

## ADDENDUM 1

**Loan No. and Title**

**ADB Loan No.: Applied For;  
Kolkata Environmental Improvement Investment Program (KEIIP) – Project 2**

**Contract No. and Title**

**KEIIP/NCB/TR-2/SD 12/2015-16  
Laying of Trunk Sewer along James Long Sarani by Micro-tunnelling Method.**

SI. No	Description and Reference clause of Bid document	Details of Addendum
	Section 4 : Bill 1 of BOQ Item SI No. 1	<p>Replace :</p> <p>Survey, Investigations, Designing, Supplying and Laying of R.C.C. NP pipes with M-50 grade of concrete &amp; inside HDPE lining using trenchless/micro-tunneling technology true to line / curve as shown in the construction drawings, including preparation of survey / construction drawing, construction of all jacking and receiving shafts (pits), earthwork in excavation, backfilling after conversion of shafts to manholes, bailing out / dewatering (by pumps or otherwise) water from working area, disposal of muck / spoil, dismantling and removal of jacking / receiving shafts, CCTV survey of pipe line, construction of manholes including RCPC manhole frame, covers and polyelastomer foot rest, barricading, all safety measures, sign boards, area lighting, transportation, temporary diversion of utilities, traffic diversion arrangements, cleaning of pipeline, final clearing of sites, etc. all complete as per drawings and specification including cost of all materials, labours and plant &amp; equipment. The rate shall include all necessary equipment, machinery, man power and consummables. complete as per drawings, specifications and direction of Engineer.</p> <p>By :</p> <p>'Survey, Investigations, Designing, Supplying and Laying of R.C.C. NP pipes with M-50 grade of concrete &amp; inside HDPE lining (integrally cast) using trenchless/micro-tunneling technology true to line / curve as shown in the drawings, including preparation of survey / construction drawing, construction of all jacking and receiving shafts/pits, earthwork in excavation, backfilling, bailing out / dewatering (by pumps or otherwise) water from working area, disposal of muck / spoil, dismantling and removal of jacking / receiving shafts, CCTV survey of pipe line, construction of mandatory manholes (as shown in the drawings) including RCPC manhole frame, covers and poly-elastomer foot rest, barricading, all safety measures, sign boards, area lighting, transportation, temporary diversion of utilities, traffic diversion arrangements, cleaning of pipeline,</p>

