Proceedings of the pre-bid meeting held on 10th June 2016 with the potential bidders for the Procurement of EPC Contract for Construction of New Navigational Lock at Farakka, West Bengal

The following IWAI officials attended the pre-bid meeting:

(i) Shri Pravir Pandey, Vice Chairman and Project Director, PMU
(ii) Cdr. P K Srivastava, Hydrographic Chief
(iii) Shri M K Saha, Director (Traffic) and Project Manager, PMU
(iv) Shri A K Gupta, Chief Accounts Officer (I/c)
(v) Shri A K Singhal, Sr. Consultant
(vi) Col. Sunil Kumar (Retd.), Sr. Consultant for Civil Engineering Works, PMU
(vii) Shri Prashant P Singh, Sr. Consultant for Procurement Activities, PMU
(viii) Jb. Arshad Kamal, Specialist for Marketing and Business Development, PMU

2. The signature sheet of the representatives of the firms who attended the pre-proposal meeting is attached at Enclosure-1.

3. Shri Pravir Pandey, Vice Chairman and Project Director (PMU) gave the background of the Project & intimated about the necessity of submission of bids by the potential bidders within the specified time

4. Thereafter, the specific queries made by the potential bidders (those received in writing and those made orally) were addressed as indicated in the statement at Enclosure -2.

5. Amendment-1 to the Bid document is enclosed.

****

Date: 10th June 2016

Subject: Preproposal meeting for Farakka Navigation Lock

S. No.	Bidders details with address & contact no.	E-mail id of Bidder	Signature of Bidder
1.	PRATANU SAHANA (Manager) ITD Cementation India Ltd. Mob - 9538617727.	pratanu.sahana@itdcem.co.in	
2.	R. VIJAYARAJ ITD Cementation India Limited, Chennai - 09677127744	ramanathan.vijayaraj@itdcem.co.in	
3.	Aditya Sinha International Seaport Dredging	aditya@alar.in	
4	P. VENUGOPAL ALAR INFRA (P) Ltd. N. Delhi	Venugopal venu.alar@gmail.com	
5	UWE TRENKMANN DSD NOELL GmbH, GERMANY	ankit@pacificpower.in	
6	ANKIT AGARWAL DSD NOELL GmbH, GERMANY	ankit@pacificpower.in	

S. No.	Bidders details with address & contact no.	E-mail id of Bidder	Signature of Bidder
7.	RAJIV CHAUHAN PEL Engg. Pvt Ltd.	9910109763 rajiv.chauhan@pelmotor.in	
8.	B. K. Talapatra, V.P, GMW Makarpura, Baroda, Gujarat	09898823140 bkt@gmw.in	
9	S. Baskaran - L&T-chennai	bas@Lntecc.com	
10	M. Kumaran - L&T-chennai	mkn@Lntecc.com	
11	Vipin kumar - L&T- Delhi (9958961946)	vipin.chandel@Lntecc.com	
12	STEVEN VERCAUTEREN S.B.E. INTERNATIONAL SLACHTHUISSTRAAT 71 9100 SINT-NIKLAAS BELGIUM	steven.vercauteren@sbe.be +32 473.89.00.78	
13.	ANKUR MALHOTRA, ITD CEM, 301-302, Sagar Tower, Jamalpur	Marketing@itdcem.co.in 9910709288	

S. No.	Bidders details with address & contact no.	E-mail id of Bidder	Signature of Bidder
14.	RAKESH RANJAN KHUNTIA International Seaport Dredging Pvt. Ltd. 9949411127	RRK@ISDPL.COM	
15	NEERAJ KUMAR BANSAL, GR Infraprojects Limited, New Delhi	neeraj.bansal@grinfra.com Mob: +91-8800691905	
16	Balbir Jha Gammon India LTD	9953745737	
17	B. C OJHA ILFS Engineering and Construction Co. Ltd	BHASKERA_OJHA@ILFSENGG.COM 9910041349	
18.	Deepak Ratra. HCC Ltd.	deepak.ratra@hccindia.com 9999282020	
19.	Prafull Biradar AFCONS Ltd	Prafull.biradar@afcons.com 8652424205	
20 21.	Bharat kothari A. SAIN. Om metals Infraproject Limited New Delhi	bharat@ommetals kolkata@ommetals.com	

S. No.	Bidders details with address & contact no.	E-mail id of Bidder	Signature of Bidder
22	ASHOK AJMERA OM metals Infraprojects Ltd 9868112253	ashok@ommetals.co.in	

RFP No: **CANW-1/IWAI/JMV/16**

Assignment Title: Engineering Procurement and Construction Contract for New Navigational Lock at Farakka, West Bengal

