



Request for Proposal (RFP)

For

Clearing the existing legacy waste and current waste on daily basis, Construction of Material Recovery Facility, waste processing, scientific landfill, leachate treatment plant and providing digital monitoring mechanism at Kankaity in Bhagalpur with Operation & Maintenance for five years on Engineering, Procurement & Construction (EPC) basis

Under

SMART CITY MISSION (SCM)

in Bhagalpur, Bihar

Issued By:

**Chief Executive Officer, Bhagalpur
Smart City Limited**

DISCLAIMER

The information contained in this Request for Proposal (“RFP”) document or subsequently provided to bidders, verbally or in documentary or any other form by or on behalf of the Bhagalpur Smart City Limited (here forth referred to as BSCL in this document) or any of its employees or advisers, is provided to bidders on the terms and conditions set out in this RFP and such other terms and conditions subject to which such information is provided.

This RFP is not an agreement and is not an invitation by the Employer to the prospective Consultants or any other person. The purpose of this RFP is to provide interested bidders with information that may be useful to them in the formulation of their Proposals pursuant to this RFP. This RFP includes statements, which reflect various assumptions and assessments arrived at by the Employer in relation to the Consultancy. Such assumptions, assessments and statements do not purport to contain all the information that each bidder may require. This RFP may not be appropriate for all persons, and it is not possible for the Employer, its employees or advisers to consider the objectives, technical expertise and particular needs of each party who reads or uses this RFP. The assumptions, assessments, statements and information contained in this RFP, may not be complete, accurate, adequate or correct. Each bidder should, therefore, conduct its own investigations and analysis and should check the accuracy, adequacy, correctness, reliability and completeness of the assumptions, assessments and information contained in this RFP and obtain independent advice from appropriate sources. Information provided in this RFP to the bidder (consultant/contractor/developer/Manufacturer/Supplier etc.) is on a wide range of matters, some of which depends upon interpretation of law. The information given is not an exhaustive account of statutory requirements and should not be regarded as a complete or authoritative statement of law. The Employer accepts no responsibility for the accuracy or otherwise for any interpretation or opinion on the law expressed herein.

The BSCL and its employees and advisers make no representation or warranty and shall have no liability to any person including any bidder under any law, statute, rules or regulations or tort, principles of restitution or unjust enrichment or otherwise for any loss, damages, cost or expense which may arise from or be incurred or suffered on account of anything contained in this RFP or otherwise, including the accuracy, adequacy, correctness, reliability or completeness of the RFP and any assessment, assumption, statement or information contained therein or deemed to form part of this RFP or arising in any way in this Selection Process.

The BSCL also accepts no liability of any nature whether resulting from negligence or otherwise however caused arising from reliance of any bidder upon the statements contained in this RFP. The BSCL may in its absolute discretion, but without being under any obligation to do so, update, amend or supplement the information, assessment or assumption contained in this RFP. The issue of this RFP does not imply that the Employer is bound to select a bidder or to appoint the selected bidder, as the case may be, for the Consultancy and the BSCL reserves the right to reject all or any of the Proposals without assigning

any reasons whatsoever.

The bidder shall bear all its costs associated with or relating to the preparation and submission of its Proposal including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by the BSCL or any other costs incurred in connection with or relating to its Proposal.

All such costs and expenses will remain with the bidder and the BSCL shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by a bidder in preparation or submission of the Proposal, regardless of the conduct or outcome of the Selection Process.

Sd/

Chief Executive Officer
Bhagalpur Smart City Limited

INSTRUCTIONS TO BIDDERS AND QUALIFICATION INFORMATION

INDEX

S.No	Section	Description	Page No.
		VOLUME –I	
1	Section -1	Invitation for Bid	6-15
2	Section -2	Instruction to Bidders	16-47
3	Section -3	Qualification Information & Other forms	48-57
4	Section -4	General Conditions of Contract	58-191
5	Section - 5	Special Conditions of Contract	192-198
6	Section - 6	Contract Data	199-202
		VOLUME – II	
7	Section - 7	Technical Specifications	203-261
		VOLUME – III	
8	Section - 8	Form of Bid	262-264
9	Section - 9	Price Bid	265-268
10	Section - 10	Securities & Other Forms	269-281
		VOLUME – IV	
11	Section – 11	Drawings	282-295
		VOLUME – V	
12	Section - 12	Documents to be furnished by Bidder	296-302

VOLUME-I

SECTION 1

INVITATION FOR BID (IFB)

NIT No:		BSCL/ISWM/2020/23
1.	(a) Name of the work	Clearing the existing legacy waste and current waste on daily basis, Construction of Material Recovery Facility, waste processing, scientific landfill, leachate treatment plant and providing digital monitoring mechanism at Kankaity in Bhagalpur with Operation & Maintenance for five years on Engineering, Procurement & Construction (EPC) basis
	(b) Scope of Work	Clearing the existing legacy waste and current waste on daily basis, Construction of Material Recovery Facility, Construction of Processing Sheds, Landfill & other infrastructure, Procurement, Installation and Commissioning of Compost Plant Machineries, scientific landfill, leachate treatment plant and providing digital monitoring mechanism at Kankaity (Jagdishpur) in Bhagalpur with Operation & Maintenance in defect liability period of five years on Engineering, Procurement & Construction (EPC) basis
2.	Mode of Bid Submission	e-tendering (http://www.eproc.bihar.gov.in)
3.	Estimated Cost (Rs.)	Rs.30.46 Crores (Rupees Thirty Crore Forty-Six Lakh only)
4.	Online Tender Fee	https://www.eproc.bihar.gov.in/
5.	EMD/Bid Security	As per NIT. (The EMD/Bid Security should be submitted in the form of Demand Draft/Bank Guarantee drawn in favour of “Chief Executive Officer, Bhagalpur Smart City Limited” payable at Bhagalpur.)
6.	Tender Document Fee	As per NIT
7.	Date / Time of Publication of Tender on e-Proc Website	As per NIT
8.	Last Date / Time of for Bid Submission	As per NIT
9.	Last Date / Time of Submission of Tender Fee & EMD	As per NIT
10.	Date of Bid Opening	As per NIT
11.	Bid Submission Address	Bhagalpur Smart City Limited, Municipal Corporation, Court Compound, Bhagalpur – 812001

Note: Only e-Tenders shall be accepted.

Further details are available on Bihar Government e-Procurement website and select Bhagalpur Smart City and can be seen on the website <http://www.eproc.bihar.gov.in>

Sd/-
Chief Executive Officer
BSCL, Bhagalpur

Instructions to Bidders for Online Submission of Bids

Detailed instructions & documents to be furnished for online bidding:

1. Guidelines for online submission of bids can be downloaded from the website <http://www.eproc.bihar.gov.in>
2. Bidders in order to participate in the online bidding process have to get 'Digital Signature Certificate (DSC)' as per Information Technology Act-2000. This Certificate will be required for digitally signing the bid. Bidders can get the above mentioned digital signature certificate from any vendor approved by Controller of Certifying Authorities (CCA). Bidders, who already possess valid Digital Certificates, need not procure new Digital Certificate.
3. Bidders should submit their bids online in electronic format with digital signature. Bids without Digital Signature will not be accepted. No proposal will be accepted in physical form.
4. Bids will be opened online as per time schedule mentioned in the Invitation for Bids (IFB).
5. Bidders should be ready with the scanned copies of cost of documents & bid security as specified in the tender document. Before submission of bids online, bidders must ensure that scanned copies of all the necessary documents have been attached with the bid.
6. Bidders should produce original Demand Draft /Bank Guarantee towards tender fee & bid security as mentioned in the Invitation for Bids (IFB) to the BSCL, Bhagalpur office during the period & time as mentioned in the IFB, failing which bid will not be accepted. The details of cost of documents, bid security specified in the tender documents should be the same as submitted online (scanned copies), otherwise bid will summarily be rejected.
7. The Department will not be responsible for delay in online submission of bids due to any reason, whatsoever.
8. All required information for bid must be filled and submitted online.
9. Other details can be seen in the bid documents.
10. Only online withdrawal or modification of bids, if any, in pursuance of relevant clauses of the SBD is acceptable.
11. Details of documents to be furnished for online bidding:

(Scanned copies of the following documents to be up-loaded in pdf format on the website <https://www.eproc.bihar.gov.in> in technical bid folder).

- i. Demand Draft towards Tender fee.
 - ii. Bid security (Bank Guarantee) in the form specified in Section-10 of SBD.
 - iii. Qualification information and supporting documents, as specified in Section-3. of SBD.
 - iv. Certificates, undertakings, affidavits as specified in Section-3 of SBD.
 - v. Any other information pursuant to Clause-4.3 of Section-2 ITB.
 - vi. Undertakings that the bid shall remain valid for the period specified in Clause- 15.1 of Section-2 ITB.
12. Scanned copies of the following documents are required to be uploaded on the website <http://www.eproc.bihar.gov.in> in financial bid folder:
- i. Form of bid as specified in Section-8 of SBD in pdf format.
 - ii. Duly filled Price Bid.
13. Uploaded documents of successful bidder will be verified with the original before signing of the agreement. The successful bidder should provide the originals to the concerned authority on receipt of such a letter in this regard, which will be sent through registered post or speed post or by e-mail or delivered by hand.
14. Each uploading shall be digitally signed by the bidder.

Sd/-
Chief Executive Officer
BSCL, Bhagalpur

INVITATION FOR BIDS (IFB)**NATIONAL COMPETITIVE BIDDING****NIT No. BSCL/ISWM/2020/23**

The undersigned, on behalf of the BSCL, Bhagalpur invites lump sum bids for the work mentioned in table below through e-Procurement from eligible Contractors, registered in appropriate class with Central/State Govt. Departments/CPSU/CPSE/State PSU's/Autonomous Bodies, Govt. of Bihar/Govt. of India or an entity incorporated under Indian Companies act or any appropriate law engaged in recycling and reprocessing of waste material/waste to energy/ municipal solid waste projects or any public sector undertaking either of central or of state engaged in recycling and reprocessing of waste material/waste to energy/ municipal solid waste projects can also participate. The bid shall be submitted online in the website <http://www.eproc.bihar.gov.in>. The bidder(s) should have necessary portal enrolment with their own Digital Signature Certificate:

Sl. No.	Name of the work	Approximate value of work (Rs.)	Bid Security* (Rs.)	Cost of Document	Period of Completion
1	2	3	4	5	6
1	Clearing the existing legacy waste and current waste on daily basis, Construction of Material Recovery Facility, waste processing, scientific landfill, leachate treatment plant and providing digital monitoring mechanism at Kankaity in Bhagalpur with Operation & Maintenance for five years on Engineering, Procurement & Construction (EPC) basis	Rs.30.46Crores (Rupees Thirty Crore Forty Six Lakh only)	As per NIT	As per NIT	12 Months

2. Scope of work:

1.0 Clearing the existing legacy waste and current waste on daily basis, Construction of Material Recovery Facility, waste processing, scientific landfill, leachate treatment plant and providing digital monitoring mechanism at Kankaity (Jagdishpur) in Bhagalpur with Operation & Maintenance in defect liability period of five years on Engineering, Procurement & Construction (EPC) basis. Broader scope of work not limited to include the following

- Screening and Biomining of old dumped waste at Kankaity (Jagdishpur)
- Construction of Material Recovery Facility at Kankaity (Jagdishpur)
- Construction of Processing Sheds, Landfill & other infrastructure
- Procurement, Installation and Commissioning of Compost Plant Machineries
- Electrical Works
- Development of Water supply facility
- Procurement, Installation and Commissioning of Leachate Treatment Plant (60 KLD)
- Procurement of Composting & Landfill Vehicles
- Solar Roof Top on Processing plant shed
- ICT Hardware for Treatment & Disposal site
- Personnel Protective Equipments etc.

1.1 INTRODUCTION**1.2 About BSCL**

Bhagalpur Smart City Limited (BSCL) is the special purpose vehicle created under the Bhagalpur Municipal Corporation to deliver several Pan City and Area Based Development initiatives with a focus on both infrastructure and ICT advancements in the city and at strategic locations.

1.3 Introduction to Bhagalpur Smart City Project

The Ministry of Housing and Urban Affairs (MoHUA), Government of India (GoI) has initiated Smart Cities Mission (SCM), under which selected cities will be developed as smart cities with a focus on improving citizen services with ICT intervention. Smart Cities Mission is an urban renewal and retrofitting programme by the Government of India with a mission to develop 100 cities all over the country making them citizen friendly, sustainable and investment destination. Under the Smart City Scheme, Government has emphasized to improve the basic civic amenities of the cities on one hand and the provision of modern technological advances for ease of living on the other hand.

The Smart City Proposal for Bhagalpur envisions to implementing a number of projects categorized into Area Based Development (ABD) projects and Pan City components. The ABD projects focuses on physical infrastructure components,

whereas the Pan City components focuses on the ICT interventions in the city. To achieve Bhagalpur 's vision for a smart city, large numbers of measures are required to be implemented. Considering the priorities echoed by city stakeholders during the consultative process and practical feasibility, the main project umbrella initiatives shortlisted are:

- SUSHAASIT BHAGALPUR (Smart and Quality Governance)
- SAMRUDH BHAGALPUR (Promoting Tourism in Silk City of India)
- GATIMAAN BHAGALPUR (Enhanced public transport)
- SUDRID BHAGALPUR (A well-functioning, smart, and efficient city)
- SARVABHOUMIKVIKAS (Socially Inclusive Growth)

To bridge the gap and provide a society in line with the vision of inclusive growth the Smart City mission has been launched in India. The purpose of the Smart Cities Mission is to drive economic growth and improve the quality of life of people by enabling local area development and harnessing technology, especially technology that leads to Smart outcomes. Area based development will transform existing areas (retrofitting and redevelopment), including slums into better planned ones, thereby improving livability of the whole City. New areas (Greenfield) will be developed around city to accommodate the expanding population in urban areas. Pan-city development is oriented towards application of selected Smart Solutions to the existing city-wide infrastructure. Application of Smart Solutions will involve the use of technology, information and data to make infrastructure and services better and befitting with demand coming up in the next decades.

SUSHAASIT BHAGALPUR

Bhagalpur Municipal Corporation recognizes the importance of addressing the needs of a growing population and an expanding city. It would strive to make Bhagalpur 'a city for people' where continuous engagement of local government with citizens is institutionalized in the decision-making architecture. It would provide safe, accessible, and lively public spaces the city living experience and the river bank. Bhagalpur Municipal Corporation is committed to excellence in every sector, providing its staff opportunities of growth by learning and adopting state of the art technologies and methods to better their performance in every way. Its goal is to become financially self-sufficient and sustainable moving towards increased private investments and partnerships.

SAMRUDH BHAGALPUR

Promoting Tourism in Silk City of India: A historically and culturally significant city with ever- growing number of visitors, Bhagalpur Municipal Corporation is committed to preserve and promote its multi-faceted built heritage ranging from ancient Hindu rock-cut sculptures to Jain pilgrimage sites to archaeological remains of one of the biggest universities of Buddhist times to architecture from Mughal and British periods. Bhagalpur's identity and image as a culturally and historically significant place will be promoted on regional, national and international level. The

city will support regular religious festivals and celebrations and also design new city level events for residents and tourists. Bhagalpur will be the most visited place in Bihar in the years to come.

GATIMAAN BHAGALPUR

A well-connected city with enhanced public transport, BMC will develop multi-modal transport system and provide more intra and inter-city roadways and buses to ease people's arrival to the city. It will improve vehicular movement and decongest roads. It will encourage NMT and pedestrian safety. Intelligent Transport System to be adopted to improve mobility especially of public transport and IPT. The city will have greens links connecting places of different land use to enhance walk-ability.

SUDRID BHAGALPUR

A well-functioning, smart, and efficient city: Bhagalpur Municipal Corporation recognizes the current gaps in services especially Water supply, sanitation, SWM, and public transport. For a smoothly functioning city, new technology and ICT will be adopted. The power infrastructure will be robust and promote energy efficiency and use of renewable energy. The sub-goals are –

(i) Bhagalpur will not stop moving due to traffic jams; (ii) every resident and visitor to Bhagalpur will have access to clean drinking water; (iii) All streets will be clean and municipal waste will be treated and disposed scientifically; (iv) Every household will be connected to a functional sanitation system; (v) city will have robust IT enabled infrastructure; (vi) All power cables to be underground.

SARVABHOUMIKVIKAS

Socially Inclusive Growth: Bhagalpur will be more sensitive towards social infrastructure by improving quality of Health, Education, and Safety. All sections of society of Bhagalpur especially the old, children and differently-abled will be taken care of in design and development of projects. The city will put in efforts to alleviate urban poverty and increase livelihood opportunities. The city will provide liveable conditions for slum dwellers by up gradation of physical infrastructure. The informal sector will be regularized by providing basic infrastructure and facilities and formal vending zones.

- 2.** Period of availability of tenders online/date & time of bidding on-line/last date of seeking clarification/date of opening of tender papers are as given below –

Sl. No.	Procurement Officer	Place of Opening	Availability of tender on- line for bidding		Date & Time of opening of technical bid
			From	To	
1	2	3	4	5	6
1	Chief Executive Officer, BSCL, Bhagalpur	Bhagalpur Smart City Limited, Municipal Corporation, Court Compound, Bhagalpur -812001	As per NIT	As per NIT	As per NIT

3. Cost of bidding document for a non-refundable fee as indicated shall be in the form of Demand Draft of any **Nationalized or Scheduled Indian Bank**, payable at Bhagalpur in favour of “Chief Executive Officer”, Bhagalpur Smart City Limited.
4. Bids must be accompanied by Security amount specified for the work in the table, payable at Bhagalpur and drawn in favour of “Chief Executive Officer”, Bhagalpur Smart City Limited. Bid Security will have to be in any one of the forms as specified in the bidding document and shall have to be valid for 45 days beyond the validity of the bid.
5. Cost of bidding document and Bid Security shall be deposited in the office of the Chief Executive Officer, **BSCL, Municipal Corporation, Court compound, Bhagalpur, Bihar - 812001, on the time & date mentioned as per NIT by post / hand**. Only those applications will be entertained whose cost of bidding document and bid security is received on or before time & date mentioned as per NIT. BSCL will not be held responsible for postal delay, if any, in the delivery of the document or non-receipt of the same in BSCL.
6. Tenderer(s) shall upload Scanned copy in pdf format/Digitally Signed copy of his/her Valid DD, Bid Security, Credit Facility, GST, GST return upto January 2020, PAN, Five Years Audited Turnover, Five Years Income Tax Return, Work Experience, Partnership Deed or Article of Association / Memorandum, Undertakings, Affidavits, labour license, EPF and ESI registration failing which the bid shall be rejected. Bidder has to submit Demand Draft/Bank Guarantee, JV, Power of Attorney, Undertaking & Solvency Certificate in Original.
7. Uploaded documents of successful bidder will be verified with the original before signing the agreement. The successful bidder has to provide the originals to the concerned authority on receipt of such a letter, which can be sent through registered post or speed post or can be delivered by hand or email.
8. Bidders in order to participate in the bidding process have to get ‘Digital Signature Certificate (DSC)’ as per Information Technology Act-2000 to participate in online bidding. This certificate will be required for digitally signing the bid. Bidders can get

the above-mentioned digital Signature certificate from any approved vendors (CCA). Bidders, who already possess valid Digital Certificates, need not procure new Digital Certificate.

9. Bidders have to submit their bid online in electronic format with Digital Signature. Bids without Digital Signature will not be accepted.
10. The work shall have to be completed in time, failing which penalty for non-completion of work in time shall be imposed, as stated in the Bid Document. Please note that there is a provision of Bonus for early completion of work.
11. Bidders who have rescind work in any department / PSU shall not be eligible to participate in the bidding process.
12. Bidders shall provide their Banker's contact details, so that BSCL can contact the Bank, if required.
13. If any work is awarded to a bidder after submission of bid to BSCL, his bid capacity shall be reduced by that bid amount as indicated in Para 1.4 of Qualification Information & Other Forms (Section-3 of ITB).
14. Successful bidder shall have to take all necessary approvals and clearances from the competent authority such as Ministry of Environment and Forest (MoEF)/ Central Pollution Control Board/ State Pollution Control Board etc.
15. Successful bidder will have to submit "As Built Plan" in color print showing all Design and document the overall operational architecture of the Solid Waste Management as per the scope etc. after completion of the work in 5 hard (coloured) and 1 soft copy for reference in future, failing which the amount to be withheld from the final payment to supply "as built" drawings by the date required is Rs 10.00 lakhs for projects up to Rs 50 crores, and additional Rs 0.15 lakhs for every 1 crore increment in project cost thereafter, with upper limit of Rs 50 lakhs.
16. Other details can be seen in the bidding documents.

Sd/-
Chief Executive Officer BSCL,
Bhagalpur

SECTION 2

INSTRUCTIONS TO BIDDERS

(ITB)

Instructions to Bidders

INDEX

S. No.	Clause	Page No.
A.	General	19
1	Scope of Bid	19
2	Source of Funds	19
3	Eligible Bidders	19
4	Qualification of Bidder	19-25
5	One Bid per Bidder	26
6	Cost of Bidding	26
7	Site visit	26
B.	Bidding Documents	27
8	Content of Bidding Documents	27
9	Clarification of Bidding	27-28
10	Amendment of Bidding Documents	28
C.	Preparation of Bids	29
11	Language of Bid	29
12	Documents Comprising the Bid	29-30
13	Bid Prices	31
14	Currencies of Bid and Payment	31
15	Bid Validity	31
16	Bid Security	32
17	Alternative Proposals by Bidders	33
18	Format and Signing of Bid	33

S. No.	Clause	Page No.
D.	Submission of Bids	33
19	Method Of Submission	33
20	Deadline of Submission of Bids	33
21	Late Bids	33
22	Modification and Withdrawal of Bids	34
E.	Bid Opening and Evaluation	35
23	Bid Opening & Evaluation of Bids	35
24	Process to be Confidential	36
25	Clarification of Financial Bids	36
26	Examination of Bids and Determination of Responsiveness	36-37
27	Correction of Errors	37
28	Evaluation and Comparison of Financial Bids	37-38
F.	Award of Contract	39
29	Award Criteria	39
30	Employer's right to Accept any Bid and reject any Bid	39
31	Notification of Award and Signing of Agreement	39-40
32	Performance Security	40
33	Advance Payment and Security	40
34	Corrupt or Fraudulent Practices	40
35	Dispute Resolution	41

A. GENERAL

1. Scope of Bid

- 1.1 The Employer (named in appendix to ITB) invites bids for the construction of works (as defined in these documents and referred to as “the works”) detailed in the table given in IFB. The bidders need to submit bids for entire work detailed in the table given in IFB as the work is to be executed in Engineering Procurement and Construction (EPC) Mode.
- 1.2 In this EPC project, cost of the project given in the documents is only indicative and bidders should submit their bid amount with regard to the entire work including survey, investigation, collection of data, planning, design & drawing and execution as per the scope as indicated above complete in all respect internal and external finish etc., approval of the same from competent authorities (BSCL) for the entire project and construction of the project according to approved design & drawing.
- 1.3 The successful bidder will be expected to complete the works by the intended completion date specified in the Contract data.
- 1.4 Throughout these bidding documents, the terms ‘bid’ and ‘tender’ and their derivatives (bidder/ tenderer, bidding/tendering, etc.) are synonymous.

2. Source of Funds

The expenditure on this project will be met from fund allocated to Bhagalpur Smart City Limited from Govt. of Bihar & Govt. of India under Smart City Mission.

3. Eligible Bidders

- 3.1 This invitation for Bids is open to all bidders as mentioned in IFB.
- 3.2 All bidders shall provide in Section 3, Forms of Bid and Qualification Information, a statement in para 1.12, that the Bidder is neither associated, nor has been associated, directly or indirectly, with the Consultant or any other entity that has prepared the tender design, specifications and other documents for the Project or being proposed as Project Manager for the Contract. A firm that has been engaged by the Employer to provide consulting services for the preparation or supervision of the works, and any of its affiliates, shall not be eligible to bid.

4. Qualification of the Bidder

- 4.1 All bidders shall provide in Section 3, Forms of Bid and Qualification Information, a preliminary description of the proposed work method and schedule, including drawings and charts, as necessary. The proposed methodology should include programme of construction along with

equipment planning and deployment duly supported with broad calculations and quality assurance procedures proposed to be adopted justifying their capability of execution and completion of work as per technical specifications, within stipulated period of completion.

4.2 Deleted.

4.3 All bidders shall include the following information and documents with their bids in Section 3:

- a) copies of original documents defining the constitution or legal status, place of registration, and principal place of business; written power of attorney of the signatory of the Bid to commit the Bidder;
- b) total value of similar nature of work performed for each of the last five years (presently between 2014-2015 and 2018-2019).
- c) experience in similar works means:
Installation & commissioning of plant and machinery of municipal solid waste (MSW) of capacity 100 Tons Per Day (TPD)

And

Bidder should have experience in construction of at least one sanitary land fill site for 100 Tons Per Day (TPD) MSW.

Or

Bidder should have experience of installation and commissioning of at least one leachate treatment plant of 30 KLD complete in all respect.

- d) major items of computers, tablets, application software etc. proposed to carry out the Contract;
- e) qualifications and experience of key site management and technical personal proposed for Contract;
- f) reports on the financial standing of the Bidder, such as profit and loss statements and auditor's reports for the last five years, income tax return (ITR) details for the last five years (presently between 2014-2015 and 2018-2019);
- g) evidence of access to line (s) of credit and availability of other financial resources facilities (10% of contract value), certified by the approved Bankers (not more than 3 months old)
- h) undertaking that the bidder will be able to invest a minimum cash up to 25% of contract value of work, during implementation of work.
- i) authority to seek references from the Bidders' bankers;
- j) self-attested copy of information regarding any litigation, current or during the last five years, in which the Bidder is involved, the parties' concerned, and disputed amount;
- k) proposals for subcontracting components of the works amounting

to more than 10 percent of the Bid Price shall not be permitted.

- l) the proposed methodology and programme of Design and document the overall operational architecture of the Solid Waste Management showing Clearing the existing legacy waste and current waste on daily basis, Construction of Material Recovery Facility, waste processing, scientific landfill, leachate treatment plant and providing digital monitoring mechanism along with Operation & Maintenance in defect liability period of five years on Engineering, Procurement & Construction (EPC) basis. quality control procedures proposed to be adopted, justifying their capability of execution and completion of the work as per scope within the stipulated period of completion as per milestones.

4.4 Joint ventures is acceptable.

4.4.1 Joint Venture partners would be limited to **three** (including the lead partner)

4.4.2 One of the partners, who is responsible for performing a key in contract management (Lead Partner of the JV) or is executing a major component of the proposed contract, shall be nominated as being in charge during Bidding periods and in the event of successful Bid, during contract execution. The partner in charge shall be authorized to incur liabilities and receive instructions for and on behalf of the partner(s) of the Joint Venture. This authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all partners.

4.4.3 Both the partners of Joint Ventures shall be, jointly and severally liable, during the Bidding process and for the execution of the contract in accordance with the contract terms, and a statement of this affect shall be included in the authorization. The Bid shall be signed so as to legally bind all the partners, jointly and severally. Bid security and performance guarantee, as required, will be furnished by the Lead Partner OR jointly.

4.4.4 Qualifying criteria for Joint Venture – Joint venture will be permitted for projects costing any amount.

Joint Venture must comply with the following requirements: -

- a) **The Joint Venture must satisfy collectively the criteria for this purpose. The following data of each member of the Joint Venture may be added together to meet the collective qualifying criteria.**

I. Annual Turnover (Cl. 4.5 (A) (a) of ITB Section-2)

- II. Particular Project Experience. (Cl. 4.5 (A) (b) of ITB Section-2)
- III. Capabilities of computers, tablets, application software etc.. (Annexure I of Section-2)
- IV. Personal Capabilities. (Annexure II of Section-2)
- V. Financial Capabilities [Cl.4.3(g) & Cl.4.3(h) of ITB Section-2]

b) The Lead partner shall meet the following qualifying criteria in proportion to the partnership in JV but not less than 50%.

- (i) Annual Turnover. (Cl. 4.5 (A) (a) of ITB Section-2)
- (ii) Particular Project Experience. (Cl. 4.5 (A) (b) of ITB Section 2)
- (iii) Financial Capabilities. [Cl. 4.3 (g) & 4.3 (h) of ITB Section 2]

c) Other partner shall meet the following qualifying criteria in proportion to the partnership in JV but not less than 25%.

- I. Annual Turnover. (Cl. 4.5 (A) (a) of ITB Section 2)
- II. Particular Project Experience. (Cl. 4.5 (A) (b) of ITB Section 2)
- III. Financial Capabilities. [Cl. 4.3 (g) & 4.3 (h) of ITB Section 2]

4.4.5 A copy of the Joint Venture Agreement (JVA) entered into the between the partner shall be submitted with the application. Alternatively, a letter of Intent to execute a JVA in the event of successful Bid shall be signed by all partner(s) and submitted with the application together with a copy of the proposed agreement. The JVA shall include among other things a Joint Venture's objectives and proposed management structure, the contribution of each partner to the Joint Venture operation, the commitment of the partner to Joint Venture in the event of the default or withdrawal of any partner an arrangement for providing the required indemnities:

- I. Stepping into the shoes of the existing partner(s) of JV with all liabilities of the existing partners from the beginning of the contract.
With the prior approval of the employer.
- II. Notwithstanding demarcation or allotment of work between two JV partner(s), JV shall be liable for non-performance of the whole contract irrespective of their demarcation or shared of work.

In case of successful Bid being accepted by employer the payments under the contract will only be made to the JV not to the individual partner(s).

4.4.6 Joint Venture Agreement shall contain a Clause to the effect that there shall be a separate JV Bank Account (distinct from the Bank Account of the

individual partners) to which the individual partner shall contribute their share / or working capital.

Joint Venture Agreement shall also contain a Clause to the effect that the financial obligations of the JV shall be discharged through the said JV Bank Account only and

also all the payments received or paid by the employer by the JV shall be through that Account alone.

4.5 A. To qualify for award of the contract, each bidder in its name must have in the last five years as referred to in Appendix.

- a) The contractor/ firm must have achieved a minimum annual financial turnover equal to **50% of estimated cost** (in all classes of similar nature of works only) in any one financial year during last five completed financial years (presently between 2014-2015 to 2018-2019) up to the time of submission of bid in the current financial year.
- b) The contractor/firm must have satisfactorily completed as a prime contractor at least one similar work of value not less than **50% of estimated value of contract during last five completed financial years** between 2014-15 to 2018-19 (work of 90% or more of contract value executed will be taken as completed work) up to the time of submission of bid in the current financial year.

experience in similar works means:

Installation & commissioning of plant and machinery of municipal solid waste (MSW) of capacity 100 Tons Per Day (TPD)

And

Bidder should have experience in construction of atleast one sanitary land fill site for 100 Tons Per Day (TPD) MSW.

Or

Bidder should have experience of installation and commissioning of atleast one leachate treatment plant of 30 KLD complete in all respect.

Even though the bidder meets the above qualifying criteria, he is subject to be disqualified, if he has made a misleading or false representation(s) in the forms, statements and attachments in proof of the qualifying requirements.

- (c) The contractor or his identified sub-contractor should possess required valid electrical license for executing the electrification works and should have executed any electrical works for a minimum amount of 55 lakh in any one

year between 2014-15 to 2018-19.

- (d) The contractor or his identified sub-contractor should have executed any water supply/sanitary Engineering works for a minimum amount 5 lakh in any one year between 2014-15 to 2018-19.
- (e) Deleted

B. Each bidder should further demonstrate

- a) availability (either owned or leased or by procurement against mobilization advances) of the key and critical equipment for this work given in Annexure-I of section-2 which is indicated for this EPC work based on the studies, carried out by client equipment to attain the completion of works in accordance with the prescribed design and development schedule.

The bidders should, however, undertake their own studies and furnish with their bid, a detailed planning and methodology supported with layout and necessary drawings and calculations (detailed) as per their experience provided in clause 4.3(C) above in order to allow the employer to review their proposals. The numbers, types and capacities of each equipment shall be shown in the proposals along with the cycle time for each operation for the given production capacity to match the requirements.

- b) Availability of personnel for this work with adequate experience as required; as per Annexure-II of Section-2.
- c) liquid assets and/or availability of credit facilities of no less than amount indicated in para 5 of Appendix to ITB (Section-2) (credit lines/letter of credit/certificates from Banks for meeting the funds requirements etc.-usually the equivalent of the estimated cash flow for 3 months in peak construction period.)

C. To qualify for a package of contracts made up of this and other contracts for which bids are invited in the IFB, the bidder must demonstrate having experience and resources sufficient to meet the aggregate of the qualifying criteria for the individual contracts.

4.6 Sub-contractors' experience and resources shall not be taken into account in determining the bidder's compliance with the qualifying criteria.

4.7 Bidders who meet the minimum qualification criteria will be qualified only if their available bid capacity is more than the total bid value. The available bid capacity will be calculated as under:

$$\text{Available Bid capacity} = (A \times 3 \times N - B)$$

where,

A = Maximum value of similar nature of works executed in any one year during the last five financial years between 2014-15 and 2018-19 (updated to the price level of the year indicated in para 15 of Appendix to ITB) taking into account the completed as well as works in progress.

N = Number of years prescribed for completion of the works for which bids are invited up to two place of decimals.

B = Value (updated to the price level of the year as indicated in para 15 of Appendix to ITB) of existing commitments and ongoing works to be completed during the next 12 months.

Note:

1. The statements showing the value of existing commitments and on-going works as well as the stipulate period of completion remaining for each of the works listed should be countersigned by the Engineer in charge, not below the rank of Executive Engineer or equivalent.
 2. Escalation factor (for computing common base value for works completed) is given in para 15 of Appendix to ITB.
- 4.8 Even though the bidders meet the above qualifying criteria, they are subject to be disqualified, if they have:
- made misleading or false representations in the forms, statements and attachments in proof of the qualification requirements; and/or
 - record of poor performance such as abandoning the works, not properly completing the contract, inordinate delays in completion, litigation history, or financial failures etc.

5. One Bid per Bidder

5.1. Each bidder shall submit only one bid for one package. A bidder who submits or participates in more than one Bid (other than as a subcontractor or in cases of alternatives that have been permitted or requested) will cause all the proposals with the Bidder's participation to be disqualified.

6. Cost of Bidding

6.1 The bidder shall bear all costs associated with the preparation and submission of his Bid, and the Employer will in no case be responsible and liable for those costs.

7. Site Visit

7.1 The Bidder, at the Bidder's 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 construction of the works. The costs of visiting the Site shall be at the Bidder's own expense.

7.2 General Terms and Conditions for E-tendering:

- a) The detail tender notice and Tender Document can be seen on website: <https://www.eproc.bihar.gov.in> and downloaded online from the Portal: <https://www.eproc.bihar.gov.in> by the Firms / Individual registered on the Portal.
- b) As the proposals are to be submitted online and are required to be encrypted and digitally signed, the Bidders are advised to obtain Digital Signature Certificate (DSC) at the earliest.
- c) The payment for Tender Document Fee shall be made by the bidder in the mode of Demand Draft in favour of "Chief Executive Officer, BSCL" and EMD shall be submitted in the form of DD/Bank Guarantee drawn in favour as mentioned above through the Nationalized/Scheduled bank only.
- d) The undersigned reserves the right to reject any or all the tenders without assigning any reason what so ever and no conditional and postal tenders will be accepted.
- e) If the date on which the tenders are to be received is declared a public holiday, the tender will be received on the next working day.
- f) The offer will remain valid up to 120 days from the due date of submission of tenders.
- g) Any amendment to a tender after opening of tender made by the tenderer according to his own will is liable to be ignored altogether and such tenderer will be debarred from tendering for a period of six months

Chief Executive Officer
Bhagalpur Smart City Limited
Bhagalpur (Bihar)

B. BIDDING DOCUMENTS

8. Content of Bidding Documents

8.1 The set of bidding documents comprises the documents listed below and addenda issued in accordance with Clause 10:

Section	Particulars	Volume No.
1	Invitation for Bids (IFB) including Instructions to Bidders for Online Submission of Bids	
2	Instruction to Bidders	I
3	Qualification Information and other forms	
4	General Conditions of contract – General and Special Conditions of Contract	
5	Special Conditions of Contract & Additional Conditions of Contract	
6	Contract Data	
7	Technical Specifications	II
8	Form of bid	III
9	Price Bid	
10	Securities and other forms	
11	Drawings	IV
12	Documents to be furnished by bidder	V

8.2. Documents to be furnished by the bidder in compliance to Section 2 will be prepared by him in two parts viz Part 1 – Technical Bid, Part 2- Financial Bid and furnished as Volume- V in two parts (refer clause 12).

8.3 The bidder is expected to examine carefully all instructions, conditions of contract, contract data, forms/ terms, technical specifications, price bid form, Annexes and drawings in the Bid Document. Failure to comply with the requirements of Bid Documents shall be at the bidder's own risk. Pursuant to clause 26 hereof, bids which are not substantially responsive to the requirements of the Bid Documents shall be rejected.

9. Clarification of Bidding Documents

9.1 Clarification of Bidding Refer to sub Clause 9.2 of IFB

9.2 Pre-bid meeting

9.2.1 The bidder or his official representative is invited to attend a pre-bid meeting which will take place at the address, venue, time and date as mentioned in NIT.

9.2.2 The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

9.2.3 The bidder may request a clarification on any clause of the RFP documents up to the Prebid query submission date and time indicated in the NIT.

Clarification should be submitted in the following table in excel format otherwise the queries shall not be entertained:

Sr. No.	RFP Page No.	Clause No.	Description as per RFP	Queries/ Suggestions

9.2.4 Minutes of the meeting, including the text of the questions raised (without identifying the source of enquiry) and the responses given will be transmitted without delay to all purchasers of the bidding documents. Any modification of the bidding documents listed in sub-Clause 8.1 which may become necessary as a result of the pre- bid meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant to Clause 10 and not through the minutes of the pre-bid meeting.

9.2.5 Non-attendance at the pre-bid meeting will not be a clause for disqualification of a bidder.

10. Amendment of Bidding Documents

10.1 Before the deadline for submission of bids, the Employer may modify the bidding documents by issuing addenda/corrigenda.

10.2 Any addendum/corrigendum thus issued shall form part of the bidding documents and shall be communicated in writing or by cable to all the purchasers of the bidding documents. Prospective bidders shall acknowledge receipt of each addendum in writing or by cable to the Employer. The Employer will assume no responsibility for postal delays.

10.3 To give prospective bidders reasonable time to take appropriate action in accordance to the addendum/corrigendum while preparing their bids, the Employer may, at his discretion, extend as necessary the deadline for submission of bids, in accordance with Sub-Clause 20.2 below.

C. PREPARATION OF BIDS

11. Language of the Bid

11.1 All documents relating to the bid shall be in English language.

12. Documents Comprising the Bid

12.1 The bid to be submitted by the bidder will be as Volume V of the bid document (refer Clause 8.1) and shall be in two separate parts viz part I and part II detailed below:

Part I shall be “Technical Bid” and shall comprise

- i. Bid security (Bank Guarantee etc.) in the form specified in Section 10.
- ii. Qualification Information and supporting documents as specified in Section 3.
- iii. Certificates, undertaking, affidavits as specified in Section 3.
- iv. Any other information pursuant to Clause 4.3 of these instructions.
- v. Undertakings that the bid shall remain valid for the period specified in Clause 15.1 of section -2

Part II shall be “Financial Bid” and shall comprise

- i. Form of Bid as specified in Section 8.
- ii. Price Bid as specified in Section 9

12.2 Priced Bid for whole work as specified in Section 9, read together with clause 19. The bidder shall submit bid online in the correct slot prescribed in the e-Procurement website by using digital signature.

12.3 Following documents, which are not submitted with the bid, will be deemed to be part of the bid.

Section	Particulars		Volume No.
1.	Invitation for Bids(IFB)		
2.	Instruction to Bidders		
3.	Qualification Information and other forms		
4 & 5.	Conditions of Contract (General and Special Conditions of Contract)		I
6.	Contract Data		
7.	Technical Specifications		II
8.	Form of Bid		III
9.	Price Bid		
10.	Securities and other forms		
11.	Drawings		IV

12.	Documents to be furnished by bidder	V
-----	-------------------------------------	---

12.4 Bidders have to submit their bids as per below instructions otherwise it may result in the rejection of the Bid;

Name of Documents	Content	Mode of Submission
RFP Document fee & Bid Security/ Earnest Money Deposit (EMD)	RFP Document Fee receipt Bid Security/Earnest Money Deposit (EMD) receipt in Original.	Both in Online and Hard Copy
All Declarations / Affidavit / Agreements / Authorisation	All Declarations / Affidavit / Agreements / Authorisation in Original.	Both in Online and Hard Copy
Qualification Bid	All the documents for Submission of the Qualification Bid, its sub sections and any other applicable documents as per RFP.	Online Only
Technical Bid	All the documents for Submission of the Technical Bid, its sub sections and any other applicable documents as per RFP.	Online only
Financial Bid	All the formats for Submission of the Commercial Bid, its sub sections and any other applicable documents as per RFP.	Online Only

13. Bid Prices

- 13.1 The contract shall be for the whole works as described in Sub-Clause 1.1 and table given in IFB (Section-1) as per the price bid.
- 13.2 The bidder shall fill in rates both in figure and words. In case of any difference, the rate quoted in words will be taken as the quoted rate.
- 13.3 All taxes including GST payable by the contractor under the contract, or for any other cause shall be included in Bid Price submitted by the Bidder.
- 13.4 The prices quoted by the bidder shall be fixed for the entire duration of the Contract and shall not be subject to adjustment on any account as this is a lump sum contract to be completed in a time bound manner.

14. Currencies of Bid and Payment

- 14.1 The unit rates and the prices shall be quoted by the bidder entirely in Indian Rupees. All payment shall be made in Indian Rupees.

15. Bid Validity

- 15.1 Bids shall remain valid for a period not less than 120 days after the deadline date for bid submission specified in Clause 20. A bid valid for a shorter period shall be rejected by the Employer as non-responsive. In case of discrepancy in bid validity period between that given in the undertaking pursuant to clause 12.1 (indicated as sl.no v of Part 1- Technical Bid) and the Form of Bid submitted by the bidder, the latter shall be deemed to stand corrected in accordance with the former and the bidder has to provide for any additional security that is required.
- 15.2 In exceptional circumstances, prior to expiry of the original time limit, the Employer may request that the bidders may extend the period of validity for a specified additional period. The request and the bidders' responses shall be made in writing or by cable. A bidder may refuse the request without forfeiting his bid security. A bidder agreeing to the request will not be required or permitted to modify his bid, but will be required to extend the validity of his bid security for a period of the extension, and in compliance with Clause 16 in all respects.
- 15.3 Bid evaluation will be based on the bid prices.

16. Bid Security

The Bidder shall furnish, as part of his Bid, a Bid security in the amount as shown in column 4 of the table of IFB for this particular work. This bid security shall be in favour of Employer as named in Appendix and may be in one of the following forms:

- a) Receipt in challan of cash deposit in the Government Treasury in India.
- b) Deposit-at-call receipt from any Nationalized/ Scheduled Indian Bank from any of the branches Nationalized / Scheduled Bank situated **within India, approved by the Reserve Bank of India.**
- c) Indian Post Office/Fixed Deposit/National Savings Certificates duly endorsed by the competent Postal Authority in India.
- d) Bank Guarantee from any from any Scheduled Indian Bank from any of the branches Nationalized / Scheduled Bank situated **within the territory of India** in the form given in Section 9.
- e) Fixed deposit receipt, a certified cheque or an irrevocable letter of credit, issued by any Nationalized/ Scheduled Indian Bank approved by the Reserve Bank of India.

16.1 Bank guarantees (and other instruments having fixed validity) issued as surety for the bid shall **be valid for 45 days beyond the validity of the bid.**

16.2 Any bid not accompanied by an acceptable Bid Security and not secured as indicated in Sub-Clauses 16.1 and 16.2 above shall be rejected by the Employer as non- responsive.

16.3 The Bid security of unsuccessful bidders will be returned within 28 days of the end validity period specified in sub-Clause 15.1.

16.4 The Bid security of the successful bidder will be discharged when the bidder has signed the Agreement and furnished the required Performance Security.

16.5 The Bid security may be forfeited

- a) if the Bidder withdraws the Bid after Bid opening during the period of Bid validity;
- b) if the Bidder does not accept the correction of the Bid Price, pursuant to Clause 27; or
- c) in the case of a successful Bidder, if the Bidder fails within the specified time limit to
 - i) sign the Agreement; or
 - ii) Furnish the required Performance Security.

17. Alternative Proposals by Bidders

- 17.1 Bidders shall submit offers that fully comply with the requirements of the bidding documents, including the conditions of contract (including mobilization advance or time for completion), basic technical design as indicated in the drawing and specifications. **Conditional offer or alternative offers will not be considered further in the process of tender evaluation.**

18. Format and Signing of Bid

- 18.1 The bidder shall submit the bids as per “Instructions to Bidders for Online Submission of Bids”.
- 18.2 Instruction to Bidders to be followed. Bids submitted online should be digitally signed by the bidder.
- 18.3 Bidders shall follow the Method of submission of bid as mentioned in Instruction to Bidders and Instructions to Bidders for Online Submission of Bids.

D. SUBMISSION OF BIDS

19. Method of Submission

- 19.1 Bidders shall follow the Method of submission as per Instructions to Bidders for Online Submission of Bids given in Section-1 (IFB) in so far this bid is considered whose identification is given in item no. 10 Appendix to ITB.

20. Deadline for Submission of the Bids

- 20.1 Bidders shall follow the Method of online submission of bid as mentioned in Instruction to Bidders (for EPC contract) in section-1 and the bid should be submitted online latest by the date and time given at item 12 Appendix to ITB.
- 20.2 The Employer may extend the deadline for submission of bids by issuing an amendment in accordance with Clause 10, in which case all rights and obligations of the employer and the bidders previously subject to the original deadline will then be subject to the new deadline.

21. Late Bids

- 21.1 Any Bid received by the Employer after the deadline prescribed in Clause 20 will be returned to the bidder.

22. Modification and Withdrawal of Bids

- 22.1.1 Bidders may modify or withdraw their bid(s) before the deadline prescribed in Clause 20 or pursuant to Clause 23.
- 22.1.2 Bidders shall follow the Method of submission modification & withdrawal of bid as mentioned in Instruction to Bidders (for SBD contract).
- 22.1.3 No bid may be modified after the deadline for submission of Bids except in pursuance of Clause 23.
- 22.1.4 Withdrawal or modification of a Bid between the deadline for submission of bids and the expiration of the original period of bid validity specified in Clause 15.1 above or as extended pursuant to clause 15.2 may result in the forfeiture of the Bid security pursuant to Clause 16.

E. BID OPENING AND EVALUATION

23. Bid Opening

23.1 The Employer will open all the Technical Bids submitted online including modification made pursuant to Clause 22, in the manner specified in Clause 20 and 23.3. In the event of the specified date of Bid opening being declared a holiday for the Employer, the Bids will be opened at the appointed time and location on the next working day. A notice for the same shall be posted on the website.

23.2 Evaluation of Bid

- i. Subject to confirmation of the bid security by the issuing bank, the bids accompanied with valid security will be taken up for evaluation with respect to the Qualification Information and other information furnished in Part I of the bid pursuant to ITB clause 12.1.
- ii. After receipt of confirmation of the bid security, the bidder will be asked in writing/ e-mail (usually within 10 days of opening of the Technical Bid) to clarify his technical bid, if necessary, with respect to any rectifiable defects.
- iii. The bidders will respond by e-mail in not more than 7 days of issue of the clarification letter, which will also indicate the date, time and venue of opening of the Financial Bid (usually on the 21st day of opening of the Technical bid)
- iv. Immediately (usually within 3 or 4 days), on receipt of these clarifications the Evaluation Committee will finalize the list of responsive bidders whose financial bids are eligible for consideration.

23.3 After the technical evaluation, these will be put to the Employer, which will find technically responsive bids. The financial of those bids will be opened who are found technically responsive. The financial bids of remaining bidders will remain unopen.

23.4 In case bids are invited in more than one package, the order for opening of the “Financial Bid” shall be that in which they appear in the “Invitation for Bid”.

23.5 The Employer shall prepare disclose information regarding bid opening to those present.

23.6 The Employer shall open the bid and the information regarding bid opening may be disclosed to those present as representative of the bidder.

24. Process to be Confidential

- 24.1 Information relating to the examination, clarification, evaluation and comparison of bids and recommendations for the award of a contract shall not be disclosed to bidders or any other persons not officially concerned with such process until the award to the successful Bidder has been announced. Any effort by a Bidder to influence the Employer's processing of bids or award decisions may result in the rejection of his Bid.

25. Clarification of Financial Bids

- 25.1 To assist in the examination, evaluation and comparison of bids, the Employer may, at his discretion, ask any Bidder for clarification of his Bid, justification, including breakdowns of unit rates. The request for clarification and the response shall be in writing or by cable, but no change in the price of substance of the Bid shall be sought, offered or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the bids in accordance with ITB Clause-27.
- 25.2 Subject to ITB sub-clause 25.1, no Bidder shall contact the Employer on any matter relating to his bid from the time of the bid opening to the time the contract is awarded. If the bidder wishes to bring additional information to the notice of the Employer, it should do so in writing.
- 25.3 Any effort by the Bidder to influence the Employer in the Employer's bid evaluation, bid comparison or contract award decisions may result in the rejection of the Bidders' bid.

26. Examination of Bids and Determination of Responsiveness

- 26.1 During the detailed evaluation of 'Technical Bids', the Employer will determine whether each Bid:
- 26.1.1 meets the eligibility criteria defined in ITB Clause 3 and 4;
 - 26.1.2 has been properly signed digitally;
 - 26.1.3 is accompanied by the required securities; and
- 26.1.4 is substantially responsive to the requirements of the bidding documents. During the detailed evaluation of the 'Financial Bid' the responsiveness of the bids will be further determined with respect to the remaining bid conditions, i.e. price bid, technical specifications, and drawings.
- 26.2 A substantially responsive 'Financial Bid' is one which conforms to all the terms, conditions, and specifications of the Bidding documents, without material deviation or reservation. A material deviation or reservation is one (a) which affects in any substantial way the scope, quality, or performance of the works; (b) which limits in any substantial way, inconsistent with the bidding

documents, the Employer's rights or the bidder's obligations under the Contract; or (c) whose rectification would affect unfairly the competitive position of other bidders presenting substantially responsive bids.

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

27. Correction of Errors

- 27.1 'Financial Bids' determined to be substantially responsive will be checked by the Employer for any arithmetical errors. Errors will be corrected by the Employer as follows:

- (a) where there is a discrepancy between the rates in figures and in word, the rate in words will govern; and
- (b) Where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern.

- 27.2 The amount stated in the 'Financial Bid' will be corrected by the Employer in accordance with the above procedure and the bid amount adjusted with the concurrence of the Bidder in the following manner:

- i. If the Bid price increases as a result of these corrections, the amount as stated in the bid will be the 'bid price' and the increase will be treated as rebate;
- ii. If the bid price decrease as a result of the corrections, the decreased amount will be treated as the 'bid price'. Such adjusted bid price shall be considered as binding upon the bidder. If the Bidder does not accept the corrected amount the Bid will be rejected, and the Bid Security shall be forfeited in accordance with ITB Sub-clause 16.6(b).

28. Evaluation and Comparison of Financial Bids

- 28.1 The Employer will evaluate and compare only the Bids determined to be substantially responsive in accordance with Sub-Clause 26.2.

- 28.2 In evaluating the Bids, the Employer will determine for each Bid the evaluated Bid Price by adjusting the Bid Price as follows:

- a) making any corrections for errors pursuant to clause 27; or
- b) making an appropriate adjustment for any other acceptable variations, deviations

- 28.3 In case lowest quote is made by more than one bidder, then the bidder

who has successfully completed and attached completion certificate while submitting online bid for more number of similar projects in the last 3 years would be awarded the work. In case of Joint Venture, although the qualifying criteria is satisfied collectively by the joint venture for which the number of similar works attributed to each member of the joint venture is added; the computation for number of similar projects for award of work to the joint venture in case of lowest quote would be computed on pro-rata basis of their participation in the JV and not by simply summing arithmetically, the number of similar projects. Still, if there is a tie, lottery system will be followed to award the contract.

F. AWARD OF CONTRACT

29. Award Criteria

29.1 Subject to Clause 30, the Employer will award the Contract to the Bidder whose Bid has been determined

- i. to be substantially responsive to the bidding documents and who has offered the lowest evaluated Bid Price; and
- ii. to be within the available bid capacity adjusted to account for his bid price which is evaluated the lowest in any of the packages opened earlier than the one under consideration. In no case, the contract shall be awarded to any bidder whose available bid capacity is less than the evaluated bid price, even if the said bid is the lowest evaluated bid. The contract will in such cases be awarded to the next lowest bidder at the L1 cost if accepted by next lowest bidder otherwise tender stands cancelled.

30. Employer's Right to Accept or Reject any Bid

30.1 Notwithstanding Clause 29, the Employer reserves the right to accept or reject any Bid, to cancel the bidding process and reject all bids, at any time prior to the award of Contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the Employer's action.

30.2 After Award of contract, if the Bidder is found to have concealed any fact relevant to projects, the employer may blacklist the Bidder or Bidders within 180 days, with due process as -

- i. 3 Years Blacklisting for the Project Cost Rs. 2.50 Crore to Rs. 10.00 Crore
- ii. 5 Years Blacklisting for the Project Cost above Rs. 10.00 Crore to Rs.100.00 Crore
- iii. 10 Years Blacklisting for the Project Cost above Rs. 100.00 Crore

31. Notification of Award and Signing of Agreement

31.1 The Bidder whose Bid has been accepted will be notified of the award by the employer prior to expiration of the Bid validity period by cable, telex or facsimile confirmed by letter. This letter (hereinafter and in the Conditions of Contract called the "Letter of Acceptance") will state the sum that the Employer will pay the contractor in consideration of the execution, completion, and maintenance of the Works by the contractor as prescribed by the contract (hereinafter and in the contract called the "Contract Price").

- 31.2 The notification of award will constitute the formation of the Contract, subject only to the furnishing of a performance security in accordance with the provisions of Clause 32.
- 31.3 The Agreement will incorporate all agreements between the Employer and the successful Bidder. This agreement will be signed only after furnishing of the performance security by the successful bidder but within 14 days of issue of Letter of Acceptance. The Employer will promptly notify the other bidders that their Bids have been unsuccessful.

32. Performance Security

- 32.1 Within 14 days of receipt of the Letter of Acceptance, the successful Bidder shall deliver to the Employer a Performance security in any of the forms given in 32.2 for an amount equivalent to 2% of the Contract price.
- 32.2 A bank guarantee from any of the branches of Nationalized/Scheduled Bank situated within territory of India in the form given in Section 10; or Certified Cheque / Bank Draft payable to employer as indicated in item no. 16 Appendix to ITB.
- 32.3 If the performance security is provided by the successful Bidder in the form of a Bank Guarantee, it shall be issued from any of the branches of Nationalized/ Scheduled Bank situated within the territory of India.
- 32.4 Failure of the successful Bidder to comply with the requirements of Sub-Clause 32.1 shall constitute grounds for cancellation of the award and forfeiture of the Bid Security.
- 32.5 The validity of the performance security is 28 days beyond the defect liability period.

33. Advance Payment and Security

- 33.1 The Employer will provide contractor an interest-bearing mobilization advance (as per CVC guidelines in this regard) on the Contract Price in two stages of 5 % each subject to maximum amount of 10% of contract price.

34. Corrupt or Fraudulent Practices

- 34.1 The Employer will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question and will declare the firm ineligible, either indefinitely or for a stated period of time, to be awarded a contract with BSCL, UD & HD, Government of Bihar, and any other state agencies, if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for the contract, or in execution of the work related to contract.