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		final clearing of sites, etc. all complete as per drawings and specification including cost of all materials, labours and plant & equipment. The rate shall also include all necessary equipment, machinery, man power and consumables complete as per drawings, specifications and direction of Engineer.'										
	Section 4 : Bill 3 of BOQ Item SI No. 6	<p>Replace :</p> <p>'Earthwork in excavation in trenches and pits for sewers/ drains, manholes, catch pits, gully pits, inspection pits etc. and any other structures, including bailing out/ dewatering manually or by pumps in all sorts of soil or loose material including removing surplus spoils and debris to a destination to be arranged by Contractor and in keeping with laws of the land, as per specification, drawing and as directed by the Engineer (No extra lead will be payable). (Volume to be measured from the bottom of the road crust i.e. excluding the volume executed under item 1, 2, 3, 4 &amp; 5 above.) Trench shall be kept dry by dewatering and removal of slush.'</p> <p>By :</p> <p>'Earthwork in excavation in trenches and pits for sewers/ drains, manholes, catch pits, gully pits, inspection pits etc. and any other structures, including bailing out/ dewatering manually or by pumps in all sorts of soil or loose material including removing surplus spoils and debris to a destination to be arranged by Contractor and in keeping with laws of the land, as per specification, drawing and as directed by the Engineer (No extra lead will be payable). (Volume to be measured from the bottom of the road crust i.e. excluding the volume executed under all above items). Trench shall be kept dry by dewatering and removal of slush.'</p>										
	Section 6 : Pg 9 of 115 Clause 1.1.3	<p>Replace Last Paragraph:</p> <p>'Full details of the different items covered by the scope of work are in Section 5 on Technical Specification.'</p> <p>By:</p> <p>'Full details of the different items covered by the scope of work are in Technical Specification.'</p>										
	Section 6 : Pg 10 of 115 Clause 2.1.1	<p>Replace the existing table :</p> <table border="1" data-bbox="867 1177 1957 1328"> <thead> <tr> <th data-bbox="867 1177 1131 1252">Method</th> <th data-bbox="1131 1177 1507 1252">Stretch</th> <th data-bbox="1507 1177 1629 1252">Size</th> <th data-bbox="1629 1177 1772 1252">Length (km)</th> <th data-bbox="1772 1177 1957 1252">Depth of Invert (m)</th> </tr> </thead> <tbody> <tr> <td data-bbox="867 1252 1131 1328">Micro-tunnelling</td> <td data-bbox="1131 1252 1507 1328">From MH C5005 to MH C5012</td> <td data-bbox="1507 1252 1629 1328">1600 Ø</td> <td data-bbox="1629 1252 1772 1328">0.657</td> <td data-bbox="1772 1252 1957 1328">4.560 to 5.787</td> </tr> </tbody> </table>	Method	Stretch	Size	Length (km)	Depth of Invert (m)	Micro-tunnelling	From MH C5005 to MH C5012	1600 Ø	0.657	4.560 to 5.787
Method	Stretch	Size	Length (km)	Depth of Invert (m)								
Micro-tunnelling	From MH C5005 to MH C5012	1600 Ø	0.657	4.560 to 5.787								

Sl. No	Description and Reference clause of Bid document	Details of Addendum				
		Micro-tunnelling	From MH C5012 to MH C4051	2200 Ø	0.874	6.165to 6.955
Micro-tunnelling	From MH C4051 to Joka PS & From MH C5030P to MH C5030N	2400 Ø	2.249	6.800to 7.992		
		Total	3.78			
Table mentioned in the clause shall be replaced with Table enclosed herewith.						
		<b>Method</b>	<b>Stretch</b>	<b>Size</b>	<b>Length (km)</b>	<b>Depth of Invert (m)</b>
		Micro-Tunneling	From MH C1011 to MH C1022	1600Φ	0.657	5.020 to 5.769
		Micro-Tunneling	From MH C1022 to MH C3023A	2200Φ	0.874	6.300 to 7.009
		Micro-Tunneling	From MH C3023A to MH C5030N/A	2400Φ	2.249	7.009 to 8.099
			Total		3.78	
	Section 6 : Pg 14 of 115 Clause 3.1.5 Last Sentence	Delete the line "Besides, the submittal will include details of flap gates that are to be installed at the outfall structure".				
	Section 6 : Pg 21 of 115 Clause 3.1.20, point No. (a) Line no 6 to 8	Delete the sentence 'the special arrangements to be made inside the trench to facilitate welding on the outside of joints of 1829 mm dia steel pipes'				
	Section 6 : Pg 33-34 of 115 Clause 4.1.25	Add the following after point (iv): 'v) Casting and stacking yard.'				
	Section 6 : Pg 36 of 115 Clause 5.1	Delete the first sentence : "Stretch to be laid by Open Cut Method (RCC Gravity Sewer)"				
	Section 6 : Pg 36 of 115	Add additional sub-clause 5.2 'HDPE Liner – High density Polyethylene (HDPE) liner shall be of minimum thickness 3mm. It shall be				

