally signed in support of the minimum criterion as mentioned above. If any documentsubmitted / uploaded by the Bidder is either manufactured or false the eligibility of Bidder willbe out rightly rejected at any stage without prejudice and action will be taken as per stipulation of ITRules in force.

Sd/-
Managing Director
West Bengal Medical Services Corporation Limited

SECTION–II

FORM–I

B.1. PRE-QUALIFICATION APPLICATION.

To
Managing Director,
West Bengal Medical Services Corporation Limited

Ref:-Tender for _____
_____work_____
_____
_____

N.I.T. No: WBMSCL/NIT-114/2021, Dated –10/05/2021 of West Bengal Medical Services Corporation Limited

Dear Sir,
Having examined the Statutory, Non statutory, Instruction to Bidders & NIT documents along with its Agenda & corrigendum, I /we hereby submit all the necessary information and relevant documents for evaluation

The application is made by me / us on behalf of _____

In the Capacity _____ duly authorized to submit the order.

The necessary evidence admissibleby law in respect of authorityassignedto us on behalf of the group of firms for Application and for completion of the contractdocuments is attached herewith. We are interested in biddingfor the work(s)given in Enclosure to this letter. **We understand that:**

(a) Tender Inviting & Accepting Authority/Engineer-in-Charge can amend the scope & value of the contractbid under this project.
(b) Tender Inviting & Accepting Authority/Engineer-in-Charge reserve the right to reject any application without assigningany reason.

(c) **Enclo:- e-Filling:-**
(d) 1. StatutoryDocuments.
(e) 2. Non StatutoryDocuments.

_____

Date:-

Signature of applicant including title
and capacity in which application is made.

SECTION–III

FORM-II

B.3. STRUCTURE AND ORGANISATION.

B.3.1. Name of applicant::_____

B.3.2. Office Address:: _____

_____

Telephone No.:: _____

Fax No. **::**_____

E-mail ID : : _____

B.3.3. Name & address of Bankers::_____

_____

_____

B.3.4. Attach an organization chart showing the structure of the company with names of Key personnel and technical staff with Bio-data.

Note: Application covers Proprietary Firm, Partnership, Limited Company or Corporation,

_____

Date: **Signature of applicant.**
including title and capacity in which application is made.

SECTION–III

FORM –III

B.4. EXPERIENCE PROFILE.

B.4.1. Name of the Firm: _____

_____

B.4.2. LIST OF PROJECTS COMPLETED THAT ARE SIMILAR IN NATURE TO THE WORKS HAVING MORE THAN 40% OF THE PROJECT COST EXECUTED DURING THE LAST FIVE YEARS.

Name, Location & nature of work	Deptt. Concern	Engineerin-Charge	Contract price in Indian Rs.	% of Participation of company	Original Time Schedule		Actual Time Schedule		Reasons for delay in completion (if any)
					Start Date	Completion Date	Start Date	Completion Date	

Note: a) Certificate from the Employers to be attached

b) Non-disclosure of any information in the Schedule will result in disqualification of the firm.

_____

Date: **Signature of applicant**

including title and capacity in which application is made.

SECTION–III

FORM –IV

[Print out in Agency's Letter head & upload the filled proforma with digitally signed as stated below]

DECLARATIONBYTHETENDERER

I/We have inspected the site of work and have made myself/ourselves fully acquainted with local conditions in and around the site of work. I /We have carefully gone through the Notice Inviting Tender and other tender documents mentioned therein along with the drawing attached. I/We have also carefully gone through the 'Priced schedule of Probable Items and Quantities'.

My/Our tender is offered taking due consideration of all factors regarding the local site conditions stated in this Detailed Notice Inviting Tender to complete the proposed work referred to above in all respects.

I/We promise to abide by all the stipulations of the contract documents and carry out and complete the work to the satisfaction of the department.

I/We declare that I/We in the capacity of individual/ as a partner of a firm not debarred in the last financial year.

I/We also agree to procure tools, plants and others as per requirement, at my/our cost required for the work.

Signature of Tenderer **Date :**

Postal address of the Tenderer

Name of the Firm with Seal

INSTRUCTION TO BIDDER

SECTION–III

Detailed Scope of work and other terms & condition for the Comprehensive Annual Operation & maintenance (with manpower & consumables) contract of the Sewage Treatment & ETP Plant

The tender is for

1. ***Sewage Treatment Plant (of capacity 235KLD) at Deben Mahata Govt. Medical College, Hatuara, Purulia.***
2. ***Sewage Treatment & ETP Plant (of capacity 400KLD) at Super Speciality Hospital, Hatuara, Purulia***

The intending bidders are requested to visit the sites at their own cost to ascertain the cost of Annual Operation & Maintenance (with manpower & consumables) Contract. In case of any non-functional /breakdown of STP/ETP plant, the primary servicing cost has to be ascertain and have to be placed in the prescribed format. No travelling charges will be given to the agency for their site visit.

1. In case of the non-functional/breakdown of the STP/ETP plant, the bidders have to quote a rate separately along with supporting BOQ for servicing of STP/ETP Plant to make these in working condition.

2. The bidders have to place the direct quotation for annual operation & maintenance (with manpower & consumables) as per the prescribed format (Section III, Form V). Gross bided value will be considered as the summation of the amount of those two aforesaid quoted rate.
3. Then selected contractor should make the STP/ETP Plant in running condition within 01 month from date of Work order in case of non-functional/breakdown. The AMC will be operational from the very first day of proper functioning of the said Plant after servicing (if and where required).
4. **Overall Scope of Work:**
    1) On day to day basis (24 X 7), the contractor must operate & maintain the entire (all electrical & mechanical equipment and other parts of the system) STP/ETP plant, regular scavenging of the plant room/rooms and the landscaping/gardening work at the surrounding area (at least upto 50m radius) of the plant for a period of 01 (One) year after which the AMC may be extended depending on the performance of the contractor or till finalization of the next tender. The intending bidders who wishes to quote are required to visit and examine the whole systems and satisfy themselves before submitting their offer and to apprise themselves about the plant and equipment's, accessories and parts of the complete systems.

2) Contractor have to provide all necessary consumables i.e, all spare parts(pumps, Motors, clarifier, chlorination, electrical panels, fittings/fixtures etc.), chemicals (for example like:- Gear Oil, Sodium Hypochlorite, Poly electrolyte, Food Grade Soda, Bacteria, Alum, Liquid Chlorine etc). as required for the proper functioning of the plant as per requirements/guidelines of manufacturer during the AMC period. The requirement of chemicals/consumables may differ from the mentioned above, thus need to be checked by themselves after inspecting the whole system. The intending bidder is requested to visit the sites at their own cost to ascertain the cost of chemicals and consumables. All spares parts and materials shall be genuine and of same make and type as installed wherever applicable and a minimum quantity of spares and materials for routine maintenance may be kept at site to minimize time of maintenance. The firm / agency / contractor has to keep all equipments well maintained for the Plant so as to give proper output at all times.

3) The contractor shall fulfill the requirement of various law enforcing agencies / local authorities, such as Pollution control Board, Panchayat, ZillaParishadetc by taking their approvals as and required. The contractor has to obtain NOC/or renewal of NOC from Pollution Control Board on behalf of competent authority. In case of any failure the 5% of the contract amount will be deducted from the final bill.

4) The firm/ agency/contractor will be responsible for the safety of their deputed staff during the performance of their duty at site.

5) The contractor shall be responsible for day to day basis operation & shall maintain the decorum, punctuality, discipline work output and cleanliness of the Plant and its surroundings (at least up to 50m radius).

6) The firm/ agency/contractor will be responsible for disposal of excess treated water or the excess untreated sludge (in case of any emergency breakdown). If required, arrangement should be done by their own.

5. **Operation & Maintenance Part**:

1) The day to day (24 hr X 7 days) operation work of the plant is to be done by the experienced and qualified personnel with a reasonable duty roster.

2) The contractor shall keep the equipment well maintained, neat and clean and adhere to the **Operation & Maintenance Manual given in the respective manual (Section IV).** Upon placement of work order, they will prepare the maintenance schedule and dosing rate/schedule of required chemicals for STP/ETP Plant as per the manufacturer's specifications and approved the same from WBMSCL before implementation. This may be revised from time to time as per the requirement.

3) Proper care shall be taken to avoid major breakdown at the plant. In the event of any breakdown, the same will be rectified/attended immediately within 24 hours from the time of reporting of the fault. Similarly, if any breakdown takes place due to negligence of contractor (except force

measured), the whole component has to replaced/ rectified to bring it to the original condition immediately (within 24 hours) by the contractor.

4) Any inconvenience caused so far as performance of STP/ETP System due to negligence in the part of the agency, if detected, will be liable to penalty. Quantum of penalty would be decided in EIC depending on the gravity of situation

5) In case of any problem with the equipment/system, the contractor shall inform Site Engineer of WBMSCL immediately.

6) The routine maintenance and periodical maintenance & routine checking of all the equipment is under the scope of this tender and is to be done with proper care. Necessary preventive maintenance, breakdowns if any is to be attended throughout the day, all 7 days a week, with experienced and qualified personnel.

7) The contractor shall operate the filter press of STP as and when required. The contractor shall provide and maintain bacteria culture of STP as and when required.

8) The disposal of excess treated water or the untreated sludge (in case of any emergency breakdown) is under the scope of the contractor. Sufficient arrangement must be done as per site condition and approval from WBMSCL's end. The treated water pump should be maintained properly and should be operated on regular basis in close coordination with WBMSCL.

9) The contractor should test the water (from STP/ETP plant) as per relevant IS Codes form NABL approved test centers on **monthly basis** and the analysis should be done as per APHA standard. The testing parameters are The result of the treated water should as per the parameter mentioned in the relevant IS Codes.

10) There must availability of special tools and tackles, testing apparatus (for SS, MSLSS, MLVSS, VSS, SVI, temp, hardness, pH value etc. as per the operation manual), measurement and inspection devices including diagnostics equipmentsetc at call centre/site office.

11) Precaution against any fire hazards, theft or other damages to Plant and equipment shall be arranged by the firm. WBMSCL shall remain indemnified by the contractor from any encumbrance /loss on this account.

12) Regular servicing & inspection of the system-equipments should be carried out at least twice in a month preferably during 1st & 3rd week of the month by the contractor. The contractor shall perform preventive maintenance to the system-equipments and its accessories as per service manual. The contractor shall also attend any breakdown & emergency call immediately.

13) Any type of system components installed in the network must be kept at site for easy and quick replacement of spares as well as rectification of defects.

14) Changing of all spares and machineries attached with the STP/ETP System are under the AMC contract.

15) Any changes in the STP/ETP System i.e. for new technical development on the system must be informed to user.

16) In circumstance such that the Contractor fails to attend the breakdown within four normal working hours after notification of the breakdown and where remedial work interrupted during normal working hours for purposes other than obtaining replacement parts, the employer reserves the right to order such action as may be necessary to expedite completion of remedial work which shall be at the Contractors expense without abrogation of the Contractors responsibilities.

6. Documents to be Maintained:

1) Printed &binded duplicate **LOG-BOOKs** (on daily/weekly basis) must be maintained for recording of **parameters** related to STP/ETP, **maintenance activities**, **running status of all equipments**, **chemical dosing schedule**&**servicing**. The format of the log-book must be approved by WBMSCL prior to implementation. One copy of those log-sheets are to be submitted to WBMSCL as and when asked to.

2) A **Register** should be maintained by the contractor for call login/site instructions and result/compliance thereafter. The Site Engineer/Technician should have common telephone no by which a user can communicate with him directly.

3) **Certificate for** satisfactory performance of the STP/ETP System should be submitted to the concerned SAE twice in a month and that has to be countersigned by the AE and to be submitted along with the bill.

4) All the **test reports** are to be submitted periodically and also to be submitted along with the bills.

7. MANPOWER:

1) The day to day (24 hr X 7 days) operation of the plant is to be done by the experienced and qualified personnel.

2) The agency/firm/contractor shall provide one highly skilled/highly technically expert person for routine visit within every 15 days

3) In case any of staff is not found upto the mark and not able to do work properly, he will have to be changed as per the instruction of WBMSCL and immediately replaced by another qualified staff.

4) The contractor should provide escalation matrix to WBMSCL to lodge complaint of breakdown of STP/ETP Plant. In the escalation matrix the contractor has to provide at least 02 mobile no. and e-mail ID. If any changes is made in mobile no. / e-mail ID the same should be notified to WBMSCL in written within 7 working days.

8. Payment Schedule:

1) No advance payment will be made at any circumstances.

2) On successful completion of every quarter, 3 (three) months (1st quarter, 2nd quarter, 3rd quarter and 4th quarter respectively), running account bills can be placed along with certified copies of service reports/check lists, log sheets, compliance register copy, water test reports, or any other work done as per the scope of work mentioned in the tender/contract duly certified by the Concerned Site-in charge of WBMSCL.

3) WBMSCL will make payment to the contractor within a reasonable period after receipt of the certified bills along with all supporting documents (as stated above) and after deduction of applicable taxes/TDS, Security deposit etc.

4) Payment will be made according to the availability of fund from the concerned source. No claim, whatsoever, for delay in payment if any will be entertained.

9. <u>Penalty:</u>

1) The contractor shall rectify/attend any breakdown/comlains within 24 hours failing which penalty for non-performance for each @ Rs. 500/- per day of delay subject to a maximum of 10% of the contract price of the respective site/unit will be imposed and in the event of any damage to the property or life arising out of non-performance, contractor will be solely responsible.

2) Any inconvenience caused so far as performance of STP & WTP System due to negligence in the part of the agency, if detected, will be liable to penalty. Quantum of penalty would be decided in EIC depending on the gravity of situation.

3) The contractor has to obtain NOC/or renewal of NOC from Pollution Control Board on behalf of WBMSCL. In case of any failure the 5% of the contract amount will be deducted from the final bill.

10. The services required are for a period of One year. As per the willingness of the Contractor, the contract may be extended with same rate and terms & condition subsequently based on performance or till finalization of the next tender. The contract may be terminated at any stage solely at the option of WBMSCL with an advance notice of one month without assigning any reason.

11. WBMSCL authority reserves the right to terminate the contract against three months' notice for the non-satisfactory performance or other administrative reasons.

12. The rates shall be quoted as per the prescribed format of WBMSC (Section-III, Form V). The rates shall be all inclusive of all taxes, transportation charges and duties etc. No extra cost beyond the quoted rate will be admissible.

13. The rates at any stage once quoted shall not be withdrawn.

14. No addition / alteration / deletion in the tender document is allowed.

15. An agreement detailing the terms & conditions shall be executed with the service provider for entering into this contract.

SECTION–III

FORM –A

Sl No	Description of Item	Quantity	Unit	Rate (Rs/Unit)	Amount (Rs.)
Comprehensive Annual Operation & Maintenance (with manpower & consumables) contract of the Sewage Treatment Plant (of capacity 235KLD) at Deben Mahata Govt. Medical College & Hospital, Hatuara, Purulia.					
1.1	Quotation for Comprehensive Annual Operation & Maintenance (with manpower & consumables) contract of the Sewage Treatment Plant (of capacity 235KLD) at Deben Mahata Govt. Medical College & Hospital, Hatuara, Purulia	4	Quarterly		
1.2	Quotation for servicing of non-functional/breakdown STP/ETP plant to make these in working condition. (if any required) (BOQ has to be submitted showing break up details)	1	Lumpsum		
Comprehensive Annual Operation & Maintenance (with manpower & consumables) contract of the Sewage Treatment & ETP Plant (of capacity 400KLD), at Super Speciality Hospital, Hatuara, Purulia					
2.1	Quotation for Comprehensive Annual Operation & Maintenance (with manpower & consumables) contract of the Sewage Treatment & ETP Plant (of capacity 400KLD), at Super Speciality Hospital, Hatuara, Purulia	4	Quarterly		
2.2	Quotation for servicing of non-functional/breakdown STP/ETP plant to make these in working condition. (if any required) (BOQ has to be submitted showing break up details)	1	Lumpsum		
				Total=	
In Figure:					

NOTE:

1. Rate/Rates should be inclusive of all taxes.
2. In case of non-fill-up of 1.2 & 2.2, it is to be considered that the respective STP/ETP plant is in running condition.

OPERATION
&
MAINTENANCE MANUAL

OF
SEWAGE TREATMENT PLANT (BASED ON MBBR)

CAPACITY- 235 KLDSTP

AT

DEBENMAHATA GOVT. MEDICAL COLLEGE & HOSPITAL,
HATUARA, PURULIA

CONTENT

1.0.INTRODUCTION

"M/S Purulia, West Bengal" has decided to set up a 235 KLD Sewage Treatment Plant based on MBBR technology**.** In order to conserve water, the treated effluent can be used for various purposes. The effluent is to be generated mainly from industries.

WAPP-Water, Air Pollution and Prevention is committed to providing environment solutions to urban/rural India. Since 1996, WAPP has been providing solutions for water, energy, waste and environment management to numerous hotels, hospitals, housing societies, industries and commercial complexes. Our prime objective is to provide innovative solutions to protect environment and we call it "Eco-Innovision".

WAPP is specializing in the field of Industrial wastewater and Sewage Treatment and offers customized solutions to its clients.

Wastewater Treatment Technologies being offered by WAPP are:

a) Extended Aeration (EA)
b) Sequential Batch Reactor (SBR)
c) Submerged Aerated Fixed Film (SAFF)
d) Anaerobic Treatment (AT)
e) Chemo Autotrophic Activated Carbon Oxidation (CAACO)
f) Moving Bed Bio Reactors (MBBR)
g) Membrane Bio Reactor (MBR)
h) Trickling Filters (TF)
i) Soil Bio Technology (SBT)
j) Biotechnology – Bio-augmentation of wastewater facilities.

We are also continuously working on developing new user-friendly technologies in collaboration with various reputed Indian Institutions such as IIT's, CSIR, TERI and other Institutions/Foreign Companies.

2.0.DESIGN BASIS:

The design of STP for **"M/S Purulia, West Bengal"** is based on the wastewater generation rate and characteristics of wastewater. The wastewater is generated mainly from domestic sewage. It is proposed to treat the effluent in MBBR reactor, in order to reduce the level of pollution in the wastewater and make it suitable for various purposes.

2.1.WASTEWATER GENERATION RATE & CHARACTERISTICS

The total wastewater generation rate and salient characteristics would be as below:

Total effluent generated	**235 KLD**

BOD (5 days at 20-degree C)	**250-300 mg/l**
COD	**350-450 mg/l**
Total Suspended Solids	**25-300 mg/l**
Oil & Grease	**20 mg/l**

2.2.TREATED WASTEWATER CHARACTERISTICS

The salient characteristics of treated wastewater shall be as follow:

BOD (5 days at 20-degree C)	**<20 mg/lit**
COD	**<60mg/l**
TSS	**<20 mg/l**
Oil & Grease	**<5 mg/l**

2.3.TECHNOLOGY

MBBR treatment is based on aerobic Moving Bed Bio Reactor in which microorganisms is grown on the moving bed. The media consists of specially designed spiral media. The benefit of MBBR media is there are least chances of choking and if the system is designed with reasonable loading rates, the system stability can be better.

WAPP can offer the right selection of process, with the right loading rates, for stability of process and proven design (by experience), to offer all the advantages of attached growth processes and long life of the system.

Membrane Bed Bio Reactor based compact system for high-end water quality applications.

Advantages of MBBR: -

- Maximum Surface Area generated per unit volume.
- Highly efficient multi- purpose media.
- Most efficient weapon for biological treatment.
- Provides high oxygen transfer efficiency in wastewater treatment. Chock free and entire surface exposed for biological treatment.
- Extremely high organic loading rates possible in biological treatment.
- High efficient, hence resulting in energy saving.
- Backwash for cleaning operation simple and easy.
- Reduces plant size and space saving.
- Cost effective, easy to install and maintain.

2.4.PROCESS FLOW DIAGRAM-

Attached with this manual.

2.5.TREATMENT PROCESS

The main components of the process adopted for the treatment includes the following:

- The kitchens, toilets, washrooms and floor washing wastewater collected via gravity in a collection tank after screening through the bar screen.
- Via submersible pumps, collected screened wastewater is then transfer to Oil & Grease Trap (OGT), where removal of oil & grease occurs.
- Oil/Grease free screened and equalized wastewater from EQT is transferred into the MBBR tank through centrifugal Reactor Feed Pump.
- Biological treatment is carried out which is based on aerobic Moving Bed Bio Reactor (MBBR) in which microorganisms is grown on the moving bed. The media consists of specially designed spiral media.
- Secondary Clarification of aerated mixed liquor is carried out in Two Secondary Tube Settlers (SSTs) consisting of PVC tubular media to enhance the settling rate & efficiency.
- Storage and chlorination of clarified water in Chlorine Contact Tank (CCT).
- Further removal of solids is carried out through Multi-Grade Filter (MGF) using fine and coarse sand as filtering media.

- Polishing and removal of color & odor is done through Activated Carbon Filter (ACF).
- After complete treatment soft water is stored in Soft Water Tank (SWT) from where it can be reused for domestic uses.
- From Secondary Settling Tanks (SSTs) sludge is sent in sludge holding (SHT) from where sludge fed into filter press through sludge feed screw pump for dewatering.
- De-watering of sludge is done by Sludge Dewatering System (Filter Press).

2.6.DESIGN CRITERIA

The major parameters towards designing of the treatments are as follow:

Source of Wastewater	-	Domestic sewage
Flow Rate	-	235 m^3/day
Treatment Process	-	Moving Bed Bio Reactor

Act and Rules under Which Designing Should Be Done

Permissible limit as prescribed Act & Rules -

1. Environment (Protection) Rules 1986.
2. Water (Prevention & Control of Pollution) Act- 1974
3. Hazardous Wastes (Management & Handling) Rules- 1989
4. Manufacturer, use import and storage and hazardous Micro-organizers, genetically Engineered Organizations or Cell Rules- 1989
5. The Public Liability Insurance Act- 1991
6. Manual on Sewage & Sewerage Treatment – CPHEEO
7. All standard as laid down by Central Pollution Control Board and any other relevant statutory authority.

3.0.OPERATION PHILOSOPHY/PROCESS DETAILS-

In order to conserve water, Sewage Treatment Plant has been designed to ensure that the treated wastewater is well below the permissible limits, under the varying flow conditions which are typical for such systems and can be used in irrigation and other domestic purposes.

The major process steps along with salient technological aspects are described below: -

The wastewater generated from residential sources like kitchen, toilet, and washroom, and floor washing, sewage is collected through gravity in collection after bar screens. Via pumping, collected screened wastewater is transferred to OGT where Oil and Grease removal takes place. Then, Screened and Oil & Grease free wastewater is transferred to equalization tank (EQT) via gravity. Air is provided in Equalization Tank (EQT) by Disk Type diffuser, which also serves to maintain the liquor in the completely mixed regime and to keep all the solids in suspension. After Equalization Tank, wastewater is pumped to single 2 staged MBBR Tank. The MBBR Tank consists of PVC fill media, which facilitate attached fixed film growth of microorganisms. Microbial film attached to the PVC media, which oxidize all biodegradable compounds (Carbohydrate, Fats and proteins) present, that sewage water flowing to the MBBR media.

The aerobic environment in the MBBR tanks shall be achieved by the use of fine bubble diffused aeration, which also serves to maintain the liquor in a completely mixed regime. Air supplied in to MBBR Tank, Sludge Holding Tank and Equalization Tank by twin lobe Air Blowers 3(2W +1S) and distributed by Disk type diffusers.
The treated wastewater overflows in MBBR Tank and then further overflows to two Secondary Settling Tanks (SSTs). SSTs consists of tube settler, which is specially designed Tubular Synthetic PVC media, which enhances the settling rate of the separation of microorganisms from the treated wastewater. The settled sludge transferred into sludge holding tank on regular interval of time.

The clarified wastewater from Tube settlers overflows between the scum baffle and overflow launder into the outlet channel from where it will be discharged in to Chlorine Contact Tank (CCT) where disinfection through chlorination is practiced.

Clarified and chlorinated wastewater after CCT is pumped by horizontal centrifugal Filter Feed Pump to the Multi-Grade Sand Filter (MGF), Activated Carbon filter (ACF). In MGF, Fine & Coarse Sands are used as Filter media. It is used to remove the turbidity and suspended solids remained after Secondary Settling Tank (SST).

After MGF, treated water passed through Activated Carbon Filter (ACF) for further polishing takes place.

Water stream from ACF is taken into water softener where hardness removal takes place. Softener makes water suitable for cooling tower and other uses.

The treated effluent water must be disinfected if it is to be recycled. Chlorine in the form of sodium hypochlorite with free chlorine in the range of 5-12% is being used for disinfection. Sodium hypochlorite solution is to be dosed in the chlorine contact tank. A minimum retention time of half an hour and dozes of 3-5 mg/ltr of chlorine is normally desired in the chlorine contact tanks to achieve a good degree of disinfection. Chlorine kills bacteria in wastewater and thus reduces the normal development of microorganisms. Since the bacterial population is lower, putrefactive reactions are reduced if not eliminated entirely. It is these bacterial putrefactive reactions which result in odors and all other nuisance conditions in wastewater.

CONTROL OF DOSING RATE-

As the minimum residual chlorine is desirable in the treated water, very good control of dosing rate of chemical is desirable. An electronic diaphragm type dosing pump with adjustable capacities is being used for the dosing. Its operation is electrically interlocked with the sump pumps in auto mode. Only when the sump pumps deliver raw effluent into the SSTs, the treated water overflows into the chlorine contact tank. The rate of delivery of effluent into the SSTs is to be matched with the rate of dosing of chemical and the residual chlorine has to be checked from time to time.

In Online Chlorination process, Chlorine is added in the form of Sodium Hypochlorite solution. A free residual chlorine level of 0.2 to 0.4 mg/l will be maintained. Based on a dosage of 3-5ppm of chlorine, the total consumption of Sodium Hypochlorite (10 % available chlorine) can be calculated.

Finally treated soft water is collected in Soft Water Tank for cooling tower and other domestic uses.

The sludge settled in Secondary Settling Tanks (SSTs) shall be disposed off after dewatering through the sludge dewatering system (Filter Press). This sludge will be fully stabilized and can be used as manure.

4.0 TREATMENT UNITS:

The plant has been designed with the most optimum utilization of space and sufficient space availability for the ease of maintenance of the plant.

List of Treatment units involved in treatment are:

S. No.	Tank	Quantity
1	Screen Chamber for Sewage	1
2	Collection Tank	1
3	Oil and Grease Tank	1
4	Equalization Tank	1
5	MBBR Stage I	1
6	MBBR Stage II	1
7	Secondary Settling Tank	1
8	Chlorine Contact Tank	1
9	Multi Grade Filter	1
10	Activated carbon filter	1
11	Filter press for Sludge Dewatering	1
12	Sludge Holding Tank (SHT)	1

5.0 TESTING & COMMISSIONING

Commissioning is initial stage of any treatment plant**.** Plant should be properly commissioned so that they operate correctly and within the design parameters. It is essential that the commissioning process is carried out in a logical and defined manner. The responsibilities of the staff carrying out the commissioning process should be clearly defined with adequate time and resources allocated to allow the integrated parts of the installation to be commissioned correctly.

6.1 TESTING/PRE-COMMISSIONING

Before the commissioning starts, firstly we go for the pre-commissioning the plant, in which, we check all the equipements individually as per their specification and also check individual units' performance.

After successful completion of construction and installation of all electrometrical equipment and instruments, plant need to be commissioned to check the working, efficiency and performance of all units and equipment as per the data considered during designing stage.

For commissioning of wastewater treatment plant following five steps are taken under consideration:

1. Panel Test
2. Dry Run Test
3. Wet Run / Hydraulic Test
4. Automation Test
5. Performance Test

During commissioning of any panel, we have to check and ensure the following points:

Physical Test: In physical test, following points must be checked.

- Dimension of panel as per design and drawing
- Electrical continuity of each conductor
- Size of busbar as per the drawing
- Bill of material and rating of components

Electrical Test: In Electrical test, following points must be checked.

Insulation resistance test must be conducted with 500v meggar and the following results should be obtained:

- Between phase (RY, YB and BR) should be more than 200 Mega ohms.
- Between phase & Neutral (RN, YN and BN) should be more than 200 Mega ohms.
- Between phase & Earth should be more than 200 Mega ohms.
- Between Neutral & Earth should be more than 200 Mega ohms.

In Dry run, all electro mechanical equipment must run without any load to ensure the smooth running and working of all equipment, during dry run we check the equipment for any abnormal sound, vibration, heat etc.

After Dry run, wet run test is conducted to test the leakage/ dampness in civil units. In wet run test all civil unit are filled with water and left for 24 hours to ensure the leakage and

dampness in civil structure. During wet run test, we also check the discharge capacity of pumps.

Automation testing must be done to ensure the working of sensors and programming logic to control the equipment automatically.

The pre-commissioning process can be broadly divided into three phases-

a. Inventory check of equipment, manuals, tools required and consumables available prior to start up as:

1. Operation and maintenance manual.
2. A complete set of drawings.
3. A manufacturer's literature on operation and maintenance of its equipment.
4. Manual and literature deemed appropriate for plant operation and efficiency.
5. Desired laboratory glassware, equipment and chemicals needed for analytical work process control.
6. Grease and oil needed for maintenance and operation of the equipment.
7.

b. Visual Inspection

The visual inspection should be attended by the commissioning expert, the site in charge and if possible by the equipment manufacturers` representatives. The in-charge should record the action that take place during the inspection.

During this inspection equipment should be checked for proper mounting, direction of rotation and proper lubrication procedure during the inspection and also all valves for their proper installation and functioning etc.

c. Wet Run Inspection

The wet run inspection should be carried out after the hydraulic testing of Equalized Effluent Sump and before starting process. The equipment manufacturer instruction should be followed when inspecting and pre testing the equipment. The wet run inspection should include:

- Checking all the piping and valves for leaks.
- Inspection or Operation of all the valves.
- Inspecting all pumps.
- Checking all the Electrical instrumentation for proper operation.
- Inspecting overflow weirs and their levels, adjusting it for startup if necessary.