35. Dispute Resolution

35.1 The dispute arising between the employer and the contractor, if not resolved amicably shall be referred to appointed expert mediator of Bihar State Legal Services Authority (BSLSA). If the matter does not get resolved it will finally go for arbitration. Arbitration in such a case will be done in accordance to Indian Arbitration and Conciliation Act, 1996 and amended provisions thereof. The place of arbitration shall be Bhagalpur and the language of arbitration shall be English. This may be read in conjunction with clause 20.2 of Condition of Contract.

APPENDIX to ITB

S. No.	Description	Clause Reference with respect to Section- 2
1.	Name of the Employer is Chief Executive Officer, Bhagalpur Smart City Limited, Bhagalpur	[Cl. 1.1]
2.	The last five years	[Cl. 4.5 A (a)]
	2014 – 2015	
	2015 – 2016	
	2016 – 2017	
	2017 – 2018	
	2018 – 2019	
3.	Minimum annual financial turnover amount is Rs 15.23 (Fifteen Crores Twenty Three lakhs) Crores (all class of similar nature of work as defined in last five years)	[Cl.4.5A(a)]
4.	Minimum work Completion Experience	[Cl.4.5A(b)]
5.	Liquid assets and/or availability of credit facilities is Rs.7.62 Crores.	[Cl.4.5B(c) & Cl.4.3 (h)]
6.	Price level of the financial year 2019-20	[Cl. 4.7]
7.	The pre-bid meeting will take place at – BSCL Office, Municipal Corporation, Court Compound, BSCL, Bhagalpur	[Cl. 9.2.1]

8.	The Technical bid will be opened at BSCL Office, Bhagalpur	[C1 .23.1.]
9.	Address of the Employer: Bhagalpur Smart City Limited, Municipal Corporation, Court Compound, Bhagalpur	
10.	Submission of Bid:	[Cl. 19]
	Bid for Clearing the existing legacy waste and current waste on daily basis, Construction of Material Recovery Facility, waste processing, scientific landfill, leachate treatment plant and providing digital monitoring mechanism at Kankaity in Bhagalpur with Operation & Maintenance for five years on Engineering, Procurement & Construction (EPC) basis.	
11.	NIT No.	BSCL/ISWM/2020/23
12.	The bid should be submitted online	[C1. 20.1]
13.	The bid will be opened at the time, date and venue mentioned in NIT	[C1.23.1]
14.	The Bank draft shall be in favour of Chief Executive Officer, Bhagalpur Smart City Limited Payable at - Bhagalpur	[C1.32.2]
15.	Escalation factors (For bringing the cost of works executed in different financial year to a common base value)	
	Years before	Multiply factor
	2014-15	1.61
	2015-16	1.46
	2016-17	1.33
	2017-18	1.21
	2018-19	1.10

ANNEXURE – I

List of Indicative Machine/ Equipment to be procured and deployed on Contract**work [Reference C1. 4.5 (B) (a)]**

1. Indicative list of Vehicles / Processing equipment to be procured in the name of BSCL and to be handed over after completion of project in working conditions.

Sl	Name of the Vehicles / Processing Equipments	Required Number
1	Tipper truck	2
2	Excavator with front end loader	2
3	Tractor	2
4	Trolley Hydraulic Tipping	10
5	Tanker	1
6	Trommel with 100 mm Sieve	1
7	Trommel with 35 mm Sieve	1
8	Trommel with 16 mm Sieve	1
9	Trommel with 4 mm Sieve	1
10	Roller	1

2. Indicative list of ICT equipments to be procured in the name of BSCL and to be handed over after completion of project in working conditions.

Sr. No.	Item Description	Qty	Unit
1.01	Wall mounted Biometric Device for attendance recording with Internet and storage facility with accessories	3	Nos.
	4G SIM for Wall mounted biometric device	3	
1.02	Supply and installation of CCTV with 2 dome & 2 Bullet IP Cameras, 8 port NVR, 4TB Harddisk, LED Monitors, UPS 30min backup& accessories complete in all aspects	3	Nos.
	CCTV dome camera	6	Nos.
	Bullet IP Cameras	6	Nos.
	8 port NVR, 4TB Harddisk,	3	Nos.
	LED Monitors	3	Nos.
	UPS 30 mins backup& accessories	3	Nos.
	Broadband on Fibre (Minimum 10 Mbps Upload) with static IP	3	
	Firewall for VPN Security	3	
	POE 8 port L2 Switch	3	

	Rack and other accessories - 9 U	3	
	Electric and networking cabling and other required passive component to make site live	3	
1.03	Fixed RFID readers with internet with mounting clamps and accessories + Poles for RFID Reader + UHF ID Antenna + Controller for UHF ID for Antenna	2	Nos.
1.04	GPS Devices in IP 66/67 Cabinet for mounting in Vehicles for VTS	24	Nos.
	2G SIM for GPS Devices	24	
1.05	PTZ Camera,4ch NVR,2TBHDD,LED Monitors,UPS 30min backup + Installations, cable and Accessories + Broadband Internet+ External Power Module	3	Sets
	PTZ Camera	6	
1.06	Passive RFID Tag (UHF Tag) for various Vehicles, Bins, Rickshaw, tricycle, pushcart, etc for all other municipal assets for SWM	4	Nos.
1.07	Hardware for Automated Weigh Bridge Controller , along with Automatic Boom Barrier + Traffic Lights with controller + 1 CCTV Pole Mounted Camera to be connected to Central NVR through Broadband internet,	2	Sets
	Boom Barrier	2	
	Traffic Light with controller	2	
	Pole Mounted CCTV Camera	2	
	Pole, Electric & Netowrk cabling work, Water work and other required work to make site live	2	
1.09	Computer + Printer + UPS + Broadband Internet	1	Sets
	Computer with Antivirus	1	
	Printer	1	

3. Indicative list of equipments to be deployed

Sl.	Type of Equipment (leased or owned)	Maximum age as on 01.01.2019 (in Years)	Minimum no. of Equipment required
1.	Dozer	5	1
2.	Front end Loader	5	1
3.	Smooth Wheeled Roller	5	1
4.	Water Tank	5	1
5.	Bar Cutting Machine	5	4
6.	Bar Bending Machine	5	2
7.	Welding Machine	5	4

8.	Vibrator (Needle)	5	4
9.	Well-equipped Laboratory facility for quality test		One
10.	Transit Mixer with pumping arrangement	5	1
11.	Steel Prop	5	For 1000 Sqm
12.	Concrete Batching Plant (10 cum / hour)	5	1
13.	Steel Plate with fitting	5	For 1000 Sqm
14.	Staging pipe with fitting	5	For 1000 Sqm
15.	Cube Testing Machine (UTM)	5	1
16.	Cube Mould	5	50

ANNEXURE – II

List of Minimum Key Personal to be deployed on Contract Work by the Contract Agency:

[Reference C1.4.5 (B) (b)]

4. During Construction Period

Srl No	Role	Numbers	Minimum Qualification and experience
1	Project Manager	One	<ul style="list-style-type: none"> • B.E. / B. Tech / B.Sc (Engg.) in any discipline + Master in Environmental Engineering or Equivalent (preferable) • 10 Years of Experience; with 2+ years of Experience as Project Manager • 4 Years of experience in Municipal Solid Waste (MSW).
2	Support Engineers	One	Graduate /Diploma Holders with experience of 2 years in MSW.
3	Civil Engineer	One	B.E. / B. Tech / B.Sc (Engg.) in Civil Engineering with 4 years of experience or Diploma in Civil Engineering with 6 years of experience in construction works
4	Electrical Engineer	One	B.E. / B. Tech / B.Sc (Engg.) in Electrical Engineering with 4 years of experience or Diploma in Electrical Engineering with 6 years of experience in electrical works
5	Mechanical Engineer	One	B.E. / B. Tech / B.Sc (Engg.) in Mechanical Engineering with 4 years of experience or Diploma in Mechanical Engineering with 6 years of experience in mechanical works
6	Quantity Surveyor	One	B.E. / B. Tech / B.Sc (Engg.) in Civil Engineering with 3 years of experience or Diploma in Civil Engineering with 6 years of experience in related assignments
7	Quality Control Engineer	One	B.E. / B. Tech / B.Sc (Engg.) in Civil Engineering with 3 years of experience or Diploma in Civil Engineering with 6 years of experience in related assignments

5. During Operation & Maintenance (O&M) Period

Srl No	Role	Numbers	Minimum Qualification and experience
1	Project Manager	One	<ul style="list-style-type: none"> • B.E. / B. Tech / B.Sc (Engg.) in any discipline + Master in Environmental Engineering or Equivalent (preferable) • 10 Years of Experience; with 2+ years of Experience as Project Manager • 4 Years of experience in Municipal Solid Waste (MSW).
2	Support Engineers	One	Graduate /Diploma Holders with experience of 2 years in MSW.

3	Mechanical Engineer	One	B.E. / B. Tech / B.Sc (Engg.) in Mechanical Engineering with 4 years of experience or Diploma in Mechanical Engineering with 6 years of experience in mechanical works.
4	Operator	Four	As per practice
5	Driver	Six	As per practice
6	Compounder/ Nurse	Two	As per practice
7	Support Staff	Eight	As per practice

All the bio data of the proposed staffs shall be duly signed by the Authorized Signatory of the bidder.

SECTION 3

QUALIFICATION INFORMATION

&

OTHER FORMS

QUALIFICATION INFORMATION

The information to be filled in by the bidder in the following pages will be used for purposes of post qualification as provided for in Clause 4 of the Instructions to Bidders. This information will not be incorporated in the Contract.

1. For Individual Bidders

1.1. Constitution or legal status of Bidder [Attach copy]

Place of registration:

Principal place of business:

Power of attorney of signatory of Bid [Attach]

1.2. Total value of similar nature of work performed in the last five financial years (in Rs. Lakhs)**

2014-15	
2015-16	
2016-17	
2017-18	
2018-19	

1.3. Work of similar nature performed as prime contractor, work performed in the past as a nominated sub- contractor will also be considered provided the sub-contract involved execution of all main item of works which comes under similar projects, provided further that all other qualification criteria are satisfied (in the same name) on works of a similar nature over the last five financial years (2014-15 to 2018-19) and the current financial year till date.

Project Name	Name of the Employer *	Description of Work	Contact Number	Value of Contract (Rs. Crore) (β)	Date of issue of Work Order	Period of Completion	Actual of Completion*	Remarks Explaining Reasons for Delay and Work Completed

* Attach completion / performance certificate(s) from the Engineer(s)-in-Charge/EE/Employer. β Attached certificate from Chartered Accountant (CA)

In case lowest quote is made by more than one bidder, then the bidder who has successfully completed and attached completion certificate while submitting online bid for more number of similar projects in the last 3 years would be awarded the work. In case of Joint Venture although the qualifying criteria is satisfied collectively by the joint venture for which the number of similar works attributed to each member of the joint venture is added; the computation for number of similar projects for award of work to the joint venture in case of lowest quote would be computed on pro-rata basis of their participation in the JV and not by simply summing arithmetically, the number of similar projects. Still, if there is a tie, lottery system will be followed to award the contract.

1.4 Information on Bid capacity (works for which bids have been submitted and works which are yet to be completed) as on the date of this bid.

(A). Existing commitments and on-going works:

Description of works	Place & State	Contract No.	Name & Address of Employer	Value Contract (Rs Lakh)	Period of Completion	Value of Works* Of remaining To be completed (Rs Lakh)	Anticipated date of completion
1	2	3	4	5	6	7	8

* Attach certificate(s) from the Engineer(s)-in-Charge/EE/Employer. The item of work for which data is requested should tally with that specified in ITB clause 4.7.

(B). Works for which bids already submitted:

Description of work	Place & State	Name & Address of Employer	Estimated value of works (Rs Lakh)	period of completion	Date when decision is expected	Remarks If any
1	2	3	4	5	6	7

1.5 Availability of key items of Contractor's Equipment essential for carrying out the Works [ref. Clause 4.5(B)(a). The Bidder should list all the information requested below. Refer also to Sub Clause 4.3(d) of the Instructions to Bidders.

Item of Equipment	Requirement		Availability Proposals			Remarks (from whom to be purchased)
	No.	Capacity	Owned / Leased to be procured	Nos. / Capacity	Age/ Condition	

1.6 Qualifications and experience of key personnel required for administration and execution of the Contract [Ref. Clause 4.5(B)(b)]. Attach biographical data. Refer also to sub Clause 4.3 (e) of Instructions to Bidders.

Position	Name	Qualification	Years of Professional Experience	Years of experience in Proposed position

1.7 Proposed sub-contracts and firms involved. [Refer ITB Clause 4.3(k)]

Sanctions of the works	Value of Sub-contract	Sub-contractor (Name & Address)	Experience in similar Work

Attach copies of certificates on possession of valid license for electrification / [Reference Clause 4.5A(c) of ITB].

1.8 Financial reports for the last five financial years: balance sheets, profit and loss statements, auditors' reports (in case of companies/corporation), etc. List them below and attach copies. (Attach certificate from Chartered Accountant)

1.9 Evidence of access to financial resources to meet the qualification requirements:

Cash in hand, lines of credit, etc. List them below and attach copies of support documents.

1.10 Name, address, and telephone, telex, and fax numbers of the Bidders' bankers who may provide references if contacted by the Employer.

1.11 Information on litigation history of Past 7 financial years starting 2013-14 in which the Bidder is involved.

Other Party(ies)	Employer	Cause of Dispute	Amount involved	Remarks showing Present Status

1.12 Statement of compliance under the requirements of Sub Clause 3.2 of the Instructions to Bidders. (Name of Consultant engaged for project preparation is)

1.13 Proposed work methods and schedule. The Bidder should attach descriptions, drawings and charts as necessary to comply with the requirements of the Bidding documents. [Refer ITB Clause 4.1 & 4.3 (a)]

1.14 Programme

1.15 Quality Assurance Programme

2. **Additional Requirements.**

2.1. Affidavit as provided in Section 3 of ITB

2.2. Undertaking as provided in Section 3 of ITB

2.3. Bidders should provide any additional information required to fulfill the requirements of Clause 4 of the Instructions to the Bidders, if applicable.

2.4. Copy of letter of association in the form of agreement with subcontractor for the work defined or for any specialize /Engineering methodology work.

2.5. **Note: Even though the bidder meets the above qualifying criteria, he is subject to be disqualified, if he has made a misleading or false**

representation(s) in the forms, statements and attachments in proof of the qualifying requirements.

**SAMPLE FORMAT FOR EVIDENCE OF ACCESS TO OR
AVAILABILITY OF CREDIT FACILITIES**

(Clause 4.3 (g) OF ITB)

BANK CERTIFICATE

This is to certify that M/s. _____ is a reputed
Company with a good financial standing.

If the contract for the work, namely _____ is
awarded to the above firm, we shall be able to provide overdraft/credit facilities
to the extent of Rs. _____ to meet their working capital requirements for
executing the above contract during the contact period.

(Signature) Name of Bank

Senior Bank Manager
Address of the Bank

AFFIDAVIT

Also refer qualification information format para 2.1 in the same Section

1. I, the undersigned, do hereby certify that all the statements made in the required attachments are true and correct.
2. The undersigned also hereby certifies that neither our firm M/S _____ have abandoned any work of **Bhagalpur Smart City Limited** or any contract awarded to us for such work have been rescinded, during last five years prior to the date of this bid.
3. The undersigned hereby authorize(s) and request(s) any bank, person, firm or corporation to furnish pertinent information deemed necessary and requested by the Department to verify this statement or regarding my (our) competence and general reputation.
4. The undersigned understand and agrees that further qualifying information may be requested, and agrees to furnish any such information at the request of the Department/Project implementing agency.

(Signed by an authorized Officer of the Firm)

Title of officer

Name of Firm

Date

UNDERTAKING

Also refer qualification information format para 2.2 in the same Section

I, the undersigned do hereby undertake that our firm M/s

would invest a minimum cash up to 25% of the value of the work during implementation of the Contract.

(Signed by an authorized Officer of the Firm)

Title of officer

Name of Firm

Date

SECTION 4

GENERAL CONDITIONS OF CONTRACT

General Conditions of Contract

ARTICLES

1. Definitions of Interpretation
2. Scope of Work
3. Obligation of the Contractor
4. Obligation of the Authority
5. Representation & Warranties
6. Disclaimer
7. Performance Security
8. Site of Project
9. Utilities & Trees
10. Design & Construction of the Project
11. Quality Assurance, Monitoring & Supervision
12. Completion Certificate
13. Change of Scope
14. Traffic Regulation
15. Defects Liability
16. Authority's Engineer
17. Financial Covenants
18. Insurance
19. Force Majeure
20. Suspension of Contractor's Rights
21. Termination
22. Assignment & Charges
23. Liability & Indemnity
24. Dispute Resolution
25. Miscellaneous
26. Definition

ARTICLE 1

DEFINITIONS AND INTERPRETATION**1.1 Definitions**

The words and expressions beginning with capital letters and defined in this Agreement (including those in Article 26) shall, unless the context otherwise requires, have the meaning ascribed thereto herein, and the words and expressions defined in the Schedules and used therein shall have the meaning ascribed thereto in the Schedules.

1.2 Interpretation**1.2.1** In this Agreement, unless the context otherwise requires,

- a. references to any legislation or any provision thereof shall include amendment or re-enactment or consolidation of such legislation or any provision thereof so far as such amendment or re-enactment or consolidation applies or is capable of applying to any transaction entered into hereunder;
- b. references to laws of India or Indian law or regulation having the force of law shall include the laws, acts, ordinances, rules, regulations, bye laws or notifications which have the force of law in the territory of India and as from time to time may be amended, modified, supplemented, extended or re-enacted;
- c. references to a “**person**” and words denoting a natural person shall be construed as a reference to any individual, firm, company, corporation, society, trust, government, state or agency of a state or any association or partnership (whether or not having separate legal personality) of two or more of the above and shall include successors and assigns;
- d. the table of contents, headings or sub-headings in this Agreement are for convenience of reference only and shall not be used in, and shall not affect, the construction or interpretation of this Agreement;
- e. the words “**include**” and “**including**” are to be construed without limitation and shall be deemed to be followed by “without limitation” or “but not limited to” whether or not they are followed by such phrases;
- f. references to “construction” include, unless the context otherwise requires, survey and investigation, design, developing, engineering, procurement, supply of plant, materials, equipment, labour, delivery, transportation,

installation, processing, fabrication, testing, and commissioning of the Project, including maintenance during the Construction Period, removing of defects, if any, and other activities incidental to the construction and “**construct**” or “**build**” shall be construed accordingly;

- g. references to “**development**” include, unless the context otherwise requires, construction, renovation, refurbishing, augmentation, up-gradation and other activities incidental thereto during the Construction Period, and “develop” shall be construed accordingly;
- h. any reference to any period of time shall mean a reference to that according to Indian standard time;
- i. any reference to day shall mean a reference to a calendar day;
- j. reference to a “**business day**” shall be construed as reference to a day (other than a Sunday) on which banks in the State are generally open for business;
- k. any reference to month shall mean a reference to a calendar month as per the Gregorian calendar;
- l. references to any date, period or Project Milestone shall mean and include such date, period or Project Milestone as may be extended pursuant to this Agreement;
- m. any reference to any period commencing “from” a specified day or date and “**till**” or “**until**” a specified day or date shall include both such days or dates; provided that if the last day of any period computed under this Agreement is not a business day, then the period shall run until the end of the next business day;
- n. the words importing singular shall include plural and vice versa;
- o. references to any gender shall include the other and the neutral gender;
- p. “**lakh**” means a hundred thousand (100,000) and “**crore**” means ten million (10,000,000);
- q. “**indebtedness**” shall be construed so as to include any obligation (whether incurred as principal or surety) for the payment or repayment of money, whether present or future, actual or contingent;
- r. references to the “**winding-up**”, “**dissolution**”, “**insolvency**”, or “reorganization” of a company or corporation shall be construed so as to include any equivalent or analogous proceedings under the law of the

- jurisdiction in which such company or corporation is incorporated or any jurisdiction in which such company or corporation carries on business including the seeking of liquidation, winding-up, reorganization, dissolution, arrangement, protection or relief of debtors;
- s. save and except as otherwise provided in this Agreement, any reference, at any time, to any agreement, deed, instrument, licensee or document of any description shall be construed as reference to that agreement, deed, instrument, license or other document as amended, varied, supplemented, modified or suspended at the time of such reference; provided that this Sub-clause (s) shall not operate so as to increase liabilities or obligations of the Authority hereunder or pursuant hereto in any manner whatsoever;
 - t. any agreement, consent, approval, authorization, notice, communication, information or report required under or pursuant to this Agreement from or by any Party or the Authority's Engineer shall be valid and effective only if it is in writing under the hand of a duly authorized representative of such Party or the Authority's Engineer, as the case may be, in this behalf and not otherwise;
 - u. the Schedules and Recitals to this Agreement form an integral part of this Agreement and will be in full force and effect as though they were expressly set out in the body of this Agreement;
 - v. references to Recitals, Articles, Clauses, Sub-clauses, Provisos or Schedules in this Agreement shall, except where the context otherwise requires, mean references to Recitals, Articles, Clauses, Sub-clauses, Provisos and Schedules of or to this Agreement; reference to an Annex shall, subject to anything to the contrary specified therein, be construed as a reference to an Annex to the Schedule in which such reference occurs; and reference to a Paragraph shall, subject to anything to the contrary specified therein, be construed as a reference to a Paragraph of the Schedule or Annex, as the case may be, in which such reference appear;

the damages payable by either Party to the other of them, as set forth in this Agreement, whether on per diem basis or otherwise, are mutually agreed genuine pre-estimated loss and damage likely to be suffered and incurred by the Party entitled to receive the same and are not by way of penalty (the “**Damages**”); and

- w. time shall be of the essence in the performance of the Parties' respective obligations. If any time period specified herein is extended for the reasons specified in the Agreement, such extended time shall also be of the essence.
- 1.2.2 Unless expressly provided otherwise in this Agreement, any Documentation required to be provided or furnished by the Contractor to the Authority shall be provided free of cost and in three copies, and if the Authority is required to return any such

Documentation with its comments and/or approval, it shall be entitled to retain two copies thereof.

- 1.2.3 The rule of construction, if any, that a contract should be interpreted against the parties responsible for the drafting and preparation thereof, shall not apply.
- 1.2.4 Any word or expression used in this Agreement shall, unless otherwise defined or construed in this Agreement, bear its ordinary English meaning and, for these purposes, the General Clauses Act, 1897 shall not apply.

1.3 Measurements and arithmetic conventions

All measurements and calculations shall be in the metric system and calculations done to 2 (two) decimal places, with the third digit of 5 (five) or above being rounded up and below 5 (five) being rounded down.

1.4 Priority of agreements and errors/discrepancies

- 1.4.1 This Agreement, and all other agreements and documents forming part of or referred to in this Agreement are to be taken as mutually explanatory and, unless otherwise expressly provided elsewhere in this Agreement, the priority of this Agreement and other documents and agreements forming part hereof or referred to herein shall, in the event of any conflict between them, be in the following order:

- 1. this Agreement; and

- all other agreements and documents forming part hereof or referred to herein;
 - i.e. this Agreement at (a) above shall prevail over the agreements and documents at (b).

- 1.4.2 Subject to the provisions of Clause 1.4.1, in case of ambiguities or discrepancies within this Agreement, the following shall apply:

- i. between two or more Clauses of this Agreement, the provisions of a specific Clause relevant to the issue under consideration shall prevail over those in other Clauses;
 - ii. between the Clauses of this Agreement and the Schedules, the Clauses shall prevail and between Schedules and Annexes, the Schedules shall prevail;
 - iii. between any two Schedules, the Schedule relevant to the issue shall prevail;
 - iv. between the written description on the Drawings and the Specifications and Standards, the latter shall prevail;
 - v. between the dimension scaled from the Drawing and its specific written dimension, the latter shall prevail; and
 - vi. between any value written in numerals and that in words, the latter shall prevail.

1.5 Joint and several liability

1.5.1 If the Contractor has formed a Joint Venture of two or more persons for implementing the Project:

- i. these persons shall, without prejudice to the provisions of this Agreement, be deemed to be jointly and severally liable to the Authority for the performance of the Agreement; and
- ii. The Contractor shall ensure that no change in the composition of the Joint Venture is effected without the prior consent of the Authority.

1.5.2 Without prejudice to the joint and several liability of all the members of the Joint Venture, the Lead Member shall represent all the members of the Joint Venture and shall at all times be liable and responsible for discharging the functions and obligations of the Contractor. The Contractor shall ensure that each member of the Joint Venture shall be bound by any decision, communication, notice, action or inaction of the Lead Member on any matter related to this Agreement and the Authority shall be entitled to rely upon any such action, decision or communication of the Lead Member. The Authority shall have the right to release payments to Joint Venture and shall not in any manner be responsible or liable for the *inter se* allocation of payments among members of the Joint Venture.

Part II

Scope of the Project

ARTICLE 2

SCOPE OF THE PROJECT

2.1 Scope of the Project

- i. Under this Agreement, the scope of the Project (the “**Scope of the Project**”) shall be defined as scope of work as indicated in Invitation for Bids (IFB) with the Specifications and Standards set forth in RFP.
- ii. Performance and fulfillment of all other obligations of the Contractor in accordance with the provisions of this Agreement and matters incidental thereto or necessary for the performance of any or all of the obligations of the Contractor under this Agreement.

ARTICLE 3

OBLIGATIONS OF THE CONTRACTOR

3.1 Obligations of the Contractor

- 3.1.1 Subject to and on the terms and conditions of this Agreement, the Contractor shall undertake the survey, investigation, design, engineering, procurement, and construction of the Project and observe, fulfil, comply with and perform all its obligations set out in this Agreement or arising hereunder.
- 3.1.2 The Contractor shall comply with all Applicable Laws and Applicable Permits (including renewals as required) in the performance of its obligations under this Agreement.
- 3.1.3 Save and except as otherwise provided in this Agreement or Applicable Laws, as the case may be, the Contractor shall, in discharge of all its obligations under this Agreement, conform with and adhere to Good Industry Practice at all times.
- 3.1.4 The Contractor shall remedy any and all loss or damage to the Project, occurring on or after the Appointed Date and until the date of Provisional Certificate, with respect to the Works completed prior to the issuance of the Provisional Certificate and/or Completion Certificate, with respect to the Works referred to in the Punch List, at its own cost, save and except to the extent that any such loss or damage shall have arisen from any default of the Authority or on account of a Force Majeure Event in which case the provisions of Clause 19 shall apply.
- 3.1.5 The Contractor shall remedy any and all loss or damage to the Project during the Defects Liability Period at its own cost, to the extent that such loss or damage shall have arisen out of the reasons specified in Clause 15.3.
- 3.1.6 The Contractor shall, at its own cost and expense, in addition to and not in derogation of its obligations elsewhere set out in this Agreement:
- a. make, or cause to be made, necessary applications to the relevant Government Instrumentalities with such particulars and details as may be required for obtaining Applicable Permits set forth and obtain and keep in force and effect such Applicable Permits in conformity with Applicable Laws;
 - b. procure, as required, the appropriate proprietary rights, licences, agreements and permissions for Materials, methods, processes, know-how and systems used or incorporated into the Project;
 - c. make reasonable efforts to maintain harmony and good industrial relations among the personnel employed by it or its Sub-contractors in connection with the performance of its obligations under this Agreement;

- d. ensure and procure that its Sub-contractors comply with all Applicable Permits and Applicable Laws in the performance by them of any of the Contractor's obligations under this Agreement;
- e. always act in a manner consistent with the provisions of this Agreement and not cause or fail to do any act, deed or thing, whether intentionally or otherwise, which may in any manner be violative of any of the provisions of this Agreement;
- f. support, cooperate with and facilitate the Authority in the implementation and operation of the Project in accordance with the provisions of this Agreement;
- g. ensure that the Contractor and its Sub-contractors comply with the safety and welfare measures for labour in accordance with Applicable Laws and Good Industry Practice;
- h. keep, on the Site, a copy of this Agreement, publications named in this Agreement, the Drawings, Documents relating to the Project, and Change of Scope Orders and other communications sent under this Agreement, and provide access to all these documents at all reasonable times to the Authority's Engineer and its authorised personnel;
- i. cooperate with other contractors employed by the Authority and personnel of any other public authority; and
- j. not interfere unnecessarily or improperly with the convenience of the public, or the access to and use and occupation of all the existing facilities within the Right of Way, irrespective of whether they are public or in the possession of the Authority or of others.

3.1.7 The Contractor shall undertake all necessary superintendence to plan, arrange, direct, manage, inspect and test the Works.

3.2 The Contractor may be allowed to sub-contract works amounting to 10% of the contracting value.

3.3 Obligations relating to employment of foreign nationals

The Contractor acknowledges, agrees and undertakes that employment of foreign personnel by the Contractor and/or its Sub-contractors and their sub-contractors shall be subject to grant of requisite regulatory permits and approvals including employment/residential visas and work permits, if any required, and the obligation to apply for and obtain the same shall and will always be of the Contractor. Notwithstanding anything to the contrary contained in this Agreement, refusal of or inability to obtain any such permits and approvals by the Contractor or any of its Sub-contractors or their sub-contractors shall not constitute Force Majeure Event, and shall not in any manner excuse the Contractor from the performance and discharge of its obligations and liabilities under this Agreement.

3.4 Obligations relating to Contractor's personnel

- 341 The Contractor shall ensure and procure that the personnel engaged by it or by its Sub-contractors for performance of its obligations under this Agreement are at all times appropriately qualified, skilled and experienced in their respective functions in conformity with Applicable Laws and Good Industry Practice.
- 342 The Authority's Engineer may, for reasons to be specified in writing, direct the Contractor to remove any member of the Contractor's or Sub-contractor's personnel from the Project. Provided that any such direction issued by the Authority's Engineer shall specify the reasons for the removal of such person.
- 343 The Contractor shall, on receiving a direction from the Authority's Engineer under the provisions of Clause 3.4.2, ensure and procure the removal of such person or persons from the Project with immediate effect. The Contractor shall further ensure that such persons have no further connection with the Project.

3.5 Obligations relating to advertisement on Project

The Contractor shall not use the Project or any part thereof in any manner for branding or advertising purposes including for advertising any commercial product or services or companies.

3.6 Obligations relating to Contractor's care of the Works

The Contractor shall bear full risk in and take full responsibility for the care of Works, and of Materials, goods and equipment for incorporation therein, on and from the Appointed Date and until the date of Provisional Certificate, with respect to the Works completed prior to the issuance of the Provisional Certificate, and/or Completion Certificate, with respect to the Works referred to in the Punch List, save and except to the extent that any such loss or damage shall have arisen from any default or neglect of the Authority.

3.7 Obligations relating to electricity, water and other services

The Contractor shall be responsible for procuring of all power, water and other services that it may require for the Project.

3.8 Unforeseeable difficulties

Except as otherwise specified in the Agreement:

- a. the Contractor accepts complete responsibility for having foreseen all difficulties and costs of successfully completing the Works;
- b. the Contract Price shall not be adjusted to take account of any unforeseen difficulties or costs; and
- c. the Scheduled Completion Date shall not be adjusted to take account of any unforeseen difficulties or costs.

For the purposes of this Clause, unforeseeable difficulties include physical conditions like man-made or natural physical conditions including sub-surface and hydrological conditions which the

Contractor encounters at the Site during execution of the Works.

ARTICLE 4

OBLIGATIONS OF THE AUTHORITY

4.1 Obligations of the Authority

- 4.1.1 The Authority shall, at its own cost and expense, undertake, comply with and perform all its obligations set out in this Agreement or arising hereunder.
- 4.1.2 The Authority shall be responsible for the correctness of the Scope of the Project, Project Facilities, Specifications and Standards and the criteria for Testing of the completed Works.
- 4.1.3 The Authority shall, upon receiving the Performance Security under Clause 7.1.1, provide to the Contractor:
- a. the land for construction in accordance with the provisions of Clauses 8.2 and 8.3, within a period of 15 (fifteen) days from the date of this Agreement.
 - b. approval of the general arrangement drawings (the “**GAD**”) from BSCL authorities to enable the Contractor to start construction of Project in accordance with the Specifications and Standards, and subject to the terms and conditions specified in such approval, within a period of 60 (sixty) days from the Appointed Date; and
 - c. all environmental and forest clearances as required under Clause 4.3.
- 4.1.4 Deleted.
- 4.1.5 Notwithstanding anything to the contrary contained in this Agreement, the Parties expressly agree that the aggregate Damages payable under Clauses 4.1.4, 8.3 and 9.2 shall not exceed 3% (three percent) of the Contract Price. For the avoidance of doubt, the Damages payable by the Authority under the aforesaid Clauses shall not be additive if they arise concurrently from more than one cause but relate to the same part of the Project.
- 4.1.6 The Authority agrees to provide support to the Contractor and undertakes to observe, comply with and perform, subject to and in accordance with the provisions of this Agreement and Applicable Laws, the following:
- c) upon written request from the Contractor, and subject to the Contractor complying with Applicable Laws, provide reasonable support to the Contractor in procuring Applicable Permits required from any Government Instrumentality for implementation of the Project;
 - d) upon written request from the Contractor, provide reasonable assistance to the Contractor in obtaining access to all necessary infrastructure facilities and utilities, including water and electricity at rates and on terms no less favorable than those generally available to commercial customers receiving substantially

- equivalent services;
- e) procure that no barriers that would have a material adverse effect on Works are erected or placed on or about the Project by any Government Instrumentality or persons claiming through or under it, except for reasons of Emergency, national security or law and order;
 - f) not do or omit to do any act, deed or thing which may in any manner be violative of any of the provisions of this Agreement;
 - g) support, cooperate with and facilitate the Contractor in the implementation of the Project in accordance with the provisions of this Agreement; and
 - h) upon written request from the Contractor and subject to the provisions of Clause 3.3, provide reasonable assistance to the Contractor and any expatriate personnel of the Contractor or its Sub-contractors to obtain applicable visas and work permits for the purposes of discharge by the Contractor or its Sub-contractors of their obligations under this Agreement and the agreements with the Sub-contractors.

4.2 Deleted

4.3 Obligations relating to Environmental and Forest Clearances

All the clearances shall be taken by selected bidder from the competent authority such as Ministry of Environment and Forest (MoEF)/ Central Pollution Control Board/ State Pollution Control Board etc.

ARTICLE 5

REPRESENTATIONS AND WARRANTIES

5.1 Representations and warranties of the Contractor

The Contractor represents and warrants to the Authority that:

- a) it is duly organized and validly existing under the laws of India, and has full power and authority to execute and perform its obligations under this Agreement and to carry out the transactions contemplated hereby;
- b) it has taken all necessary corporate and other actions under Applicable Laws to authorize the execution and delivery of this Agreement and to validly exercise its rights and perform its obligations under this Agreement;
- c) this Agreement constitutes its legal, valid and binding obligation, enforceable against it in accordance with the terms hereof, and its obligations under this Agreement will be legally valid, binding and enforceable obligations against it in accordance with the terms hereof;
- d) it is subject to the laws of India, and hereby expressly and irrevocably waives any immunity in any jurisdiction in respect of this Agreement or matters arising thereunder including any obligation, liability or responsibility hereunder;
- e) the information furnished in the Bid and as updated on or before the date of this Agreement is true and accurate in all respects as on the date of this Agreement;
- f) the execution, delivery and performance of this Agreement will not conflict with, result in the breach of, constitute a default under, or accelerate performance required by any of the terms of its memorandum and articles of association or any Applicable Laws or any covenant, contract, agreement, arrangement, understanding, decree or order to which it is a party or by which it or any of its properties or assets is bound or affected;
- g) there are no actions, suits, proceedings, or investigations pending or, to its knowledge, threatened against it at law or in equity before any court or before any other judicial, quasi-judicial or other authority, the outcome of which may result in the breach of this Agreement or which individually or in the aggregate may result in any material impairment of its ability to perform any of its obligations under this Agreement;
- h) it has no knowledge of any violation or default with respect to any order, writ, injunction or decree of any court or any legally binding order of any Government Instrumentality which may result in any material adverse effect on its ability to perform its obligations under this Agreement and no fact or circumstance exists which may give rise to such proceedings that would

adversely affect the performance of its obligations under this Agreement;

- i) it has complied with Applicable Laws in all material respects and has not been subject to any fines, penalties, injunctive relief or any other civil or criminal liabilities which in the aggregate have or may have a material adverse effect on its ability to perform its obligations under this Agreement;
- j) no representation or warranty by it contained herein or in any other document furnished by it to the Authority or to any Government Instrumentality in relation to Applicable Permits contains or will contain any untrue or misleading statement of material fact or omits or will omit to state a material fact necessary to make such representation or warranty not misleading;
- k) no sums, in cash or kind, have been paid or will be paid, by it or on its behalf, to any person by way of fees, commission or otherwise for securing the contract or entering into this Agreement or for influencing or attempting to influence any officer or employee of the Authority in connection therewith;
- l) all information provided by the {selected bidder/ members of the Joint Venture} in response to the Request for Qualification and Request for Proposals or otherwise, is to the best of its knowledge and belief, true and accurate in all material respects;
- m) all undertakings and obligations of the Contractor arising from the Request for Qualification and Request for Proposals or otherwise shall be binding on the Contractor as if they form part of this Agreement; and
- n) nothing contained in this Agreement shall create any contractual relationship or obligation between the Authority and any Sub-contractors, designers, consultants or agents of the Contractor.

5.2 Representations and warranties of the Authority

The Authority represents and warrants to the Contractor that:

- a) it has full power and authority to execute, deliver and perform its obligations under this Agreement and to carry out the transactions contemplated herein and that it has taken all actions necessary to execute this Agreement, exercise its rights and perform its obligations, under this Agreement;
- b) it has taken all necessary actions under Applicable Laws to authorize the execution, delivery and performance of this Agreement;
- c) it has the financial standing and capacity to perform its obligations under this Agreement;
- d) this Agreement constitutes a legal, valid and binding obligation enforceable against it in accordance with the terms hereof;
- e) it has no knowledge of any violation or default with respect to any order, writ, injunction or any decree of any court or any legally binding order of any Government Instrumentality which may result in any material adverse effect

on the Authority's ability to perform its obligations under this Agreement:

- f) it has complied with Applicable Laws in all material respects;
- g) it has good and valid right to the Site and has the power and authority to grant the site in respect thereof to the Contractor; and
- h) it shall have procured, as on the Appointed Date, site so that the Contractor can commence.

5.3 Disclosure

In the event that any occurrence or circumstance comes to the attention of either Party that renders any of its aforesaid representations or warranties untrue or incorrect, such Party shall immediately notify the other Party of the same. Such notification shall not have the effect of remedying any breach of the representation or warranty that has been found to be untrue or incorrect nor shall it adversely affect or waive any obligation of either Party under this Agreement.

ARTICLE 6

DISCLAIMER**6.1 Disclaimer**

- 6.1.1 The Contractor acknowledges that prior to the execution of this Agreement, the Contractor has, after a complete and careful examination, made an independent evaluation of the Request for Qualification, Request for Proposals, Scope of the Project, Specifications and Standards, Site, local conditions, physical qualities of ground, subsoil and geology, traffic volumes, suitability and availability of access routes to the Site and all information provided by the Authority or obtained, procured or gathered otherwise, and has determined to its satisfaction the accuracy or otherwise thereof and the nature and extent of difficulties, risks and hazards as are likely to arise or may be faced by it in the course of performance of its obligations hereunder. Save as provided in Clause 4.1.2 and Clause 5.2, the Authority makes no representation whatsoever, express, implicit or otherwise, regarding the accuracy, adequacy, correctness, reliability and/or completeness of any assessment, assumptions, statement or information provided by it and the Contractor confirms that it shall have no claim whatsoever against the Authority in this regard.
- 6.1.2 The Contractor acknowledges and hereby accepts to have satisfied itself as to the correctness and sufficiency of the Contract Price.
- 6.1.3 The Contractor acknowledges and hereby accepts the risk of inadequacy, mistake or error in or relating to any of the matters set forth in Clause 6.1.1 above and hereby acknowledges and agrees that the Authority shall not be liable for the same in any manner whatsoever to the Contractor, or any person claiming through or under any of them, and shall not lead to any adjustment of Contract Price or Scheduled Completion Date.
- 6.1.4 The Parties agree that any mistake or error in or relating to any of the matters set forth in Clause 6.1.1 above shall not vitiate this Agreement, or render it voidable.
- 6.1.5 In the event that either Party becomes aware of any mistake or error relating to any of the matters set forth in Clause 6.1.1 above, that Party shall immediately notify the other Party, specifying the mistake or error.
- 6.1.6 Except as otherwise provided in this Agreement, all risks relating to the Project shall be borne by the Contractor; and the Authority shall not be liable in any manner for such risks or the consequences thereof.

Part III

DESIGN AND DEVELOPMENT

ARTICLE 7

PERFORMANCE SECURITY**7.1 Performance Security**

- 7.1.1 The Contractor shall, for the performance of its obligations hereunder, provide to the Authority, within 21 (twenty one) days of the date of this LoI/LoA, an irrevocable and unconditional guarantee, for an amount equal to 2% (two percent) of the Contract Price, from a Bank in the form set forth in Annex-I of Schedule-F (the “**Performance Security**”). The Performance Security shall be valid until 28 (twenty eight) days of the expiry of the Defects Liability Period specified in Clause 15.1.1. Until such time the Performance Security is provided by the Contractor pursuant hereto and the same comes into effect, the Bid Security shall remain in force and effect, and upon such provision of the Performance Security, the Authority shall release the Bid Security to the Contractor. For the avoidance of doubt, the Parties expressly agree that the Contractor shall provide, no later than 30 (thirty) days prior to the expiry of the Performance Security for the Defects Liability Period specified in Clause 15.1.1, a Performance Security in respect of the extended Defects Liability Period, as specified in Clause 15.1.2, for an amount equal to 2% (two percent) of the estimated cost.
- 7.1.2 Notwithstanding anything to the contrary contained in this Agreement, the Parties agree that in the event of failure of the Contractor to provide the Performance Security in accordance with the provisions of Clause 7.1.1 and within the time specified therein or such extended period as may be provided by the Authority, in accordance with the provisions of Clause 7.1.3, the Authority may encash the Bid Security and appropriate the proceeds thereof as Damages, and thereupon all rights, privileges, claims and entitlements of the Contractor under or arising out of this Agreement shall be deemed to have been waived by, and to have ceased with the concurrence of the Contractor, and this Agreement shall be deemed to have been terminated by mutual agreement of the Parties.
- 7.1.3 In the event the Contractor fails to provide the Performance Security within 21 (twenty one) days of the date of this Agreement, it may seek extension of time for a period not exceeding a further 15 (fifteen) days on payment of Damages for such extended period in a sum calculated at the rate of 0.05% (zero point zero five percent) of the Contract Price for each day until the Performance Security is provided.

7.2 Extension of Performance Security

The Contractor may initially provide the Performance Security for a period of 12 months; provided that it shall procure the extension of the validity of the Performance

Security, as necessary, at least 2 (two) months prior to the date of expiry thereof. Upon the Contractor providing an extended Performance Security, the previous Performance Security shall be deemed to be released and the Authority shall return the same to the Contractor within a period of 7 (seven) business days from the date of submission of the extended Performance Security.

7.3 Appropriation of Performance Security

- 731 Upon occurrence of a Contractor Default, the Authority shall, without prejudice to its other rights and remedies hereunder or in law, be entitled to encash and appropriate from the Performance Security the amounts due to it as Damages for the Contractor's Default.
- 732 Upon such encashment and appropriation from the Performance Security, the Contractor shall, within 30 (thirty) days thereof, replenish, in case of partial appropriation, to its original level the Performance Security, and in case of appropriation of the entire Performance Security provide a fresh Performance Security, as the case may be, and the Contractor shall, within the time so granted, replenish or furnish fresh Performance Security as aforesaid failing which the Authority shall be entitled to terminate the Agreement in accordance with Article 21. Upon such replenishment or furnishing of a fresh Performance Security, as the case may be, the Contractor shall be entitled to an additional Cure Period of 30 (thirty) days for remedying the Contractor Default, and in the event of the Contractor not curing its default within such Cure Period, the Authority shall be entitled to encash and appropriate such Performance Security as Damages, and to terminate this Agreement in accordance with Article 21.

7.4 Release of Performance Security

The Authority shall release the Performance Security within 60 (sixty) days of the expiry of the Defects Liability Period or the extended Defects Liability Period, as the case may be, under this Agreement. Notwithstanding the aforesaid, the Parties agree that the Authority shall not be obliged to release the Performance Security until all Defects identified during the Defects Liability Period or the extended Defects Liability Period, as the case may be, have been rectified.

7.5 Retention Money

- 751 From every payment for Works due to the Contractor in accordance with the provisions of Clause 17.5, the Authority shall deduct 9% (nine percent) thereof as guarantee money for performance of the obligations of the Contractor during the Construction Period (the "**Retention Money**") subject to the condition that the maximum amount of Retention Money shall not exceed 8% (eight percent) of the Contract Price.
- 752 Upon occurrence of a Contractor's Default, the Authority shall, without prejudice to its other rights and remedies hereunder or in law, be entitled to appropriate the

relevant amounts from the Retention Money as Damages for such Contractor's Default.

- 753 On completion of the whole work half of the total retention money shall be released to the contractor and balance half will be paid after completion of Defect Liability period provided that all defects notified by Engineer as rectified by Contractor and Engineer has issued certificate for the same (Annex-II of Schedule-F).
- 754 Within 15 (fifteen) days of the date of issue of the Completion Certificate, the Authority shall discharge the bank guarantees, if any, furnished by the Contractor under the provisions of Clause 7.5.3 and refund the balance of Retention Money remaining with the Authority after adjusting the amounts appropriated under the provisions of Clause 7.5.2 and the amounts refunded under the provisions of Clause 7.5.3.
- 755 The Parties agree that in the event of Termination of this Agreement, the Retention Money and the bank guarantees specified in this Clause 7.5 shall be treated as if they are Performance Security and shall be reckoned as such for the purposes of Termination Payment under Clause 21.6.

ARTICLE 8**SITE OF PROJECT****8.1 The Site**

The site of the Project (the “**Site**”) shall comprise the site described in respect of which the land shall be provided by the Authority to the Contractor. The Authority shall be responsible for:

acquiring and providing land on the Site in accordance with the [alignment] finalized by the Authority, free from all encroachments and encumbrances, and free access thereto for the execution of this Agreement.

8.2 Deleted**8.3 Deleted.****8.4 Deleted.****8.5 Deleted.****8.6 Deleted****8.7 Deleted****8.8 Geological and archaeological finds**

It is expressly agreed that mining, geological or archaeological rights do not form part of this Agreement with the Contractor for the Works, and the Contractor hereby acknowledges that it shall not have any mining rights or interest in the underlying minerals, fossils, antiquities, structures or other remnants or things either of particular geological or archaeological interest and that such rights, interest and property on or under the Site shall vest in and belong to the Authority or the concerned Government Instrumentality. The Contractor shall take all reasonable precautions to prevent its workmen or any other person from removing or damaging such interest or property and shall inform the Authority forthwith of the discovery thereof and comply with such instructions as the Authority or the concerned Government Instrumentality may reasonably give for the removal of such property. For the avoidance of doubt, it is agreed that any reasonable expenses incurred by the Contractor hereunder shall be reimbursed by the Authority. It is also agreed that the Authority shall procure that the instructions hereunder are issued by the concerned Government Instrumentality within a reasonable period so as to enable the Contractor to continue its Works with such modifications as may be deemed necessary.

ARTICLE 9

UTILITIES AND TREES

9.1 Deleted.

9.2 Deleted.

9.3 New utilities

931 The Contractor shall allow, subject to such conditions as the Authority may specify, access to, and use of the Site for laying telephone lines, water pipes, electric cables or other public utilities. Where such access or use causes any financial loss to the Contractor, it may require the user of the Site to pay compensation or damages as per Applicable Laws. For the avoidance of doubt, it is agreed that use of the Site under this Clause 9.3 shall not in any manner relieve the Contractor of its obligation to construct the Project in accordance with this Agreement and any damage caused by such use shall be restored forthwith at the cost of the Authority.

932 In the event the construction of any Works is affected by a new utility or works undertaken in accordance with this Clause 9.3, the Contractor shall be entitled to a reasonable Time Extension as determined by the Authority's Engineer in accordance with the provisions of Clause 10.4.

933 The Authority may, by notice, require the Contractor to connect any adjoining road to the Project, and the connecting portion thereof falling within the Site shall be constructed by the Contractor at the Authority's cost in accordance with Article 10.

934 Deleted.

9.4 Felling of trees

The Authority shall assist the Contractor in obtaining the Applicable Permits for felling of trees to be identified by the Authority for this purpose if and only if such trees cause a Material Adverse Effect on the construction of the Project. The cost of such felling and of the compensatory plantation of trees, if any, shall be borne by the Selected Bidder. In the event of any delay in felling thereof for reasons beyond the control of the Contractor; it shall be excused for failure to perform any of its obligations hereunder if such failure is a direct consequence of delay in the felling of trees. The Parties hereto agree that the felled trees shall be deemed to be owned by the Authority and shall be disposed in such manner and subject to such conditions as the Authority may in its sole discretion deem appropriate. For the avoidance of doubt, the Parties agree that if any felling of trees result any period of delay in providing the Applicable Permits, the Contractor shall be entitled to Time Extension.

ARTICLE 10

DESIGN AND DEVELOPMENT OF THE PROJECT

10.1 Obligations prior to commencement of Works

10.1.1 Within 20 (twenty) days of the Appointed Date, the Contractor shall:

- i) appoint its representative, duly authorised to deal with the Authority in respect of all matters under or arising out of or relating to this Agreement;
- ii) appoint a design engineer (the “**Design Engineer**”) who will head the Contractor’s design unit and shall be responsible for surveys, investigations, collection of data, and preparation of preliminary and detailed designs;
- iii) undertake and perform all such acts, deeds and things as may be necessary or required before commencement of Works under and in accordance with this Agreement, Applicable Laws and Applicable Permits; and
- iv) make its own arrangements for quarrying of materials and procurement needed for the Project under and in accordance with Applicable Laws and Applicable Permits.

10.1.2 The Authority shall, within 15 (fifteen) days of the date of this Agreement, appoint an engineer (the “**Authority’s Engineer**”) to discharge the functions and duties specified in this Agreement, and shall notify to the Contractor the name, address and the date of appointment of the Authority’s Engineer forthwith.

10.1.3 Within 30 (thirty) days of the Appointed Date, the Contractor shall submit to the Authority and the Authority’s Engineer a programme (the “**Programme**”) for construction of the Works, developed using networking techniques and giving the following details:

Part I Contractor’s organization for the Project, the general methods and arrangements for design and construction, environmental management plan, Quality Assurance Plan including design quality plan, traffic management and safety plan covering safety of users and workers during construction, Contractor’s key personnel, and equipment.

Part II Programme for completion of all stages of construction and Project Milestones of the Works as specified in Project Completion Schedule set forth in Schedule-I. The Programme shall include:

- i. the order in which the Contractor intends to carry out the Works, including the anticipated timing of design and stages of Works;
- ii. the periods for reviews under Clause 10.2; and

- iii. the sequence and timing of inspections and tests specified in this Agreement.

The Contractor shall submit a revised programme whenever the previous programme is inconsistent with the actual progress or with the Contractor's obligations.

Part III Monthly cash flow forecast for the Project.

For the avoidance of doubt, the Contractor acknowledges and agrees that the Authority may, within a period of 15 (fifteen) days of receipt of the Programme, convey its comments to the Contractor stating the modifications, if any, required for compliance with the provisions of this Agreement, and the Contractor shall carry out such modifications, to the extent required for conforming with the provisions of this Agreement.

10.1.4 The Contractor shall compute, on the basis of the Drawings prepared in accordance with Clause 10.2.7, and provide to the Authority's Engineer, the length, area and numbers, as the case may be, in respect of the various items of work specified and comprising the Scope of the Project. The Parties expressly agree that these details shall form the basis for estimating the interim payments for the Works in accordance with the provisions of Clause 17.3. For the avoidance of doubt, the sum of payments to be computed in respect of all the items of work shall not exceed the Contract Price, as may be adjusted in accordance with the provisions of this Agreement.

10.1.5 The Contractor shall appoint a safety consultant (the "**Safety Consultant**") to carry out safety audit at the design stage of the Project in accordance with Applicable Laws and Good Industry Practice. The Safety Consultant shall be appointed after proposing to the Authority a panel of 3 (three) names of qualified and experienced firms from which the Authority may choose 1 (one) to be the Safety Consultant. Provided, however, that if the panel is not acceptable to the Authority and the reasons for the same are furnished to the Contractor, the Contractor shall propose to the Authority a revised panel of 3 (three) names for obtaining the consent of the Authority. The Authority shall, within 15 (fifteen) days of receiving a proposal from the Contractor hereunder, convey its decision, with reasons, to the Contractor, and if no such decision is conveyed within the said period, the Contractor may proceed with engaging of the Safety Consultant. For the avoidance of doubt, the Parties agree that no firm or person having any conflict of interest shall be engaged hereunder. The Parties further agree that any assignments completed at least 3 (three) years prior to the appointment hereunder shall not be reckoned for the purposes of conflict of interest.

10.1.6 The safety audit pursuant to Clause 10.1.5 shall be carried out by the Safety Consultant in respect of all such design details that have a bearing on safety of Users as well as pedestrians and animals involved in or associated with accidents. The recommendations of the Safety Consultant shall be incorporated in the design of the

Project and the Contractor shall forward to the Authority's Engineer a certificate to this effect together with the recommendations of the Safety Consultant. In the event that any works required by the Safety Consultant shall fall beyond the scope, the Contractor shall make a report thereon and seek the instructions of the Authority for Change in Scope. For the avoidance of doubt, the Safety Consultant to be engaged by the Contractor shall be independent of the design and implementation team of the Contractor.

10.2 Design and Drawings

10.2.1 Design and Drawings shall be developed in conformity with the Specifications and Standards. In the event, the Contractor requires any relaxation in design standards due to restricted Right of Way in any Section, the alternative design criteria for such Section shall be provided for review of the Authority's Engineer.

10.2.2 The Contractor shall appoint a proof check consultant (the "**Proof Consultant**") after proposing to the Authority a panel of 3 (three) names of qualified and experienced firms from whom the Authority may choose 1 (one) to be the Proof Consultant. Provided, however, that if the panel is not acceptable to the Authority and the reasons for the same are furnished to the Contractor, the Contractor shall propose to the Authority a revised panel of 3 (three) names for obtaining the consent of the Authority. The Contractor shall also obtain the consent of the Authority for 2 (two) key personnel of the Proof Consultant who shall have adequate experience and qualifications with respect to the main elements of the Project. The Authority shall, within 15 (fifteen) days of receiving a proposal from the Contractor hereunder, convey its decision, with reasons, to the Contractor, and if no such decision is conveyed within the said period, the Contractor may proceed with engaging of the Proof Consultant. For the avoidance of doubt, the Parties agree that no firm or person having any conflict of interest shall be engaged hereunder. The Parties further agree that any assignments completed at least three years prior to the appointment hereunder shall not be reckoned for the purposes of conflict of interest.

10.2.3 The Proof Consultant shall:

- a) evolve a systems approach with the Design engineer so as to minimise the time required for final designs and construction drawings; and
- b) proof check the detailed calculations, drawings and designs, which have been approved by the Design Director.

10.2.4 In respect of the Contractor's obligations with respect to the design and Drawings of the Project as set forth in Schedule-H, the following shall apply:

- c) The Contractor shall prepare and submit, with reasonable promptness and in such sequence as is consistent with the Project Completion Schedule, 3 (three) copies each of the design and Drawings, duly certified by the Proof Consultant, to the Authority's Engineer for review.