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		manufactured with co-extruded anchors/T-ribbed. The anchors and lining shall be integrally cast with RCC pipe. During pre-casting the anchors shall be embedded within the concrete. During post-casting phases, installation and operation it shall not get free off from RCC surface. HDPE welding shall be carried out at pipe joints after installation. The locking anchorage shall be minimum 10mm inside the concrete. The locking extension shall be minimum 60mm apart. It shall be abrasion resistant as per ASTM and should be able to resist impact during operation. Its material property and chemical resistant shall complying with ASTM relevant codes.'
	Section 6 : Pg 41 of 115 Clause 6.1.9, point No. vi	Replace : 'Construction of brick manhole by converting jack pit/receiving pit as per drawing including fixing 35T RCPC manhole cover' By: 'Construction of mandatory manholes complete in all respect, as per drawings and specification.'
	Section 6 : Pg 42 of 115 Clause 6.1.9	Include additional point : 'xvi) utility survey and submission of report'
	Section 6 : Pg 47 of 115 Clause 7.7.6	Replace last paragraph: 'For the items 1.11.1 and 1.11.2 no additional payment will be made to the Contractor', By 'For the relevant items no additional payment will be made to the Contractor.'
	Section 6 : Pg 56 of 115 Clause 8.9.6	Including additional Steel grade : 'Grade designation – S 500 Bar type conforming to governing IS speciation- IS:1786 High Yield Strength Deformed Bars Characteristic strength – 500 MPa Elastic Modulus – 200 GPa'
	Section 6 : Pg 67 of 115 Clause 8.10.5	Include additional grade of concrete : 'M50 as per relevant codes'
	Section 6 : Pg 8 of 115 Clause 1.1.2	Under the clause, Package no. 'Tr-2/SD 05' shall be read as 'Tr-2/SD 13'
	Section 6 : Pg 12 of 115	Drg. No. 'KEIIP/TR-2/SD 04/03-08' shall be read as 'KEIIP/TR-2/SD 12/03-08'.

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	Clause 2.1.7	
	Section 6 : Pg 21 of 115 Clause 3.1.19	Replace : 'The submittals should be on the same line as described in clause 3.3 covering .....' By: 'The submittals should be on the same line as described in relevant cause covering .....
	Section 6 : Pg 21 of 115 Clause 3.1.22	Replace : 'The submittals should be on the same line as described in clause 3.13 covering .....' By: 'The submittals should be on the same line as described in relevant cause covering .....
	Section 6 : Pg 21 of 115 Clause 3.1.23	Replace : 'The submittals should be on the same line as described in clause 3.14 covering .....' By: 'The submittals should be on the same line as described in relevant cause covering .....
	Section 6 : Pg 21 of 115 Clause 3.1.24	Replace : 'The submittals should be on the same line as described in clause 3.16 covering .....' By: 'The submittals should be on the same line as described in relevant cause covering .....
	Section 6 : Pg 22 of 115 Clause 3.1.26	Replace : 'The submittals should covered the items generally as described in clause 3.18and.....' By: 'The submittals should covered the items generally as described in relevant cause and .....
	Section 6 : Pg 22 of 115 Clause 3.1.28	Replace : 'The submittals should covered on the same lines as in clause 3.20 and.....' By: 'The submittals should covered on the same lines as in relevant cause and.....'
	Section 6 : Pg 22 of 115 Clause 3.1.29	Replace : 'The submittals should be on the same line as described in clause 3.21 and .....' By: 'The submittals should be on the same line as described in relevant cause and .....
	Section 6 : Pg 39 of 115	In line 22, replace 'KEIIP/TR-2/SD 04/01', by 'KEIIP/TR-2/SD 12/01'