Amendment – 1

This amendment forms an integral part of the Bid Document issued on 27th May, 2016

Consequent to the queries received from the potential Bidders regarding various issues, the modifications suggested to the original Bid Document for Engineering Procurement and Construction Contract for New Navigational Lock at Farakka, West Bengal are as under:

S. No.	**Volume, Section and clause No. in Bid document**	**Original Text**	**Amendment**
1.	Vol I, Section II, ITB 7.1	The e-procurement portal of the Employer is: https://eprocure.gov.in/eprocure/app The prospective Bidder can seek clarifications only through the e-procurement portal mentioned above. Clarifications sought through any other mode shall not be entertained. The Employer will upload its response on the e-procurement portal mentioned above and also the Employer's website i.e. https://eprocure.gov.in/eprocure/app without identifying the source.	The e-procurement portal of the Employer is: https://eprocure.gov.in/eprocure/app The prospective Bidder can seek clarifications by sending mails to vc.iwai@nic.in along with e-procurement portal of the employer. The Employer will upload its response on the e-procurement portal mentioned above and also the Employer's website i.e. https://eprocure.gov.in/eprocure/app without identifying the source.

2.	Vol I, Section II, ITB 22.2	**The deadline for bid submission is:** Date: 11th July, 2016 Time: 1500 hrs IST Bidders have to submit their bids electronically. The documents comprising the Bid shall be digitally signed by the person duly authorized to sign on behalf of the Bidder. The documents comprising the Bid shall then be uploaded on the e-procurement portal https://eprocure.gov.in/eprocure/app. After electronic on line bid submission, the system generates a unique bid identification number which is time stamped as per server time. This shall be treated as acknowledgement of bid submission.	**The deadline for bid submission is:** Date: 19th August, 2016 Time: 1500 hrs IST Bidders have to submit their bids electronically. The documents comprising the Bid shall be digitally signed by the person duly authorized to sign on behalf of the Bidder. The documents comprising the Bid shall then be uploaded on the e-procurement portal https://eprocure.gov.in/eprocure/app. After electronic on line bid submission, the system generates a unique bid identification number which is time stamped as per server time. This shall be treated as acknowledgement of bid submission.
3.	Vol I, Section II, ITB 25.1	The bid opening shall take place **at the Office of the Inland Waterways Authority of India, A-13, Sector-1, Noida – 201301, Uttar Pradesh, India** on Date: 11th July, 2016 Time: 15:30 hrs IST The Employer will open all the Bids received (except those whose original documents were not received up-to specified time), including modifications made pursuant to Clause 22 and 24, online and this could be viewed by bidders online. 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.	The bid opening shall take place **at the Office of the Inland Waterways Authority of India, A-13, Sector-1, Noida – 201301, Uttar Pradesh, India** on Date: 19th August, 2016 Time: 15:30 hrs IST The Employer will open all the Bids received (except those whose original documents were not received up-to specified time), including modifications made pursuant to Clause 22 and 24, online and this could be viewed by bidders online. 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.
4.	Vol I, Section II, ITB 34.3	Contractor's proposed subcontracting: Maximum percentage of subcontracting permitted is: 20% by value of contract Works and not whole of Works or any particular length / stretch	Contractor's proposed subcontracting: Maximum percentage of subcontracting permitted is: 25% by value of contract Works and not whole of Works or any particular length / stretch
5.	Vol-I, Cl.2.4.2, Specific Experience	Design of Hydropower Projects having pit type power/ irrigation structure with gate size of 15m x 15m.	Design of Hydropower Projects having pit type power/ irrigation structure with gate size of **12m x 12m or more.**