- d) by submitting the Drawings for review to the Authority's Engineer, the Contractor shall be deemed to have represented that it has determined and verified that the design and engineering, including field construction criteria related thereto, are in conformity with the Scope of the Project, Specifications and Standards, Applicable Laws and Good Industry Practice;
- e) within 15 (fifteen) days of the receipt of the Drawings, the Authority's Engineer shall review the same and convey its observations to the Contractor with particular reference to their conformity or otherwise with the Scope of the Project and the Specifications and Standards. The Contractor shall not be obliged to await the observations of the Authority's Engineer on the Drawings submitted pursuant hereto beyond the said period of 15 (fifteen) days and may begin or continue Works at its own discretion and risk;
- f) if the aforesaid observations of the Authority's Engineer indicate that the Drawings are not in conformity with the Scope of the Project or the Specifications and Standards, such Drawings shall be revised by the Contractor in conformity with the provisions of this Agreement and resubmitted to the Authority's Engineer for review. The Authority's Engineer shall give its observations, if any, within 10 (ten) days of receipt of the revised Drawings. In the event the Contractor fails to revise and resubmit such Drawings to the Authority's Engineer for review as aforesaid, the Authority's Engineer may cause the payment for the affected works to be withheld under the provisions of Clause 17.5.4. If the Contractor disputes any decision, direction or determination of the Authority's Engineer hereunder, the Dispute shall be resolved in accordance with the Dispute Resolution Procedure;
- g) no review and/or observation of the Authority's Engineer and/or its failure to review and/or convey its observations on any Drawings shall relieve the Contractor of its obligations and liabilities under this Agreement in any manner nor shall the Authority's Engineer or the Authority be liable for the same in any manner; and if errors, omissions, ambiguities, inconsistencies, inadequacies or other Defects are found in the Drawings, they shall be corrected, along with the affected Works, at the Contractor's cost, notwithstanding any review under this Article 10;
- h) the Contractor shall be responsible for delays in submitting the Drawings, as set forth in Schedule-H, caused by reason of delays in surveys and field investigations, and shall not be entitled to seek any relief in respect thereof from the Authority; and
- i) the Contractor warrants that its designers, including any third parties engaged by it, shall have the required experience and capability in accordance with Good Industry Practice and it shall indemnify the Authority against any damage, expense, liability, loss or claim, which the

Authority might incur, sustain or be subject to arising from any breach of the Contractor's design responsibility and/or warranty as set out in this Clause.

10.2.5 Any cost or delay in construction arising from review by the Authority's Engineer shall be borne by the Contractor.

10.2.6 Works shall be executed in accordance with the Drawings provided by the Contractor in accordance with the provisions of this Clause 10.2 and the observations of the Authority's Engineer thereon as communicated pursuant to the provisions of Clause 10.2.4 (d). Such Drawings shall not be amended or altered without prior written notice to the Authority's Engineer. If a Party becomes aware of an error or defect of a technical nature in the design or Drawings, that Party shall promptly give notice to the other Party of such error or defect.

10.2.7 Within 90 (ninety) days of the Project Completion Date, the Contractor shall furnish to the Authority and the Authority's Engineer a complete set of as-built Drawings, in 2 (two) hard copies and in its editable digital format or in such other medium or manner as may be acceptable to the Authority, including an as-built survey illustrating the layout of the Project and setback lines, if any, of the structures forming part of Project Facilities, and shall hand them over to the Authority against receipt thereof.

10.3 Construction of the Project

10.3.1 The Contractor shall construct the Project in conformity with the Specifications and Standards set forth in this RFP. The Contractor shall be responsible for the correct positioning of all parts of the Works, and shall rectify any error in the positions, levels, dimensions or alignment of the Works. The 12 months from the Appointed Date shall be the scheduled completion date (the "**Scheduled Completion Date**") and the Contractor agrees and undertakes that the construction shall be completed on or before the Scheduled Completion Date, including any extension thereof.

10.3.2 The Contractor shall construct the Project in accordance with the Project Completion Schedule set forth in Schedule-I. In the event that the Contractor fails to achieve any Project Milestone or the Scheduled Completion Date within a period of 30 (thirty) days from the date set forth in Schedule-I, unless such failure has occurred due to Force Majeure or for reasons attributable to the Authority, it shall pay Damages to the Authority in a sum calculated at the rate of 0.05% (zero point zero five per cent) of the Contract Price for delay day reckoned from the date specified in Schedule - I and until such Project Milestone is achieved or the Works are completed; provided that if the period for any or all Project Milestones or the Scheduled Completion Date is extended in accordance with the provisions of this Agreement, the dates set forth in Schedule-I shall be deemed to be modified accordingly and the provisions of this Agreement shall apply as if Schedule-I has been amended as above; provided further that in the event the Works are completed within or before the Scheduled

Completion Date including any Time Extension, the Damages paid under this Clause 10.3.2 shall be refunded by the Authority to the Contractor, but without any interest thereon. For the avoidance of doubt, it is agreed that recovery of Damages under this Clause 10.3.2 shall be without prejudice to the rights of the Authority under this Agreement including the right of Termination thereof. The Parties further agree that Time Extension hereunder shall only be reckoned for and in respect of the affected Works as specified in Clause 10.4.2.

10.3.3 The Authority shall notify the Contractor of its decision to impose Damages in pursuance of the provisions of this Clause 10.3. Provided, however, that no deduction on account of Damages shall be effected by the Authority without taking into consideration the representation, if any, made by the Contractor within 20 (twenty) days of such notice. The Parties expressly agree that the total amount of Damages under Clause 10.3.2 shall not exceed 5% (five percent) of the Contract Price.

10.4 Extension of time for completion

10.4.1 Without prejudice to any other provision of this Agreement for and in respect of extension of time, the Contractor shall be entitled to extension of time in the Project Completion Schedule (the “**Time Extension**”) to the extent that completion of any Project Milestone is or will be delayed by any of the following, namely:

- a) delay in providing site, environmental clearances specified in Clause 4.1.4;
- b) Change of Scope, unless an adjustment to the Scheduled Completion Date has been agreed under Article 13;
- c) occurrence of a Force Majeure Event;
- d) any delay, impediment or prevention caused by or attributable to the Authority, the Authority’s personnel or the Authority’s other contractors on the Site; and
- e) any other cause or delay which entitles the Contractor to Time Extension in accordance with the provisions of this Agreement.

10.4.2 The Contractor shall, no later than 15 (fifteen) business days from the occurrence of an event or circumstance specified in Clause 10.4.1, inform the Authority’s Engineer by notice in writing, with a copy to the Authority, stating in reasonable detail with supporting particulars, the event or circumstances giving rise to the claim for Time Extension in accordance with the provisions of this Agreement. Provided that the period of 15 (fifteen) business days shall be calculated from the date on which the

Contractor became aware, or should have become aware, of the occurrence of such an event or circumstance.

Provided further that notwithstanding anything to the contrary contained in this Agreement, Time Extension shall be due and applicable only for the Works which are affected by the aforesaid events or circumstances and shall not in any manner affect the Project Completion Schedule for and in respect of the Works which are not affected thereby.

10.4.3 In the event of the failure of the Contractor to issue to the Authority's Engineer a notice in accordance with the provisions of Clause 10.4.2 within the time specified therein, the Contractor shall not be entitled to any Time Extension and shall forfeit its right to any such claims in future. For the avoidance of doubt, in the event of failure of the Contractor to issue notice as specified in this Clause 10.4.3, the Authority shall be discharged from all liability in connection therewith.

10.4.4 The Authority's Engineer shall, on receipt of a claim in accordance with the provisions of Clause 10.4.2, examine the claim expeditiously within the time frame specified herein. In the event the Authority's Engineer requires any clarifications to examine the claim, the Authority's Engineer shall seek the same within 15 (fifteen) days from the date of receiving the claim. The Contractor shall, on the receipt of the communication of the Authority's Engineer requesting for clarification, furnish the same to the Authority's Engineer within 10 (ten) days thereof. The Authority's Engineer shall, within a period of 30 (thirty) days from the date of receipt of such clarifications, forward in writing to the Contractor its determination of Time Extension. For the avoidance of doubt, the Parties agree that the Authority's Engineer shall, in accordance with the provisions of this Agreement, notify the Contractor of the aforesaid Time Extension no later than 60 (sixty) days from the date of receipt of the Contractor's claim for Time Extension.

Provided that when determining each extension of time under this Clause 10.4, the Authority's Engineer shall review previous determinations and may increase, but shall not decrease, the total Time Extension.

10.4.5 If the event or circumstance giving rise to the notice has a continuing effect:

- f) the detailed claim shall be considered as interim;
- g) the Contractor shall, no later than 10 (ten) days after the close of each month, send further interim claims specifying the accumulated delay, the extension of time claimed, and such further particulars as the Authority's Engineer may reasonably require; and
- h) the Contractor shall send a final claim within 30 (thirty) days after the effect of the event or the circumstance ceases.

Upon receipt of the claim hereunder, the Authority's Engineer shall examine and determine the same in accordance with the provisions of Clause 10.4.4 within a period of 60 (sixty) days of the receipt thereof.

10.5 Incomplete Works

In the event the Contractor fails to complete the Works in accordance with the Project Completion Schedule, including any Time Extension granted under this Agreement, the Contractor shall endeavour to complete the balance work expeditiously and shall pay Damages to the Authority in accordance with the provisions of Clause 10.3.2 for delay of each day until the Works are completed in accordance with the provisions of this Agreement. Recovery of Damages under this Clause shall be without prejudice to the rights of the Authority under this Agreement including the right to termination under Clause 21.1.

ARTICLE 11

QUALITY ASSURANCE, MONITORING AND SUPERVISION**11.1 Quality of Materials and workmanship**

- 11.1.1 The Contractor shall ensure that the Construction, Materials and workmanship are in accordance with the requirements specified in this Agreement, Specifications and Standards and Good Industry Practice.
- 11.1.2 The Contractor warrants that all Materials shall be new, unused, not reconditioned and in conformity with Specification and Standards, Applicable Laws and Good Industry Practice, and that the Contractor shall not use any materials which are generally recognized as being deleterious under Good Industry Practice.

11.2 Quality control system

- 11.2.1 The Contractor shall establish a quality control mechanism to ensure compliance with the provisions of this Agreement (the “**Quality Assurance Plan**” or “**QAP**”).
- 11.2.2 The Contractor shall, within 30 (thirty) days of the Appointed Date, submit to the Authority’s Engineer its Quality Assurance Plan which shall include the following:
- i) organization, duties and responsibilities, procedures, inspections and documentation;
 - ii) quality control mechanism including sampling and testing of Materials, test frequencies, standards, acceptance criteria, testing facilities, reporting, recording and interpretation of test results, approvals, check list for site activities, and proforma for testing and calibration in accordance with the Specifications and Standards and Good Industry Practice; and
 - iii) internal quality audit system.
- The Authority’s Engineer shall convey its comments to the Contractor within a period of 21 (twenty-one) days of receipt of the QAP stating the modifications, if any, required, and the Contractor shall incorporate those in the QAP to the extent required for conforming with the provisions of this Clause 11.2.
- 11.2.3 The Contractor shall procure all documents, apparatus and instruments, fuel, consumables, water, electricity, labour, Materials, samples, and qualified personnel as are necessary for examining and testing the Project Assets, Materials and workmanship in accordance with the Quality Assurance Plan.
- 11.2.4 The cost of testing of Construction, Materials and workmanship under this Article 11 shall be borne by the Contractor.

11.3. Methodology

The Contractor shall, at least 15 (fifteen) days prior to the commencement of work, submit

to the Authority's Engineer for review the methodology proposed to be adopted for executing the Works, giving details of equipment to be deployed, traffic management and measures for ensuring safety. The Authority's Engineer shall complete the review and convey its comments, if any, to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed methodology from the Contractor.

11.4. Inspection and technical audit by the Authority

The Authority or any representative authorized by the Authority in this behalf may inspect and review the progress and quality of the Works and issue appropriate directions to the Authority's Engineer and the Contractor for taking remedial action in the event the Works are not in accordance with the provisions of this Agreement.

11.5 External technical audit

At any time during construction, the Authority may appoint an external technical auditor to conduct an audit of the quality of the Works. The findings of the audit, to the extent accepted by the Authority, shall be notified to the Contractor and the Authority's Engineer for taking remedial action in accordance with this Agreement. The Contractor shall provide all assistance as may be required by the auditor in the conduct of its audit hereunder. Notwithstanding anything contained in this Clause 11.5, the external technical audit shall not affect any obligations of the Contractor or the Authority's Engineer under this Agreement.

11.6 Inspection of construction records

The Authority shall have the right to inspect the records of the Contractor relating to the Works.

11.7 Monthly progress reports

During the Construction Period, the Contractor shall, no later than 10 (ten) days after the close of each month, furnish to the Authority and the Authority's Engineer a monthly report on the progress of Works and shall promptly give such other relevant information as may be required by the Authority's Engineer.

11.8 Inspection

11.8.1 The Authority's Engineer and its authorized representative shall at all times:

- iv) have full access to all parts of the Site and to all places from which natural Materials are being obtained for use in the Works; and
- v) during production, manufacture and construction at the Site and at the place of production, be entitled to examine, inspect, measure and test the Materials and workmanship, and to check the progress of manufacture of Materials.

11.8.2 The Contractor shall give the Authority's Engineer and its authorized agents access,

facilities and safety equipment for carrying out their obligations under this Agreement.

- 11.8.3 The Authority's Engineer shall submit a monthly inspection report (the "**Inspection Report**") to the Authority and the Contractor bringing out the results of inspections and the remedial action taken by the Contractor in respect of Defects or deficiencies. For the avoidance of doubt, such inspection or submission of Inspection Report by the Authority's Engineer shall not relieve or absolve the Contractor of its obligations and liabilities under this Agreement in any manner whatsoever.

11.9 Samples

The Contractor shall submit the following samples of Materials and relevant information to the Authority's Engineer for review:

- vi) manufacturer's test reports and standard samples of manufactured Materials; and
- vii) samples of such other Materials as the Authority's Engineer may require.

11.10 Tests

- 11.10.1 For determining that the Works conform to the Specifications and Standards, the Authority's Engineer shall require the Contractor to carry out or cause to be carried out tests, at such time and frequency and in such manner as specified in this Agreement, and in accordance with Good Industry Practice for quality assurance. The Contractor shall, with due diligence, carry out all the tests in accordance with the Agreement and furnish the results thereof to the Authority's Engineer. Of the total tests for each category or type to be undertaken by the Contractor under the provisions of this Agreement and Good Industry Practice, the Authority's Engineer shall (a) carry out or cause to be carried out, test checks equal to about 10% (ten percent) of the number of the tests required to be undertaken by the Contractor; and (b) witness or participate in at least 10% (ten percent) of the number of such tests conducted or caused to be conducted by the Contractor.

- 11.10.2 In the event that results of any tests conducted under this Clause 11.10 establish any Defects or deficiencies in the Works, the Contractor shall carry out remedial measures and furnish a report to the Authority's Engineer in this behalf. The Authority's Engineer shall require the Contractor to carry out or cause to be carried out tests to determine that such remedial measures have brought the Works into compliance with the Specifications and Standards, and the procedure shall be repeated until such Works conform to the Specifications and Standards. For the avoidance of doubt, the cost of such tests and the remedial measures in pursuance thereof shall be solely borne by the Contractor.

11.11 Examination of work before covering up

In respect of the work which the Authority's Engineer is entitled to examine, inspect, measure or test before it is covered up or put out of view or any part of the work is placed thereon, the Contractor shall give notice to the Authority's Engineer whenever any such work is ready and before it is covered up. The Authority's Engineer shall then either carry out the examination, inspection or testing without unreasonable delay, or promptly give notice to the Contractor that the Authority's Engineer does not require to do so. Provided, however, that if any work is of a continuous nature where it is not possible or prudent to keep it uncovered or incomplete, the Contractor shall notify the schedule of carrying out such work to give sufficient opportunity, not being less than 3 (three) business days' notice, to the Authority's Engineer to conduct its inspection, measurement or test while the work is continuing. Provided further that in the event the Contractor receives no response from the Authority's Engineer within a period of 3 (three) business days from the date on which the Contractor's notice hereunder is delivered to the Authority's Engineer, the Contractor shall be entitled to assume that the Authority's Engineer would not undertake the said inspection.

11.12 Rejection

- 11.12.1 If, as a result of an examination, inspection, measurement or testing, any Plant, Material, design or workmanship is found to be defective or otherwise not in accordance with the provisions of this Agreement, the Authority's Engineer may reject such Plant, Material, design or workmanship by giving notice to the Contractor, with reasons. The Contractor shall then promptly make good the Defect and ensure that the rejected item complies with the requirements of this Agreement.
- 11.12.2 If the Authority's Engineer requires the Plant, Material, design or workmanship to be retested, the tests shall be repeated on the same terms and conditions, as applicable in each case. If the rejection and retesting cause the Authority to incur any additional costs, such costs shall be recoverable by the Authority from the Contractor and may be deducted by the Authority from any monies due to be paid to the Contractor.
- 11.12.3 The Contractor shall not be entitled to any extension of time on account of rectifying any Defect or retesting as specified in this Clause 11.12.
- 11.12.4 No examination, inspection, measurement or testing of any Plant, Material, design or workmanship by the Authority's Engineer or its failure to convey its observations or to examine, inspect, measure or test shall relieve the Contractor of its obligations and liabilities under this Agreement in any manner nor shall the Authority be liable for the same in any manner.

11.13 Remedial work

- 11.13.1 Notwithstanding any previous test or certification, the Authority's Engineer may

instruct the Contractor to:

1. remove from the Site and replace any Plant or Materials which are not in accordance with the provisions of this Agreement;
2. remove and re-execute any work which is not in accordance with the provisions of this Agreement and the Specification and Standards; and
3. execute any work which is urgently required for the safety of the Project, whether because of an accident, unforeseeable event or otherwise; provided that in case of any work which is required on account of a Force Majeure Event, the provisions of Clause 19.6 shall apply.

11.13.2 If the Contractor fails to comply with the instructions issued by the Authority's Engineer under Clause 11.13.1, within the time specified in the Authority's Engineer's notice or as mutually agreed, the Authority's Engineer may advise the Authority to have the work executed by another agency. The cost so incurred by the Authority for undertaking such work shall, without prejudice to the rights of the Authority to recover Damages in accordance with the provisions of this Agreement, be recoverable from the Contractor and may be deducted by the Authority from any monies due to be paid to the Contractor.

11.14 Delays during construction

Without prejudice to the provisions of Clause 10.3.2, in the event the Contractor does not achieve any of the Project Milestones within the time period stipulated in Schedule I or the Authority's Engineer shall have reasonably determined that the rate of progress of Works is such that Completion of the Project is not likely to be achieved by the end of the Scheduled Completion Date, it may notify the same to the Contractor, and the Contractor shall, within 15 (fifteen) days of such notice, by a communication inform the Authority's Engineer in reasonable detail about the steps it proposes to take to expedite progress and the period within which it shall achieve the Project Completion Date.

11.15 Quality control records and Documents

The Contractor shall hand over to the Authority's Engineer a copy of all its quality control records and documents before the Completion Certificate is issued pursuant to Clause 12.2.

11.16 Video recording

During the Construction Period, the Contractor shall provide to the Authority for every calendar quarter, a video recording, which will be compiled into a 3 (three) hour digital video disc or any substitute thereof, covering the status and progress of Works in that quarter. The video recording shall be provided to the Authority no later than 15 (fifteen) days after the close of each quarter after the Appointed Date.

11.17 Suspension of unsafe Construction Works

11.17.1 Upon recommendation of the Authority's Engineer to this effect, or on its own

volition in cases of emergency or urgency, the Authority may by notice require the Contractor to suspend forthwith the whole or any part of the Works if, in the reasonable opinion of the Authority's Engineer or the Authority, as the case may be, such work threatens the safety of the Users and or other persons on or about the Project. Provided, however, that in case of an emergency, the Authority may *suo moto* issue the notice referred to hereinabove.

11.17.2 The Contractor shall, pursuant to the notice under Clause 11.17.1, suspend the Works or any part thereof for such time and in such manner as may be specified by the Authority and thereupon carry out remedial measures to secure the safety of suspended works, the Users, other persons and vehicles on or about the Project including pedestrians. The Contractor may by notice require the Authority's Engineer to inspect such remedial measures forthwith and make a report to the Authority recommending whether or not the suspension hereunder may be revoked. Upon receiving the recommendations of the Authority's Engineer, the Authority shall either revoke such suspension or instruct the Contractor to carry out such other and further remedial measures as may be necessary in the reasonable opinion of the Authority, and the procedure set forth in this Clause 11.17 shall be repeated until the suspension hereunder is revoked.

11.17.3 Subject to the provisions of Clause 19.6, all reasonable costs incurred for maintaining and protecting the Works or part thereof during the period of suspension (the "Preservation Costs"), shall be borne by the Contractor; provided that if the suspension has occurred as a result of any breach of this Agreement by the Authority, the Preservation Costs shall be borne by the Authority.

11.17.4 If suspension of Works is for reasons not attributable to the Contractor, the Authority's Engineer shall determine any Time Extension to which the Contractor is reasonably entitled in accordance with the provisions of Clause 10.4.

ARTICLE 12

COMPLETION CERTIFICATE

12.1 Tests on completion

12.1.1 No later than 30 (thirty) days prior to the likely completion of the Project, or a Section thereof, the Contractor shall notify the Authority's Engineer of its intent to subject the Project or a Section thereof, to Tests. The date and time of each of the Tests shall be determined by the Authority's Engineer in consultation with the Contractor, and notified to the Authority who may designate its representative to witness the Tests. The Contractor shall either conduct the Tests as directed by the Authority's Engineer or provide such assistance as the Authority's Engineer may reasonably require for conducting the Tests. For the avoidance of doubt, the Parties agree that in the event of the Contractor and the Authority's Engineer failing to mutually agree on the dates for conducting the Tests, the Contractor shall fix the dates by giving not less than 10 (ten) days' notice to the Authority's Engineer, and in the event the Authority's Engineer delays the Tests hereunder, the Authority shall impose exemplary penalties on the Authority's Engineer and shall ensure that Tests are completed in time either by the Authority's Engineer or any substitute thereof.

12.1.2 All Tests shall be conducted in accordance with Schedule-J at the cost and expense of the Contractor. The Authority's Engineer shall observe, monitor and review the results of the Tests to determine compliance of the Project or a Section thereof, with Specifications and Standards and if it is reasonably anticipated or determined by the Authority's Engineer during the course of any Test that the performance of the Project or Section or any part thereof, does not meet the Specifications and Standards, it shall have the right to suspend or delay such Test and require the Contractor to remedy and rectify any Defect or deficiency. Upon completion of each Test, the Authority's Engineer shall provide to the Contractor and the Authority copies of all Test data including detailed Test results. For the avoidance of doubt, the Parties expressly agree that the Authority's Engineer may require the Contractor to carry out or cause to be carried out additional Tests, in accordance with Good Industry Practice, for determining the compliance of the Project or Section thereof with the Specifications and Standards.

12.2 Provisional Certificate

12.2.1 Subject to the provisions of Clause 12.2.5, upon completion of all Works forming

part of the Project, save and except the Works for which Time Extension has been granted under Clause 10.5, the Authority's Engineer shall, at the request of the Contractor, issue a provisional certificate of completion substantially in the form set forth in Schedule-K (the "**Provisional Certificate**") if the Tests for and in respect of the completed Works are successful. The Provisional Certificate shall have appended thereto a list of outstanding items of work (the "**Punch List**") that need to be completed in accordance with the provisions of this Agreement. The Contractor undertakes to complete the minor outstanding items of works in respect of those Sections of the Project for which the Provisional Certificate has been issued, within a period of 30 (thirty) days of the date of Provisional Certificate, and those parts of the Works in respect of which Time Extension has been granted, within the extended period thereof. For the avoidance of doubt, the Parties agree that the Punch List shall include all Works for which Time Extension has been granted and shall also include any minor outstanding items of work forming part of the completed Sections if such works do not materially affect the use of the completed Sections for their intended purpose. The Parties further agree that Provisional Certificate shall not be issued if the completed Works cannot be safely and reliably placed in service of the Users thereof.

- 12.2.2 Upon issue of Provisional Certificate, the provisions of Article 15 shall apply to the completed parts of the Project and the property and ownership of all such completed Works shall vest in the Authority.
- 12.2.3 If the Authority's Engineer determines that the Project or any completed part thereof does not conform to the provisions of this Agreement and cannot be safely and reliably placed in operation, it shall forthwith make a report in this behalf and send copies thereof to the Authority and the Contractor and withhold issuance of the Provisional Certificate until the Defects or deficiencies are rectified by the Contractor and Tests are successful in accordance with this Article 12.
- 12.2.4 Notwithstanding anything to the contrary contained in Clause 12.2.3, the Authority may, at any time after receiving a report from the Authority's Engineer under that Clause, direct the Authority's Engineer to issue a Provisional Certificate under Clause 12.2.1 and such direction shall be complied forthwith.
- 12.2.5 No Provisional Certificate shall be issued under the provisions of this Clause 12.2 until the Contractor has submitted valid claims for payment of at least 80% (eighty percent) of the amount arrived at after reducing the lump sum price specified in Clause 17.1.1 by the amount attributable to works which have been withdrawn under the provisions of Clause 8.3.3. For the avoidance of doubt and by way of illustration, the Parties agree that if the Contract Price specified in Clause 17.1.1 is Rs.105 cr. (Rs. one hundred and five crore) and the works withdrawn under Clause 8.3.3 have a value of Rs.5 cr. (Rs. five crore), a Provisional Certificate shall not be issued until valid claims for payment of an amount of Rs.80 cr. (Rs. eighty crore) have been

submitted by the Contractor in accordance with the provisions of this Agreement. It is further agreed that all price adjustments made in pursuance of Clause 17.10 shall not be reckoned for computation of the claims for payments referred to in this Clause 12.2.5. It is also agreed that any Change of Scope effected within 30 (thirty) days of the Appointed Date shall be reckoned for the purposes of determining the Contract Price hereunder.

12.3 Completion of remaining Works

All items in the Punch List shall be completed by the Contractor in accordance with the provisions of this Agreement. For any delay in their completion other than for the reasons attributable to the Authority or due to Force Majeure, the Authority shall be entitled to recover Damages from the Contractor in accordance with the provisions of Clause 10.3.2 of this Agreement.

12.4 Completion Certificate

12.4.1 Upon completion of all Works, including the items specified in the Punch List, and the Authority's Engineer determining the Tests to be successful, it shall forthwith issue to the Contractor and the Authority a certificate substantially in the form set forth in Schedule-K (the "**Completion Certificate**").

12.4.2 Upon receiving the Completion Certificate, the Contractor shall remove its equipment, materials, debris and temporary works from the Site within a period of 30 (thirty) days thereof, failing which the Authority may remove or cause to be removed, such equipment, materials, debris and temporary works and recover from the Contractor an amount equal to 120% (one hundred and twenty percent) of the actual cost of removal incurred by the Authority.

12.4.3 Without prejudice to the obligations of the Contractor specified in Article 15, the property and ownership of all the completed Works forming part of the Project shall vest in the Authority.

12.5 Rescheduling of Tests

If the Authority's Engineer certifies to the Authority and the Contractor that it is unable to issue the Completion Certificate or Provisional Certificate, as the case may be, because of events or circumstances on account of which the Tests could not be held or had to be suspended, the Contractor shall be entitled to re-schedule the Tests and hold the same as soon as reasonably practicable.

ARTICLE 13

CHANGE OF SCOPE**13.1 Change of Scope**

13.1.1 The Authority may, notwithstanding anything to the contrary contained in this Agreement, require the Contractor to make modifications or alterations to the Works (“**Change of Scope**”) before the issue of the Completion Certificate either by giving an instruction or by requesting the Contractor to submit a proposal for Change of Scope involving additional cost or reduction in cost. Any such Change of Scope shall be made and valued in accordance with the provisions of this Article 13.

13.1.2 Change of Scope shall mean:

- 1) change in specifications of any item of Works;
- 2) omission of any work from the Scope of the Project except under Clause 8.3.3; provided that, subject to Clause 13.5, the Authority shall not omit any work under this Clause in order to get it executed by any other entity; or
- 3) any additional work, Plant, Materials or services which are not included in the Scope of the Project, including any associated Tests on completion of construction.

13.1.3 If the Contractor determines at any time that a Change of Scope will, if adopted, (i) accelerate completion, (ii) reduce the cost to the Authority of executing, maintaining or operating the Project, (iii) improve the efficiency or value to the Authority of the completed Project, or (iv) otherwise be of benefit to the Authority, it shall prepare a proposal with relevant details at its own cost. The Contractor shall submit such proposal, supported with the relevant details including the amount of reduction in the Contract Price, if any, to the Authority to consider such Change of Scope. The Authority shall, within 15 (fifteen) days of receipt of such proposal, either accept such Change of Scope with modifications, if any, and initiate proceedings therefor in accordance with this Article 13 or reject the proposal and inform the Contractor of its decision. For the avoidance of doubt, the Parties agree that the Contractor shall not undertake any Change of Scope without a Change of Scope Order being issued by the Authority, save and except any Works necessary for meeting any Emergency.

13.2 Procedure for Change of Scope

13.2.1 In the event of the Authority determining that a Change of Scope is necessary, it may direct the Authority’s Engineer to issue to the Contractor a notice specifying in reasonable detail the works and services contemplated thereunder (the “**Change of**

Scope Notice”).

13.2.2 Upon receipt of a Change of Scope Notice, the Contractor shall, with due diligence, provide to the Authority and the Authority’s Engineer such information as is necessary, together with preliminary documentation in support of:

- a) the impact, if any, which the Change of Scope is likely to have on the Project Completion Schedule if the works or services are required to be carried out during the Construction Period; and
- b) the options for implementing the proposed Change of Scope and the effect, if any, each such option would have on the costs and time thereof, including the following details:
- c) break down of the quantities, unit rates and cost for different items of work;
- d) proposed design for the Change of Scope; and
- e) proposed modifications, if any, to the Project Completion Schedule of the Project. For the avoidance of doubt, the Parties expressly agree that, subject to the provisions of Clause 13.4.2, the Contract Price shall be increased or decreased, as the case may be, on account of Change of Scope.

13.2.3 The Contractor’s quotation of costs for the Change of Scope shall be determined on the following principles:

- a) For works of similar nature compared to the Works being executed, the quotation shall be based on the rate for the work inclusive of all labour, Materials, equipment, incidentals, overheads and profit derived in accordance with the provisions of Clause 17.3; and the price adjustment in accordance with Clause 17.8 shall apply to the rates so worked out.
- b) For works not similar in nature to the Works being executed, the cost of work shall be derived on the basis of Bihar SOR Standard Data Book.

13.2.4 Upon reaching an agreement, the Authority shall issue an order (the “**Change of Scope Order**”) requiring the Contractor to proceed with the performance thereof. In the event that the Parties are unable to agree, the Authority may:

- c) issue a Change of Scope Order requiring the Contractor to proceed with the performance thereof at the rates and conditions approved by the Authority till the matter is resolved in accordance with Article 24; or
- d) proceed in accordance with Clause 13.5.

13.2.5 The provisions of this Agreement, insofar as they relate to Works and Tests, shall apply *mutatis mutandis* to the works undertaken by the Contractor under this Article 13.

13.3 Payment for Change of Scope

Payment for Change of Scope shall be made in accordance with the payment

schedule specified in the Change of Scope Order.

13.4 Restrictions on Change of Scope

- 13.4.1 No Change of Scope shall be executed unless the Authority has issued the Change of Scope Order save and except any Works necessary for meeting any Emergency.
- 13.4.2 Unless the Parties mutually agree to the contrary, the total value of all Change of Scope Orders shall not exceed 10% (ten percent) of the Contract Price.
- 13.4.3 Notwithstanding anything to the contrary in this Article 13, no change arising from any default of the Contractor in the performance of its obligations under this Agreement shall be deemed to be Change of Scope, and shall not result in any adjustment of the Contract Price or the Project Completion Schedule.

13.5 Power of the Authority to undertake works

- 13.5.1 In the event the Parties are unable to agree to the proposed Change of Scope Orders in accordance with Clause 13.2, the Authority may, after giving notice to the Contractor and considering its reply thereto, award such works or services to any person on the basis of open competitive bidding from amongst bidders who are pre-qualified for undertaking the additional work; provided that the Contractor shall have the option of matching the first ranked bid in terms of the selection criteria, subject to payment of 2% (two percent) of the bid amount to the Authority, and thereupon securing the award of such works or services. For the avoidance of doubt, it is agreed that the Contractor shall be entitled to exercise such option only if it has participated in the bidding process and its bid does not exceed the first ranked bid by more than 10% (ten per cent) thereof. It is also agreed that the Contractor shall provide assistance and cooperation to the person who undertakes the works or services hereunder, but shall not be responsible for rectification of any Defects in works carried out by other agencies. For the avoidance of doubt, the Authority acknowledges and agrees that it shall not undertake any works or services under this Clause 13.5.1 if such works or services cause a Material Adverse Effect on the Contractor.
- 13.5.2 The works undertaken in accordance with this Clause 13.5 shall conform to the Specifications and Standards and shall be carried out in a manner that minimises disruption to the Project. The provisions of this Agreement, insofar as they relate to Works and Tests, shall apply *mutatis mutandis* to the works carried out under this Clause 13.5.

ARTICLE 14 - Deleted

ARTICLE 15**DEFECTS LIABILITY****15.1 Defects Liability Period**

The Contractor shall be responsible for all the Defects and deficiencies, except usual wear and tear in the Project or any Section thereof, till the expiry of operation & maintenance period of five (05) years from the date of commencement (the “Defects Liability Period”).

15.1.1 Deleted.

15.2 Remedy and rectification of Defects and deficiencies

Without prejudice to the provisions of Clause 15.2 the Contractor shall repair or rectify all Defects and deficiencies observed by the Authority’s Engineer during the Defects Liability Period within a period of 15 (fifteen) days from the date of notice issued by the Authority’s Engineer in this behalf, or within such reasonable period as may be determined by the Authority’s Engineer at the request of the Contractor, in accordance with Good Industry Practice.

15.3 Cost of remedying Defects

For the avoidance of doubt, any repair or rectification undertaken in accordance with the provisions of Clause 15.2, including any additional tests, shall be carried out by the Contractor at its own risk and cost, to the extent that such rectification or repair is attributable to:

- a) the design of the Project;
- b) Works, Plant, Materials or workmanship not being in accordance with this Agreement and the Specifications and Standards;
- c) improper maintenance during construction of the Project by the Contractor; or
- d) failure by the Contractor to comply with any other obligation under this Agreement.

15.4 Contractor’s failure to rectify Defects

In the event that the Contractor fails to repair or rectify such Defect or deficiency within the period specified in Clause 15.2, the Authority shall be entitled to get the same repaired, rectified or remedied at the Contractor’s cost so as to make the Project conform to the Specifications and Standards and the provisions of this Agreement. All costs consequent thereon shall, after due consultation with the Authority and the Contractor, be determined by the Authority’s Engineer. The cost so determined, and an amount equal to 20% (twenty percent) of such cost as Damages, shall be recoverable by the Authority from the Contractor and may be deducted by the Authority from any monies due to the Contractor.

15.5 Contractor to search cause

- 15.5.1 The Authority's Engineer may instruct the Contractor to examine the cause of any Defect in the Works or part thereof before the expiry of the Defects Liability Period.
- 15.5.2 In the event any Defect identified under Clause 15.5.1 is attributable to the Contractor, the Contractor shall rectify such Defect within the period specified by the Authority's Engineer, and shall bear the cost of the examination and rectification of such Defect.
- 15.5.3 In the event such Defect is not attributable to the Contractor, the Authority's Engineer shall, after due consultation with the Authority and the Contractor, determine the costs incurred by the Contractor on such examination and notify the same to the Contractor, with a copy to the Authority, and the Contractor shall be entitled to payment of such costs by the Authority.

15.6 Extension of Defects Liability Period

- 15.6.1 The Defects Liability Period shall be deemed to be extended till the identified Defects under Clause 15.2 have been remedied.
- 15.6.2 Any Materials or Works with Defects identified under Clause 15.2 and replaced or repaired during the Defects Liability Period or the extended Defects Liability Period, as the case may be, would be further warranted for a period of twelve (12) months from the date of completion of such repair or replacement.
- 15.6.3 The Contractor shall upon termination or expiry of this Agreement, or upon expiry of the Defects Liability Period, assign any outstanding benefit in respect of any subcontract or any warranty from any subcontractor, to the Authority or to such other person as the Authority may direct.

ARTICLE 16

AUTHORITY'S ENGINEER

16.1 Appointment of the Authority's Engineer

- 16.1.1 The Authority shall appoint a consulting engineering firm substantially in accordance with the selection criteria set forth in Schedule-L, to be the engineer under this Agreement (the "**Authority's Engineer**").
- 16.1.2 The appointment of the Authority's Engineer shall be made no later than 15 (fifteen) days from the date of this Agreement. The Authority shall notify the appointment or replacement of the Authority's Engineer to the Contractor forthwith.
- 16.1.3 The staff of the Authority's Engineer shall include suitably qualified engineers and other professionals who are competent to assist the Authority's Engineer to carry out its duties.

16.2 Duties and functions of the Authority's Engineer

- 16.2.1 The Authority's Engineer shall perform its duties and discharge its functions in accordance with the provisions of this Agreement, and substantially in accordance with the terms of reference ("**Terms of Reference**" or "**TOR**") set forth in Annex 1 of Schedule L, but subject to obtaining prior written approval of the Authority before determining:
- a) any Time Extension;
 - b) any additional cost to be paid by the Authority to the Contractor;
 - c) the Termination Payment; or
 - d) any other matter which is not specified in (a), (b) or (c) above and which creates an obligation or liability on either Party for a sum exceeding Rs. 5,00,000 (Rs. five lakh).
- 16.2.2 No decision or communication of the Authority's Engineer shall be effective or valid unless it is accompanied by an attested true copy of the approval of the Authority for and in respect of any matter specified in Clause 16.2.1.
- 16.2.3 The Authority's Engineer shall submit regular periodic reports, at least once every month, to the Authority in respect of its duties and functions under this Agreement. Such reports shall be submitted by the Authority's Engineer within 10 (ten) days of the beginning of every month. For the avoidance of doubt, the Authority's Engineer shall include in its report compliance of the recommendations of the Safety Consultant.
- 16.2.4 A true copy of all communications sent by the Authority to the Authority's Engineer and by the Authority's Engineer to the Authority shall be sent forthwith by the Authority's Engineer to the Contractor.
- 16.2.5 A true copy of all communications sent by the Authority's Engineer to the Contractor

and by the Contractor to the Authority's Engineer shall be sent forthwith by the Authority's Engineer to the Authority.

16.3 Authorized signatories

The Authority shall require the Authority's Engineer to designate and notify to the Authority and the Contractor up to 2 (two) persons employed in its firm to sign for and on behalf of the Authority's Engineer, and any communication or document required to be signed by the Authority's Engineer shall be valid and effective only if signed by any of the designated persons; provided that the Authority's Engineer may, by notice in writing, substitute any of the designated persons by any of its employees.

16.4 Instructions of the Authority's Engineer

- 164.1 The Authority's Engineer may issue to the Contractor instructions for remedying any Defect. The Contractor shall take such instructions from the Authority's Engineer only.
- 164.2 The instructions issued by the Authority's Engineer shall be in writing. However, if the Authority's Engineer issues any oral instructions to the Contractor, it shall confirm in writing the oral instructions within 2 (two) working days of issuing such oral instructions.
- 164.3 In case the Contractor does not receive the confirmation of the oral instructions within the time specified in Clause 16.4.2, the Contractor shall seek the written confirmation of the oral instructions from the Authority's Engineer and shall obtain acknowledgement from the Authority's Engineer of the communication seeking written confirmation. In case of failure of the Authority's Engineer to reply to the Contractor within 2 (two) days of the receipt of the communication from the Contractor, the Contractor may not carry out the instruction.

16.5 Determination by the Authority's Engineer

- 165.1 The Authority's Engineer shall consult with each Party in an endeavour to reach agreement wherever this Agreement provides for the determination of any matter by the Authority's Engineer. If such agreement is not achieved, the Authority's Engineer shall make a fair determination in accordance with this Agreement having due regard to all relevant circumstances. The Authority's Engineer shall give notice to both the Parties of each such agreement or determination, with supporting particulars.
- 165.2 Each Party shall give effect to each agreement or determination made by the Authority's Engineer in accordance with the provisions of this Agreement. Provided, however, that if any Party disputes any instruction, decision, direction or determination of the Authority's Engineer, the Dispute shall be resolved in accordance with the Dispute Resolution Procedure.

16.6 Remuneration of the Authority's Engineer

The remuneration, cost and expenses of the Authority's Engineer shall be paid by the Authority.

16.7 Termination of appointment of the Authority's Engineer

- 167.1 The Authority may, in its discretion, replace the Authority's Engineer at any time, but only upon appointment of another Authority's Engineer in accordance with Clause 16.1.
- 167.2 If the Contractor has reasons to believe that the Authority's Engineer is not discharging its duties and functions in accordance with the provisions of this Agreement, it may make a written representation to the Authority and seek termination of the appointment of the Authority's Engineer. Upon receipt of such representation, the Authority shall hold a tripartite meeting with the Contractor and Authority's Engineer and make best efforts for an amicable resolution of the Dispute. In the event that the appointment of the Authority's Engineer is terminated hereunder, the Authority shall appoint forthwith another Authority's Engineer in accordance with Clause 16.1.

16.8 Interim Arrangement

In the event that the Authority has not appointed an Authority's Engineer, or the Authority's Engineer so appointed has relinquished its functions or defaulted in discharge thereof, the Authority may, in the interim, designate and authorize any person to discharge the functions of the Authority's Engineer in accordance with the provisions of this Agreement, save and except that such person shall not exercise any functions relating to review, comment, approval or inspection as specified in this Agreement for and in respect of the Authority's Engineer, and such functions shall be discharged as and when an Authority's Engineer is appointed in accordance with the provisions of this Agreement. Provided, however, that nothing contained in this Clause 16.8 shall in any manner restrict the rights of the Authority to enforce compliance of the provisions of this Agreement.

Part IV

Financial Covenants

ARTICLE 17

PAYMENTS**17.1 Contract Price**

- 17.1.1 The Authority shall make payments to the Contractor for the Works on the basis of the lump sum price accepted by the Authority in consideration of the obligations specified in this Agreement for an amount of Rs. ***** (Rs. *****) (the “**Contract Price**”), which shall be subject to adjustments in accordance with the provisions of this Agreement. The Parties further agree that save and except as provided in this Agreement, the Contract Price shall be valid and effective until issue of Completion Certificate.
- 17.1.2 The Contract Price includes all duties, taxes, royalty, and fees that may be levied in accordance with the laws and regulations in force as on the Base Date on the Contractor’s equipment, Plant, Materials and supplies acquired for the purpose of this Agreement and on the Works undertaken under this Agreement. Nothing in this Agreement shall relieve the Contractor from its responsibility to pay any tax including any tax that may be levied in India on profits made by it in respect of this Agreement.
- 17.1.3 The Contract Price shall not be adjusted for any change in duties, taxes etc. specified in Clause 17.1.2 above, save and except as specified in Clauses 17.8 and 17.13.
- 17.1.4 The Contract Price shall not be adjusted to take account of any unforeseen difficulties or costs, unless otherwise provided for in this Agreement.
- 17.1.5 Unless otherwise specified in this Agreement, the Contract Price covers all the Contractor’s obligations for the Works under this Agreement and all things necessary for the Construction thereof and for the rectification of any Defects in the Project.
- 17.1.6 All payments under this Agreement shall be made in Indian Rupees.

17.2 Advance Payment

- 17.2.1 The Authority shall make an advance payment (the “**Advance Payment**”), equal to 10% (ten percent) of the Contract Price, for mobilization expenses and for acquisition of equipment. The Advance Payment shall carry simple interest at the rate of 8% (eight per cent) per annum and shall be made in two equal installments.
- 17.2.2 The Contractor may apply to the Authority for the 1st (first) installment of the Advance Payment at any time after the Appointed Date, along with an irrevocable and unconditional guarantee from a Bank for an amount equivalent to 110% (one hundred and ten per cent) of such installment, substantially in the form provided at Annex-III of Schedule-F, to remain effective till the complete and full repayment of such installment and any interest thereon.
- 17.2.3 At any time, after 60 (sixty) days from the Appointed Date, the Contractor may apply to the Authority for the 2nd (second) installment of the Advance Payment along with an irrevocable and unconditional guarantee from a Bank for an amount

equivalent to 110% (one hundred and ten per cent) of such installment, substantially in the form provided at Annex-III of Schedule-F, to remain effective till the complete and full repayment of such installment and any interest thereon.

- 17.2.4 The installments of Advance Payment shall be paid by the Authority to the Contractor within 15 (fifteen) days of the receipt of its respective requests in accordance with the provisions of this Clause 17.2.
- 17.2.5 The Advance Payment shall be recovered through proportionate deductions to be made in the Interim Payments Certificates issued in accordance with the provisions of Clause 17.5.2. Deductions of Advance Payment shall commence from the Interim Payment Certificate in which the cumulative interim payments certified shall have reached 20% (twenty percent) of the Contract Price. The total amount recovered in each Interim Payment Certificate shall not exceed 20% (twenty percent) of the amount due and payable under such Interim Payment Certificate, which shall include interest on the amount being recovered hereunder. For the avoidance of doubt, the Parties agree that in the event the total payment specified in any Interim Payment Certificate exceeds the limit of 20% (twenty percent) of the Contract Price, the proportion of recovery hereunder shall be restricted to the amount exceeding 20% (twenty per cent) of the Contract Price. By way of illustration, the Parties agree that if the first recovery of say, Rupees 'x' is made after 20 (twenty) months from the date of 1st (first) installment of the Advance Payment, interest on Rupees 'x' shall be due and payable for a period of 20 (twenty) months; and when the next recovery is made in the following month for say, Rupees 'y', interest on Rupees 'y' shall be due and payable for a period of 21 (twenty one) months. The Parties further agree that no payments in excess of 90% (ninety per cent) of the Contract Price shall be released to the Contractor until the Advance Payment, including interest thereon, has been fully recovered.
- 17.2.6 If the Advance Payment has not been fully repaid prior to Termination under Clause 19.7 or Article 21, as the case may be, the whole of the balance then outstanding shall immediately become due and payable by the Contractor to the Authority. In the event of Termination for Contractor Default, the Advance Payment shall be deemed to carry interest at an annual rate of 3% (three per cent) above the Bank Rate from the date of Advance Payment to the date of recovery thereof. For the avoidance of doubt, the aforesaid interest shall be payable on each installment of the Advance Payment, regardless of whether the installment or any part thereof has been repaid to the Authority prior to Termination.

17.3 Procedure for estimating the payment for the Works

- 17.3.1 The Authority shall make interim payments to the Contractor, as certified by the Authority's Engineer on completion of a stage.

17.3.2 The Contractor shall make its claim for interim payment for the stages completed till the end of the month for which the payment is claimed, valued in accordance with Clause 17.3.1, and supported with necessary particulars and documents in accordance with this Agreement.

17.3.3 Any reduction in the Contract Price arising out of Change of Scope or the Works withdrawn under Clause 8.3, as the case may be, shall not affect the amounts payable for the items or stage payments thereof which are not affected by such Change of Scope or withdrawal.

17.4 Stage Payment Statement for Works

The Contractor shall submit a statement (the “**Stage Payment Statement**”), in 3 copies, by the 7th (seventh) day of a month to the Authority’s Engineer in the form set forth in Schedule-M, showing the amount calculated in accordance with Clause

17.3 to which the Contractor considers itself entitled for the completed stage(s) of Works. The Stage Payment Statement shall be accompanied with the progress reports and any other supporting documents. The Contractor shall not submit any claim for payment of incomplete stages of work. In the event that there is no claim for a month in accordance with the provisions of this Clause 17.4, the Contractor shall submit a ‘Nil’ claim to the Authority’s Engineer.

17.5 Stage Payment for Works

17.5.1 Within 10 (ten) days of receipt of the Stage Payment Statement from the Contractor pursuant to Clause 17.4, the Authority’s Engineer shall broadly determine the amount due to the Contractor and recommend to release of 70% (seventy per cent) of the amount so determined as part payment against the Stage Payment Statement, pending issue of the Interim Payment Certificate by the Authority’s Engineer. Within 10 (ten) days of the receipt of recommendation of the Authority’s Engineer, the Authority shall make an electronic payment thereof directly to the Contractor’s bank account.

17.5.2 Within 15 (fifteen) days of the receipt of the Stage Payment Statement referred to in Clause 17.4, the Authority’s Engineer shall determine and shall deliver to the Authority and the Contractor an IPC certifying the amount due and payable to the Contractor, after adjusting the payments already released to the Contractor against the said statement. For the avoidance of doubt, the Parties agree that the IPC shall specify all the amounts that have been deducted from the Stage Payment Statement and the reasons therefore.

17.5.3 In cases where there is a difference of opinion as to the value of any stage, the opinion of the Authority’s Engineer shall prevail and interim payments shall be made to the Contractor on that basis; provided that the foregoing shall be without prejudice to the Contractor’s right to raise a Dispute.

17.5.4 The Authority’s Engineer may, for reasons to be recorded, withhold from payment:

- a) the estimated value of work or obligation that the Contractor has failed to perform in accordance with this Agreement and in respect of which the Authority's Engineer had notified the Contractor; and
- b) the estimated cost of rectification of any Works which have not been constructed in accordance with this Agreement.

17.5.5 Payment by the Authority hereunder shall be deemed to be provisional and shall not be construed as the Authority's acceptance, approval, consent or satisfaction with the work done.

17.5.6 In the event the amounts released by the Authority under Clause 17.5.1 exceed the amount finally determined by the Authority's Engineer pursuant to Clauses 17.5.2 to 17.5.4, the difference thereof shall be accounted for in the next IPC.

17.6 Payment of Damages

17.6.1 The Contractor may claim Damages due and payable to it in accordance with the provisions of this Agreement.

17.6.2 The Authority's Engineer shall issue the IPC within 15 (fifteen) days of the receipt of the claim under Clause 17.6.1, after making adjustments in accordance with the provisions of this Agreement. The Authority shall pay to the Contractor the amount due under such IPC within a period of 30 (thirty) days from the date of the submission of the claim under this Clause 17.6.

17.7 Time of payment and interest

17.7.1 The Authority shall pay to the Contractor any amount due under any payment certificate issued by the Authority's Engineer in accordance with the provisions of this Agreement as follows:

Payment shall be made no later than 30 (thirty) days from the date of submission of the Stage Payment Statement by the Contractor to the Authority's Engineer for certification in accordance with the provisions of Clause 17.4 for an IPC; provided, however, that in the event the IPC is not issued by the Authority's Engineer within the aforesaid period of 30 (thirty) days, the Authority shall pay the amount shown in the Contractor's Stage Payment Statement and any discrepancy therein shall be adjusted in the next payment certificate; and payment shall be made no later than 30 (thirty) days from the date of submission of the Final Payment Certificate for Works along with the discharge submitted to the Authority's Engineer for certification in accordance with the provisions of Clause 17.12.

17.7.2 Deleted.

17.8 Deleted

17.9 Deleted.

17.10 Final Payment Statement

17.10.1 Within 60 (sixty) days of receiving the Completion Certificate under Clause 12.4, the Contractor shall submit to the Authority's Engineer six copies of a final payment statement (the "**Final Payment Statement**"), with supporting documents, in the form prescribed by the Authority's Engineer in respect of:

- a) the summary of Contractor's Stage Payment Statements for Works as submitted in accordance with Clause 17.4;
- b) the amounts received from the Authority against each claim; and
- c) any further sums which the Contractor considers due to it from the Authority.

17.10.2 If the Authority's Engineer disagrees with or cannot verify any part of the Final Payment Statement, the Contractor shall submit such further information as the Authority's Engineer may reasonably require.

17.10.3 The Authority's Engineer shall deliver to the Authority:

- 1) an IPC for those parts of the Final Payment Statement which are not in dispute, along with a list of disputed items which shall then be settled in accordance with the provisions of Article 24; or
- 2) a Final Payment Certificate in accordance with Clause 17.15, if there are no disputed items.

17.10.4 The Authority's Engineer does not prescribe the form referred to in Clause 17.10.1 within 15 (fifteen) days of the date of issue of the Completion Certificate, the Contractor shall submit the statement in such form as it deems fit.

17.11 Discharge

Upon submission of the Final Payment Statement under Clause 17.10, the Contractor shall give to the Authority, with a copy to the Authority's Engineer, a written discharge confirming that the total of the Final Payment Statement represents full and final settlement of all monies due to the Contractor in respect of this Agreement for all the Works arising out of this Agreement, except for any monies due to either Party on account of any Defect. Provided that such discharge shall become effective only after the payment due has been made in accordance with the Final Payment Certificate issued pursuant to Clause 17.12.

17.12 Final Payment Certificate

17.12.1 Within 30 (thirty) days after receipt of the Final Payment Statement under Clause 17.10, and the written discharge under Clause 17.11, and there being no disputed

items of claim, the Authority's Engineer shall deliver to the Authority, with a copy to the Contractor, a final payment certificate (the "**Final Payment Certificate**") stating the amount which, in the opinion of the Authority's Engineer, is finally due under this Agreement or otherwise. For the avoidance of doubt, before issuing the Final Payment Certificate, the Authority's Engineer shall ascertain from the Authority all amounts previously paid by the Authority, all sums due to the Authority, and the balance, if any, due from the Authority to the Contractor or from the Contractor to the Authority, as the case may be.

17.12.2 The Authority shall, in accordance with the provisions of Clause 17.7, pay to the Contractor the amount which is specified as being finally due in the Final Payment Certificate.

17.13 Change in law

17.13.1 If as a result of Change in Law, the Contractor suffers any additional costs in the execution of the Works or in relation to the performance of its other obligations under this Agreement, the Contractor shall, within 15 (fifteen) days from the date it becomes reasonably aware of such addition in costs, notify the Authority with a copy to the Authority's Engineer of such additional costs due to Change in Law.

17.13.2 If as a result of Change in Law, the Contractor benefits from any reduction in costs for the execution of this Agreement or in accordance with the provisions of this Agreement, either Party shall, within 15 (fifteen) days from the date it becomes reasonably aware of such reduction in costs, notify the other Party with a copy to the Authority's Engineer of such reduction in costs due to Change in Law.

17.13.3 The Authority's Engineer shall, within 15 (fifteen) days from the date of receipt of notice from the Contractor or the Authority, as the case may be, determine any addition or reduction to the Contract Price, as the case may be, due to the Change in Law.

17.14 Correction of Interim Payment Certificates

The Authority's Engineer may by an Interim Payment Certificate make any correction or modification in any previous Interim Payment Certificate issued by the Authority's Engineer.

17.15 Authority's claims

If the Authority considers itself to be entitled to any payment from the Contractor under any

Clause of this Agreement, it shall give notice and particulars to the Contractor 20 (twenty) days before making the recovery from any amount due to the Contractor, and shall take into consideration the representation, if any, made by the Contractor in this behalf, before making such recovery.

17.16 Bonus for early completion

In the event that the Project Completion Date occurs prior to the Scheduled Completion Date, the Contractor shall be entitled to receive a payment of bonus equivalent to 0.03% (zero point zero three per cent) of the Contract Price for each day by which the Project Completion Date precedes the Scheduled Completion Date, but subject to a maximum of 3% (three per cent) of the Contract Price. Provided, however, that the payment of bonus, if any, shall be made only after the issue of the Completion Certificate. For the avoidance of doubt, the Parties agree that for the purpose of determining the bonus payable hereunder, the Contract Price shall always be deemed to be the amount specified in Clause 17.1.1, and shall exclude any revision thereof for any reason.