- All deficiency found during the inspection and testing should be corrected.

Electrical Control

Checks and Maintenance Instructions for Electrical Equipment A.Mechanical Checks

- Check alignment of driving and driven equipment set right.
- Check for any damaged / loose bearing, replace it.
- Check condition of grease after opening/ removing grease covers, if it has hardened, dirty or has a skin over it, clean it, replace it and repack it with the recommended grade of grease. Do not mix grease of various grade and makes.
- Check gap between rotor and starter, record for further comparison. It varies from 0.15 mm for small motors to 1.5 mm for larger motors. The motor should be free rotating by means of a hand and no unfamiliar sound of bearing etc should be there.
- Check equipment's valves and NRV working properly & direction of valves & NRV (shut & open).

B. Electrical Checks

- Check all the connections and contacts for tightness. If any wire or lead shows discoloration, cause of heating be rectified and lead replaced.
- Check earth connections and measure earth resistance and keep a record for further comparison. Replace any damaged / rusty earth wire clamp or fastening.
- Check fuses and setting of over current/ load devices.
- Check voltage on all phases for being equal. If significantly unequal, remedy the cause.

C. Maintenance

- The motor should be cleaned for any dust. Dust which enters and deposited in various parts by blowing with dry air in a direction opposite to that of cooling air. Deposited dust should be cleaned and after drying out varnish be applied. The motor shall be mechanically and electrically isolated.
- Insulation resistance of motor should be measured at regular intervals by means of a 675 meggar tester or electric insulation tester and record kept for comparison. If found decreasing, the resistance should be improved. The IR values as a guide are 0.2 ohms for low voltage and 0.4 ohm for medium voltage supplies.
- Damaged, broken or loosen motor bars be replaced /repaired. A jarring noise at starting gives an indication of this defect.

- Motor distress will show up an unusual noise and odor from the winding. The cause i.e. faulty bearing or damaged insulation/winding should be replaced if not repairable.
- The performance of a motor should be checked from the full load current, from the starting current and from no load current, viz. A viz. any unusual vibration noise.

6.2.COMMISSIONING

a)Equalization Tank:

Two no.s screens (1fine + 1bar) are provided at the inlet of this tank to restrict the larger solids to enter into the process. It has the provision of take out of the screenings manually. This tank is also provided to collect and equalize the effluent. Air is also provided to restrict the settling of solids and to check the odor problems. 02 no.s (1 working + 1 standby) centrifugal reactor feed pumps are provided to transfer the effluent in MBBR Reactor.

Normal Operation & Routine Checks

- Screen should be clear for removal of larger particles.
- There is no odor problem in sump. If so, check that the air in sump is on.
- Setting of Low & High level of Water Level controller.
- Proper air supply in tank through diffusers.

b)MBBR Commissioning:

The following step must be taken to ensure smooth & perfect commissioning of MBBR:

Points to be check before commissioning:

1. Volume of tank
2. HRT of the tank
3. Proper installation of diffusers
4. Proper air supply inside tank
5. Hydraulic testing of tank

Points to be monitor during commissioning:

1. DO
2. pH
3. MLSS /MLVSS
4. F/M ratio
5. Nature of effluent

Steps taken before commissioning:

The Moving Bed Bio Reactor process is utilized to biologically oxidize the organic matter contributing to Biochemical Oxygen Demand (by converting non-settable substances, in finely divided, colloidal and dissolved form into settable sludge and to remove this newly formed

sludge, thereby providing a high degree of treatment). This is achieved in the MBBR Tank through growth of microorganisms on fixed PVC film & diffused aeration system using fine bubble membrane type diffusers.

In Moving Bed Bio Reactor microorganisms are grown on moving bed, it can take shock loads due to variable effluent flow with varying loads and there is minimal generation of excess sludge. Diffused aeration has the advantage of going for larger depths of the MBBR Tank compared to surface aeration where the mechanical aerators are used. Non- clog, fine bubble, membrane type diffusers are being used in the plant in order to have maintenance free operation and oxygen transfer efficiencies are high.

- The mixed liquor should carry adequate nos. of bacteria.
- Dissolved oxygen should be present in sufficient concentration in all the portions of the MBBR reactor (2-4 ppm).
- The activated sludge should separate readily from the treated wastewater in the final settling tanks and should be readily removed.
- There should be sufficient nutrients in wastewater such as nitrogen and phosphorus available for the growth and maintenance of MLSS. If the sufficient amount of nutrient is not present, then add Urea and DAP.

COMMISSIONING:

For commissioning of MBBR Tank, either activated sludge from any working STP or cow dung can be used. If cow dung is proposed to be used, it should be strained through gunny bags. The fresh, strained cow dung is to be mixed with water in 1:2 proportions to make slurry.

Following procedure can then be carried out:

Fill the one third of the MBBR Tank with fresh water.

Start the blower and adjust the air quantity passing through the diffusers through the valve and then add the slurry of cow dung. The diffusers are provided in such a way that there is complete mixing and agitation taking place in the tank. (A detailed instruction manual for the startup and maintenance of blowers in enclosed)

Continue the aeration in the tanks for 48 hrs.

48 hrs after the introduction of cow dung slurry, add 10-15% by vol. of the effluent into the MBBR and continue aeration for 24 hrs. If the mixed liquor overflows into the secondary clarifier, start the return sludge lifting pumps immediately. After 24 hrs. of starting the return sludge lifting pumps, take a liter sample of the mixed liquor from

the MBBR Tank and allow it to settle in a one-liter cylinder. If the supernatant is turbid, do not add another dose of effluent but continue aeration for another 24 hrs. Period.

Repeat the above settling test after 24 hrs. of period and if the supernatant is clearer than before, then add 20% by vol. of domestic waste to the Collection Tank/Equalization Tank and continue aeration. The return sludge pump should be run continuously during this period with 120% recycling.

Test the mixed liquor in the MBBR Tank for SS, volatile solids (suspended) and sludge vol. index. Keep a close watch over the settleability of the sludge solids and the clarity of the supernatant when the mixed liquor from the MBBR Tank is settled for 30 minutes.

AT NO TIMES DURING THE ENTIRE PERIOD, SHOULD THE BLOWERS BE STOPPED.

NORMAL OPERATION

Sludge film to be made on the surface of the PVC fill media and treated water should be clear.

ABNORMAL OPERATION

In the event of power failure, blowers and return sludge pump will stop. If power failure continues for a long time, these have to be run on Generator.

MLSS drops below 2000 mg/lt. This drop will not occur suddenly but will be indicated by a gradual drop of MLSS over a period of days. This may be due to insufficient aeration or insufficient/excess BOD, in that case following procedure is to be followed.

If MLSS does not rise to desired range, incoming waste has to be analyzed for Nitrogen, phosphorus, carbon and any toxic material. If carbon: nitrogen: phosphorus ratio changes from desired 120:5:1, action must be taken to rectify the imbalance by adding urea and DAP.

Presence of toxicity in any form is intolerable to the microorganism. Toxicity in any form is not expected but TDS levels of the incoming effluent might have to be watched for MLSS growing beyond 5000 mg /lt. In case it occurs, reduce the addition of return sludge and start sludge wasting.

In case of blackish water i.e., color of mixed liquor in MBBR turning to black either due to failure of power for a long period or due to some other reason following corrective measures should take for trouble shooting.

Regulate the flow through FRB (flow regulating box).

c)Secondary Settling Tank

This unit is provided to remove the settable solids formed in MBBR reactor. It is a hopper typesettling tank consisting of PVC tubular media in which the mixed liquor from the MBBR reactor overflows. The sludge settles down and is continuously removed by the Sludge transfer/Recirculation pumps. The clear water overflows into the chlorine contact tank. The main factors affecting the settling process are the arrangement of PVC media, surface loading rate, and quality of sludge and period of retention. The quality of sludge in terms of settle ability determines the quality of overflow from the clarifier.

NORMAL OPERATION & ROUTINE CHECKS

Continuous removal of sludge through Sludge transfer/Re-circulation pumps, operating in auto mode through timer.

Check for the scum collection on the surface of the clarifier and remove it from time to time.

Check for the clarity of water by withdrawing a sample in measuring glass.

In case of poor clarity or floating sludge if any, shall be indicative of poor settleability& higher retention time.

Following corrective measures should be taken for trouble shooting:

Check and regulate the feed rate of effluent.

Check and regulate the airflow and also check the air distribution.

In case of floating sludge of black color increase the frequency of sludge removal by resetting the timer.

d)Chlorine Dosing System

- Measure the rate of inflow in Reactor.
- Adjust the rate of dosing of sodium hypo-chlorite in the range of 3-5 mg/lt. The specific gravity of 10% sodium hypo-chlorite is 1.15.
- Adjust the knobs of the dosing pump to get the desired flow and test the same with the help of a measuring cylinder.
- Measure the residual chlorine in the treated water using the residual chlorine test kit to fine tune the dosing.
- Commission the system in auto mode through the electrical interlocking.

e)Sludge Holding Tank:

This is a sludge holding tank (SHT) to hold the volume of sludge. The excess sludge generated in the Secondary Clarifier is wasted in this SHT and the air is blown for proper mixing. So, check it for proper air supply in it.

f)Multi Grade Filter

- Check the inlet, outlet & drain connections and their supports.
- Ensure that an isolation valve should be provided on the inlet of the filter.
- Set the valve on by pass to drain position, open the isolation valve and start the FFP (Filter Feed Pump)
- Close the isolation valve and shift the multi-grade filter valves on BACKWASH position and open the isolation valve.
- After a prolonged backwash close the isolation valve and shift filter valves to the RINSE position and open the isolation valve slightly. Increase the inlet flow of the feed water slowly.

- Be sure that the operator is handling the opening & closure of the valves according to the service, backwash, and rinse requirements.
- Check outlet water and its capacity for required plant.
- Check the discharge of the filter feed pump.
- After a prolonged backwash close the isolation valve and shift multi-grade filter valves to Service position and open the isolation check the outlet.
- Check the service position of the plant.
- After a prolonged backwash close the isolation valve and shift filter valves on backwash position and open the isolation valve.
- Set the valve on by pass to drain position, open the isolation valve and start the FFP (Filter feed pump). **Backwash**
- Close the isolation valve and shift the Multi-Grade filter valves on BACKWASH position and open the isolation valve.
- After a backwash of 10-15 minutes close the isolation valve and shift valves to the RINSE position and open the isolation valve.
- After rinse 10-15 minutes close the isolation valve and shift filter valves to the SERVICE position and open the isolation valve.

5.0) DAILY OPERATION & GENERAL MAINTENANCE

i) Control Parameter

1. Total Suspended Solid

2. Biological oxygen demand
3. Chemical oxygen demand
4. Turbidity

ii) WATER QUALITY MONITORING

As the complete wastewater from the complex is to be treated together in the STP and reused for horticulture and flushing, the following parameters are to continuously monitored/measured and recorded:

Keeping Data Records-

A prerequisite for early detection of potential problems is proper record keeping and plant performance normalization. This includes proper calibration of all instruments. Without accurate readings, it might be too late before a problem can be detected and corrected. Another key to successful troubleshooting is understanding the effects of changing system parameters on system performance. Some apparent plant problems are simply the normal reaction of the plant to changing feed or other operating parameters.

Identify the Cause-

Once a performance decline has been identified, the first step in solving the problem is to localize the problem and to identify the cause(s) of the problem. This can be done using the data of the record keeping log sheet or by the use of some additional on-line measurements. If these data are not sufficient to determine the cause(s) and to recommend corrective action, one or more membrane elements must be taken from the plant and analyzed. System Optimization Services program offers an extensive array of membrane and element analytical tests, which will help, not only determine the cause(s) of a problem, but can help with detailed solutions as well.

Interactive Membrane Troubleshooting Guide-

Consists of a set of tables, which describe the symptoms, and causes of typical problems that may arise and offer solutions or suggestions to improve the system operation. There are links to additional information such as cleaning procedures, etc., where appropriate.

7.0.FOR THE PLANT OPERATOR

The successful operation of a wastewater treatment plant involves many considerations that can be stated as follows:

- ***To keep the plant operating properly:-***

This involves operating valves and switches; collecting and analyzing wastewater samples; recording and interpreting data; making calculations; and troubleshooting.

- ***To maintain equipment and plant area:-***
  This involves checking and lubricating equipment; organizing maintenance programmes; keeping maintenance records and inventories; painting and gardening.
- ***To make sure that the plant is safe:-***
  This involves personal cleanliness as well as preventing accidents.
- ***To supervise people and budgets:-***

Good public relations require the plant to be clean and well maintained as well as producing a good quality effluent.

7.1 SUMMARY OF MONITORING ACTIVITIES BY OPERATORS

Operators should carry out the following monitoring activities from the start of every operating shift. These activities should become a set and regular procedure.

1. Check the laboratory results from the previous and current week and observe the data trends (graphs) each day.
   This will provide information on:
   - Effluent quality, i.e. did the plant meet the license requirements;
   - Operating conditions, e.g. sludge age, floc load, MLSS, DO, SVI.
2. Check the operator log from the previous and current week.
   This will provide information on:
   - Equipment malfunctions;
   - Process malfunctions;
   - Process changes that need to be made during the shift, i.e. RAS, WAS, AERATION TIME.
3. Log required flow and analytical data for:
   - Raw wastewater
   - WAS
   - Basin Volumes
   - Effluent per day
4. Walk around the plant and
   - Make observations (ears, eyes and nose) of raw wastewater, plant effluent and mixed liquor in main reactor.
5. Check the dissolved oxygen.
6. Log the DO of each of the stages of MBBR reactor during the aeration. These readings should be regularly checked.
7. Measure and log sludge settleability in reactor (SV30 and SV120) at least twice per week.

8. Collect data on OUR, sludge wasting estimates, SRT, SVI, VSS/TSS, SV and MLSS (relative to BWL).
9. Notify the plant supervisor or his delegated deputy of:
    - Any abnormalities;
    - Required changes to AERATION (time and set point concentration) or WAS sequences.

7.2.SAMPLE COLLECTION

A lot of time, effort and expense are incurred in collecting and analysing samples. Consequently, they should be collected and handled correctly.

It is important that a sample contain the same pollutants when it is analysed as when it was collected.

The following list provides some hints for obtaining good samples:

- Wastewater and mixed liquor samples contain microorganisms that break down pollutants as quickly in the sample bottle as in the process. As a result, the concentrations of constituents in samples will change before they are tested in the laboratory, unless precautions are taken to prevent these changes.

Suitable precautions include:

- Test samples as quickly as possible;
- Keep samples chilled;
- Add chemicals to "preserve" the sample. The laboratory will decide whether samples need to be preserved in this way and which chemicals to add.
- Collect samples from the same place every time. This means that the results can be directly compared over a period of time.
- Collect samples from places where the material to be sampled is well mixed. Do not collect solid matter that has settled out at the bottom of channels or basins.
- Do not collect large particles in the sample.
- Do not collect floating objects. The sample container should be below the liquid surface to avoid this.
- Do not touch the sample. This can cause infections, and it may also contaminate the sample.

There are two types of samples that can be collected. These are grab samples and composite samples.

A grab sample is one in which the entire sample is collected at the same time. It is collected with a container such as a clean plastic bucket and gives information at the instant when the sample was taken.

A composite sample is collected over a period of time. Twenty-four-hour composite raw wastewater and plant effluent samples are required to properly determine the performance of the plant. This means that these samples are collected over 24 hour periods of time. Automatic samplers are used to collect composite samples (although they can also collect grab samples). They collect small amounts of sample at intervals during 24 hours and put them all into the one sample container. This type of sample gives average characteristics over 24 hours. The most widely used indicators of process performance, including BOD, COD, TSS, and nitrogen and phosphorus forms, require the use of composite sampling techniques. Samples should be taken from a location where fluid is free flowing and has sufficient velocity to keep the solid matter in suspension. A composite sample should be flow proportioned; sometimes time averaged samples are substituted unknowingly incurring major errors.
Make doubly sure that all samples are representative. An effluent grab sample taken at one specific time throughout the daily flow pattern is not representative of system performance over the entire day. It can be representative of the total number of basins discharging at that time.

7.3.SAMPLING, TESTING & INSPECTION

Proper sampling, testing, recording of data and inspection is a must to enable to operate the plant continuously at a good efficiency and maintain the water quality at the outlet.

Sampling points have been provided in the plant room which is as follows:

1. In the raw effluent delivery line from equalization tank to MBBR reactor.
2. Before Multi- grade filter and activated carbon filter.
3. After activated carbon filter.
4. After softener.
   - Besides this, continuous sampling and preliminary testing of the samples from the MBBR Tank is also a must.
   - Inspection of top of MBBR - Daily for seeing the top level.
   -

Testing

All the analysis should be done as per APHA standard. The testing parameters are:

INFLUENT	IN-BASIN	EFFLUENT

Flow	MLSS, MLVSS	COD, CODS
BOD5	Sludge settled volume (30, S+D time)	BOD_5
SS, VSS	Sludge volume index SVI30, SVI (S+D) time	SS, VSS
COD, CODS	Temperature	Hardness

8.0.OBSERVATIONS

Operators should be alert and use their senses. They should get into the habit of regularly walking around the plant and making the observations listed below.

The raw wastewater, mixed liquor and treated effluent should be inspected every operating day. These inspections are extremely effective in determining whether the plant is operating normally. Operators will develop an awareness of normal and proper operation that will help them to decide whether changes to the process are required.

a)Smell

- Fresh raw wastewater has a musty or humus smell. It should not have obnoxious smells such as rotten egg smell of hydrogen sulphide.
- Mixed liquor has a mild humus smell.
- Plant effluent should not smell.

b)Colour

- Fresh raw wastewater may be light grey colour.
- Septic wastewater is black.
- Industrial discharges can cause other colours.
- Mixed liquor should be medium to dark brown.
  Over aeration can cause a reddish colour.
  Under aeration can cause a grey-black colour.
  Excessive sludge wasting can cause a brown colour.
- Treated wastewater is a light gold colour having good clarity.

c)Clarity of Clear Water

Effluent should be clear after settling. Murky, i.e. turbid*, effluent suggests bulking sludge or too much biosolids in the reactor basin.

Effluent clarity is one of the best indicators of plant performance.

* Turbid, Murky, not clear. It is caused by very small particles that are too small to settle out.

d)Scum and Foam

There should not be large amounts of foam.

- Nocardia causes thick, scummy, dark tan foam.
- Bubbly, white foam can be caused by detergents or over aeration.

e)Appearance of Settled Sludge

The sludge should settle as a blanket with a smooth surface.

f)Blocked and Uneven Flows over Weirs

Uneven flows over the weir can disturb the sludge blanket causing turbid effluent.

g) Dead Spots during Aeration Check for blocked air diffusers.

h) Short Circuiting of Wastewater from Inlet to Clear Water Tank

Overcoming this problem may require a modification to the operating protocol.

i) Hissing Sounds

This sound is caused by leaking valves, joints etc.

9.0 OTHER PROCESS INDICATORS

1.Turbulence

Observe the entire surface of the aeration basin. There should be a consistent mixing pattern throughout the tank. If the mixing is excessive or deficient in any area, the air flow should be re-adjusted and/or the diffusers should be inspected and cleared of any obstructions (attached rags, etc.). Since the process is a biological oxidation process, it is essential that the solids and the incoming organic matter be mixed to provide maximum contact. If there are dead spots or poorly mixed core areas, the process efficiency may be affected.

2.Surface Foam and Scum

Foam and scum accumulation as well as its colour provides a general indication of the facility's long term wasting requirements. In general, the foam on the aeration basin can be classified as:

Fresh Crisp White Foam

Moderate amounts of crisp white or light coloured foam are usually associated with activated sludge processes that are producing an excellent final effluent. The presence of this type of foam usually indicates a well-balanced system. If this type of foam is present, plant operations should continue at those established levels until physical characteristics or control tests show a need to vary.

Thick, Greasy, Dark Tan Foam

A thick, greasy, dark tan or brown foam or scum may be observed on the surface of the aeration basin. This type of foam or scum will normally indicate an old sludge that is over oxidized. This type of foam or scum indicates a probable need to increase the amount of wasting. This should be done moderately (i.e. ten percent increase). The process should be observed carefully to insure that sludge wasting is not excessive.

White Billowing Foam

If the aeration tank is covered with large amounts of white soapsuds like foam, it is very likely that the process contains a very young under oxidized sludge. This condition can be improved by reducing the amount of sludge wasted from the system. Again, the change should be made slowly (i.e. ten percent change per day). Wasting should be decreased daily until the visible indicators and control tests indicate an improving trend. Once an improvement is noted, the wasting should be continued for approximately three days and then adjusted to maintain desired conditions.

3.Sludge Colour and Odour

Sludge colour and odour do not provide a control tool as easy to use as the foam and scum indicators. However, there is some value in observing the colour and odour of the sludge.

Light Tan or Brown

The presence of a light tan or brown colour can be the result of two possible causes:

- Severe inflow and infiltration problems that have resulted in an accumulation of clay and sand in the aeration tank.
- Extremely young under oxidized sludge (this condition will possibly be accompanied by the light billowing foam described earlier).

Dark Brown - Almost Black in Colour

Dark brown, almost black, sludge will normally be accompanied by the foul rotten egg type odours of hydrogen sulphide. When this occurs, increase the air flow and or the air time. If

after adjustment, the condition still occurs, loading conditions on the plant should be evaluated. Odour may also be a sign of poor housekeeping. Grease and solids build-up on the edge of the basins can go anaerobic and may cause odours. Odours are much more often caused by poor housekeeping than poor operation.

10.0SHUTDOWN PROCEDURE

A) Shutdown procedure for few hours or a day

Before shutdown the plant for few hours or a day, following measures should be taken for shut down of plant:

a) Clean the bar screen
b) Backwash the filters
c) Shutdown all the pumps, except the blowers.

B)Shutdown procedure for long time

Before shutdown the plant, we have to take care of plant, so that it does not cause any problem during startup the plant. For shut down of plant following measures should be taken:

i) Drain out the wastewater present in different units.
ii) Wash all the units with fresh water. iii)Pumps should be properly cleaned.
iv)Oil and greasing of pumps should be properly done after cleaning of pump.
v)If the process equipment is opened, then it should be properly covered.

Need for Re-commissioning-

If the commissioning of the plant is not successful, the MLSS not developed as per requirement then re-commissioning of the plant is essential. For this we check all units for any fault and take action as per requirement. If the plant is to be shut down for a longer period (few months or year) then again re-commissioning should be done as per the procedure given in precommissioning and commissioning.

11.0OPERATION & MAINTENANCE

Control Parameter

pH
Total Suspended Solid
Biological Oxygen Demand
Chemical Oxygen Demand

Oil & Grease

Water Quality Monitoring

As the complete wastewater from the complex is to be treated together in the STP and reused for horticulture & flushing, the following parameters are to be continuously monitored/measured and recorded:

- **Flow:** Flow should be measured at inlet and outlet of STP**.**
- **pH:** pH is to be monitored at the inlet and outlet of STP. It should be within the range of 6.0-
  8.5.
- **Suspended solids:** To be monitored in the raw sewage, after the tertiary treatment.
- **BOD/COD:** To be monitored in the raw sewage, after the secondary as well as tertiary treatment.

TABLE DESIGN FLOWS AND TYPICAL POLLUTANT CONCENTRATIONS IN STP INFLUENT AND EFFLUENT.

Inlet Flow	**-**	**235 m_3/day**
Peak Factor	**-**	**1.0 – 2.5**
Inlet BOD	**-**	**250-300 mg/L**
Outlet BOD	**-**	**≤ 20 mg/L**
Inlet COD	**-**	**350-450 mg/L**
Outlet COD	**-**	**≤ 60 mg/L**
Inlet TSS	**-**	**25-300 mg/L**
Outlet TSS	**-**	**≤ 20 mg/L**
Inlet Oil & Grease	**-**	**20 mg/L**
Outlet Oil & Grease	**-**	**<5 mg/L**

Plant Monitoring oCheck to see that all mechanical equipment is operating.

oCheck pre-treatment device. The pretreatment devices consist of a bar screen. The most commonly used bar screen removes grease, leaves, sticks, rags, rubber & plastics etc. oCheck the dosing tank and pumps, flow of equalization tank and tertiary for proper operation.

12.0PROCESS DISTURBANCES

It is probably inevitable that something unexpected can involve you from a process operational standpoint. In such cases you should have no hesitation in contacting WAPP. You should be aware that a single point deviation with a grab sample can only be viewed as an indication as such sampling techniques can be associated with a large error. Consistent results using a grab sampling technique are another matter. In any case and as a matter of course there should be a continued record of the pertinent process parameters from which a graphical trend record is developed to assist with day to day process control of the plant.

EXCEEDING OF REQUIRED EFFLUENT CONCENTRATIONS

Parameter in effluent	Possible reasons for values repeatedly exceeding.
BOD_5>20 mg/l	• Solids carry over in the effluent (TSS/VSS content in the effluent must be analyzed. Check SV and MLSS). • Insufficient process oxygen (check input loadings). • High organics and/ or TKN in the influent. • Toxic shock load in the influent (check DO profile).
COD>60 mg/l	• Solids carry over in the effluent (TSS/VSS content in the effluent must be analyzed. Check SV and MLSS). • Insufficient process oxygen (check input loadings). • High organics and or TKN in the influent (check COD, CODS in effluent). • Toxic shock load in the influent (check DO profile).
TSS >20 mg/l	• Solids carry over in the effluent (TSS/VSS content in the effluent must be analyzed). • Color of effluent solids-straggler floc (if white, OUR is too low). • Check SV and MLSS. • Too much, too little DO. • Check MLVSS, MLSS. • Filamentous sludge bulking in basin. • Insufficient alkalinity.

12.1.IN-BASIN PARAMETERS

•Sludge Volume Index (SVI)

In the case of rising sludge volume indices resulting in a process disturbance (150 –200 mL/g), experts need to be consulted because of the various possible reasons. Following analyses needs to be carried out:

1. Microscopic determination of the activated sludge.

2. Check the oxygen uptake.

•Sludge settling velocity

It must be measured once a week in secondary settling tank. Reduced settling velocity may be caused by increasing SVI or too high MLSS in the basin.

•Flow in the MBBR reactor

The MBBR reactor must be checked for settled sludge by periodically measuring the dry solids in the individual compartments.

•Sudden changes in dry solids content values

It is necessary to check if the reactor is completely mixed during aeration. If not, the aeration area must be extended.

•Removal of the surplus sludge

Each basin operates to a set point MLSS concentration at designated BWL. This value is adjustable according to temperature, hydraulic load and actual wastewater concentrations that are experienced at the plant.

For a TWL set point MLSS concentration of 4000 mg/L, control variance should be of the order of 200 mg/L. Continued trending above a set point indicates a need to extend the pump time (no more than 10% increase in any day); while trending below indicates a need to reduce the pump time (no more than 10% decrease in any day).

Sludge is removed from the basins by the Surplus (Waste) Activated Sludge (SAS or WAS) pumps. The pumps operate for an operator adjustable period and selectable cycles and discharge sludge from reactor basin. The MLSS concentration needs to be analysed in reactor basin on a daily basis and thereafter the MLSS content must be adjusted to the respective operating conditions.

The reasons for disturbances concerning the removal of the surplus sludge can be mechanical problems of the pump, valve or retroactive signals from the sludge treatment line.

•Problems with scum (floating sludge)

If scum generates the kind of scum needs to be checked (is it just a seasonal generation of scum, which normally does not cause problems, or is it a real “floating sludge” which forms a uniform layer on the basin surface).

If the floating sludge layer accumulates to a height of 20 cm, it will disturb the operation of the STP. In this case, the floating sludge needs to be removed continuously e. g. with floating pumps or with a cesspool cleaner.

13.0.TROUBLESHOOTING:

i.Most Common Problems and Probable Solution of Biological Treatment:

S. No.	Problem / Observations	Probable Reasons / Check points	Actions
1	Excess white foaming in MBBR tank	1. High organic load 2. Low DO 3. Low MLVSS 4. Fluctuation in load	1. Check BOD, DO and MLSS if BOD is high, decrease running flow and increase aeration time. 2. Maintain Constant F/M Ratio.
2	MLSS turning black	1. Low DO 2. Anoxic Condition 3. Shock load 4. Excess Sludge	1. Increase aeration to avoid anoxic condition. 2. Add nutrient (DAP & Urea to maintain healthy condition of bacteria. 3. Sludge wasting must be done on constant interval.
3	Sludge not settling during SVI test	1. Low DO 2. Young sludge 3. Lack of nutrients 4. Dead sludge	1. Check Do level it must be 2.53ppm during process and 1.5ppm during non-process time. 2. If flock are lighter, add DAP and urea. 3. Stop wasting of sludge.
4	Sludge is settling during SVI but supernatant is not clear	1. High F/M ratio 2. Low DO concentration 3. Unhealthy condition of Bacteria	1. Check BOD load & MLVSS concentration. 2. Increase aeration by reducing flow. 3. Add DAP & Urea (if required).
5	Sludge bulking	1. Dead sludge 2. High Temp 3. Excess nitrogen & Phosphorus	1. Drain out dead sludge. 2. Maintain nutrient level.
6	BOD is High in treated wastewater	1. Lack of healthy MLVSS 2. Lack of DO	1. Increase healthy concentration of MLVSS by adding bio culture. 2. Increase aeration (DO).