<table>
<tr>
<td>6.</td>
<td>Volume-1,
Section III, Equipment, Cl-2.6, Pg-42</td>
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<tr><th rowspan="2">Sl. No</th><th colspan="3">Equipment Type and Characteristics</th><th rowspan="2">Minimum Number required</th></tr>
<tr><th>Equipment</th><th>Minimum Capacity</th><th>Max. age (years)</th></tr>
<tr><td></td><td>Crane (Tyre mounted)</td><td>100T</td><td>5</td><td>1 no.</td></tr>
<tr><td></td><td>Crane (Tyre mounted)</td><td>50T</td><td>5</td><td>1 no.</td></tr>
<tr><td></td><td>Pile Driving Rigs with minimum 10 T winch complete with DMC/Bater/Chiesel etc.</td><td>-</td><td>5</td><td>2 nos.</td></tr>
<tr><td></td><td>Hydra</td><td>10 to 12 T</td><td>5</td><td>4 nos.</td></tr>
<tr><td></td><td>Trailer</td><td>-</td><td>5</td><td>2 nos.</td></tr>
<tr><td></td><td>Winches</td><td>10 to 12T</td><td>5</td><td>2 nos.</td></tr>
<tr><td></td><td>Concrete Batching Plant</td><td>30 cum</td><td></td><td></td></tr>
<tr><td></td><td>Transit Mixer</td><td>5 cum</td><td></td><td></td></tr>
<tr><td></td><td>Concrete pump with adequate pipelines</td><td>30 cum</td><td></td><td></td></tr>
</table>
These equipment must be owned by bidder and by lead member in case of JV
</td>
<td>
<table>
<tr><th rowspan="2">Sl. No</th><th colspan="3">Equipment Type and Characteristics</th><th rowspan="2">Minimum Number required</th></tr>
<tr><th>Equipment</th><th>Minimum Capacity</th><th>Max. age (years)</th></tr>
<tr><td></td><td>Crane (Tyre mounted/crawler)</td><td>100T</td><td>10</td><td>1 no.</td></tr>
<tr><td></td><td>Crane (Tyre mounted/crawler)</td><td>50T</td><td>10</td><td>1 no.</td></tr>
<tr><td></td><td>Pile Driving Rigs with minimum 10 T winch complete with DMC/Bater/Chiesel etc.</td><td>-</td><td>10</td><td>2 nos.</td></tr>
<tr><td></td><td>Hydra</td><td>10 to 12 T</td><td>10</td><td>4 nos.</td></tr>
<tr><td></td><td>Trailer</td><td>-</td><td>10</td><td>2 nos.</td></tr>
<tr><td></td><td>Winches</td><td>7.5T</td><td>10</td><td>2 nos.</td></tr>
<tr><td></td><td>Concrete Batching Plant</td><td>30 cum</td><td></td><td></td></tr>
<tr><td></td><td>Transit Mixer</td><td>5 cum</td><td></td><td></td></tr>
<tr><td></td><td>Concrete pump with adequate pipelines</td><td>30 cum</td><td></td><td></td></tr>
</table>
These equipment must be owned /hired by bidder and by lead member in case of JV
</td>
</tr>
<tr>
<td>7.</td>
<td>Volume-1,
Cl-8.3.3, Pg-99</td>
<td>8.3.3 Notwithstanding anything to the contrary contained in this Agreement, the Employer may at any time withdraw any Works forming part of this Agreement, subject to such Works not exceeding an aggregate value, such value to be determined in accordance with Schedule-H, equal to 10(ten) percent of the Contract Price.</td>
<td>8.3.3 Notwithstanding anything to the contrary contained in this Agreement, the Employer may at any time withdraw any Works forming part of this Agreement, subject to such Works not exceeding an aggregate value, equal to 10(ten) percent of the Contract Price.</td>
</tr>
</table>

8.	Volume-1, Part II, Construction of the Navigational Lock, Cl. 10.3.2, Pg-107	The contractor shall construct the navigation lock in accordance with the Project Completion Scheduled set forth in Scheduled-J. In the event that the Contractor to achieve any Project Milestone or the Scheduled Completion Date within a period of 30 (thirty) days from the date set forth in Schedule-J, unless such failure has occurred due to Force Majeure or for reasons solely attributable to the Employer, it shall pay Damages to the Employer of a sum calculated at the rate of 0.05% (zero point zero five percent) of the Contract Price for delay of each day reckoned from the date specified in Schedule-J 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-J shall be deemed to be modified accordingly and the provisions of this Agreement shall apply as if Schedule-J 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, applicable for that work or section, the Damages paid under this Clause 10.3.2 shall be refunded by the Employer to the Contractor, but without any interest thereon.	The contractor shall construct the navigation lock in accordance with the Project Completion Scheduled set forth in **Scheduled-G**. In the event that the Contractor to achieve any Project Milestone or the Scheduled Completion Date within a period of 30 (thirty) days from the date set forth in **Scheduled-G**, unless such failure has occurred due to Force Majeure or for reasons solely attributable to the Employer, it shall pay Damages to the Employer of a sum calculated at the rate of 0.05% (zero point zero five percent) of the Contract Price for delay of each day reckoned from the date specified in **Scheduled-G** 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 **Scheduled-G** shall be deemed to be modified accordingly and the provisions of this Agreement shall apply as if **Scheduled-G** 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, applicable for that work or section, the Damages paid under this Clause 10.3.2 shall be refunded by the Employer to the Contractor, but without any interest thereon.