ARTICLE 18

INSURANCE

18.1 Insurance for Works

18.1.1 The Contractor shall effect and maintain at its own cost the insurances specified in Schedule-N and as per the requirements under Applicable Laws.

18.1.2 Subject to the provisions of Clause 19.6, the Contractor shall, in accordance with the provisions of this Agreement, be liable to bear the cost of any loss or damage that does not fall within the scope of this Article 18 or cannot be recovered from the insurers.

18.1.3 Save and except as provided in Clause 18.1.4, the Contractor shall fully indemnify, hold harmless and defend the Authority from and against any and all losses, damages, costs, charges and/or claims with respect to:

- I. the death of or injury to any person; or
- II. the loss of or damage to any property,

that may arise out of or in consequence of any breach by the Contractor of this Agreement during the execution of the Works or the remedying of any Defects therein.

18.1.4 Notwithstanding anything in Clause 18.1.3, the Authority shall fully indemnify the Contractor from and against any and all losses, damages, costs, charges, proceedings and/or claims arising out of or with respect to

- a) the use or occupation of land or any part thereof by the Authority;
- b) the damage to property which is the unavoidable result of the execution and completion of the Works, or the remedying of any Defects therein, in accordance with this Agreement; and
- c) the death of or injury to persons or loss of or damage to property resulting from any act or neglect of the Authority, its agents, servants or other contractors, not being employed by the Contractor.

Provided, however, that in the event of any injury or damage as a result of the contributory negligence of the Contractor, the Authority shall be liable to indemnify the Contractor from and against any and all losses, damages, costs, charges, proceedings and/or claims to the extent as proportionate to the liability of the Authority, its servants or agents or other contractors not associated with the Contractor in such injury or damage.

18.1.5 Without prejudice to the provisions of Clauses 18.1.3 and 18.1.4, the Contractor shall maintain or effect such third party insurances as may be required under Applicable Laws.

18.1.6 The Contractor shall provide to the Authority, within 30 days of the Appointed Date, evidence of professional liability insurance maintained by its Design engineer and/or consultants to cover the risk of professional negligence in the design of Works. The

professional liability cover shall be for a sum of not less than [3% (three per cent)] of the Contract Price and shall be maintained until the end of the Defects Liability Period.

18.2 Notice to the Authority

No later than 15 (fifteen) days after the date of this Agreement, the Contractor shall by notice furnish to the Authority, in reasonable detail, information in respect of the insurances that it proposes to effect and maintain in accordance with this Article. Within 15 (fifteen) days of receipt of such notice, the Authority may require the Contractor to effect and maintain such other insurances as may be necessary pursuant hereto, and in the event of any difference or disagreement relating to any such insurance, the Dispute Resolution Procedure shall apply.

18.3 Evidence of Insurance Cover

18.3.1 All insurances obtained by the Contractor in accordance with this Article 18 shall be maintained with insurers on terms consistent with Good Industry Practice. Within 10 (ten) days from the Appointed Date, the Contractor shall furnish to the Authority notarized true copies of the certificate(s) of insurance, copies of insurance policies and premium payment receipts in respect of such insurance, and no such insurance shall be cancelled, modified, or allowed to expire or lapse until the expiration of at least 45 (forty-five) days after notice of such proposed cancellation, modification or non-renewal has been delivered by the Contractor to the Authority.

18.3.2 The Contractor shall procure and ensure the adequacy of the insurances at all times in accordance with the provisions of this Agreement.

18.4 Remedy for failure to insure

If the Contractor shall fail to effect and keep in force all insurances for which it is responsible pursuant hereto, the Authority shall have the option to either keep in force any such insurances, and pay such premia and recover the costs thereof from the Contractor, or in the event of computation of a Termination Payment, treat an amount equal to the Insurance Cover as deemed to have been received by the Contractor.

18.5 Waiver of subrogation

All insurance policies in respect of the insurance obtained by the Contractor pursuant to this Article 18 shall include a waiver of any and all rights of subrogation or recovery of the insurers thereunder against, inter alia, the Authority, and its assigns, successors, undertakings and their subsidiaries, Affiliates, employees, insurers and underwriters, and of any right of the insurers to any set-off or counterclaim or any other deduction, whether by attachment or otherwise, in respect of any liability of any such person insured under any such policy or in any way connected with any loss, liability or obligation covered by such policies of insurance.

18.6 Contractor's waiver

The Contractor hereby further releases, assigns and waives any and all rights of subrogation

or recovery against, inter alia, the Authority and its assigns, undertakings and their subsidiaries, Affiliates, employees, successors, insurers and underwriters, which the Contractor may otherwise have or acquire in or from or in any way connected with any loss, liability or obligation covered by policies of insurance maintained or required to be maintained by the Contractor pursuant to this Agreement (other than third party liability insurance policies) or because of deductible clauses in or inadequacy of limits of any such policies of insurance.

18.7 Cross liabilities

Any such insurance maintained or effected in pursuance of this Article 18 shall include a cross liability clause such that the insurance shall apply to the Contractor and to the Authority as separately insured.

18.8 Accident or injury to workmen

Notwithstanding anything contained in this Agreement, it is hereby expressly agreed between the Parties that the Authority shall not be liable for or in respect of any damages or compensation payable to any workman or other person in the employment of the Contractor or Sub-contractor, save and except as for death or injury resulting from any act, omission or default of the Authority, its agents or servants. The Contractor shall indemnify and keep indemnified the Authority from and against all such claims, proceedings, damages, costs, charges, and expenses whatsoever in respect of the above save and except for those acts, omissions or defaults for which the Authority shall be liable.

18.9 Insurance against accident to workmen

The Contractor shall effect and maintain during the Agreement such insurances as may be required to insure the Contractor's personnel and any other persons employed by it on the Project from and against any liability incurred in pursuance of this Article 18 Provided that for the purposes of this Clause 18.9, the Contractor's personnel/any person employed by the Contractor shall include the Sub-contractor and its personnel. Provided further that in respect of any persons employed by any Sub-contractor, the Contractor's obligations to insure as aforesaid under this Clause

18.9 shall be discharged if the Sub-contractor shall have insured against any liability in respect of such persons in such manner that the Authority is indemnified under the policy. The Contractor shall require such Sub-contractor to produce before the Authority, when required, such policy of insurance and the receipt for payment of the current premium within 10 (ten) days of such demand being made by the Authority.

18.10 Application of insurance proceeds

The proceeds from all insurance claims, except for life and injury, shall be applied for any

necessary repair, reconstruction, reinstatement, replacement, improvement, delivery or installation of the Project and the provisions of this Agreement in respect of construction of Works shall apply *mutatis mutandis* to the Works undertaken out of the proceeds of insurance.

18.11 Compliance with policy conditions

The Contractor hereby expressly agrees to fully indemnify the Authority from and against all losses and claims arising from the Contractor's failure to comply with conditions imposed by the insurance policies effected in accordance with this Agreement.

Part V

Force Majeure and Termination

ARTICLE 19

FORCE MAJEURE**19.1 Force Majeure**

As used in this Agreement, the expression “**Force Majeure**” or “**Force Majeure Event**” shall mean occurrence in India of any or all of Non-Political Event, Indirect Political Event and Political Event, as defined in Clauses 19.2, 19.3 and 19.4 respectively, if it affects the performance by the Party claiming the benefit of Force Majeure (the “**Affected Party**”) of its obligations under this Agreement and which act or event (a) is beyond the reasonable control of the Affected Party, and the Affected Party could not have prevented or overcome by exercise of due diligence and following Good Industry Practice, and (c) has Material Adverse Effect on the Affected Party.

19.2 Non-Political Event

A Non-Political Event shall mean one or more of the following acts or events:

- ☐ act of God, epidemic, extremely adverse weather conditions, lightning, earthquake, landslide, cyclone, flood, volcanic eruption, chemical or radioactive contamination or ionising radiation, fire or explosion (to the extent of contamination or radiation or fire or explosion originating from a source external to the Site);
- ☐ strikes or boycotts (other than those involving the Contractor, Sub-contractors or their respective employees/representatives, or attributable to any act or omission of any of them) interrupting supplies and services to the Project for a continuous period of 24 (twenty-four) hours and an aggregate period exceeding 10 (ten) days in an Accounting Year, and not being an Indirect Political Event set forth in Clause 19.3;
- ☐ any failure or delay of a Sub-contractor but only to the extent caused by another Non-Political Event;
- ☐ any judgement or order of any court of competent jurisdiction or statutory authority made against the Contractor in any proceedings for reasons other than (i) failure of the Contractor to comply with any Applicable Law or Applicable Permit, or (ii) on account of breach of any Applicable Law or Applicable Permit or of any contract, or (iii) enforcement of this Agreement, or (iv) exercise of any of its rights under this Agreement by the Authority; or (v) breach of its obligations by the Contractor under its sub-contracts;
- ☐ the discovery of geological conditions, toxic contamination or archaeological remains on the Site that could not reasonably have been expected to be discovered through a site inspection; or
- ☐ any event or circumstances of a nature analogous to any of the foregoing.

19.3 Indirect Political Event

An Indirect Political Event shall mean one or more of the following acts or events:

- C. an act of war (whether declared or undeclared), invasion, armed conflict or act of foreign enemy, blockade, embargo, riot, insurrection, terrorist or military action, civil commotion or politically motivated sabotage;
- D. industry-wide or State-wide strikes or industrial action for a continuous period of 24 (twenty-four) hours and exceeding an aggregate period of 10 (ten) days in an Accounting Year;
- E. any civil commotion, boycott or political agitation which prevents construction of the Project by the Contractor for an aggregate period exceeding 10 (ten) days in an Accounting Year;
- F. failure of the Authority to permit the Contractor to continue with its Construction Works, with or without modifications, in the event of stoppage of such work after discovery of any geological or archaeological finds;
- G. any failure or delay of a Sub-contractor to the extent caused by any Indirect Political Event;
- H. any Indirect Political Event that causes a Non-Political Event; or
- I. any event or circumstances of a nature analogous to any of the foregoing.

19.4 Political Event

A Political Event shall mean one or more of the following acts or events by or on account of any Government Instrumentality:

- d) Change in Law, only if consequences thereof cannot be dealt with under and in accordance with the provisions of Clause 17.13;
- e) compulsory acquisition in national interest or expropriation of any Project Assets or rights of the Contractor or of the Sub-contractors;
- f) unlawful or unauthorized or without jurisdiction revocation of, or refusal to renew or grant without valid cause, any clearance, license, permit, authorization, no objection certificate, consent, approval or exemption required by the Contractor or any of the Sub-contractors to perform their respective obligations under this Agreement; provided that such delay, modification, denial, refusal or revocation did not result from the Contractor's or any Sub-contractor's inability or failure to comply with any condition relating to grant, maintenance or renewal of such clearance, license, authorization, no objection certificate, exemption, consent, approval or permit;
- g) any failure or delay of a Sub-contractor but only to the extent caused by another Political Event; or
- h) any event or circumstances of a nature analogous to any of the foregoing.

19.5 Duty to report Force Majeure Event

19.5.1 Upon occurrence of a Force Majeure Event, the Affected Party shall by notice report such occurrence to the other Party forthwith. Any notice pursuant hereto shall include full particulars of:

- i) the nature and extent of each Force Majeure Event which is the subject of any claim for relief under this Article 19 with evidence in support thereof;
- j) the estimated duration and the effect or probable effect which such Force Majeure Event is having or will have on the Affected Party's performance of its obligations under this Agreement;
- k) the measures which the Affected Party is taking or proposes to take for alleviating the impact of such Force Majeure Event; and
- l) any other information relevant to the Affected Party's claim.

19.5.2 The Affected Party shall not be entitled to any relief for or in respect of a Force Majeure Event unless it shall have notified the other Party of the occurrence of the Force Majeure Event as soon as reasonably practicable, and in any event no later than 10 (ten) days after the Affected Party knew, or ought reasonably to have known, of its occurrence, and shall have given particulars of the probable material effect that the Force Majeure Event is likely to have on the performance of its obligations under this Agreement.

19.5.3 For so long as the Affected Party continues to claim to be affected by such Force Majeure Event, it shall provide the other Party with regular (and not less than weekly) reports containing information as required by Clause 19.5.1, and such other information as the other Party may reasonably request the Affected Party to provide.

19.6 Effect of Force Majeure Event on the Agreement

19.6.1 Upon the occurrence of any Force Majeure

- a) prior to the Appointed Date, both Parties shall bear their respective Force Majeure costs.
- b) after the Appointed Date, the costs incurred and attributable to such event and directly relating to this Agreement (the "**Force Majeure costs**") shall be allocated and paid as follows:
- c) upon occurrence of a Non-Political Event, the Parties shall bear their respective Force Majeure costs and neither Party shall be required to pay to the other Party any costs thereof;
- d) upon occurrence of an Indirect Political Event, all Force Majeure costs attributable to such Indirect Political Event, and not exceeding the Insurance Cover for such Indirect Political Event, shall be borne by the Contractor, and to the extent Force Majeure costs exceed such Insurance Cover, one half of such excess amount shall be reimbursed by the

Authority to the Contractor for the Force Majeure events; and

- e) upon occurrence of a Political Event, all Force Majeure costs attributable to such Political Event shall be reimbursed by the Authority to the Contractor.

For the avoidance of doubt, Force Majeure costs may include costs directly attributable to the Force Majeure Event, but shall not include debt repayment obligations, if any, of the Contractor.

19.6.2 Save and except as expressly provided in this Article 19, neither Party shall be liable in any manner whatsoever to the other Party in respect of any loss, damage, cost, expense, claims, demands and proceedings relating to or arising out of occurrence or existence of any Force Majeure Event or exercise of any right pursuant hereto.

19.6.3 Upon the occurrence of any Force Majeure Event during the Construction Period, the Project Completion Schedule for and in respect of the affected Works shall be extended on a day for day basis for such period as performance of the Contractor's obligations is affected on account of the Force Majeure Event or its subsisting effects, as may be determined by the Authority's Engineer.

19.6.4 Force Majeure costs for any event which results in any offsetting compensation being payable to the Contractor by or on behalf of its Sub-contractors shall be reduced by such amounts that are payable to the Contractor by its Sub-contractors.

19.7 Termination Notice for Force Majeure Event

If a Force Majeure Event subsists for a period of 60 (sixty) days or more within a continuous period of 120 (one hundred and twenty) days, either Party may in its discretion terminate this Agreement by issuing a Termination Notice to the other Party without being liable in any manner whatsoever, save as provided in this Article 19, and upon issue of such Termination Notice, this Agreement shall, notwithstanding anything to the contrary contained herein, stand terminated forthwith; provided that before issuing such Termination Notice, the Party intending to issue the Termination Notice shall inform the other Party of such intention and grant 15 (fifteen) days time to make a representation, and may after the expiry of such 15 (fifteen) days period, whether or not it is in receipt of such representation, in its sole discretion issue the Termination Notice.

19.8 Termination Payment for Force Majeure Event

19.8.1 In the event of this Agreement being terminated on account of a Non-Political Event, the Termination Payment shall be an amount equal to the sum payable under Clause 21.5.

19.8.2 If Termination is on account of an Indirect Political Event, the Termination Payment shall include:

- any sums due and payable under Clause 21.5; and
- the reasonable cost, as determined by the Authority's Engineer, of the Plant and Materials procured by the Contractor and transferred to the Authority for use in Construction, only if such Plant and Materials are in conformity with the Specifications and Standards;

19.8.3 If Termination is on account of a Political Event, the Authority shall make a Termination Payment to the Contractor in an amount that would be payable under Clause 21.6.2 as if it were an Authority Default.

19.9 Dispute resolution

In the event that the Parties are unable to agree in good faith about the occurrence or existence of a Force Majeure Event, such Dispute shall be finally settled in accordance with the Dispute Resolution Procedure; provided that the burden of proof as to the occurrence or existence of such Force Majeure Event shall be upon the Party claiming relief and/or excuse on account of such Force Majeure Event.

19.10 Excuse from performance of obligations

If the Affected Party is rendered wholly or partially unable to perform its obligations under this Agreement because of a Force Majeure Event, it shall be excused from performance of such of its obligations to the extent it is unable to perform on account of such Force Majeure Event; provided that:

- ii the suspension of performance shall be of no greater scope and of no longer duration than is reasonably required by the Force Majeure Event;
- iii the Affected Party shall make all reasonable efforts to mitigate or limit damage to the other Party arising out of or as a result of the existence or occurrence of such Force Majeure Event and to cure the same with due diligence; and
- iv when the Affected Party is able to resume performance of its obligations under this Agreement, it shall give to the other Party notice to that effect and shall promptly resume performance of its obligations hereunder.

ARTICLE 20

SUSPENSION OF CONTRACTOR'S RIGHTS**20.1 Suspension upon Contractor Default**

Upon occurrence of a Contractor Default, the Authority shall be entitled, without prejudice to its other rights and remedies under this Agreement including its rights of Termination hereunder, to (a) suspend carrying out of the Works or any part thereof, and (b) carry out such Works itself or authorize any other person to exercise or perform the same on its behalf during such suspension (the “**Suspension**”). Suspension hereunder shall be effective forthwith upon issue of notice by the Authority to the Contractor and may extend up to a period not exceeding 90 (ninety) days from the date of issue of such notice.

20.2 Authority to act on behalf of Contractor

During the period of Suspension hereunder, all rights and liabilities vested in the Contractor in accordance with the provisions of this Agreement shall continue to vest in the Contractor and all things done or actions taken, including expenditure incurred by the Authority for discharging the obligations of the Contractor under and in accordance with this Agreement shall be deemed to have been done or taken for and on behalf of the Contractor and the Contractor undertakes to indemnify the Authority for all costs incurred during such period. The Contractor hereby licenses and sub-licenses respectively, the Authority or any other person authorized by it under Clause 20.1 to use during Suspension, all Intellectual Property belonging to or licensed to the Contractor with respect to the Project and its design, engineering, construction, and which is used or created by the Contractor in performing its obligations under the Agreement.

20.3 Revocation of Suspension

20.3.1 In the event that the Authority shall have rectified or removed the cause of Suspension within a period not exceeding 60 (sixty) days from the date of Suspension, it shall revoke the Suspension forthwith and restore all rights of the Contractor under this Agreement. For the avoidance of doubt, the Parties expressly agree that the Authority may, in its discretion, revoke the Suspension at any time, whether or not the cause of Suspension has been rectified or removed hereunder.

20.3.2 Upon the Contractor having cured the Contractor Default within a period not exceeding 60 (sixty) days from the date of Suspension, the Authority shall revoke the Suspension forthwith and restore all rights of the Contractor under this Agreement.

20.4 Termination

20.4.1 At any time during the period of Suspension under this Article 20, the Contractor may by notice require the Authority to revoke the Suspension and issue a Termination Notice. The Authority shall, within 15 (fifteen) days of receipt of such

notice, terminate this Agreement under and in accordance with Article 21 as if it is a Contractor Default under Clause 21.1.

- 20.4.2 Notwithstanding anything to the contrary contained in this Agreement, in the event that Suspension is not revoked within 90 (ninety) days from the date of Suspension hereunder, the Agreement shall, upon expiry of the aforesaid period, be deemed to have been terminated by mutual agreement of the Parties and all the provisions of this Agreement shall apply, *mutatis mutandis*, to such Termination as if a Termination Notice had been issued by the Authority upon occurrence of a Contractor Default.

ARTICLE 21

TERMINATION**21.1 Termination for Contractor Default**

21.1.1 Save as otherwise provided in this Agreement, in the event that any of the defaults specified below shall have occurred, and the Contractor fails to cure the default within the Cure Period set forth below, or where no Cure Period is specified, then within a Cure Period of 60 (sixty) days, the Contractor shall be deemed to be in default of this Agreement (the “**Contractor Default**”), unless the default has occurred as a result of any breach of this Agreement by the Authority or due to Force Majeure. The defaults referred to herein shall include the following:

- a) The Contractor fails to provide, extend or replenish, as the case may be, the Performance Security in accordance with this Agreement;
- b) subsequent to the replenishment or furnishing of fresh Performance Security in accordance with Clause 7.3, the Contractor fails to cure, within a Cure Period of 30 (thirty) days, the Contractor Default for which the whole or part of the Performance Security was appropriated;
- c) the Contractor does not achieve the latest outstanding Project Milestone due in accordance with the provisions of Schedule-I, subject to any Time Extension, and continues to be in default for 45 (forty five) days;
- d) the Contractor abandons or manifests intention to abandon the construction of the Project without the prior written consent of the Authority;
- e) the Contractor fails to proceed with the Works in accordance with the provisions of Clause 10.1 or stops Works for 30 (thirty) days without reflecting the same in the current programme and such stoppage has not been authorised by the Authority’s Engineer;
- f) the Project Completion Date does not occur within the period specified in Schedule-I for the Scheduled Completion Date, or any extension thereof;
- g) failure to complete the Punch List items within the periods stipulated therefor in Clause 12.3;
- h) the Contractor fails to rectify any Defect, the non-rectification of which shall have a Material Adverse Effect on the Project, within

the time specified in this Agreement or as directed by the Authority's Engineer;

- i) the Contractor subcontracts the Works or any part thereof in violation of this Agreement or assigns any part of the Works without the prior approval of the Authority;
- j) the Contractor creates any Encumbrance in breach of this Agreement;
- k) an execution levied on any of the assets of the Contractor has caused a Material Adverse Effect;
- l) the Contractor is adjudged bankrupt or insolvent, or if a trustee or receiver is appointed for the Contractor or for the whole or material part of its assets that has a material bearing on the Project;
- m) the Contractor has been, or is in the process of being liquidated, dissolved, wound-up, amalgamated or reconstituted in a manner that would cause, in the reasonable opinion of the Authority, a Material Adverse Effect;
- n) a resolution for winding up of the Contractor is passed, or any petition for winding up of the Contractor is admitted by a court of competent jurisdiction and a provisional liquidator or receiver is appointed and such order has not been set aside within 90 (ninety) days of the date thereof or the Contractor is ordered to be wound up by a court except for the purpose of amalgamation or reconstruction; provided that, as part of such amalgamation or reconstruction, the entire property, assets and undertaking of the Contractor are transferred to the amalgamated or reconstructed entity and that the amalgamated or reconstructed entity has unconditionally assumed the obligations of the Contractor under this Agreement; and provided that:
 - o) the amalgamated or reconstructed entity has the capability and experience necessary for the performance of its obligations under this Agreement; and
 - p) the amalgamated or reconstructed entity has the financial standing to perform its obligations under this Agreement and has a credit worthiness at least as good as that of the Contractor as at the Appointed Date;
 - q) any representation or warranty of the Contractor herein contained which is, as of the date hereof, found to be materially false or the Contractor is at any time hereafter found to be in breach thereof;

- r) the Contractor submits to the Authority any statement, notice or other document, in written or electronic form, which has a material effect on the Authority's rights, obligations or interests and which is false in material particulars;
- s) the Contractor has failed to fulfil any obligation, for which failure Termination has been specified in this Agreement;
or
- t) the Contractor has failed to make any payment to the Authority within the period specified in this Agreement;
- u) the Concessionaire issues a Termination Notice in violation of this Agreement; or
- v) the Contractor commits a default in complying with any other provision of this Agreement if such a default causes a Material Adverse Effect on the Project or on the Authority.

21.1.2 Without prejudice to any other rights or remedies which the Authority may have under this Agreement, upon occurrence of a Contractor Default, the Authority shall be entitled to terminate this Agreement by issuing a Termination Notice to the Contractor; provided that before issuing the Termination Notice, the Authority shall by a notice inform the Contractor of its intention to issue such Termination Notice and grant 15 (fifteen) days to the Contractor to make a representation, and may after the expiry of such 15 (fifteen) days, whether or not it is in receipt of such representation, issue the Termination Notice.

21.1.3 After termination of this Agreement for Contractor Default, the Authority may complete the Works and/or procure its completion through any other entity. The Authority and such entity may, for this purpose, use any Materials, Plant and equipment, Contractor's documents and other design documents made by or on behalf of the Contractor.

21.2 Termination for Authority Default

21.2.1 In the event that any of the defaults specified below shall have occurred, and the Authority fails to cure such default within a Cure Period of 90 (ninety) days or such longer period as has been expressly provided in this Agreement, the Authority shall be deemed to be in default of this Agreement (the "**Authority Default**") unless the default has occurred as a result of any breach of this Agreement by the Contractor or due to Force Majeure. The defaults referred to herein shall include the following:

- a) The Authority commits a material default in complying with any of the provisions of this Agreement and such default has a Material Adverse Effect on the Contractor;

- b) the Authority has failed to make payment of any amount due and payable to the Contractor within the period specified in this Agreement;
- c) the Authority has failed to provide, within a period of 180 (one hundred and eighty) days from the Appointed Date, the environmental clearances and forest clearances required for construction of the Project;
- d) the Authority repudiates this Agreement or otherwise takes any action that amounts to or manifests an irrevocable intention not to be bound by this Agreement; or
- e) the Authority's Engineer fails to issue the relevant Interim Payment Certificate within 60 (sixty) days after receiving a statement and supporting documents.

21.2.2 Without prejudice to any other right or remedy which the Contractor may have under this Agreement, upon occurrence of an Authority Default, the Contractor shall be entitled to terminate this Agreement by issuing a Termination Notice to the Authority; provided that before issuing the Termination Notice, the Contractor shall by a notice inform the Authority of its intention to issue the Termination Notice and grant 15 (fifteen) days to the Authority to make a representation, and may after the expiry of such 15 (fifteen) days, whether or not it is in receipt of such representation, issue the Termination Notice.

21.3 Termination for Authority's convenience

Notwithstanding anything hereinabove, the Authority may terminate this Agreement for its own convenience. The termination shall take effect 30 (thirty) days from the date of notice hereunder and shall be deemed to be termination on account of Authority Default.

21.4 Requirements after Termination

Upon Termination of this Agreement in accordance with the provisions of this Article 21, the Contractor shall comply with and conform to the following:

- a) deliver to the Authority all Plant and Materials which shall have become the property of the Authority under this Article 21;
- b) deliver all relevant records, reports, Intellectual Property and other licences pertaining to the Works, other design documents and in case of Termination occurring after the Provisional Certificate has been issued, the "**as built**" Drawings for the Works;
- c) transfer and/or deliver all Applicable Permits to the Authority to the

extent permissible under Applicable Laws; and

d) vacate the Site within 15 (fifteen) days.

21.5 Valuation of Unpaid Works

21.5.1 Within a period of 45 (forty-five) days after Termination under Clause 21.1, 21.2 or 21.3, as the case may be, has taken effect, the Authority's Engineer shall proceed in accordance with Clause 16.5 to determine as follows the valuation of unpaid Works (the "**Valuation of Unpaid Works**"):

- i. value of the completed stage of the Works, less payments already made; and
- ii. reasonable value of the partially completed stages of works as on the date of Termination, only if such works conform with the Specifications and Standards.

and shall adjust from the sum thereof (i) any other amounts payable or recoverable, as the case may be, in accordance with the provisions of this Agreement; and (ii) all taxes due to be deducted at source.

21.5.2 The Valuation of Unpaid Works shall be communicated to the Authority, with a copy to the Contractor, within a period of 45 (forty five) days from the date of Termination.

21.6 Termination Payment

21.6.1 Upon Termination on account of Contractor Default under Clause 21.1, the

Authority shall:

- iii. Encash and appropriate the Performance Security or Retention Money, whichever is more, and in the event the Contractor has failed to replenish or extend the Performance Security, claim the amount stipulated in Clause 7.1.1, as agreed pre-determined Damages, if any;
- iv. encash and appropriate the bank guarantee, if any, to the extent of the outstanding Advance Payment and interest thereon; and
- v. pay to the Contractor, by way of Termination Payment, an amount equivalent to the Valuation of Unpaid Works after adjusting any other sums payable or recoverable, as the case may be, in accordance with the provisions of this Agreement, and shall adjust from the sum thereof
 - (i) any other amounts payable or recoverable, as the case may be, in accordance with the provisions of this Agreement, and
 - (ii) all taxes due to be deducted at source.

21.6.2 Upon Termination on account of an Authority Default under Clause 21.2 or for

Authority's convenience under Clause 21.3, the Authority shall:

- a) return the Performance Security and Retention Money forthwith;

- b) Encash and appropriate the bank guarantee, if any, to the extent of the outstanding Advance Payment, including interest thereon; and
- c) pay to the Contractor, by way of Termination Payment, an amount equal to:
- d) Valuation of Unpaid Works;
- e) the reasonable cost, as determined by the Authority's Engineer, of the Plant and Materials procured by the Contractor and transferred to the Authority for its use, only if such Plant and Materials are in conformity with the Specifications and Standards;
- f) the reasonable cost of temporary works, as determined by the Authority's Engineer; and
- g) 10% (ten percent) of the cost of the Works that are not commenced or not completed, and shall adjust from the sum thereof (i) any other amounts payable or recoverable, as the case may be, in accordance with the provisions of this Agreement, and (ii) all taxes due to be deducted at source.

21.6.3 Termination Payment shall become due and payable to the Contractor within 30 (thirty) days of a demand being made by the Contractor to the Authority with the necessary particulars, after the Valuation of Unpaid Works has been communicated by the Authority's Engineer. For the avoidance of doubt, it is expressly agreed that Termination Payment shall constitute full discharge by the Authority of its payment obligations in respect thereof hereunder.

21.6.4 The Contractor expressly agrees that Termination Payment under this Article 21 shall constitute a full and final settlement of all claims of the Contractor on account of Termination of this Agreement and that it shall not have any further right or claim under any law, treaty, convention, contract or otherwise.

21.7 Other rights and obligations of the Parties

Upon Termination for any reason whatsoever

- a) the property and ownership in all Materials, Plant and Works and the Project shall, as between the Contractor and the Authority, vest in the Authority in whole, free from any and all Encumbrances; provided that the foregoing shall be without prejudice to Clause 21.6;
- b) the risk of loss or damage to any Materials, Plant or Works and the care and custody thereof shall pass from the Contractor to the Authority; and

- c) the Authority shall be entitled to restrain the Contractor and any person claiming through or under the Agreement from entering upon the Site or any part of the Project except for taking possession of materials, stores, implements, construction plants and equipment of the Contractor, which have not been vested in the Authority in accordance with the provisions of this Agreement.

21.8 Survival of rights

Notwithstanding anything to the contrary contained in this Agreement any Termination pursuant to the provisions of this Agreement shall be without prejudice to the accrued rights of either Party including its right to claim and recover money damages, insurance proceeds, security deposits, and other rights and remedies, which it may have in law or Agreement. All rights and obligations of either Party under this Agreement, including Termination Payments, shall survive the Termination to the extent such survival is necessary for giving effect to such rights and obligations.

Part VI

Other Provisions

ARTICLE 22**ASSIGNMENT AND CHARGES****22.1 Restrictions on assignment and charges**

This Agreement shall not be assigned by the Contractor to any person, save and except with the prior consent in writing of the Authority, which consent the Authority shall be entitled to decline without assigning any reason.

22.2 Hypothecation of Materials or Plant

Notwithstanding the provisions of Clause 22.1, the Contractor may pledge or hypothecate to its lenders, any Materials or Plant prior to their incorporation in the Works. Further, the Contractor may, by written notice to the Authority, assign its right to receive payments under this Agreement either absolutely or by way of charge, to any person providing financing to the Contractor in connection with the performance of the Contractor's obligations under this Agreement. The Contractor acknowledges that any such assignment by the Contractor shall not relieve the Contractor from any obligations, duty or responsibility under this Agreement. For the avoidance of doubt, all Materials and Plants shall, upon their incorporation into Works, be free from any and all Encumbrances without the Authority being required to make any payment to any person on account of any costs, compensation, expenses and charges for such Materials, Plants and Works.

ARTICLE 23

LIABILITY AND INDEMNITY**23.1 General indemnity**

The Contractor shall indemnify, defend, save and hold harmless the Authority and its officers, servants, agents, Government Instrumentalities and Government owned and/or controlled entities/enterprises, (the “**Authority Indemnified Persons**”) against any and all suits, proceedings, actions, demands and third party claims for any loss, damage, cost and expense of whatever kind and nature, whether arising out of any breach by the Contractor of any of its obligations under this Agreement or from any negligence under the Agreement, including any errors or deficiencies in the design documents, or tort or on any other ground whatsoever, except to the extent that any such suits, proceedings, actions, demands and claims have arisen due to any negligent act or omission, or breach or default of this Agreement on the part of the Authority Indemnified Persons.

23.2 Indemnity by the Contractor

23.2.1 Without limiting the generality of Clause 23.1, the Contractor shall fully indemnify, hold harmless and defend the Authority and the Authority Indemnified Persons from and against any and all loss and/or damages arising out of or with respect to:

- a) failure of the Contractor to comply with Applicable Laws and Applicable Permits;
- b) payment of taxes required to be made by the Contractor in respect of the income or other taxes of the Sub-contractors, suppliers and representatives; or
- c) non-payment of amounts due as a result of Materials or services furnished to the Contractor or any of its Sub-contractors which are payable by the Contractor or any of its Sub-contractors.

23.2.2 Without limiting the generality of the provisions of this Article 23, the Contractor shall fully indemnify, hold harmless and defend the Authority Indemnified Persons from and against any and all suits, proceedings, actions, claims, demands, liabilities and damages which the Authority Indemnified Persons may hereafter suffer, or pay by reason of any demands, claims, suits or proceedings arising out of claims of infringement of any domestic or foreign patent rights, copyrights or other Intellectual Property, proprietary or confidentiality rights with respect to any materials, information, design or process used by the Contractor or by the Sub- contractors in performing the Contractor’s obligations or in any way incorporated in or related to the Project. If in any such suit, action, claim or proceedings, a temporary restraint order or preliminary injunction is granted, the Contractor shall make every reasonable effort, by giving a satisfactory bond or otherwise, to secure the revocation

or suspension of the injunction or restraint order. If, in any such suit, action, claim or proceedings, the Project, or any part thereof or comprised therein, is held to constitute an infringement and its use is permanently enjoined, the Contractor shall promptly make every reasonable effort to secure for the Authority a license, at no cost to the Authority, authorizing continued use of the infringing work. If the Contractor is unable to secure such license within a reasonable time, the Contractor shall, at its own expense, and without impairing the Specifications and Standards, either replace the affected work, or part, or process thereof with non- infringing work or part or process, or modify the same so that it becomes non- infringing.

23.3 Notice and contest of claims

In the event that either Party receives a claim or demand from a third party in respect of which it is entitled to the benefit of an indemnity under this Agreement (the “**Indemnified Party**”) it shall notify the other Party (the “**Indemnifying Party**”) within 15 (fifteen) days of receipt of the claim or demand and shall not settle or pay the claim without the prior approval of the Indemnifying Party, which approval shall not be unreasonably withheld or delayed. In the event that the Indemnifying Party wishes to contest or dispute the claim or demand, it may conduct the proceedings in the name of the Indemnified Party, subject to the Indemnified Party being secured against any costs involved, to its reasonable satisfaction.

23.4 Defense of claims

23.4.1 The Indemnified Party shall have the right, but not the obligation, to contest, defend and litigate any claim, action, suit or proceeding by any third party alleged or asserted against such Party in respect of, resulting from, related to or arising out of any matter for which it is entitled to be indemnified hereunder, and reasonable costs and expenses thereof shall be indemnified by the Indemnifying Party. If the Indemnifying Party acknowledges in writing its obligation to indemnify the Indemnified Party in respect of loss to the full extent provided by this Agreement, the Indemnifying Party shall be entitled, at its option, to assume and control the defense of such claim, action, suit or proceeding, liabilities, payments and obligations at its expense and through the counsel of its choice; provided it gives prompt notice of its intention to do so to the Indemnified Party and reimburses the Indemnified Party for the reasonable cost and expenses incurred by the Indemnified Party prior to the assumption by the Indemnifying Party of such defense. The Indemnifying Party shall not be entitled to settle or compromise any claim, demand, action, suit or proceeding without the prior written consent of the Indemnified Party, unless the Indemnifying Party provides such security to the Indemnified Party as shall be reasonably required by the Indemnified Party to secure the loss to be indemnified hereunder to the extent so compromised or settled.

23.4.2 If the Indemnifying Party has exercised its rights under Clause 23.3, the Indemnified Party shall not be entitled to settle or compromise any claim, action, suit or

proceeding without the prior written consent of the Indemnifying Party (which consent shall not be unreasonably withheld or delayed).

23.4.3 If the Indemnifying Party exercises its rights under Clause 23.3, the Indemnified Party shall nevertheless have the right to employ its own counsel, and such counsel may participate in such action, but the fees and expenses of such counsel shall be at the expense of the Indemnified Party, when and as incurred, unless:

- d) the employment of counsel by such party has been authorised in writing by the Indemnifying Party;
- e) the Indemnified Party shall have reasonably concluded that there may be a conflict of interest between the Indemnifying Party and the Indemnified Party in the conduct of the defense of such action;
- f) the Indemnifying Party shall not, in fact, have employed independent counsel reasonably satisfactory to the Indemnified Party, to assume the defense of such action and shall have been so notified by the Indemnified Party; or
- g) the Indemnified Party shall have reasonably concluded and specifically notified the Indemnifying Party either:
 - 1) that there may be specific defenses available to it which are different from or additional to those available to the Indemnifying Party; or
 - 2) that such claim, action, suit or proceeding involves or could have a material adverse effect upon it beyond the scope of this Agreement:

Provided that if Sub-clauses (b), (c) or (d) of this Clause 23.4.3 shall be applicable, the counsel for the Indemnified Party shall have the right to direct the defense of such claim, demand, action, suit or proceeding on behalf of the Indemnified Party and the reasonable fees and disbursements of such counsel shall constitute legal or other expenses hereunder.

23.5 No consequential claims

Notwithstanding anything to the contrary contained in this Article 23, the indemnities herein provided shall not include any claim or recovery in respect of any cost, expense, loss or damage of an indirect, incidental or consequential nature, including loss of profit, except as expressly provided in this Agreement.

23.6 Survival on Termination The provisions of this Article 23 shall survive Termination.

ARTICLE 24

DISPUTE RESOLUTION**24.1 Dispute resolution**

24.1.1 Any dispute, difference or controversy of whatever nature howsoever arising under or out of or in relation to this Agreement (including its interpretation) between the Parties, and so notified in writing by either Party to the other Party (the “**Dispute**”) shall, in the first instance, be attempted to be resolved amicably in accordance with the conciliation procedure set forth in Clause 24.2.

24.1.2 The Parties agree to use their best efforts for resolving all Disputes arising under or in respect of this Agreement promptly, equitably and in good faith, and further agree to provide each other with reasonable access during normal business hours to all non-privileged records, information and data pertaining to any Dispute.

24.2 Conciliation

In the event of any Dispute between the Parties, either Party may call upon an officer of the Authority, not below the rank of Secretary to the Government or Chief Engineer, as the case may be, or such other person as the Parties may mutually agree upon (the “**Conciliator**”) to conciliate and assist the Parties in arriving at an amicable settlement thereof. Failing conciliation by the Conciliator or without the intervention of the Conciliator, either Party may require such Dispute to be referred to the Secretary or Chief Engineer of the Authority and the Chairman of the Board of Directors of the Contractor for amicable settlement, and upon such reference, the said persons shall meet no later than 7 (seven) business days from the date of reference to discuss and attempt to amicably resolve the Dispute. If such meeting does not take place within the 7 (seven) business day period or the Dispute is not amicably settled within 15 (fifteen) business days of the meeting or the Dispute is not resolved as evidenced by the signing of written terms of settlement within 30 (thirty) business days of the notice in writing referred to in Clause 24.1.1 or such longer period as may be mutually agreed by the Parties, either Party may refer the Dispute to arbitration in accordance with the provisions of Clause 24.3.

24.3 Arbitration

24.3.1 Any Dispute which is not resolved amicably by conciliation, as provided in Clause 24.2, shall be finally decided by reference to arbitration by an arbitral tribunal constituted in accordance with Clause 24.3.2. Such arbitration shall be held in accordance with the Rules of Arbitration of the International Centre for Alternative Dispute Resolution, New Delhi or Construction Industry Arbitration Council (CIAC), New Delhi (the “**Rules**”), or such other rules as may be mutually agreed by the Parties, and shall be subject to the provisions of the Arbitration and Conciliation

Act, 1996. The place of such arbitration shall be the capital of the State, and the language of arbitration proceedings shall be English.

The Arbitration shall be in Institutional mode & would not be adhoc, in any case, and the online mode of dispute resolution may also be resorted to as per the latest notification of Ministry of Law & Justice, Government of India.

24.3.2 There shall be an arbitral tribunal comprising three arbitrators, of whom each Party shall select one, and the third arbitrator shall be appointed by the two arbitrators so selected and in the event of disagreement between the two arbitrators, the appointment shall be made in accordance with the Rules.

24.3.3 Wherever possible or required, On-line dispute resolution mechanism as prescribed By Ministry of Law vide their notification - http://doj.gov.in/sites/default/files/List%20of%20firm%20with%20profile-17_1.pdf, with subsequent amendments if any, is to be resorted to, in place of the traditional in-situ arbitration procedures. The decision on which system of procedures is to be followed (viz. traditional or on-line) would rest with the Contracting Parties at the time of signing the contract, who may if they so decide, permit the decision to be made by Third Arbitrator (appointed by the two nominated arbitrators).

24.3.4 The arbitral tribunal shall make a reasoned award (the “**Award**”). Any Award made in any arbitration held pursuant to this Article 24 shall be final and binding on the Parties as from the date it is made, and the Contractor and the Authority agree and undertake to carry out such Award without delay.

24.3.5 The Contractor and the Authority agree that an Award may be enforced against the Contractor and/or the Authority, as the case may be, and their respective assets wherever situated.

24.3.6 This Agreement and the rights and obligations of the Parties shall remain in full force and effect, pending the Award in any arbitration proceedings hereunder.

24.3.7 In the event the Party against whom the Award has been granted challenges the Award for any reason in a court of law, it shall make an interim payment to the other Party for an amount equal to 75% (seventy five per cent) of the Award, pending final settlement of the Dispute. The aforesaid amount shall be paid forthwith upon furnishing an irrevocable Bank Guarantee for a sum equal to the aforesaid amount. Upon final settlement of the Dispute, the aforesaid interim payment shall be adjusted and any balance amount due to be paid or returned, as the case may be, shall be paid or returned with interest calculated at the rate of 10% (ten per cent) per annum from the date of interim payment to the date of final settlement of such balance.

24.4 Adjudication by a tribunal

In the event of constitution of a statutory tribunal or other forum with powers to adjudicate upon disputes between the Contractor and the Authority, all Disputes arising after such constitution shall, instead of reference to arbitration under Clause

24.3, be adjudicated upon by such tribunal or other forum in accordance with Applicable Laws and all references to Dispute Resolution Procedure shall be construed accordingly.

ARTICLE 25

MISCELLANEOUS**25.1 Governing law and jurisdiction**

This Agreement shall be construed and interpreted in accordance with and governed by the laws of India, and the courts in the State shall have exclusive jurisdiction over matters arising out of or relating to this Agreement.

25.2 Waiver of immunity

Each Party unconditionally and irrevocably:

1. agrees that the execution, delivery and performance by it of this Agreement constitute commercial acts done and performed for commercial purpose;
2. agrees that, should any proceedings be brought against it or its assets, property or revenues in any jurisdiction in relation to this Agreement or any transaction contemplated by this Agreement, no immunity (whether by reason of sovereignty or otherwise) from such proceedings shall be claimed by or on behalf of the Party with respect to its assets;
3. waives any right of immunity which it or its assets, property or revenues now has, may acquire in the future or which may be attributed to it in any jurisdiction; and
4. consents generally in respect of the enforcement of any judgement or award against it in any such proceedings to the giving of any relief or the issue of any process in any jurisdiction in connection with such proceedings (including the making, enforcement or execution against it or in respect of any assets, property or revenues whatsoever irrespective of their use or intended use of any order or judgement that may be made or given in connection therewith).

25.3 Deleted.**25.4 Waiver**

25.4.1 Waiver, including partial or conditional waiver, by either Party of any default by the other Party in the observance and performance of any provision of or obligations under this Agreement:

- a) shall not operate or be construed as a waiver of any other or subsequent default hereof or of other provisions of or obligations under this Agreement;
- b) shall not be effective unless it is in writing and executed by a duly authorized representative of the Party; and
- c) shall not affect the validity or enforceability of this Agreement in any manner.

25.4.2 Neither the failure by either Party to insist on any occasion upon the performance of the terms, conditions and provisions of this Agreement or any obligation thereunder nor time or other indulgence granted by a Party to the other Party shall be treated or

deemed as waiver of such breach or acceptance of any variation or the relinquishment of any such right hereunder.

25.5 Liability for review of Documents and Drawings

Except to the extent expressly provided in this Agreement:

- a) no review, comment or approval by the Authority or the Authority's

Engineer of any Document or Drawing submitted by the Contractor nor any observation or inspection of the construction of the Project nor the failure to review, approve, comment, observe or inspect hereunder shall relieve or absolve the Contractor from its obligations, duties and liabilities under this Agreement, Applicable Laws and Applicable Permits; and

- b) the Authority shall not be liable to the Contractor by reason of any review, comment, approval, observation or inspection referred to in Sub-clause (a) above.

25.6 Exclusion of implied warranties etc.

This Agreement expressly excludes any warranty, condition or other undertaking implied at law or by custom or otherwise arising out of any other agreement between the Parties or any representation by either Party not contained in a binding legal agreement executed by both Parties.

25.7 Survival

25.7.1 Termination shall:

- a) not relieve the Contractor or the Authority, as the case may be, of any obligations hereunder which expressly or by implication survive Termination hereof; and
- b) except as otherwise provided in any provision of this Agreement expressly limiting the liability of either Party, not relieve either Party of any obligations or liabilities for loss or damage to the other Party arising out of, or caused by, acts or omissions of such Party prior to the effectiveness of such Termination or arising out of such Termination.

25.7.2 All obligations surviving Termination shall only survive for a period of 3 (three) years following the date of such Termination.

25.8 Entire Agreement

This Agreement and the Schedules together constitute a complete and exclusive statement of the terms of the agreement between the Parties on the subject hereof, and no amendment or modification hereto shall be valid and effective unless such modification or amendment is agreed to in writing by the Parties and duly executed by persons especially empowered in this behalf by the respective Parties. All prior written or oral understandings, offers or other communications of every kind

pertaining to this Agreement are abrogated and withdrawn. For the avoidance of doubt, the Parties hereto agree that any obligations of the Contractor arising from the Request for Qualification or Request for Proposals and bid submissions, as the case may be, shall be deemed to form part of this Agreement and treated as such.

25.9 Severability

If for any reason whatsoever, any provision of this Agreement is or becomes invalid, illegal or unenforceable or is declared by any court of competent jurisdiction or any other instrumentality to be invalid, illegal or unenforceable, the validity, legality or enforceability of the remaining provisions shall not be affected in any manner, and the Parties will negotiate in good faith with a view to agreeing to one or more provisions which may be substituted for such invalid, unenforceable or illegal provisions, as nearly as is practicable to such invalid, illegal or unenforceable provision. Failure to agree upon any such provisions shall not be subject to the Dispute Resolution Procedure set forth under this Agreement or otherwise.

25.10 No partnership

This Agreement shall not be interpreted or construed to create an association, joint venture or partnership between the Parties, or to impose any partnership obligation or liability upon either Party, and neither Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party.

25.11 Third parties

This Agreement is intended solely for the benefit of the Parties, and their respective successors and permitted assigns, and nothing in this Agreement shall be construed to create any duty to, standard of care with reference to, or any liability to, any person not a Party to this Agreement.

25.12 Successors and assigns

This Agreement shall be binding upon, and inure to the benefit of the Parties and their respective successors and permitted assigns.

25.13 Notices

Any notice or other communication to be given by any Party to the other Party under or in connection with the matters contemplated by this Agreement shall be in writing and shall:

- a) in the case of the Contractor, be given by facsimile or e-mail and by letter delivered by hand to the address given and marked for attention of the person set out below or to such other person as the Contractor may from time to time designate by notice to the Authority; provided that notices or other communications to be given to an address outside the city specified in Sub-clause (b) below may, if they are subsequently confirmed by

sending a copy thereof by registered acknowledgement due, air mail or by courier, be sent by facsimile or e-mail to the person as the Contractor may from time to time designate by notice to the Authority;

Attention:

{Designation:

Address:

Fax No:

Email: }

- b) in the case of the Authority, be given by facsimile or e-mail and by letter delivered by hand and be addressed to the person named below with a copy delivered to the Authority Representative or such other person as the Authority may from time to time designate by notice to the Contractor; provided that if the Contractor does not have an office in the same city as the Authority, it may send such notice by facsimile or e-mail and by registered acknowledgement due, air mail or by courier;

{Designation:

Address:

Fax No:

Email: };

- c) any notice or communication by a Party to the other Party, given in accordance herewith, shall be deemed to have been delivered when in the normal course of post it ought to have been delivered and in all other cases, it shall be deemed to have been delivered on the actual date and time of delivery; provided that in the case of facsimile or e-mail, it shall be deemed to have been delivered on the working day following the date of its delivery.

25.14 Language

All notices required to be given by one Party to the other Party and all other communications, Documentation and proceedings which are in any way relevant to this Agreement shall be in writing and in English language.

25.15 Counterparts

This Agreement may be executed in two counterparts, each of which, when executed and delivered, shall constitute an original of this Agreement.

25.16 Confidentiality

The Parties shall treat the details of this Agreement as private and confidential, except to the extent necessary to carry out obligations under it or to comply with Applicable Laws. The Contractor shall not publish, permit to be published, or disclose any particulars of the Works in any trade or technical paper or elsewhere without the previous consent of the Authority.

25.17 Copyright and Intellectual Property rights

25.17.1 As between the Parties, the Contractor shall retain the copyright and other Intellectual Property rights in the Contractor's Documents and other design documents made by (or on behalf of) the Contractor. The Contractor shall be deemed (by signing this Agreement) to give to the Authority a non-terminable transferable non-exclusive royalty-free license to copy, use and communicate the Contractor's Documents, including making and using modifications of them. This license shall:

- (a) apply throughout the actual or intended working life (whichever is longer) of the relevant parts of the Works,
- (b) entitle any person in proper possession of the relevant part of the Works to copy, use and communicate the Contractor's Documents for the purposes of completing, operating, maintaining, altering, adjusting, repairing and demolishing the Works, and
- (c) in the case of Contractor's Documents which are in the form of computer programs and other software, permit their use on any computer on the Site and other places as envisaged by this Agreement, including replacements of any computers supplied by the Contractor:

25.17.2 The Contractor's Documents and other design documents made by (or on behalf of) the Contractor shall not, without the Contractor's consent, be used, copied or communicated to a third party by (or on behalf of) the Authority for purposes other than those permitted under this Clause 25.17.

25.17.3 As between the Parties, the Authority shall retain the copyright and other Intellectual Property rights in this Agreement and other documents made by (or on behalf of) the Authority. The Contractor may, at its cost, copy, use, and obtain communication of these documents for the purposes of this Agreement. They shall not, without the

Authority's consent, be copied, used or communicated to a third party by the Contractor, except as necessary for the purposes of the contract.

25.18 Limitation of Liability

25.18.1 Neither Party shall be liable to the other Party for loss of use of any Works, loss of profit, loss of any contract or for any indirect or consequential loss or damage which may be suffered by the other Party in connection with this Agreement.

25.18.2 The total liability of one Party to the other Party under and in accordance with the provisions of this Agreement, save and except as provided in Articles 21 and 23, shall not exceed the Contract Price. For the avoidance of doubt, this Clause shall not limit the liability in any case of fraud, deliberate default or reckless misconduct by the defaulting Party

ARTICLE 26

DEFINITIONS

26.1 Definitions

In this Agreement, the following words and expressions shall, unless repugnant to the context or meaning thereof, have the meaning hereinafter respectively assigned to them:

“Accounting Year” means the financial year commencing from the first day of April of any calendar year and ending on the thirty-first day of March of the next calendar year;

“Advance Payment” shall have the meaning as set forth in Clause 17.2.1;

“Affected Party” shall have the meaning as set forth in Clause 19.1;

“Affiliate” means, in relation to either Party {and/or Members}, a person who controls, is controlled by, or is under the common control with such Party {or Member} (as used in this definition, the expression “control” means, with respect to a person which is a company or corporation, the ownership, directly or indirectly, of more than 50% (fifty per cent) of the voting shares of such person, and with respect to a person which is not a company or corporation, the power to direct the management and policies of such person, whether by operation of law or by contract or otherwise);

“Agreement” means this Agreement, its Recitals, the Schedules hereto and any amendments thereto made in accordance with the provisions contained in this Agreement;

“Applicable Laws” means all laws, brought into force and effect by GOI or the State Government(s) including rules, regulations and notifications made thereunder, and judgements, decrees, injunctions, writs and orders of any court of record, applicable to this Agreement and the exercise, performance and discharge of the respective rights and obligations of the Parties hereunder, as may be in force and effect during the subsistence of this Agreement;

“Applicable Permits” means all clearances, licences, permits, authorisations, no objection certificates, consents, approvals and exemptions required to be obtained or maintained under Applicable Laws in connection with the construction of the Project during the subsistence of this Agreement;

“Appointed Date” means date of this Agreement.