7	High nutrients in treated wastewater	1. Strong organic waste. 2. Insufficient supply of oxygen 3. Lack of carbonaceous matter	1. Increase aeration in to oxidize the nitrogenous compound. 2. If nutrient concentration is very high, chemical treatment is required.
8	Turbidity is high in treated wastewater	1. High concentration of colloidal/ suspended particles. 2. High dissolved organic /inorganic load. 3. Sludge Settling is not proper. 4. SVI Value is high. 5. Sludge wasting is not done on time. 6. Improper back wash of filters. 7. F/M ratio is high; load reduction capacity is reduced. 8. Concentration of dissolved solids is high.	1. Check Turbidity, TDS, and BOD on regular basis. 2. Filters must be backwash properly. 3. Check the condition of Media on time to time. 4. Check the SVI on regular basis; it must be in the range of 80-150ml/gm 5. Sludge disposal must be done on time. 6. F/M ratio must be maintained 0.8-0.15.

a. Blower Cuts Out on Overload Protection

1. Inlet air filter plugged: Remove, clean, and replace air filter.
2. Low voltage: Check or have the voltage checked with voltmeter while unit is running.

b. Excessive Foaming

1. Over-aeration: Reduce running time on timer system or adjust diffuser valves to reduce air input.
2. Lack of Solids: (Usually found only during first few weeks of operation.) Operate foam control and hose down.
3. Excessive use of detergents: Reduce amount used or change to soap or a low variety of detergent.

c. Equipment does not work automatically

1. Failure of time clock, if any. Have electrician check.
2. Overload may be released. Push reset button.

ii.<u>Lubrication Section</u>:

Blower

Blower is designed for both ends oil lubrication, which in turn gives better limiting speed for blower. Oil level indicator is provided on both sides of oil covers to monitor the level of oil at any time. The oil should be periodically checked and fresh oil should be added required to maintain proper level.

Lubrication Schedule*:* First oil change at 200 operating hours or earlier. And subsequent oil change 1675 operating hours or earlier, based on service condition. During schedule oil change, old oil should be completely flushed out before putting new oil.

Recommended Lubricant:We recommend lubricating oil sp–320 of Indian oil (IOCL) make. However, other lubricants similar characteristics can also be used.

Blower Motor: Bearing is packed with grease prior to shipment and need no further lubrication unless grease fitting are present.

iii.<u>Plant Maintenance Procedure</u>:

A. Daily Procedure

a) Check to see that all mechanical equipments are operating.
b) Check pre-treatment device. The pretreatment devices consist of a bar screen. Clean the bar screen daily.
c) Check aeration tanks for uniform roll.
d) Check the dosing tank and pumps, flow equalization tank and pumps, and tertiary units for proper operation.
e) Check the chlorination for proper operation.

B. Weekly Procedure

a) Check the oil level in blower.
b) Check lubrication of comminatory gear box (if any).
c) The Multi-grade filters and Activated carbon filters should be alternated on a regular basis. Clean surface sand filters, approximately every two weeks. During bed cleaning, all solids materials and weeds should be disposed off in an approved landfill.

C. Monthly Procedure

a) Lubricate blower bearings.
b) Check V-belts for proper tension and wear. Replace when necessary.
c) Check air filter and clean when necessary. Wash screen with fuel oil or kerosene.
d) If difficulties are encountered which cannot be handled by your maintenance personnel following this manual, service should be obtained from a qualified person such as the manufacturer's representative.

D. Annually

a)Wire brush and paint any rusted metal atleast annually or when indicated.

b)Clean diffusers.

c)Check grading for structural integrity

13.1.OPERATION & MAINTENANCE SCHEDULE Operational and Preventative Maintenance Frequency

Operational Controls	Daily	Weekly	Mo.	3 Mo.	6 Mo	Yearly	As Needed
Perform necessary operational and control tests (settleability test, F/M, pH, MLSS, chlorine residual, etc.)	√						
Perform tests as required by NPDES permit and Ohio EPA							√
PRETREATMENT							
Clean bar screen	√						
Remove and dispose of rags and accumulations from bar screen	√						
MBBR REACTOR							
Observe odor, color, and foaming MBBR Reactor.	√						
Check mixing of the aeration in MBBR chamber	√						
Visually check aeration system for an even air distribution, even roll across the aeration chamber, no dead spots or septic areas.	√						
Raise and clean rags from diffusers							√
Check oil level in blower gear case	√	√					
Check for air leaks around base And fittings							
Check valves for leaks	√						

Check belts for wear		√					
Check motor and blower casing For overheating	√						
Check aeration system for Unusual noises or vibrations	√						
PUMPS							
Check for blockage in return Sludge pump	√						
Check pumps for clogging or Near clogging condition	√						
Clean screen and intake of suction piping of pumps							√
Lubricate pump bearings Per manufacturer recommendations							√
Check pump motors for overheating	√						
BLOWERS							
Check air valve settings on diffusers			√				
Check diffusers				√			
Check pulley alignment		√					
Clean air filter			√				
Check oil pressure relief valve in the blower		√					
Inspect V-belt for wear		√					
Check V-belt for slippage		√					
Check and lubricate pressure relief valve			√				
MOTORS							
Check electrical load			√				
Inspect breaker, fuses, and resets			√				
Check blower oil level		√					
Grease blower bearing per manufacturer recommendations							√
SLUDGE							
Turn off sludge tank air, settle and return supernatant prior to wasting sludge		√					

Check sludge holding tank solids level and have pumped as needed			√				

14.0.RECORDS & REPORTS

Total Report of plant

Proper records are to be maintained for the sampling & testing and daily report is to be made for the operation of the plant. The report should carry the following details.

1. The total flow into the STP in the last 24 hrs.
2. Reports and results of various samples and abnormality seen if any.
3. Status of multi-grade filters, activated carbon filters.
4. Hourly pressure gauge reading before and after the filters.
5. Status of various pumps and equipments.
6. Backwash frequency of filters.
7. Consumption of consumables.
8. Energy consumption.

15.0.

16.0 DO'S & DON'T'S OF SEWAGE TREATMENT PLANT

Do's:

- Cleaning of bar screens 2-3 times in a day.
- Keep all the plant room area neat & clean.
- Maintain log book on daily basis and record chemical consumption.
- Draw the water sample and show it to the engineer in charge daily.
- Test the treated water for pH & chlorine at regular intervals.
- Regular backwash followed by rinse of MGF, ACF & softener as per requirement.
- Clean the blower's suction filter once every week.
- Always wear helmet and ear plugs while entering the plant room.
- Always use hand gloves during chemicals handling.
- Keep all the equipment neat & clean.
- Maintain necessary tools in the tool kit.
- Maintain the first aid box in the plant room.

- See that the lighting, ventilation and exhaust systems are working in the plant room.

Don'ts:

- Don't shut off the blower at any time. Blower should operate continuously for 24 hours.
- Don't operate the filter valves in running mode of filter feed pump.
- Don't clean bar screens or tanks individually. Whenever operator does cleaning activities, there should be one more person outside the tank to take care.
- Don't close the over flow line of tanks at any time.
- Don't touch electrical panel without safety gadgets and without wearing rubber shoes.
- Don't over dose hypo-chlorine solution in Soft Water otherwise treated water is harmful for irrigation purposes.
- Keep the rubber mat dry and clean.
- Keep all the manholes covered.
- Don't leave the plant room unattended.
- Don't be panic in case of any break down or failure.

17.0 MAINTENANCE & SAFETY PROCEDURE

1. All gratings and fencing should be locked when unattended.
2. All gratings should be kept painted and inspected regularly for structural integrity.
3. Turn the power off when doing electrical work.
4. Become friendly with the safety and storage requirements for any chemicals at the plant (i.e. granular and tablet chlorine).
5. Do not smoke or eat until your hands are thoroughly washed. When possible gloves should be worn.
6. Do not enter a confined space without proper training in these potential hazards. Never enter a wet well or deep manhole without adequate ventilation. Do not enter a manhole while working alone.
7. Avoid wearing loose clothing around moving mechanical equipment. Do not get near motor blower belts when the blower is running or on automatic timer.

17.1.SPECIFIC SAFETY PRECAUTION:

I.HAZARDS-

ELECTRICAL

Potential electrical hazard exits when servicing the local control panels, pumps, and tank mixers, skid-mounted instrumentation.

MOVING PARTS

Potential moving parts hazards exists during the following circumstances:

Ion exchange vessels` manhole opening before relieving the pressure from the tanks.

LIFITING LOADS

The potential of injury when lifting heavy loads wildly exists. You are advised to make a note of the following hazards for necessary precautions:

•Lifting and handling bags or drums of chemicals.

FALLING HAZARD

Potential falling hazard exits when using a ladder to replace the media or servicing any components associated with the water storage tanks, filters, which are located near or on top of the vessels.

CONFINED SPACE HAZARDS

Potential confined space hazard exists when servicing any internal components of media filters or when servicing internal components of storage tanks. **II.SAFETY-**

Safety precautions are to be observed by the plant operating staff while operating, maintenance, sampling and inspection. Employee hazards in such plants include exposure to:

1. Physical injuries
2. Body infections
3. Oxygen deficiency
4. Noxious gases and vapours.

These occupational hazards are largely avoided by the execution of safe practices and the use of safety equipment.

•Prevention of physical injuries:

- Lift objects safely. - Prevent falls
- Be cautious while climbing the ladders or steep, narrow stairs. Keep manholes in place.
- Avoid body injuries due to tools. Have sufficient lighting arrangement.
- Avoid Electrical shocks and injuries.

- Prevention of body infection

  Provide safe drinking water and proper first aid. Avoid long exposures to aeration tank etc.

- Noxious gases and vapors
  - Sodium hypo-chlorite with free chlorine is being used as a disinfectant. Avoid long exposures.
  - Avoid exposure to volatiles in the exhaust from the aeration tank.

III.MAINTENANCE-

A.The backbone of a successful plant is the regular preventive maintenance by the supervisory and operating staff. The following are the general points to be noted and kept in mind for maintenance.

i) Oil level to be checked and the deficit level to be made up by using the recommended grade of oil in reduction gears.

ii) The major greasing points to be checked once in a week are listed below:-
- Hand wheel operated spindle/ valves
- Motors
- Pumps

iii) Only recommended grade of grease should be used.

B.Common Instructions for Operation And Maintenance

- Ensure that adequate quantities of the appropriate lubricant oil and grease are available in the stock.
- Check and ensure that the pump set, motors, valves, piping etc. are secured and in proper alignment.
- Remove all construction materials and tools lying in and around units.
- Ensure that the drainage is clear and in working order.
- Fill up the bearing, gear box and moving parts with the correct grade and quantity of lubricants.
- Turn unit by hand to ensure free movement of pump and drive shafts.
- Ensure that the voltage is correct and power supply is sufficient to run all equipments at full load.
- Ensure that the correct grade of chemicals such as Urea, DAP, Sodium hypo-chlorite are available in ready stock at least for one-month consumption.

C.Maintenance of Gear Boxes

- Check the oil level by means of the dipstick or oil level plug and if necessary, top up with the recommended grade of lubricant.
- Ensure that breathers are clean and operating properly
- On units having grease lubricated bearing, add two shots of grease from a grease gun or where screw in type lubricators are fitted, screw in the lubricator two turns and refill when necessary with recommended grease.

D.Oil Changes

Regular oil changes are essential to ensure the unit gives long and trouble free service. The frequency at which the oil should be changed is determined by following factors:-

- Oil temperature: unit operating under load
- Type of oil: plain or containing additives
- Environment: humidity, dust etc.
- Operating conditions: shock loading etc.

At elevated temperature, the effective life of the oil is very much reduced. This is most pronounced with oil containing fatty and E.P. additives.

16.0.GENERAL HOUSE KEEPING

Good housekeeping for any treatment plant is mandatory for obtaining a satisfactory performance. It calls for the establishment of systematic approach. A single individual should be responsible for conducting various functions.

The plant operators should be regular employee, well versed and experienced to handle the sophisticated electrical and mechanical equipment.

Good housekeeping makes it possible for each worker to devote full attention to their assigned job. Tools and material are readily available and always in the same place, there is adequate working space, and the workers' efforts are not obstructed by irrelevant objects.

Housekeeping with respect to chemicals is critical as we are exposed to their hazards in four ways:

- Inhalation (Breathing in)
- Absorption (Skin contact)
- Ingestion (Swallowing)
- Injection (By needle or other sharp object

18.1.FACTORS GOVERNING HOUSEKEEPING

There are three main requirements needed for good housekeeping:

- Proper layout and well set up equipments and facilities
- Correct material handling and storage
- Cleanliness and orderliness

17.0.PROCEDURE FOR ENVIRONMENTAL CLEARENCE/ACT

- Water (Prevention and Control of Pollution) Act, 1974
- Air (Prevention and Control of Pollution) Act, 1981
- Cess Act, 1977, - Environment (Protection) Act, 1986 and Rules there under
- Public Liability Insurance Act, 1981
- National Environmental Tribunal Act, 1995
- National Environment Appellate Authority Act, 1997

GLOSSARY

Absorption

The process, in wastewater, by which an organic material is consumed by a microorganism by passing it through the cell of the microorganism.

Activated Sludge

Sludge floc produced in raw or settled wastewater by the growth of microorganism (bacteria and other organisms) in the presence of dissolved oxygen (DO) and accumulated insufficient concentration by returning floc previously formed. The term activated implies that the sludge is teaming with the active or living microorganisms or bacteria.

Activated Sludge Process

A biological wastewater treatment process in which a mixture of wastewater and activated sludge is agitated and aerated. The activated sludge is subsequently separated from the treated wastewater (mixed liquor) by sedimentation and wasted or returned to the process as needed.

Adsorption

The sticking of a solid in the wastewater to the surface of the microorganism.

Aeration

The process of bringing about the intimate contact between air and a liquid by bubbling air through the liquid by the use of a diffuser.

Aerobic

A condition in which “free” or dissolved oxygen is present in the aquatic environment.

Aerobic Bacteria

Bacteria that requires “free” or dissolved oxygen for their life and growth.

Anaerobic

Requiring, or is not destroyed by, the absence of air or free elemental oxygen.

Anaerobic Bacteria

Bacteria that grow only in the absence of air or free elemental oxygen.

Bacteria

A group of universally distributed, rigid, essentially unicellular, microscopic organisms lacking chlorophyll. Bacteria usually appear as spheroid, rod-like, or curved entities, but occasionally appear as sheets, chains, or branched filaments.

Baffles

Deflectors vanes, guides, grids, gratings, or similar devices constructed or placed in flowing water, wastewater, to check or affect a more uniform distribution of velocities; absorb energy, divert, guide, or agitate liquid.

Biochemical Oxygen Demand (BOD)

A measurement of the amount of oxygen required by the microorganisms to metabolize or digest the organic material in the wastewater. An oxidation brought about by biological activity which results in chemical combination of oxygen with organic matter. “It is the quantity of oxygen used in the biological oxidation of organic matter in a specified time, at a specified temperature and under specified conditions”.

Biochemical Process

The process by which the life activities of bacteria and other microorganisms, in search of food, breakdown complex organic material into simple, more stable substrates.

Carbonaceous Biochemical Oxygen Demand (CBOD)

A measurement of the amount of oxygen required by the microorganisms to metabolize or digest the carbonaceous organic material in the wastewater. An oxidation caused by the biological activity those results in chemical combination of Oxygen with carbonaceous organic matter. It is the quantity of oxygen used in the biological oxidation of carbonaceous organic material in a specified time at a specified temperature and under specified conditions.

Chlorination

The application of chlorine to water or wastewater generally for the purpose of disinfection, but also for accomplishing other biological or chemical results.

Chlorine Contact Chamber

A detention basin is provided primarily to secure the diffusion of chlorine through the liquid. It allows for the proper detention time for the chlorine to remain in contact with the liquid for the specified amount of time to ensure adequate disinfection occurs.

Contact Tank

The tank in the contact stabilization plant that receives wastewater and aerated return sludge.

Adsorption takes place in the tank.

De-chlorination

The partial or complete reduction of residual chlorine in a liquid by any chemical or physical means.

Decomposition of Wastewater

The breakdown of organic matter in wastewater by bacterial action, either by aerobic or anaerobic bacteria.

Detention Time

The theoretical time required to displace the contents of a tank or unit at a given rate of discharge.

Diffuser

A porous plate, tube, or device through which air is forced and divided into minute bubbles for diffusion in liquids. These diffusers are used in aeration tanks to diffuse air into various portions of the wastewater treatment process.

Disinfected Wastewater

Wastewater to which chlorine or other types of disinfecting devices or chemicals have been applied during or after treatment to destroy pathogenic organisms.

Dissolved Solids

Consist of organic and inorganic material that is present in true solution in the wastewater.

Effluent

Water, wastewater, or other liquid flowing or exiting from a basin, reservoir, or tank of the treatment process. This liquid is generally referred to as the final effluent when it is discharged from the last treatment process and enters the environment.

Grit

The heavy mineral material present in wastewater such as sand, eggshells, gravel and cinders.

Influent

Water, wastewater, or other liquid that enters into a reservoir or basin of a treatment plant.

Inorganic waste

Waste material such as sand, salt, iron, calcium and other mineral materials which are not converted in large quantities by microorganism action. Inorganic wastes are chemical substances of mineral origin and may contain carbon and oxygen.

Microorganism

Microscopic living objects which require energy, carbon, and small amounts of inorganic elements to grow and multiply. They get these requirements from the wastewater and the sun and in doing so, help to remove the pollutants from the wastewater.

Mixed Liquor

Used to refer to the mixture of wastewater and the return activated sludge in the aeration tank of an activated sludge system.

Nitrification

The conversion of nitrogenous matter in to nitrates by bacteria.

Organic Matter

Chemical substance of animal or vegetable origin or more correctly of basically carbon structure comprising compounds consisting of hydrocarbons and their derivatives.

Oxygen Demand

The quantity of oxygen required to satisfy the oxygen requirement in a given liquid.

Over aerated

Sludge which remains for long periods in the aeration tanks with dissolved oxygen at 4.0mg/l and above.

Over oxidized

Sludge which passes through the aerator and clarifier many times in one day due to high return rates.

Organic Wastes

Waste material which comes from animal or vegetable sources. Organic waste generally can be consumed by bacteria and other small organisms. Organic wastes contain mainly carbon and hydrogen along with other elements.

pH

A term used to express the intensity of the acid or alkaline sources. A pH of 7.0 is considered neutral with acidity increasing as the pH decreases. The pH becomes more alkaline as the pH value increases. The normal pH for waste- water treatment is 6.5 to 7.5.

Residual Chlorine

Chlorine remaining in water or wastewater at the end of a specified contact period as combined or free chlorine.

Scum

The layer or film of extraneous or foreign matter that rises to the surface of a liquid and is formed there. It may also beam as so solid matter that floats on the surface or is a residue there is deposited in a channel or container at the surface of the water.

Septic

A condition produced by the growth of anaerobic organisms. If severe, the wastewater turns black, giving off a foul odor and creating a heavy oxygen demand.

Settleable Solids

That matter in wastewater which will not stay in suspension during a pre-selected settling time period such as an hour. This material either settles to the bottom or floats to the surface.

Settleability Test

A determination of the settle ability of solids in a suspension by measuring the volume of solids
settled out of a measured volume of sample in a specified interval of time usually reported in milliliter per liter. The time requirement of the settle ability test usually is 30 minutes, however various other characteristics about the sludge equality can be determined by varying the length of time used for the settling test.

Sludge

The settle able solids separated from the liquid during clarification.

Sludge Age

The theoretical length of time that a particle of activated sludge will remain in the aeration system.

Sludge Bulking

A phenomenon that occurs inactivated sludge plants where by the sludge, occupies excessive volumes will not concentrate readily and will not settle in the final clarification process.

Sludge Digestion

A process, by which organic matter in sludge is gasified, liquefied, mineralized or converted to a more stable form by anaerobic or aerobic organisms.

Stabilization Tank

The tank in the contact stabilization plant that receive return sludge from the clarifier for more aeration (re-aeration). Absorption takes place here.

Squeegee

A device, usually with a soft rubber edge, used for dislodging and removing deposited wastewater solids from the wall sand bottoms of sedimentation.

Supernatant

Liquid removed from settled sludge. Supernatant commonly refers to the liquid between the sludge on the bottom and the scum on the surface of any settling tank.

Suspended Solids

Solids that either float on the surface of or are in suspension in water, wastewater or other liquids and are largely removable by filtering.

Tile Field

A system of open-jointed tile, usually laid on a rockfill, used for dispersing wastewater effluent into the ground.

Total Solids

The sum of dissolved and undissolved constituents in water or wastewater, usually stated in milligrams per liter.

Unit operation*:*

A specific treatment process employing physical forces, addition of chemicals or biological activity.

Wastewater

The spent water of a community. It may be a combination of liquid and water carried wastes from residences, commercial buildings, industrial plants and institutions, together with any ground water, surface water and storm water that may be present.

Wastewater Decomposition

Transformation of organic or inorganic materials contained in wastewater through the action of chemical or biological processes.

Wastewater Oxidation

The process whereby, through the agency of living organisms in the presence of oxygen, the organic matter contained in wastewater is converted into a more stable or mineral form.

Weir

A diversion device that controls the level of the water and allows the effluent to pass over while prohibiting any solids from exiting the system. The primary purpose is to allow for an even steady flow of effluent to be discharge from the clarifier. The device has a crest and some side containment of known geometric shape, such as a V. The liquid surface is exposed to the atmosphere 'Flow is related to upstream heights of water above the crest to a position of crest with respect to downstream water surface and to geometry of the weir opening.

Weir loading

In a solid contact or sedimentation unit, the rate in gallons per minute per foot of weir length at which clarified or treated is leaving the unit. This loading rate is used to determine the retention time and the discharge.

Sewage Treatment & ETP Plant (of capacity 400KLD) at Super Speciality Hospital, Hatuara, Purulia

LIST OF MAJOR INVENTORIES OF THE PLANT

1. RAW SEWAGR TRANSFER PUMP- 02NOS
2. PLANT ROOM SUMP PUMP – 02NOS
3. SLUDGE RECYCLING PUMP – 02NOS
4. FILTER FEED PUMP – 02NOS
5. TREATED WATER TRANSFER PUMP – 02 NOS
6. SCREW PUMP – 02NOS
7. AIR BLOWER – 02NOS
8. MULTIGRADE FILTER – 01 NO
9. ACTIVATED CARBON FILTER – 01NO
10. ULTRA VIOLET SYATEM – 01NO
11. FILTER PRESS – 01 NO
12. CONTROL PANEL – 02 NOS
13. AGITATOR – 01NO
14. DOSING PUMP – 02 NOS
15. CHEMICAL TANK – 02 NOS
16. MAGNETIC FLOW METER – 01NO
17. DIFFERENTIAL PRESSURE SWITCH – 01 NO

Sewage Treatment Plant in STP Building

Name of the Client: West Bengal Medical Service Corporation Limited

Name of the Site: West Bengal Medical College, Purulia

Name of the Executing agency: Larsen & Toubro Constructions

Date of Handing / Taking over:

Sl. No.	WORK DESCRIPTION	EQUIPMENT SPECIFICATION	MAKE	Service	UOM	QTY
1	Multigrade filter Tank	Dia. 1200 x 1800 HOS (MSEP), Discharge - 12 Cum/sq.m/Hr, Mild steel with inside Ms epoxy painted	Wapp	Fliteration of clean Water from Chlorine contact tank to treated water tank	Set	1
2	Activated Filter Tank	Dia. 1200 x 1800 HOS (MSEP), Discharge - 12 Cum/sq.m/Hr, Mild steel with inside Ms epoxy painted	Wapp	Fliteration of clean Water from Chlorine contact tank to treated water tank	Set	1
3	Reactor Feed Pump (1W+1S), submergible raw sewase transfer pump	Capacity-12Cum/Hrs, Head-9.5m, Model - FAS 50/30D, Motor Rating - 0.75 KW, RPM-1440	Wilo	Transfering of Sewase water from equalization tank to Anoxic, Mbbr tanks and using of emergency bypass purpose	Sets	2
4	Sludge transfer cum Circulation Pump (1W+1S)	Capacity-10Cum/Hrs Head-12mter, Model - SP-0M , Sl No- A19DAE007717, A19DAE007754, Motor Rating - 0.75KW, RPM-2700	Kirloskar brother ltd	Recircling of sludge Water from tube settling tank to anoxi and sludge holding tank	Sets	2
5	Screw Pump (1W+1S)	Capacity- 1Cum/Hrs, Head-35m, M/C no- FEF34/XV, Motor Rating - 0.75 KW, RPM-1440	Kirloskar electric	To transfer sludge from sludge holding tank to fliterpress and recirculation of SHT	Sets	2
6	Sump Pump (1W+1S), Drain Pit	Capacity- 15Cum/Hr, Head-24.5m, Model - FAS 50/30D DM, Motor Rating - 2.2KW, RPM-1440	Wilo	To drain water from pump room	Sets	2
7	Flushing water Pump (1W+1S)	Capacity- 8Cum/Hrs, Head-54meter, Model - MPM1017, Motor Rating - 7.5KW, RPM-2930	Wilo	To transfer treated water to the building for flushing purpose	Sets	2
8	Irrigation Water Transfer Pump (1W+1S)	Capacity- 4.5Cum/Hrs, Head-30 m, Model - GMC-1540, Sl No- A20EDM000141, A20EDM000168, Motor Rating -1.1KW, RPM-2700	Kirloskar brother ltd	To transfer treated water to the landscape for irrigation purpose	Sets	2
9	Filter Feed Pump (1W+1S)	Capacity-12Cum/Hrs, Head-30meter, Model -KDI-335++ , Sl No-A20ZBK000087,A20ZBK000088, Motor Rating - 2.5KW, RPM-2840	Kirloskar brother ltd	Filtering of clean water of Chlorine contact tank through muntigrade filter & Activated carbon filter	Sets	2
10	Butterfly, Non-Retunr, Ball, Solenoid Valves etc.	Size-50mm, 65mm, 100mm	Zoloto		Nos	84
11	Y-Type Strainer	Size 65mm dia.	Zoloto		Nos	1
12	Poly Dosing System with storage tank	Capacity- 0-100Ltr/Hrs, Head, Sl No-67D19, Motor Rating - 0.37KW, RPM-2800, Tank Capacity - 200ltrs	Raj Pump	poly chemical use for sludge holding tank of sewase water using of thickly purpose to fliterpress	Sets	1
13	Clorine Dosing System with storage tank	Capacity- 6L/Hrs, Model - FE-A-104, Motor Rating - 0.0001Watt, Tank Capacity-100ltrs	Focus Engineer	Reduce water smell and change the colour water and kill the harmful bacteria	Sets	1
14	SS Bar Screen	Size - 600x800 mm, Ms epoxy coated	Wapp	Screening / filteringto solid particles of intake sludge	Set	1
15	Filter Press	Filter Press, 18"x18"x23 Nos	Sachin / Fluidtech	Making of Sewage cake and can use as organic fartilizer for gradan	Set	1
16	MCC Electrical Pump Control Panel	BMS monotoring Electrical Control Panel	SNG	Power supply to motors	Set	1
17	Electrical & automation	Float switch, electrical cable, gland, tray, earthing etc.	Wapp		Lot	1
18	Air Blower for Equalization Tank (1W)	Capacity- 150Cum/Hrs, pressure - 0.5 kg/sqCm, Model - 44Ac, Sl No, m- 19050200, Motor Rating -m/c no.-FEF 41/XV-280 ,5.5KW, RPM-1440.	Blower -Airvak blower ,Motor -kirloskar electric	Air supply (oxigen) to Equalization tank to develope bacteria and mixing of sewage water & all types paticles	Sets	1
19	Air Blower for MBBR Tank (1W+1S)	Capacity- 230Cum/Hrs, pressure - 0.55 kg/sqCm, Model - 53OC, Sl No, m-19050201 and 19050202, Motor Rating -m/c no.-FEF 42-54, 7.5KW, RPM-1450..	Blower -Airvak blower ,Motor -kirloskar electric	Air supply (oxigen) to Anoxic & MBBR Tanks to develope bacteria and mixing of sewage water & all types paticles	Sets	2
20	Automatic control level sensors	Fluid level controller, micro switch 250V Ac	Elecare	Automatic on / off of Motor when in Dry / wet condition	Nos	10
21	Magnetic Flow Meter (Water meter)	Electric water meter	Aster	To Messure inlat sludge water to process (Anoxic/MBBR Tanks)	No	1
22	Tube seteller Media	Spiral Media	Cooldeck	To enhance the settling rate & effeiciency of aerated mixed liquor	Lot	1
23	MBBR Media	Spiral Media	Cooldeck	Biological treatment carried out based on aerobic moving	Lot	1
24	Disk type fine bubble (Defuser)	300mm dia. Total - 32nos (MBBR Tank-1&2)	Schogen	Air blowing to bacteria development	Lot	1
25	Coarse bubble (Defuser)	150mm dia. Total - 27nos (Equalization Tank & SHT)	Schogen	Air blowing to bacteria development	Lot	1

Signature by L&T ENGINEER 31/07/2020

Signature by L&T QA / QC 31.07.20

Signature by L&T PROJECT MANAGER 31/07/2020

Signature by WBMSCL

(Taken over by)

Sewage Treatment Plant in STP Building

Name of the Client: West Bengal Medical Service Corporation Limited

Name of the Site: West Bengal Medical College, Purulia

Name of the Executing agency: Larsen & Toubro Constructions

Date of Handing / Taking over:

Sl. No.	WORK DESCRIPTION	EQUIPMENT SPECIFICATION	MAKE	Service	UOM	QTY
1	Multigrade filter Tank	Dia. 1200 x 1800 HOS (MSEP), Discharge - 12 Cum/sq.m/Hr, Mild steel with inside Ms epoxy painted	Wapp	Fliteration of clean Water from Chlorine contact tank to treated water tank	Set	1
2	Activated Filter Tank	Dia. 1200 x 1800 HOS (MSEP), Discharge - 12 Cum/sq.m/Hr, Mild steel with inside Ms epoxy painted	Wapp	Fliteration of clean Water from Chlorine contact tank to treated water tank	Set	1
3	Reactor Feed Pump (1W+1S), submergible raw sewase transfer pump	Capacity-12Cum/Hrs, Head-9.5m, Model - FAS 50/30D, Motor Rating - 0.75 KW, RPM-1440	Wilo	Transfering of Sewase water from equalization tank to Anoxic, Mbbr tanks and using of emergency bypass purpose	Sets	2
4	Sludge transfer cum Circulation Pump (1W+1S)	Capacity-10Cum/Hrs Head-12mter, Model - SP-0M , Sl No- A19DAE007717, A19DAE007754, Motor Rating - 0.75KW, RPM-2700	Kirloskar brother ltd	Recircling of sludge Water from tube settling tank to anoxi and sludge holding tank	Sets	2
5	Screw Pump (1W+1S)	Capacity- 1Cum/Hrs, Head-35m, M/C no- FEF34/XV, Motor Rating - 0.75 KW, RPM-1440	Kirloskar electric	To transfer sludge from sludge holding tank to fliterpress and recirculation of SHT	Sets	2
6	Sump Pump (1W+1S), Drain Pit	Capacity- 15Cum/Hr, Head-24.5m, Model - FAS 50/30D DM, Motor Rating - 2.2KW, RPM-1440	Wilo	To drain water from pump room	Sets	2
7	Flushing water Pump (1W+1S)	Capacity- 8Cum/Hrs, Head-54meter, Model - MPM1017, Motor Rating - 7.5KW, RPM-2930	Wilo	To transfer treated water to the building for flushing purpose	Sets	2
8	Irrigation Water Transfer Pump (1W+1S)	Capacity- 4.5Cum/Hrs, Head-30 m, Model - GMC-1540, Sl No- A20EDM000141, A20EDM000168, Motor Rating -1.1KW, RPM-2700	Kirloskar brother ltd	To transfer treated water to the landscape for irrigation purpose	Sets	2
9	Filter Feed Pump (1W+1S)	Capacity-12Cum/Hrs, Head-30meter, Model -KDI-335++ , Sl No-A20ZBK000087,A20ZBK000088, Motor Rating - 2.5KW, RPM-2840	Kirloskar brother ltd	Filtering of clean water of Chlorine contact tank through muntigrade filter & Activated carbon filter	Sets	2
10	Butterfly, Non-Retunr, Ball, Solenoid Valves etc.	Size-50mm, 65mm, 100mm	Zoloto		Nos	84
11	Y-Type Strainer	Size 65mm dia.	Zoloto		Nos	1
12	Poly Dosing System with storage tank	Capacity- 0-100Ltr/Hrs, Head, Sl No-67D19, Motor Rating - 0.37KW, RPM-2800, Tank Capacity - 200ltrs	Raj Pump	poly chemical use for sludge holding tank of sewase water using of thickly purpose to fliterpress	Sets	1
13	Clorine Dosing System with storage tank	Capacity- 6L/Hrs, Model - FE-A-104, Motor Rating - 0.0001Watt, Tank Capacity-100ltrs	Focus Engineer	Reduce water smell and change the colour water and kill the harmful bacteria	Sets	1
14	SS Bar Screen	Size - 600x800 mm, Ms epoxy coated	Wapp	Screening / filteringto solid particles of intake sludge	Set	1
15	Filter Press	Filter Press, 18"x18"x23 Nos	Sachin / Fluidtech	Making of Sewage cake and can use as organic fartilizer for gradan	Set	1
16	MCC Electrical Pump Control Panel	BMS monotoring Electrical Control Panel	SNG	Power supply to motors	Set	1
17	Electrical & automation	Float switch, electrical cable, gland, tray, earthing etc.	Wapp		Lot	1
18	Air Blower for Equalization Tank (1W)	Capacity- 150Cum/Hrs, pressure - 0.5 kg/sqCm, Model - 44Ac, Sl No, m- 19050200, Motor Rating -m/c no.-FEF 41/XV-280 ,5.5KW, RPM-1440.	Blower -Airvak blower ,Motor -kirloskar electric	Air supply (oxigen) to Equalization tank to develope bacteria and mixing of sewage water & all types paticles	Sets	1
19	Air Blower for MBBR Tank (1W+1S)	Capacity- 230Cum/Hrs, pressure - 0.55 kg/sqCm, Model - 53OC, Sl No, m-19050201 and 19050202, Motor Rating -m/c no.-FEF 42-54, 7.5KW, RPM-1450..	Blower -Airvak blower ,Motor -kirloskar electric	Air supply (oxigen) to Anoxic & MBBR Tanks to develope bacteria and mixing of sewage water & all types paticles	Sets	2
20	Automatic control level sensors	Fluid level controller, micro switch 250V Ac	Elecare	Automatic on / off of Motor when in Dry / wet condition	Nos	10
21	Magnetic Flow Meter (Water meter)	Electric water meter	Aster	To Messure inlat sludge water to process (Anoxic/MBBR Tanks)	No	1
22	Tube seteller Media	Spiral Media	Cooldeck	To enhance the settling rate & effeiciency of aerated mixed liquor	Lot	1
23	MBBR Media	Spiral Media	Cooldeck	Biological treatment carried out based on aerobic moving	Lot	1
24	Disk type fine bubble (Defuser)	300mm dia. Total - 32nos (MBBR Tank-1&2)	Schogen	Air blowing to bacteria development	Lot	1
25	Coarse bubble (Defuser)	150mm dia. Total - 27nos (Equalization Tank & SHT)	Schogen	Air blowing to bacteria development	Lot	1

Signature by L&T ENGINEER 31/07/2020

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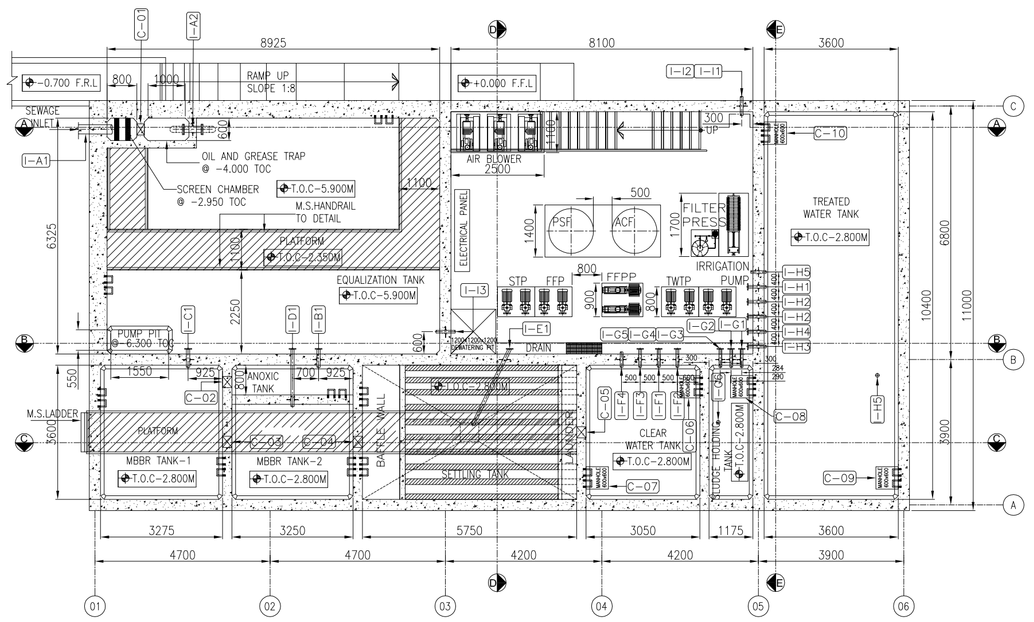
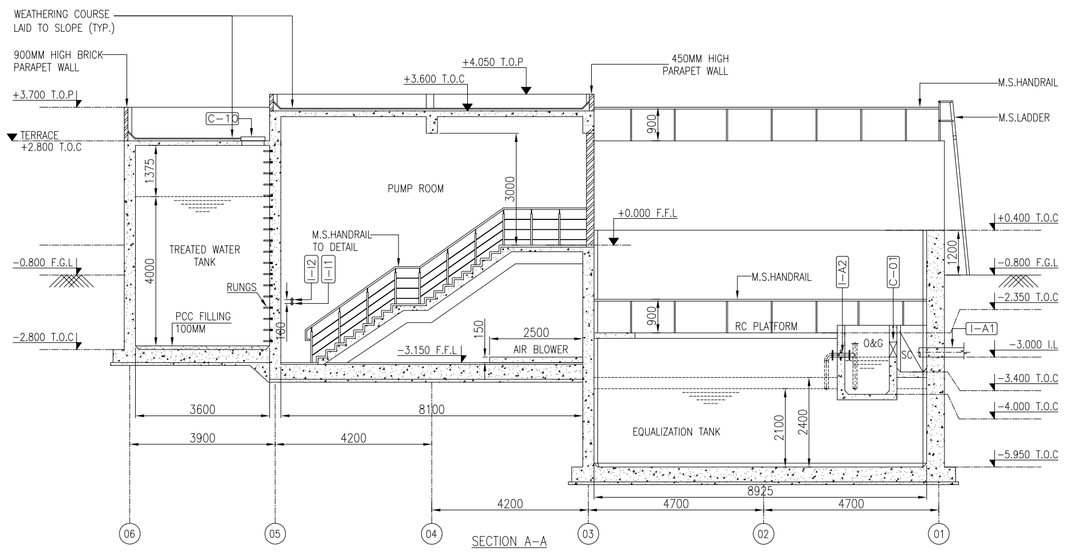
Signature by L&T PROJECT MANAGER 31/07/2020

Signature by WBMSCL

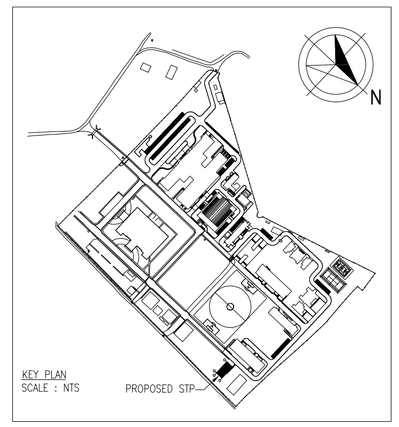
(Taken over by)

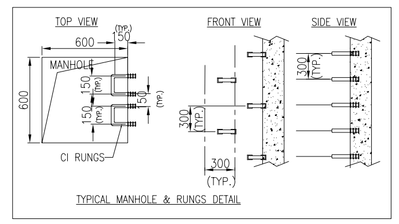


GENERAL ARRANGEMENT PLAN

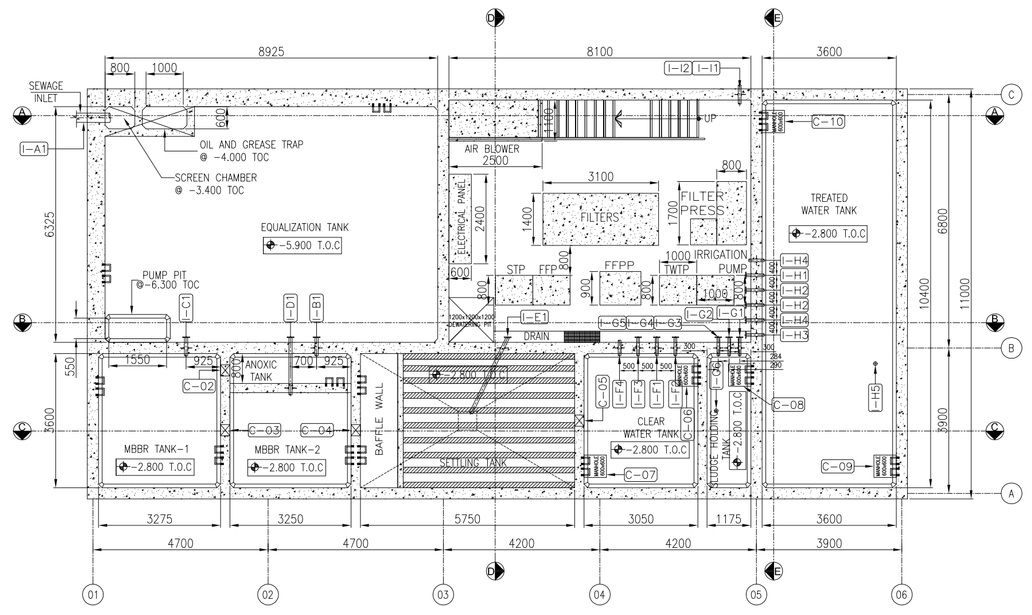


SECTION A-A

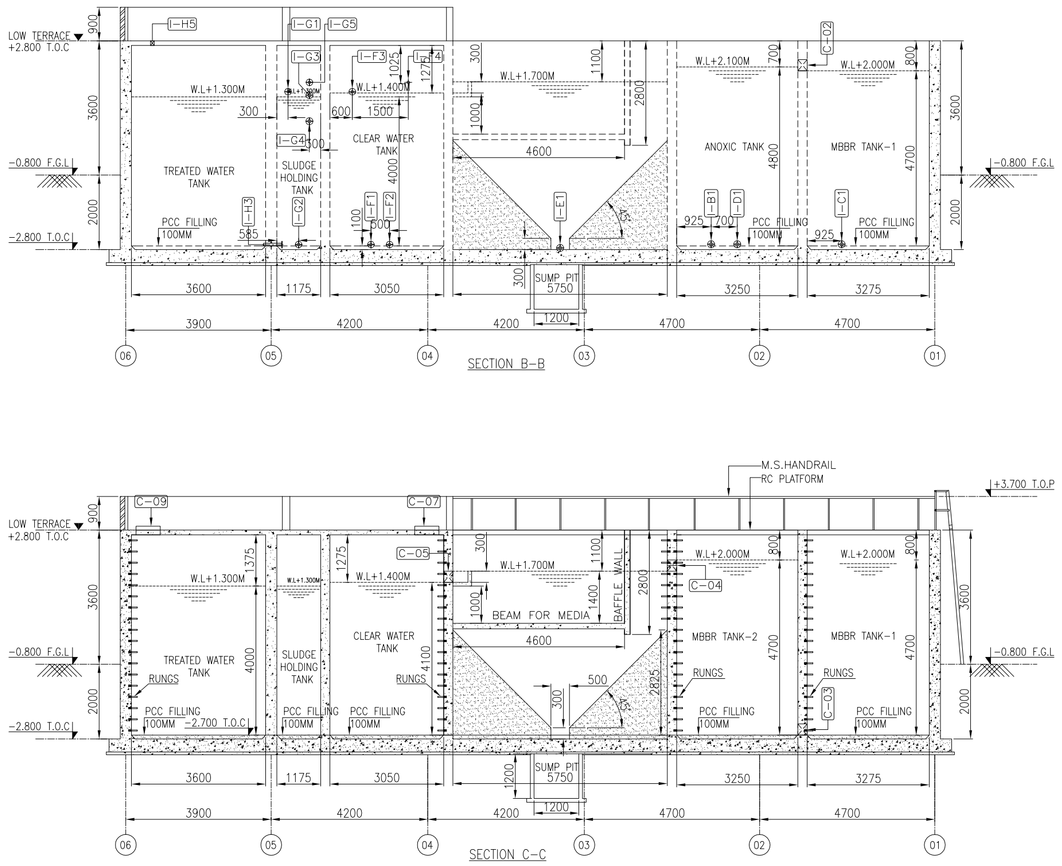




TYPICAL MANHOLE & RUNGS DETAIL

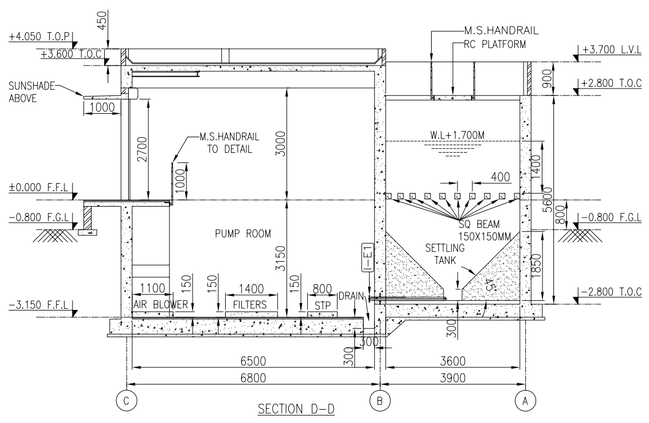


PLAN AT BOTTOM LEVEL



SECTION B-B

SECTION C-C



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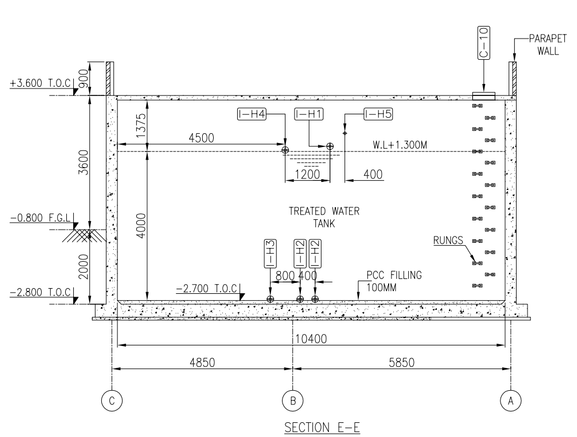

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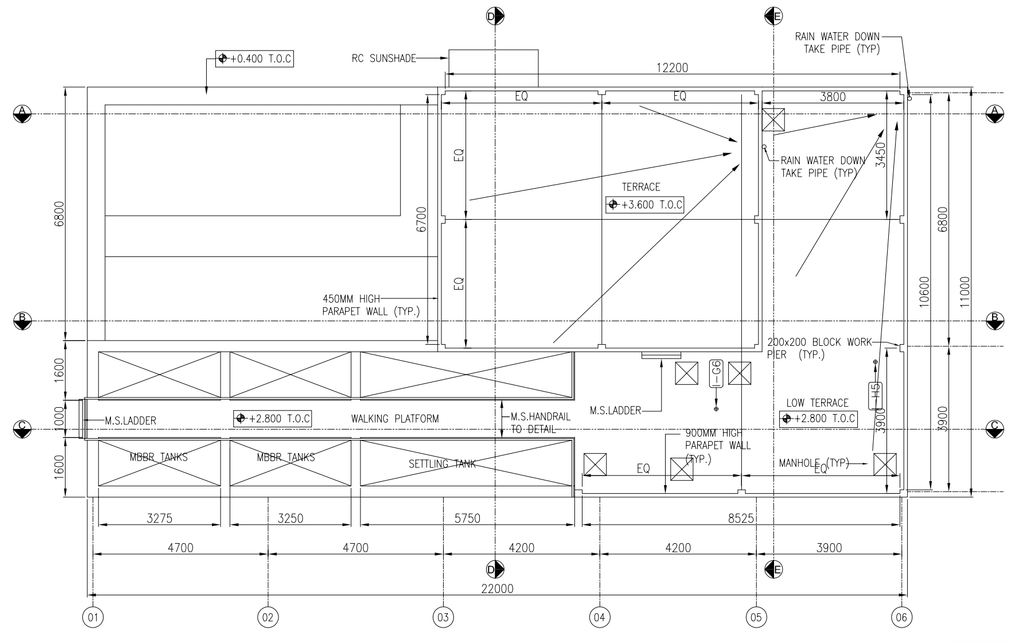


TERRACE PLAN

FOUNDATION DETAIL FOR STP

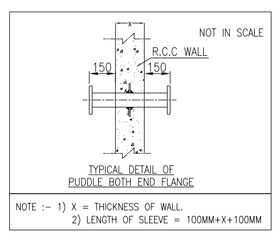
SR.NO	DESCRIPTION	LENGTH IN MM.	WIDTH IN MM.	HEIGHT IN MM.
01	AIR BLOWERS	2500	1100	150
02	FILTER FEED PUMP	1000	800	150
03	SLUDGE RE-CIRCULATION PUMP	1000	800	150
04	TREATED WATER TRANSFER PUMP	1000	800	150
05	FILTER PRESS FEED PUMP	1000	800	150
06	MGF & ACF	3100	1400	150
07	ELECTRICAL PANEL	2400	600	150
08	FILTER PRESS	1700	800	150
09	IRRIGATION PUMP	1000	800	150

CIVIL TANKS DETAIL

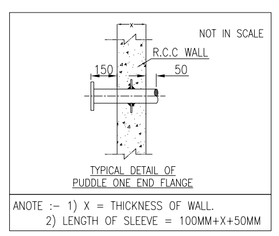
SR.NO	DESCRIPTION	SIZE IN MM (LxWxH (W.D+FREE BOARD))	VOLUME (IN CUBIC METER)	M.O.C
01	SCREEN CHAMBER	800x600X400+400	0.192M³	R.C.C
02	OIL & GREASE TRAP	1200x600x1000+850	0.720M³	R.C.C
03	EQUALIZATION TANK	8925x6325x2100	119.0M³	R.C.C
04	ANOXIC TANK	3250X800X4800+700	12.00M³	R.C.C
05	MBBR TANK-1	3275x3600x4700+800	55.00M³	R.C.C
06	MBBR TANK-2	3250x2550x4700+800	39.00M³	R.C.C
07	SETTLING TANK	5750x3600x4500+1100	93.00M³	R.C.C
08	CLEAR WATER TANK	3050x3600x4100+1275	45.00M³	R.C.C
09	SLUDGE HOLDING TANK	1175x3600x4200+1175	18.00M³	R.C.C
10	TREATED WATER TANK	10400x3600x4000+1375	150.0M³	R.C.C
11	SUMP PUMP	1200X1200X1200	1.728M³	R.C.C

GENERAL NOTES:-

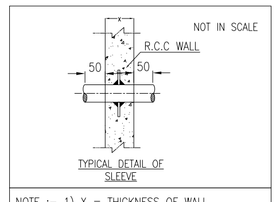
1) ALL DIMENSIONS ARE IN MM.
2) ALL DIMENSIONS ARE CLEAR DIMENSIONS AFTER PLASTER & WATER PROOFING.
3) ALL CIVIL WORK, CIVIL DESIGN, INCLUDING DRAIN TRENCHES BY CLIENT.
4) ALL INTERNAL / EXTERNAL SURFACES OF R.C.C TANKS SHALL BE PROTECTED WITH TWO COATS OF EPOXY PAINT/WATER PROOFING BY CLIENT/CIVIL CONTRACTOR.
5) B.O.T :- BOTTOM OF TANK. 8) F.F.L :- FINISH FLOOR LEVEL. 9) B.O.P. :- BOTTOM OF PIPE 10) ALL CIVIL INCLUDING RUNGS,LADDERS, HAND RAILING, CHECKERED PLATE,STRUCTURE FOR MEDIA SUPPORT, INTERNAL & EXTERNAL PAINTING etc. IS IN CLIENT'S SCOPE.
6) ALL WALL THICKNESS TO BE DECIDED BY CIVIL DESIGNER.
7) INVERT LEVEL & ALL OTHER LEVELS AS MENTIONED IN DRAWING NEED TO BE RE-CONFIRMTION FROM CLIENT/SITE IN CHARGE.
8) ALL PUDDLE FLANGES AS PER OUR DRAWING, READY BY CLIENT PRIER TO START OF CIVIL WORK.
9) ALL TANKS ARE TO BE TESTED HYDRAULICALLY PRIER TO START OF EXECUTION OF ELECTROMECHANICAL EQUIPMENTS.



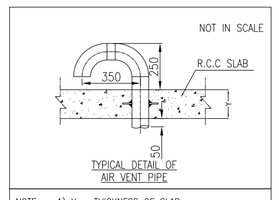
NOTE :- 1) X = THICKNESS OF WALL.
2) LENGTH OF SLEEVE = 100MM+X+100MM



ANOTE :- 1) X = THICKNESS OF WALL.
2) LENGTH OF SLEEVE = 100MM+X+50MM



NOTE :- 1) X = THICKNESS OF WALL.
2) LENGTH OF SLEEVE = 50MM+X+50MM



NOTE :- 1) Y = THICKNESS OF SLAB.
2) LENGTH OF SLEEVE = 150MM+Y+50MM

INSERTS DETAILS

A) SCREEN CHAMBER & EQUALIZATION TANK

S.NO.	DESCRIPTION	MOC	DIA(MM)	BOTTOM LVL. OF PIPE(M)	PUDDLE/SLEEVE
I-A1	SEWAGE INLET	RCC(NP2)	250	-3.000	BY CLIENT
I-A2	OGT TO EQUALIZATION	MSEP	150	-3.000	PUDDLE BOTH END FLANGE

B) ANOXIC TANK

S.NO.	DESCRIPTION	MOC	DIA(MM)	BOTTOM LVL. OF PIPE(M)	PUDDLE/SLEEVE
I-B1	ANOXIC TANK DRAIN	MSEP	80	-2.700	PUDDLE SINGLE END FLANGE

C) MBBR TANK-1

S.NO.	DESCRIPTION	MOC	DIA(MM)	BOTTOM LVL. OF PIPE(M)	PUDDLE/SLEEVE
I-C1	DRAIN FOR MBBR-1	MSEP	80	-2.700	PUDDLE SINGLE END FLANGE

D) MBBR TANK-2

S.NO.	DESCRIPTION	MOC	DIA(MM)	BOTTOM LVL. OF PIPE(M)	PUDDLE/SLEEVE
I-D1	DRAIN FOR MBBR-2	MSEP	80	-2.700	PUDDLE SINGLE END FLANGE

E) SETTLING TANK

S.NO.	DESCRIPTION	MOC	DIA(MM)	BOTTOM LVL. OF PIPE(M)	PUDDLE/SLEEVE
I-E1	OUTLET CUM DRAIN	MSEP	80	-2.800	PUDDLE SINGLE END FLANGE

F) CLEAR WATER TANK

S.NO.	DESCRIPTION	MOC	DIA(MM)	BOTTOM LVL. OF PIPE(M)	PUDDLE/SLEEVE
I-F1	OUTLET	MSEP	65	-2.700	PUDDLE SINGLE END FLANGE
I-F2	DRAIN	MSEP	65	-2.700	PUDDLE SINGLE END FLANGE
I-F3	OVER FLOW	MSEP	65	+1.400	PUDDLE SINGLE END FLANGE
I-F4	INSTRUMENT	MSEP	65	+1.650	SLEEVE

G) SLUDGE HOLDING TANK

S.NO.	DESCRIPTION	MOC	DIA(MM)	BOTTOM LVL. OF PIPE(MM)	PUDDLE/SLEEVE
I-G1	SLUDGE INLET		65	+1.400	PUDDLE SINGLE END FLANGE
I-G2	SLUDGE OUTLET CUM DRAIN		65	-2.700	PUDDLE SINGLE END FLANGE
I-G3	OVER FLOW		80	+1.300	PUDDLE SINGLE END FLANGE
I-G4	SUPERNATANT		80	+0.600	PUDDLE SINGLE END FLANGE
I-G5	INSTRUMENT		65	+1.650	SLEEVE
I-G6	AIR VENT		100	AT SHT SLAB	SLEEVE

H) TREATED WATER TANK

S.NO.	DESCRIPTION	MOC	DIA(MM)	BOTTOM LVL. OF PIPE(M)	PUDDLE/SLEEVE
I-H1	TANK INLET	MSEP	65	+1.400	PUDDLE SINGLE END FLANGE
I-H2	TANK OUTLET (2 NOS.)	MSEP	65	-2.700	PUDDLE SINGLE END FLANGE
I-H3	DRAIN	MSEP	65	-2.700	PUDDLE SINGLE END FLANGE
I-H4	OVER FLOW	MSEP	65	+1.300	PUDDLE SINGLE END FLANGE
I-H5	INSTRUMENT	MSEP	65	+1.750	SLEEVE
I-H6	AIR VENT FOR TREATED WATER TANK	MSEP	100	AT TANK SLAB	SLEEVE

I-I1	IWS PIPE	MSEP	75	-1.600	SLEEVE
I-I2	DWS PIPE	MSEP	75	-1.500	SLEEVE
I-I3	DEWATERING PIPE	MSEP	75	-3.000	SLEEVE

CUTOUT DETAILS

SCREEN CHAMBERS, EQUALIZATION TANK, CWT, SHT,& TWT

S.NO.	DESCRIPTION	SIZE(MM)	BOTTOM LVL. OF CUTOUT)	TYPE
C-01	SEWAGE FROM BAR SCREEN TO OGT	300X300	-2.950	SQUARE
C-02	CUTOUT FOR ANOXIC TANK TO MBBR TANK-1	300X300	+2.000	SQUARE
C-03	CUTOUT FOR MBBR TANK-1 TO MBBR TANK-2	300X300	-2.700	SQUARE
C-04	CUTOUT FOR MBBR TANK-2 TO SETTLING TANK	300X300	+1.700	SQUARE
C-05	CUTOUT FOR SETTLING TANK TO CLEAR WATER TANK	300X300	+1.400	SQUARE
C-06	CUTOUT FOR MANHOLE CLEAR WATER TANK SLAB	600X600	AT TANK SLAB	SQUARE
C-07	CUTOUT FOR MANHOLE CLEAR WATER TANK SLAB	600X600	AT TANK SLAB	SQUARE
C-08	CUTOUT FOR MANHOLE SHT TANK SLAB	600X600	AT TANK SLAB	SQUARE
C-09	CUTOUT FOR MANHOLE TREATED WATER TANK SLAB	600X600	AT TANK SLAB	SQUARE
C-10	CUTOUT FOR MANHOLE TREATED WATER TANK SLAB	600X600	AT TANK SLAB	SQUARE

AS BUILT

ISSUE		DATE	DRN BY	APP BY
00	ISSUED FOR APPROVAL	20.06.20	DK	S.P.SINGH
	MODIFICATION			

CLIENT:- LARSEN & TOUBRO LIMITED (L&T) MEP SEGMENT-B&FIC

CONSULTANT:- CONVENIENT CONSTRUCTION & CONSULTANCY PVT. LTD.