9.	Volume-1, Part IV, Financial Covenants, Cl. 19.2, Pg-130	**19.2 Advance Payment** 19.2.1 The Employer shall make an interest-free advance payment (the "Advance Payment"), equal in amount to 10 (ten) percent of the Contract Price, for mobilisation expenses and for acquisition of equipment. The Advance Payment shall be made in three instalments. The first instalment shall be an amount equal to 2% (two percent) of the Contract Price, the second instalment shall be equal to 3% (three percent) of the Contract Price, and the third instalment shall be equal to 5% (five percent) of the Contract Price. 19.2.2 The Contractor may apply to the Employer for the first instalment 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 instalment, substantially in the form provided at Annex-III of Schedule-G, to remain effective till the complete and full repayment thereof. 19.2.3 At any time after 60 (sixty) days from the Appointed Date, the Contractor may apply for the second instalment 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 instalment, substantially in the form provided at Annex-III of Schedule-G, to remain effective till the complete and full repayment thereof. The application shall also include the details of utilization of earlier advances. 19.2.4 At any time, after 120 (one hundred and twenty) days from the Appointed Date, the Contractor may apply to the Employer for the third instalment 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 instalment, substantially in the	**19.2 Advance Payment** 19.2.1 The Employer shall make an interest-free advance payment (the "Advance Payment"), equal in amount to 10 (ten) percent of the Contract Price, for mobilisation expenses and for acquisition of equipment. The Advance Payment shall be made in three instalments. The first instalment shall be an amount equal to 5% (five percent) of the Contract Price, the second instalment shall be equal to 5% (five percent) of the Contract Price. 19.2.2 The Contractor may apply to the Employer for the first instalment 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 instalment, substantially in the form provided at Annex-III of Schedule-G, to remain effective till the complete and full repayment thereof. 19.2.3 At any time after 60 (sixty) days from the Appointed Date, the Contractor may apply for the second instalment 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 instalment, substantially in the form provided at Annex-III of Schedule-G, to remain effective till the complete and full repayment thereof. The application shall also include the details of utilization of earlier advances. 19.2.4 Deleted 19.2.5 The first and second instalments shall be paid by the Employer to the Contractor within 15 (fifteen) days of the receipt of its respective requests in accordance with the provisions of this Clause 19.2.

10.	Volume-1, , Cl. 19.10, Pg-133	**Price adjustment for the Works** 19.10.1 The amounts payable to the Contractor for Works shall be adjusted in accordance with the provisions of this Clause 19.10. 19.10.2 Subject to the provisions of Clause 19.10.3, the amounts payable to the Contractor for Works, shall be adjusted in the IPC issued by the Employer's Engineer for the increase or decrease in the index cost of inputs for the Works, by the addition or subtraction of the amounts determined by the formulae prescribed in Clause 19.10.4. 19.10.3 To the extent that full compensation for any increase or decrease in costs to the Contractor is not covered by the provisions of this or other Clauses in this Agreement, the costs and prices payable under this Agreement shall be deemed to include the amounts required to cover the contingency of such other increase or decrease of costs and prices. 19.10.4 The Contract Price shall be adjusted for increase or decrease in rates and price of labour, cement, steel, Plant, machinery and spares, bitumen, fuel and lubricants, and other material inputs in accordance with the principles, procedures and formulae specified below: a) Price adjustment shall be applied on completion of the specified stage of the respective item of work in accordance with Schedule-H; b) Adjustment for each item of work/stage shall be made separately. c) The following expressions and meanings are assigned to the value of the work done; and JW= Value of work done for the completion of a stage under the following items of Schedule-H:	**Price adjustment for the Works** 19.10.1 The amounts payable to the Contractor for Works shall be adjusted in accordance with the provisions of this Clause 19.10. 19.10.2 Subject to the provisions of Clause 19.10.3, the amounts payable to the Contractor for Works, shall be adjusted in the IPC issued by the Employer's Engineer for the increase or decrease in the index cost of inputs for the Works, by the addition or subtraction of the amounts determined by the formulae prescribed in Clause 19.10.10. 19.10.3 To the extent that full compensation for any increase or decrease in costs to the Contractor is not covered by the provisions of this or other clauses in the contract, the Contract Price shall be deemed to include amounts to cover the contingency of such other any increase or decrease in costs. 19.10.4 The compensation for escalation shall be worked out at quarterly intervals and shall be with respect to the cost of work done during the previous three months. The first such payment will be made at the end of three months after the month (excluding) in which the Tender was accepted and thereafter at three months interval. 19.10.5 Payment of such claims for reimbursement / refund would be made on certification by the Employer's Engineer. 19.10.6 In the event the price of cement, steel, fuel and / or wages of labour required for execution of the work decrease/s, there shall be downward adjustment of the cost of work so that such price of materials, fuel and/or wages of labour will be deductible from the cost of work under this contract and in this regard the formula stated in clause 19.10.8 shall apply: 19.10.7 Price escalation shall apply for the work done from the commencement date up to end of