“Arbitration Act” means the Arbitration and Conciliation Act, 1996 and shall include modifications to or any re-enactment thereof, as in force from time to time;

“Authority” shall have the meaning attributed thereto in the array of Parties hereinabove as set forth in the Recitals;

“**Authority Default**” shall have the meaning as set forth in Clause 21.2.1;

“**Authority’s Engineer**” shall have the meaning as set forth in Clause 16.1.1;

“**Authority Representative**” means such person or persons as may be authorised in writing by the Authority to act on its behalf under this Agreement and shall include any person or persons having authority to exercise any rights or perform and fulfil any obligations of the Authority under this Agreement;

“**Bank**” means a bank incorporated in India and having a minimum net worth of Rs. 1,000 crore (Rupees one thousand crore) or any other bank acceptable to the Authority;

“**Bank Rate**” means the rate of interest specified by the Reserve Bank of India from time to time in pursuance of section 49 of the Reserve Bank of India Act, 1934 or any replacement of such Bank Rate for the time being in effect;

“**Base Date**” means the last date of that calendar month, which date precedes the Bid Due Date by at least 28 (twenty-eight) days;

“**Bid**” means the documents in their entirety comprised in the bid submitted by the [selected bidder/Joint Venture] in response to the Request for Proposals in accordance with the provisions thereof and “**Bids**” shall mean the bids submitted by any and all pre-qualified bidders;

“**Bid Security**” means the bid security provided by the Contractor to the Authority in accordance with the Request for Proposals, and which is to remain in force until substituted by the Performance Security;

“**CPI (IW)**” means the Consumer Price Index for Industrial Workers as published by the Labour Bureau, Government of India and shall include any index which substitutes the CPI (IW), and any reference to CPI (IW) shall, unless the context otherwise requires, be construed as a reference to the CPI (IW) published for the period ending with the preceding month, save and except that for the purposes of annual revision of the Fixed Charge in accordance with the provisions of Clause 25.3, the revision due on April 1 of any year shall be computed with reference to CPI (IW) as on January 31 of that year;

“**Change in Law**” means the occurrence of any of the following after the

Base Date:

- i. the enactment of any new Indian law;
- ii. the repeal, modification or re-enactment of any existing Indian law;
- iii. the commencement of any Indian law which has not entered into effect until the Base Date;
- iv. a change in the interpretation or application of any Indian law by a judgement

of a court of record which has become final, conclusive and binding, as compared to such interpretation or application by a court of record prior to the Base Date; or

- v. any change in the rates of any of the Taxes or royalties that have a direct effect on the Project;

“Change of Scope” shall have the meaning as set forth in Article 13;

“Change of Scope Notice” shall have the meaning as set forth in Clause 13.2.1;

“Change of Scope Order” shall have the meaning as set forth in Clause 13.2.4;

“Completion Certificate” shall have the meaning as set forth in Clause 12.4.1;

“Joint Venture” means the Joint Venture of entities which have formed a joint venture for implementation of this Project;

“Construction” shall have the meaning as set forth in Clause 1.2.1 (f);

“Construction Period” means the period commencing from the Appointed Date and ending on the date of the Completion Certificate;

“Contract Price” means the amount as specified in Clause 17.1.1;

“Contractor” shall have the meaning attributed thereto in the array of Parties hereinabove as set forth in the Recitals;

“Contractor Default” shall have the meaning as set forth in Clause 21.1.1;

“Cure Period” means the period specified in this Agreement for curing any breach or default of any provision of this Agreement by the Party responsible for such breach or default and shall:

- ☐ commence from the date on which a notice is delivered by one Party to the other Party asking the latter to cure the breach or default specified in such notice;
- ☐ not relieve any Party from liability to pay Damages or compensation under the provisions of this Agreement; and
- ☐ not in any way be extended by any period of Suspension under this Agreement;

provided that if the cure of any breach by the Contractor requires any reasonable action by the Contractor that must be approved by the Authority or the Authority’s Engineer hereunder, the applicable Cure Period shall be extended by the period taken by the Authority or the Authority’s, Engineer to accord their approval;

“Damages” shall have the meaning as set forth in paragraph of Clause 1.2.1;

“Defect” means any defect or deficiency in Construction of the Works or any part thereof, which does not conform with the Specifications and Standards;

“Defects Liability Period” shall have the meaning as set forth in Clause 15.1.1;

“**Dispute**” shall have the meaning as set forth in Clause 24.1.1;

“**Dispute Resolution Procedure**” means the procedure for resolution of Disputes as set forth in Article 24;

“**Drawings**” means all of the drawings, calculations and documents pertaining to the Project as set forth in Schedule-H, and shall include ‘as built’ drawings of the Project;

“**Document**” or “**Documentation**” means documentation in printed or written form, or in tapes, discs, drawings, computer programmes, writings, reports, photographs, films, cassettes, or expressed in any other written, electronic, audio or visual form;

“**Emergency**” means a condition or situation that is likely to endanger the safety or security of the individuals on or about the Project, including Users thereof, or which poses an immediate threat of material damage to the Works or any of the Project Assets;

“**Encumbrances**” means, in relation to the Project, any encumbrances such as mortgage, charge, pledge, lien, hypothecation, security interest, assignment, privilege or priority of any kind having the effect of security or other such obligations, and shall include any designation of loss payees or beneficiaries or any similar arrangement under any insurance policy pertaining to the Project, where applicable herein but excluding utilities referred to in Clause 9.1;

“**EPC**” means engineering, procurement and construction;

“**Final Payment Certificate**” shall have the meaning as set forth in Clause 17.12.1;

“**Final Payment Statement**” shall have the meaning as set forth in Clause 17.10.1;

“**Force Majeure**” or “**Force Majeure Event**” shall have the meaning ascribed to it in Clause 19.1;

“**GAD**” or “**General Arrangement Drawings**” shall have the meaning as set forth in Clause 4.1.3 (b);

“**GOI**” or “**Government**” means the Government of India;

“**Good Industry Practice**” means the practices, methods, techniques, designs, standards, skills, diligence, efficiency, reliability and prudence which are generally and reasonably expected from a reasonably skilled and experienced contractor engaged in the same type of undertaking as envisaged under this Agreement and which would be expected to result in the performance of its obligations by the Contractor in accordance with this Agreement, Applicable Laws and Applicable Permits in reliable, safe, economical and efficient manner;

“**Government Instrumentality**” means any department, division or sub-division of the Government or the State Government and includes any commission, board, authority, agency or municipal and other local authority or statutory body, including panchayat, under the control of the Government or the State Government, as the case may be, and having jurisdiction over all or any part of the Project or the performance of all or any of the services or obligations of the Contractor under or pursuant to this Agreement;

“**Indemnified Party**” means the Party entitled to the benefit of an indemnity

pursuant to Article 23;

“Indemnifying Party” means the Party obligated to indemnify the other Party pursuant to Article 23;

“Indirect Political Event” shall have the meaning as set forth in Clause 19.3;

“Insurance Cover” means the aggregate of the maximum sums insured under the insurances taken out by the Contractor pursuant to Article 18, and includes all insurances required to be taken out by the Contractor under Clauses 18.1 and 18.9 but not actually taken, and when used in the context of any act or event, it shall mean the aggregate of the maximum sums insured and payable or deemed to be insured and payable in relation to such act or event;

“Intellectual Property” means all patents, trademarks, service marks, logos, get-up, trade names, internet domain names, rights in designs, blue prints, programmes and manuals, drawings, copyright (including rights in computer software), database rights, semi-conductor, topography rights, utility models, rights in know-how and other intellectual property rights, in each case whether registered or unregistered and including applications for registration, and all rights or forms of protection having equivalent or similar effect anywhere in the world;

“Interim Payment Certificate” or **“IPC”** means the interim payment certificate issued by the Authority’s Engineer for payment to the Contractor in respect of Contractor’s claims for payment raised in accordance with the provisions of this Agreement;

“LOA” or **“Letter of Acceptance”** means the letter of acceptance referred to in Recital (D);

“Lead Member” shall, in the case of a Joint Venture, mean the member of such Joint Venture who shall have the authority to bind the Contractor and each member of the Joint Venture; and shall be deemed to be the Contractor for the purposes of this Agreement;

“Manuals” shall mean the manuals;

“Material Adverse Effect” means a material adverse effect of any act or event on the ability of either Party to perform any of its obligations under and in accordance with the provisions of this Agreement and which act or event causes a material financial burden or loss to either Party;

“Materials” “are all the supplies used by the Contractor for incorporation in the Works of the Project;

“Non-Political Event” shall have the meaning as set forth in Clause 19.2;

“Parties” “means the parties to this Agreement collectively and **“Party”** shall mean any of the parties to this Agreement individually;

“Performance Security” “shall have the meaning as set forth in Clause 7.1.1;

“Plant” means the apparatus and machinery intended to form or forming part of the Works;

“Political Event” shall have the meaning as set forth in Clause 19.4;

“Programme” shall have the meaning as set forth in Clause 10.1.3;

“Project” means the construction of the Project in accordance with the provisions of this Agreement, and includes all works, services and equipment relating to or in respect of the Scope of the Project;

“Project Assets” means all physical and other assets relating to (a) tangible assets such as civil works and equipment including [foundations, embankments, pavements, road surface, interchanges, bridges, culverts, road over-bridges, drainage works, traffic signals, sign boards, kilometre-stones, electrical systems, communication systems, rest areas, relief centres, maintenance depots and administrative offices]; and (b) Project Facilities situated on the Site;

“Project Completion Date” means the date on which the last Provisional Certificate is issued;

“Project Completion Schedule” means the progressive Project Milestones set forth in Schedule-I for completion of the Project on or before the Scheduled Completion Date;

“Project Facilities” means all the amenities and facilities to be constructed on the Site,

“Project Milestone” means the project milestone as set forth in Schedule-I and includes the Scheduled Completion Date;

“Proof Consultant” shall have the meaning as set forth in Clause 10.2.2;

“Provisional Certificate” shall have the meaning as set forth in Clause 12.2.1;

“Punch List” shall have the meaning as set forth in Clause 12.2.1;

“Quality Assurance Plan” or **“QAP”** shall have the meaning as set forth in Clause 11.2.1;

“Re.”, “Rs.” or “Rupees” or “Indian Rupees” means the lawful currency of the Republic of India;

“Request for Proposals” or **“RFP”** shall have the meaning as set forth in Recital (C);

“Retention Money” shall have the meaning as set forth in Clause 7.5.1;

“Safety Consultant” shall have the meaning as set forth in Clause 10.1.5;

“Scheduled Completion Date” shall be the date as set forth in Clause 10.3.1;

“Scope of the Project” shall have the meaning as set forth in Clause 2.1;

“Section” means a part of the Project;

“Site” shall have the meaning as set forth in Clause 8.1;

“Specifications and Standards” means the specifications and standards relating to the quality, quantity, capacity and other requirements for the Project and any modifications thereof, or additions thereto, as included in the design and engineering for the Project submitted by the Contractor to, and expressly approved by, the Authority;

“Stage Payment Statement” shall have the meaning as set forth in Clause 17.4;

“State” means the State or the Union Territory, as the case may be, in which the

headquarters of the Authority are situate and “**State Government**” means the government of that State or Union Territory;

“**Structures**” means an elevated [road or a flyover], as the case may be;

“**Sub-contractor**” means any person or persons to whom a part of the Works has been subcontracted by the Contractor and the permitted legal successors in title to such person, but not an assignee to such person;

“**Suspension**” shall have the meaning as set forth in Clause 20.1;

“**Taxes**” means any Indian taxes including excise duties, customs duties, value added tax, sales tax, local taxes, cess and any impost or surcharge of like nature (whether Central, State or local) on the goods, Materials, equipment and services incorporated in and forming part of the Project charged, levied or imposed by any Government Instrumentality, but excluding any interest, penalties and other sums in relation thereto imposed on any account whatsoever. For the avoidance of doubt, Taxes shall not include taxes on corporate income;

“**Termination**” means the expiry or termination of this Agreement;

“**Termination Notice**” means the communication issued in accordance with this Agreement by one Party to the other Party terminating this Agreement;

“**Termination Payment**” means the amount payable by either Party to the other upon Termination in accordance with Article 21;

“**Terms of Reference**” or “**TOR**” shall have the meaning as set forth in Clause 16.2.1;

“**Tests**” means the tests set forth in Schedule-J to determine the completion of Works in accordance with the provisions of this Agreement;

“**Time Extension**” shall have the meaning as set forth in Clause 10.4.1;

“**User**” means a person who uses or intends to use the Project or any part thereof in accordance with the provision of this Agreement and Applicable Laws;

“**Valuation of Unpaid works**” shall have the meaning as set forth in Clause 21.5.1;

“**WPI**” means the wholesale price index for various commodities as published by the Ministry of Commerce and Industry, GOI and shall include any index which substitutes the WPI, and any reference to WPI shall, unless the context otherwise requires, be construed as a reference to the WPI published for the period ending with the preceding month; and

“**Works**” means all works including survey and investigation, design, engineering, procurement, construction, Plant, Materials, temporary works and other things necessary to complete the Project in accordance with this Agreement.

**IN WITNESS WHEREOF THE PARTIES HAVE EXECUTED AND
DELIVERED THIS AGREEMENT AS OF THE DAY, MONTH AND YEAR
FIRST ABOVE WRITTEN.**

SIGNED, SEALED AND DELIVERED

SIGNED, SEALED AN DELIVERED

For and on behalf of

For and on behalf of

[THE AUTHORITY] by:

THE CONTRACTOR by:

(Signature)

(Name)

(Designation)

(Signature)

(Name)

(Designation)

In the presence of:

1.

2.

{ COUNTERSIGNED and accepted by:

Name and particulars of other members of the Joint Venture }

Schedules

SCHEDULE – A

(See Clauses 2.1 and 8.1)

SITE OF THE PROJECT

1 The Site

- 1.1 The site is located at Kankaity (Jagdishpur), Bhagalpur, site of the Project shall include the land and the site is under possession of BSCL.
- 1.2 The dates of providing the land to the Contractor within 15 days of agreement.
- 1.3 An inventory of the Site including the land, building, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority Representative and the Contractor, and such inventory shall form part of the memorandum referred to in Clause 8.2.1 of this Agreement.
- 1.4 The alignment plans of the Project are specified in Annex-III. In the case of sections where no modification in the existing alignment of the Project is contemplated, the alignment plan has not been provided. Alignment plans have only been given for sections where the existing alignment is proposed to be modified.

SCHEDULE – F

(See Clauses 7.1.1, 7.5.3 and 19.2)

FORM OF BANK GUARANTEE

Annex-I

(See Clause 7.1.1)

Form of Guarantee for Performance Security

.....,

.....,

.....,

WHEREAS:

- a)(insert name and address of the contractor) (hereinafter called the “**Contractor**”) and (insert name and address of the project authority), (hereinafter called the “**Authority**”) have entered into an agreement (hereinafter called the “**Agreement**”) for the construction of theProject on Engineering, Procurement and Construction (the “**EPC**”) basis, subject to and in accordance with the provisions of the Agreement
- b) The Agreement requires the Contractor to furnish a Performance Security for due and faithful performance of its obligations, under and in accordance with the Agreement, during the Construction Period and Defects Liability Period (as defined in the Agreement) in a sum of Rs..... cr. (Rupees crore) (the “Guarantee Amount”).
- c) We, through our branch at (the “Bank”) have agreed to furnish this bank guarantee (hereinafter called the “Guarantee”) by way of Performance Security.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees and undertakes to pay to the Authority upon occurrence of any failure or default in the due and faithful performance of all or any of the Contractor's obligations, under and in accordance with the provisions of the Agreement during the {Construction Period/ Defects Liability Period} on its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.
2. A letter from the Authority, under the hand of an officer not below the rank of a Chief Engineer of the Authority, that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.
3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Agreement or to extend the time or period for the compliance with, fulfilment and/ or performance of all or any of the obligations of the Contractor contained in the Agreement or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and

obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Agreement or for the fulfillment, compliance and/or performance of all or any of the obligations of the Contractor under the Agreement.
7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
8. The Guarantee shall cease to be in force and effect on \$. Unless a demand or claim under this Guarantee is made in writing before expiry of the Guarantee, the Bank shall be discharged from its liabilities hereunder.
9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

11. This Guarantee shall come into force with immediate effect and shall remain in force and effect for up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement

Signed and sealed this day of, 20..... at

SIGNED, SEALED AND

DELIVERED For and on behalf of the

Bank by:

(Signature)

(Name)

(Designation) (Code Number)

(Address)

NOTES:

- & The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.
- & The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

Annex – II

(Schedule - F)

(See Clause 7.5.3)

Form of Guarantee for Withdrawal of Retention Money

.....,

.....,

.....,

WHEREAS:

- a)(insert name and address of the contractor) (hereinafter called the “**Contractor**”) has executed an agreement (hereinafter called the “**Agreement**”) with the (insert name and address of the project authority), (hereinafter called the “**Authority**”) for the construction of Integrated Solid Waste Management (ISWM). on Engineering, Procurement and Construction (the “**EPC**”) basis, subject to and in accordance with the provisions of the Agreement.
- b) In accordance with Clause 7.5.3 of the Agreement, the Contractor may withdraw the retention money (hereinafter called the “**Retention Money**”) after furnishing to the Authority a bank guarantee for an amount equal to the proposed withdrawal.
- c) We, through our branch at (the “**Bank**”) have agreed to furnish this bank guarantee (hereinafter called the “**Guarantee**”) for the amount of Rs. cr. (Rs..... crore) (the “**Guarantee Amount**”).

NOW, THEREFORE, the Bank hereby unconditionally and irrevocably guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum

specified therein.

2. A letter from the Authority, under the hand of an officer not below the rank of a Chief Engineer of the Authority, that the Contractor has committed default in the due and faithful performance of all or any of its obligations for under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final, and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.
3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Retention Money and any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Retention Money.
7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this

Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The Guarantee shall cease to be in force and effect 90 (ninety) days after the date of the Completion Certificate specified in Clause 12.4 of the Agreement.
9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.
11. This Guarantee shall come into force with immediate effect and shall remain in force and effect up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.
Signed and sealed this day of, 20..... at

SIGNED, SEALED AND DELIVERED

For and on behalf of the

Bank by: (Signature)

(Name) (Designation) (Code Number)

(Address)

NOTES:

- (i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.
- (ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

Annex – III

(Schedule -

F) (See

Clause 19.2)

Form of Guarantee for Advance Payment

.....,

.....,

.....,

WHEREAS:

- (A)(insert name and address of the contractor)
(hereinafter called the “**Contractor**” has executed an agreement (hereinafter called the “**Agreement**”) with the (insert name and address of the project authority), (hereinafter called the “**Authority**”) for the construction of the Integrated Solid Waste Management Project (“**Project**”)on Engineering, Procurement and Construction (the “**EPC**”) basis, subject to and in accordance with the provisions of the Agreement
- (B) In accordance with Clause 19.2 of the Agreement, the Authority shall make to the Contractor an interest free advance payment (herein after called “**Advance Payment**”) equal to 10% (ten per cent) of the Contract Price; and that the Advance Payment shall be made in three instalments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equivalent to 110% (one hundred and ten per cent) of such instalment to remain effective till the complete and full repayment of the instalment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second/third} instalment of the Advance Payment is Rs. cr. (Rupeescrore) and the amount of

this Guarantee is Rs. cr. (Rupees..... crore)(the “**Guarantee Amount**”)^{\$}.

- (C) We, through our branch at (the “Bank”) have agreed to furnish this bank guarantee (*hereinafter called the “Guarantee”*) for the Guarantee Amount.
-

^{\$} The Guarantee Amount should be equivalent to 110% of the value of the applicable instalment.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful repayment on time of the aforesaid instalment of the Advance Payment under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.
2. A letter from the Authority, under the hand of an officer not below the rank of a Chief Engineer of the Authority, that the Contractor has committed default in the due and faithful performance of all or any of its obligations for the repayment of the instalment of the Advance Payment under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.
3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other

- body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
 5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Advance Payment or to extend the time or period of its repayment or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
 6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Advance Payment.
 7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
 8. The Guarantee shall cease to be in force and effect on \$ unless a demand or claim under this Guarantee is made in writing on or before the aforesaid date, the Bank shall be discharged from its liabilities hereunder.
 9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
 10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at

the time when it ought to have been delivered in due course of post and in providing such notice when given by post it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

- m) This Guarantee shall come into force with immediate effect and shall remain in force and effect up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

Signed and sealed this day of, 20..... at

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signaure) (Name)

(Designation) (Code Number)

(Address)

NOTES:

- f) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.
- g) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

SCHEDULE – H

(See Clause 10.2.4)

DRAWINGS

a) Drawings

In compliance of the obligations set forth in Clause 10.2 of this Agreement, the Contractor shall furnish to the Authority's Engineer, free of cost, all Drawings listed in Annex-I of this Schedule-H.

b) Additional Drawings

If the Authority's Engineer determines that for discharging its duties and functions under this Agreement, it requires any drawings other than those listed in Annex-I, it may by notice require the Contractor to prepare and furnish such drawings forthwith. Upon receiving a requisition to this effect, the Contractor shall promptly prepare and furnish such drawings to the Authority's Engineer, as if such drawings formed part of Annex-I of this Schedule-H.

Annex – I

(Schedule – H)

List of Drawings

[**Note:** The Authority will be informed at the time of Agreement, however all the drawings related to civil works shall be submitted by the bidder]

SCHEDULE – I

(See Clause 10.3.2)

PROJECT COMPLETION SCHEDULE**1 Project Completion Schedule**

During Implementation period, the Contractor shall comply with the requirements set forth in this Schedule-I for each of the Project Milestones and the Scheduled Completion Date. Within 15 (fifteen) days of the date of each Project Milestone, the Contractor shall notify the Authority of such compliance along with necessary particulars and the same should be approved in the following format by the Authority.

2.0 Project Milestones:

Milestone Number	Description of Each Milestone	Payment (%)	Cumulative Payment	Completion Period
1	Site Development	2	2	12 months
2	Installation and Commissioning of Biomining/ Screening Plant and Machinery	13	15	
3	100% Processing of Legacy waste		35	
3a	25% Processing of Legacy waste	5		
3b	25% Processing of Legacy waste	5		
3c	25% Processing of Legacy waste	5		
3d	25% Processing of Legacy waste	5		
4	Construction of Processing Sheds, Landfill & other infrastructure including Electrical Work	20	55	
5	Procurement, Installation and Commissioning of Leachate Treatment Plant (60 KLD)	10	65	
6	Procurement of Composting & Landfill Vehicles	5	70	
7	Solar Roof Top on Processing plant shed	5	75	

8	ICT Hardware for Treatment & Disposal site and procurement of Personnel Protective Equipments	5	80	
---	---	---	----	--

- **Apart from legacy waste the Contractor shall have to process the current waste, collected on day to day basis along with legacy waste.**

Milestone Number	Description of Each Milestone	Payment (%age)	Cumulative Payment	Cumulative O&M Period
9	Operation and Maintenance of Treatment & Disposal (Billing shall be on quarterly basis)	4	4	1years
10	Operation and Maintenance of Treatment & Disposal (Billing shall be on quarterly basis)	4	8	2years
11	Operation and Maintenance of Treatment & Disposal(Billing shall be on quarterly basis)	4	12	3years
12	Operation and Maintenance of Treatment & Disposal (Billing shall be on quarterly basis)	4	16	4years
13	Operation and Maintenance of Treatment & Disposal(Billing shall be on quarterly basis)	4	20	5years

- **Operation and Maintenance of Treatment & Disposal shall start from the day one of Schedule Completion Date.**
- **The revenue earned from selling of recyclable products after segregation shall remain with the Contractor**

Payment Certificates

The Contractor shall submit to the Engineer milestone bills of the estimated value of the work completed less the cumulative amount certified previously.

The Engineer shall check the Contractor's milestone bills within 14 days and certify the amount to be paid to the Contractor.

The value of work executed shall be determined and approved by the Engineer.

Scheduled Completion Date

- 5.1 The Scheduled Completion Date shall be the 12 months from the notice to start the work.
- 5.2 On or before the Scheduled Completion Date, the Contractor shall have completed construction in accordance with this Agreement.

a) Extension of time

Upon extension of any or all of the aforesaid Project Milestones or the Scheduled Completion Date, as the case may be, under and in accordance with the provisions of this Agreement, the Project Completion Schedule shall be deemed to have been amended accordingly.

SCHEDULE – J

(See Clause 12.1.2)

TESTS ON COMPLETION**1 Schedule for Tests**

- 1.1 The Contractor shall, no later than 30 (thirty) days prior to the likely completion of construction, notify the Authority's Engineer and the Authority of its intent to subject the Project to Tests, and no later than 10 (ten) days prior to the actual date of Tests, furnish to the Authority's Engineer and the Authority detailed inventory and particulars of all works and equipment forming part of Works.
- 1.2 The Contractor shall notify the Authority's Engineer of its readiness to subject the Tests at any time after 10 (ten) days from the date of such notice, and upon receipt of such notice, the Authority's Engineer shall, in consultation with the Contractor, determine the date and time for each Test and notify the same to the Authority who may designate its representative to witness the Tests. The Authority's Engineer shall thereupon conduct the Tests itself or cause any of the Tests to be conducted in accordance with Article 12 and this Schedule-J.

2 Tests

- 2.1 Visual and physical test: The Authority's Engineer shall conduct a visual and physical check of implementing works to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include [***].
- 2.2 Deleted.
- 2.3 Deleted

- 2.4 Other tests: The Authority's Engineer may require the Contractor to carry out or cause to be carried additional tests, in accordance with Good Industry Practice, for determining the compliance of the Project with Specifications and Standards.
- 2.5 Environmental audit: The Authority's Engineer shall carry out a check to determine conformity of the Project with the environmental requirements set forth in Applicable Laws and Applicable Permits.
- 2.6 Safety Audit: The Authority's Engineer shall carry out, or cause to be carried out, a safety audit to determine conformity of the Project with the safety requirements and Good Industry Practice.

i. Agency for conducting Tests

All Tests set forth in this Schedule-J shall be conducted by the Authority's Engineer or such other agency or person as it may specify in consultation with the Authority.

ii. Completion Certificate

Upon successful completion of Tests, the Authority's Engineer shall issue the Completion Certificate in accordance with the provisions of Article 12.

SCHEDULE – K

(See Clause 12.2 and 12.4)

PROVISIONAL CERTIFICATE

- 1) I/We, (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated (the "**Agreement**"), for construction of the (the "**Project**") on Engineering, Procurement and Construction (EPC) basis through

(Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been undertaken to determine compliance of the Project with the provisions of the Agreement.

- 2) Works that are incomplete on account of Time Extension have been specified in the Punch List appended hereto, and the Contractor has agreed and accepted that it shall complete all such works in the time and manner set forth in the Agreement. In addition, certain minor works are incomplete and these are not likely to cause material inconvenience to the Users of the Project or affect their safety. The Contractor has agreed and accepted that as a condition of this Provisional Certificate, it shall complete such minor works within 30 (thirty) days hereof. These minor works have also been specified in the aforesaid Punch List.
- 3) In view of the foregoing, I/We am/are satisfied that the Projectcan be safely and reliably placed in service of the Users thereof, and in terms of the Agreement, the Project is hereby provisionally declared fit for entry into operation on this the day of 20.....
- 4)

ACCEPTED, SIGNED, SEALED AND DELIVERED		ACCEPTED, SIGNED, SEALED AND DELIVERED
For and on behalf of		For and on behalf of
Contractor by:		Authority's Engineer by:

Signature		Signature
Name & Designation		Name & Designation
Address		Address

COMPLETION CERTIFICATE

- a) I/We,(Name of the Authority’s Engineer), acting as the Authority’s Engineer, under and in accordance with the Agreement dated (the “**Agreement**”), for construction of the (the “**Project**”) on Engineering, Procurement.....and Construction (EPC) basis through.....

(Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project with the provisions of the Agreement, and I/We am/are satisfied that the Project can be safely and reliably placed in service of the Users thereof.

- b) It is certified that, in terms of the aforesaid Agreement, all works forming part of Project have been completed, and the Project is hereby declared fit for entry into operation on this the day of 20.....

SIGNED, SEALED AND

DELIVERED For and on behalf

of the Authority’s Engineer by:

(Signature) (Name) (Designation)

(Address)

SCHEDULE – L

(See Clause 18.1.1)

SELECTION OF AUTHORITY’S ENGINEER**1.0 Selection of Authority’s Engineer**

- 1.1** The provisions of the Model Request for Proposals for Selection of Technical Consultants, issued by the Ministry of Finance, Government of India vide OM 24(23)/PF-II/2008 dated 21, May 2009, or any substitute thereof shall apply for selection of an experienced firm to discharge the functions and duties of an Authority’s Engineer. Provided, however, that no entity which is owned or controlled by the Authority shall be eligible for appointment as the Authority’s Engineer hereunder.
- 1.2** In the event of termination of the Technical Consultants appointed in accordance with the provisions of Paragraph 1.1, the Authority shall appoint another firm of Technical Consultants forthwith and may engage a government-owned entity in accordance with the provisions of Paragraph 3 of this Schedule-L.

2.0 Terms of Reference

The Terms of Reference for the Authority’s Engineer (the “**TOR**”) shall substantially conform with Annex 1 to this Schedule L.

3.0 Appointment of Government entity as Authority’s Engineer

Notwithstanding anything to the contrary contained in this Schedule, the Authority may in its discretion appoint a government-owned entity as the Authority’s Engineer; provided that such entity shall be a body corporate having as one of its primary functions the provision of consulting, advisory and supervisory services for engineering projects; provided further that a government-owned entity which is owned or controlled by the Authority shall not be eligible for appointment as Authority’s Engineer.

Annex – I

*(Schedule - L)***Terms of reference for Authority's Engineer****1 Scope**

- 1.1** These Terms of Reference (the “TOR”) for the Authority’s Engineer are being specified pursuant to the EPC Agreement dated (the “Agreement”), which has been entered into between the (insert name and address of the Authority) (the “Authority”) and (the “Contractor”) for construction of ISWM on Engineering, Procurement, Construction (EPC) basis, and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.
- 1.2** The TOR shall apply to construction of the Project.

2 Definitions and interpretation

- 2.1** The words and expressions beginning with or in capital letters and not defined herein but defined in the Agreement shall have, unless repugnant to the context, the meaning respectively assigned to them in the Agreement.
- 2.2** References to Articles, Clauses and Schedules in this TOR shall, except where the context otherwise requires, be deemed to be references to the Articles, Clauses and Schedules of the Agreement, and references to Paragraphs shall be deemed to be references to Paragraphs of this TOR.
- 2.3** The rules of interpretation contained in Clauses 1.2, 1.3 and 1.4 of the Agreement shall apply, *mutatis mutandis*, to this TOR.

3 General

- 3.1** The Authority’s Engineer shall discharge its duties in a fair, impartial and efficient manner, consistent with the highest standards of professional integrity and Good Industry Practice.
- 3.2** The Authority’s Engineer shall perform the duties and exercise the authority in accordance with the provisions of this Agreement, but subject to obtaining prior written approval of the Authority before determining:
- a) any Time Extension;
 - b) any additional cost to be paid by the Authority to the Contractor;
 - c) the Termination Payment; or
 - d) any other matter which is not specified in (a), (b) or (c) above and which creates an obligation or liability on either Party for a

sum exceeding Rs. 5,00,000 (Rs. five lakh).

- 3.3** The Authority's Engineer shall submit regular periodic reports, at least once every month, to the Authority in respect of its duties and functions under this Agreement. Such reports shall be submitted by the Authority's Engineer within 10 (ten) days of the beginning of every month.
- 3.4** The Authority's Engineer shall inform the Contractor of any delegation of its duties and responsibilities to its suitably qualified and experienced personnel; provided, however, that it shall not delegate the authority to refer any matter for the Authority's prior approval in accordance with the provisions of Clause 18.2.
- 3.5** The Authority's Engineer shall aid and advise the Authority on any proposal for Change of Scope under Article 13.
- 3.6** In the event of any disagreement between the Parties regarding the meaning, scope and nature of Good Industry Practice, as set forth in any provision of the Agreement, the Authority's Engineer shall specify such meaning, scope and nature by issuing a reasoned written statement relying on good industry practice and authentic literature.

4.0 Construction Period

- 4.1** During the Construction Period, the Authority's Engineer shall review the Drawings furnished by the Contractor along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, topographical surveys, and the recommendations of the Safety Consultant in accordance with the provisions of Clause 10.1.6. The Authority's Engineer shall complete such review and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt of such Drawings; provided.
- 4.2** The Authority's Engineer shall review any revised Drawings sent to it by the Contractor and furnish its comments within 10 (ten) days of receiving such Drawings.
- 4.3** The Authority's Engineer shall review the Quality Assurance Plan submitted by the Contractor and shall convey its comments to the Contractor within a period of 21 (twenty-one) days stating the modifications, if any, required thereto.
- 4.4** The Authority's Engineer shall complete the review of the methodology proposed to be adopted by the Contractor for executing the Works, and convey its comments to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed methodology from the Contractor.
- 4.5** The Authority's Engineer shall grant written approval to the Contractor, where

necessary, for interruption and diversion of the flow of traffic in the existing lane(s) of the Project for purposes of maintenance during the Construction Period in accordance with the provisions of Clause 10.4.

- 4.6 The Authority's Engineer shall review the monthly progress report furnished by the Contractor and send its comments thereon to the Authority and the Contractor within 7 (seven) days of receipt of such report.
- 4.7 The Authority's Engineer shall inspect the Construction Works and the Project and shall submit a monthly Inspection Report bringing out the results of inspections and the remedial action taken by the Contractor in respect of Defects or deficiencies. In particular, the Authority's Engineer shall include in its Inspection Report, the compliance of the recommendations made by the Safety Consultant.
- 4.8 The Authority's Engineer shall conduct the pre-construction review of manufacturer's test reports and standard samples of manufactured Materials, and such other Materials as the Authority's Engineer may require.
- 4.9 For determining that the Works conform to Specifications and Standards, the Authority's Engineer shall require the Contractor to carry out, or cause to be carried out, tests at such time and frequency and in such manner as specified in the Agreement and in accordance with Good Industry Practice for quality assurance.
- 4.10 The Authority's Engineer shall test check at least 20 (twenty) percent of the quantity or number of tests prescribed for each category or type of test for quality control by the Contractor.
- 4.11 The timing of tests referred to in Paragraph 4.9, and the criteria for acceptance/rejection of their results shall be determined by the Authority's Engineer in accordance with the Quality Control Manuals. The tests shall be undertaken on a random sample basis and shall be in addition to, and independent of, the tests that may be carried out by the Contractor for its own quality assurance in accordance with Good Industry Practice.
- 4.12 In the event that results of any tests conducted under Clause 11.10 establish any Defects or deficiencies in the Works, the Authority's Engineer shall require the Contractor to carry out remedial measures.
- 4.13 The Authority's Engineer may instruct the Contractor to execute any work which is urgently required for the safety of the Project, whether because of an accident, unforeseeable event or otherwise; provided that in case of any work required on account of a Force Majeure Event, the provisions of Clause 21.6 shall apply.
- 4.14 In the event that the Contractor fails to achieve any of the Milestones, the Authority's Engineer shall undertake a review of the progress of construction and identify potential delays, if any. If the Authority's Engineer shall

determine that completion of the Project is not feasible within the time specified in the Agreement, it shall require the Contractor to indicate within 15 (fifteen) days the steps proposed to be taken to expedite progress, and the period within which the Project Completion Date shall be achieved. Upon receipt of a report from the Contractor, the Authority's Engineer shall review the same and send its comments to the Authority and the Contractor forthwith.

- 4.15 The Authority's Engineer shall obtain from the Contractor a copy of all the Contractor's quality control records and documents before the Completion Certificate is issued pursuant to Clause 12.4.
- 4.16 Authority's Engineer may recommend to the Authority suspension of the whole or part of the Works if the work threatens the safety of the Users and pedestrians. After the Contractor has carried out remedial measures, the Authority's Engineer shall inspect such remedial measures forthwith and make a report to the Authority recommending whether or not the suspension hereunder may be revoked.
- 4.17 In the event that the Contractor carries out any remedial measures to secure the safety of suspended works and Users, and requires the Authority's Engineer to inspect such works, the Authority's Engineer shall inspect the suspended works within 3 (three) days of receiving such notice, and make a report to the Authority forthwith, recommending whether or not such suspension may be revoked by the Authority.
- 4.18 The Authority's Engineer shall carry out, or cause to be carried out, all the Tests specified in Schedule-J and issue a Completion Certificate or Provisional Certificate, as the case may be. For carrying out its functions under this Paragraph 4.18 and all matters incidental thereto, the Authority's Engineer shall act under and in accordance with the provisions of Article 12 and Schedule-J.

5 Determination of costs and time

- 5.1 The Authority's Engineer shall determine the costs, and/or their reasonableness, that are required to be determined by it under the Agreement.
- 5.2 The Authority's Engineer shall determine the period of Time Extension that is required to be determined by it under the Agreement.
- 5.3 The Authority's Engineer shall consult each Party in every case of determination in accordance with the provisions of Clause 18.5.

6.0 Payments

- 6.1 The Authority's Engineer shall withhold payments for the affected works for which the Contractor fails to revise and resubmit the Drawings to the Authority's Engineer in accordance with the provisions of Clause 10.2.4 (d).

6.2 Authority's Engineer shall

within 10 (ten) days of receipt of the Stage Payment Statement from the Contractor pursuant to Clause 19.4, determine the amount due to the Contractor and recommend the release of 90 (ninety) percent of the amount so determined as part payment, pending issue of the Interim Payment Certificate; and
within 15 (fifteen) days of the receipt of the Stage Payment Statement referred to in Clause 19.4, deliver to the Authority and the Contractor an Interim Payment Certificate certifying the amount due and payable to the Contractor, after adjustments in accordance with the provisions of Clause 19.10.

7.0 Other duties and functions

The Authority's Engineer shall perform all other duties and functions as specified in the Agreement.

8 Miscellaneous

- 8.1 A copy of all communications, comments, instructions, Drawings or Documents sent by the Authority's Engineer to the Contractor pursuant to this TOR, and a copy of all the test results with comments of the Authority's Engineer thereon, shall be furnished by the Authority's Engineer to the Authority forthwith.
- 8.2 The Authority's Engineer shall retain at least one copy each of all Drawings and Documents received by it, including 'as-built' Drawings, and keep them in its safe custody.
- 8.3 Within 90 (ninety) days of the Project Completion Date, the Authority's Engineer shall obtain a complete set of as-built Drawings, in 2 (two) hard copies and in micro film format or in such other medium or manner as may be acceptable to the Authority, reflecting the Project as actually designed, engineered and constructed, including an as-built survey illustrating the layout of the Project and setback lines, if any, of the buildings and structures forming part of Project Facilities; and shall hand them over to the Authority against receipt thereof.
- 8.4 The Authority's Engineer, if called upon by the Authority or the Contractor or both, shall mediate and assist the Parties in arriving at an amicable settlement of any Dispute between the Parties.
- 8.5 The Authority's Engineer shall inform the Authority and the Contractor of any event of Contractor's Default within one week of its occurrence.

SCHEDULE – M

*(See Clauses 19.4.1, 19.6.1, and 19.8.1)***FORMS OF PAYMENT STATEMENTS****a) Stage Payment Statement for Works**

Milestone Number	Description of Each Milestone	Payment (%age)	Cumulative Payment	Completion Period
1	Site Development	2	2	12 months
2	Installation and Commissioning of Biomining/ Screening Plant and Machinery	13	15	
3	100% Processing of Legacy waste		35	
3a	5% processing waste	5		
3b	5% processing waste	5		
3c	5% processing waste	5		
3d	5% processing waste	5		
4	Construction of Processing Sheds, Landfill & other infrastructure including Electrical Work	20	55	
5	Procurement, Installation and Commissioning of Leachate Treatment Plant (60 KLD)	10	65	
6	Procurement of Composting & Landfill Vehicles	5	70	
7	Solar Roof Top on Processing plant shed	5	75	
8	ICT Hardware for Treatment & Disposal site and procurement of Personnel Protective Equipments	5	80	

- **Apart from legacy waste the Contractor shall have to process the current waste, collected on day to day basis along with legacy waste.**

Milestone Number	Description of Each Milestone	Payment (%age)	Cumulative Payment	Cumulative O&M Period
9	Operation and Maintenance of Treatment & Disposal(Billing shall be on quarterly basis)	4	4	1years
10	Operation and Maintenance of Treatment & Disposal(Billing shall be on quarterly basis)	4	8	2years
11	Operation and Maintenance of Treatment & Disposal (Billing shall be on quarterly basis)	4	12	3years
12	Operation and Maintenance of Treatment & Disposal(Billing shall be on quarterly basis)	4	16	4years
13	Operation and Maintenance of Treatment & Disposal(Billing shall be on quarterly basis)	4	20	5years

- **Operation and Maintenance of Treatment & Disposal shall start from the day one of Schedule Completion Date.**
- **The revenue earned from selling of recyclable products after segregation shall remain with the Contractor.**

Payment Certificates

The Contractor shall submit to the Engineer milestone bills of the estimated value of the work completed less the cumulative amount certified previously.

The Engineer shall check the Contractor's milestone bills within 14 days and certify the amount to be paid to the Contractor.

The value of work executed shall be determined by the Engineer.

(e) Contractor's claim for Damages

Note: The Contractor shall submit its claims in a form acceptable to the Authority.

SCHEDULE – N

(See Clause 20.1)

INSURANCE**1.0 Insurance during Construction Period**

1.1 The Contractor shall effect and maintain at its own cost, from the Appointed Date till the date of issue of the Completion Certificate, the following insurances for any loss or damage occurring on account of Non Political Event of Force Majeure, malicious act, accidental damage, explosion, fire and terrorism:

- a) insurance of Works, Plant and Materials and an additional sum of [15% (fifteen per cent)] of such replacement cost to cover any additional costs of and incidental to the rectification of loss or damage including professional fees and the cost of demolishing and removing any part of the Works and of removing debris of whatsoever nature; and
- b) insurance for the Contractor's equipment and Documents brought onto the Site by the Contractor, for a sum sufficient to provide for their replacement at the Site.

1.2 The insurance under paragraph 1.1 (a) and (b) above shall cover the Authority and the Contractor against all loss or damage from any cause arising under paragraph 1.1 other than risks which are not insurable at commercial terms.

2. Insurance for Contractor's Defects Liability

The Contractor shall effect and maintain insurance cover for the Works from the date of issue of the Completion Certificate until the end of the Defects Liability Period for any loss or damage for which the Contractor is liable and which arises from a cause occurring prior to the issue of the Completion Certificate. The Contractor shall also maintain other insurances for maximum sums as may be required under Applicable Laws and in accordance with Good Industry Practice.

3. Insurance against injury to persons and damage to property

3.1 The Contractor shall insure against its liability for any loss, damage, death or bodily injury, or damage to any property (except things insured under Paragraphs 1 and 2 of this Schedule or to any person (except persons insured under Clause 20.9), which may arise out of the Contractor's performance of this Agreement. This insurance shall be for a limit per occurrence of not less than the amount specified below with no limit on the number of occurrences.

The insurance cover shall be not less than estimated cost.

- 3.2 The insurance shall be extended to cover liability for all loss and damage to the Authority's property arising out of the Contractor's performance of this Agreement excluding:

The Authority's right to have the construction works executed on, over, under, in or through any land, and to occupy this land for the Works; and damage which is an unavoidable result of the Contractor's obligations to execute the Works.

4 Insurance to be in joint names

The insurance under paragraphs 1 to 3 above shall be in the joint names of the Contractor and the Authority.

SECTION - 5

SECTION 5: SPECIAL CONDITIONS OF CONTRACT

- 5.1 **General:** The special conditions are supplementary instructions to the tenders and shall form part of the contract.
- 5.2 **Drawing:** All Drawings/Layout plans given in Section 11 are for reference or guidance purpose only. The Bidder will submit the detailed Contract execution plan within 15 days from date of issuing Work Order or Agreement whichever is earlier. The same shall be reviewed and approved by BSCL or through other agency approved by BSCL. These 15 days period is included in stipulated time of Contract Period. Construction of ISWM shall be carried out as per the drawings approved by BSCL.
- 5.3 **Data to be furnished by the Bidder:** The Bidder shall submit the following information to BSCL.
- 5.4 Proposed constructions Programme and time schedule showing sequence of operations within **15 days** of receipt of notice to proceed with the work in pursuance of the conditions of contract.
- 5.5 **Action when the progress of any item of work is unsatisfactory:** If the progress of an item of work during construction, which is important for timely completion of work is unsatisfactory, BSCL shall notwithstanding that the general progress of work is satisfactory, after giving the Bidder **15 days'** notice in writing get the said work executed by employing other means including other labour / Bidder etc. and the Bidder will have no claim for compensation for any loss sustained by him owing to such action.
- 5.6 In case if any of the works under this contract are found unsatisfactorily by BSCL, the BSCL shall either request the bidder to rectify the defect immediately or at his discretion may have it done by others (vendor or contractor) and deduct the actual amount incurred as per market rate plus 15 % extra incurred in such works from the bidders.
- 5.7 **Inspection and Tests:** Except as otherwise provided in here of all material and workmanship if not otherwise designated by the specifications shall be subject to inspection, examination and test by BSCL at any and all times during manufacture and/or construction and at any/all places where such manufacture or constructions are carried on. The BSCL shall have the right to reject defective materials and workmanship or require its corrections. Rejected workmanship shall be satisfactorily replaced with the proper material without charge thereof and the Bidder shall properly segregate and remove the rejected material from the premises. If the Bidder fails to proceed at once with the replacement of the rejected material and/or the construction of defective workmanship BSCL may replace such material and/or correct such workmanship and charge the cost thereof to the Bidder.

The Bidder shall be liable for replacement of defective work up to the time of completion of DLP in accordance with the conditions of contract of all work to be done under the contract. The Bidder shall furnish promptly without additional

charge all facilities, labour and material necessary for the safe and convenient inspection and tests that may be required by BSCL. All inspections and tests by the departments shall be performed in such a manner as to not unnecessarily delay the work. Special full size and performance test shall be charged with any additional cost of inspection when materials and workmanship are not kept ready by the Bidder at the time of inspection.

- 5.8 **Removal of temporary work, Plant & Surplus materials:** Prior to final acceptance of the completed work, but excepting as otherwise expressly directed or permitted in writing, the Bidder shall, at his own expenses remove from the site and dispose of all the temporary structures including buildings, all plant and surplus materials, and all rubbish and debris for which he is responsible to the satisfaction of BSCL.
- 5.9 **Possession prior to completion:** BSCL shall have the right to take possession of or use any completed part of the work. Such possession or use shall not be deemed as an acceptance of any work not completed in accordance with the contract.
- 5.10 **Damage to works:** The works whether fully completed or incomplete, all the materials, machinery, plants, tools, temporary building and other things connected there with shall remain at the risk and in the sole charge of the Bidder until the completed work has been delivered to BSCL and till completion certificate has been obtained from BSCL . Until such delivery of the completed work, the Bidder shall at his own cost take all precautions reasonably to keep all the aforesaid works, materials, machinery, plants, temporary buildings and other things connected there with free from any loss, damages and in the event of the same or any part there of being lost or damaged, he shall forthwith reinstate and make good such loss or damages at his own cost.
- 5.11 **Examination and tests on completions:** On the completion of the work and not later than three months thereafter, BSCL shall make such examination and tests of the work as may then seem to him to be possible, necessary or desirable, and the Bidder shall furnish free of cost any materials and labour which may be necessary thereof and shall facilitate in every way all operations required by BSCL, in making examination and tests.
- 5.12 **Climatic Conditions:** BSCL may order the Bidder to suspend any work that may be subject to damage by climatic conditions and no claims of the Bidder will be entertained by the department on this account.
- 5.13 As per the Ministry of Environment and Forest Guidelines 2010 and Ministry of Urban Development notifications, the Site area shall be protected from dust by fixing Green Fencing around the Construction site area.

The Contractor is instructed to strictly adhere to the following at his own cost.

- a) Supply and Fixing Green barriers and wind breaking walls around their sites.
- b) Cover tarpaulin on scaffolding around area of construction,
- c) Do not store construction material, particularly sand, on any part of the street,

- roads in any colony,
- d) Cordon the work area with proper fencing by other means with due consideration of safety of workers, public, etc.
 - e) Dust emissions from construction site are controlled.
 - f) Sprinklers should be compulsorily used at the site and Wet jets in grinding and stone cutting must be used.
 - g) The work area shall be well illuminated during nights.
- 5.14 **Safety regulations:** During the entire contract period, while carrying out this works indicated in this tender, the Bidder will ensure compliance of all safety regulations as provided in the Safety Code (**Annexure - D**). The bidder will be responsible for safety of the works.
- 5.15 **The Bidder will make his own arrangement:** for supply of water, light & power for his works and labour camps etc.: The Bidder will make his own arrangement for supply of water, light and power for his works and labour camps etc. The department will not entertain any claim what so ever for any failure or break down etc. in supply of to the Bidder. The Bidder will supply and fix his own tested meter of the approved make but the meter will be kept in the custody of the department.
- 5.16 **Interference with other Bidders:** The Bidder must not interfere with other Bidders who may be employed simultaneously or otherwise by the department at the Site. He will at no time engage departmental labour or that of other Bidders without the written permission of BSCL. **Bidder is fully responsible for cause of damages of the adjoining works of different works at site and the same cost of rectification of damages shall be recovered from the Bidder as per BSCL's instructions.**
- 5.17 **Regulations and bye laws:** The Bidder shall conform to the regulations, bye-laws any other statutory rules made by any local authorities or by the Government and shall protect and indemnify BSCL, against any claim or liability arising from or based on the violation of any such laws, safety, theft, ordinance, regulation, orders, decrees etc.
- 5.18 **Site Order Book:** A site order book shall be kept in the departmental office at the site of the work. As far as possible all orders regarding the works are to be entered in this book. All entries therein shall be signed by the departmental officers in direct charge of the work and the Bidder or his representatives. In the important cases the Chief General Manager of BSCL will countersign the entries which the Bidders or his representative shall be bound to take note of all instructions meant for the Bidder as entered in the site order book without having to be called for separately to note them. BSCL shall submit periodically copies of the remarks of the site order book to the Chief General Manager, BSCL for record and to the Bidder for compliance and report.
- 5.19 **Conversion of units:** Whenever in the contract agreement dimensions and units have been expressed in F.P.S. system, the same will be converted in to metric system units by applying the standard conversion table of Indian

Standard Institution so as to derive the corresponding figure arithmetically and the Bidder will have to accept the figures so derived without any claim or compensation whatsoever.

- 520 **Rights of other Bidders and persons:** If, during the progress of the work covered by this contract, it is necessary for other Bidders or persons to do work in or about the site of work, the Bidder shall afford such facilities, as BSCL may require.
- 521 **Employment of technical persons:** The Bidder shall employ or produce evidence of having in his employment of the qualified technical person as indicated in the RFP from the Institution recognized by the Government of Bihar / Govt. of Other State / Govt. of India
- 522 The above is the minimum requirement of Manpower. However, contractor shall access the actual requirement and deploy the necessary manpower. No extra cost will be paid for deployment of extra manpower if required.
- 523 The technical staff shall be got approved in writing from BSCL (whose approval may be withdrawn any time) for supervision of works and to receive direction from the Engineer of the work on behalf of the contractor. The supervisory staff of the contractor will not be changed without the approval of BSCL.

5.3 **Bonus for early completion**

In the event that the Project Completion Date occurs prior to the Scheduled Completion Date, the Contractor shall be entitled to receive a payment of bonus equivalent to 1% (one percent) of the Contract Price per month computed on per day basis, shall be payable to the contractor subject to a maximum of 5% (five per cent) of the Contract Price. Provided, however, that the payment of bonus, if any, shall be made only after the issue of the Completion Certificate.

Additional Special Conditions

1. Contractor is advised to read carefully all chapters and give complete information regarding his proposals, substantiating the same with calculations, drawings literature, with clear reference to any standards adopted (which are not mentioned in the tender), in such manner that there is no ambiguity or nothing is left to chance. All relevant information, so as to make the proposal understandable shall be given. Vague remarks and remarks like “will be given later” are not acceptable. If in the opinion of BSCL, the proposal is grossly incomplete, this will form sufficient reason for complete rejection of the tender on technical grounds.
2. Contractor shall note that this is a lumpsum rate tender. The bidder shall give rate for complete work. However, his proposals are subject to scrutiny and approval for unit wise / sub unit wise progressive payments by the competent authority. He shall therefore take utmost precaution to offer very standard equipment manufactured by only reputed manufacturers (wherever the makes are specified, the same shall be offered). However, the bidder should note that after the tenders are opened, all modifications, corrections, changes should be carried out entirely to the satisfaction of BSCL at no extra cost to BSCL. The contractor shall not be allowed to change the price quoted.
3. All the equipment installed shall be thoroughly tested at the time of commissioning of the plant and all initial defects shall be rectified to the entire satisfaction of the engineer. Damaged or non-working parts shall be replaced at no extra cost to BSCL.
4. **Training of the BSCL, staff before Handling over the Equipment/Instruments.** As there is fair amount of automation specified, there will be very large number of small components, which form units of equipment. In order that the BSCL staff engaged on operations and maintenance becomes proficient in understanding and handling the equipment correctly, the contractor will have to organize training programme in the manufacturers’ shops as well as on site during actual operation of the plant. For this purpose, he will have to employ suitably qualified, trained personnel to carry out this training. The training period is for 7 days after commissioning of the plant or for such extra period before commissioning in the workshops. A mutually agreed programme shall be formulated during the execution, which will be binding on the contractor.
5. **Third Party Inspection:** BSCL reserves the right to appoint any organization/ institution for checking of design, & quality & quantity checks of works during currency of the contract & no additional cost shall be payable by BSCL on this account
6. The overall development of site at which processing sheds shall be constructed inclusive of roads, horticulture, lights and other utilities services such as water supply, sewerage, drainage etc. shall be provided by contractor agency as per drawings approved by BSCL.

7. The Bidder shall liable for all statutory clearances inclusive from Bihar Pollution Control Board for execution and till operation period.
8. Bidder shall liable to all consequences arising there upon.
9. During the Construction Period, the Contractor shall maintain, at its cost, the Project Site and the assets thereon so that the traffic and commercial worthiness and safety thereof are at no time materially inferior as compared to their condition 7 (seven) days prior to the date of this Agreement, and shall undertake the necessary repair and maintenance works for this purpose.
10. The Construction work shall be executed by the bidder strictly as per technical specification of Bihar Construction Department/CPWD. In case of ambiguity or dispute arises, Bihar Construction Department (BCD) specification will prevail over.
11. The bidder shall strictly abide the General Conditions of contract and Special Conditions of Contract of the RFP document. In no case, the bidder may violate the above conditions and no amendments should be made in the GCC or SCC.
12. In case of arbitration or dispute of the Contract, the Hon'ble High court of Patna, Bihar is the Jurisdiction.
13. The RFP document shall form part of Contract Agreement. The bidder should download all pages of the RFP document and must sign all pages (authorized signatory of the Contract agency) before uploading the RFP document in the www.eproc.bihar.gov.in portal

SECTION 6

CONTRACT DATA

CONTRACT DATA

Clause Reference With respect to section 4.

Items marked “N/A” do not apply in this contract.

	Name: BSCL. Address: Municipal Corporation, Court Compound, Bhagalpur Name of Employer’s Representative: - Chief Executive Officer, Bhagalpur Smart City Limited, Bhagalpur	[Cl.1.1 of ITB of Section - 1]
	The Engineer is: - To be Informed Later.	GCC Cl .16 of Article -16
	The Dispute Review Expert will be Expert Mediator of the Govt. of India rules.	[GCC Cl. 24 of Article -24]
	The Defects Liability Period is upto 5 years during operation & maintenance	[GCC Cl. 15 of Article -15]
	The commencement date shall from the issue of letter of notice to proceed (NTP)	[GCC Cl. 10 of Article -10]
	The Intended Completion Date for the whole of the Works is 12 months after agreement For detail refer Important Milestone	[GCC Cl 12 of Article -12]
	Mile Stone Physical works to be completed	12 Months from the start date of work
	The Site is located at Bhagalpur	[[Cl.7 of ITB)
	The name and identification number of the Contract is	[ITB CL 1.1]
	The work consists of Clearing the existing legacy waste and current waste on daily basis, Construction of Material Recovery Facility, waste processing, scientific landfill, leachate treatment plant and providing digital monitoring mechanism at Kankaity in Bhagalpur with Operation & Maintenance for five years on Engineering, Procurement & Construction (EPC) basis	[Cl. 1.1 of ITB)
	The following documents also form part of the Contract	[GCC Cl 1.0 of Article -1]

	The law which applies to the Contract is the law of Union of India	[GCC Cl.25.1 of Article -25]
	The language of the Contract documents is English	[GCC Cl.25.14 of Article -25]
	The limit of sub-contracting	10% of the contract value
	The Schedule of Key Personnel	[Annexure – II of ITB of section 2)
	The minimum insurance cover for physical property, injury and death is Rs.5 lakhs per occurrence with the number of occurrences limited to four. After each occurrence, contractor will pay additional premium necessary to make insurance valid for four occurrences always till Defect Liability Period of the Project.	[GCC. 18.0 of Article 17.0)
	The Site Possession Dates shall be 10 days after the issue of LoA.	[GCC Cl.8.2 of Article 8]
	The period for submission of the programme for approval of Engineer shall be 30 days from the appointed date	[GCC Cl.10.1.3 of Article 10] 10.1.3
	The currency of the Contract is Indian Rupees	[GCC Cl.17.2 of Article 17)
	The proportion of payments retained (retention money) shall be 9 % from each bills subject to a maximum of 8 % of final contract price.	[GCC Cl. 7.5.1 of Article 7]
	Amount of liquidated damages for delay in completion of works For whole work: (I/2000) of the Initial Contract Price, rounded off to the nearest hundred, per day.	[GCC CL 10.3.2]
	Maximum limit of liquidated damages for delay in completion of work 5 per cent of the Initial Contract Price rounded off to the nearest thousand.	[GCC Cl. 10.3.2 & 10.3.3 of Article 10)
	Amount of Bonus for early completion of whole of the works As per GCC	[GCC Cl. 17.16 of Article 17]
	The amounts of the advance payment are:	[GCC Cl 17.2 of Article 17]

	<p>i. Mobilization (Interest bearing) – 10% of the Contract price. On submission of unconditional Bank Guarantee (to be drawn before the end of 20% of the contract period). The contractor shall furnish part 'Bank Guarantee' of 110% of amount of advance taken as Mobilization.</p>	<p>The mobilization advance shall be released in two equal installments of 5% each.</p>
	<p>Repayment of advance payment for mobilization and equipment: The advance loan shall be repaid with percentage deductions from the interim payments certified by the Engineer under the Contract. Deductions shall commence in the next Interim Payment Certificate following that in which the total of all such payments to the Contractor has reached not less than 20 percent of the Contract Price or 6 (six) months from the date of payment of first installment of advance whichever period concludes earlier, and shall be made at the rate of 20 per cent of the amounts of all Interim Payment Certificates until such time as the loan has been repaid, always provided that the loan shall be completely repaid prior to the expiry of the original time for completion pursuant to Clauses 8.2 and 8.4 (Condition of Contract). In case non-achievement of milestone and accordingly non-production of running bills and consequently non-recovery of mobilization advance, the part Bank Guarantee (BG) against the Mobilization advance to that extent shall be forfeited.</p>	<p>[GCC Cl. 17.2.5 of Article 17]</p>
	<p>The Securities shall be for the following minimum amounts equivalent as a percentage of the Contract Price: Performance Security for 2 per cent of contract price plus Rs. (to be decided after evaluation of the bid) as additional security in terms of ITB Clause 29.5.</p>	<p>[Cl. 7.1 of Article 7)</p>
	<p>The date by which "as-built" drawings (in scale as directed and in color print) in 5 sets of Hard copy (coloured) and 1 set of soft copy are required within 28 days of issue of certificate of completion of whole or section of the work, as the case may be.</p>	<p>GCC CL 10.2.7 of Article 10)</p>
	<p>The amount to be withheld for failing to supply "as built" drawings in color print by the date required is Rs 10.00 lakhs for projects up to Rs 50 crores, and additional Rs 0.15 lakhs for every Rs. 1.00 crore increment in project cost thereafter, with upper limit of Rs 50 lakhs.</p>	<p>GCC CL 10.2.7 of Article 10</p>
	<p>The percentage to apply to the value of the work not completed representing the Employer's additional cost for completing the Works.</p>	<p>GCC Cl 10.5 of Article 10)</p>

VOLUME-II

SECTION 7

TECHNICAL SPECIFICATION

Disclaimer: The technical specifications provided herein for Bhagalpur Smart City Limited) are as per NBC, IS 456, IS 800, Solid Waste Management Rules 2016 and other relevant IS codes. In the absence of any definite provisions on any particular issue in the aforesaid specifications, reference may be made to the specifications of Government of Bihar/India which provides the specifications of various items of works which may be taken as minimum and any item of lower specifications shall not be allowed.