CONTRACTOR:- ENHANCED WAPP SYSTEMS (I) PVT. LTD.
914-B 9 FLOOR BPTP PARK CENTRA,SEC 30, GURGAON.
TEL:- 0124-6710900-98, FAX :- 0124-6710099

PROJECT:- 235 KLD STP (MBBR BASED-PURULIA)

SIZE	SCALE	DIMN.	TITLE:-
A1	1:115	MM	(AS BUILT) INSERT & CUTOUT DETAIL

DRN. BY	CHD. BY	APP. BY	DATE	DRG NO.
DK	DINESH	S.P.SINGH	20.06.20	REV. NO. 0

GENERAL NOTES:-

1. SYSTEM VOLTAGE:-
   415V AC TPN,50HZ (VARIATION IN VOLTAGE ±10% & FREQUENCY ±5%) SOLIDELY GROUNDED NEUTRAL.

2. THE PANEL BOARD SHALL BE CUBICAL DESIGN, FREE STANDING,FLOOR MOUNTING, NON COMPARTMENTALISED, SINGLE FRONT EXECUTION, DUST AND VERMIN PROOF, WITH DEGREE OF PROTECTION-IP42.

3. THE PANEL BOARD SHALL BE FABRICATED OUT OF C.R.C.A SHEET HAVING THICKNESS OF:-
   (a) LOAD BEARING MEMBERS :- 2MM
   (b) DOOR & NON LOAD BEARING MEMBERS :- 1.6MM
   (c) GLAND PLATE :-3MM
   (d) BOTTOM FRAME :-75X40X3MM

4. THE PANEL SHALL BE PAINTED WITH ELECTRO STATIC POWDER COATING PAINT WITH MIN. 7 TANK PROCESS AS PER FOLLOWING COLOUR SCHEME :-
   A. DOOR / COVERS & SIDES :- SIEMENS GRAY RAL-7035
   B. MOUNTING PLATE :- ORANGE
   B. BASE FRAME :- BLACK

5. ALL CONTROL WIRING SHALL BE DONE AS UNDER:-
   VOLTAGE CIRCUIT :- 1.5 SQ. MM 1100 VOLTS GRADE CU. WIRE.
   CURRENT CIRCUIT :- 2.5 SQ. MM 1100 VOLTS GRADE CU. WIRE
   POWER CIRCUIT :- MIN. 4.0 SQ. MM 1100 VOLTS GRADE CU. WIRE AND SUITABLE HIGHER SIZE AS PER LOAD REQUIREMENT.
   EARTH WIRE : 2.5 SQ.MM CU. WIRE GREEN WITH YELLOW STRIP

6. CABLE ENTRY WILL BE FROM TOP / BOTTOM
7. THE CONTROL VOLTAGE WILL BE 230 V AC .
8. ALL BUS BAR SUPPORTS SHALL BE OF SMC/DMC CAST AND PROVIDED AT SUITABLE INTERVAL.
9. THE MINIMUM CLERANCE IN MAIN BUS BAR (HORIZONTAL/ VERTICAL) SHALL BE AS FOLLOWS:
   (a) BETWEEN PHASE TO PHASE :- 32 MM
   (b) BETWEEN PHASE TO NEUTRAL :- 26 MM
   (c) BETWEEN PHASE TO EARTH :- 26 MM
   (d) BETWEEN NEUTRAL TO EARTH :- 26 MM
10. BUS BAR CURRENT DENSITY SHALL BE 1.0 AMP/MM²
11. ALL DOORS SHALL BE EARTHED WITH 4.0 Sqmm. OF BRAIDED COPPER WIRE.
12. EACH FEEDER SHALL BE PROVIDED WITH INDIVIDUAL INSCRIPTION PLATE MADE OUT OF AL. BLACK ANODIZED SHEETWITH ENGRAVED LETTERS.
13. SHROUDING SHALL BE DONE WITH (FR-2) & POLYCARBONATE MATERIAL.
14. ALL MCBs SHALL BE OF TYPE -C CURVE.

AS BUILT

REV NO.	DATE.	REVISION

PROJECT:-
235 KLD STP (MBBR BASED-PURULIA)

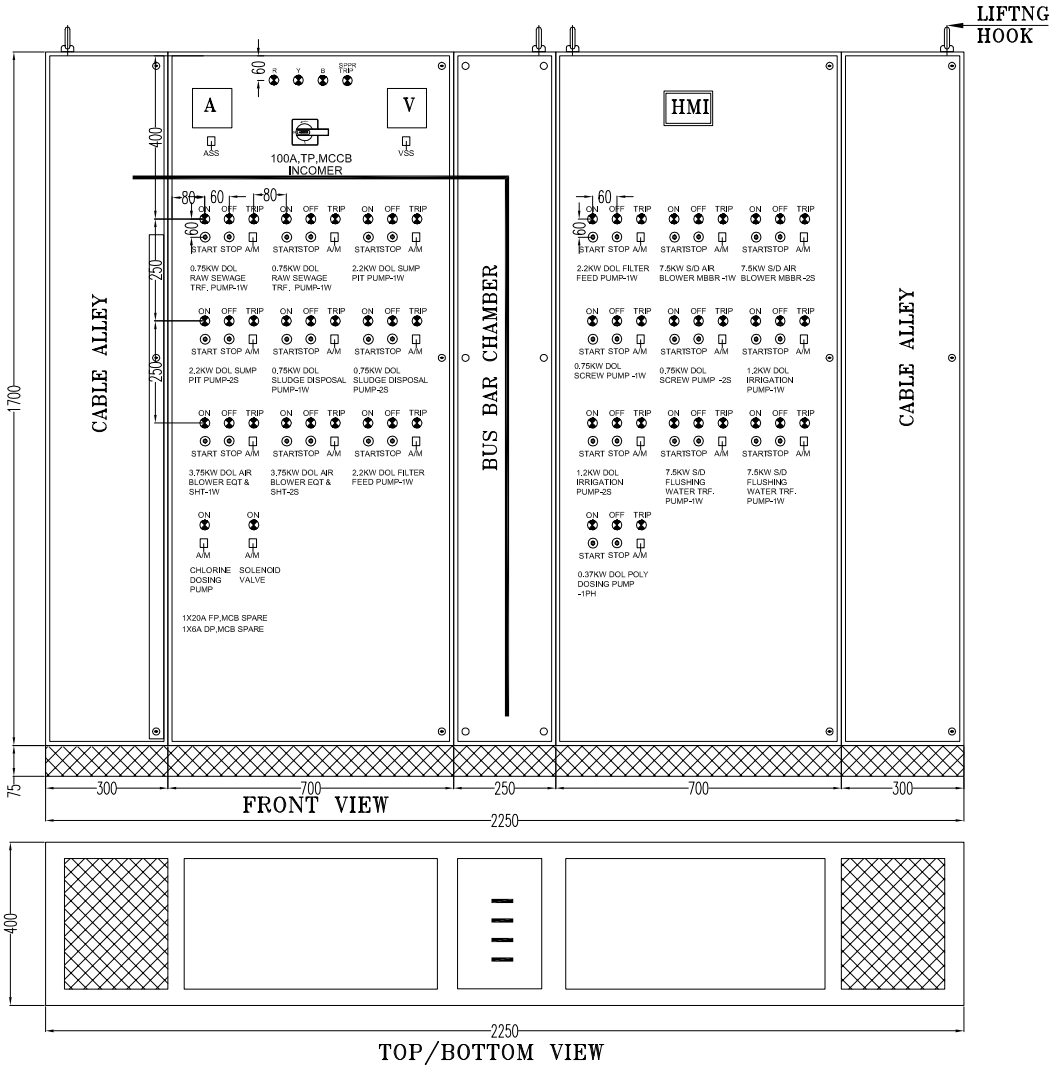
CLIENT:-
LARSEN & TOUBRO LIMITED (L&T)
MEP SEGMENT-B&FIC

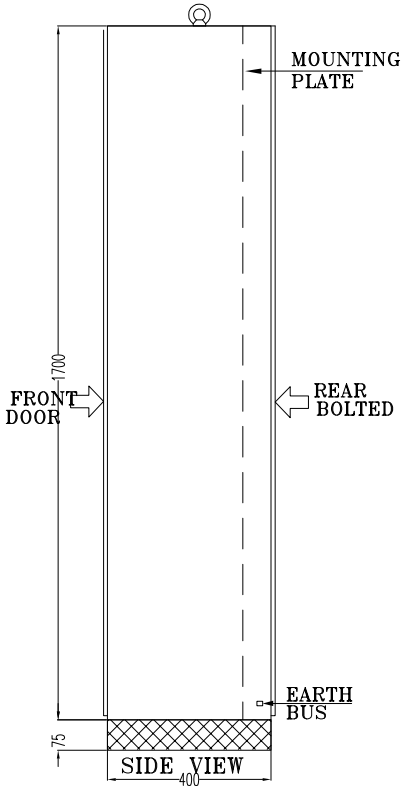
CONSULTANT:-
CONVENIENT CONSTRUCTION & CONSULTANCY PVT. LTD.

ENHANCED WAPP SYSTEMS (I) PVT. LTD.
914-B 9 FLOOR BPTP PARK CENTRA,SEC 30, GURGAON
TEL:- 0124-6710000-98, FAX :- 0124-6710999

TITLE:-
GENERAL NOTES

DRN. R.K	APR.	DRAWING NO.
DATE. 20/06/20	SIGN:	------
SCALE . N.T.S.	SHEET 1 OF 1	REV.-R0





MAIN BUS BAR SIZE–100A TPN AL.
PHASE –1x25x6mm AL.
NEU. –1x25x6mm AL.
EARTH BUS–1x20x6mm AL.

AS BUILT

REV NO.	DATE.	REVISION

PROJECT:–
235 KLD STP (MBBR BASED–PURULIA)

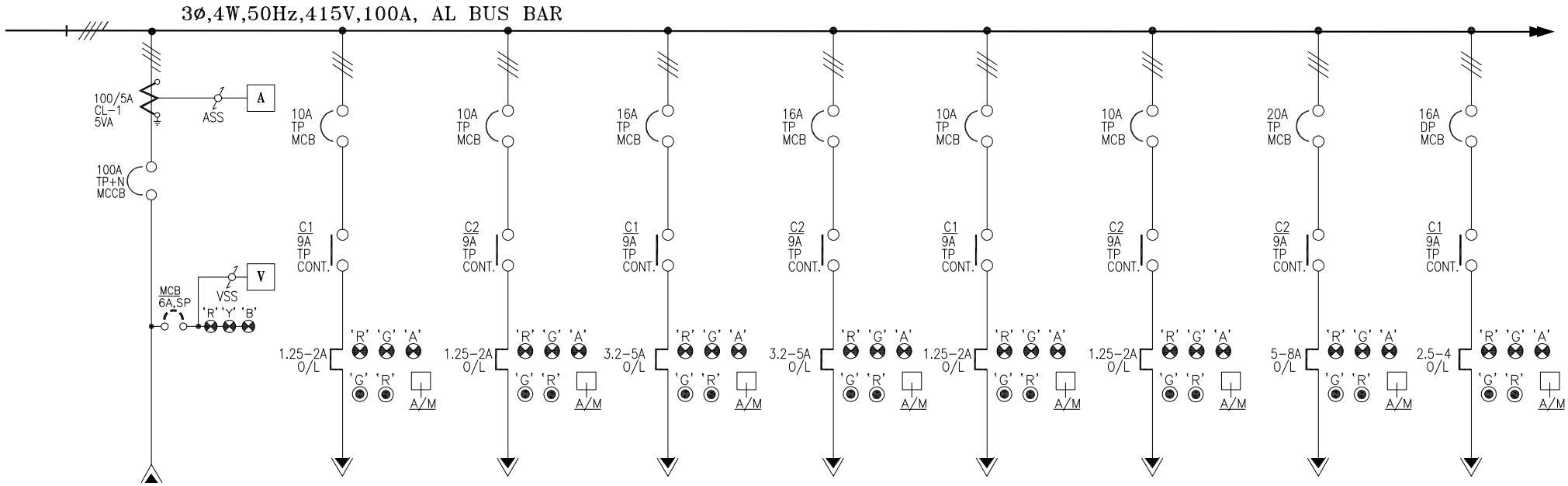
CLIENT:–
LARSEN & TOUBRO LIMITED (L&T)
MEP SEGMENT–B&FIC

CONSULTANT:–
CONVENIENT CONSTRUCTION & CONSULTANCY PVT. LTD.

ENHANCED WAPP SYSTEMS (I) PVT. LTD.
914-B 9 FLOOR BPTP PARK CENTRA,SEC 30, GURGAON
TEL:- 0124-6710000-98, FAX :- 0124-6710999

TITLE:–
GA DRAWING OF STP PANEL

DRN. R.K	APR.	DRAWING NO.
DATE. 20/06/20	SIGN:	-------
SCALE . N.T.S.	SHEET 1 OF 1	REV.–R0



FEEDER No.									
FEEDER RATING	100A TP+N MCCB	0.75KW DOL	0.75KW DOL	2.25KW DOL	2.25KW DOL	0.75KW DOL	0.75KW DOL	3.7KW DOL	0.37KW DOL
FEEDER DESCRIPTION	INCOMER --	RAW WATER SEWAGE TRF. PUMP-1W	RAW WATER SEWAGE TRF. PUMP-2S	SUMP PIT PUMP-1W	SUMP PIT PUMP-2S	SLUDGE DISPOSAL PUMP-1W	SLUDGE DISPOSAL PUMP-2S	AIR BLOWER EQT & SHT-1W	POLY DOSING
CABLE SIZE IN mm2	**	3CX4mmsq Al Ar.Cable	3CX4mmsq Al Ar.Cable	3CX4mmsq Al Ar.Cable	3CX4mmsq Al Ar.Cable	3CX4mmsq Al Ar.Cable	3CX4mmsq Al Ar.Cable	3CX4mmsq Al Ar.Cable	3CX4mmsq Al Ar.Cable
SCHEME DRG MODULE	M1	M2	M3	M6	M7	M2	M3	M2	M21

AS BUILT

REV NO.	DATE.	REVISION

PROJECT:-
235 KLD STP (MBBR BASED-PURULIA)

CLIENT:-
LARSEN & TOUBRO LIMITED (L&T)
MEP SEGMENT-B&FIC

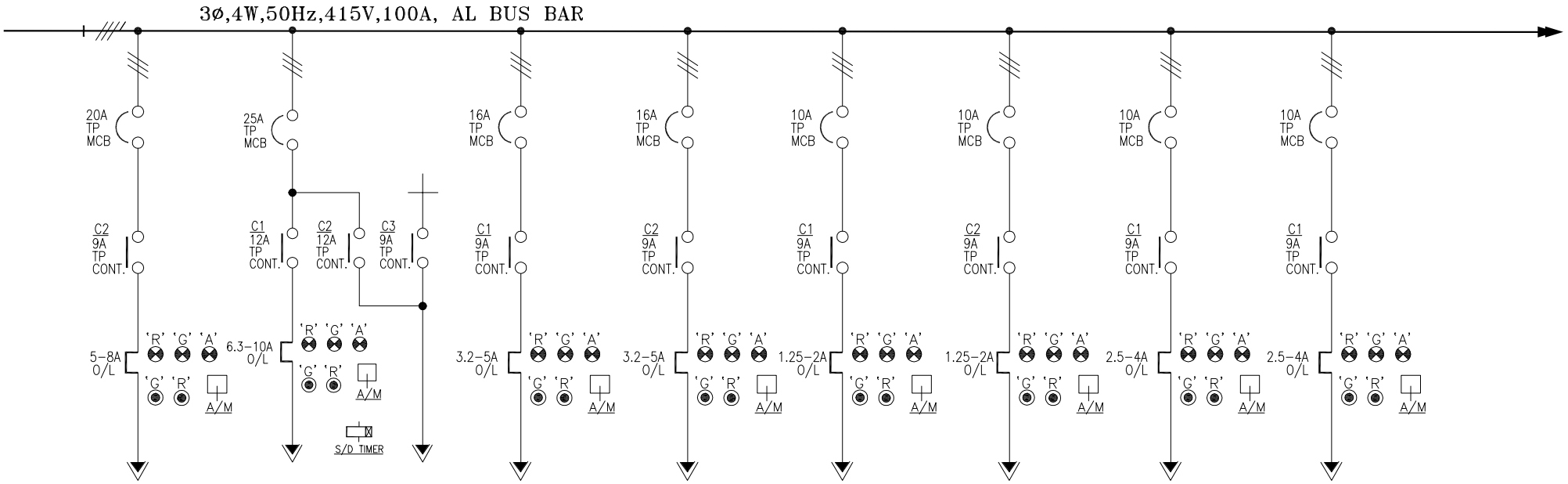
CONSULTANT:-
CONVENIENT CONSTRUCTION & CONSULTANCY PVT. LTD.

ENHANCED WAPP SYSTEMS (I) PVT. LTD.
914-B 9 FLOOR BPTP PARK CENTRA,SEC 30, GURGAON
TEL:- 0124-6710000-98, FAX :- 0124-6710999

TITLE:-

SINGLE LINE DRAWING OF STP PANEL

DRN. R.K	APR.	DRAWING NO.	
DATE. 20/06/20	SIGN:	------	
SCALE . N.T.S.	SHEET 1 OF 3	REV.-R0	



FEEDER No.	**	**						
FEEDER RATING	3.7KW DOL	7.5KW S/D	2.25KW DOL	2.25KW DOL	0.75KW DOL	0.75KW DOL	1.2KW DOL	1.2KW DOL
FEEDER DESCRIPTION	AIR BLOWER EQT & SHT-2S	AIR BLOWER MBBR-1W	FILTER FEED PUMP-1W	FILTER FEED PUMP-2S	SCREW PUMP-1W	SCREW PUMP-2S	IRRIGATION PUMP-1W	IRRIGATION PUMP-2S
CABLE SIZE IN mm2	3CX4mmsq Al Ar.Cable	2x(3CX10mmsq Al Ar. Cable)	3CX4mmsq Al Ar.Cable	3CX4mmsq Al Ar.Cable	3CX4mmsq Al Ar.Cable	3CX4mmsq Al Ar.Cable	3CX4mmsq Al Ar.Cable	3CX4mmsq Al Ar.Cable
SCHEME DRG MODULE	M2	M4	M6	M7	M2	M3	M2	M2

AS BUILT

REV NO.	DATE.	REVISION

PROJECT:-
235 KLD STP (MBBR BASED-PURULIA)

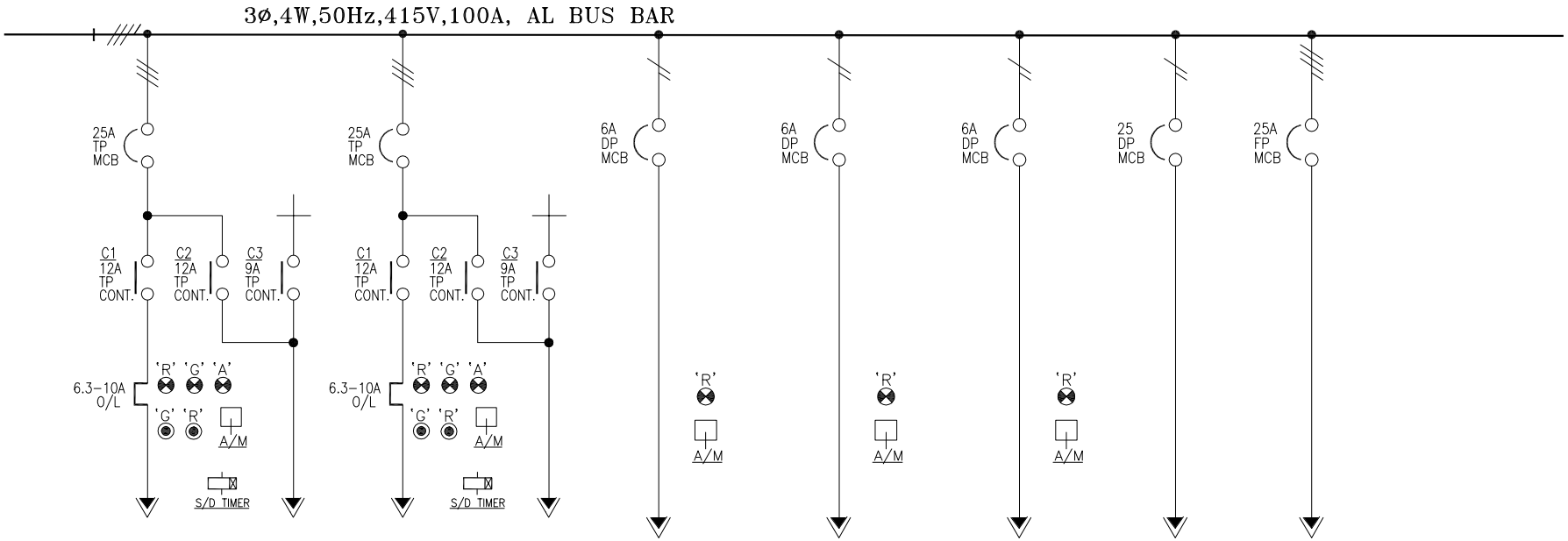
CLIENT:-
LARSEN & TOUBRO LIMITED (L&T)
MEP SEGMENT-B&FIC

CONSULTANT:-
CONVENIENT CONSTRUCTION & CONSULTANCY PVT. LTD.

ENHANCED WAPP SYSTEMS (I) PVT. LTD.
914-B 9 FLOOR BPTP PARK CENTRA,SEC 30, GURGAON
TEL:- 0124-6710000-98, FAX :- 0124-6710999

TITLE:-
SINGLE LINE DRAWING OF STP PANEL

DRN. R.K	APR.	DRAWING NO.
DATE. 20/06/20	SIGN:	-------
SCALE . N.T.S.	SHEET 2 OF 3	REV.-R0



FEEDER No.	**	**					
FEEDER RATING	7.5KW S/D	7.5KW S/D	0.1KW	0.1KW	0.1KW	25,DP MCB	25A,FP MCB
FEEDER DESCRIPTION	FLUSHING WATER TRF PUMP-1W	FLUSHING WATER TRF PUMP-2S	CHLORINE DOSING	CHLORINE DOSING	FLOW METER	SPAER	SPARE
CABLE SIZE IN mm2	2x(3CX10mmsq Al Ar. Cable)	2x(3CX10mmsq Al Ar. Cable)					
SCHEME DRG MODULE	M4	M5	M17	M17	M17	M18	M25

AS BUILT

REV NO.	DATE.	REVISION

PROJECT:-
235 KLD STP (MBBR BASED-PURULIA)

CLIENT:-
LARSEN & TOUBRO LIMITED (L&T)
MEP SEGMENT-B&FIC

CONSULTANT:-
CONVENIENT CONSTRUCTION & CONSULTANCY PVT. LTD.

ENHANCED WAPP SYSTEMS (I) PVT. LTD.
914-B 9 FLOOR BPTP PARK CENTRA,SEC 30, GURGAON
TEL:- 0124-6710000-98, FAX :- 0124-6710999

TITLE:-
SINGLE LINE DRAWING OF STP PANEL

DRN. R.K	APR.	DRAWING NO.
DATE. 20/06/20	SIGN:	------
SCALE . N.T.S.	SHEET 3 OF 3	REV.-R0

LEGENDS

SR.NO	SYMBOLS	DESCRIPTION
01		AIR BLOWER
02		SUBMERSIBLE PUMP
03		BUTTERFLY VALVE
04		NON RETURN VALVE
05		SCREW PUMP
06		SOLENOID VALVE
07		BALL VALVE
08		Y STRAINER
09		ROTAMETER
10	PI	PRESSURE INDICATOR
11	SP	SAMPLING VALVE
12		DIFFUSER
13		REDUCER
14		MBBR MEDIA

S.No.	DESCRIPTION	SPECIFICATION	QTY.
1	SCREEN	SIZE- 600X800mm	2 NOS.
2	REACTOR FEED PUMP	CAPACITY- 12m³/hr@9.5m HEAD	2(1W+1S)
3	FILTER FEED PUMP	CAPACITY- 12.0m³/hr@30m HEAD	2(1W+1S)
4	SLUDGE RECIRCULATION PUMP	CAPACITY- 10m³/hr@12m HEAD	2(1W+1S)
5	AIR BLOWER FOR EQT & SHT	CAPACITY- 150m³/hr@ 5000mmwc	1(1W)
6	AIR BLOWER FOR MBBR TANK	CAPACITY- 230m³/hr@ 5500mmwc	2(1W+1S)
7	SCREW PUMP	CAPACITY- 1m³/hr@35m HEAD	2(1W+1S)
8	MULTI GRADE FILTER	DIA:-1200 X 1800 HOS..	1 NO.
9	ACTIVATED CARBON FILTER	DIA:-1200 X 1800 HOS..	1 NO.
10	FILTER PRESS	18"x18"x23 NOS PLATE	1 NO.
11	POLY DOSING SYSTEM	CAPACITY:- 0-30 LPH	1 NO.
12	CHLORINE DOSING SYSTEM	CAPACITY:- 0-6 LPH	2 NOS.
13	SUMP PUMP	CAPACITY- 15.0m³/hr@22m HEAD	2(1W+1S)
14	IRRIGATION WATER TRANSFER PUMP	CAPACITY- 4.5m³/hr@30m HEAD	2(1W+1S)
15	TREATED WATER TRANSFER PUMP	CAPACITY- 8.0m³/hr@54m HEAD	2(1W+1S)

LEGENDS

	SEWAGE LINE
	WATER LINE
	AIR LINE
	DOSING LINE
	SLUDGE LINE

NOTE:- SLUDGE DISPOSAL BY CLIENT SCOPE

AS BUILT

ISSUE	MODIFICATION	DATE	DRN. BY	APP.BY
R2	AS BUILT	20.06.20	DK	DINESH
R1	ISSUED FOR APPROVAL	08.10.18	DK	NEHA
R0	ISSUED FOR APPROVAL	16.08.18	ASHU	NEHA

CLIENT:- LARSEN & TOUBRO LIMITED (L&T) MEP SEGMENT-B&FIC

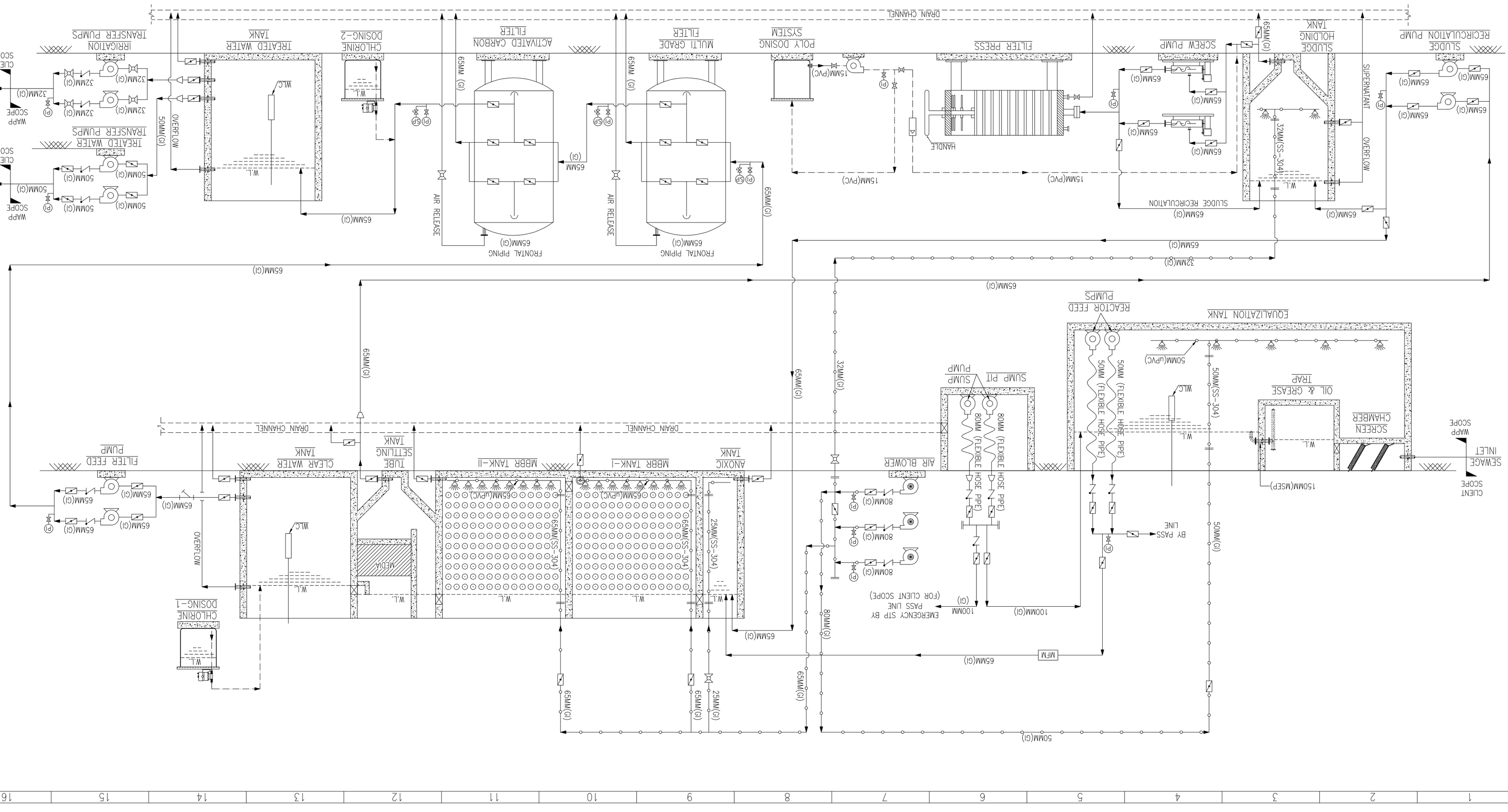
CONSULTANT:-

CONTRACTOR:- ENHANCED WAPP SYSTEGI (I) PVT. LTD.
914-B 9 FLOOR BPTP PARK CENTRA,SEC 30, GURGAON.
TEL:- 0124-6710900-98, FAX :- 0124-6710099

PROJECT:- 235KLD STP (MBBR BASED) (PURULIA)

SIZE	SCALE	DIMN.	TITLE:- (AS BUILT)	SHEET
A2	N.T.S.	MM	PROCESS & INSTRUMENT DIAGRAM (P&ID)	01

DRN. BY	CHD. BY	APP.BY	DATE	DRG NO.	REV.
ASHU	NEHA	RAJESH	16.08.2018	–	R0



SECTION–IV
FORM-2911

Issued to (Bidder): ……
Postal Address with Contact No. & e-mail ……..