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	Clause 6.1.12	
	Section 6 : Pg 40 of 115 Clause 6.1.12	In line 2 of relevant page, replace 'KEIIP/TR-2/SD 04/01', by 'KEIIP/TR-2/SD 12/01'
	Section 6 : Pg 40 of 115 Clause 6.1.5	Drawing no.: 'KEIIP/TR-2/SD 04/01' shall be replaced with 'KEIIP/TR-2/SD 12/01'.
	Section 6 : Annexure B-6 PRECAUTIONS TO BE TAKEN DURING JACKING OPERATION	Replace Line no. 9 under point a): 'Maximum lipping between edge of adjacent pipes +- 5m' By : 'Maximum lipping between edge of adjacent pipes +- 5mm'
	Section 6 : Annexure B-6 PRECAUTIONS TO BE TAKEN DURING JACKING OPERATION	Under point g), line 4 Replace 'D-9' by 'B-9'
	Section 4 Bill of Quantities	Bills of the BOQ shall be designated by : Bill no. 1 – Pipe laying by Micro-tunneling method Bill no. 2 – Pipe laying by Jack pushing method Bill no. 3 – Pipe laying by Open cut method
	Section 6 : Technical Specification - Technical Parameters Annexure B-6	Under point ( f), Line no 2 Replace 'Annexure E' by 'Annexure C'
	Section 6 Technical Specifications	Under header 'Annexure C' shall be replaced by 'Annexure A'. Under header 'Annexure D' shall be replaced by 'Annexure B'. Under header 'Annexure J' shall be replaced by 'Annexure C'. Under header 'Annexure N' shall be replaced by 'Annexure D'.
	Section 6 Technical Specifications	Replace all ' KEIP' by 'KEIIP'.



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ADB Loan No.: Applied For;  
Kolkata Environmental Improvement Investment Program (KEIIP) – Project 2

Contract No. and Title

KEIIP/NCB/TR-2/SD 12/2015-16  
Laying of Trunk Sewer along James Long Sarani by Micro-tunnelling Method.

Sl. No.	Description and Reference Clause of Bid document	Details of Addendum 1
1	<b>Section 3: Evaluation &amp; Qualification Criteria</b> <b>Table of Criteria</b>	Insert Clause 2.4.2 : Construction Experience in Key Activities.....Page 8
2	<b>Section 5</b> Eligible Countries	Replace country list No.35: 'Micronesia, Federal States of By 'Micronesia, Federated States of
3	<b>Sub-Clause 1.1.3.7 Defects Notification Period</b> Section 8 Particular Conditions of Contract	Replace "365 days for each Section of the Works from the date of taking over of each Section. (refer "Summary of Sections of the Works" given below)". By "365 days".
4	<b>Sub-Clause 4.8 Safety Procedure</b> Section 8 Particular Conditions of Contract	Delete the sentence : A deduction of 0.5% shall be made from the interim payment for non-compliance of the safety measures during the implementation stage.
5	<b>Sub-Clause 4.18 Protection of the Environment</b> Section 8 Particular Conditions of Contract	Delete the sentence : A deduction of 0.5% shall be made from the interim payment for non-compliance of the environmental protection measures during the implementation stage.



# Bill of Quantities

## Content

The Bill of Quantities is divided into following sections:-

- (a) Preamble for Works
- (b) Summary
- (c) Work Items (grouped into Parts);