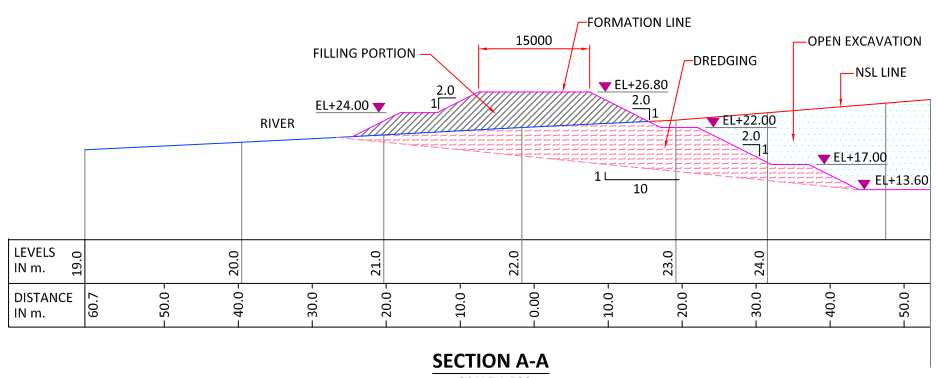
11.	Volume-2, Cl. 1.2.2	IV. The locks shall have all the required accessories/ fixtures including but not limited to the following : a) Mitre gates(2.0 nos. one each in U/S and D/S) b) Radial gates(4.0 nos. Two each in U/S and D/S inlets) c) Bulkhead gates (8.0 nos. Two each in U/S & D/S inlets and Two each in U/S and D/S outlets) d) Fenders including all its ancillaries e) Bollards f) Mooring rings g) Safety rung	IV. The locks shall have all the required accessories/ fixtures including but not limited to the following : a) Mitre gates(2.0 nos. one each in U/S and D/S) **b) Caisson gates** c) Radial gates(4.0 nos. Two each in U/S and D/S inlets) d) Bulkhead gates (8.0 nos. Two each in U/S & D/S inlets and Two each in U/S and D/S outlets) e) Fenders including all its ancillaries f) Bollards g) Mooring rings h) Safety rung
12.	Volume-2, Cl. 1.1.6.1	Not existing	**Berthing load** – Berthing of 300-3000DWT fully loaded barge shall be considered
13.	Volume-2, Cl. 3.6.5	**Model Studies** The Mathematical/Physical model studies for the whole structure to access the filling/emptying time of the lock chamber, sedimentation in the hydraulic system, check for air entrapment in the hydraulic system, waves, currents and turbulence generation in the lock chamber. The speed of the flow inside the culverts, head losses and cavitation, particularly in bends and inter-independent interaction of various elements such as, speed of the opening of the valves with the locking duration, mooring forces, shall be made during detailed designs and modification to structures, if required, shall be done by the contractor. Post Construction Survey	**Model Studies** The Mathematical/Physical model studies for the whole structure to access the filling/emptying time of the lock chamber **shall be done before the issue of construction drawings**, sedimentation in the hydraulic system, check for air entrapment in the hydraulic system, waves, currents and turbulence generation in the lock chamber. The speed of the flow inside the culverts, head losses and cavitation, particularly in bends and inter-independent interaction of various elements such as, speed of the opening of the valves with the locking duration, mooring forces, shall be made during detailed designs and modification to structures, if required, shall be done by the contractor. Post Construction Survey
14	Volume-2	Not existing	Chapter on EMP is enclosed as Annex
15	Volume-2	Fl-002	Revised drawing is enclosed