Price – Free of Cost

West Bengal Form No. 2911
Applicable For Works of value up to Rs 25 (Twenty Five) Crore

Tender No. WBMSCL/NIQ-114/2021 Date- 10.05.2021

TENDER AND CONTRACT FOR WORKS
GENERAL RULES AND DIRECTIONS FOR GUIDANCE OF BIDDERS/CONTRACTORS

(A) Applicable for off-line tenders up to Tender Value of Rs. 5.0lakh

1. All work proposed for execution by contract will be notified in the form of invitation to tender posted in concerned departmental website, e-procurement portal of the Government of West Bengal (https://wbtenders.gov.in) and to be published in local news paper for wide circulation also in the notice boards at public places signed by the Tender Inviting Authority.

This form will state the work to be carried out, the date for submitting and opening of tenders as well as the time allowed for carrying out the work; also the amount of earnest money to be deposited with the tender, the amount of security deposit to be deposited by the successful bidder and the percentage, if any, to be deducted from bills. Copies of the specification, design & drawings and other documents required in connection with the work, signed for the purpose of identification by the Authority inviting Tender shall also be open for inspection by the contractor at the office of the Tender Inviting Authority 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 absence of any of the partners, it must be signed on his/her behalf by a person holding a Power-of-Attorney authorizing him/her to do so. Such power-of-attorney is to be produced with the tender, and in the case of a firm carried on by one member of a joint family; it must disclose that the firm is duly registered under the Indian Partnership Act.

3. Acceptance of measurements entered and bills raised on account of a work, when executed by a firm, must also be signed by the several partners, except where the contractors are described in their tender as a firm in which case the receipts must be signed in the name of the firm by one of the partners or by some other person having authority to give effectual receipt for the firm.

4. Any person who submits a tender shall fill up the usual printed form, stating at what rate he or she is willing to undertake the work. Tenders which propose any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other conditions of any sort, will be liable to rejection. No single tender shall include more than one work, but contractors who wish to tender for two or more works shall submit a separate tender for each. Tenders shall have the name and number of the work to which they refer, written outside the sealed envelopes.

5. The Tender Inviting Authority or his/her duly authorized representative will open tenders in presence of intending contractors/bidders who may be present at the time,and

will enter the bid amounts as percentage rates above or below or at par of the tender BOQ of several tenders in a comparative statement in a suitable form. In the event of a tender being accepted, a receipt shall thereupon be given to the contractor/bidder who shall thereupon for the purpose of identification, sign copies of specifications and other documents mentioned in the Rules. In the event of a tender being rejected, the earnest money with such unaccepted tender shall be refunded within 10 days from the date on which the tender is decided, provided the contractor(s) present himself/herself before the Tender Inviting Authority to take the earnest moneyrefund.

6. The accepting authority reserves the right to reject any or all of the tenders without assigning any reasons to the participating bidders and he/she will not be bound to accept eitherthelowesttenderoranyoftheothertenders.

7. Receipt of an accountant or clerk for any money paid by the contractor/bidder will not be considered as an acknowledgement of payment to the Tender Inviting Authority and the contractor shall be responsible for ensuring that he/she procures a receipt signed by the Tender Inviting Authority, or a duly authorizedrepresentative.

8. The Memorandum of work tendered for, and the schedule of materials to be supplied by the executing Department at their supply/issue rates, shall be filled in and completed in the office of the Tender Inviting Authority before the tender form is issued. If a form is issued to an intending bidder/contractor without having been so filled in and completed, he/she shall request the office to have this done before he/she completes and delivers his/hertender.

(B) Applicable for e-tenders of value above Rs. 5.0Lakh

1. All works of tender value above Rs. 5.00 lakh proposed for execution through this contract document are to be notified and published in the form of notice inviting e-tender (e-NIT) in the designated official tender website of Government of West Bengal having URL https://wbtenders.gov.in, and uploaded simultaneously in the URL of concerned Department inviting Tenders. Thus the tender may be seen and downloaded by logging into the"e-procurement"linkprovidedtherein,digitally signedbytheconcernedTenderInviting Authority and its corresponding abridged notice also published on the same date in the printmedia.

2. This e-Notice Inviting Tender (e-NIT) will state the work to be carriedout, the date for encrypting (submitting) and decrypting (opening) of e-tenders, the time allowedfor carrying out the work; amount of earnest moneyto be deposited with the e-tender; procedure for submission of EMD, amount of security to be furnished by the successful bidder/contractor, security/ performance securityto be deducted from running account bills, copies of specifications, Bill ofQuantities, design and drawings and any other document required in connection with the work, digitally signed for the purposeof identification by the Tender InvitingAuthority.

3. Intending contractors/bidders are required to download the e-tender documents directly from the website stated above. Tender is required to be submitted online by the intending bidders by authorized e-Tokens provided as DSC. This is the only mode of e-submission of tender and document(s). All information posted in the website consisting of e-NIT, WB Form No. 2911, Tender Bill of Quantities (BOQ), corrigenda notices and drawings etc., if any, shall form part of the Contract. Details of procedure of submission have been explained under "General Terms & Conditions" and Annexure attached with the notice of e-tender(e-NIT).

4. All the documents uploaded by the Tender Inviting Authority forms an integral part of the tender contract/agreement. Contractors/bidders are required to upload the entire set of tender documents along with other related documents as asked for in the e-tender through the above website(s) within the stipulated date and time as given in the e-NIT. Tenders are to be submitted in two folders at a time for each work, one being the 'Technical Bid' and the other 'Financial Bid'. The contractor/ bidder shall carefully go through all the documents and prepare to upload the scanned documents in Portable Document Format (PDF) in the designated link in the web portal as their Technical Bid. He/she needs to fill up the rates of items/percentage in the BOQ downloaded for the work in the designated cell and upload the same again in the designated link in the portal as their Financial Bid. Documents uploaded are virus scanned and digitally signed using the Digital Signature Certificate (DSC). Contractors/bidders should especially take note ofall

the addenda and corrigenda related to the e-tender and upload all of these documents alsoasapartoftheirtenderdocument.

5. Documents uploaded by the contractors/bidders with all information & rates comprising Technical and Financial bids cannot be changed after last/end date for submission of thee-tender.

6. Deed of Consortium/Partnership Firm, and documents of their registration in the form of certified copy of 'Form No. VIII,' issued under the Indian Partnership Act, 1932 (Act-IX of 1932), GST, & PAN (Permanent Account Number) as per RBI guidelines/above Rs. 50,000/- may be compulsorily furnished for all contracts and all other statutory clearances defined in thee-NIT.

7. The tender evaluation and accepting authorities reserve the right to reject any or all of the tenders without assigning any reasons and he/she will not be bound to accept either the lowest tender or any of thetenders.

8. Withdrawal of e-Tender once the bid has been submitted online and after passing of end date for submission which has been accepted for further processing is not allowed. EMD will be forfeited by the Government and the bidder/contractor penalized in terms of provisions in the notice of thetender.

9. Generally Bids will be valid for 120 days from the date of opening of the financial proposal. However, extension of bid validity may be suitably considered by the Tender Inviting Authority, if required, subject to obtaining a written confirmation of the contractor/bidder(s) to thateffect.

TENDER FOR WORKS

I/We on behalf of the Governor hereby tender for the execution of the work specified in the underwritten "Memorandum" within the time specified in such " Memorandum" at the rates specified therein, and in accordance, in all respects within the Rules contained in clauses hereinafter, in all of the annexed Ge ne r al C onditions of Contract (GCC), Special C onditions of Contract (SCC) and with such other materials as are provided for, by and in all other respects in accordance and with such conditions so far asapplicable.

MEMORANDUM

(a) General description of work.....

(a) If several sub-works are included, they should be detailed in a separatelist

(b) Estimated cost puttoTender ... Rs

(c) Earnest MoneyDeposit ... Rs.

(d) Security Deposit (includingearnestmoney) .....Rs

(e) Percentage, if any, to be deductedfrombill..... Rs .....
(Rupees.....
Percentage.....)

(f) Time allowed for the work from date of written order to Commence .....calendarmonths.

For offline tender during submission of bid and during execution of Agreement for online tender

Name of Work Tendered	Amount Put to Tender	Rate Quoted by the Bidder (% above or less or at par)	Tendered Amount (Contract Price both in words & figures)

Should this Tender be accepted, I/we hereby agree to abide by and fulfill all of the terms and provisions of the said conditions of contract annexed hereto so far as applicable, or in default thereof to forfeit and pay to the Governor or his/ her successions in office, the sums of money mentioned in the saidconditions.

**Give particulars and numbers*

Strikeout (a) or (b) as applicable.

A sum of Rs ..... * has been furnished through online net banking/RTGS/NEFT transfer as earnest money deposit [(a) the full value of which is to be absolutely forfeited to the Governor or his/her successors in office, without prejudice to any other rights or remedies of the said Governor or his successors in office. Should I/we not deposit the full amount of security specified in the above 'Memorandum' in accordance with clause I(A) of the said conditions of contract, the said sum of Rs ..... shall be retained by the Government as on account of such security as aforesaid:(b) the full value of which shall be retained by Government on account of the security deposit specified in clause I (B) of the said conditions of contract].

T Signature of Contractor before submission of tender

Datedthe Dayof 20

T

X Signature of Witness to Contractor's signature

X
(Witness)
Address
Occupation

XX Signature of the Executive Engineer/AE on behalf of the Department.

The above tender is here by accepted by me for and on behalf of the Governor of the State of westBengal

XX

Datedthe_____Dayof_____(Month)_____(Year)

GENERAL CONDITIONS OF CONTRACT

Clause 1 1.1 Earnest Money - The person/persons who intend to participate in the Tender for an Estimated Amount up to Rs. 25 (Twenty Five) Crore shall have to deposit Earnest Money @ 2% (Two percent) of the Estimated Amount put to Tender or Rs 10 Lakh, whichever is lower.

In case of offline tender earnest money is to be submitted in the form of Bank Draft or BankersCheque.

In case of Online Tender (e-Tender) earnest money is to be deposited through e-tender portal (https://wbtenders.gov.in**)** by selecting from either of the following payment modes:

i) Net banking (any of the banks listed in the ICICI Bank Payment gateway) in case of payment through ICICI Bank PaymentGateway.
ii) RTGS/NEFT in case of offline payment through bank account in any Bank with his/her tender/quotation as per Memorandum No. 3975-F(Y) dated: - 28.07.2016 of Secretary to the Government of West Bengal, Finance Department. The L1 bidder shall make the Formal Agreement after getting the Letter of Acceptance (LOA) issued by the Tender Accepting Authority. Failure to make the Formal Agreement within the time period as prescribed in the Letter of Acceptance (LOA) for the purpose, may be construed as an attempt to disturb the tendering process and will be dealt with accordinglyinalegalmannerasdeemedfitincludingblacklistingthebidder.

1.2 Security Deposit - While making any payment to the person(s) whose tender has been accepted (hereinafter shall be called the contractor) for work done under the contract, the authority making payment shall deduct such sum which together with the Earnest Money already deposited and converted into security deposit, shall amount to 10% of the value of works executed at the material point of time and paid during the progressive running accounts bills, so that total deductiontogether with

Earnest Money constitute 10% of the tendered value of work actually done.

In case of excess/and supplementary work over the tendered amount, additional security @ of 10% of such additional amount is to be deposited for all such excess/ and supplementaryworksbeyondthetenderedamountbeforepaymentoffinalbill.

Compensation of all other sums of money payable by the contractor to the Government under the terms of the contract may be deducted from the security deposit.

However, even though the earnest money deposited exceeds the prescribed percentage, due to reduction of tendered amount due to any reason whatsoever, such additional earnest money shall be deemed to have been converted into security and further deductions from progressive bills shall be made, taking into consideration the enhanced component of earnest money so converted into security.

Security deduction will not normally be required for hiring of inspection vehicles and boats etc., supply of tools & plants, furniture and computer peripherals. Separate agreement may be required in those cases, particularly for consultancy and RFP for EPC, whichshallbemadeinstandardformatstobeapprovedbytheGovernment.

After completion of the work, the Contractor may opt for refund of the Security Deposit by replacing equal amount of Bank Guarantee of scheduled Bank valid up to 3 months beyond the defect liability period.

Additional Performance Security @ 10% of the tendered amount in the form of Bank Guarantee from a Scheduled Bank, valid up to the date of completion of work, shall be obtained from the successful bidder, if the accepted bid value is 80% or less than the estimated amount put to tender.

If the bidder fails to submitAdditional Performance Security within 7 (seven) working days from the dateof LoA or the time period as approved by the Tender inviting Authority,hisEarnestMoneywillbeforfeited.

If the bidder fails to complete the works successfully, the Additional Performance Security along with Security Deposit lying with the Government shall be forfeited at any timeduringthependencyofcontractperiodasperrelevantClausesoftheContract.

Necessary provisions regarding deductions of Security Deposit from the progressive bills of the Contractor as per relevant clauses of the contract will in no way be affected/ altered by this Additional PerformanceSecurity.

Compensation for delay

Clause 2. The time allowed for carrying out the work as entered in the tender shall be strictly observed by the contractor and shall be reckoned from the date on which the order to commence work is given to the contractor. The work shall throughout the stipulated period of the contract be proceeded with all due diligence. Time being deemed to be the essence of the contract on the part of the contractor, the contractor shall be bound in all cases, to achieve the 'Milestones' as defined under Clause 5 and specified in the NITinto various 'Identifiable and quantifiable construction related stages' pertaining to the work. In the event of the contractor failing to comply with any of the conditions related to achieving the 'Milestones' within the specified time period prescribed for such 'Milestone' plus one month, he/she shall be liable topay compensation.

If the contractor fails to commence and/or maintain required progress viz. Milestones defined in the Notice Inviting Tender over the total time allotted for its full completion and in terms of clause 5 or fails to complete the work and clear the site on or before the end of contract period or extended date of completion, he/she shall, without prejudice to any other right or remedy available under the law on account of such breach,payasagreedcompensationtotheimplementingDepartment.

This will also apply to items or group of items for which a separate period of completion has beenspecified.

Compensation for delay of work: @ 2% (Two percent) of the tendered value of work arrived for each month of delay to be computed on per day basis subject to the ceiling limit of security deposit already withheld or due to be withheld during imposition of the said clause and minimum payable compensation equivalent to the Earnest Money deposited(EMD).

Provided always, that the total amount of compensation for delay, to be paid under this clause shall not exceed 10% of the tendered value of work or the tendered value of the item or group of items of the work, for which a separate period of completion is originally given.

Action when whole of security deposit is forfeited

The amount of compensation may be adjusted or set-off against any sum payable to the contractor under this contract, if the contractor catches up with the progress of work subsequently, part or full of the desired progress as per the contract in accordance with the decision of the Tender Accepting Authority, under powers delegated by Government to be communicated by the Engineer-in-Charge, the withheld amount shall be released. However,nointerest,whatsoever,shallbepayableonsuchwithheldamount.

Force majeure :-If the work(s) be delayed for the following reasons:-
Due to war, internal emergency and other conditions such as abnormally bad weather, flood, cyclone natural calamity or serious loss or damage by fire or civil commotion, the contractor shall immediately give notice thereof in writing to the Engineer-in-charge but shall nevertheless use constantly his/her best endeavors to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer- in-charge to proceed with theworks.

Contractor remains liable to pay compensation, if action is not taken under Clause3

Clause 3. Subject to other provisions contained in this clause, the Engineer-in-charge with the prior approval of Tender Accepting Authority, may, without prejudice to his/her any other rights, remedy against the Contractor in respect of any delay, inferior workmanship, any claims for damages and/or any other provision of the contract or otherwise, and whether the date of completion has or has not been elapsed, by notice in writing, absolutely determine the contract in any of the following cases:

(i) If the Contractor has been given by the Engineer-in-Charge a notice in writing to rectify, reconstruct or replace any defective work or that work is being performed in an inefficient or otherwise improper or un-workman like manner, shall omit to complywiththerequirementsofsuchnoticeforaperiodofsevendaysthereafter;

(ii) If the Contractor has without reasonable cause suspended the progress of work, or has failed to proceed with the work with due diligence so that, in the opinion of the Engineer-in-Charge he/she will be unable to secure completion of the work by the schedule date for completion, and continues to do so after a notice of seven days in writing from theEngineer-in-charge;

(iii) If the Contractor fails to complete the work within the stipulated date or the Milestones/items of work within individual dates of completion, if any, stipulated on or before such date(s) of completion and does not complete them or reach the defined Milestones within the period specified in the notice given in writing to that effect by theEngineer-in-charge;

(iv) If the Contractor persistently neglects to carry out his/her obligations under the contract and/or commits default by not complying with any of the terms & conditions of the contract and does not remedy it, or take effective steps to remedy it, within seven days after a notice in writing is given to him/her to that effect by theEngineer-in-Charge;

(v) If the Contractor being an individual, or a firm, or any partner thereof, shall at any time be adjudged insolvent or have a 'Receiving Order' or Order for administration of his/her Estate made against him/her, or take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) under any Insolvency Act for the time being in force, or make any conveyance or assignment of his/her effects or composition or arrangement for the benefit of his/her creditor or purport to do so, or if any application be made under Insolvency Act for the time being in force for the sequestration of his/her Estate, or ifatrustdeedisexecutedbyhim/herforbenefitofhis/hercreditors;

(vi) If the Contractor being a Company pass a resolution or the court delivers an order of judgement that the Company shall be wound up, or if a receiver or a manager on behalf of a creditor be appointed, or if a circumstance arise which entitle the Court or the creditor to appoint a receiver or a manager or which entitle the court to issue a winding uporder;

(vii) If the Contractor shall suffer an execution order being levied on his/her goods and allowsittobecontinuedforaperiodof21days;

(viii) If the Contractor assigns without prior written approval of the TenderAccepting

Authority,transfers, sublets (engagement of labour on piece work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or otherwise partswith or attempts to assign, transfer, sublet or otherwise parts with the entire work or any portion thereof without prior writtenapproval of theEngineer–in–charge;

(ix) AND THEREFORE, the Contractor has made himself/herself liable for action under any of the cases aforesaid, the Engineer-in-charge on behalf of the Government with the prior approval of Tender Accepting Authority, shall have the powers to adopt any of the following actions, as he/she may deem best suited to the interest of theGovernment:-

(a) To determine the contract as aforesaid, of which rescission notice in writing and costs to be recovered for works since executed subject to a minimum of the amount of Earnest Money deposited by the Contractor under the hand of Engineer-in-charge, shall be the conclusive evidence. Upon such determination, the Earnest Money Deposit, Security Deposit already recovered for executed works and performance guarantee, if any under the contract shall be liable to be forfeited and shall be absolutely at the disposal of the Government.

(b) After giving notice to the Contractor to measure up the work executed and to take such whole or the balance or part thereof, as shall be un-executed out of his/her hands, and to give it to another Contractor to complete the balance work. The Contractor, whose contract is determined or rescinded as above, shall not be allowed to participate in the tendering process for the balance work.

(c) To employ labour paid by the implementing Department, and to supply materials, to carry out the works or any part of the work, debarring the contractoranddebitingthecostoflabourandpriceofmaterials(oftheamountof which cost and price determined by certificate of the Engineer-in-Charge shall be final and conclusive against the contractor) and crediting him/her with the value of the work done, in all respects in the same manner and at the same rates as if it had been carried out by the contractor under the terms of his/her contract; the certificate of the Executive Engineer as to the value of the work done shall be final and conclusive against thecontractor.

Contractors remains liable to pay compensation if action not taken under Clause 3

In the event of above course being adopted by the Engineer-in-charge, the Contractor shall have no claim of compensation for any loss sustained by him/her by reason of his/her having purchased or procured any material or entered into any engagement ormade any advances on any account or with a view to execute the work or the performance of the contract. In case, action is taken under any of the provisions aforesaid, the contractor shall not be entitled to recover or be paid any sum for any work thereof actually performed under this contract, unless and until the Engineer-in-charge has certified in writing that the performance of such work and value payable in respect thereof,andhe/sheshallonlybeentitledtobepaidthevaluesocertified.

Clause 3A. In case, the work cannot be started due to reasons not within the control of the Contractor within 1/4th (one fourth) of the stipulated time for completion of the work or 45 days whichever is less, which is accepted as a valid &justified reason by the Tender Accepting Authority, either party viz. Contractor &the Engineer-in-Charge may close the contract with the approval of Tender Accepting Authority. In such an eventuality, the earnest money deposited and the security of the contractor shall be refunded, but no payment on account of interests, loss of profit or damages etc. shall be payable atall.

Clause 3B. In case a continuing work cannot be completed due to reasons beyond the control of the contractor, like Force Majeure enumerated later under Clause 5, the contract may be terminated as stated in clause 3A above by the Engineer-in-Charge withtheconsentofthecontractorandapprovaloftheTenderAcceptingAuthority.

Clause 4. In cases in which any of the powers conferred upon the Engineer-in-ChargeunderClause3hereofshallhavebecomeexercisableandthesamehadnot

Power to take possession of or require removal of or sell Contractor's plant

been previously exercised, non-exercising thereof shall not constitute as a waiver of any of the conditions hereto, and such powers shall, notwithstanding be exercisable in the event of any future case of default by the contractor, for which by any clause or clauses hereof, he/she is declared liable to pay compensation amounting to whole of his/her security deposit, and the liability of the contractor for past and future compensation shall remain unaffected. In the event of the Engineer-in-Charge putting in force either of the powers under ix (a) or (c) vested with him/her under the preceding clause, he/she may if he/she so desires, take possession of all or any tools & plant, materials and stores, in or upon the work, or the site thereof, or belonging to the contractor, or procured by him/her and intended to be used for execution of the work, or any part thereof, paying or allowing for the same in account at the contract rates or in case of these not being applicable, at current market rates to be certified by the Engineer-in-Charge whose certificate thereof, shall be final and binding. Otherwise, the Engineer-in-Charge may deliver notice in writing to the contractor or his/her clerk, foreman or other authorized agent, requiring him/her to remove such tools & plant, 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-in- Charge may remove them at the contractor's expense or sale them by p u b l i c auction or private sale on account of the contractor and at his/her risk, in all respects, and the certificate of the Engineer-in-Charge as to the expense of any such removal, and the amount of the proceeds and expense of any such sale shall be final and conclusive against thecontractor.

Clause 5. The time allowed for execution of a work as specified in the 'Schedule of Work' or in the extended time inaccordance with the terms and conditions shall be the essence of the contract. Execution of work shall commence from such time period as mentioned in the said schedule, or from the date of handing over of the site to the contractor whichever is later. If the contractor commits default in commencing execution of the work as aforesaid within thirty days, without justifiable reasons included under Force Majeure or other such reasons beyond the control of the contractor, in which case to be reported within seven days by the contractor, considered valid and cogent by the Engineer-in-Charge, the Engineer-in-Charge shall after passing of thirty days from the date of scheduled commencement of work as per work order, with the prior approval of the Tender Accepting Authority, without prejudice to any other right to remedy available in law, be at liberty to apply clause 2 and subsequently clause 3 of the tenderdocument.

As soon as possible after the contract is executed, signed and agreed, the contractor shall submit a 'Time and Progress Chart' for each broad activity (Milestone) and get it approved by the Engineer-in-Charge. The chart shall be prepared in direct relation to the time slated in the Notice Inviting Tender (NIT) document, for completion of items or group of items of the work. It shall indicate the forecast of the dates of commencement and completion of various trades of sections of the work. This may be amended, as necessary, by an agreement between the Engineer-in-Charge and the contractor within the limitations of time imposed in the NIT document. Further, to ensure good progress during execution of work, the contractor shall in all cases, in which the time allowed for any work exceeds one month (save and except for special jobs for which a separate programme has been agreed upon) to complete the work as per defined 'Milestones' given in such 'Schedule of Work' defined clearly in the NIT itself into various 'Identifiable and quantifiable construction related stages' related with the type and nature of work, and that the 'total time allowed for completion of work' is to be broken up against achievement of those stages during the construction / progress of work to ensure a periodic monitoring of progress and enable the contractor and the Engineer-in-Charge to take corrective measures from time totime.

If the work(s) be delayedby:

Force majeure, due to war, internal emergency and other conditions such as abnormally bad weather, flood, cyclone natural calamity or serious loss or damage by fire or civil commotion, strike or lockout affecting procurement of construction materials or any of the trades employed in the work, or any other cause which in the absolute discretion of the Engineer-in-Charge is beyond the contractor's control, then upon happening of any such event causing delay,the

contractor shall immediately give notice in writing to the Engineer-in-Charge but shall nevertheless use constantly his/her best endeavors to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer-in-Charge to proceed with theworks.

Request for rescheduling of 'Milestones' of various activities and extension of time, to be eligible for consideration, shall be made by the contractor in writing within fourteen days of the happening of the event causing delay in the prescribed form. The contractor may also, if practicable, indicate in such a request the period for which extension isdesired.

If any such case the Engineer-in-Charge, with the approval of TenderAccepting Authority, may give a fair and reasonable extension of time and reschedule the activity wise 'Milestones' for completion of the work. Such extension shall be communicatedtothecontractorbytheEngineer-in-Chargewiththeapprovalof Tender Accepting Authority in writing within maximum 1 (one) month of the date of receipt of suchrequest.

Final Certificate

Clause 6. On completion of work, the contractor shall be furnished with a certificate by the Engineer-in-Charge of such completion, but no such certificate shall be given, nor shall the work be considered to be completed until and unless the contractor shall have removed from the work premises on which the work is executed, all scaffolding, surplus materials and rubbish, and cleaned off the dirt from wood works, doors, windows, floors, or other parts of any building, upon or about which the work is executed, or of which he may have had possession for the purpose of the execution thereof, nor until the work shall have been measured by the Engineer-in-charge whose measurements shall be binding and conclusive against the contractor. If the contractor shall fail to comply with the requirements of this clause as to removal of scaffolding, surplus materials and rubbish and cleaning off dirt on or before the date fixed for completion of the work, the Engineer-in-charge may at the expense of the contractor remove such scaffolding, surplus materials and rubbish, and dispose of the same as he/she thinks fit, and clean off such dirt as aforesaid; and the contractor shall forthwith b e b o u n d t o pay the amount of all expense 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 salethereof.

Payment on inter- mediate certificates to be regarded asadvances

Clause 7. No running account bill payment shall be normally made for works less than 30 (Thirty) percent of Tendered Value or up to Rs 25.00 lakh, whichever is less, till after the whole of the work shall have been completed and certificate of completion given. For works of tendered value above Rs 25.00 lakh, for running account bill payment, the contractor shall on submitting a bill of at least Rs 25.00 lakh there for, be entitled to receive a payment proportionate to the part thereof, approved and passed by the Engineer-in-charge, whose certificate of such approval and passing of the sum so payable shall be final and conclusive against the contractor. But all such intermediate payments shall be regarded as payments by way of advance against the final m e a s u r e d b i l l payment only and not as payments for work actually done and completed, and shall not preclude the bad, unsound, and imperfect or unskillful work which is to be removed and taken away and reconstructed, or re-erected or to be considered as an admission of the due performance of the contract, or any part thereof, in any respect, or the accruing of any claim, nor shall it conclude, determine or affect in any way the powers of the Engineer-in-charge under these conditions or any of them as to the final settlement and adjustment of the accounts or otherwise or in any other way vary or affect the contract. The final bill shall be submitted by the contractor within one month of the date fixed for completion of the work, otherwise the Engineer-in-charge's certificate of the measurement and of the total amount payable for the work accordingly shall be final and binding on allparties.

Bills to be submitted monthly

Clause 8. W o r k s bill shall be submitted by the contractor each month, after fulfilling above clause, on or before the date fixed by the Engineer-in-charge, for all works executed during the previous month, and the Engineer-in-charge shall take or cause to take the requisite measurement for the purpose of having the same verified, and the claim as far as admissible adjusted, if possible, before the expiry of fourteen days from the presentation of the bill. If the contractor does not submit the bill within the time fixed as aforesaid,theEngineer-in-chargemaydeputeaJuniorEngineertomeasureupthesaid

work in presence of the contractor, whose countersignature in the measurement book will be sufficient warrant; and the Engineer-in-charge may prepare a bill from such list which shallbebindingonthecontractorinallrespects.

Within 10 (Ten) days of completion of work, the contractor shall give notice of such completion to the Engineer-in-charge and within 14 (Fourteen) days of receipt of such notice, the Engineer-in-charge shall inspect the work, and if there is no defect in the work, he/she shall furnish to the contractor a final certificate of completion. Otherwise, a provisional certificate of physical completion indicating defects (a) to be rectified by the Contractor and/or (b) for which payment will be made at reduced rates, shall be issued. Such reduced rate is to be imposed with the approval of Superintending Engineerconcerned.

Clause 8A. When annual repair and maintenance work is carried out, the splashes and droppings from white washing, colour washing, painting etc., on walls, floors, windows shall be removed and the surface cleaned simultaneously with the completion of these items of work in the individual rooms, quarters or premises etc. where the work is done without waiting for the actual completion of all the other items of work in the contract. In case, the contractor fails to comply with the requirements of this clause, the Engineer-in-Charge shall have the right to get this work done at the cost of the contractor either Departmentally or through any other contractor. Before taking such action,theEngineer-in-Chargeshallgivetendaysnoticeinwritingtothecontractor.

Clause 8B. The Contractor shall submit completion Plan/Drawing as required in the 'General Specification' for Civil as well as Electrical Works as applicable within 30 days of completion of thework.

Clause 9. The Contractor shall submit all bills in printed forms, as per format prescribedbyGovernmentofWestBengal,intheofficeoftheEngineer- in-Charge, and the charges in the bills shall always be entered at the rates specified in tender or in case of any extra work ordered in pursuance of these conditions, and not mentioned or provided for in the tender at rates thereinafter provided for suchwork.