## Bill of Quantities

**(a) PREAMBLE TO BILL OF QUANTITIES**

**FOR WORKS**

**1.0 INTRODUCTION**

- 1.1 The Bill of Quantities (BOQ) shall be read in conjunction with the Instructions to Bidders, General Conditions of Contract, Particular Conditions of Contract, Technical Specifications, Data Sheets and Drawings. The rates quoted shall be inclusive of cost of all materials, transportation and carriage of material upto works site, labour, plant and equipment, tools and tackles, safety gadgets, incidentals etc. as may be required for that particular item in the BOQ which is to be read in conjunction in the specification.
- 1.2 The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be on the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices tendered in the priced Bill of Quantities. If such rates are not available in the Bill of Quantities, this will be treated as extra work and such rates and prices will be fixed by the Engineer as per the terms of the Contract.
- 1.3 Mode of measurement, if not specified elsewhere shall be followed as per available codes of practice published by the Bureau of Indian Standards (BIS).
- 1.4 The rates and prices tendered in the priced Bill of Quantities shall, except insofar as it is otherwise provided under the contract, include all temporary facilities, access, notices to maintain traffic prevailing in an accessible manner, as far as possible for similar flow existing and also including all construction of plant, labour, supervision, materials, erection, maintenance, insurance, overhead, profit, taxes and duties together with all general risk, liabilities and obligation set out or implied in the contract.
- 1.5 General directions and descriptions of work and materials are not necessarily repeated or summarized in the Bill of Quantities. The Bidder must refer to the relevant sections of the bid documents including specifications, data sheets and drawings before quoting rates or prices against each item in the Bill of Quantities.
- 1.6 Provisional Sum so designated shall be expended in whole or in part at the direction and discretion of the Employer/ Engineer in accordance with the General Conditions of Contract. Payment for work under provisional item shall be payable for statutory requirement by other agencies viz. CESC, WBSEDCL, KMC, KMDA, PWD, Kolkata Police, West Bengal Police & specialized agencies or the like and for any unforeseen items of work or for any other items of procurement for which the quantity cannot be planned before bidding. . Payment for statutory requirement by the external agencies as above will be made as per bill raised by the other agency + 7.5% as Contractor's service charges. However, approval of the agency and their rates shall be done jointly by the Engineer and Employer. The amount kept under this head is as decided by the Employer and the Contractor shall not change this figure or quote of his own. The amount is subject to variation as per requirement of project with approval of the Employer.
- The Provisional Sum of INR 6,00,00,000.00 (INR Six Crore only), forming a part of contract value, shall be expended for shifting and / or repairing of utilities and supporting utilities, dismantling and restoration of entry, engagement of traffic volunteers, payment of fees of various statutory authorities, transplantation of trees or planting new saplings with guard and other miscellaneous works not covered in the Bill of Quantity and as directed by the Engineer. The Bidder need not quote any rate for the Provisional Sum.
- 1.7 Abbreviations used in Bill of Quantities and rates have the meaning shown below :

KMC	–	The Kolkata Municipal Corporation
KMDA	–	Kolkata Metropolitan Development Authority
CESC	–	Calcutta Electric Supply Company Limited
WBSEDCL	–	West Bengal State Electricity Distribution Company Limited
IRC	–	Indian Road Congress
CPWD	–	Central Public Works Department
PWD	–	Public Works Department
I&WD	–	Irrigation and Waterways Directorate
NABHI	–	Nabhi Publication (Analysis of Rates)
RCC	–	Reinforced Cement Concrete
PCC	–	Plain Cement Concrete
CC	–	Cement Concrete
PSC	–	Pre-Stressed Concrete
CM	–	Cement Mortar
CBW	–	Cement brick work
MS	–	Mild Steel
CI	–	Cast Iron
DI	–	Ductile Iron
SW	–	Glazed Stoneware Pipes
DWC	–	Double Wall Corrugated
PVC	–	Polyvinyl Chloride
HDPE	–	High Density Polyethylene
km	–	Kilometer
m	–	Meter
cm	–	Centimeter
mm	–	Millimeter
RM	–	Running meter
cum / m <sup>3</sup>	–	Cubic meter
sqm / m <sup>2</sup>	–	Square meter
Dia./ dia.	–	Diameter
Wt	–	Weight
MT	–	Metric Tonne
kg	–	Kilogram
LS	–	Lump sum
No./ no.	–	Number
SWF	–	Storm Water Flow
DWF	–	Dry Weather Flow
TS	–	Trunk Sewers
WBM	–	Water bound macadam
BOQ	–	Bill of Quantity
TDH	–	Total Dynamic Head