TECHNICAL SPECIFICATIONS OF EQUIPMENTS

1. HANDHELD RFID READERS

Highly integrated analog circuitry to demodulate and decode responses

- Buffered output drivers for connecting an antenna with the minimum number of external components, Supports ISO/IEC 14443 A/MIFARE and NTAG and 125 KHz
- Typical operating distance in read/write mode up to 50 mm depending on the antenna size and tuning
- Supports MF1xxS20, MF1xxS70 and MF1xxS50 encryption in Read/Write mode
- Supports ISO/IEC 14443 A higher transfer speed communication up to 848 k Bd, Supports MFIN/MFOUT
- Additional internal power supply to the smart card IC connected via MFIN/MFOUT, Supported host interfaces
- SPI up to 10 Mbit/s, I2C-bus interface up to 400 k Bd in Fast mode, up to 3400 k Bd in High-speed mode
- RS232 Serial UART up to 1228.8 k Bd, with voltage levels dependent on pin voltage supply
- FIFO buffer handles 64 bytes send and receive, flexible interrupt modes
- Hard reset with low power function, power-down by software mode
- Programme able timer Internal oscillator for connection to 27.12 MHz quartz crystal
- 2.5 V to 3.3 V power supply, CRC coprocessor

S. No	Parameter	Specifications
1	Transponder Protocol	EPC Global – Gen 2 (ISO 1800-6C)
2	Antenna	Integrated mono static or Bi-static or External
		From 10 dBm to 30 dBm (1 W), +/-1 .0 dBm accuracy
3	RF Power Output	
4	Frequency	865-867 MHz or Any other frequencies approved by WPC India
		Industrial port: 10/100 Base-T Ethernet interface, Serial RS232
5	Data Control Interface	port/ GPRS.
6	External DC Power	10 -30 VDC supply voltage.
7	Maximum DC power	up to 40W
8	Operating temp.	From -5°C to +50°C
9	Storage Temperature	From -40°C to +70°C
10	TAG Buffer	More than 50,000 tags
11	Minimum TAG Read distance	Up to 5 meters.

2. RFID TAG

Chip Type: MyFair, 15 mm X 22 mm, Storage capacity: 8Kbit, 16 partitions, each partition two passwords, Operating frequency: 13.56 MHz, Communication speed: 106K Boud, reading distance: 2.5 ~ 10cm, reading time: 1 ~ 2ms, Working temperature: -20°C ~ 55°C, Endurance:> 100,000 times, Data retention:> 10 years, Executive Standard: ISO14443A.

Parameter	Specifications
Operating Frequency	860-960MHz, (Should be de-licensed)
Chip Type	AC 230 VEPC class 1 Gen 2 compliant up to 512 bits
Power Frequency	50 Hz
Storage Temp	-40°C to +70°C
Operating Temp	-5°C to +55°C
Ingress Protection	IP 65
Operating mode	Passive (battery-less transponder)

3. Waste Bin mounted Wireless Garbage Level Sensor

S. No.	Specification	Value
1.	Operation Frequency	42 KHz
2.	Minimum Detection Range	25 cm to 300 cm for Accuracy Class mentioned below
3.	Usage	Outdoor
4.	IP Rating	IP 67
5.	Accuracy	+/-1 cm
6.	Resolution	1 cm
7.	Level Reading Frequency	1 hour
8.	Transmission Frequency	Option 1: Read every 1 Hour and Transmit on Threshold Breach. Option 2: read Every 1 Hour and transmit every 4 hours.
9.	Battery Life	Greater than 5 years. Sensor and Microcontroller shall be in sleep mode when not transmitting. Wake on radio feature shall be enabled to wake up sensor node when Reader polls for reading.
10.	Operational Temperature Rating	-40 to +85 Degree centigrade
11.	Interface	Analog Voltage, Pulse Width Modulation, and RS232 Serial
12.	Power Supply	Battery Based 3.3 V
13.	Average Power Consumption	2.1 mA or lower
14.	Peak Power Consumption	50mA or lower
15.	Calibration	Automatic for compensating Temperature, Humidity and Applied Voltage Changes before each reading Shall be mounted on side wall of open bin with
16.	Mounting	appropriate metal fixture and window for ultrasonic beam

17.	Shock Test Certification	40g, 11ms, 3 pos/neg per axis, 18 terminal peaks saw tooth pulses 75g, 11ms, 2 pos/neg per axis, 12 terminal peak sawtooth pulses
18.	Vibration Certification	10Hz to 2000Hz, 3 Axes, 1 Hour/Axis
19.	Casing	Flame Retardant Polycarbonate, Full Horn Form factor
20.	Direct Communication Band for Sensor Readings	865-867MHz or 2.4 Ghz or 2G/3G

4. COMPUTER SYSTEMS

Item	Description of Requirement
Processor	Intel Core i5 7th generation Processor
Chipset	Compatible Chipset on Intel motherboard
Memory	8 GB DDR4 RAM upgradable to 16 GB
Storage	500 GB 7200 Serial ATA HDD or higher
DVD	Internal DVD Writer
Monitor	47 cm (18.5 inch) TFT LED Digital Colour Monitor, TCO' 06 certified monitors
Bays	Min. 3 nos.
Keyboard	OEM USB Keyboard
Mouse	Two button USB Optical Scroll Mouse
Cabinet	Small Form Factor
	One Serial Port, 1 RJ45 port for Gigabit Ethernet, min. 2 USB3.0 ports in the
I/O Ports	front, min. 4 USB ports at the back, Headphone (front), Microphone(front),
	Line in, Line out, VGA Port
Network Features	10/100/1000 on board integrated network port

5. Refuse Collector Cum Compactor of 8 m³ capacity

Power to hydraulic system of Refuse collector cum compactor through power take of unit of vehicle.

Body Construction: Load body is to be fabricated from M.S sections to reduce weight and should have welding by Co₂ MIG welding process to minimize in built stresses; thickness of M.S. sheets should be as under:

(a)	Floor	:	4 mm
(b)	Sides	:	3 mm
(c)	Top	:	2.6 mm
(d)	Hopper	:	6 mm
(e)	Vehicle wheel base	:	3800 mm

Engine: Turbo charged 4 stroke, 4 cylinders BS-III

Packing Plate: 6 mm thick strong enough to pack without deformation by solid waste etc; the travel should not be less than 120; the packing is to be done by 2 nos. hydraulic cylinders of 80 mm diameter and 56 mm rod (spindle).

Hopper: This is to be provided at rear of body and should have capacity to store minimum 1100 litre garbage volume from bins (biodegradable and non-biodegradable) without spillage; should be made of 6mm thick plate; the profile of hopper should match with travel of packer plate; should be so designed that it may not bend in any circumstances.

Bin Lifting Arm: Lifting should be through 2 nos. arms strong enough to take minimum load of 1.0 MT; the arm should hold firmly the jacketed plastic bins without jerk/swing; the arms are to be designed to properly empty the 1100 litre bins in to hopper without spillage and jerk etc.

Hydraulic Cylinder: There should be 6 nos. cylinders in total, all hydraulic cylinders should have bore and rod dimensions as per IS-8208; a test certificate for proof/pressure test and internal leakage test as per IS-10585 should be enclosed with each cylinder by cylinder manufacturer.

- a. Tipping: 2 Nos. of double acting telescopic cylinder for tipping
100 mm dia – 83 mm shaft dia
70 mm dia – 55 mm shaft dia
- b. Bin Lifting: 2 Nos. of bin lifting
80 mm dia – 50 mm shaft dia
Single stage, double acting cylinder
- c. Packer: 2 Nos. for packer plate
Cylinder 80 mm dia – 56 mm shaft dia single stage, doubles acting

6. AUTO TIPPER (4-WHEELER) CAPACITY (2 m³)

Chassis Specifications

4 stroke indirect injection diesel engine

Max. Output: 16 hp @ 3200 rpm

Max. Torque: 3.8 mkg @ 2000 rpm

Displacement: 700 cc

Dimensions:

Length (mm) = 3800

Width (mm) = 1500

Height (mm) = 1845

Wheelbase (mm) = 2100

Loading deck length (mm) = 2140

Loading deck width (mm) = 1430

Height of side panels (mm) = 300

Minimum turning circle diameter = 8.6 m

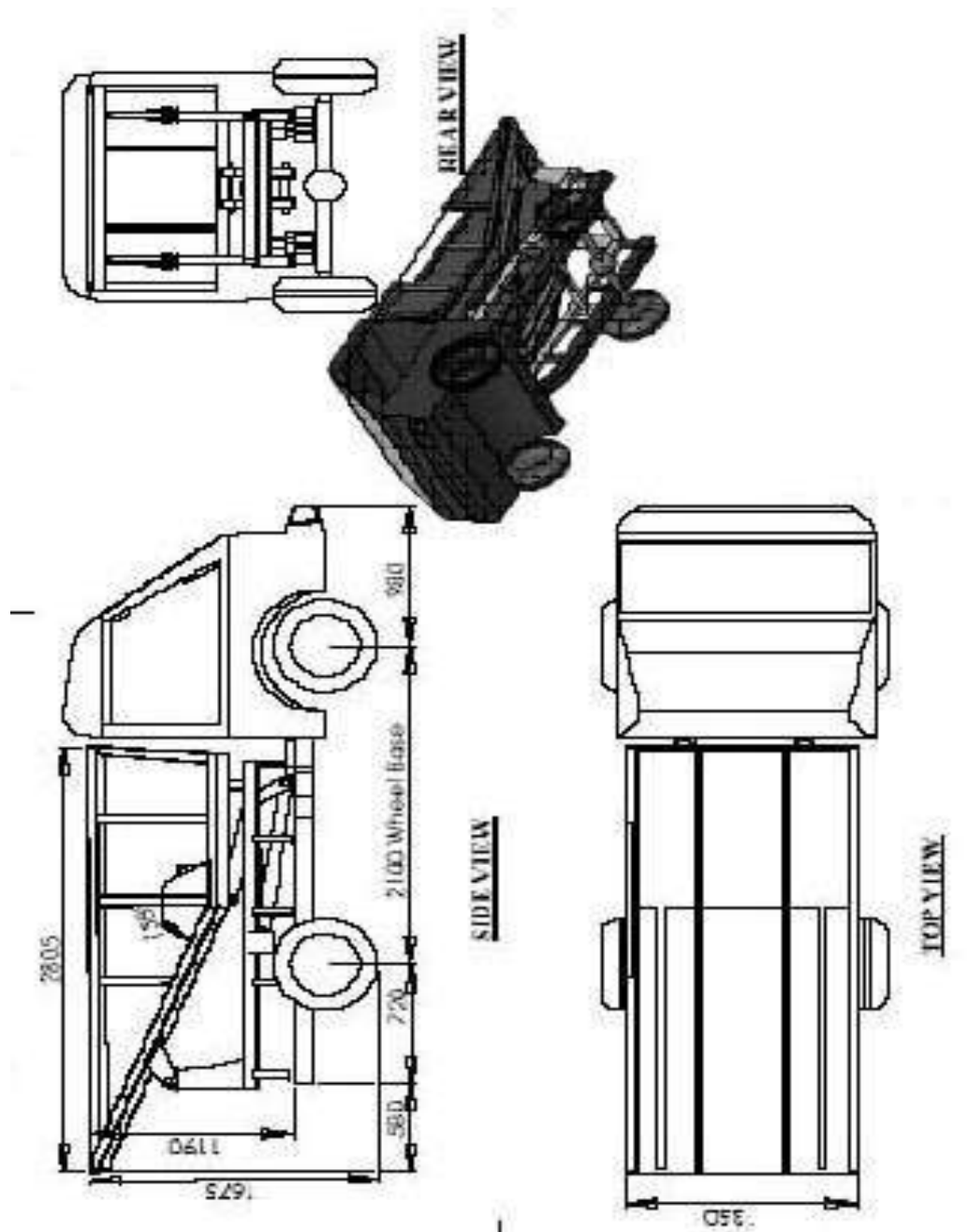
Maximum GVW = 1550 kg

Kerb Weight = 815 kg

Tipper Specifications

Volumetric Capacity	: 2.0 Cum
Carrying Material	: Wet Garbage with separate Partition for dry Garbage.
Container	: All welded construction of Sheet metal adequately reinforced by having formed ribs on the container. (If required the container can be hot deep galvanized)
Hoist	: Make 80x45x500 hydraulic cylinder with scissor mechanism
Sub-Frame	: All weld construction of rectangular hollow section, reinforced adequately on the load members, mounted on chassis with nuts and bolts
Power Pack	: 12 v DC Wipro power pack unit with 15 lit. Oil tank
Tipping angle	: 60 Degree (Flat floor).
Sliding angle	: 37 Degree
Overall Dimension of Container	: 2800x1500x820(mm).
Loading Height	: 1600 mm.
Unloading Height	: 1250 mm.

- Painting : Super structure painted with one coat of zinc chromate primer and two coat of enamel paint.
- Top cover : Shall be of mechanically lockable tarpaulin system



GENERAL TECHNICAL SPECIFICATIONS

1.0 Preparation of Area/Clearance of Site

Clearing Site

Clearing and grubbing operations shall be performed in the entire work area. The sites should be cleared of all vegetation, rubbish and all other objectionable or organic matter such as dismantling of RCC, PCC, Brick work, RR masonry and structural steel of abandoned above ground and underground structures along with abandoned cables pipes etc. Trees of specified girth and/or any other cleared material shall be stockpiled and handed over to the Engineer-in-Charge or disposed as per direction of the Engineer-in-Charge.

2.0 Excavation and Filling Work

This section of specification covers the technical requirements for excavation and filling in and around structures, pipes trenches, wall foundations, pits, drains and similar works. This also covers filling areas and plinth with selected materials, conveyance and disposal of surplus soils and/or stacking them properly as directed by Engineer-in-Charge

Existing trees, shrubs, any other plants, pole, lines, signs, monuments, buildings, pipelines, drains, sewers, facilities within or adjacent to the works being carried out which are not to be disturbed shall be protected from damage by the Implementing Agency. The implementing agency shall provide and install suitable safeguards approved by the Engineer-in-Charge for this purpose.

During excavation, the implementing agency shall take all necessary precautions against soil erosion, water and environmental pollution and where ever required undertake additional works to achieve this objective. Before start of operations, the implementing agency shall submit to the Engineer-in-Charge for approval, its work plan and procedure it intends to follow for disposal of waste material etc. and the schedule for carrying out temporary and permanent works. However, the approval of the Engineer-in-Charge shall not absolve the implementing agency of its responsibility for safe and sound work.

All excavation and filling works shall conform to relevant BIS specifications.

2.1. Excavation in Soil

Sides and bottoms of excavation shall be sharp and true to line and level. Undercutting shall not be permitted. When machines are used for excavation, the last 300 mm before reaching the required level shall be excavated manually or by such equipment, such that soil at the required final level will be left in its natural condition. Suitability of strata (at the bottom of excavations) for laying the foundation there on shall be determined by the Engineer-in-Charge.

The bottom of all excavations shall be trimmed to required levels. Necessary arrangements i.e. Cofferdams, sheeting, shoring, bracing, maintaining, suitable slopes, draining etc. shall be provided and installed to the satisfaction of the Engineer-in-Charge

Any water collected in excavated pits and other areas due to rain water/ground water, sludge's, springs etc shall have to be constantly pumped out and maintain dry working conditions at all times until the excavation, placement of foundation/liner arrangement, backfilling etc. is completed. All slush/ muck from the excavated areas shall be removed to keep the work area dry.

All materials shall be removed arising from excavations from the vicinity to the work either for direct filling, stacking and subsequent filling or for ultimate disposal as directed by the Engineer-in-Charge. In no case shall the excavated soil be stacked within a distance of 1.5 m from the edge of excavation or one-third the depth the excavation whichever is more. Material to be used for filling shall be kept separately.

2.2. Rock Excavation

Rock, when encountered, shall be removed up to the formation/bed level or as otherwise indicated on the Drawings. Where, however, unstable shale's or other unsuitable materials are encountered at the formation/bed level, these shall be excavated to the extent of 500 mm below the formation/bed level or otherwise specified. In all cases; the excavation operations shall be so carried out that at no point on cut formation/bed the rock protrudes above the specified levels.

Where excavation is done to levels lower than those specified, the excess excavation shall be made good to the satisfaction of the Engineer-in-Charge

Slopes in rock cutting shall be finished to uniform lines corresponding to slope lines shown on the Drawings or as directed by the Engineer. Notwithstanding the foregoing, all loose pieces of rock on excavated slope surface which move when pierced by the crowbar shall be removed.

2.3. Carriage of excavated materials beyond the initial lead of 50 M

The disposal/stacking areas for excavated materials shall be indicated by the Engineer-in-Charge. The carriage of excavated materials shall be done by the methods mentioned below:

- 2.3.1. The excavated materials shall be carried beyond the initial lead of 50 m but up to 500 m by manual/animal labor or by mechanical means. If directed by the Engineer-in-Charge, this material shall be used directly for filling purposes.
- 2.3.2. For leads exceeding 500 m, the implementing agency shall transport the excavated materials by mechanical means or as directed by the Engineer-in-Charge. The Implementing agency shall allow for movements on Kuchha road etc. Providing and maintaining Kuchha road shall be responsibility of the implementing agency.
- 2.3.3. The transported material shall be neatly stacked and dressed as directed by Engineer-in-Charge.

3.0 Filling

Materials

Materials to be used for filling purpose shall be selected excavated material free from shingle, salts, organic materials, large roots and excessive amount of sod, lumps, concrete or any other foreign substances, which could harm or impair the strength of the substructure in any manner. In any case, the materials to be used for filling purpose shall have the prior written approval of the Engineer-in-Charge

3.1. Filling Procedure

- 3.1.1. After completion of foundation, footings, walls and other construction below the elevation of the final grades, and prior to filling, all temporary shoring, timber etc. shall be sequentially removed and excavation cleaned of all trash, debris, and perishable materials. Filling shall begin with the approval of the Engineer-

in-Charge. Also areas identified for filling shall be cleared of all soft pockets, vegetation, bushes, slush etc. In case of plinth and similar filling, the ground shall be dressed and consolidated by ramming and light rolling.

- 3.1.2. Filling materials shall not be dropped directly upon or against any structure or facility where there is danger of displacement or damage. Filling shall be started after the concrete masonry has fully set and shall be carried in such a manner so as not to cause any undue lateral thrust on any part of the structure.
- 3.1.3. All space between foundation (concrete or masonry) and the sides of excavation shall be filled to the original surface after making allowance for settlement. Fill shall be placed in horizontal layers not exceeding 200 mm loose thickness. Each layer shall be watered and compacted with proper moisture content and with such equipment as may be required to obtain a compaction/density as specified.
- 3.1.4. Fill adjacent to pipes shall be free of stones, concrete etc. and shall be hand placed and compacted uniformly on both sides of the pipe and where practicable up to a minimum depth of 300 mm over the top of pipes. While tamping around the pipes, care should be taken to avoid unequal pressure.
- 3.1.5. Filling shall be accurately finished to line, slope, cross section and grade as shown on the drawings. Finished surface shall be free of irregularities and depressions and shall be within 20 mm of the specified level.

4.0 Compaction

- 4.1. Compaction to 95% Standard Proctor Density shall be done by mechanical means only. Where access is possible, compaction shall be by 8 to 10 tonnes rollers smooth wheeled, sheep foot or wobbly wheeled as directed by the Engineer-in-Charge smaller weight roller may be permitted by the Engineer-in-Charge. In special cases, but in any case not less than 6 passes of the roller will be accepted for each layer. Each layer shall be wetted or the material dried by aeration to moisture content of 3-5% above the optimum moisture content to be determined by the Implementing agency. Each layer shall be watered, rammed and compacted to the density as required.
- 4.2. For compacting each sand layer, water shall be sprayed over it to flood it and it shall be kept flooded for 24 hours to ensure maximum compaction. Vibro-compactors shall also be used if necessary to obtain the required degree of compaction. Any temporary works required to contain sand under flooded condition shall also be undertaken. The surface of the consolidated sand shall be dressed to required levels or slope.
- 4.3. The degree of compaction of compacted fill in place will be subjected to tests by the Engineer-in-Charge as the work progresses, and the Implementing agency shall provide the necessary facilities to make such tests. If any test indicates that the compaction achieved is less than the specified degree of compaction, the Engineer-in-Charge, may require all fill placed subsequent to the last successful test to be removed and re-compacted by the Implementing agency. Compaction procedure shall be amended as necessary to obtain satisfactory results.
Compaction shall conform to relevant BIS specifications.

5.0 Sampling, Testing and Quality Control

5.1. General

- 5.1.1. The Implementing agency shall carry out all sampling and testing in accordance with the relevant Indian Standards and/or International Standards and shall conduct such tests as are called for by the Engineer-in-Charge. Where no specific testing procedure is mentioned, the tests shall be carried out as per the prevalent accepted engineering practice to the directions of the Engineer-in-Charge. Tests shall be done in the field and at a laboratory approved by the Engineer-in-Charge and the implementing agency shall submit to the Engineer-in-Charge, the test results in triplicate within three days after completion of a test. The Engineer-in-Charge may, at his discretion, waive some of the stipulations given below, for small and unimportant operations.
- 5.1.2. In case, work found unsuitable for acceptance shall be removed and replaced by the Implementing agency. Such work shall be redone as per specification requirements and to the satisfaction of the Engineer-in-Charge.

7.0 Weighbridge

Scope

The Implementing agency shall procure electronic type weigh-bridge (road) as per this specification from an approved vendor (approved vendor list attached with the tender). Erection / installation, commissioning, performance testing and calibration of the weigh bridge at site shall be under the scope of supply of implementing agency

7.1 General requirements

- a) Supply one no. Electronic Weigh- Bridge (road) of 30 T capacity along with other accessories as per the technical requirements of this specification.
The weigh-bridge shall basically comprise of:
 - Steel platform for the required size with approaches on both sides.
 - Load cells with integral cables and mountings.
 - All electrical parts:
 - junction boxes
 - Cable between junction box and weigh cabin (The weigh cabin shall be located at approx. 3m from, nearest edge of the weigh-bridge.)
 - Weighing console with a digital indicator.
 - 2 no. RS -232C/422/485 serial communication ports in weighing console.
 - All necessary software required for the unit (It shall be customised to generate the reports desired by the operating personnel of the Owner).
 - Necessary furniture for the operators and the console.
 - Window type air conditioners required for the weigh cabin.
 - Any other item required for the Smooth & trouble free operation of the weigh bridge.
- b) All commissioning spares (as per the Manufacturer's recommendation)
- c) All consumables required for start-up & commissioning and for first 6 months operation.
- d) All test weights (10 % of rated weight)
- e) Spare parts for 2 years trouble free operation (as per the manufacturer's recommendation)

7.2 Technical requirements

Weigh-bridge type	:	Electronic type pit less/pit type
-------------------	---	-----------------------------------

Material handled	:	Garbage trucks, in general
Weigh-bridge capacity	:	30T 4 Load Cells
Weigh-bridge construction	:	Pit less with approach ramps on both sides and non-skid type steel plates
Platform size	:	9mx3-m
No. of load cells for weighing	:	4-nos. Min.
Weighing console	:	Microprocessor based with suitable memory device for storing data of 90days with 100 trucks/day transactions.
Area classification	:	Safe
Corrosion Allowance for fabricated items	:	3mm
Material of Construction	:	IS 2062, for fabricated structure / component
Control Console Room	:	The console shall be provided on suitable table with the operator chair at a convenient location in the control room. The control room shall also be provided with window air-conditioner(s). UPS for 2 hr. rating, required for the system shall be supplied.

7.3 Vendor data requirements

- GA drawing of the platform with details of MOC
- Foundation drawing with load details
- All electrical drawing with the specification/ rating of the items as per the tender specification.
- Installation, operation and maintenance manuals

8.0 Piezometers

Scope

This section of the specifications covers supply and installation of piezometers as indicated in the basic design and engineering report and the drawings to be released for the construction or as directed by the Engineer-in-Charge.

8.1 General requirements

The implementing agency shall furnish all labour, equipment and material required for the complete performance of the work in accordance with the drawings and as described herein.

The piezometer shall conform to relevant BIS specifications.

8.2 Specifications

Piezometer shall be constructed to monitor the quality of groundwater. Four piezometers shall be constructed on the downstream side of the landfill i.e. on the eastern side. Two piezometers shall be constructed on the upstream side i.e. on the western side of the landfill. The piezometer consists of a stand pipe made up of stainless steel which shall be screened along the entire aquifer depth. The screened interval shall be encased in a filter zone made up of gravel and sand layer. The function of the filter zone is to allow free flow of groundwater into and out of standpipe and prevent fines from entering the standpipe. Immediately above the screened interval, a clay and bentonite seal shall be placed. The thickness of clay seal shall be 0.5 m. above the clay and bentonite seal, a grout seal consisting of cement and bentonite shall be constructed which provides a barrier for preventing surface water and ground water from elsewhere from migrating into the screened interval. At the ground level, a steel casing embedded in concrete pad shall be employed. A cap shall be placed on the top of steel casing to prevent rainwater and surface water

from entering into the standpipe. The piezometer shall be constructed at a distance of 7 m from outside edge of the embankment.

TECHNICAL SPECIFICATIONS OF COMPOST PLANT

S. No.	Description of Equipments	Sizes (LXB)	Quantity (in nos.)	Application
1	Feed Conveyor	20 m x 1 m	01	Feeding of waste from the tipping floor
2	Tromell 100 mm	7.25 m x dia 2.25 m	01	Screening of waste
3	Accept 100 mm conveyor <	13 m x 1m	01	Conveying <100 mm material up to compost pad
4	Reject 100 mm conveyor >	8 m x 1 m	01	Carrying >100 mm material
5	Reversible Conveyor (optional)	8 m x 1 m	01	A special time saving transfer conveyor efficiently loading accepts in trucks from both sides to avoid spillage
6	Electrical Control panel with cabling	Provided separately for this section	01	Logical control of operation of entire section
Connected Load		45 HP, 3 Phase, 440 V		



The rejects from the 100mm sieve will be taken to RDF storage area for further processing / sorting. The sorted waste containing mostly the organic portion of the fresh garbage will be taken to the compost pad for windrow formation by reversible conveyors.

Windrows Management System: The material sieved from 100 mm tromell are taken to

Windrows through the Conveyors. The fresh MSW will be stacked on the compost pad (non-permeable concrete windrow platform) in the form of Trapezoidal Heaps called Windrows. Here

S. No.	Description of Equipments	Sizes (LXB)	Quantity (in nos.)	Application
1	Feed Conveyor	13 m x 1 m	01	Feeding of waste from the tipping floor
2	Tromell 35 mm	7 m x dia 2 m	01	Screening of waste
3	Accept conveyor < 35 mm	18 m x 0.8 m	01	Conveying <35 mm material up to compost pad
4	Reject conveyor > 35 mm	8 m x 0.8 m	01	Carrying >35 mm material
5	Tromell 16 mm	7 m x dia 2 m	01	Screening of waste
6	Accepts <16 mm conveyor	17 m x 0.8 m	01	Conveying curing shed <16 mm material
7	Rejects >16 mm conveyor	8 m x 0.8 m	01	Carrying >16 mm material
Connected Load 60 HP, 3 Phase, 440 V				
The rejects from the 35mm sieve and 16 mm sieve will be taken to RDF storage area for further processing. As per proposed design an area of 884 sq. m (52 m length and 17 m width) will be allocated for housing secondary section facility with 35 mm and 16 mm sieve and curing System				

TECHNICAL SPECIFICATIONS OF SANITARY LANDFILL**A. FACILITY****1. Filling for Clay Liner and Foundation
Scope**

This section of specification covers the item of filling for clay liner and foundation. This section also covers borrowing approved quality of impervious clay from approved designated borrow areas,

1.1. General Requirements

- a. The Implementing agency shall furnish all labour, equipment and material required for complete performance of the work in accordance with the drawings, schedule of items and as described herein.
- b. The foundation and clay liner shall be constructed in layers not exceeding 200 mm in compacted thickness and in the manner described under placing the Earth fill in Clause 8.5.0 using impervious clayey soil obtained from approved designated borrow areas having hydraulic conductivity in the range of 10-7cm/see and plasticity index between 10 to 30%. The soil layers shall not contain soil particles or chunks of rocks larger than 25 mm in size, the suitability or otherwise of the material shall be determined by laboratory tests. Each layer of earth deposited shall be compacted to have a dry density not less than 95% of the maximum dry density (standard proctor) for the soil with suitable tractor drawn heavy sheep foot tamping rollers or by any other method approved by the Engineer-in-Charge. The compaction will have to be uniform throughout the length and breadth of the layers. The roller should be made to travel over the entire section of each layer so that the earth is fully compacted and the roller leaves no visible marks on the surface, Where smooth rollers are used with the approval of the Engineer-in-Charge, the surface of each layer of compacted material shall be roughened with a harrow and thoroughly furrowed or raked before depositing the succeeding layer of material. Care shall be exercised to avoid occurrence of horizontal seams. Earthwork should be continuous from day-to-day. In case of break in compaction exceeding four days, the dried surface shall be well watered and harrowed before a fresh layer of earth is laid on it.
- c. Before placing the HDPE pipes within the embankment, construction of embankment up to 600 mm above the RCC lining for pipes shall be carried out without actually placing the pipes. Later on, trenches shall be excavated for pipes and lining work and pits for cutoff collars. These trenches shall then be filled using CL-ML type soil (plasticity index 720). Earth layer deposited in these trenches shall be compacted with plate compactors to have a dry density not less than 95% of the maximum dry density (standard proctor).
- d. The spreading of the next layer shall be carried out only after the underlying layer has been approved by the Engineer-in-Charge or his authorised representative.
- e. The clay liner will conform to all relevant BIS specifications.

1.2. Water for Clay filling works

The Implementing agency has to make his own arrangements for the supply of water for earth filling works. It shall be the responsibility of the Implementing agency to identify and develop water source or sources, running a pipe line/pipe lines laid at a distance not less than 10 meters away from the toe/heel of the

embankment for conveying the water required for the work from the supply sources, tapping water from manifolds provided at suitable intervals along the pipe line with the aid of water hoses and sprinkling jets for sprinkling water uniformly over the entire area (and not poured in patches) for bringing up the layers to the required moisture content. Alternately he may employ sufficient number of water tankers also. No separate payment for the above will be made and entire cost on account of the same shall be included in the rates for relevant items of schedule.

2. Foundation for Embankment

Scope

This section covers the preparation/compaction of foundation of the embankment described herein.

2.1. General Requirements

- a. Foundation preparation shall be performed as described herein subsequent to stripping of foundation and excavation, if any. No material shall be placed in any section of the fill portion until the foundation for that section of the fill has been dewatered, suitably prepared and has been approved by the Engineer-in-Charge. All portions of excavations made for test pits or other sub-surface investigation and all other existing cavities, found within the area are to be filled with earth and properly compacted and which extend below the established lines of excavation for foundation shall be filled with earth of the corresponding zone and properly compacted. The foundation should be free from all organic materials, vegetable sods. The topsoil of foundation should be stripped properly such that vegetable sods and top layers are removed to ensure proper bond between embankment and foundation.
- b. Masonry surfaces of the back of retaining walls, wing walls and box culverts etc. against which the fill is to be placed, shall be cleaned and moistened prior to placing the earth. The foundation immediately adjacent to the masonry/concrete structures shall be thoroughly cleaned of loose materials and moistened. Pools of water shall not be permitted in the foundation and shall be drained and cleaned prior to placing the first layer of embankment material.

3. Earthen Embankment

Scope

This section of specification covers the earthwork involved in the embankment formation as per the drawings and as mentioned herein.

3.1. General Requirements

The Implementing agency shall furnish all labour, equipment and materials required for complete performance of the work in accordance with drawings, schedule of items and as described herein.

3.2. Earthen Embankment

The embankment shall be constructed to the lines and grades shown on the drawings. Placement of fill shall be performed in an orderly way and in an efficient and workman like manner, so as to produce fills having such quantities of density, strength and permeability as will ensure the highest practicable degree of stability and performance of the embankment.

No bushes, roots, sods or other perishable or unsuitable materials shall be placed in the embankment. The suitability of each part of the foundation for placing embankment materials thereon and of all materials for use in embankment construction shall be determined by the Engineer-in-Charge. The embankment may be constructed in separate portions, provided that:

- a. The slopes of the bonding surfaces between the previously completed portions of the embankment and materials to be placed in each zone shall not be steeper than 2.5 horizontal to 1 vertical along the centerline of the embankment.
- b. The embankment is constructed right across the whole section in each portion.

3.3. Fill Materials

The materials for embankment shall be obtained from the designated borrow areas and available excavated material. In general, all materials from the particular borrow area shall be a mixture of materials obtained for the full depth of the cut. Some earth material available from the excavation in the landfill area if found suitable will also be used for the embankment construction.

The Fill material shall conform to relevant BIS specifications

3.4. Placing the fill material

- a. Before placing the fill the foundation shall be prepared and compacted. Prior to placing the first layer of embankment on the foundation moistening and compacting the surface by rolling to achieve dry density not less than 95% of maximum dry density. (Standard Proctor) shall be done. The distribution and gradation of materials throughout the fill shall be as shown in the drawings or as directed. The fills shall be free from lenses, pockets, streaks, or layers of material differing suitably in texture or gradation from the surrounding material. The combined excavation and placing operations shall be such that the materials when compacted in the fill will be blended sufficiently to produce the specified degree of compaction and stability. The earth obtained from a particular borrow area as far as possible shall be used in forming the complete cross-section of the fill for a particular stretch. Sequencing of the placing of fill material shall be such that it shall be possible to identify at all stages of construction which borrow area material is used in which stretch of the fill/embankment.
- b. No stones cobbles or rock fragments, having maximum dimensions of more than 5 cm shall be placed in the fill. Such stones and cobbles shall be removed either at the borrow pit or after being transported to the site but before the materials in the fill are rolled and compacted. Such stones or cobbles shall be placed in other portions of embankment if found suitable or rejected as directed. The materials shall be placed in the fill in continuous horizontal layers, stretching right across the whole section, not more than 20 cm in compacted thickness and rolled as herein specified. During construction a small transverse slope from center towards the edges should be given to avoid pools or water forming due to rains. The surface of materials to be placed thereon shall be moistened and/or worked with harrow, or other suitable equipment, in an approved manner to a sufficient depth to provide a satisfactory bonding surface before the next layer of fill material is placed. If the rolled surface of any fill is found to be too wet for proper compaction, it shall be raked up, allowed to dry, or shall be worked with a harrow or any other approved equipment to

reduce the moisture content to the required amount and then it shall be re compacted before the next layer of earth is placed.

- c. When compacting the soils against steep rock abutment or walls or masonry or concrete structure the construction surface of embankment shall be sloped away from rock or masonry or concrete structures for a distance of 3 m to 4 m at an inclination not steeper than 6 horizontal to 1 vertical. If the foundation surface is too irregular to allow the use of a large roller directly against a structure or rock out crop, the roller shall be used to compact the soil as close to the structure or the out crop as possible and the portion of the embankment directly against the rock or the structure shall be compacted with pneumatic hand tampers in thin layers. The moisture content of the earth placed against the rock or the structure shall be high enough to allow it to be compacted into all irregularities of the rock. Care shall be taken in placing the first layer of the fill so that no damage is caused by the hauling machinery to the base grade as this may get concealed by the spread layer or fill. Sheep foot roller shall not be employed for compacting till the thickness of the layers already compacted by other means is greater by 30 cm than the depth of the feet on the roller drum. The soil for the first layer shall be at moisture content sufficient to enable bonding of the fill with the rock surface.

3.5. Weather Conditions

Embankment materials shall be placed only when the weather conditions are satisfactory to permit accurate control of the moisture content in the embankment materials.

3.6. Moisture Control

Prior to and during compacting operations, the materials in each layer of earth shall have moisture content about 2% less than the optimum moisture content. Laboratory investigations may impose some restrictions on the lower limits of the practicable moisture contents on the basis of studies of compaction in embankment. As far as practicable the materials shall be brought to the proper moisture content in the borrow area before excavation. If additional moisture content is required, it shall be added by sprinkling water before rolling. The Implementing agency shall make his own arrangements for supply of water in a manner described under water for earth fill work. If the moisture content is greater than required, the material shall be spread and allowed to dry before starting rolling. The moisture content shall be uniform throughout the layer of material and ploughing, dicing, harrowing or other methods of mixing may be required to obtain uniform distribution. If the moisture content is more or less than the range of the required particle, moisture content, or if it is not uniformly distributed throughout the layer, rolling shall be stopped and shall be started again only when the above conditions are satisfied.

3.7. Compaction Equipment

While the specifications provide that equipment of a particular type and size is to be furnished and used, it is to be understood that the use of improved equipment is to be encouraged. Tamping (sheep foot) rollers or pneumatic rollers and vibratory rollers shall be used for compacting cohesive materials and pneumatic rollers and vibratory rollers shall be used for compacting cohesion less materials.

a. Tamping (Sheep foot) Rollers

Tamping rollers shall conform to the following requirements

b. Roller drums

Each drum of a roller shall have an outside diameter of not less than 1.5 m and shall not be more than 1.8 m in length. The space between two adjacent drums when on level surface shall neither be less than 30 cm nor more than 40 cm. Each drum shall be free to pivot about an axis parallel to the direction of travel.

c. Tamping Feet

At least one tamping foot shall be provided for each 600 sq.cm of drum surface. The shape measured on the surface of the drum between the centers of any two adjacent tamping feet shall not less than 25 cm.

The length of each tamping foot from the outside surface of the drum..-3hall be maintained at not less than 25 cm. The cross sectional area of each tamping foot shall" not be more than 60 sq .cm at a plane normal to the axis of the shank 15 cm from the drum surface and shall be maintained at not less than 45 sq. cm and not more than 60 sq. cm at a place normal to the axis of the shank 20 cm from the drum surface.

d. Roller Weight

The weight of a roller when fully loaded shall not be less than 7000 kgs per drum. The loading used in the roller drums and operating of rollers shall be as required to obtain the desired breakdown and compaction of materials. If more than one roller is used on anyone layer of fill, all rollers so used shall be of the same type and essentially of the same dimensions. Tractors used for pulling rollers shall have sufficient power to pull them at a speed of about 4 km per hour with drums fully loaded. During the operation of rolling the spaces between the tamping feet shall be kept clear of materials which could impair the effectiveness of the tamping rollers. If the rollers used are at tandem, the tamper spacing shall be set so that the circumferential rows of the rear drums are in line with the midpoint between the circumferential rows on the forward drums.

e. Pneumatic rollers

Pneumatic rollers shall have four wheels equipped with pneumatic tyres and a body suitable for ballast loading so that the load per wheel may be varied as necessary from 7000 kgs to 11000 kgs. Tyre pressure shall not exceed 2.5 kgs/ sq. cm. The tyres shall be of such size and ply as can be maintained during rolling operations with tire pressure not greater than 2.5 kgs/ sq. cm for a 11000 kgs wheel load. The roller wheels shall be located abreast and each wheel and tire shall be mounted in such a way that all wheels exert approximately equal loads when traversing uneven grounds. The spacing of the wheels shall be such that the distances between the nearest edges of adjacent tyres at the imprint will not be greater than 50 per cent of the width of single tire. When one pneumatic roller is attached to a tractor, the entire tractor and roller unit shall be capable of executing a 180 deg turn on a 5 m radius.

f. Vibratory Rollers

Vibratory rollers shall have dead weight 5 to 15 tonnes and the vibrators shall have frequency between 1100 and 1800 pulses per minute and amplitude of vibration shall between 0.5 mm and 1.5 mm

3.8. Rolling and Tamping

a. Rolling

When each layer of material has been conditioned, so as to have the proper moisture content uniformly distributed throughout the material, it shall be compacted by passing the roller. The exact number of passes shall be decided after necessary field tests. The layers shall be compacted in strips overlapping not less than 0.6 m. The rollers or loaded vehicles shall travel in a direction parallel to the axis of the embankment. Turns shall be made carefully to ensure uniform compaction. Rollers shall always be pulled Density tests shall be made after rolling and the dry density attained shall be not less than 95% of maximum dry density (Standard Proctor) obtained in the Laboratory for the type of material used.

b. Tamping

Rollers will not be permitted to operate within 1.0 m of concrete and masonry structures. In locations where compaction of the earth fill material by means of the roller is impracticable or undesirable, which would be designated at the sole discretion of the Engineer-in-Charge the earth shall be specially compacted

Fill shall be spread in layers not more than 20 cm in compacted thickness and shall be moistened to have the required moisture content. When each layer of material has been conditioned to have the required moisture content it shall be compacted to achieve the dry density of 'not less than 95% of Maximum Dry Density (Standard Proctor) by special rollers mechanical tampers hand held vibratory tampers or by other approved methods and all equipment and methods used shall be subject to approval based on evidence of actual performance. The moisture control and compaction shall be equivalent to that obtained in the earth actually placed in the embankment in accordance with specifications explained here in.

3.9. Inspection Test

Control tests shall be carried out in laboratory from time to time to determine whether the earth produced by methods employed satisfies the requirements of the specifications. Routine field tests shall also be carried out by the Engineer-in-Charge and the work shall be inspected regularly. Field density test should be particularly and specially made in the following areas.

- a. Where the degree of compaction is doubtful.
- b. Where embankment operations are concentrated i.e. where 2 or more layers are placed one over the other on the same day.
- c. To represent every 1000 cu. meters of embankment placed.
- d. Atleast one test for every full or part shift of compaction operations and
- e. Atleast one test for every 250 m length of embankment in each layer.

The Engineer-in-Charge shall determine whether the desired results are being obtained.

The Implementing agency shall provide all facilities such as labour conveyance equipment etc. required for collection of samples and to conduct test in situ or at laboratory. Relevant test to be conducted by the Engineer-in-Charge at his discretion at the borrow area.

3.10. Dressing and Trimming of the slopes

The outer slopes of the embankment shall be neatly dressed to line. Compaction shall extend over the full width of the embankment and the material in the slopes shall be compacted as for the rest of structure. To ensure proper compaction at the outer edge, the fill shall be constructed for a minimum of 0.5 m extra width on either edges or the outer edge dressed to true width and slope after compaction. No earth slope shall be left without trimming to design slope. Slopes shall be maintained until final completion and acceptance. Any material that is lost by weathering or due to any other cause shall be replaced. The trimmed material is permitted for reuse in the embankment. No separate payment will, however be made for forming extra width offsets or trimming the slopes and the unit rates for the embankment work shall therefore provide for the same.

3.11. Provision for Settlement

While forming the embankment due allowance shall be made to allow for settlement so as to maintain the top of embankment at designed elevation.

4. TURFING

Scope

This section of specifications covers turfing on the slope of the embankment as Indicated in the following drawing and mentioned herein with turf sods.

4.1. General Requirement

The implementing agency shall furnish all labour, equipment and materials required for the complete performance of the work in accordance with the drawings, schedule of items and as described herein.

Grass turf sods of approved variety shall be used in this work. No directing planting of grass on the embankment slope shall be permitted. The turfing will conform to relevant BIS specifications.

4.2. Placing

The slope of the embankment including berms if any shall be turf sodded. After the slope has been dressed to line, it shall be slightly roughened and scarified. The entire slope surface shall then be covered with a layer of turf sod consisting of blocks of thin lining grass growth of approved species. The sods shall include a mat of roots and earth. Thick Sod containing an excessive amount of obnoxious weed growth shall be excluded Sod shall be carefully handled in transportation and placing so that a minimum amount of earth will be lost from the root mass. The blocks of sod shall be laid on the slope in close contact and then tamped firmly in place so as to fill and close the joints between blocks. The interval of time between cutting and laying shall be kept to a minimum and sod shall not be permitted to dry out. Immediately after placing the sods, slope shall be thoroughly wetted and then kept moist for 3 months or till such time the grass establishes itself uniformly on the surface whichever is later. The watering shall be done. The growth of weeds on the turfing shall be prevented by removing them and disposing off. The finished work shall be to the satisfaction of the Engineer-in-Charge and his decision shall be final in the matter.

5. HDPE Liner

Scope

This section covers the specifications for the supply, laying, jointing and testing of HDPE geomembrane liner as per the drawings and specifications mentioned herein to the satisfaction of the Engineer-in-charge

5.1. Sheet Material

The HDPE sheet shall conform to the minimum average roll value requirements listed below in Table-2. The minimum width of the roll shall be 8 m and the minimum length shall be 150 m.

Specification of HDPE as Liner Material

Parameter	Test Method	Minimum values
Thickness, mm	ASTM D 5199	1.5 mm (-5% to +10%)
Color	-	Black
<i>Permeability</i>	ASTM E 96	2.3×10^{-14} cm/sec.
Density	ASTM D 1505	>0.935 gm/cc
Coefficient of Linear Thermal Expansion	ASTM E 831	$1.5 \times 10^{-4} \text{ }^{\circ}\text{C}^{-1}$
Tensile Strength at Yield	ASTM D 638, Type IV Dumbbell at 2 inch/min	245 N/cm width
Tensile Strength at Break	ASTM D 638, Type IV Dumbbell at 2 inch/min	420 N/cm width
Elongation at Yield	ASTM D 638, Type IV Dumbbell at 2 inch/min	12-13 %

Parameter	Test Method	Minimum values
Elongation at Break	ASTM D 638, Type IV Dumbbell at 2 inch/min	700 %
Carbon Black	ASTM D 4218	2 to 2.5%
Ozone resistance	ASTM D 1149, 168 hrs	No crack
Water absorption	ASTM D 570, 23 °C	0.1%
Environmental Stress Cracking	ASTM D 1693	> 2000 hrs
Volatile Losses	ASTM D 1203	0.1%
Tear Resistance	ASTM D 1004, A	131 N/mm
Water Vapor Transmission	ASTM E 96	0.024 g/day.m ²
Puncture Resistance	ASTM D 4833	3500 N/cm
Seam Properties (a) Shear Strength (b) Peel Strength (hot wedge fusion) (c) Peel Strength (filled extrusion)	ASTM D 4437 mod.	13.8 MPa 10.3 MPa 9.0 MPa
Change in weight (%)	EPA 9090A, Chemical Compatibility Test	≤10
Change in volume (%)	EPA 9090A, Chemical Compatibility Test	≤10
Change in tensile strength (%)	EPA 9090A, Chemical Compatibility Test	<20
Change in elongation at break (%)	EPA 9090A, Chemical Compatibility Test	<30
Change in modulus (%)	EPA 9090A, Chemical Compatibility Test	<30
Change in hardness (%)	EPA 9090A, Chemical Compatibility Test	<10

HDPE liner material should conform to relevant BIS specifications.

5.2. QA/QC Requirements for Membrane Raw Materials

All raw material supplied to the manufacturer shall be delivered in rail car batches and must be supplied with test certification from the raw material supplier. The certification must state the results of tests, which confirm the quality of the resin. The raw material supplier must also confirm that each batch of resin is all of the same type and is 100% Virgin. Each batch of resin shall be given an identification (batch) number which shall be used and remain on file to keep track of all rolls manufactured from each batch.

The use of any off spec, recycled or blends of resins will not be considered. Prior to the production of the membrane, the membrane manufacturer shall test the raw material batches to certify the raw material suppliers test results and entity of the singular resin. The membrane manufacturer shall provide certification and all available test result for raw materials prior to the delivery of materials to site.

5.3. QA/QC Requirements for Membrane Manufacturing

The manufacturing process shall be a fully automated Flat-Cast extrusion process controlled by a fully computerized system. The control system shall provide for the continuous monitoring of the parameters like; Temperature, Pressure and Speed. The manufacturing process must also provide for the automated continuous monitoring of thickness and sheet quality.

5.4. Thickness: - Each roll shall be tested automatically and evenly over its entire surface area, the minimum parameters acceptable for testing each roll shall be 6,000 thickness point checks. The acceptable thickness for each roll shall not be greater than -5% to +10% of the specified material thickness.

5.5. Sheet Quality: - Each roll shall be tested automatically for High Voltage Test over its entire surface area for any point of Electrical Continuity through (across) the thickness of the sheet. The high voltage scanner shall be capable of detecting any pinhole, void or significant reduction of electrical resistance. Any roll detected to have holes or electrically conductive inclusions shall be rejected and not sent to the site.

Each roll delivered to site shall be provided with a roll test data report, these reports must provide the following information and test results as per the specified ASTM standards, reports must also carry the manufactures laboratory QA/QC approval seal.

The liner material shall be supplied with a 125mm-film sheet along the roll longitudinal edges in order to keep this zone clean and to stop oxidization. This film shall be removed immediately before welding.

The overlapping and welding area shall be marked to assure an optimum welding. The HDPE liner shall have a glossy smooth surface.

5.6. Roll Identification

1. Roll Number and dimensions
2. Production Date
3. Area of Sheet on Roll
4. Roll Length
5. Roll Width
6. Roll Weight

5.7. Resin Lot Information

1. Batch Number
2. Resin Type
3. Resin Test Results as per following ASTM Test methods.
 - a. Density D792
 - b. Moisture D570
 - c. Brittleness D746
 - d. Melt Index D1238
 - e. O.I.T. D3895

5.8. Membrane Property

The implementing agency will arrange to carry out the following tests, at their cost, at a reputed and approved laboratory at the time of execution of work to ascertain and assure the quality of material received at project site. The tests shall be witnessed by client / consultant at their discretion. The frequency of tests for physical and mechanical properties and their conformity norms are indicated in following Table.

Frequency	Property	Norms (ASTM)
1/5000 m2	Thickness	D-5199
1/5000 m2	Density	D-792
1/5000 m2	Carbon black content	D-1603
1/5000 m2	Carbon black dispersion	D-5596-94
1/1500 m2	Mechanical Properties Tensile resistance	D-638 Mod.NSF 43
1/2000 m2	Shear test (on seam)	D-4437, 6.3 NSF mod.
1/2000 m2	Peel test (on seam) Rupture test (on seam)	D-4437, 6.2 NSF mod. US-EPA.
Every lot	ESCR	ASTM D 1693 –B
1/5000 m2	Puncture Resistance	ASTM D 4833
1/5000 m2	Tear Resistance	ASTM D 1004
Note	Sample size for conformity test a meter of the entire width for the roll and must not be taken in the first thickness.	

5.9. QA/QC at site

The material shall be inspected after it is delivered at site as follows:

1. Rolls or portions of rolls that appear damaged shall be marked.
2. Verification shall be done to ensure that materials are stored in secure place and are protected against dirt, theft, vandalism, and passage of vehicles.
3. Rolls shall be properly labeled with date and roll size.

Any material rejected on site by the Engineer-in-charge shall be jointly inspected by the Engineer-in-Charge and the Manufacturer/Installer. If required, the material shall be tested and if the material is unable to meet the specification, it shall be replaced by the Manufacturer / Installer at his cost.

5.10. Preparation for HDPE Liner Deployment:

Prior to commencement of HDPE liner deployment, layout drawings shall be prepared to indicate the panel configuration and general location of field seams for the project. The actual panel layout may vary, but shall have to be approved by the Engineer-in-charge, in order to accommodate field conditions. Each panel used for the installation will be given a number that will be correlated with a batch or roll number.

Overlap the panels of geo-membrane approximately six (6”) inches prior to welding. Clean the seal area prior to seaming to assure the area is clean and free of moisture, dirt or debris of any kind. No grinding is required for fusion welding.

Adjust the panels so that the seams are aligned with the fewest possible number of wrinkles and “fish mouth”.

Grind seams overlap prior to welding within one (1) hour of the welding operation in a manner that does not damage the geo-membrane. Grind marks should be covered with extrude whenever possible. In all cases, grinding should not extend more than one quarter inch (1/4”) past the edge of the area covered by the extrude welding.

5.11. Special Instructions for Installation

Implementing agency shall protect the sub soil desiccation, flooding protection, if required may consist of a thin plastic protective cover (or other material as approved by Engineer-in-Charge installed over the

completed sub-soil until such times as the placement of geo-membrane liner begins. Sub soil found to have desiccation cracks greater than half inch (1/2") in width or depth or which exhibit swelling, heaving or other similar conditions shall be replaced or reworked by the implementing agency to remove these defects.

5.12. Sub-base Preparation

The sub-base must be properly prepared and compacted for installation of HDPE liner. The sub-base must not contain any particles. The sub-base must be checked for footprints or similar depressions before laying the liner. The seaming equipment tends to get caught in such small depressions, causing burnout and subsequent repair. A small piece of the synthetic membrane placed below the membranes that are being seamed (this piece is moved forward along with the seaming equipment) may reduce burnout due to small depressions.

5.13. Field Panel Placement

HDPE deployment will generally be not done during any precipitation, in the presence of excessive moisture, in an area of standing water, or during high winds.

Installation of field panels shall be done as indicated on the approved layout drawing keeping the provision for settlement of the soil. If the panels are deployed in a location other than that indicated on the layout drawings, the revised location will be noted in the field. Information relating to HDPE panel placement including date, panel number, and panel dimensions may be maintained on a site-specific basis. If a portion of a roll is set aside to be used at another time, the roll number will be written on the remainder of the roll at several places.

The method and equipment used to deploy the panels must not damage the HDPE or the supporting sub grade surface. No personnel working on the HDPE engage in actions that could result in damage to the HDPE. Adequate temporary loading and/or anchoring, (i.e. sandbags, tires) which will not damage the HDPE, will be placed to prevent uplift of the HDPE by wind.