Payments of contractor's bills to Banks

Clause 9A (1) Payments due to the contractor may, if so desired by him/her be made to his bank through e-Pradan, details of which has to be directly furnished to the Engineer- in-charge.
While the online receipt given by such Banks shall constitute a full and sufficient discharge/acquittance for the payment, the contractor should wherever possible present his/her bills duly receipted and discharged through his/herBanker/s.

(2) In the case of bills, which the contractor presents for payment direct, and which are not endorsed in favour of the Bank, while efforts will be made to secure payment to the financing Bank, payments made to the contractor should be accepted as full acquittance so far as the Government is concerned. As a part of the arrangement, the financing Bank should give the Government a letter to thiseffect.

Note1. The procedure will not affect the usual rights of the Government to deduct from contractor's bill, (whether endorsed in favour of a Bank or not) any sum due to Government of account of penalties, over-payments etc., on this or any other contract with the Governor of the State of WestBengal.

Note2. Nothing contained herein shall operate to create in favour of the Bank any rights, claims or equities vis-à-vis theGovernor.

Stores supplied by Government

Clause 10. If the specification or estimate of the work provides for use of any special description of material to be supplied by the Engineer-in-Charge, (such materials & stores and the prices to be charged there for as hereinafter mentioned being so far as practicable for the convenience of the contractor, but not so as in any way to control the meaning or effect of this contract specified in the schedule or 'Memorandum' hereto annexed), the contractor shall be supplied with such materials and stores as is required from time to time to be used by him/her for the purpose of the contract only, and the value of the full quantity of materials and stores so supplied at the rates specified in the said schedule or Memorandum may be set off or deducted from any sums then due, or thereafter to become due to the contractor under the contract, or otherwise or against or from the security deposit, or the proceeds of sale thereof; if the same is held in Governmentsecurities,thesameorasufficientportionthereofbeinginthiscasesoldfor

the purpose. All materials supplied to the contractor shall remain the absolute property of Government, and shall not on any account be removed from the site of the work, and shall at all times be open for inspection by the Engineer-in-charge. Any such material unused and in perfectly good condition at the time of the completion or determination of the contract shall be returned to the Engineer-in-charge's store, if by a notice in writing under his/her hand, he/she shall so require; but the contractor shall not be entitled to return any such material unless with such consent, and shall have no claim for compensation on account of any such material so supplied to him/her as aforesaid being unusedbyhim,orforanywastageordamagetoanysuchmaterial.

Work to be executed in accordance with specifications, drawings, orders, etc.

Clause 11. The Contractor shall execute the whole and every part of work in the most substantial and workman like manner, and both, as regards to materials and otherwise, in every respect, in strict accordance with the specifications. The contractor shall also conform exactly, fully and faithfully to the design and drawings, and instructions in writing relating to the work signed by the Engineer-in-Charge and lodged in his/her office, to which the contractor shall be entitled to have access at such office, or on the site of the work for the purpose of inspection during office hours, and the contractor shall, if he/she so require, be entitled at his/her own expense to make or cause to be made copies of the specifications, and of all such design, drawings and instructions as aforesaid.

Alteration in specification and designs do not invalidate contract

Clause 12. The Engineer-in-Charge shall have powers to make any alteration in, omission from, addition to, or substitution for, the original specifications, drawings, designs and instructions, that may appear to him/her to be necessary or recommended by Superintending Engineer or the Chief Engineer during the progress of work, and the contractor shall be at all times be bound to carry out these works, in accordance to any instructions which may be given to him/her in writing, signed by the Engineer-in-charge, and such alterations, omissions, additions or substitutions, shall not invalidate the contract but shall be deemed to have formed a part of the work included in the original tender and any altered, additional or substituted work which the contractor may be directed to do in the manner specified above as a part of the work shall be carried out by the contractor on the same conditions in all respects on which he/she agreed to do the main work, and at the same rates, if any, may be specified in the tender for the main work. Time for the completion of the work shall be extended in the proportion that the altered, additional or substituted work bears to the original work contract, and the certificate of the Engineer-in-charge shall be conclusive as to such proportion. And, if the altered, additional or substituted work includes any class of work, for which no rate is specified in the contract, then such class of work shall be carried out at the rates entered in the schedule of rates of concerned Works Department applicable in the district, which was in force at the time of acceptance of the contract, minus/plus the percentage which the total tendered amount bears to the estimated cost of the entire work put to tender; and if the altered, additional or substituted work is not entered in the said schedule of rates, payment thereof shall be made by the Engineer-in-charge by determining the rates on analysis worked out from (a) the basic rates of materials and labour provided in the aforesaid schedule of rates, or (b) the current market rates of materials and labour when even basic rates for the work are not available in the schedule. In cases when such rates are determined on analysis by the Engineer-in-charge under (a) above, the stipulated percentage above or below schedule of rates as provided in the contract shall also apply, and in case of rates worked out on analysis under (b) above, payment shall be made at the rates so determined without application of the said stipulated percentage. In the event of any dispute regarding rates determined on analysis for any altered, additional or substituted work under this clause, the decision of the Superintending Engineer shall be final andbinding.

Rates for works not in tender BOQ/SoR

No compensation for alternation in or restriction of work to be carriedout.

Clause 13. If at any time after the commencement of the work the Governor shall for any reason whatsoever not require the whole thereof as specified in the tender to be carried out, the Engineer-in-charge shall give notice in writing of the fact to the contractor, who shall have no claim to any payment or compensation whatsoever on account of any profit or advantage which he might have derived from execution of the work in full, but which he/she did not derive in consequence of the full amount of the work not having been carried out; neither shall he/she have any claim for compensation by reason of any alterations having been made in the original specifications, drawings, designs and instructionswhichshallinvolveanycurtailmentoftheworkasoriginallycontemplated.

Action and compensation payable in case of bad work

Clause 14. If it shall appear to the Engineer-in-charge or his/her subordinate engineer in-charge of the work, that any work has been executed with unsound, imperfect, or unskillful workmanship, or with materials of any inferior description, or that any materials or articles provided by the Contractor, for the execution of the work are 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-in-charge specifying the work, materials or articles complained of notwithstanding that the same may have been inadvertently passed, certified and paid for, forthwith rectify or remove and re-construct the work so specified in whole or in part, as the case may require, or as the case may be remove the materials or articles so specified and provide other proper and suitable materials or articles at his/her own proper charge and cost; and in the event of his failing to do so within a period to be specified by the Engineer-in-charge in his/her demand aforesaid, then the contractor shall be liable to pay compensation at the rate of one percent on the amount of the estimate put to tender / on up to date executed work value for every day not exceeding ten days, while his/ her failure to do so shall continue and in the case of any such failure, the Engineer-in-charge may rectify or remove, and re-execute the work 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 thecontractor.

Work to be open to inspection

Contractor or his/her responsible agent to be present

Clause 15. All work under or in course of execution or executed in pursuance of the contract shall at all times be open to inspection and supervision of the Engineer-in-Charge and all his/her subordinates and also higher Officers / Authority of the Government and the contractor shall at all times during the normal working hours, and at all other times at which reasonable notice of the intention of the Engineer-in-charge or his/her subordinates to visit the work site shall have been given to the contractor, either himself/herself 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 it had been given to the contractorhimself/herself.

Notice to be given before work is covered up

Clause 16. The Contractor shall give, not less than five days notice in writing to the Engineer-in-charge or his/her subordinate in-charge of the work, before covering up or otherwise placing beyond the reach of measurement any work, in order that the same is so covered up or placed 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-in-charge or his/her subordinate, in-charge of the work; and if any work shall be covered up or placed 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 or the materials with which the same wasexecuted.

Contractor liable for damage done and for imperfections for 180 days after certificate

Clause 17. If the Contractor or his/her workers or authorized representatives shall break, deface, injure or destroy any part of the structure in which they may be working or any building, road, road curbs, fence, canals, water pipes, cables, drains, electric or telephone posts or wires, trees, grass or grassland or cultivated ground contiguous to the premises on which the work or any part of it is being executed, or if any damage shall happen to the work from any cause whatever or any imperfections become apparent in it at any time, whether during its execution or within a period of six months after issuance of a certificate of its completion by the Engineer-in-Charge, the contractor shall make the same good at his/her own expense, or in default, the Engineer-in-Charge may cause the same to be made good by other workers, and deduct the expenses (of which the certificate of the Engineer-in-Charge shall be final and binding) from any sums, whether under the contract or otherwise, that may be then, or at any time thereafter become due to the contractor by the Government or from his/her security deposit, or the proceeds of sale thereof, or of a sufficient portion thereof, and if the cost in the opinion of the Engineer-in-Charge whose opinion shall be final and conclusive against the contractor, making such damage or imperfections good shall exceed the amount of such security deposit and/or such sums, it shall be lawful for the Government to recover the excess costs from the contractor in accordancewiththeprocedureprescribedbyanylawforthetimebeinginforce.

Clause 17A. The Contractor shall also supply without charge the requisite number of persons with the means and materials necessary for the purpose of setting out works, and counting, weighing, assisting in the joint measurement or examination at any time and fromtimetotimeoftheworkormaterials.Failinghis/hersodoingthesamemaybe

provided by the Engineer-in-Charge at the expense of the Contractor and the expenses may be deducted from any money due to the contractor under the contract or from his/her Security Deposit or the proceeds of sales thereof or of a sufficient portion thereof. The Contractor shall also provide all necessary fencing / barricading / providing caution boards etc. and light required to protect the public from accident, and shall be bound to bear the expenses of defence of every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damage and costs which may be awarded in such suit, actions or proceedings to any such persons or which may with the consent of the Contractor be paid to compromise any claim by any suchpersons.

Clause 18A. In every case in which by virtue of the provisions under sub-section (1) of Section 12, of the Workmen's Compensation Act, 1923, the implementing Department is obliged to pay compensation to a workman employed by the contractor, in execution of the works. The implementing Department will recover from the Contractor the amount of compensation so paid; and without prejudice to the rights of the Department under sub-section (2) of section 12, of the said Act, implementing Department shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by implementing Department to the Contractor whether under this contract or otherwise. The implementing Department shall not be bound to contest any claim made against it under sub-section (1) Section 12, of the said Act, except on the written request of the contractor and upon his/her giving to the implementing Department full security for all costs for which the Department might become liable in consequence of contesting suchclaims.

Clause 18B. In every case in which by virtue of the provisions under 'The Contract Labour (Regulation & Abolition) Act 1970', and its amendments and rules, the implementing Department is obliged to pay amount of wages to a workman employed by the Contractor in execution of the works, or to incur any expenditure in providing welfare and health amenities required to be provided under the above said Act and the rules framed by Government from time to time for the protection of health and sanitary arrangements for workers employed by Contractors, executing Department will recover from the Contractor, the amount of wages so paid or the amount of expenditure so incurred; and without prejudice to the rights of the executing Department under sub- section(2) of Section 20, and sub-section (4) of Section 21, of the Contract Labour (Regulation and Abolition) Act, 1970, executing Department shall be at liberty to recover such amount or any part thereof by deducting it form the security deposit or from any sum due by Executing Department to the Contractor whether under this contract or otherwise and the executing Department shall not be bound to contest any claim made against it under sub-section (1) of Section 20, sub-section (4) of section 21, of the said Act, except on the written request of the Contactor and upon his/her giving to the implementing Department full security for all costs for which the Department might become liable in contesting suchclaim.

Clause 19. The Contractor shall obtain a valid license under the Contract Labour (Regulation and Abolition) Act, 1970, before the commencement of the work, and continue to have valid licenses until the completion of the work. The contractor shall also abide by the provisions of the Child Labour (Prohibition and Regulation) Act, 1986, Fatal Accident Act,1855,PersonalInjuries(CompensationInsurance)Act,1970.

The Contractor shall also comply with the provisions of the 'Building and Other Construction Workers (Regulation of Employment & Conditions of Service) Act, 1996' and 'The Building and Other Construction Workers Welfare Cess Act, 1996'. Failure to fulfill these requirements shall attract penal provisions of the contract, arising out of the resultant non-implementation of suchprovisions.

Labour

Clause 19A. No labour/s below the age of eighteen years shall be employed in the work and the contractor shall abide by the provisions of the Child Labour (Prohibition & Regulation) Act, 1986. Employment of female labour/s in works in the neighborhoods of sensitive barracks should be avoided as far as possible.

Payment of minimum Wages to Labour

Clause 19B. The Contractor shall pay to labours employed by him/her either directly or through Sub-Contractors, wages not less than fair wages as defined by the Labour Commissioner of the State Government under 'Minimum Wages Act, 1948', Contractor's Labour Regulations or as per the provisions of the Contract Labour (Regulation and

Abolition) Act, 1970, wherever applicable.

The contractor shall, notwithstanding the provisions of any contract to the contrary, cause to be paid fair wage to labour indirectly engaged on the work, including any labour engaged by his sub-contractors in connection with the said work, as if the labour had been immediately employed byhim/her.

In respect of all labourers directly or indirectly employed in the works for performance of the Contractor's part of the contract, the contractor shall comply with or cause to be complied with the contractor's Labour Regulations made by the State Government/ Government of India, from time to time in regard to payment of wages, wage period, deductions from wages, recovery of wages not paid and deductions made without authority, maintenance of wage books or wage slips, publication of scale of wage and other terms of employment, inspection and submission of periodical returns and all other matters likewise in nature or as per the provisions of the Contract Labour (Regulation and Abolition) Act, 1970, and the Inter-State Migrant Workmen (Regulation of Employment andConditionsofService)Act,1979,MinimumWagesAct,1948,whereverapplicable.

a) The Engineer-in-Charge concerned shall have the right to deduct from the money due to the contractor any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non-fulfillment of the conditions of the contract for the benefit of the workers, non-payment of wages or of deductions made from his/her/their wages which are not justified by their terms of the contract or non-observance of theregulations.

b) Under the provision of Weekly Holidays Act, 1986, the contractor is bound to allow to the labours, directly or indirectly employed in the work, one day rest for 6 days of continuous work, and pay wages at the same rate as for duty. In the event of default, the Engineer-in-charge shall have the right to deduct the sum or sums not paid on account of wages for weekly holidays to any labour and pay the same to the persons entitled thereto from any money due to the contractor by the Engineer-in-charge concerned.

The contractor shall also comply with the provisions of the 'Employees Liability Act, 2008', Workmen's Compensation Act and 'Maternity Benefits Act' or the amendments thereof or any other law relating thereto, and the rules made there under from time to time.

The Contractor shall indemnify and keep indemnified the implementing Department against payments to be made under and for the observance of the laws aforesaid and PW Contractor's Labour Regulations without prejudice to this right to claim indemnity from his/hersub-contractors.

The laws aforesaid shall be deemed to be a part of this contract and any breach thereof shallbedeemedtobeabreachofthiscontract.

Whatever is the minimum wage for the time being, or if the wage payable is higher than minimum wage, such wage shall be paid by the contractor to the workers directly without the intervention of any Dafadar, and that Dafadar shall not be entitled to deduct or recover any amount from the minimum wage payable to the workers as and by way of commission orotherwise.

The contractor shall ensure that no amount by way of commission or otherwise is deductedorrecoveredbytheDafadarfromthewageofworkers.

Clause 19C. In respect of all labours directly or indirectly employed in the work for the performance of the contractor's part of this contract, the contractor shall at his/her own expenses, arrange for the safety provisions as framed from time to time by the competent authority, and shall at his/her own expense provide all facilities in connection therewith. In case the contractor fails to make arrangement, and fail to provide necessary facilities as aforesaid, he/she shall be liable to pay a penalty of Rs. 2000/- for each default, and in addition the Engineer-in-Charge shall be at liberty to make arrangement and provide facilitiesasaforesaidandrecoverthecostsincurredintheirbehalf,fromthecontractor.

Clause 19D. For the works above Rs. 2.0 crore, the Contractor shall submit by the 4th and 19th of every month to the Engineer-in-charge, a true statement showing in respect of the second half of the preceding month and the first half of the current month respectively-

The number of labourers employed by him/her on the work, their working hours, and the

wages paid to them;

Accidents that had occurred during the said fortnight showing the circumstances under which it had happened, and the extent of damage and injury caused by them, and the number of female workers who have been allowed maternity benefits according to Clause 19F of the contract and the amount paid to them;

Failing which the contractor shall be liable to pay to the Department, a sum not exceeding Rs. 2000/- for each default or materially incorrect statement. The decision of the Engineer-in-charge shall be final in deducting from any bill due to the contractor; the amount levied as fine and would be binding on the contractor.

Clause 19E. In respect of all labours directly or indirectly employed in the work for the performance of the contractor's part of this contract, the contractor shall comply with or cause to be compiled with all the rules framed by the Government from time to time for the protection of health and sanitary arrangements of workers employed by the contractor.

Clause 19F. In the event of the contractor(s) committing a default or breach of any of the provisions of the Contractor's Labour Regulations and Rules for the protection of health and sanitary arrangement for the workers as amended from time to time or furnishing any information or submitting or filing any statement under the provisions of the above Regulations and Rules which is materially incorrect, he/she shall, without prejudice to any other liability, pay to the Department a sum not exceeding Rs. 2000/- for every default, breach or furnishing, making, submitting, filing such materially incorrect statements and in the event of the contractors defaulting continuously in this respect, the penalty may be enhanced to Rs. 200/- per day for each day of default subject to a maximum of five per cent of the tendered value. The decision of the Engineer-in-charge shallbefinalandbindingontheparties.

Should it appear to the Engineer-in-charge that the contractor(s) is/are not properly observing and complying to the provisions of the Contractor's Labour Regulations and Rules, The Minimum Wages Act, 1948 and Contract Labour (Regulation and Abolition) Act 1970, for the protection of health and sanitary arrangements for work-people employed by the contractor(s) (hereinafter referred as 'the said Rules') the Engineer-in-charge shall have the power to give notice in writing to the contractor(s) requiring that the said Rules be complied with and the amenities prescribed therein be provided to the work-people within a reasonable time to be specified in the notice. If the contractor(s) shall fail within the period specified in the notice to comply with and/or observe the said Rules and to provide the amenities to the work-people as aforesaid, the Engineer-in-charge shall have the power to provide the amenities herein before mentioned at the cost of the contractor(s). The contractor(s) shall erect, make and maintain at his/her own expense and to approved standards all necessary hutments and sanitary arrangements required for his/her/their work-people on the site in connection with the execution of the works, and if the same shall not have been erected or constructed, according to approved standards, the Engineer-in-charge shall have power to give notice in writing to the contractor(s) requiring that the said hutments and sanitary arrangements be remodeled and/or reconstruct such hutments and sanitary arrangements according to approved standards, and if the contractor(s) shall fail to remodel or reconstruct such hutments and sanitary arrangements according to approved standards within the period specified in the notice, the Engineer-in-charge shall have the power to remodel or reconstruct such hutments and sanitary arrangements according to approved standards at the cost of the contractor(s).

Clause 19G. The contractor shall comply with all the provisions of The Minimum Wages Act, 1948, Contract Labour (Regulation and Abolition) Act, 1970, Employees Liability Act, Industrial Dispute Act and Maternity Benefit Act, 1961, as amended from time to time and rules framed thereunder and other labour laws affecting contract labour that may be broughtintoforcebytheappropriateauthorityfromtimetotime.

Clause 19H. The Engineer-in-charge may require the contractor to remove from the site of work, any person or persons engaged/assigned or employed by the contractors upon the work who may be determined as insane or incompetent or misconducts himself/herself,andthecontractorshallforthwithcomplywithsuchrequirements.

Clause 19I. It shall be the responsibility of the contractor to see that the

building/structure under construction is not occupied by anybody unauthorized during construction, and is handed over to the Engineer-in-charge with vacant possession free from encumbrances in entirety, If such buildings/structures through completed is occupied illegally, then the Engineer-in-Charge shall have the option to refuse to accept the said building/structure in that position. Any delay in acceptance on this account will be treated as the delay in completion and for such delay a levy up to 5% of tendered value of work may be imposed by the Engineer-in-charge whose decision shall be final both with regardtothejustificationandquantumandshallbebindingonthecontractor.

However, the Engineer-in-charge, through a notice, may require the contractor to remove the illegal occupations, any time on or before construction and delivery.

Work onSundays

Clause 20. No work shall be done on Sundays without the p r i o r sanction of the Engineer-in-charge.

Work not to be sublet. Contract may be rescinded and security deposit forfeited for subletting, bribing, or if contractor becomesinsolvent

Clause 21. The contract shall not be assigned or sublet without specific orders from Government in respect of a specified sub-contractor. And if the contractor shall assign or sublet his contract, or attempt so to do, or become insolvent or commence any in insolvency proceedings or make any composition with his creditor, or attempt to do so, or if any bribe, gratuity, gift, loan, perquisite, 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 Divisional Officer may thereupon by notice in writing rescind the contract, and the security deposit of the contractor shall thereupon stand forfeited and be absolutely at the disposal of Government and the same consequences shall ensure as if the contract had been rescinded under the Clause 3 hereof, and in addition the contractor shall not be entitled torecoverorbepaidforanyworkthereforactuallyperformedunderthecontract.

Sum payable as compensation to be considered as reasonable without reference to actual loss

Clause 22. 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 Government without reference to the actual loss or damage sustained and whether or not any damage shall have beensustained.

Changes in constitution of firm

Clause 23. Where the contractor is a partnership firm or a consortium, prior approval in writing of the Engineer-in-Charge shall be obtained for any change made in the constitution of the firm/consortium. Where the contractor is an individual or a Hindu Undivided Family (HUF) business concern, such approval as aforesaid shall likewise be obtained, before the contractor enters into any partnership agreement/Memorandum of Articles whereunder the partnership firm/ consortium would have the right to carry out the works hereby undertaken by the contractor. If previous approval as aforesaid is not obtained,thecontractisliabletoberescinded.

Works to be under direction of Engineer-in-Charge

Clause 24. All works to be executed under the contract shall be executed under the direction of Engineer-in-Charge. Further instructions/advices, if felt necessary by Superintending Engineer/ Chief Engineer, shall also be binding to be communicated by theEngineer-in-Charge.

Clause 25. Settlement of Disputes and Arbitration:

Settlement of disputes - Dispute Redressal Committee'

Except where otherwise provided in the contract, all questions and disputes relating to the meaning of the specifications, designs, drawings and instructions hereinbefore mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or thing whatsoever, in any way arising out of or relating to the contracts, designs, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning the works, or the executions or failure to execute the same, whether arising during the progress of the work, or after the completion orabandonmentthereofshallbedealtwithasmentionedhereinafter:

If the contractor considers any work demanded of him/her to be outside the requirements of the contract, or disputes any drawings, record or decision given in writing by the Engineer-in-Charge or any matter in connection with or arising out of the contract or carrying out of the work to be unacceptable, he/she shall promptly within 15 days requesttheChairmanoftheDepartmentalDisputeRedressalCommittee,inwriting,for

written instruction or decision. Thereupon, the Dispute Redressal Committee shall give its written instruction or decision within a period of three months from the date of receipt of the Contractor's letter.

The Dispute Redressal Committee in each of the Works Departments shall be constituted with the following officials as Members:

1	Secretary / Engineer-in-Chief of the Department concerned	Chairman
2	Joint Secretary / Deputy Secretary / any Officer of equivalent rank of the Department	Member
3	One Designated Chief Engineer / Engineer of the Department to be nominated by the Department concerned.	Member Secretary and Convenor
4	One representative of Finance Department of the Government not below the rank of Joint Secretary or Financial Advisor in case of the Works Department where FA system has been introduced.	Member

This provisions will be applicable irrespective of the value of the works to which the dispute mayrelate.

Clause 26. The contractor shall fully indemnify and keep indemnified the implementing Department against any action, claim or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties which may be payable in respect of any article or part thereof included in the contract. In the event of any claims made under or action brought against implementing Department in respect of any such matter as aforesaid, the contractor shall be immediately notified thereof by the implementing Department and the contractor shall be at liberty, at his/ her own expense, to settle any dispute or to conduct any litigation that may arise therefrom, provided that the contractor shall not be liable to indemnify the implementing Department if the infringement of the patent or design or any alleged patent or design right is thedirectresultofanorderpassedbytheEngineer-in-Chargethisbehalf.

Lump sum as in estimates

Clause 27. When the estimate on which the tender is made includes lump sums in respect of parts of the work, the contractor shall be entitled to payment in respect of the items of works involved or the part of the work in question at the same rates as are payable under this contract for such items, or if the part of the work in question is not, in the opinion of the Engineer-in-charge, capable of measurement, certificate in writing of the Engineer-in-charge shall be final and conclusive against the contractor with regard to any sum or sums payable to him under the provisions of thisclause.

Action where nospecification

Clause 28. In the case of any class of work for which there is no such specifications as referred to under Clause 11, such work shall be carried out in accordance with the latest Bureau of Indian Standards (BIS) specifications. In case there are no such specifications in Bureau of Indian Standards, the work shall be carried out as per reputed manufacturer's specifications if accepted by the Engineer-in-Charge. If not available, then as per State Government / Union Government accepted and approved specifications. In case there are no such specifications as required above, the work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer-in-Charge which is approved by the Tender Accepting Authority.

Definition of works

Clause 29. The expression "works" or "work" where used in these conditions shall, unless there be something either in the subject or context repugnant to such construction, be constructed and taken to mean the works by or by virtue of the contract constructed to be executed, whether temporary or permanent and whether original, altered, substituted or additional.

Clause 30. The Contractor(s) shall at his/their own cost provide his/their labour with hutting on an approved site, and shall make arrangements for conservancy and sanitation in the labour camp to the satisfaction of the local Public Health and Medical Authorities. He/they shall also at his/their own cost make arrangements for thelaying

of pipe lines for water supply to his/their labour camp from the existing mains wherever available, and shall pay all fees, charges and expenses in connection with there and incidentalthereto.

Clause 31. The contractor(s) shall make his/their own arrangements for water required for the work and nothing extra will be paid for the same. This will be subject to the followingconditions:-

i) That the water used by the contractor(s) shall be fit for construction purposes to the satisfaction of theEngineer-in-charge;

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

Clause 32. The contractor undertakes to make arrangement for the supervision of the work by the firm supplying the construction materials. The Contractor shall collect thetotal quantity of materials as per approved programme required for the work as per approved programme, before the work is started and shall hypothecate it to the Engineer- in-Charge. If any material remains unused on completion of the work on account of lesser use of materials in actual execution for reasons other than authorized changes of specifications and abandonment of portion of work, a corresponding deduction equivalent to the cost of unused materials as determined by the Engineer-in-Charge shall be made and the material returned to the contractor. Although the materials are hypothecated to Institute, the contractor undertakes the responsibility for their proper watch, safe custody and protection against all risks. The materials shall not be removed from site of workwithout the consent of the Engineer-in-Charge inwriting.

The contractor shall be responsible for rectifying defects noticed within Defect Liability Period from the date of completion of the work and the portion of the security deposit relating to work shall be refunded after the expiry of Defect Liability Period.

Contractors Superintendence, Supervision, Technical Staff & Employees

Clause 33. The contractor shall provide all necessary superintendence during execution of the work and as long thereafter as may be necessary for proper fulfilling of the obligations under thecontract.

The contractor shall immediately after receiving letter of acceptance of the tender and before commencement of the work, intimate in writing to the Engineer-in-Charge, the name(s), qualifications, experience, age, address(es) and other particulars along with certificates, of the principal technical representative to be in charge of the work and other technical representative(s) who will be supervising the work. The Engineer-in-Charge shall within 3 days of receipt of such communication intimate in writing his/her approval or otherwise of such representative(s) to the contractor. Any such approval may at any time be withdrawn and in case of such withdrawal, the contractor shall appoint another such representative according to the provisions of this clause. Decision of the tender accepting authority shall be final and binding on the contractor in this respect. Such a principal technical representative shall be appointed by the contractor soon after receipt of the approvalfromtheEngineer-in-ChargeandshallbeavailableatsitebeforestartofworK.

If the contractor (or any partner in case of firm/company) himself/herself has such qualifications, it will not be necessary for the said contractor to appoint such a principal technical representative but the contractor shall designate and appoint a responsible agent to represent him and to be present at the work whenever the contractor is not in a position to be so present. All the provisions applicable to the principal technical representative under the clause will also be applicable in such a case to the contractor or his responsible agent. The principal technical representative and/or the contractor shall on receiving reasonable notice from the Engineer-in-Charge or his designated representative(s) in charge of the work in writing or in person or otherwise, present himself/herself to the Engineer-in-Charge and/or at the site of work, as required, to take instructions. Instructions given to the principal technical representative or the responsible agent shall be deemed to have the same force as if these have been given to the contractor. The principal technical representative and/or the contractor or his/her responsible authorized agent shall be actually available at site especially during important stages of execution of work, during recording of measurement of works and whenever so required by the Engineer-in-Charge by a notice as aforesaid and shall also note down instructions conveyed by the Engineer-in-Charge or his/her designated representative in the siteorder

book and shall affix his signature in token of noting down the instructions and in token of acceptance of measurements.

If the Engineer-in-Charge, whose decision in this respect is final and binding on the contractor, is convinced that no such technical representative(s) is/are effectively appointed or is/are effectively attending or fulfilling the provision of this clause, a recovery (non-refundable) shall be effected from the contractor as specified in Schedule and the decision of the Engineer-in-Charge as recorded in the site order book and measurement recorded checked / test checked in Measurement Books shall be final and binding on the contractor. Further if the contractor fails to appoint a suitable technical representative and/or other technical representative(s) and if such appointed persons are not effectively present or are absent by more than two days without duly approved substitute or do not discharge their responsibilities satisfactorily, the Engineer-in-Charge shall have full powers to suspend the execution of the work until such date as suitable other technical representative(s) is/are appointed and the contractor shall be held responsible for the delay so caused to the work. The contractor shall submit a certificate of employment of the technical representative(s) along with every running account bill / final bill and shall produceevidenceifatanytimesorequiredbytheEngineer-in-Charge.

The contractor shall provide and employ on the site only such technical assistants as are skilled and experienced in their respective fields and such foremen and supervisory staff as are competent to give proper supervision to the work.