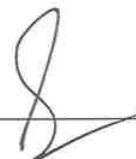
## 2.0 GENERAL

### 2.1 General Basis for Pricing



- 2.1.1 The Bidder shall be deemed to have read and examined the Bid Documents as well as inspected the project site thoroughly to conceive the work in totality to quote against each item of work as given in the BOQ.
- 2.1.2 The Bidder shall be deemed to be fully conversant with the site conditions and the nature and complexity of the work to be undertaken which include construction of sewerage & drainage network by the process of microtunnelling / jack-pushing / suitable trenchless technology / open cut method and taking into account all eventualities which can arise before, during and after project execution.
- 2.1.3 The bidder is expected to inspect the Site to investigate the following items before quoting their rates in the bids:
- a) Nature and type of soil proposed for excavation and safety of excavation;
  - b) Availability of power for execution;
  - c) Availability of water for execution;
  - d) Means of disposal of storm water/bailing out water from the Site;
  - e) Means of disposal of water due to de-watering at the Site;
  - f) Nature and type of protection required for neighboring property to ensure full safety during construction activities in progress; and
  - g) Place for disposal of serviceable / unserviceable material obtained during construction activities in progress
- 2.1.4 It is to be expressly understood that the measured work is to be taken net (not withstanding any system or practice to the contrary) according to the actual quantities finished according to the drawings or as may be ordered from time to time by the Engineer and the cost calculated for the respective prices.
- 2.1.5 Unless otherwise stated, all items shall be measured as executed as per drawing and specification and no allowance will be made for wastage, working space, bulking or shrinkage, and the like.
- 2.1.6 No land will be provided by the Employer to the Contractor for constructing any structure for his labor, workman and supervisory camps, un-authorized hutments, canteen or teashops at the Site or within the premises. The Contractor shall make his/her own arrangements for the same outside the premises/boundary. These, if any, shall be with the knowledge of and prior approval of the Employer's Representative.
- 2.1.7 The Contractor shall have to establish office at site with adequate space for their personnel, inclusive of necessary furniture & furnishing, computers with printers, consumables etc., storage space for equipment, materials etc. Contractor's quoted rates and price shall be inclusive of this and no separate payment will be made on this account.
- 2.1.8 The quoted rates and prices shall also be inclusive of communication system to be established at site (telefax, internet facilities etc.), vehicles for movement at site etc. No extra cost against such items will be paid.
- 2.1.9 Contractor shall have to provide office at site with adequate space for the Engineer, inclusive of necessary furniture & furnishing, computers with printers, consumables etc., storage space for equipment, materials etc. as per contract. Contractor's quoted rates and price shall be inclusive of this and no separate payment will be made on this account.
- 3.0 MISCELLANEOUS
- 3.1 Temporary power connections, telephones, construction water shall be arranged by the Contractor at his own cost and shall be deemed to be included in their quoted rates. Alternative power arrangement shall be made by Contractor without any extra charge.
- 3.2 The alignment of sewer lines as shown in drawings, sizes and invert levels as given in the data sheet may change and some times may be routed through a different alignment. Such change