The HDPE will be deployed with adequate allowance for typical thermal expansion.

Any area of a panel seriously damaged (torn, twisted, or crimped) will be marked and repaired.

5.14. HDPE Field Seaming

In general, seams shall be oriented parallel to the slope, i.e. oriented along, not across the slope. Whenever possible, horizontal seams should be located on the base of the cell, not less than five (5') feet from the toe of the slope. Each seam made in the field shall be numbered. Seaming information shall include seam number, welder ID, machine number, temperature setting and weather conditions.

All personnel performing seaming operations shall be trained in the operation of the specific seaming equipment being used and will qualify by successfully welding a test seam.

5.15. Equipment

5.15.1. Fusion Welding

Fusion Welding consists of placing a heated wedge, mounted on a self-propelled vehicular unit, between two (2) over-lapped sheets such that the surface of both sheets is heated above the polyethylene's melting point. After being heated by the wedge, the overlapped panels pass through a set of pre-set pressure wheels, which compress the two (2) panels together to form the weld. The fusion welder is equipped with a device, which continuously monitors the temperature of the wedge.

5.15.2. Extrusion Fillet Welding

Extrusion fillet welding consists of introducing a ribbon of molten resin along the edge of the overlap of the two (2) HDPE sheets to be welded. A hot air pre heat and the addition of molten polymer causes some of the material of each sheet to be liquefied resulting in a homogeneous bond between the molten weld bead and the surfaces of the overlapped sheets. The extrusion welder is equipped with gauges giving the temperature in the apparatus and a numerical setting for the pre-heating unit.

Factors such as the HDPE temperature, humidity, wind, precipitation, etc., can affect the integrity of field seams and must be taken into account when deciding whether or not seaming should proceed.

5.15.3. Seam Testing of HDPE

All field seams shall be non-destructively tested over their full-length using test equipment and procedures described herein. Seam testing shall be performed as the seaming work progresses, not at the completion of the field seaming.

5.15.4. Repair Procedures

Any portion of the HDPE or HDPE seam shown a flaw, or having a destructive or non-destructive test in non-compliance shall be repaired. Procedures for repair include the following

5.15.5. Patching

Patching shall be used to repair large holes, tears and destructive sample locations. All patches shall extend at least three inches (3") beyond the edges of the defects and all corners of patches shall be rounded. The total area of patches in no case shall exceed 1.0% of the panel area.

5.15.6. Grinding and Welding

Grinding and welding shall be used to repair sections of extruded fillet seams.

5.15.7. Spot Welding or Seaming

Spot welding or seaming shall be used to repair small tears, pinholes or other minor localized flaws

5.15.8. Capping

Capping shall be used to repair lengths of extrusion or fusion welded seams.

5.15.9. Verification of Repairs

Every repair shall be non-destructively tested. Repairs, which pass the non-destructive test, shall be deemed acceptable. Repairs in excess of 150 consecutive feet of seam shall require a destructive test.

5.15.10. Control and Verification Tests on Geo-membrane Installation

These tests will verify the welds' mechanical resistance to peel and shear. No assembling equipment will be used on site without a previous calibration test.

The Installer must prepare samples of a minimal length of one (1) metre by a width of 300mm, with the weld centered on the sample's width. Two (2) specimens will be taken from each end of the samples of peel and shear. For each sample, two paired peel and shear results will thus be obtained.

Calibration of all welding equipment must be performed and documented by the installer for each instrument used, at the start of each work shift, following abrupt changes in weather conditions and as requested by the Engineer-in-Charge.

Calibration of equipment will be performed by tests on geo membrane samples under the same weather conditions as those expected on site during panel assembling.

Once removed, samples will be tested on site with a calibrated portable tension meter and must meet with the requirements of welds resistance to peel and shear as described in the Technical specification.

The Installer shall provide the Engineer-in-Charge with recent certificates of standardization for all control instruments (tension meter; speed, tensile level etc.). The Engineer-in-Charge reserves the right to demand any additional calibration test at any time.

All documentation on the calibration tests performed by the Installer shall be submitted to the Engineer-in-Charge. The installer will identify each calibration test with the following information;

- Date and time
- Identification of destructive test
- Identification of weld
- Welded panel's identification number
- Quantified results of peel and shear test
- Identification of type of rupture
- Quality control technician's identification
- Localization on "As-built" plan

The Quality Assurance technician shall perform small perforations in the lining in order to assess the efficiency of the Installer's non-destructive testing program. The Quality Assurance technician shall perform those perforations with an approximate frequency of one (1) each 1000 meters of weld at least three (3) instances of the project.

The Quality Assurance technician shall document those punching or perforations by including at least the following information:

- Date and time of operation
- Identification of weld
- Exact location of perforation
- Quality Assurance technician's identification
- Results of Installer's non-destructive tests
- Date and time of repair.

If the Installer's non-destructive testing program fails to find the punching or perforations made, the Installer will repeat non-destructive testing on the faulty weld, as well as on the welds before and after it.

The Quality Assurance technicians shall perform verification destructive tests at an approximate frequency of one (1) for each 1000 meter of weld. A special testing frequency will be used at the Engineer-in-Charge discretion when visual observations indicate a potential occurrence of problems. Verification tests may be performed in the following cases:

- Variation on the thickness of the weld
- Doubtful cleanliness of overlapping
- Dirty equipment or in poor condition
- Different personnel than the one authorized
- Adverse weather conditions
- Welding equipment failure
- Visible variation in material's quality
- Close confined or complex working space
- Beginning and end of panels
- On the Engineer-in-Charge request

5.16. Warranty

Written warranties addressing HDPE material and installation workmanship shall be submitted to and approved by Engineer-in-Charge. The manufacturer's warranty shall state that the installed material meets all requirements of the contract drawings and specifications and that under typical local atmospheric conditions and weather aging, the sheet material is warranted for at least 20 years. The installer's warranty shall state that the HDPE field and factory seams will not fail within at least 20 years of the installation under similar conditions.

6. CLAY LINER

Scope

This section covers the specifications for the supply, laying and testing of clay liner as per the drawings and specifications mentioned herein to the satisfaction of the Engineer-in-charge

Composite Clay Liner serves as a hydraulic barrier to flow of leachate the properties required for compacted clay liner as per specs is as follows:

- Minimum thickness of each composite clay liner/layer (primary & Secondary) shall be 0.60 m (Total ≥ 0.9 m).
- Maximum hydraulic conductivity of 1×10^{-7} cm/ sec. ($k \leq 1 \times 10^{-9}$ m/s).

The minimum requirements recommended to achieve above specified hydraulic conductivity:

6.1. General Requirements

The soil used in the liner shall meet the following minimum criteria:

1. Be classified under the Unified Soil Classification System CL, CH, SC and OH (IS 2720 Part IV/ASTM Standard D248769)
2. Allow greater than 20 - 30 percent (dry weight) passage through no. 200 sieve (75 μ m) (grain size analysis as per IS:2720 Part IV/ ASTM Test D1140)
3. Plasticity index greater than or equal to 7 to 10% (IS 2720 Part V)/ Plasticity greater than or equal to 15 units (ASTM Test D424)
4. Gravel content shall not be exceeding more than 30 %
5. Maximum particle size shall be between 20 to 50 mm
6. Have a pH of 7.0 or higher
7. Have a liquid limit equal to or great than 30 units (IS 2720 Part V/ ASTM Test D423)
8. Moisture Density relationship as per IS: 2720 Part VIII

9. Permeability test as per IS: 2720 Part XXXVI.

The clay liner should conform to relevant BIS specifications.

6.2. Quality control aspects

General quality control aspects which shall be adhered to are as follows:

1. The material (soil) used for filling shall be free from boulders, lumps, tree roots, rubbish or any organic deleterious matter.
2. Pre-processing may be carried out for water content' adjustment, removal of oversized, materials, pulverization of any clumps, homogenization of the soils, and., introduction of additives such as bentonite.
3. Ensure that a sub-grade on which a compacted clay liner will be constructed is properly prepared by compacting and obtaining required firmness.
4. Proper compaction of liner materials is to be carried out to ensure compacted clay liner meets hydraulic conductivity specified above.
5. Determine the appropriate thickness (as measured before compaction) of each of the several lifts that will make up the clay liner. Also proper bonding between lifts is to be ensuring to avoid formation of preferential pathways.
6. Preventive measures to protect compacted layers from desiccation are to be provided during construction.

6.3. Laying of clay liner

This specification and the method of measurements described herein are applicable for construction of compact clay liner at the base and on the sides of the landfill.

1. The implementing agency has to identify the borrow soil (if required) area having the requisite properties as mentioned above and make his own approach and access roads (as required) from the borrow area to the demarcated landfill area. No ,claim shall also be admissible to the Implementing agency on account of his having to take longer leads or routes for earth movement, than envisaged by him, either due to any road cuttings, non--availability of routes, or any other grounds whatsoever.
2. In case total filling required in any area consists of earth both from borrow areas and available approved excavated material from within site area or use of any amended soil to achieve the stipulated permeability. The necessary laboratory tests/demonstrations/calculations are to be furnished to Engineer-in-Charge for approval.
3. In the event of filling of soil material as mentioned above, joint levels shall be taken before commencing the filling with earth from borrows areas.
4. Prior to the placement of the clay in the desired location, the sub grade under the clay liner shall be checked. This shall be usually performed by proof-rolling the sub grade. Any weak zones shall be removed and appropriately backfilled, and all debris should be removed. The clay may then be placed above the sub grade in loose lift.
5. Compacted clay liners shall be constructed in a series of thin lifts for proper compaction and homogeneous bonding between lifts. The lift thickness of clay liner shall be 20 to 22.5 cm before compaction and 15 cm after compaction. The soil placed in a loose lift shall be no thicker than about 230 mm. After the soil is placed, a small amount of water may be added to offset evaporative losses, and the soil may be tilled one last time prior

to compaction. Each lift of clay liner shall be bonded to the underlying and overlying lifts. The surface of a previously compacted lift must be rough so that the new and old lifts blend into one another.

6. Sheep foot rollers shall be used for compacting the clay liner. The roller with fully penetrating feet (of 22.5 cm shaft length) shall be used for compact the liner. The minimum weight of the roller shall be 10000 kg (10 Tonnes). The minimum foot length shall be between 180 to 200 mm and Minimum number of passes shall be 5. A pass shall be reckoned as one pass of the compactor, not just an axle, over a given area, and the recommended minimum of five passes is for a vehicle with front and rear drums. The compaction shall be continued till the specified hydraulic conductivity is obtained and verified by Engineer-in-Charge.
7. Each layer shall be tested in field for Moisture Content and Hydraulic Conductivity (Undisturbed Sample) before laying the next layer the next layer. A minimum of 1 test for 500 sq. m for each layer shall be conducted.
8. Successive layers of clay shall not be placed until the layer below has been thoroughly compacted to satisfy the requirements laid down in specifications.
9. Prior to compaction, the moisture content of material shall be brought to within plus or minus 2 % of the Optimum Moisture Content as described in IS: 2720 Part VII. The moisture content shall preferably be on the wet side for potentially expansive soil.
10. After compaction of a lift, the soil must be protected from desiccation, which causes the cracking of the Clay liner. Desiccation shall be minimized by smooth rolling the surface to form a relative impermeable layer at the surface or the soil can be periodically moistened. The protective measures stipulated above shall apply to each lift as well as the completed liner or cover barrier.
11. The lifts shall be placed in horizontal layers. For liners to be constructed slopes, the lifts shall be placed parallel to the slope.

7. Leachate Collection System

Scope

The primary function of the leachate collection and removal system (LCRS) is to collect and convey leachate out of the landfill unit to control the depth of leachate above the liner. The leachate collection system is placed over the unit's liner system. The bottom liner should have a minimum slope of 2 percent to allow the leachate collection system to gravity flow to a collection sump or alternate arrangements for pumping shall be made.

The implementing agency shall Design a leachate collection and removal system using adequate water balance equations or appropriate modes to estimate leachate generation for the landfill and to maintain less than 30 cm depth of leachate, or 'head', above the liner.

Leachate Collection and detection system should include a high-permeability drainage layer, perforated leachate collection pipes, a protective filter layer, and a leachate removal system. Design considerations for each of these elements are given below:

1. High permeability drainage layer:

- (a) Drainage materials are to be placed on the liner system at the same minimum 2 percent grade.
 - (b) The drainage materials (sand and gravel) shall be provided as per specifications given in chapter 21 and chapter 22 of this document.
 - (c) It should be demonstrated that the layer will have sufficient bearing capacity to withstand the weight load of full unit.
 - (d) Geo-synthetic drainage materials may be used in addition to or in place of, soil materials.
 - (e) The flow rate of geo-net can be evaluated by ASTM D-4716.
 - (f) The drainage layer shall conform to relevant BIS specifications.
2. Perforated Leachate Collection Pipes.
The leachate collection pipes shall conform to relevant BIS specifications.
3. Perforated piping system should be located in the drainage layer to rapidly transmit the leachate to the sump and removal system.
- (a) The design of perforated leachate collection pipes should consider necessary flow rates, pipe sizing and pipe structural strength.
4. Protective filter Layer
- (a) To protect the drainage layer and perforated leachate piping from clogging, a filter layer is to be placed over the high permeability drainage layer. As per the specifications given in chapter 18
 - (b) The filter layer should consist of a material with smaller pore space than the drainage material or the perforation openings in the collection pipes.
 - (c) Leachate Removal system
 - (d) A leachate collection sump shall be designed and constructed of materials compatible with and impermeable to leachate formed in landfill. The final leachate collection sump shall be common for the total secure landfill area and shall be located and sized accordingly.
 - (e) The sump should be accessible for removal of leachate if the pump becomes inoperative and the stand pipe becomes damaged.
 - (f) Pumps are to be provided to remove leachate that has collected.
 - (g) The pump should be placed at adequate depth to allow enough leachate collection to prevent the pump from running dry.
 - (h) A level control, standby pump and warning system is to be provided to ensure proper sump operation.
 - (i) Standpipes should also be provided to remove leachate from the sump.
 - (j) The leachate shall be pumped for treatment in the leachate treatment plant
 - (k) The filter layer shall conform to relevant BIS specifications.

The primary leachate collection system shall be placed over the primary liner in this project is a composite liner (geo-membrane with compacted clay beneath). The secondary leachate collection system also called leak detection system shall be placed over the secondary liner i.e. between two composite liners. The leachate, if any, shall be collected at low point (provision shall be made sufficiently) and periodically sampled so as to assess the adequacy of primary liner against leakage of leachate.

Material for Filter shall meet the following requirements:

The drainage and filter material shall be placed dry and may be lightly compacted with a vibratory roller. Care must be taken, to ensure that vehicles are up to driven over the naked HDPE liner.

Laying of Perforated Leachate Collection Pipes

The upper half of the pipe above the spring line shall be perforated, whereas the lower half of the pipe shall remain un-perforated. The bidder shall provide details of supplier of the HDPE pipes along with the three pipe parameters i.e. Compressive yield strength, wall crushing, wall buckling. The perforated pipes shall be laid out in 'v' trenches and the trenches shall be backfilled. All care shall be taken to avoid digging the trench below the levels indicated in the drawing. All the perforated-pipes shall be connected to a solid HDPE header pipe, through a Standard "T" -joint".

8. HDPE Pipes

Scope

This section covers the specifications for the supply, laying, jointing and testing of HDPE pipes as per the drawings and specifications mentioned herein to the satisfaction of the Engineer-in-charge.

8.1. Specifications

The pipe shall conform to the material grade PE-80 of latest edition of IS: 4984. The pressure rating shall be PN-6.

The pipe and fittings shall be chemically resistant and shall be suitable for all pH ranges i.e. 0 to 14.

These shall have smooth internal bore enhancing the hydraulic flow properties with low frictional losses. The pipes and fittings shall be strong and resilient enough to withstand static and hydrodynamic both with regard to internal as well as external pressures.

The pipe shall have excellent elastic properties and can take sufficient curvature. The pipes and fittings shall have the property that it can be joined conveniently with no leakage. The pipe and fittings shall be UV rays resistant and shall also be resistant to wear and abrasion. The pipes flange should be provided wherever required with joints having HDPE long stub ends. The flange shall conform to DIN-PN-10 and drilling shall be to match with the counter flange of valves/pipes/pumps etc.

HDPE pipes should conform to relevant BIS specifications

8.2. Piping System

All piping systems shall be capable of withstanding the maximum pressure in the corresponding lines at the relevant temperatures. The minimum thickness for pipes and fittings shall be adhered to higher thickness in equivalent material is acceptable. However, no credit will be given for higher thickness.

All the piping systems, fittings and accessories supplied under this package shall be designed to operate with normal maintenance for a plant service life of 20 years and shall withstand the operating parameter fluctuations and cycling which can be normally expected during this period.

All piping system shall be properly laid to take care of hydraulic shocks and pressure surges, which may arise in the system during operation. Bidder should provide necessary protective arrangements like anchor blocks / anchor bolts, etc. for the safeguard of the piping system under above-mentioned conditions. External and internal attachments to piping shall be designed so as not to cause flatter of pipes, excessive bending stresses or harmful thermal gradients of pipe walls.

Pipes and fittings shall be manufactured by an approved firm of repute. A list of approved manufacturers is given in the tender document. They should be truly cylindrical of clear internal diameter as specified in the IS code, of uniform thickness, smooth, and strong, free from dents, cracks and holes and other defects. They shall allow ready cutting, chipping or drilling, welding etc.

9. Sand Layer

Scope

This section of the specification covers supplying and laying sand layer in the leachate collection and removal system and leak detection system as shown in the drawings and as mentioned herein.

9.1. General Requirements

The implementing agency shall furnish all labour and material required for the complete performance of the work in accordance with the drawings, schedule of item and as described herein.

Graded sand filter of 100 mm thickness shall be laid as indicated in the drawing in the landfill area in the leachate collection and removal system and leak detection system

The sand layer should conform to relevant BIS specifications

9.2. Material

The material for sand layer shall consist of clean, sound and well graded coarse sand. The material shall be free from debris.

Above the gravel bed, clean sand (425 micron to 4.75 mm) shall be placed. The thickness of the sand layer shall be 100 mm. The effective size (d_{10}) of the sand recommended is 0.4 mm with uniformity co-efficient of 1.5. The sand shall be laid on the top of the gravel layer manually and spread to the specified thickness. The minimum thickness of 100 mm shall be ensured after spreading water.

The sand layers shall be well watered and rammed. Care shall be taken that materials of different layers do not get mixed, both at the time of placing and during compaction. The sand material shall be clean, sound, durable and well graded. No debris, wood, deleterious material etc., shall be permitted.

10. Gravel Layer

Scope

This section of the specifications covers supply and placement of the gravel in the leachate collection and removal system and leak detection system as indicated in the drawings released for the construction or as directed by the Engineer- in -Charge.

10.1. General requirements

The implementing agency shall furnish all labour, equipment and material required for the complete performance of the work in accordance with the drawings and as described herein.

The gravel layer should conform to relevant BIS specifications

10.2. Materials

1. Gravel layer in the leak detection system

The gravel shall be rounded, cleaned and free from disintegrated and foreign material. The size of the gravel shall decrease upwards. The size of the gravel recommended is 4.75 -65 mm. The gravel shall be stockpiled at site separately and shall be mixed as per the specifications and then laid on the ground. Average density of the gravel recommended is 1600 kg/m³. The gravels shall be well graded as directed by the Engineer-in-Charge.

2. Gravel layer in the leachate Collection and Removal System

The gravel shall be rounded, cleaned and free from disintegrated and foreign material. The size of the gravel shall be 4.75 - 80 mm. The gravel shall be stockpiled at site separately and shall be mixed as per the specifications and then laid to the ground. The gravel's shall be well graded as directed by the Engineer-in-Charge.

10.3. Placing

Graded gravel's shall be constructed as indicated in the drawings. The gravels shall be placed in layers of uniform thickness as shown in the drawings and care shall be taken to avoid segregation of coarse and fine materials and formation of pockets.

11. Vertical Centrifugal Pump

Scope

This specification covers the works of the design, manufacture, construction features, testing, delivery to site, erection, commissioning, performance of vertical centrifugal pumps. (Non-clog type)

11.1. Code and Standards

The design, manufacture and performance of the pump shall comply with all currently applicable statutes, regulation and safety codes in the locality where the equipment will be installed. The equipment shall also confirm to the latest applicable Indian or equivalent international standard.

11.2. Design Requirements

1. The pumps shall be capable of handling Liquid of pH 0 to 10. These pumps shall be designed for parameters specified in tender drawing and shall be suitable for continuous (normal) operation and intermittent operation.
2. The total head capacity curve shall be continuously rising towards the shut off with the highest at shut off. The pump speed shall not exceed 1500 rpm.

3. Pumps of particular category shall be identical pumps and shall be suitable for parallel operation with equal load division. Impellers shall preferably be of non-over loading type.
4. Pumps shall run smooth without undue noise and vibrations. The magnitude of peak-to-peak vibration at shop will be limited to 75 decibel at the bearing housing. After installation at site the magnitude of vibration shall be limited to 50 db.
5. The KW rating of the pump motor shall be:

Sufficient to drive the pump through the entire range of head – capacity curve, and KW / HP rating of the drive shall be calculated for additional 20% reserve power to take care of over loading on entire operating range.
6. The pump shall be capable of developing the specified total head at the specified rated capacity while operating in parallel and be capable of operating continuously at run-out capacity condition.
7. Pump shall be supplied with level control as per manufactures standard.

11.3. Visual Inspection

Pumps shall be offered for visual inspection to the Owner before dispatch. The components of the pumps shall not be painted before inspection.

11.4. Field Testing

After installation, the pumps offered shall be subjected to mechanical run testing and trial operation at field. If the performance at field is found not to meet the requirements, then the equipment shall be rectified or replaced by the implementing agency, at no extra cost to the Owner. The procedure of the above testing will be mutually agreed between Owner and Implementing agency.

Based on observations of the trial operation, if modifications and repair are necessary the same shall be carried out by the Implementing agency to the full satisfaction of the Engineer-in-Charge.

11.5. Drawings to be submitted

The following drawings along with datasheet shall be submitted by the Bidders for Owners approval.

1. Outline dimensional drawings showing the details of pump and motor assembly
2. Performance curves, showing capacity Vs total head, efficiency, NPSH and power consumption ranging from maximum flow to shut-off head.
3. GA drawing of pump house showing mounting arrangements, sump details, center to center distance of pumps etc.
4. Necessary Catalogues

11.6. Name Plate

Each pump shall be provided with a name plate indicating the following details:

Design capacity, total head, speed, motor rating, model number, tag number, etc., manufacture serial number and weight of equipment.

12. Valves

Scope

This specification covers the design, performance, manufacture, and construction features, testing, packing and forwarding to site erection, commissioning of the Butterfly Valve.

12.1. Code and Standards

The design, manufacture and performance of valves and specials shall comply with all currently applicable statutes, regulations and safety codes in the locality where the equipment will be installed. The equipment shall also conform to the latest applicable Indian / British / USA standards / or equivalent International standards.

12.2. Specification for Butterfly Valve

Butterfly valves shall be of double flanged confirming to AWWA-C-504 class or BS: 5155 Class 150. The Butterfly Valves shall be manually operated as wells as motor operated as per the requirement of the system. The motor shall be suitable for 415 V, 3 phase, 50 Hz and outdoor service. The motorized operated valves shall also have the manual override.

The various components of butterfly valves shall be of the following material of construction. The specification mentioned below is the minimum requirement; however bidder shall confirm that these are suitable for handling the liquid having pH range of 0 to 10. If any lining etc. is required on the wetted part of the valves, the bidder has to provide.

1.	Body	2% Ni Cast Iron - ASTM A 48 Cl. 40; BS: 1452 Gr 220; SG Iron - BS: 2789, Neoprene rubber lined Cast Iron – ASTM A 216 Groundwater. WCB; BS: 1504 Eq. Gr, Neoprene rubber lined
2.	Disc	Cast Iron – ASTM A 48 Cl. 40; BS: 1452, Gr. 200, SG Iron – BS : 2789, Neoprene rubber lined Cast Steel – ASTM A 216 Gr. WCB. BS: 1504 Eq. Gr, Neoprene rubber lined
3.	Shaft	ASTM. A 296 Gr. CF 8M/AISI 316; AISI 420; BS: 970 GR. 316S16; BS: 970 Gr. 420 S45.
4.	Seat rings	Nitrile rubber, EPDM (Ethylene propylene rubber), Hypalon
5.	Motor	Suitable for 415 V, 3 phase, 50 Hz and outdoor service

Butterfly valves shall be fitted with sleeve type bearing such as PTEF. Valves of 350 NB and above shall be provided with one or two thrust bearing to hold the disc securely in the centre of

valve seat without hydraulic or external axial shaft loads. Sleeve and other bearings fitted into the valves body shall be of self-lubricated materials that do not have any effect on the fluid handled and other components of the valves.

All the manually operated butterfly valves shall be provided with Hand wheel or Hand lever as per the requirements. For larger sizes i.e. 150 NB and above. Hand wheel shall be provided. For lever/wrench operated valves, means shall be provided for positively holding the disc is not less than three intermediate positions. Manually operated valves shall be provided with reduction gear unit for valves of size 200 NB and above. All the valves shall be equipped with adjustable mechanical stop-limiting devices to prevent over travel of the valve disc in the open and closed positions. The valve operators (Hand wheel, Gear reduction unit etc) shall be designed as per relevant International Standard.

All the butterfly valves shall be provided with an indicator to show the position of the disc. Flanges shall conform to ANSI B 16.5 C150.

12.3. Tests

All the valves shall be tested hydro-statically for strength, tightness of seats and tightness of back seating at the pressures specified in relevant code.

The procedure for testing the tightness of seats of valves shall be as follows. The valves shall be subjected to water pressure of a minimum 2.812 kg/cm. The pressure shall then be increased to the specified seat test pressure. Valves shall then be cracked open at this pressure to determine the tightness of the seat ring in the body. Butterfly valves shall be tested on both sides of disc. The testing in general shall confirm to the relevant IS standard. Vendor shall furnish five sets of the following certificates for all types of valves. Certified physical and chemical analysis certificates, metallurgical test reports of all components of the valves and specialties. Certified hydrostatic test reports for all body castings.

13. Leachate Treatment Plant

Scope

This specification covers the design, performance, manufacture, construction, site erection, commissioning and testing of the Leachate treatment plant.

13.1. General requirements

The capacity of leachate treatment plant shall be as per design documents. However the implementing agency shall review the site, collect rainfall and other relevant data and shall work out the capacity and design of the plant. All the drawings in this regards would be submitted to the Engineer-in-Charge for approval.

For designing the system the implementing agency shall account for

1. the anticipated flow rate which will require treatment;
2. the composition of the leachate at source;
3. the discharge composition required by the regulating authority.

From this information the technology needed to meet the discharge consent shall be selected. There are estimated to be approximately twenty principal technologies that can be employed for leachate treatment.

Each of which shall be combined in various modes with other standard chemical engineering unit processes to optimize the balance between cost and quality. Refer to following table.

Title	Title
Thermally driven ammonia strippers	Power generation from LFG
Sequencing batch reactors	Exhaust gas sampling equipment
Leachate heaters	Ambient air line-coolers
Eductor pump sets	Leachate evaporation
Pneumatic pumps	Odorgaard™ (Landfill gas odour control)
Borehole pumps	Pressure swing adsorption
Gas chillers	AC Range flares
Distributed monitoring systems	SC Range flares
Gas analysis packages	MC Range flares
SCADA control	RB Range flares
<u>LinkLand™ GUI</u> (For use with <u>SCADA</u> system)	SMART flares
LHC Range flares (For the combustion of low calorific value gases)	Mobile ground flares
Spray-irrigation sets	pH driven ammonia stripper
Scrubbing columns	Aeration lagoons
Stripping towers	Aeration towers

Chemical dosing equipment	Sepsizer™ (Air classification system)
Cyclone water knockout pot	Activated carbon columns
VOC adsorption with activated carbon	Flare stack standard options

13.2. Specifications

The equipments, pipes, pumps, valves, filter material, civil works shall be provided in accordance with the specifications as per relevant BIS codes.

13.3. Painting and Corrosion Protection

A shop coat of paint shall be applied to all steel and cast-iron exposed surfaces as required to prevent corrosion, after release has been given for painting and before dispatch. All parts shall be adequately protected for rust prevention; grease shall not be used on mechanical surfaces.

13.4. Drawings and Manuals

Bidder shall furnish the following drawings and documents for Owners approval:

- Dimensional outline drawings.
- P & ID
- Instruction manual.
- Operational Manual

13.5. Guarantee

Written guarantee addressing material shall be submitted to and approved by Engineer-in-Charge. The manufacturer's guarantee shall state that the installed material meets all requirements of the contract and specifications and that under typical local atmospheric/operating conditions and weather aging, the material is suitable.

The bidder shall also submit a guarantee for treated water quality parameters. The treated water quality parameters shall be in accordance with the relevant IS codes.

B. EQUIPMENTS

The technical specification of various equipments required by BSCL is indicated as follows.

1.0 Compactor /Roller

Basic specification

The compactor / roller vehicle shall be rugged and durable and shall incorporate the latest technological feature offered by the manufacturing / supplier.

The equipment should confirm to the following specification.

General Description

DRUM DIMENSIONS	
Drum width	2130 mm
Drum Diameter	1523 mm
Drum	Standard
Max. weight	10350 kg
Operating weight	9350 kg
Thickness	25 mm
Tyres	2 nos. all weather pattern
Pneumatic Tyre	23.1/26
COMPACTION CHARACTERISTIC	
Static linear load	23.7
Nominal amplitude	
High	1.72
Low	0.80
Vibration Frequency	30-1800
ENGINE	Air cooled diesel engine developing 108 bhp at 2400 RPM meeting BSII
BRAKES	Service brake Hydrostatic
Parking / Emergency	Fail safe multi disc in rear axle
MANOEUVRABILITY	
Turning Radius Inner	3750
Turning Radius Outer	5900
Speed Range	
Stage-I	0-9
Stage-II	0-23
Fuel tank Capacity	265

Standard features:

Operation cab, cushion seat, instrument panel, light equipments, lifting eyes, tool box, break warning lights, windscreen wiper, rear view mirror compactor meter, frequency meter, natural start switch, air filter clog indicator, hydraulic filter clog indicator v belt failure warning horn.rpm cum hour meter, meter, fuel gauge, engine temperature gauge, indicator for engine oil pressure, battery charging current, hydraulic oil and air filter condition, parking breaks, neutral position control lever, switches for speed range, acoustic back up alarm, 4 working light, headlamps, turn signal and hazard warning lights.

Manufacturer shall provide following with each vehicle;

- Two sets of certified net torque, horsepower and consumption curves.
- Two copies of technical details, drawings, operator's manual standard tools/part's book
- Two copied of workshop and service manual
- Two copies of spare parts catalogue
- Warranty cart for one year
- Battery warranty card

After Sales Support:

- Free service in the first year with a warranty for machine for I year from the date of commissioning

- To demonstration capabilities of giving proper service and spare parts after the expiry of warranty period
- Shall be proposing maintenance contact for subsequent year at Indore

Drawings:

The drawing of vehicle should be submitted by the bidder which shall be approved by the BSCL at the of award of work.

2.0 Tipper

Type: Water cooled direct injection diesel engine with inter-cooler

Max. Engine Output : 75-130 HP @ 2400-2800 rpm

Max. Torque : 225 – 416 Nm @ 1300- 1800 rpm

Capacity : 3 – 5 cum

Power : 75 – 130 HP

Gears : 5 forward & 1 reverse

Capacity : 2956 – 5675 cc

Frame: Ladder type frame with riveted/bolted cross members, side members of channel section, depth: 200 mm (max.)

General Requirement

The suppliers/ fabricators are required to furnish complete Technical Specification supported with product/ manufacture's catalogue (originals) or detailed shop floor drawing along with the offer.

Document

The supplier shall submit the following on completion of work and before insurance of completion certificate.

- Warranty card for supply items
- Manufacturer's test certificate is to be given along with supply item while claiming the payment.
- Catalogue
- Operation and maintenance manual
- Permanent registration certificate in the name of commissioner, local municipal body with the local RTO authorities which is the responsibility of the supplier
- Any other documents required for RTO registration

List of Approved Makes**CIVIL ITEMS:**

Sl. No.	Description of Approved Material	Approved Make
1 (a)	Cement (OPC- Grade 43/53)	Ultratech (L&T)/ Ambuja/ACC/Konark/ Birla Gold/ Emami Double Bull/JK/Coramandel /Lafarge etc.,
1 (b)	White Cement	JK White/ Birla White
2	Reinforcement Steel	SAIL/ TISCON(TATA)/ VIZAG (RINL) /JINDAL, ELECTROSTEEL or equivalent
3	Structural Steel	SAIL/ TISCON(TATA)/ VIZAG (RINL) /JINDAL, ELECTROSTEEL
4.	Glazed Ceramic Tile	KAJARIA / JOHNSON/ SOMANI/ CERA
5.	Ceramic Floor Tile	KAJARIA / JOHNSON/ SOMANI/ CERA
6.	Vitrified Tile	KAJARIA / JOHNSON/ SOMANI/ CERA
8.	Ply Wood, Shuttering Ply Conforming to IS 303-1989 / IS 4990- 1993	M/s. Century Plyboards (I) Ltd. / M/s. Green Ply Industries Ltd.
9.	-	-
10.	Fire Door	Shakti Met-Door, Metaflex
11	Rolling Shutter	Bengal Rolling Shutter, 'Standard', 'Swastik', 'Diana', 'Hercules',
12.	Stainless Steel Section	SAIL/ TATA
13.	Stainless steel hardware for doors	Dorma /Haffelle
14	Glazing	Saint Gobain / Asahi Float Glass Ltd / Hindustan Safety Glass Works Ltd. / Modi.
15.	Injection water proofing , Water Proofing coating, Water Repellents Conc., Admixtures, PVC, Plasticized membranes of water proofing	Sika Qualcrete Ltd./ Structural Waterproofing Co./Pidilite Industries Ltd./ Fosroc/ BASF (The applicator has to be certified by the water proof vendor.
16.	Synthetic Enamel Paints, Distemper, Acrylic Emulsion Paints, Melamine Coating, Aliphatic Acrylate	I.C.I (I) Ltd. / Berger Paints (I) Ltd. / Jenson & Nicholson (I) Ltd. / Asian Paints (I) Ltd. / FOSROC Chemicals(I) Pvt Ltd.

17.	Flush door (Factory made)	M/s. Century Plyboards (I) Ltd. / Green ply / Merino Industries
18.	Aluminium Sections and Extrusion shall conform IS:733-1983 and IS:1285-1975	HINDALCO / JINDAL
19.	General Hardware	
	a. Latches, Hinges etc.	GODREJ / DORMA / HAFFELLE
	b. Locks, Flush Bolt	GODREJ / DORMA / HAFFELLE
	c. Handles	GODREJ / DORMA / HAFFELLE
	d. Screw	Nettlefold / GKW / ND
	e. Door Closure	GODREJ / DORMA / HAFFELLE
	f. Floor Spring	GODREJ / M/s. EVERITE Agencies Pvt. Ltd. / M/s. Garnish
	g. Aldron	ISI Marked
	h. Tower Bolt	ISI Marked
	i. PVC Buffer Block	ISI Marked
	j. Door Stopper	ISI Marked
	k. Patch fittings for toughened glass	Dorma Systems
21.	Kota stone (Bluish grey/ Green)	Premium
22.	Waterproof Adhesive for Tile/Slab fixing to wall or floor	Terraco India (P) Ltd. / M/s. Pidilite Industries Ltd. / M/s. Roffe Construction Chemicals Pvt. Ltd.
23.	Sealant	<ul style="list-style-type: none"> • Rhodorsil-33, Pidiseal A-11 & B-11 : M/s. Pidilite • Industries Ltd., Techseal RDL-600, Techseal RDL- 940, Techseal RDL-1000 : M/s. Choksey Chemical • (P) Ltd. Roffseal : M/s. Roffe Construction Chemicals • Pvt. Ltd. or Fosroc ., Sikk Polysulphide/ Dr. Fixit • Pidiseal PS (42 P) MYK.
24.	Tile Jointing Materials	—RainbowTile Mate– HDI(M/s. Roffe construction Chemicals Pvt. Ltd.). —TerragroutI (M/s. Terraco India (P) Ltd. or Fosroc
25.	Decorative Ply (Teak / Cedar /	M/s. Century Plyboards (I)Ltd./ GREEN PLY

	Mahegony / Walnut Veneer)	
26.	Cement Based or Exterior Textured Paint	ICI (I) Ltd / Asian Paints / Berger Paint (I) Ltd . / Jenson & Nicholson
27	Glass Mosaic tiles	Shon, Kent , Bisazza
28	Glass for structural glazing & canopy (Coloured Reflective Toughened Glass)	Saint Gobain / Hindustan Pilkington/ Ashai float glass .
29	Silicone Sealant	GE/Dow Corning
30.	Aluminium composite panel	Aluco bond ,Aludecor , Alstrong
31.	MS Conduit pipe	BEC /SUPREME/ AKG
32.	PVC Conduit pipe	PLAZA/PRECISION/POLYCAB/AKG/ Arkaylite/ Havells, JUVAS
33.	Pre-constructional Anti-termite (Chloropyriphos)	Pest Control India or approved by Engineer-in-charge
34.	Cement Primer	ICI / BERGER / ASIAN PAINTS/ JENSON & NICHOLSON
35.	Textured Paint	ICI / BERGER / ASIAN PAINTS/ JENSON & NICHOLSON
36.	Waterproofing acrylic emulsion exterior grade paint	ICI / BERGER / ASIAN PAINTS/ JENSON & NICHOLSON
37.	Acrylic Polymer waterproofing coat	SIKA / FOSROC / PIDILITE / ROFFE/ BASF
38.	Expanding grout admixture	SIKA / FOSROC / PIDILITE / ROFFE/ BASF
39.	Integral waterproofing compound	SIKA / FOSROC / PIDILITE / ROFFE
40.	Waterproofing admixture	SIKA / FOSROC / PIDILITE / ROFFE
41.	Plasticizer	SIKA / FOSROC / PIDILITE / ROFFE

42	APP Modified Bituminous membrane	SIKA / FOSROC / PIDILITE / ROFFE
43	Aluminium anodized louver	HUNTER DOUGLAS
44	Structural glazing	JINDAL/HINDALCO .
45	Stainless steel handrail with balluster	GODREJ / DLINE
46	Floor hardener	Ironite/ Feronite

WATER SUPPLY, SEWERAGE & DRAINAGE

Sl. No.	Description of Approved Material	Approved Brand / Manufacturer
1.	G.I. Pipes - medium class (As per IS- 1239, P - I)	TATA/JINDAL
2.	G.I. Pipe fittings (as per IS-1239, P - II) ; of material with Galvanised Cast Iron Fillings, with material code conforming to IS- 1879	HB/ "NB" /"ZOLOTO"/Leader / -"JSI" fittings ISI approved Heavy
3.	C.P. on brass fittings	
	CP Bib cock	JAQUAR-Continental /CERA /ESSCO - Delux' or 'something special' / —Marcl/—Hindwarel or as

		approved by ENGINEER-IN-CHARGE
	CP 'Long Nose' /or' Long Body' Bib cock	- Do -
	CP Angle valve	- Do -
	CP 'Concealed' Stop cock 'Heavy' type with adjustable CP wall Flange	- Do -
	CP Shower Rose	- Do -
4.	Bronze /Gun metal-body—Pressure-	—Zoloto— 1040A / Leader— / —Sant— / —Neta
	Release valve with threaded screwed ends, class (PN-1.0) / or (PN-1.6) class	
5.	Gun metal body Ball Float valve with PVC (High pressure) Ball Float	Zoloto / Leader— / —Sant— / —Neta
6.	15 mm dia. PVC Connector pipe with Symet nuts at both ends. - (for Wash Basin	PRAYAG or as approved by ENGINEER-IN-CHARGE

	Pillar tap & W.C. & Urinal Cistern	
	connections)	
7.	Wall Outlet Connection Flexible Pipe - 15mm dia	"Jaquar" / —Esscol/ —Hindware
8.	Bronze /Gun metal-body Gate valve with threaded screwed ends, "Non-rising Spindle" type (PN-1.0) / or (PN- 1.6) class	—Leader / —Zoloto-for Bronze Sant / body / —Neta / SBM – —Peglar type
9.	Bronze -body Globe valve with 'BSPT(F), threaded screwed ends, "Non-rising Spindle" type (PN-1.0) (PN- 1.6) class	Valves of 'Zoloto', or 'Sant' or as approved by ENGINEER-IN-CHARGE.
10.	CI body Gate /Sluice valve with flanged ends rising Spindle" type (PN- 1.0) / or (PN-1.6) class	—Sant / —Zoloto / Leader / —Hawa
11.	Pump for water supply .	'Willo' / —KSB / —CRI / —Grundfos / DP.pump

12.	CP Urinal Spreader-15mm (for Urinals only)	for all Toilets :- Hindware / "Parryware" or as approved by ENGINEER-IN-CHARGE.
13.	Soil, waste & vent pipes / and Pipe Fittings & Specials :- C.I. Centri cast (as per 15-3989)	'NECO' / 'HEPCO' / 'KAPILANSH DHATU UDYOG' (P) L TD.'
14.	C.P. on brass fittings	JAQUAR/ESSCO _-Delux*/Marc /Hindware /CERA/
15.	C.P. on brass fittings C.P. Waste Coupling, ii) C.P. Bottle Trap, iii) C.P Robe Hook, iv) C.P. Towel Rail. v) CP Two way Bib Tap	JAQUAR/ESSCO _-Delux*/Marc/ Hindware /CERA
16.	CP Toil. Paper Holder	- Do -
17.	CP Towel Ring	- Do -
18	CP Soap Dish Holder	- Do -
19.	CP Bottle Trap with wall connection Pipe	- Do -

20.	Sanitary Fixtures & Fittings	
	CP Robe Hooks	- Do -
	CP "Two-way" Bib cock	- Do -
	CP Shower Rose	- Do -
21.	Rigid PVC (Concealed) Waste pipe, [Schdl.-40], (as per ASTM D 1785)- (concealed or exposed)	Supreme / Oriplast / Finolex/ Utkarsh
22.	Rain Water Pipe Fittings :- 'Sand cast Iron' - "SWR" class, as per (IS: 1792)	DO
23.	Salem' Stainless Steel Sink as per AISI 304 (18/8) conforming to I.S.- 13983	"Hindware" "Hafele" "Nirali", 'Parryware'
24.	Stone- Ware Pipes , and S.W. Pipe Fittings	Sonali / GINNI / NIRALI / Hind
25.	C. I. Manhole Cover (I.S. - 1726) - "Medium" or "Heavy" Grade' (Light duty	NECO' / 'HEPCO'/ Swastika / _BPL' / —BICl.

	only on Oil/Grease Trap Chamber)	
26.	NP-2 class R.C.C. Pipes and Pipe Fittings (i.e., RCC Collars etc.)	/ _West Bengal Eastern Spuncrete Concrete / _HINDUSTAN'/ Industries(P) Ltd. _SUR'/or equivalent ISI approved Make.
27.	Stone- Ware Gully Trap	Sonali / GINNI / NIRALI / Hind / or equivalent ISI approved make.
28.	C. I. Grating- (Over Catch Pit I Yard Gully Chamber), (I.S. - 1726) - "Medium" or "Heavy" Grade	NECO' / 'HEPCO' / _BPL'/_Kapilansh Dhatu Udyogll
29.	Rain Harvesting Pump/Agriculture Pump of required capacity -.	'Willo'/ _KSBll / —CRIll / —Grundfosll/ DP pumps/
30.	"Enclosed" Analogue type Water Meter ("Bulk" Type), conforming to IS-2373 with Calibration Certificate, including all necessary accessories.	"Dashmesh" / 'Kaycee" / "Capstan"/ —Kentll.
31.	Bronze body "Parallel Slide" Blow-off valve ("Spring loaded, blow-off pressure sellable" type), with flanged ends, also with	Zoloto' / Sant –make / Leader.

	matching Flanges (PN-1.0) / or (PN- 1.6) class	
32.	Air-Release Valve Bronze body "Parallel Slide" 'Blow-off valve ("Spring loaded, blow-off pressure sellable" type), with flanged ends, also with matching Flanges (PN-1.0) / or (PN-1.6) class	Zoloto' / Sant –make / Leader.
	Bronze / Gun metal -body Ball valve with "BSPT(F), threaded screwed ends, "quarter turn Lever operated" type (PN-1) / or (pN- 1.6) class	Valves of Bronze body :-'Leader', 'Zoloto' – Metal only:- Sant make / Leader.
33.	Gaskets-CAF 'Full face' conforming to IS- 2712, Gr.- C; (3mm thick)	"Klinger" / "Permanite" / "Champion".
34.	CPVC and uPVC and HDPE pipe including fittings	Ori-Plast /Suprim/Alom
35.	Pressure Reducing Valve , Blow-off VALVE : Bronze / Gun metal Body,; Bronze/Gun metal Body, Non- Return Valve (N.R.V) : C.I. Body	Zoloto, / "Sant" / —Leader / —Amcol / —Hawal)
36.	(Vitreous Sanitarywares chinaware):- i) W.C. - (Indian type/ European Type)	Hindware, / —Parryware/ —CERA / KOHLER

	<p>- with 'S' / 'P' - Trap - Floor mounted type, without PVC Flushing Cistern</p> <p>ii) Wash Basins - "Flat-back" type</p> <p>rectangular pattern with —Esscol CP</p> <p>Pillar Tap / or —Swan neck type Mixer</p> <p>iii) Urinal - Flat back "Small" with CP</p> <p>Spreader, CP Waste coupling, CP Bottle Traps with waste pipes.</p>	
37.	Wall Mirror	<p>6mm thick 'Modiguard' / 'Ashai' / or equivalent as</p> <p>approved by ENGINEER-IN-CHARGE, with 12mm</p> <p>thick hard-board backing</p>
38.	W.C.:- Floor mounted "Pedestal" type- W.C. -	'Hindware- /'Parryware'/'Cera' :-
39.	Wash Basin	'Hindware- /'Parryware'/'Cera'
40.	<p>For WC flushing :- PVC 'Low-level'</p> <p>"Dual- Flush" Cistern</p>	<p>Hindware' "SLEEK" or equivalent Parryware or 'Cera'</p> <p>Model.</p>

ELECTRICAL ITEMS:

Sl.	ITEM	APPROVED MAKES
1	Diesel engine	CUMMINS / CATERPILLAR / KIRLOSKAR
2	Alternator	KIRLOSKAR / STAMFORD / AREVA
3	LT Cable termination materials	DOWELLS / COMET / LOTUS
4	Air Circuit Breaker	SCHNEIDER / ABB / L&T
5	MCCB / Contactor	SCHNEIDER / ABB / L&T
6	MCB Distribution Board	SCHNEIDER / ABB / L&T
7	MCB / RCCB / RCCBO	SCHNEIDER / ABB / L&T
8	Power Factor Correction Relay	SCHNEIDER / L&T/EPCOS
9	Power Factor Correction Capacitors	SCHNEIDER / EPCOS / L&T
10	Relays	SCHNEIDER / SIEMENS / L&T
11	Meters	SCHNEIDER / ENERCON/ AEI
12	Ammeter/Voltmeter selector switch	L&T/ KAYCEE / SALZER
13	Indicating Lamp	SCHNEIDER /SIEMENS/VAISHNO/ L&T
14	Push Buttons / Indicating Lamps	SCHNEIDER /L & T (RISHAB) / SIEMENS
15	CT	KAPPA / AUTOMATIC ELECTRIC / BCH
16	L. T. Power, control and signal cable	HAVELLS / POLYCAB / CRYSTAL
17	Cu. Wires	MESCAB / FINOLEX /HAVELLS
18	M.S.Conduit	JINDAL / TATA / GST
19	PVC conduit & Accessories	ISI Marked
20	Industrial Power Socket Outlets	SCHNEIDER / ABB / L&T

21	Switches and Sockets modular type	LEGRAND / CRABTREE / L&T
22	Lighting Fixture	WIPRO / CG / PHILIPS
23	Wall/ Ceiling / Exhaust Fans	USHA / CROMPTON / HAVELLS
24	Ductable Split Units	LG / PANASONIC / CARRIER
25	Wall Mounted Split Unit	LG / PANASONIC / CARRIER
26	Cable Tray	FABRICATED / LEGRAND
27	EPABX	UNIFY / CISCO / AVAYA
28	RJ 11 SOCKET	LEGRAND/L&T/SCHNEIDER
29	RJ 45 SOCKET	LEGRAND/L&T/SCHNEIDER
30	LAN Cable & Accessories	HAVELLS / POLYCAB / CRYSTAL
31	UPS	ETON/EMERSON
32	CCTV CAMERAS	L&T/SCHNEIDER/ABB
33	PA SYSTEM along with all accessories	BOSCH / HONEYWELL
34	TRANSFORMER	VOLTAMP / SCHNEIDER /
35	HT BREAKER	SCHNEIDER/ABB/L&T
36	HT XLPE CABLE	HAVELLS / POLYCAB / CRYSTAL
37	11 KV RUBBER MAT	ISI MARKED
38	11 KV HAND GLOVES	ISI MARKED
39	ELECTRONIC LIGHTING ARRESTER	PROLITE/
40	Fan	Havells, Crompton, Bajaj

41	LED Lights	Havells, Crompton, Bajaj, Surya
----	------------	---------------------------------

FIREFIGHTING MAKES

Sl. No.	Description of Material/Item	Approved Make
1	Relays	Siemens / Schneider / L & T
2	Meters	IMP / Neptune
3	Ammeter/Voltmeter selector switch	Kaycee / Salzer / AE
4	Indicating Lamp	Siemens/ Schneider
5	Wires (copper conductor)	Mescab / Polycab/ Havells/ Nicco / Gloster
6	MCCB	Siemens/ Schneider / L & T
7	CT	Kappa
8	MS-Black Main Pipes-Hydrant ERW (IS-1239) Butt weldable /threaded IS:1239 Part-I (Heavy)	JINDAL / TATA/ Nezone/ _Skipper‘
9	Gate valve(IS:210,GR-210) ,	Crawlie & Ray
10	Butter fly valve in C.S. lever / Wheel	/Leader /Intervallve/Sant/ Zoloto/L&T
	operated to be fitted between flanges, PN-1.0 BS-5155	Kirloskar/
11	Foot Valve with Strainer as per IS-4038	
12	Sluice / Gate Valve.	
13	N.R.V.	
14	R.C.C. pipes (NP-3	Eastern Spuncrete / W.B. Concrete Industries Pvt. Ltd. / Hindustan

15	Hydrant Valve IS-5290	Shield Fire /Minimax, Surex –all ISI marked
16	CP fire Hose with G.M. Nozzle.	FireShield/Minimax, Surex – all ISI marked
17	Pressure Gauge	FireShield /Minimax, Surex – all ISI marked
18	Hose Box	FireShield /Minimax, Surex – all ISI marked
19	Fire Extinguishers D.C.P.- 5 Kg.- including MS fastening Clamps for mounting on walls/columns CO ₂ 4.5 Kg.- including MS fastening Clamps for mounting on walls/columns Water CO ₂ including MS fastening Clamps for mounting on walls/columns A B C – Powder type	FireShield /Protector/ /Surex /Minimax-all ISI approved
	(Mono Ammonium Phosphate base) - including MS fastening Clamps for mounting on walls/columns	
20	Pump	Pumps/Kirloskar/KSB/ SAM TURBO BE /WPIL /Grundfos or Equivalent
21	Y'-strainer	Kirloskar/Lead er/ Sant /Zoloto
	Pressure Release Valve	Kirloskar/Lead er/ Sant /Zoloto
23	Fire Sprinklers (both pendent & Up-Right type)	=TYCO' / =VIKING' / =Omex' / —Centrall-ELO 16/ Crawlle & Ray
24	FIRE ALARM PANEL	HONEYWELL-ESSER, Notifire, Simplex. _ Morley Edward
25	RESPONSE INDICATOR	Approved matching Brand.

26	CABLE	Finolex or equivalent
27	PVC CONDUIT	Ori-Plast or other equivalent
28	FIRE ALARM PANEL	HONEYWELL-ESSER,
29	Smoke Detector	Siemens/Esser/Tyco
30	Heat Detector	Siemens/Esser/Tyco
31	Manual Call Box	ISI Approved Make
32	PC	HP/Dell
33	Pressure Switch	Indfoss ,/ Switzer
34	Lift	OTIS/KONE/JOHNSON

All material must conform to relevant BIS specifications.

CODES & STANDARDS.

All the systems and equipment's within the scope of this tender shall be of reputed proven makes, designed and manufactured in accordance with the stipulations of latest versions of Indian Codes.

When an equipment is offered conforming to standards other than those listed below, it shall be clearly brought in notice of engineer in charge.

S. No	IS Code	Description
1	IS:1646	Code of practice for fire safety of building (general), Electrical Installations.
2	IS:1648	Code of Practice for fire safety of buildings (general), Fire Fighting Equipment and its Maintenance.
3	IS:3034	Code of Practice for Fire of Industrial Buildings, Electrical Generating and Distributing Stations.
4	IS:884	First Aid Hose Reel for Fire Fighting (For Fixed Installations).
5	IS:2171	Portable Fire Extinguisher, Dry Powder Type
6	IS:2878	Portable Fire Extinguishers, CO2 type.
7	IS:1239	Part - I : Mild Steel Tubes (upto 150mm). Part - II : Mild Steel tubulars and other wrought steel pipe fittings.
8	IS:778	Gunmetal gate, globe and check valves for general purposes.
9	IS:13095	Butter Fly Valve
10	IS:14846	Sluice Valve for water works purposes (50 to 1200mm size) – Specification.
11	IS:5312	Swing Check type Reflux (Non-Return) Valves.
12	IS:940	Portable Fire Extinguisher ,Water CO2 Type.
13	IS:10204	Portable Fire Extinguisher, Foam Type.
14	IS:2190	Code of practice for selection, installation and maintenance of portable First Aid Fire Appliances.
15	IS:1520	Horizontal Centrifugal Pumps for clear, cold and fresh water.
16	IS:5290	Landing / Hydrant Valve
17	IS:8423	Controlled Percolation Hose for fire fighting.
18	IS:903	Fire Hose Delivery Couplings, Branch Pipe, Nozzles & Nozzle spanner.
19	IS:2062	Structural Steel (Fusion / Welding Quality).
20	IS:325	Three Phase Induction Motor.

21	NBC	National Building Code, Chapter – IV (Amendment No.3, January 1997).
22	IS:2189	Code of practice for selection, installation and maintenance of Automatic Fire Detection and Alarm System.
23	IS:732	Code of practice for electrical wiring installations
24	IS:2217	Recommendations for providing first aid fire fighting arrangements in public buildings
25	IS:3844	Code of practice for installation of internal fire hydrant in multistoried buildings
26	IS:3589	Mild Steel Tubes (200mm and above).

VOLUME-III

SECTION 8 FORM OF BID

FORM OF BID

Description of the Works:

BID

To :

Address :

- 1.0 We offer to execute the Clearing the existing legacy waste and current waste on daily basis, Construction of Material Recovery Facility, waste processing, scientific landfill, leachate treatment plant and providing digital monitoring mechanism at Kankaity in Bhagalpur with Operation & Maintenance for five years on Engineering, Procurement & Construction (EPC) basis described above and remedy any defects therein in conformity with the Conditions of Contract, specification, drawings (Concept layout), Price Bid (Lumpsum format) and Addenda along with reply to the pre-bid queries.
- 2.0 We undertake, if our Bid is accepted, to commence the Works as soon as is reason- ably possible after the receipt of the Engineer's notice to commence, and to complete the whole of the Works comprised in the Contract within the time stated in the document.
- 3.0 We agree to abide by this Bid for the period of days from the date fixed for receiving the same, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
- 4.0 Unless and until a formal Agreement is prepared and executed this Bid, together with your written acceptance thereof, shall constitute a binding contract between us.
- 5.0 We understand that you are not bound to accept the lowest or any tender you may receive.