16	Volume-2	Fl-003	Revised drawing is enclosed
17	Volume-2	Not existing	Plate 1 is enclosed

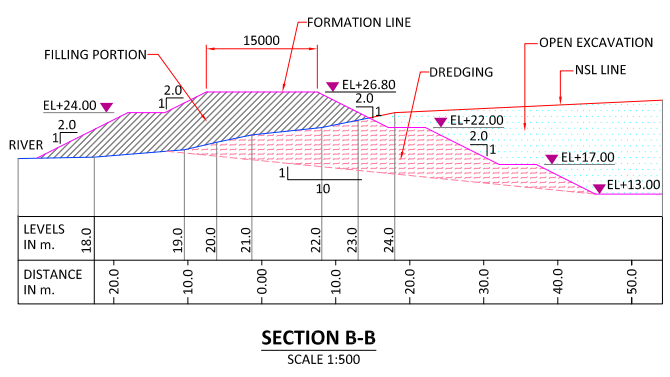
PLATE-1

EXISTING NAVIGATION LOCK
EXISTING U/S NAVIGATION CANAL
EXISTING D/S NAVIGATION CANAL
OUTLET STRUCTURE
NATURAL LEDGE TO BE DREDGED AFTER CONSTRUCTION OF NEW LOCK
NATURAL LEDGE TO BE DREDGED AFTER CONSTRUCTION OF NEW LOCK
LEVEL +26.80
15000
A
B
APPROACH CHANNEL FOR NEW LOCK
324000
EXIT CHANNEL FOR NEW LOCK
417000
EXTENSION OF U/S NAVIGATION CANAL
EXTENSION OF D/S NAVIGATION CANAL
COLLECTION CHAMBER
LEFT BANK
RIGHT BANK
LEVEL +28.44
DRAIN
SIDE FLOW D/S
CONTROL ROOM
SLOPE 1:1000
ROAD LEVEL +28.44
ROAD
BOUNDARY WALL
PORTABLE TOILET
GENERALS SITE STORE 3500X7000
CEMENT STORE 7000X7000
WORK SHOP 7mX7m
TOILET 3000X1900
CANTEEN 7000X7000
OFFICE 5000X7000
GUARD ROOM
LAB 4000X5000
STORE 5000X4500
PETROLEUM, OIL & LUBRICATE STORE 5000X7000
REALIGNMENT FBP INSPECTION ROAD
LAND INSPECTION BOUNDARY
TO N.T.P.C. PLANT
TO RAJMAHAL
EXISTING BOUNDARY WALL
EL+28.44
R80000
180000
145770
250799

LAYOUT PLAN
(SCALE – 1:1300)



SECTION A-A
SCALE 1:500



SECTION B-B
SCALE 1:500

NOTES : -

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS, UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSIONS SHALL BE MEASURED FROM THE DRAWING.

LEGEND:

- DREDGING
- OPEN EXCAVATION
- FILLING PORTION

INLAND WATERWAYS AUTHORITY OF INDIA

PROJECT: DETAILED FEASIBILITY STUDY FOR CAPACITY AUGMENTATION OF NATIONAL WATERWAY-1 AND DETAILED ENGINEERING FOR ITS ANCILLARY WORKS AND PROCESS BETWEEN HALDIA TO ALLAHABAD (JAL VIKAS PROJECT)

CONSULTANT: HOWE; PMC PROJECTS (INDIA)PRIVATE LIMITED from vision to reality...

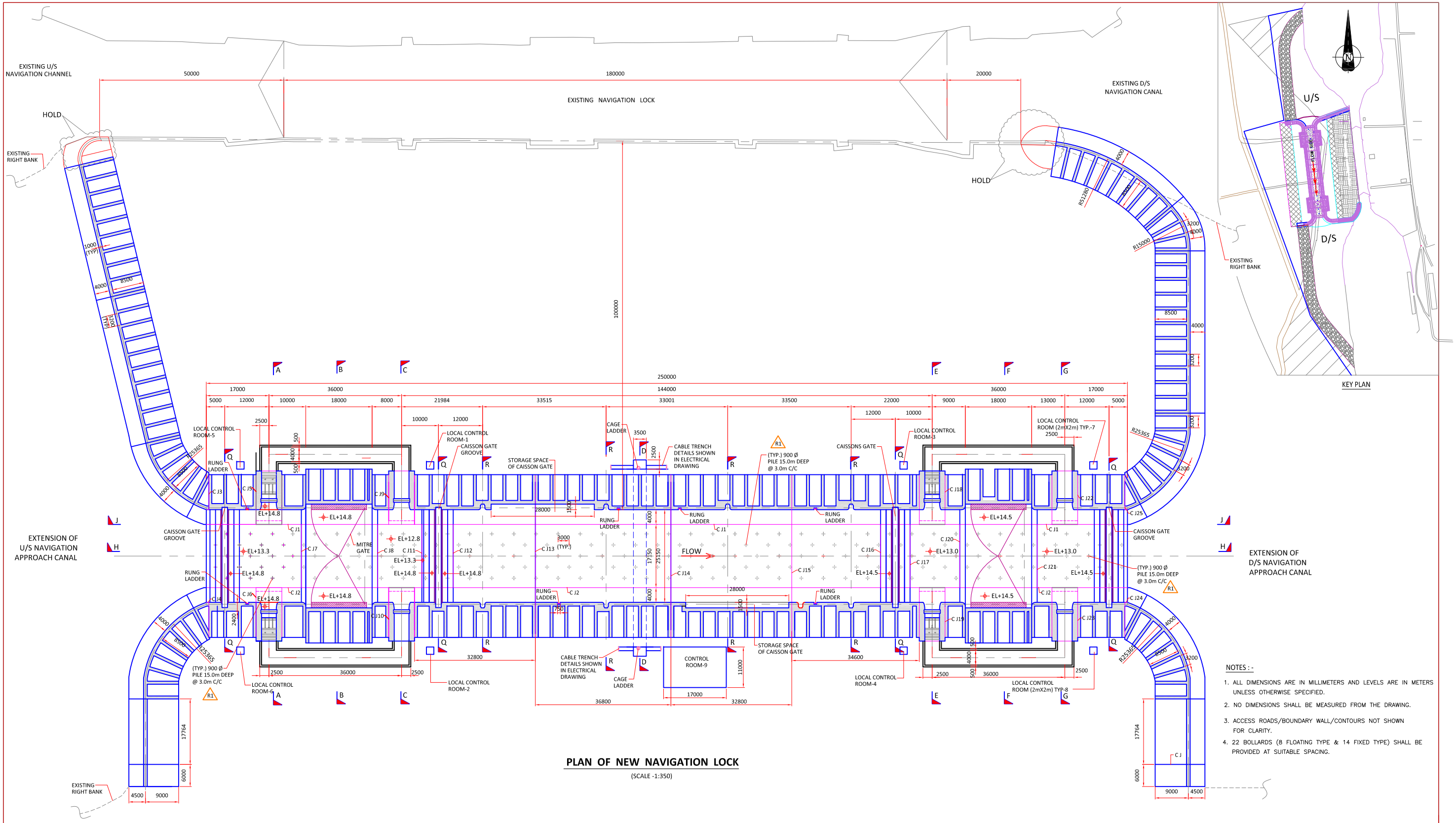
	NAME	SIGN	DATE
DRN	KS		01/03/2016
CHD	VK		01/03/2016
APD	SD		01/03/2016