The contractor shall provide and employ skilled, semi-skilled and unskilled labour as is necessary for proper and timely execution of the work.

The Engineer-in-Charge shall be at liberty to object to and require the contractor to remove from the works any person who, in his opinion, misconducts himself, or is incompetent or negligent in the performance of his duties or whose employment is otherwise considered by the Engineer-in-Charge to be undesirable. Such person shall not be employed again at works site without the written permission of the Engineer-in-Charge and the persons so removed shall be replaced as soon as possible by competentsubstitutes.

Clause 34. "Levy / Taxes Payable by Contractor"

(i) GST, Building and other Construction Workers' Welfare Cess or any other tax or Cess in respect of this contract shall be payable by the Contractor and Engineer-in-Chargeshallnotentertainanyclaimwhatsoeverinthisrespect.

(ii) The contractor shall deposit Government Royalty and obtain necessary permit for supply of the sand, stone chips, red bajri, sand stone, river bed materials etc. from localauthorities,ifthosearedirectlyprocuredfromquarrysites.

In case materials are procured from secondary sources, certificates of quarry owners to the effect of payment of royalties and Cess would have to be furnished. In absence of such certificates towards payment of Royalties and Cess such components shall be deducted from the contractor's bills at prescribed rates and deposited through 'GRIPS' portal or otherwise, in the designated GovernmentTreasuries/PAO.

If pursuant to or under any law, notification or order, any Royalty, Cess or the like becomes payable by the implementing Department and does not at any time become payable by the contractor to the State Government/Local appropriate authorities in respect of any material used by the contractor in the works then in such a case, it shall be lawful to the Department and it will have the right and be entitled to recover the amount paid in thecircumstancesasaforesaidfromduesofthecontractor.

Clause 35.

(i) All tendered rates shall be inclusive of statutory taxes and levies payable under respective statutes. However, if any further tax or cess is imposed by Statute, after the last stipulated date for the receipt of tender including extensions if any and the contractor thereupon necessarily and properly pays such taxes/levies/cess, the contractor shall be reimbursed the amount so paid. Provided such payments, if any, is not, in the opinion of the Engineer-in-charge (whose decision shall be final and binding on the contractor) attributable to delay in execution of work within the control of thecontractor.

(ii) The contractor shall keep necessary books of accounts and other documents for the purpose of this condition as may be necessary and shall allow inspection of the same byadulyauthorizedrepresentativeoftheDepartmentand/ortheEngineer-in-Charge

and further shall furnish such other information/document as the Engineer-in-Charge may require from time totime.

(iii) The contractor shall, within a period of 30 days of the imposition of any such further tax or levy or cess, give a written notice thereof to the Engineer-in-Charge that the same is given pursuant to this condition, together with all necessary information relatingthereto.

Clause 36. Without prejudice to any of the rights or remedies under this contract, if the contractor dies, the Engineer-in-charge shall have the option of terminating the contract without compensation to the contractor, but would be liable to clear full dues and claims on work done to his/her legalsuccessor/s.

Clause 37. The contractor shall not be permitted to tender for works in which his near relative is posted as in any capacity between the grades of the Executive Engineer and Junior Engineer (both inclusive). He shall also intimate the names of persons who are working with him/her in any capacity or are subsequently employed by him/her and who are near relatives to any Official in the Institute. Any breach of this condition by the contractor would render him/her liable to be removed from the approved list of contractors of the Department. If however the contractor is registered in any other Department, he/she shallbedebarredfromtenderingintheDepartmentforanybreachofthiscondition.

NOTE: By the term "near relatives" is meant wife, husband, own parents and grandparents, own children and grandchildren, own brothers and sisters, own uncles, aunts and first cousinsand their corresponding in-laws.

Clause 38. No engineer of Gazetted Rank or other Gazetted Officer employed in engineering or administrative duties in the Government shall work as a contractor or employee of a contractor for a period of one year after his/her retirement from Government service without the previous permission of Government in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found at any time to be such a person who had not obtained the permission of Government as aforesaid, before submissionofthetenderorengagementinthecontractor'sservice,asthecasemaybe.

Clause 39. The work (whether fully constructed or not) and all materials, machines, tools and plants, scaffolding, temporary buildings and other things connected therewith shall be at the risk of the contractor until the work has been delivered to the Engineer-in-Charge and a certificate from him/her to that effect obtained. In the event of the work or any materials properly brought to the site for incorporation in the work being damaged or destroyed in consequence of hostilities or warlike operation, the contractor shall when ordered (in writing) by the Engineer-in-Charge to remove any debris from the site, collect and properly stack or remove in store all serviceable materials salvaged from the damaged work and shall be paid at the contract rates in accordance with the provision of this agreement for the work of clearing the site of debris, stacking or removal of serviceable material and for reconstruction of all works ordered by the Engineer-in-Charge, such payments being in addition to compensation up to the value of the work originally executed before being damaged or destroyed and not paid for. In case of works damaged or destroyed but not already measured and paid for, the compensation shall be assessed by the Engineer-in-Charge concerned. The contractor shall be paid for the damages/destruction suffered and for the restoring the material at the rate based on analysis of rates tendered for in accordance with the provision of the contract. The certificate of the Engineer-in-Charge regarding the quality and quantity of materials and the purpose for which they were collected shall be final and binding on all parties to this contract.

Provided always that no compensation shall be payable for any loss in consequence of hostilities or warlike operations (a) unless the contractor had taken all such precautions against air raid as are deemed necessary by the Air Force Officers or the Engineer-in-Charge (b) for any material etc. not on the site of the work or for any tools, plant, machinery, scaffolding, temporary building and other things not intended for thework.

In the event of the contractor having to carry out reconstruction as aforesaid, he/she shall be allowed such extension of time for its completion as is considered reasonable by the Engineer-in-charge.

Clause 40. The contractor shall comply with the provisions of the Apprentices Act, 1961 and the Apprenticeship Rules, 1992 and orders issued thereunder from time to time. If

he/she fails to do so, his/her failure will be a breach of the contract and the Engineer-in-Charge may, in his/her discretion, cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him/her of the provisions of the saidAct.

Clause 41. Procedure For Suspension and Debarment of Supplier, Contractors and Consultants

The procedure as laid down below shall govern the suspension/debarment of Suppliers/Contractors/Consultants (Contractors for brevity) involved in Government procurement for offences or violations committed during competitive bidding and contract implementation, for the works under different Departments of Government of West Bengal.

Grounds for Suspension and Debarment:-

(1) Submission of eligibility requirements containing false information or falsified documents.

(2) Submission of Bids that contain false information or falsified documents, or the concealment of such information in the Bids in order to influence the outcome of eligibilityscreeningoranyotherstageofthebiddingprocess.

(3) Unauthorized use of one's name/digital signature certificate for the purpose of biddingprocess.

(4) Any documented unsolicited attempt by a bidder (**APerson/Contractor/Agency /Joint Venture/Consortium/Corporation participating in the procurement process and/or a person / Contractor / Agency / Joint Venture / Consortium / Corporation having an agreement/contract for any procurement with the department shall be referred as Bidder**) unduly influencing the outcome of the bidding in hisfavour.

(5) Refusal or failure to post a self–declaration to the effect of any previous debarment imposed by any other department of State Government and/or CentralGovernment.

(6) All other acts that tend to defeat the purpose of the competitive bidding such as lodging false complain about any Bidder, lodging false complain about any Officer duly authorized by the Department, restraining any interested bidder to participate in the bidding process,etc.

(7) Assignment and subcontracting of the contract or any part thereof without prior written approval of the procuringentity.

(8) Whenever adverse reports related to adverse performance, misbehaviour, direct or indirect involvement in threatening, making false complaints etc. damaging the reputation of the department or any other type complaint considered fit by the competent authority of the department, are received from more than one Officer or on more than one occasion from individualOfficer.

(9) Refusal or failure to post the required performance security / earnest money within the prescribed time without justifiablecause.

(10) Failure in deployment of Technical Personnel, Engineers and/or Work Supervisor having requisite license / supervisor certificate of competency as specified in the contract.

(11) Refusal to accept an award after issuance of "Letter of Acceptance" or enterinto contract with the Government without justifiable cause.

(12) Failure of the Contractor, due solely to his fault or negligence, to mobilize and start work or performance within the specified period as mentioned in the "Letter of Acceptance", "Letter of Acceptance cum Work Order", "Work Order", "Notice to Proceed", "Award of Contract",etc.

(13) Failure by the Contractor tofully and faithfully comply with its contractual obligations without valid cause, or failure bythe Contractor to comply with any written lawful instruction of the Procuring Entity/Authority (the Officer authorizedby the Administrative Department, Government of West Bengal for procurement) or itsrepresentative(s)pursuanttotheimplementationoftheContract.

(14) For the procurement of Consultancy Service/Contracts, poor performance by the Consultant of his services arising from his fault or negligence. Any of the following actsbytheConsultantshallbeconstruedaspoorperformance.

(i) Non deployment of competent technical personnel, competent Engineers and/or worksupervisors;

(ii) Non-deployment of committed equipment, facilities, support staff and manpower;

(iii) Defective design resulting in substantial corrective works in design and/or construction;

(iv) Failuretodelivercriticaloutputsduetoconsultant'sfaultornegligence;
(v) Specifying materials which are inappropriate and substandard or way above acceptable standards leading to high procurementcost;
(vi) Allowing defective workmanship or works by the Contractor being supervised by theConsultant.

(15) For the procurement of goods, unsatisfactory progress in the delivery of the goods by the manufacturer, supplier, or distributor arising from his fault or negligence and/or unsatisfactoryorinferiorqualityofgoods,vis-à-visaslaiddowninthecontract.

(16) Willful or deliberate abandonment or non-performance of the project or Contract by the Contractor resulting in substantial breach thereof without lawful and/or just cause.

CATEGORY OF OFFENCE :-

(A) First degree of offence: 1 to 16 of the above Clause-41 to be considered as First degree ofoffence.

(B) Second degree of offence: Any one of the offences as mentioned under 'A' above, committed by a particular Bidder/Contractor/Supplier on more than one occasion, be considered as Second degree ofoffence.

In addition to the penalty of suspension/debarment, the bid security / earnest money posted by the concerned Bidder or prospective Bidder shall also be forfeited.

PENALTY FOR OFFENCE :-

(I) For committing First degree of offence: Disqualifying a Bidder from participating in any procurement process under the Administrative Department of Government of West Bengal up to 2 (two)years.

(II) ForcommittingSeconddegreeofoffence:DisqualifyingaBidderfromparticipatingin any procurement process under the Administrative Department of Government of West Bengal up to 3 (three)years.

PROCEDURE OF SUSPENSION AND DEBARMENT DURING THE PROCUREMENT PROCESS

(1) Initiation of Action, Notification andHearings:
Any Bidder or procurement authority on his own or based on any other information made available to him may invite the process of suspension/debarment proceedings byfilingawrittenapplicationwiththe**BidEvaluationCommittee**andsuchfiling of written application has to be done within forty eight hours from the date and time of publication of the result of technical evaluation of anybid.

(a) Upon verification of the existence of grounds for suspension/debarment, the Chairpersonof**BidEvaluationCommittee**shallimmediatelynotifythebidder concerned either electronically through his registered e-mail or in writing to his postal address, advising himthat:
i) A complaint has been filed against him and prima facie material has been found, which may lead tosuspension/debarment.
ii) He has been recommended to be placed under suspension/debarment by the suspension committee (as constituted by the respective Administrative Department) stating the ground forsuch.
iii) The said bidder, within three days from the date of issue of such notification by the Bid Evaluation Committee, may approach the Chairperson of Suspension Committee by submitting all required documents in his favour for hearing. Any application made thereafter would not beentertained.
Such notice should contain the e-mail id and the postal address of the Chairperson of the Suspension Committee.

(b) After receiving the recommendation for suspension from Bid Evaluation Committee, Suspension Committee shall issue a notice to the alleged bidder electronically through his registered e-mail id, to submit all relevant documents in support of his defense within three working days after issuance of the notice of the Suspension Committee. The Suspension Committee will conduct the hearing within seven working days from the date of receipt of the documents from the alleged bidder. If no appeal has been received from the alleged bidder or if after hearing sufficient ground for suspension is found, the Suspension Committee, will suspend the alleged bidder from participating in the procurement process under the Administrative Department for a period of six monthsfromthedateofissuanceofsuspensionorder.TheChairpersonofthe

Suspension Committee shall issue the suspension order within seven days from the last date of hearing and shall notify the bidder concerned either electronically through his registered e-mail id or in writing to his postal address. The Chairperson of Suspension Committee shall also inform the decision to allconcerned.

If sufficient reason for suspension is not found, the Suspension Committee wouldrejecttherecommendationofBidEvaluationCommitteeandwouldallow the bidder to take part in the tenderingprocess.

If the bidder is suspended, the Suspension Committee would recommend debarment of the bidder and forward the case with all documents to the Debarment Committee for furtheraction.

(c) The Debarment Committee upon receipt of the recommendation of the Suspension Committee shall scrutinize the documents. The Debarment Committee will hold a hearing of the alleged bidder and issue necessary order within ten working days from the last date of hearing. The Debarment Committee, if satisfied after hearing, shall forward the case to the Department for orders of Debarment. The Department in due course will issue Debarment Order disqualifying/prohibiting the erring bidder from participating in the bidding/procurement of all projects under the Administrative Department for a specified period. The alleged bidder shall be intimated accordingly either electronically through his registered e-mail id or in writing to his postal address. Otherwise the Debarment Committee may reject the recommendation of the Suspension Committee. The Chairperson of Debarment Committee shall also inform the decision to allconcerned.

PROCEDURE FOR DEBARMENT DURING THE CONTRACT IMPLEMENTATION STAGE:-

(A) Upon termination of contract due to default of the Bidder, the Engineer-in-Charge shall recommend for debarment to the Bid Evaluation Committee. The Bid Evaluation Committee shall submit his recommendation of debarment of the alleged Bidder along with a detailed report stating clearly the reasons for debarment to the Debarment Committee within 30 (thirty) days from the date of termination of contract. The alleged Bidder shall be intimated accordingly either electronically to his registered e-mail id or in writing to his postal address. The Chairperson of Bid Evaluation Committee shall also inform the decision to allconcerned.

(B) The Debarment Committee upon receipt of the recommendation of Bid Evaluation Committee shall scrutinize the documents. The Debarment Committee will hold a hearing about the matter from the Bidder and issue necessary order within 10 (ten) working days from the last date of hearing. The Debarment Committee, if satisfied after hearing, shall forward the case to the Department for the order of debarment. The Department in due course will issue debarment order disqualifying/prohibiting the erring Bidder from participating in the bidding/procurement of all projects under the Administrative Department, Government of West Bengal for a specified period. The alleged Bidder shall be intimated accordingly either electronically to his registered e-mail id or in writing to his postal address. Otherwise the Debarment Committee may reject the recommendation of the Bid Evaluation Committee. The Chairperson of Debarment Committee shall also inform the decision to allconcerned.

STATUS OF SUSPENDED / DEBARRED BIDDER :-

(a) Bidder placed under Suspension/Debarment by the competent authority will not be allowed to participate in any procurement process under the Administrative Department within the period of suspension/debarment. The earnest money of the suspended Bidder shall stand forfeited to theGovernment.

(b) If the Suspension/Debarment Order is issued prior to the date of issue of "Letter of Acceptance", "Letter of Acceptance cum Work Order", "Work Order", "Notice to Proceed", "Award of Contract" etc. for any Bid, the Suspended/Debarred Bidder shall not be qualified for Award for the said Bid and such Procurement Process will be dealt with as per existing norms by simply excluding the erringBidder.

(c) If the Suspension/Debarment Order is issued after award of a Government Project/Contract to the Debarred Bidder, the awarded Project/Contract shall not be prejudiced by the said Order provided that the said offence(s) committed by the Debarred Bidder is not connected with the awardedproject/contract.

Clause 42. Executive Engineer of the concerned Division will be the Engineer-in-Charge inrespectoftheTendercontractandallcorrespondencesconcerningrates,claims,change

in specifications and/or design and similar important matters will be valid only if accepted/recommended by the Engineer-in-Charge. If any correspondence of above tender is made with Officers other than the Engineer-in-charge for speedy execution of works, the same will not be valid unless copies are sent to the Engineer-in-Charge and also approved by him. Instructions given by the Assistant Engineer and the Junior Engineer on behalf of the Engineer-in-Charge (who have been authorized to carry out the work on behalf of the Engineer-in-Charge) regarding specification, supervision, approval of materials and workmanship shall also be valid. In case of dispute relating to specification and work, the decision of Engineer-in-Charge shall be final and binding. The Engineer-in-Charge will however invariably take decisions relating to tender contract or as mentioned in the relevant rules and clauses of the contract document with the approval of the Tender AcceptingAuthority.

Clause43. Acceptance of the Tender will rest with the Tender Accepting Authority without assigning reason thereof to the bidder. The accepting authority reserves the right to reject anyorallofthetenderswithoutassigninganyreasonthereoftothebidder/contractor.

Clause 44. In the event of acceptance of Lowest Rate, no multiple Lowest Rates will be considered for acceptance by the Department. In such cases, the Tender will be cancelled.

Clause 45. In the event of conflicting different clauses,the clauses in the e-NIT will prevail.

Clause 46. Engineer-in-Charge shall not entertain any claim whatsoever from the Contractor for payment of compensation on account of idle labour on such grounds including non-possession of encumbrance free land.

Clause 47. Engineer-in-Charge shall not be held liable for any compensation due to machines becoming idle or any circumstances including untimely rains, other natural calamities, like strikes etc.

Clause 48. Imposition of any Duty/Tax/Octroi/Royalty etc. whatsoever of its nature (after work order / commencement and before final completion of the work) is to be borne by the contractor/bidder. Original challan of those materials, which are procured by the bidder, may be asked to be submitted for verification.

Clause 49. Cess @ 1% or as amended time to time of the cost of construction works shall be deducted from the Gross value of all Works Bill in terms of Finance Department order. Also it is instructed to register his/her establishment under the Act, with the competent registering Authority, i.e. Assistant Labour Commissioner / Deputy Labour Commissioner of theregion.

Clause 50. No Mobilization/Secured Advance will be allowed unless specified otherwise in thecontract.

Clause 51. Valid PAN issued by the Income Tax Department, Government of India, valid 15 digit Goods and Services Tax Payer Identification Number (GSTIN) under GST Act 2017, Cess, Royalty of Sand, Stone Chips, Stone Metal Gravel, Boulders, Forest product etc., Toll Tax, Income Tax, Ferry Charges and other Local Taxes, if any, are to be paid by the Contractor/Bidder. No extra payment will be made as a reimbursement or as compensation for these. The rates of supply and finished work items are inclusive of these taxes andcharges.

Clause 52. All working Tools & Plants, Scaffolding, Construction of Vats & Platforms and arrangement of Labour Camps will have to be arranged by the Contractor at his/her own cost.

Clause 53. The Contractor shall supply Mazdoors, Bamboos, Ropes, Pegs, Flags etc. for laying out the work and for taking and checking measurements for which no extra payment will bemade.

Clause 54. The Contractor/Bidder should see the site of works and Tender Documents, Drawings etc. before submitting e-Tender and satisfy himself/herself regarding the condition and nature of works and ascertain difficulties that might be encountered in executing the work, carrying materials to the site of work, availability of drinking water and

other human requirements & security etc. Work on river banks may be interrupted due to a number of unforeseen reasons e.g. sudden rises in water levels, inundation during flood, inaccessibility of working site for carriage of materials. Engineer-in Charge may order the contractor to suspend work that may be subjected to damage by climate conditions. No claim will be entertained on this account. There may be variation in alignment, height of embankment or depth of cutting, location of revetment, structures etc. due to change of topography, river condition and local requirements etc. between the preparation and execution of the scheme for which the tendered rate and contract will not stand invalid. TheContractorwillnotbeentitledtoanyclaimorextrarateonanyoftheseaccounts.

Clause 55. A machine page numbered Site Order Book (with triplicate copy) will have to be maintained at site by the Contractor and the same has got to be issued from the Engineer-in-Charge before commencement of work. Instructions given by inspecting officers not below the rank of Assistant Engineer will be recorded in this book and the contractor must note down the action to be taken by him in this connection as quickly as possible.

Clause 56. The work will have to be completed within the time mentioned in the e-NIT. A suitable Work Programme based on time allowed for completion of work as per e-NIT is to be submitted by the contractor within 7 (seven) days from the date of receipt of work order which should satisfy the time limit of completion. The contractor should inform in writing, within 7 (seven) days from the date of receipt of work order, the names of his authorized representatives who are to remain present at site daily during work execution who will receive instructions of the work, sign measurement book, bills and other Government papersetc.

Clause 57. No compensation for idle labour, establishment charge or on other reasons such as variation of price indices etc. will be entertained.

Clause 58. All possible precautions should be taken for the safety of the people and work force deployed at worksite as per safety rule in force. Contractor will remain responsible for his labour in respect of his liabilities under the Workmen's Compensation Act etc. He must deal with such cases as promptly as possible. Proper road signs as per PWD practice or any other sign board for safety purpose as per requirement by the concerned Administrative Department will have to be erected by the Contractor at his own cost while operating in publicthoroughfares.

Clause 59. The Contractor will have to maintain qualified technical employees and/or Apprentices at site as per prevailing Apprentice Act or as stipulated in the contract.

Clause 60. The Contractor will have to accept the Work Programme as per modifications and priority of work fixed by the Engineer-in-Charge so that most vulnerable reach and/or vulnerable items are completed before impending monsoon or rise in river flood water level or for other suitable reasons.

Clause 61. Quantities of different items of work mentioned in the tender schedule or in work order are only tentative. In actual work, these may vary considerably. Payment will be made on the basis of works actually done in different items and no claim will be entertained for reduction of quantities in some items or for omission of some items. For execution of quantitative excess in any item or supplementary new items of work as decided by the Department, approval of the Superintending Engineer / Chief Engineer / Government would be required, depending on whosoever be the Tender Accepting Authority, before making suchpayment.

Clause 62. In order to cope up with the present system of e-billing, supply of departmental materials is generally not allowed. However, if in special circumstances, Departmental materials may be issued to the Contractor/Bidder to the extent of requirements as assessed, those may be recovered from the Running Account Bill and/or Final Bill, asapplicable.

Clause 63. Any material brought to site by the contractor is subject to approval of the Engineer-in-Charge. The rejected materials must be removed by the contractor from the site at his own cost within 24 hours of issue of the order to that effect. The rates in the schedule are inclusive of cost and carriage of all materials to worksite. The materials will havetobesuppliedinphasewithdueintimationtotheAssistantEngineerconcernedin

conformity with the progress of the work. For special type of materials, i.e. Geo Synthetic Bags, HDPE Bags, Geo Textile Filter, Geo Jute Filter etc., if any, relevant Data Sheet containing the name of the Manufacturers, Test Report etc. will also be submitted on each occasion. Engineer-in-Charge may conduct independent test on the samples drawn randomly before according approval for using the materials at site. In this regard decision of Engineer-in-Charge shall be final andbinding.

Clause 64. For all items of contract jobs requiring skilled labour, the contractor shall have to employ 70% (Seventy Percent) of skilled labour locally. In case the Contractor fails to recruit skilled local labour, the Contractor shall employ skilled labour locally secured by Government in the manner indicated above. For bridge works, highly technical works of labour, the contractor may, with the prior permission in writing of the Engineer-in-charge to whom full facts must be placed for such permission, import and employ skilled labour up to 30% (Thirty Percent) of the total requirement. In this case the expression "Imported labour" shall mean "labour imported primarily from other States and secondarily, from the distant districts of the State of West Bengal." In case where the contactor fails to secure unskilled local labour or to engage imported labour, the contractor shall employ labour locally recruited by Government or labour imported by Government at the rate to be decided by the Superintending Engineer of the works concerned, whose decision as to the circumstances in which employment of such labour is of mutual advantage to Government andthecontractor,willbefinalandbindingontheparties.

Clause 65. All queries and disputes arising out of the works tender contract is to be brought to the notice of the Chairman of the 'Department Dispute Redressal Committee' in writing for decision within 15 days.

Clause 66. The contractor shall have to make his own arrangements for water, both for the work and use by his workers, etc., for road rollers and for all tools and plant, etc., required on thework.

Clause 67. Contractor will be responsible for the payments of all water charges payable to the Corporation Municipality / Panchayat or any other water works authority including a Government Department concerned.

Clause 68. If the contractors shall desire an extension of the time for completion of the work under clause 5 of the contract, no application for such extension will be entertained if it is not received in sufficient time to allow the Executive Engineer to consider it and the Contractor will be responsible for the consequences arising out of his negligence in this respect.

Clause 69. The Contractor will have to leave ducts in walls and floors to run conduit or cables, where necessary, and he will not be entitled to any extra payment on this account.

Clause 70. Contractors in the course of their work should understand that all materials obtained in the work of Dismantling, Excavation, etc., will be considered Government property and will be disposed of to the best advantage of Government.

Clause 71. In case of very special case of circumstances, if any Departmental materials are issued, there may be delay in obtaining the materials by the Department and the Contractor is, therefore, required to keep himself/herself in touch with the day to day position regarding the supply of materials from the Engineer-in-charge and to so adjust the progress of the work that his labour may not remain idle nor may there be any other claim due to or arising from delay in obtaining the materials. It should be clearly understood that no claim whatsoever shall be entertained by the Department on account of delay in supplyingmaterials.

Clause 72. No compensation for any damage done by rain or traffic during the execution of the work will be made.

Clause 73. Whenever a work is carried out in municipal area, electric lights or electric danger signals whenever available shall be provided by the contractors on the barriers as well as paraffin lights. Facilities for the electric connection will be made by this Department but the Contractor will bear all the expenses.

Clause 74. The Contractor should quote through rate inclusive of cost of materials and carriage to place of working.

Clause 75. The Contractors should give complete specifications showing the method of execution and the quantity and quality of materials they intend to use per hundred square metre area.

Clause 76. In cases where water is used by the Contractor he will be required to deposit in advance with the Executive Engineer the charges for water which are to be calculated in accordancewiththescheduleofmiscellaneousratesintheCanalAct.

Clause 77. It must be clearly understood by the Contractor that no claim on account of enhanced rates on those already accepted, due to fluctuations arising out of any situation will be entertained during the currency of this contract for the work as per schedule attachedtotheagreementandtheadditionalwork,ifany,underClause12ofthecontract.

Clause 78. In the event of emergency the Contractor will be required to pay his labour everyday and if this is not done, Government shall make the requisite payments as would have been paid by the contractor and recover the cost from the contractors.

INCONVENIENCE OF THE PUBLIC

Clause 79. The Contractor(s) shall not deposit material on any site which will seriously inconvenience the public. The Engineer-in-charge may require the Contractor(s) to remove any materials, which are considered by him to be a danger or inconvenience to the public orcausethemtoberemovedatthecontractor'scost.

Clause 80. The Contractor undertakes to have the site clean, free from rubbish to the satisfaction of the Engineer-in-charge. All surplus materials, rubbish etc. will be removed totheplacesfixedbytheEngineer-in-chargeandnothingextrawillbepaid.

Clause 81. The Contractor shall not allow any rubbish or debris to remain on the premises during or after repairs, but shall remove the same and keep the place neat and tidy during the progress of the work. The Engineer-in-charge may get the site premises cleared of debris etc. And recover the cost from the bill of the contractor, if the latter shows slackness in observing thisclause.

Clause-82. Construction materials brought at site shall not be stacked at random. The contractor shall stack all these materials as directed by the Engineer-in-charge.

INTERPRETATION OF CLAUSES

Governor means the Governor of the State of West Bengal and his/her successors.

The Government means Government in the concerned Works Department.

The Department means the Secretary of the concerned Department or his/her authorized representative.

The Divisional Officer means the Executive Engineer of the concerned Works Department for the time being of the Division concerned, also identified as the Engineer-in-Charge.

The Sub-divisional Officer means the Assistant Engineer of the concerned Works Department for the time being of the Sub-division concerned. Junior Engineer equivalent to Section Officerof the Section concerned.

Superintending Engineer in the concerned works Department is the final Authority regarding Schedule of Rates and also the acceptance of Non-scheduled item rates arrived on the basis of market rate analysis for supplementary items, and the authority for approval of Reduced Rates and Part Rates. He is also the Tender Accepting Authority for works of value above Rs. 45.00 lakh and up to Rs. 2.00 crore under existing delegated power.

Chief Engineer in the concerned Works Department is the technical head of the DirectorateandisalsotheTenderAcceptingAuthorityforallworksofvalueaboveRs.

2.00 crore. Excess work over individual items comprising theoriginal tender may be exceeded beyond 10% with the approval of concerned tender accepting authority andverified by the Superintending Engineer/ Chief Engineer subject to the total value of workupon completion is within the technically sanctioned cost and that there is no major deviation from original scope of work in the tender. **Any supplementary tender/item/work in connection with the main tender is to be taken up with the approval of the Tender Accepting Authority not below the rank of Executive Engineer**. Such supplementary tenders above 10% of BOQ are to be executed only withtheapprovalofappropriateGovernmentirrespectiveofthevalueoftender.

Words importing the singular number only include the plural number and vice versa.

Irrespective of the accepting authority, Divisional officer shall be the authority signing agreement for all tenders of value more than Rs. 3.00 lakh up to any amount on behalf of theState.

Schedule showing (approximately) materials to be supplied by the Engineer-in-Charge under clause 10:

Particulars	Rates at which the materials will be charged to the contractor			Place of delivery
	Unit	**Rs.**	**P.**	

Note 1- The person or firm submitting the tender should see that the rates in the above schedule are filled up by the Engineer-in-charge on the issue of the form prior to the submission of the tender.

(Name in full)
*Signature of Contractor/Agency
with official seal containing
Principal office address

(Name in full)
*Signature of Executive
Engineer/Assistant Engineer
on behalf of the Governor of the
State of West Bengal with officialseal
containing designation &address

* To be authenticated on each and every page of the contract document by all parties.