Dated this _____ day of _____ 2019

Signature _____ in the capacity of _____ duly

authorized to sign bids for and on behalf of (In block capitals or typed)

Address

Witness

Address

Occupation

SECTION 9 PRICE BID

PRICE BID

Preamble

- 1.0 The Price Bid shall be read in conjunction with the Instructions to Bidders, Conditions of Contract, Technical Specifications and Drawings (Concept Layout), Reply to Pre-Bid Queries and Addendum.
- 2.0 The numbers of related infrastructure and are given to provide a common basis for bidding. The payment will be based upon the actual quantities in respect of dwelling unit completed and carried out, as measured by the Contractor in sqm of carpet area and verified by the Engineer and valued at the rates and prices tendered in the Price Bid, within the terms of the Contract.
- 3.0 The EPC tendered in the Price Bid shall include all planning, designing, preparing of structural drawings, getting the drawings vetted from Indian Institute of Technology /National Institute of Technology (NIT)/Govt. Engineering College, constructional plant, labour, supervision, materials, erection, maintenance, insurance, profit, taxes and duties, together with all general risks, liabilities and obligations set out or implied in the Contract.
- 4.0 The rates or prices shall be quoted entirely in Indian Currency.
- 5.0 The rates or prices per sqm of carpet area shall be entered in the price bid which will be taken to have included in the cost of water supply/ plumbing, internal and external electricity/lighting, construction of overhead tanks/ sumps at ground level, barbed wire fencing, internal roads, landscaping work, etc within the premises/ land under Smart City Limited is to come up in Bihar.
- 6.0 The whole cost of constructing the Integrated Solid Waste Management (ISWM) as mentioned in above para shall be included as there will be no item provided for which the rate can be given and the cost quoted shall be deemed to be inclusive of costs of all the related Items of Work.
- 7.0 General directions and descriptions of work and materials are not necessarily repeated or summarized in the Price Bid. References to the relevant sections of the contract documentation shall be made before entering rates or price in the Price Bid.
- 8.0 The method of measurement of completed work shall be on carpet area basis for which payment shall be made as per milestone indicated in the bid documents.
- 9.0 Errors will be corrected by the Employer for any arithmetic errors pursuant to Clause 29 of the Instructions to Bidders.
- 10.0 Rock is defined as all materials which, in the opinion of the Engineer, require blasting, or the use of metal wedges and sledgehammers, or the use of compressed air drilling for its removal, and which cannot be extracted by ripping with a tractor of at least 150 kW with a single rear mounted heavy duty ripper.

PRICE BID

I/we hereby tender to execute the whole of the work described in the:

Name of the Work: - Clearing the existing legacy waste and current waste on daily basis, Construction of Material Recovery Facility, waste processing, scientific landfill, leachate treatment plant and providing digital monitoring mechanism at Kankaity (Jagdishpur) in Bhagalpur with Operation & Maintenance for five years on Engineering, Procurement & Construction (EPC) basis

PRICE BID FORMAT

S L. N O .	Description of Work	Lump sum Amount Inclusive of all taxes and GST. (in Rupees)	
		In figure	In words
01	Clearing the existing legacy waste and current waste on daily basis, Construction of Material Recovery Facility, Construction of Processing Sheds, Landfill & other infrastructure, Procurement, Installation and Commissioning of Compost Plant Machineries, scientific landfill, leachate treatment plant and providing digital monitoring mechanism at Kankaity (Jagdishpur) in Bhagalpur with Operation & Maintenance in Defect Liability Period of five years on Engineering, Procurement & Construction (EPC) basis.		
should this tender be accepted, I/we do hereby agree and bind myself/ ourselves to abide by and fulfill all the conditions annexed to the said specifications in default thereof to or forfeit and pay to BSCL, the penalties of sums of money mentioned in the said condition.			
Note:- 1. The Quantity mentioned under description is only indicative and not final and it cannot be considered as basis of any claim. This quantity is subject to increase or decrease by 20%.			
Note:-2 The Lump Sum amount quoted by the bidder shall be inclusive of all taxes and GST.			

SECTION 10

SECURITIES AND OTHER FORMS

BID SECURITY (BANK GUARANTEE)

WHEREAS, [name of Bidder] (hereinafter called "the Bidder") has submitted his Bid dated [date] for the construction of [name of Contract hereinafter called "the Bid"].

KNOW ALL PEOPLE by these presents that We _____ [name of Bank] of _____

[name of country] having our registered office at (hereinafter called "the Bank") are bound unto _____

[name of Employer's Representative] (hereinafter called "the Employer's Representative") in the sum of * for which payment well and truly to be made to the said Employer's Representative the Bank itself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this _____ day of _____

.... 2020 THE CONDITIONS of this obligation are:

1.0 If after Bid opening the Bidder withdraws his bid during the period of Bid validity specified in the Form of Bid;

OR

2.0 If the Bidder having been notified to the acceptance of his bid by the Employer during the period of Bid Validity:

3.0 fails or refuses to execute the Form of Agreement in accordance with the Instructions to Bidders, if required; or

4.0 fails or refuses to furnish the Performance Security, in accordance with the Instructions to Bidders; or

5.0 does not accept the correction of the Bid Price pursuant to Clause 27.

We undertake to pay to the Employer up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by him is due to him owing to the occurrence of one or any of the three conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date_** days after the deadline for submission of Bids as such deadline is stated in the Instructions to Bidders or as it may

be extended by the Employer, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this guarantee should reach the Bank not later than the above date.

DATE

SIGNATURE

WITNESS

SEAL

[Signature, name and address]

- 6.0 The Bidder should insert the amount of the guarantee in words and figures denominated in Indian Rupees. This figure should be the same as shown in Clause 16.1 of the Instructions to Bidders.
- 7.0 45 days after the end of the validity period of the Bid. Date should be inserted by the Employer before the Bidding documents are issued.

PERFORMANCE BANK GUARANTEE

To

_____ [name of Employer's Representative]

_____ [address of Employer's Representative]

WHEREAS, _____ [name and address of Contractor] (hereafter called "the Contractor") has undertaken, in pursuance of Contract No. _____ dated _____ to execute _____ [name of Contract and brief description of Works] (hereinafter called "the Contract").

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligation in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee:

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you on behalf of the Contractor, up to a total of _____

[amount of guarantee]* (in words), such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of _____ [amount of guarantee] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed there under or of any of the Contract documents which may be made between your and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change,

addition or modification.

This guarantee shall be valid until 28 days from the date of expiry of the Defect Liability Period. Signature and Seal of the guarantor

Name of Bank _____

Address _____

Date _____

*An amount shall be inserted by the Guarantor, representing the percentage the Contract Price specified in the Contract including additional security for unbalanced Bids, if any and denominated in Indian Rupees.

BANK GUARANTEE FOR ADVANCE PAYMENT

PERFORMANCE BANK GUARANTEE

To

_____ [name of Employer's Representative]

_____ [address of Employer's Representative]

_____ [name of Contractor]

Gentlemen:

In accordance with the provisions of the Conditions of Contract, sub-clause 14.2 ("Advance Payment") of the above-mentioned Contract, [name and address of Contractor] (herein after called "the Contractor") shall deposit with [name of Employer's Representative] a bank guarantee to guarantee his proper and faithful performance under the said Clause of the Contract in an amount of

[amount of Guarantee]* [in words].

We the [bank of financial institution], as instructed by the Contractor, agree unconditionally and irrevocably to guarantee as primary obligator and not as Surety merely, the payment to [name of Employer's Representative] on his first demand without whatsoever right of obligation on our part and without his first claim to the Contractor, in the amount not exceeding _____ [amount of guarantee]* _____ [in words]

We further agree that no change or addition to or other modification of the terms of the Contractor or Works to be performed there under or of any of the Contract documents which may be made between _____ [name of Employer's Representative]

and the Contractor, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall remain valid and in full effect from the date of the advance

payment under the Contract until [name of Employer's Representative] receives full repayment of the same amount from the Contractor.

Yours truly,

Signature and Seal : _____

Name of Bank / Financial Institution : _____

Address : _____

*An amount shall be inserted by the Bank or Financial Institution representing the amount of the Advance Payment, and denominated in Indian Rupees.

LETTER OF ACCEPTANCE

(Letter head paper of the Employer's Representative)

(Date)_____

To

(Name and address of the Contractor)

Dear Sirs,

This is to notify you that your Bid dated ____ - ____ - _____ for execution of the

_____ (name of the Contract and identification number

of Contract, as given in the instructions to Bidder) for the Contract Price of

Rupees_____

(_____)

amount in words and figures as corrected and modified in accordance with the Instructions to

Bidders¹ is hereby accepted by our agency

You are hereby requested to furnish Performance Security, in the form detailed in Para 32.1 of ITB for an amount equivalent to Rs._____ within 21 days of the receipt of

this letter of acceptance valid upto 28 days from the date of expiry of Defects Liability Period i.e. upto _____ and sign the contract, failing which action as stated in para 32.4 of ITB will be taken.

Yours faithfully,

Authorized Signature

Name and title of Signatory

(Employer's Representative)

¹.Delete "corrected and" or "and modified" if only one of these actions applies. Delete as corrected and modified in accordance with the Instructions to Bidders, if corrections or modifications have not been affected.

ISSUE OF NOTICE TO PROCEED WITH THE WORK

(Letter head of the Employer's Representative)

(Date) _____

To

(Name and address of the Contractor)

Dear Sirs,

Pursuant to your furnishing the requisite security as stipulated in ITB Clause 32.1 and signing of the Contract for the construction of

_____ at Bid Price of Rs. _____

You are hereby instructed to proceed with the execution of the said works in accordance with the contract documents.

Yours faithfully,

(Signature, name and title of
Employer's Representative)

AGREEMENT FORM

Agreement

This agreement made the _____ day of between _____

(name and address of Employer) [hereinafter called “the Employer] and _____

_____ (name and address of contractor) hereinafter called “ the

Contractor” of the other part.

Whereas the Employer is desirous that the Contractor execute _____

_____ (name and identification number of Contract) (hereinafter called “

the Works”) and the Employer has accepted the Bid by the Contractor for the execution and

completion of such Works and the remedying of any defects therein at a cost of Rs.

NOW THIS AGREEMENT WITNESSETH as follows :

1. In this Agreement, words and expression shall have the same meanings as are respectively assigned to them in the conditions of contract hereinafter referred to and they shall be deemed to form and be read and construed as part of this Agreement.
2. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy any defects therein in conformity in all aspects with the provisions of the contract.
3. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying the defects wherein Contract Price or such other sum as may become payable under the provisions of the Contract at the times

and in the manner prescribed by the Contract.

4. The following documents shall be deemed to form and be read and construed as part of this Agreement viz.

- a. The Contract Agreement
- b. Letter of Acceptance, notice to proceed with the works
- c. Contractor's Bid
- d. Contract Data
- e. Conditions of Contract including Special Conditions of Contract
- f. Employer's Requirements
- g. Technical Specifications
- h. Concept Data along with Tender documents
- i. Any other document listed in the Contract Data as forming part of the Contract

In witnessed whereof the parties there to have caused this Agreement to be executed the day and year first before written.

The Common Seal of _____ was hereunto affixed in

the presence of:

Signed, Sealed and Delivered by the said _____

in the presence of:

Binding Signature of Employer's Representative

Binding Signature of Contractor

UNDERTAKING

I, The undersigned do hereby undertake that our firm M/s _____
agree to abide by this bid for a period _____ days for the date fixed for receiving
the same and it shall be binding on us and may be accepted at any time before the expiration of
that period.

(Signed by an Authorized Officer of the Firm)

Title of Officer

Name of Firm

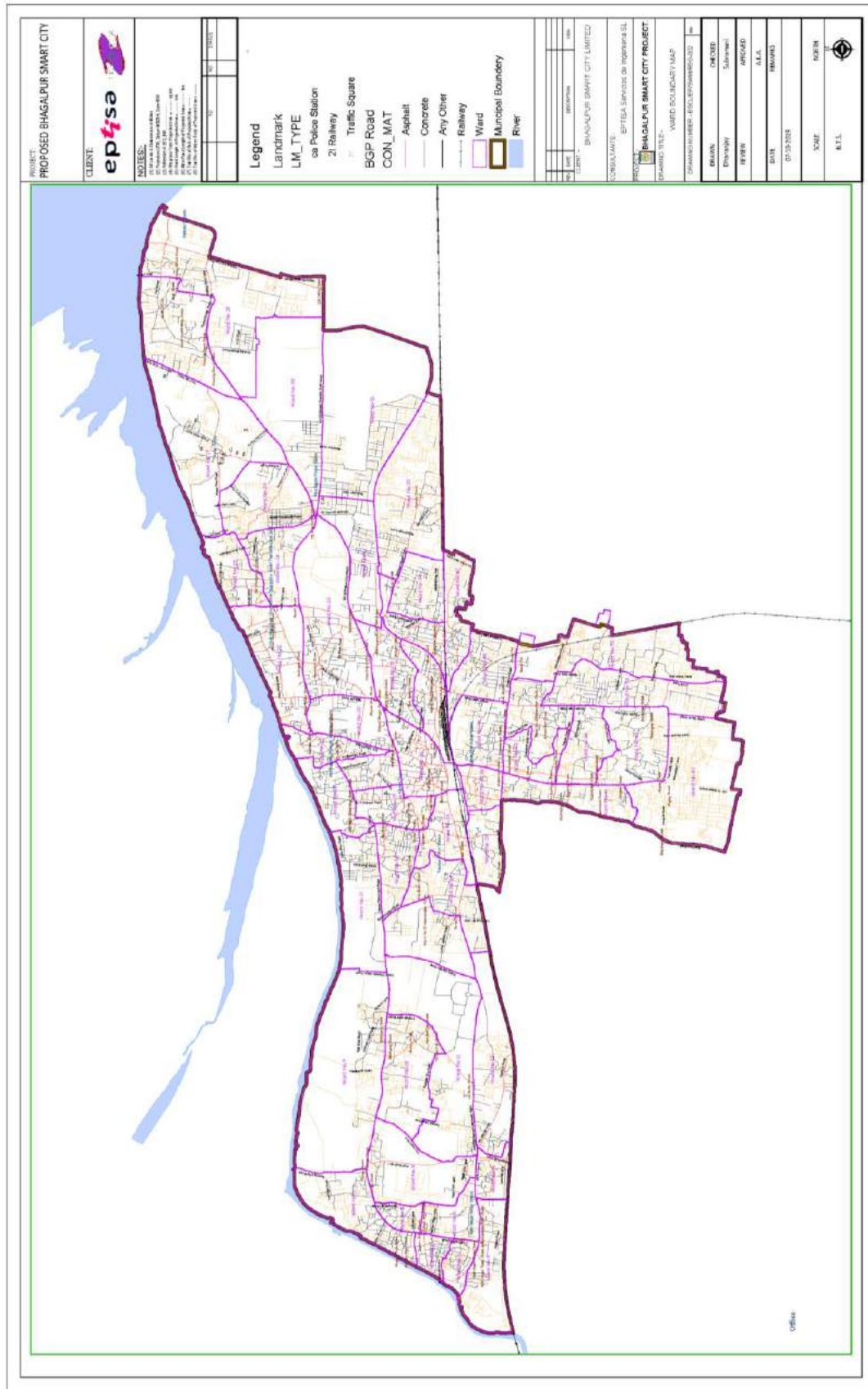
DATE

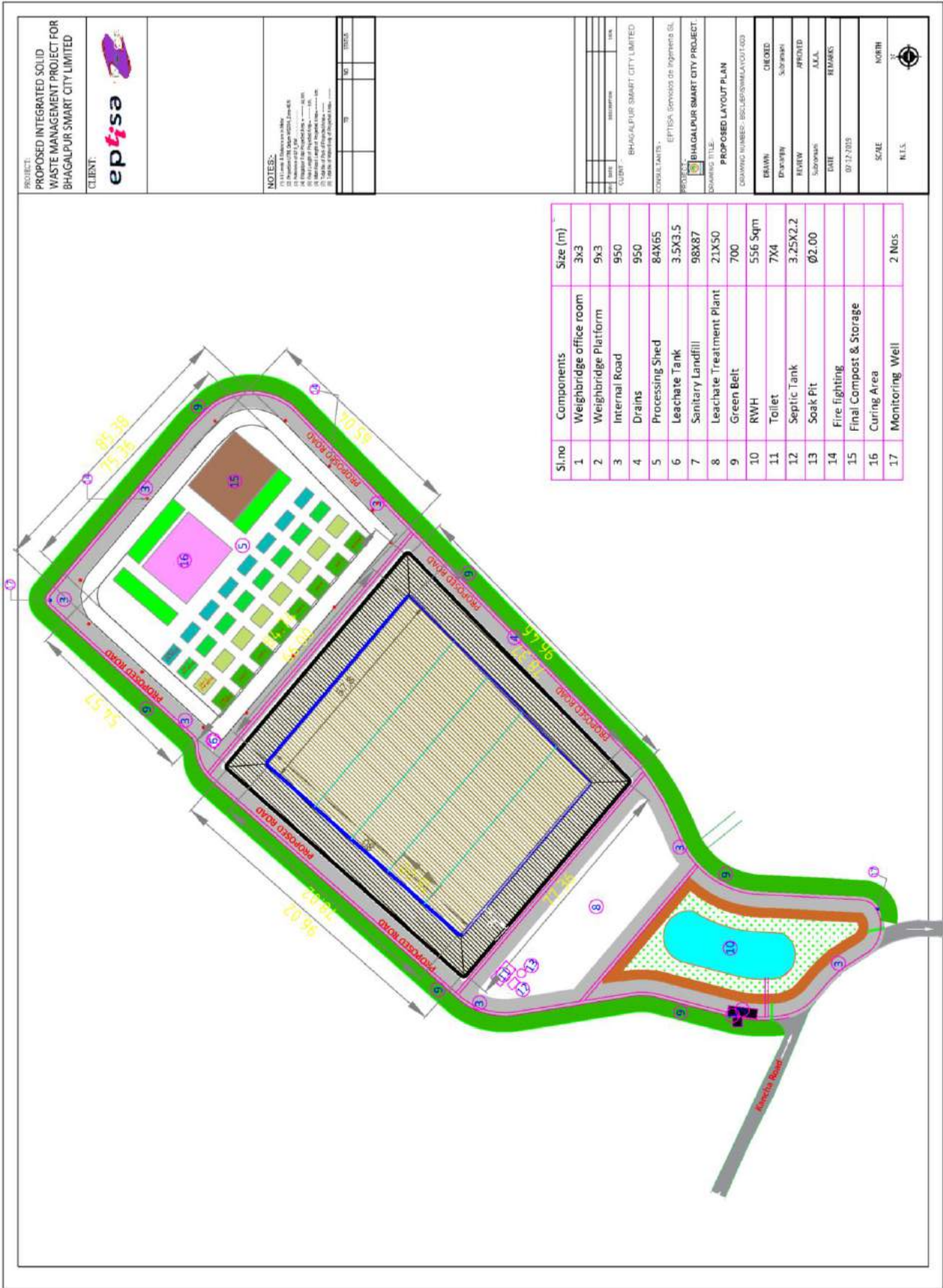
VOLUME-IV

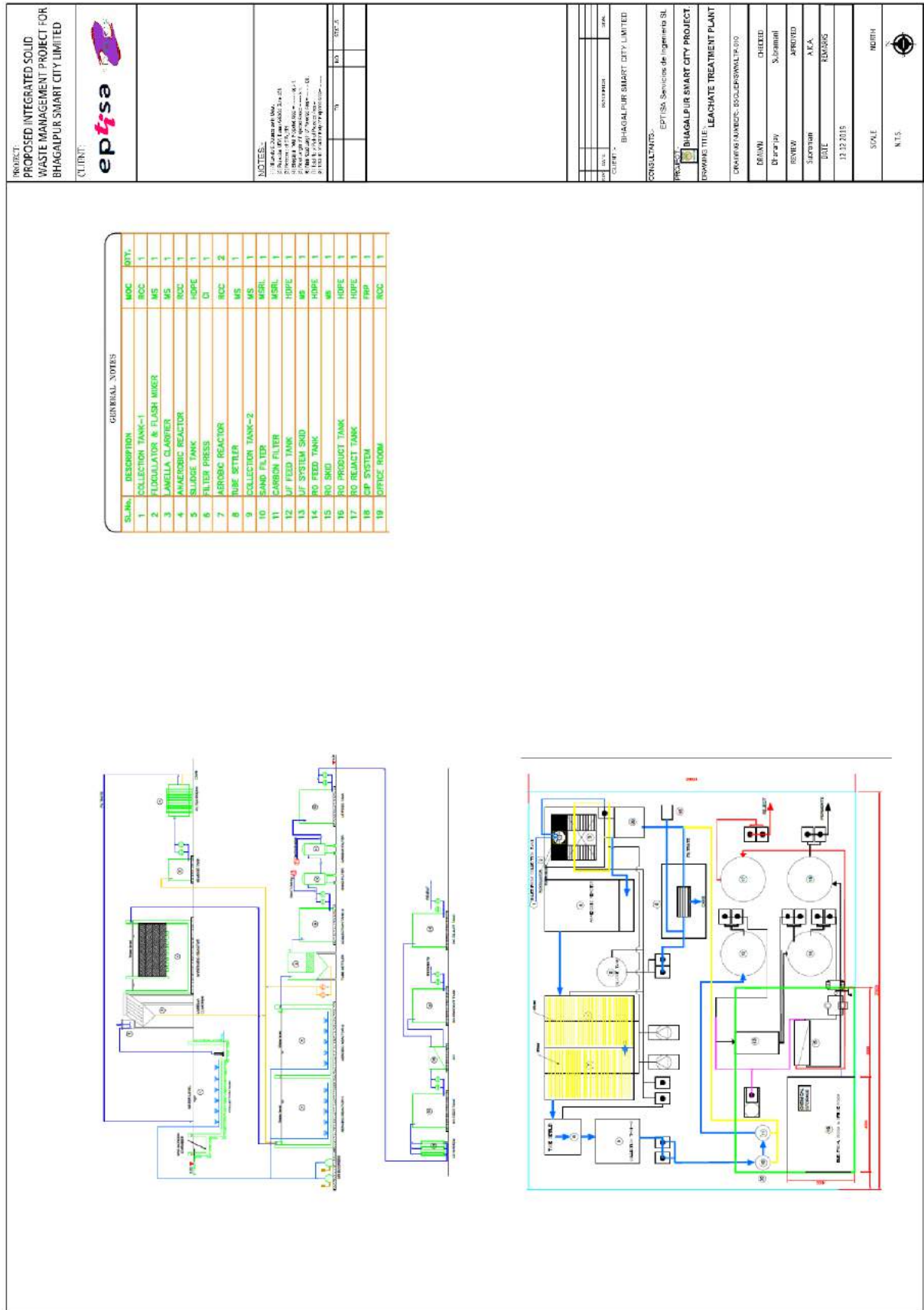
SECTION 11

DRAWINGS









PROJECT:
PROPOSED INTEGRATED SOLID WASTE MANAGEMENT PROJECT FOR BHAGALPUR SMART CITY LIMITED

CLIENT:
eptisa

NOTES:

1. All materials shall be of good quality and shall conform to the specifications of the relevant standards.
2. The design shall be based on the data provided in the RFP.
3. The design shall be based on the data provided in the RFP.
4. The design shall be based on the data provided in the RFP.
5. The design shall be based on the data provided in the RFP.
6. The design shall be based on the data provided in the RFP.
7. The design shall be based on the data provided in the RFP.
8. The design shall be based on the data provided in the RFP.
9. The design shall be based on the data provided in the RFP.
10. The design shall be based on the data provided in the RFP.
11. The design shall be based on the data provided in the RFP.
12. The design shall be based on the data provided in the RFP.
13. The design shall be based on the data provided in the RFP.
14. The design shall be based on the data provided in the RFP.
15. The design shall be based on the data provided in the RFP.
16. The design shall be based on the data provided in the RFP.
17. The design shall be based on the data provided in the RFP.
18. The design shall be based on the data provided in the RFP.
19. The design shall be based on the data provided in the RFP.

CONSULTANT:
EPTISA Services de Ingeniería SA

PROJECT:
BHAGALPUR SMART CITY PROJECT

DESIGN TITLE:
LEACHATE TREATMENT PLANT

DESIGNER:
BHAGALPUR SMART CITY LIMITED

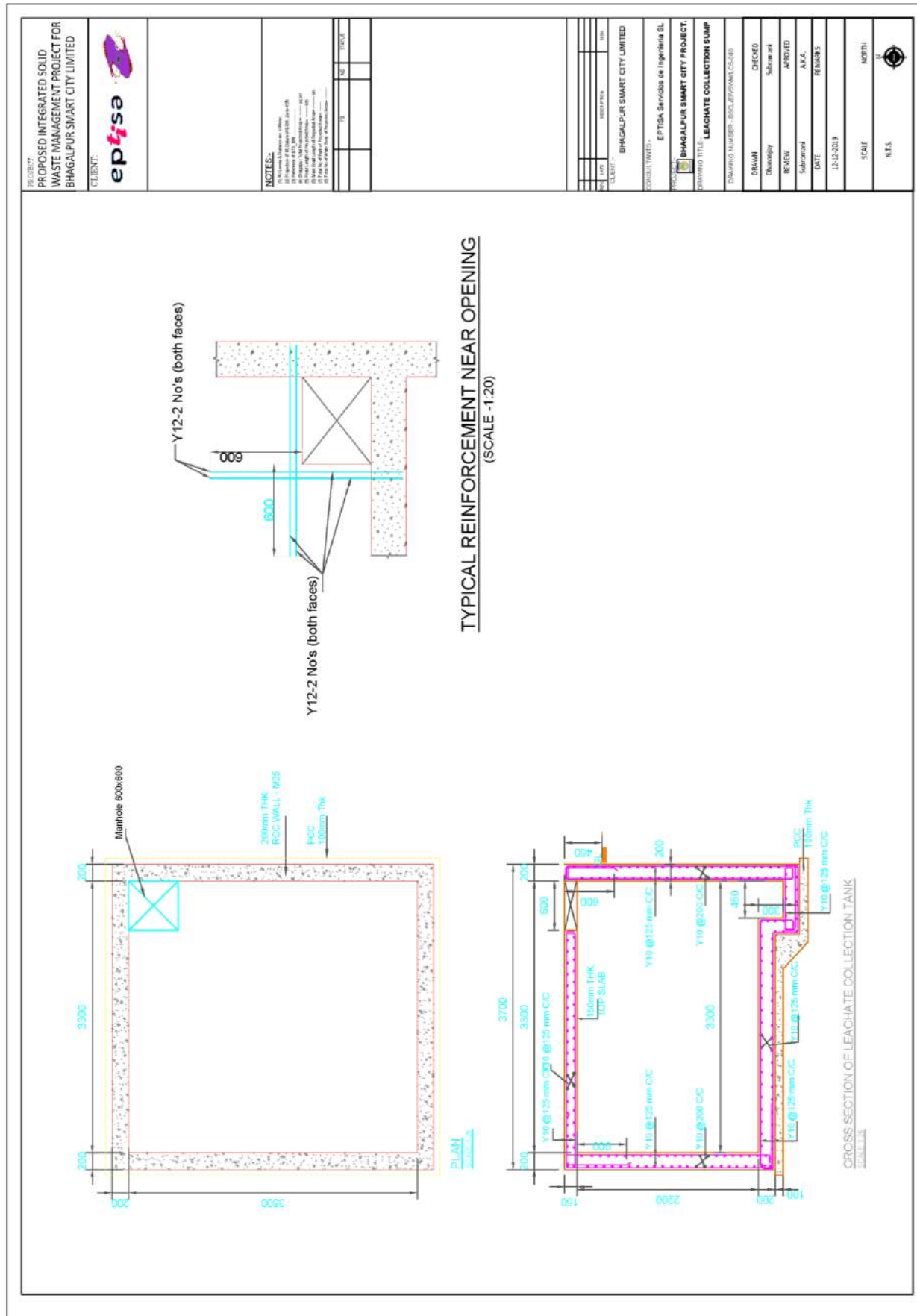
DATE:
11.12.2015

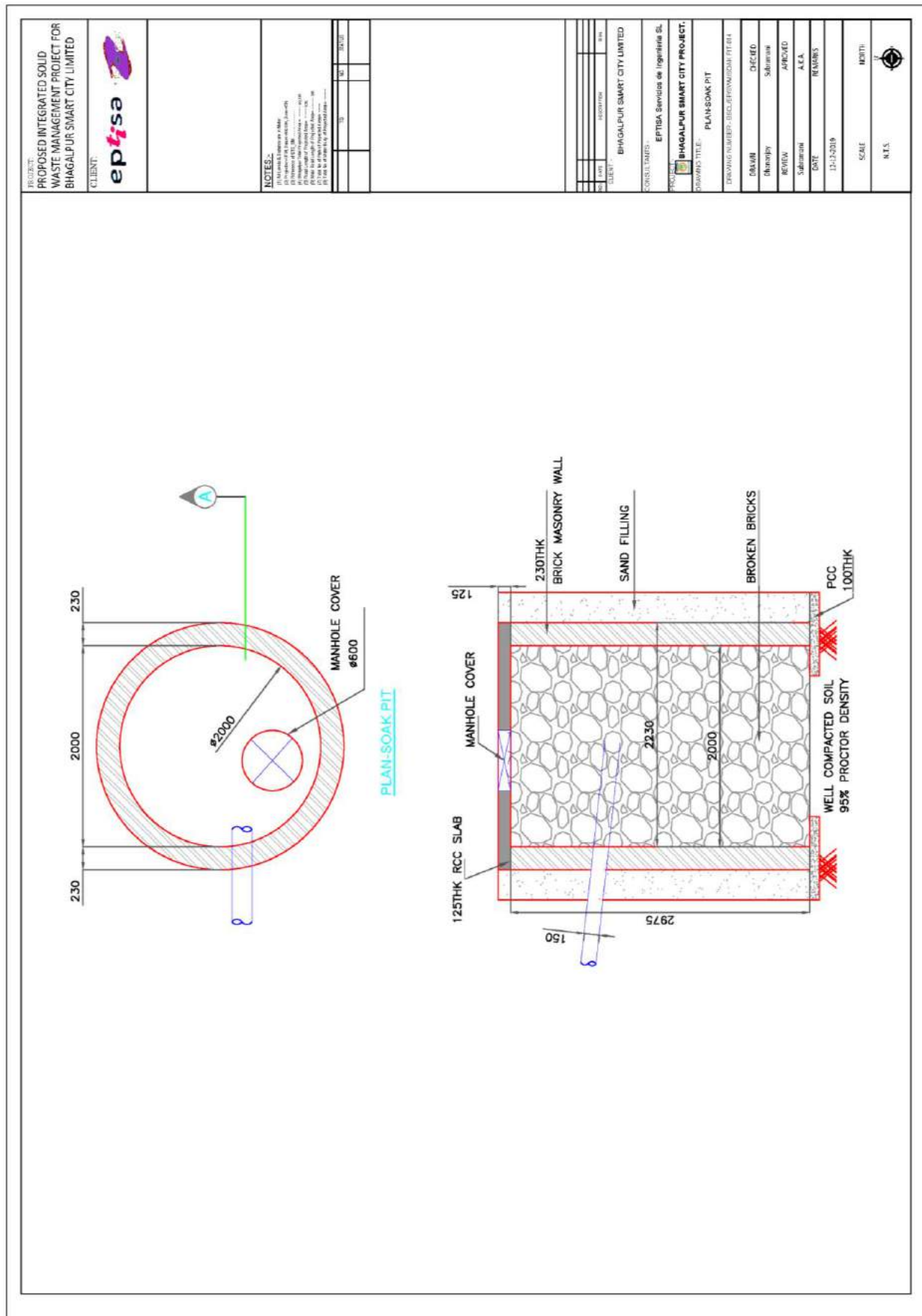
SCALE:
N.T.S.

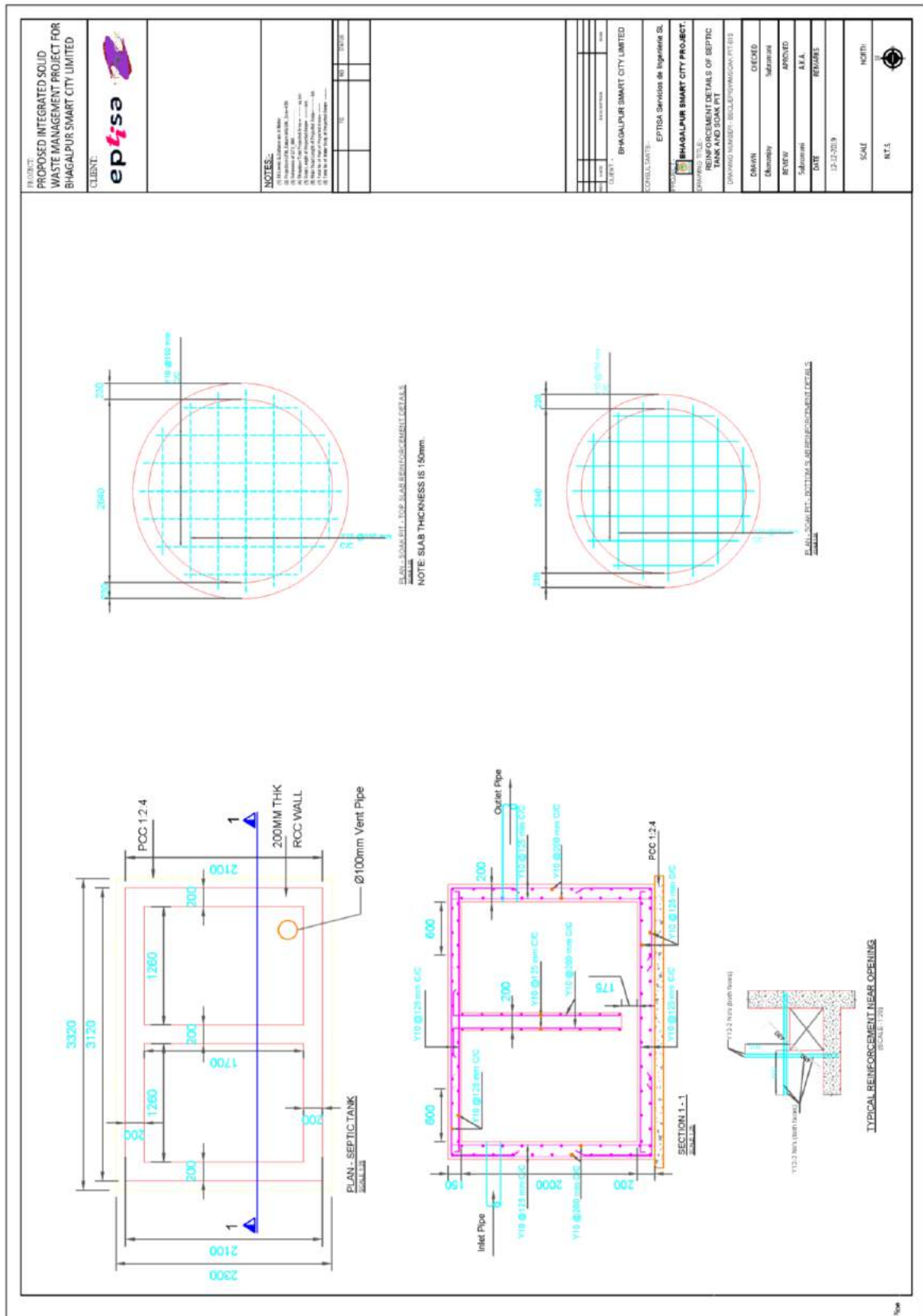
ORIENT:
NORTH

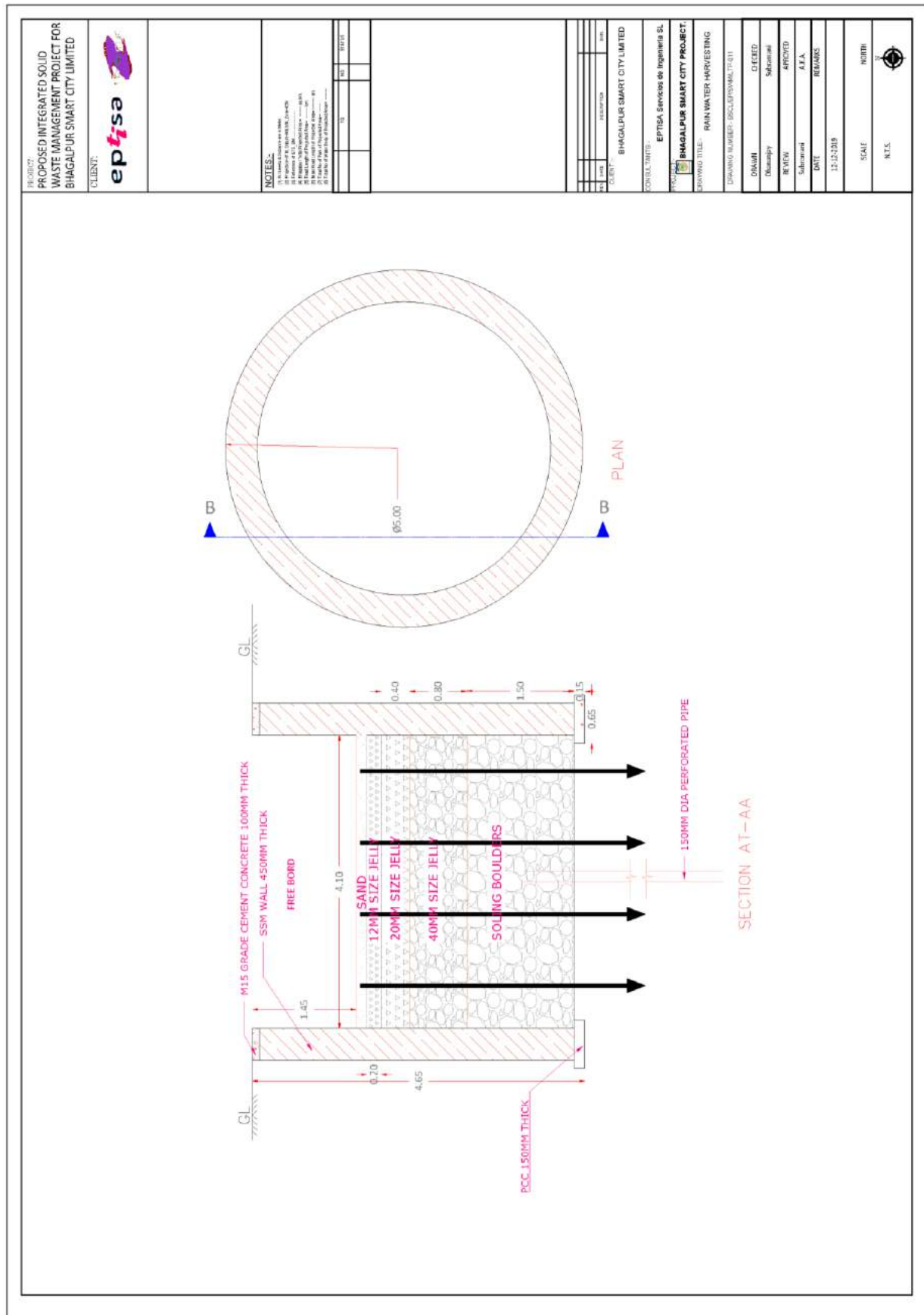
REVISIONS:

NO.	DESCRIPTION	DATE
1	ISSUED FOR TENDER	11.12.2015
2	ISSUED FOR TENDER	11.12.2015
3	ISSUED FOR TENDER	11.12.2015
4	ISSUED FOR TENDER	11.12.2015
5	ISSUED FOR TENDER	11.12.2015
6	ISSUED FOR TENDER	11.12.2015
7	ISSUED FOR TENDER	11.12.2015
8	ISSUED FOR TENDER	11.12.2015
9	ISSUED FOR TENDER	11.12.2015
10	ISSUED FOR TENDER	11.12.2015
11	ISSUED FOR TENDER	11.12.2015
12	ISSUED FOR TENDER	11.12.2015
13	ISSUED FOR TENDER	11.12.2015
14	ISSUED FOR TENDER	11.12.2015
15	ISSUED FOR TENDER	11.12.2015
16	ISSUED FOR TENDER	11.12.2015
17	ISSUED FOR TENDER	11.12.2015
18	ISSUED FOR TENDER	11.12.2015
19	ISSUED FOR TENDER	11.12.2015

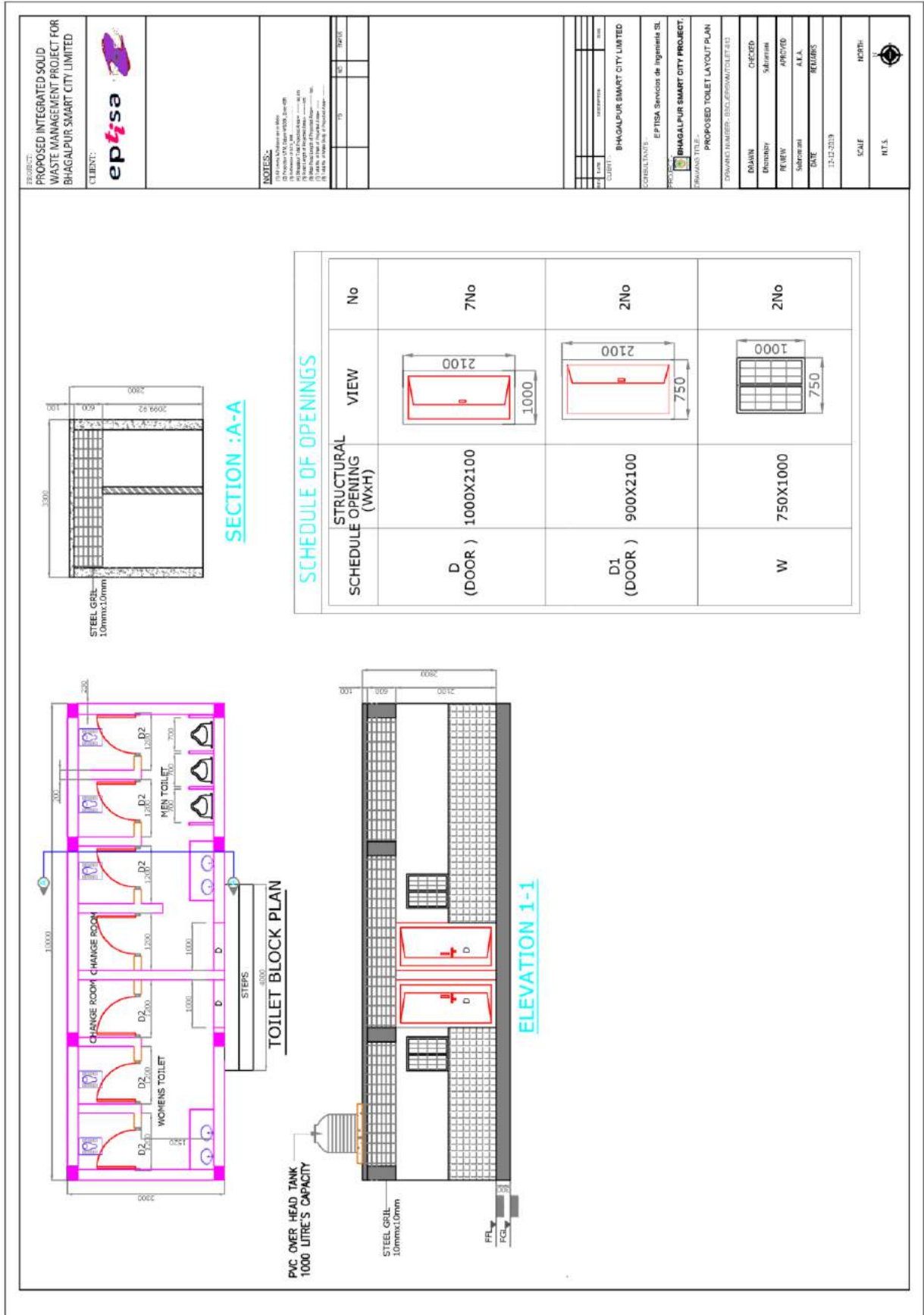




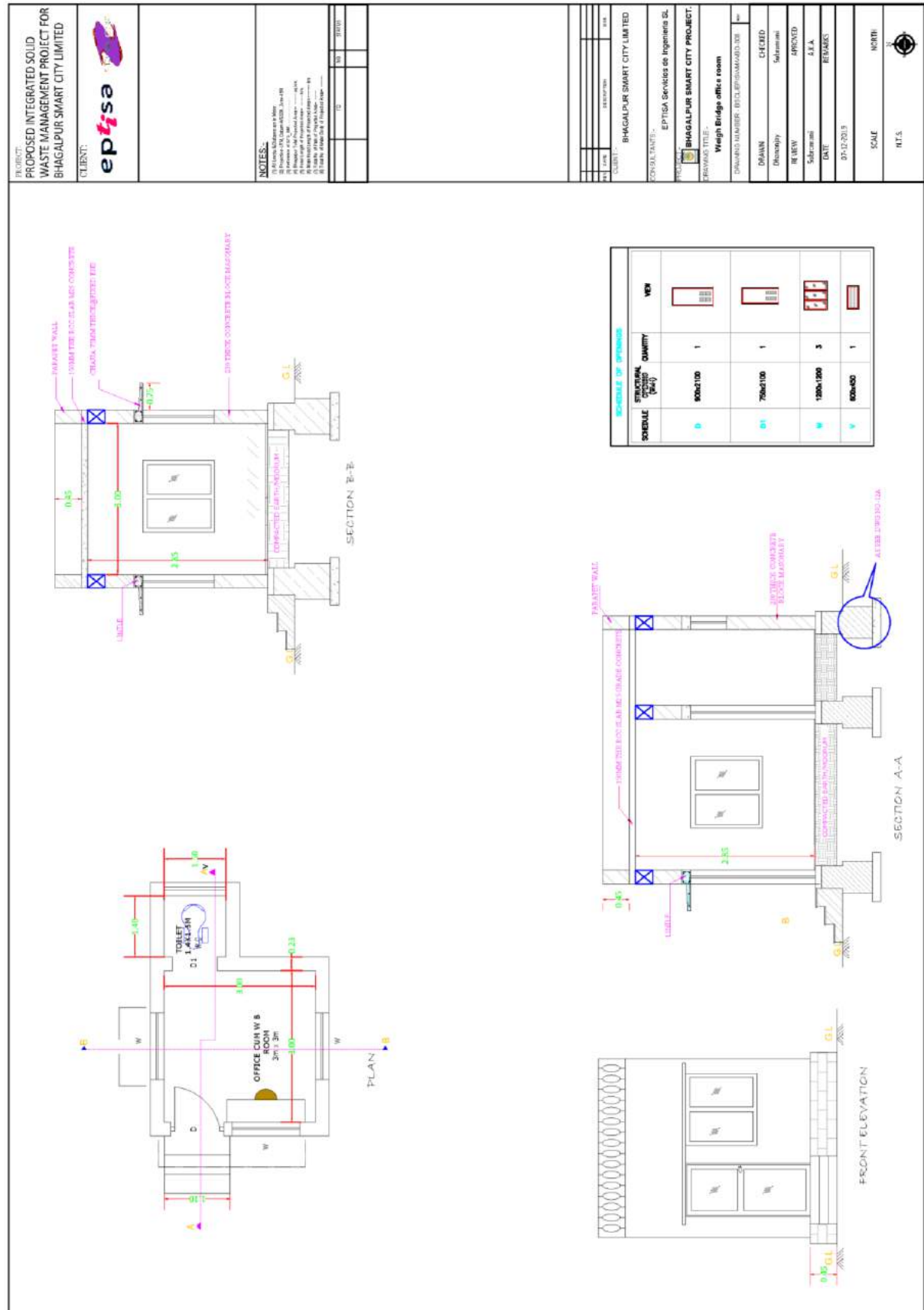


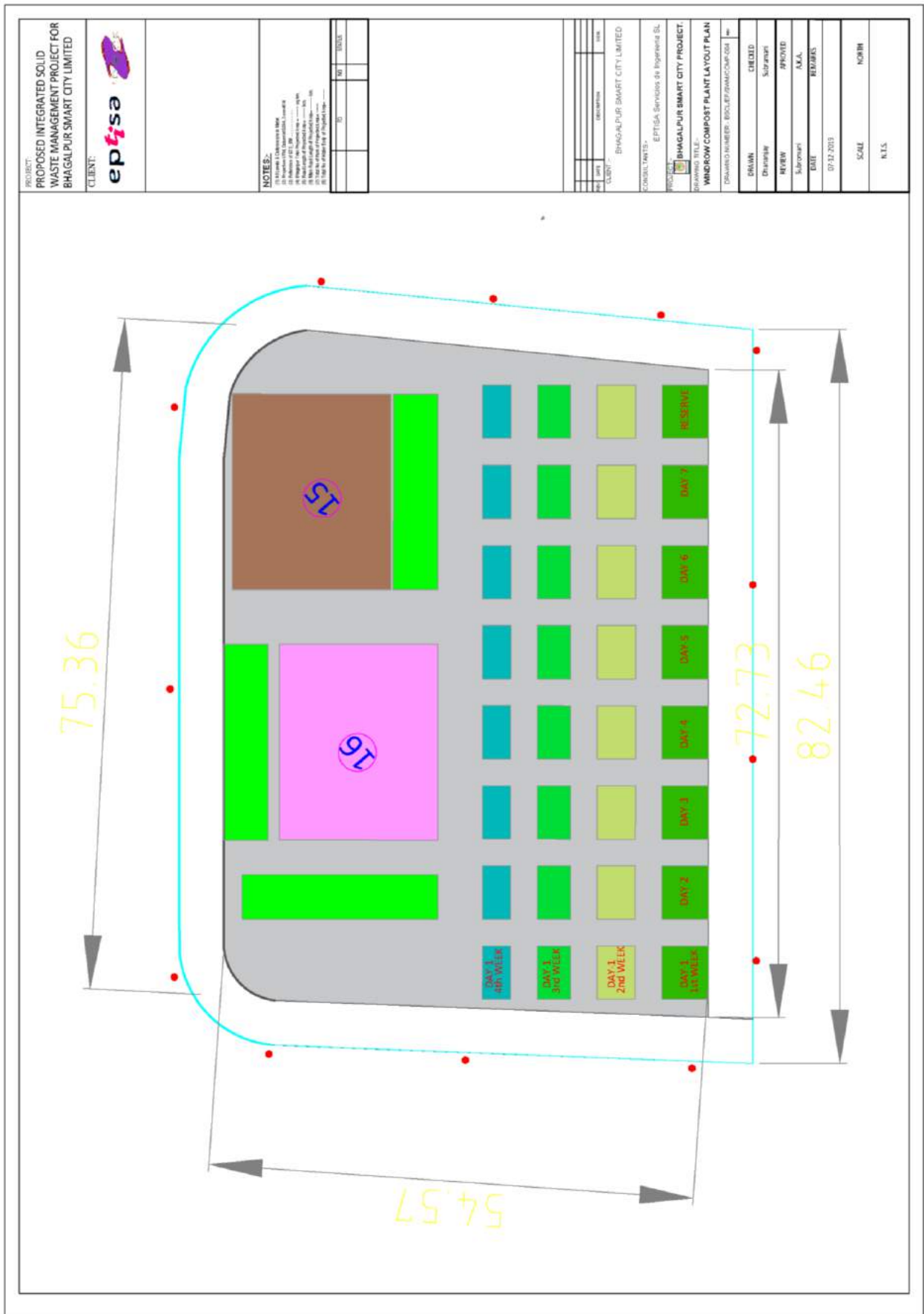


[illegible]



The figure displays two architectural plans for toilet blocks, labeled 'TOILET BLOCK PLAN' at the bottom of each. Both plans show a rectangular layout with a total width of 10000 and a depth of 3300. The layout is divided into 'WOMENS TOILET' and 'MEN TOILET' sections. Each section contains multiple 'D2' units, represented by small icons of a toilet and a sink. The plans also show a network of pipes and valves connecting the toilet units to a central system. The bottom plan includes a 'STEPS 3904.45' area at the bottom right. The top plan includes a 'STEPS 3904.45' area at the bottom left. The plans are oriented horizontally, with the 'WOMENS TOILET' section on the left and the 'MEN TOILET' section on the right.





VOLUME-V

SECTION 12

**DOCUMENTS TO BE
FURNISHED BY BIDDER**

CHECKLIST

Mandatory Check List			
Sl.no	Particulars	YES / NO	IF YES Page No.
1	Name of the Bidders		
2	Bid Control No.		
3	Details of DD Name of the Bank:- DD Number:- Date:- Amount:-		
4	EMD		
5	RFP Documents fee		
6	GST No. including GST return up to January 2020		
7	Pan Card		
8	Principal place of business		
9	Copy of following updated documents: i)Labour license, ii)EPF and iii)ESI including Registration no & Date		
10	Registration certificate from Central / State Govt. Department / CPSU/CPSE/State PSU etc.		
11	Details of Electrical Licence		
12	Electrical Qualification		
13	Water Supply/ Sanitary Engineering Qualification		
14	Power of Attorney		
15	if Joint Venture Details		

16	Partnership Deed/Article of association/ Memorandum		
17	Income Tax Return Details	2014-15	
		2015-16	
		2016-17	
		2017-18	
		2018-19	
18	Turn Over, Balance sheet, profit and loss account of firm / company duly certified by Chattered Accountant	2014-15	
		2015-16	
		2016-17	
		2017-18	
		2018-19	
19	Project Methodology		
20	CV 's as per ANNEXURE – II		
	Project Manager-----1 Nos		
	Support Engineers----1 Nos		
	Civil Engineer-----1 Nos		
	Electrical Engineer-----1 Nos		
	Mechanical Engineer----1 Nos		
	Quantity Surveyor-----1 Nos		
	Quality Control Engineer---1 Nos		
21	Work Experience Completion Status	2014-15	
		2015-16	
		2016-17	
		2017-18	
		2018-19	
22	Form of BID		
23	Undertaking from bidder		

24	Statement of compliance (bidder is not associated with consultant)		
25	Proposed Work Method and Schedule		
26	Work Programme		
27	Quality Assurance Programme		
28	Undertaking that the bidder will be able to invest a minimum cash upto 7.62 crore of contract value of work, during implementation of work.		
29	Machinery Details As per ANNEXURE – I		
	Indicative list of Vehicles / Processing equipment to be procured		
	Indicative list of equipments to be deployed		
	Dozer --- 1 Nos		
	Front end Loader --- 1 Nos		
	Smooth Wheeled Roller ---1 Nos		
	Water Tank --- 1 Nos		
	Bar Cutting Machine --- 4 Nos		
	Bar Bending Machine --- 2 Nos		
	Welding Machine --- 4 Nos		
	Vibrator (Needle) --- 4 Nos		
	Well-equipped Laboratory facility for quality test ---- 1 (one)		
	Transit Mixer with pumping arrangement --- 1 Nos		
	Steel Prop for 1000Sqm		
	Concrete Batching Plant (10 cum / hour) --- 1 unit		
	Steel Plate with fitting --- for 1000 Sqm		

	Staging pipe with fitting --- for 1000 Sqm		
	Cube Testing Machine (UTM) --- 1 Nos		
	Cube Mould ---- 50 Nos		
30	Affidavit regarding acceptance of terms and conditions given in sbd contract		
31	Affidavit validity period of bid in days		
32	Proposed sub contract firms involved		
33	Assessed available bid capacity		
34	Maximum value of similar nature of works executed in one year during last five years = A		
35	Completion time = N		
36	Value of existing commitment=B		
37	Bid capacity= $A \times 3 \times N - B$		
38	Any Other Relevant Documents		