TITLE: NATURAL LEDGE DREDGING PLAN
NEW NAVIGATION LOCK, FARAKKA

JOB. NO. I-525 | DRG. NO. PLATE-1

COORDINATE SYSTEM USED: ENTER CO-ORD SYSTEM HERE

UNIT | DWG SCALE | Size : A1 | REV. 0



PLAN OF NEW NAVIGATION LOCK

(SCALE -1:350)

NOTES : -

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSIONS SHALL BE MEASURED FROM THE DRAWING.
3. ACCESS ROADS/BOUNDARY WALL/CONTOURS NOT SHOWN FOR CLARITY.
4. 22 BOLLARDS (8 FLOATING TYPE & 14 FIXED TYPE) SHALL BE PROVIDED AT SUITABLE SPACING.

FOR TENDER PURPOSE ONLY

REV	DATE	DESCRIPTION	DRN	CHD	APD
R1	04.07.16	MINOR MODIFICATION	KS	VK	SD

THIS DESIGN OR DRAWING IS THE PROPERTY OF HOWE, PMC PROJECTS (INDIA)PRIVATE LIMITED from vision to reality... IT IS SUBJECT TO THEIR RECALL AND MUST NOT BE LENT COPIED OR REPRODUCED WITHOUT THEIR WRITTEN PERMISSION.

INLAND WATERWAYS AUTHORITY OF INDIA

PROJECT: DETAILED FEASIBILITY STUDY FOR CAPACITY AUGMENTATION OF NATIONAL WATERWAY-1 AND DETAILED ENGINEERING FOR ITS ANCILLARY WORKS AND PROCESS BETWEEN HALDIA TO ALLAHABAD (JAL VIKAS PROJECT)

CONSULTANT: HOWE, PMC PROJECTS (INDIA)PRIVATE LIMITED from vision to reality...