- in alignment or route shall have to be surveyed, construction drawings shall be prepared and executed by the Contractor as per direction of the Engineer.
- 3.3 Necessary arrangements for traffic diversion shall have to be done by the Contractor as per approved programme between the Engineer and the Contractor. The traffic diversion programme shall be prepared by the Contractor and submitted to the Engineer for approval. Any cost on account of traffic diversion shall have to be incorporated in the quoted price. No extra payment will be made on this account.
- 3.4 All underground and overground utility items shall have to be suitably supported during the construction phase by the Contractor so that the existing utility services are not damaged. No extra payment will be made on this account.
- 3.5 The Contractor shall keep plumbers and electricians ready for repair/ shifting of existing underground/ overground utilities and for crisis management.
- 3.6 Contractor shall consider in his rates the transfer of 'Great Trigonometric Survey' (GTS) level from the nearest GTS bench mark upto required points near the area of construction.
- 3.7 During progress of work, convenient access to adjacent premises shall be made by the Contractor. No extra payment will be made on this account.
- 3.8 For speedy progress of work in case of exigency, while working along busy road etc., Contractor may have to do work round the clock at the instance of the Engineer. Arrangement for lighting and other safety requirements shall have to be done for night working. No extra payment shall be made to the Contractor except the items provided in the BOQ.
- 3.9 The pump motor horse power will be dependent on the actual rating, calculated TDH as per prevalent site conditions. In such an event, if the motor differs from that in the BOQ item, then the price of motors will be adjusted pro-rata based on the published price list of the pump motor manufacturer.
- 3.10 Temporary restoration of roads, as required, with excavated spoils will have to be done by the Contractor till permanent road is constructed and handed over. Temporary restoration shall be done as per instruction of Engineer and will be payable as per BOQ provision.
- 3.11 Dewatering item in BOQ will be applicable after finalization of the scheme and programme of pumping and with the Engineer.
- 3.12 The item rates quoted by the Contractor shall, unless otherwise specified, also include compliance of/ supply of the following :
- i) General works such as setting out, clearance of site before setting out and clearance of works after completion.
  - ii) A detailed programme for the construction and completion of the work.
  - iii) Samples of various materials proposed to be used on the work for conducting tests thereon as required as per the provisions of the Contract and approved Quality Assurance Procedures (QAP).
  - iv) Design of mixes as per the relevant clauses of the specifications giving proportions of ingredients, sources of aggregates and binder along with accompanying trial mixes as per the relevant clauses of these specifications to be submitted to the Engineer for his approval before use on the works.
  - v) Detailed design calculations and drawings for all temporary works (such as formwork, staging, centering, specialized constructional handling and launching equipment and the like).



- vi) Detailed drawings for templates, bar bending and cutting schedules for reinforcement, material lists for fabrication of structural steel, etc.
- vii) Mill test reports for all mild and high tensile steel as per the relevant provisions of the specifications.
- viii) Testing of various finished items and materials including bitumen, cement, concrete, as required under these specifications and furnishing test reports/ certificates as per approved Quality Assurance Procedure (QAP).
- ix) Inspection reports in respect of formwork staging, reinforcement and other items of work as per the relevant specifications.
- x) Any other data which may be required as per these specifications or the Conditions of Contract or any other annexure/ schedules forming part of the Contract.
- xi) Any other item of work which is not specially provided in the Bill of Quantities but which is necessary for complying with the provisions of the Contract.
- xii) All temporary works, formwork and false work.
- xiii) Arrange a laboratory with facilities for testing and testing of various items of works as specified in relevant clauses.
- xiv) Cost of in-built provisions for Quality Assurance.
- xv) Cost of labour hutment, site office.
- xvi) Cost of safeguarding the environment.
- xvii) Cost of providing 'as-built drawings' in soft copy and hard copy in required numbers and preparation of O&M manual for any equipment furnished.

3.13 Extra items of work – If during the progress of work any extra items crop up, which in the opinion of the Engineer and the Employer is essentially required to be executed, then the extra item shall be analysed as follows :

- i) Derived from rates of similar items of works stated in the tendered offer
- ii) In the event an extra item of work that cannot be derived from (i) above, then the following shall be applicable.
- iii) The lowest actual cost of materials as per purchase bills inclusive of all taxes with supporting documents from three suppliers to substantiate the lowest purchase cost.
  - Actual cost of transportation as per bills or 1% of material cost in the event no bills are available.
  - Labour cost analysis as per NABHI/ IRC/ CPWD publication – latest edition prevailing at the time 30 days before the date of submission of the bid
  - Sundries as per NABHI publication for analysis of rates – latest edition prevailing at the time 30 days before the date of submission of the bid
  - Overhead & profits as per NABHI publication – latest edition prevailing at the time 30 days before the date of submission of the bid
- iv) The labour rates to be considered shall be in accordance to prevailing minimum wages applicable at the time. For pipe laying works such as excavation, shoring, PCC/ stone metal bedding, pipe laying & dewatering add 20% to total labour component for the risk involved in trench work.