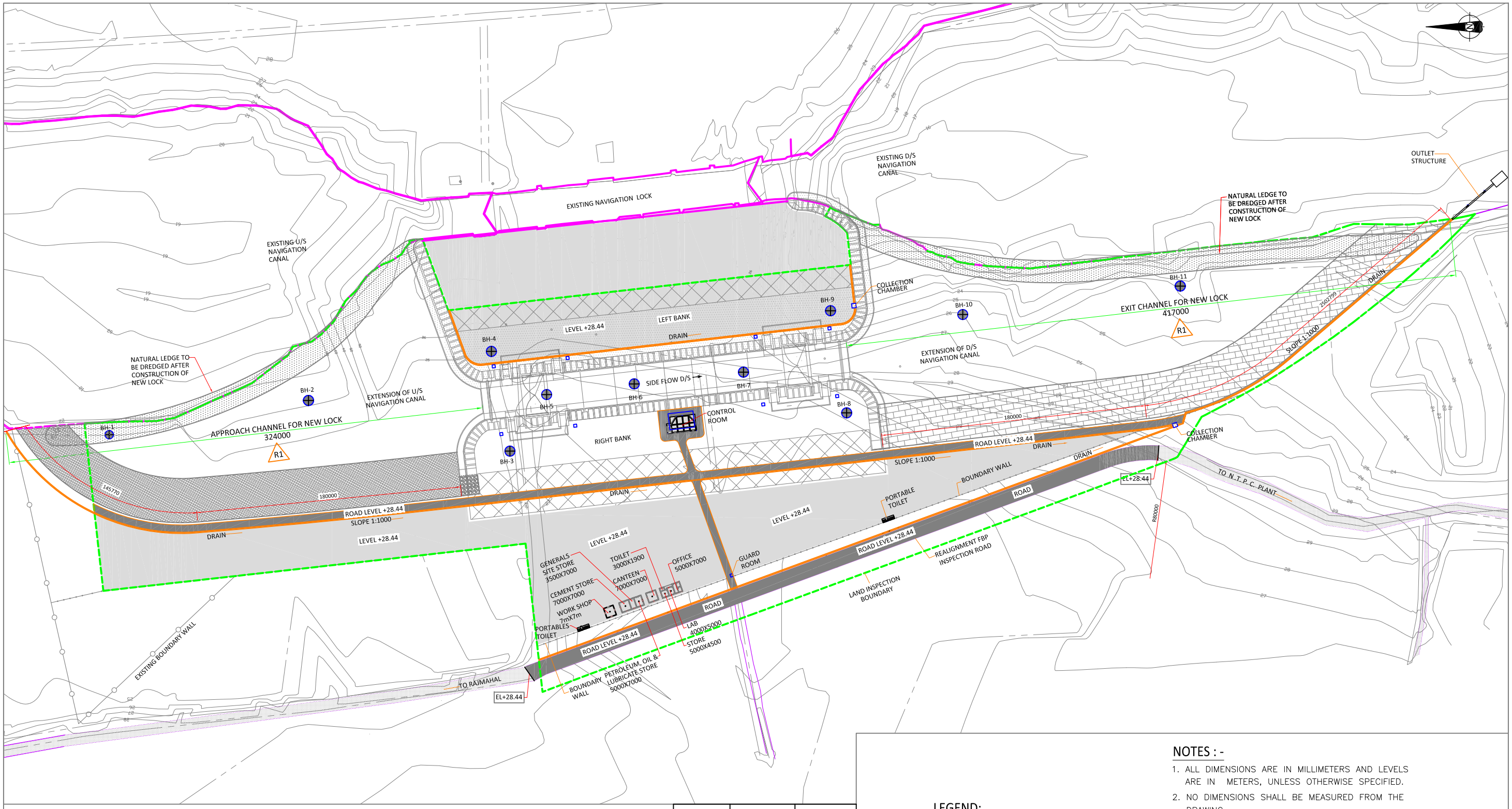
	NAME	SIGN	DATE
DRN	KS		01/03/2016
CHD	HM/SKA		01/03/2016
APD	SD		01/03/2016

TITLE: GENERAL ARRANGEMENT PLAN
NEW NAVIGATION LOCK, FARAKKA

JOB. NO. I-525 | DRG. NO. FL-003

COORDINATE SYSTEM USED: ENTER CO-ORD SYSTEM HERE

UNIT | DWG SCALE | Size : A0 | REV. R1



BORE HOLES LOCATIONS LAYOUT PLAN

(SCALE – 1:1300)

BOREHOLES	NORTHING	EASTING
BH–1	2745021.8276	591286.8872
BH–2	2744886.4925	591310.1374
BH–3	2744749.6701	591275.7592
BH–4	2744762.2824	591343.4381
BH–5	2744724.7352	591314.1155
BH–6	2744665.2767	591321.3798
BH–7	2744591.0953	591329.3717
BH–8	2744521.0031	591301.7242
BH–9	2744531.9410	591371.0264
BH–10	2744442.1502	591368.4676
BH–11	2744294.4576	591387.7830

LEGEND:

- STORM WATER DRAINAGE
- APPROACH ROAD
- EXISTING ROAD
- BANK PROTECTION
- CUTTING PORTION
- FILLING PORTION

NOTES : -

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS, UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSIONS SHALL BE MEASURED FROM THE DRAWING.

FOR TENDER PURPOSE ONLY

REV	DATE	DESCRIPTION	DRN	CHD	APD
R1	04.07.16	MINOR MODIFICATION	KS	VK	SD

INLAND WATERWAYS AUTHORITY OF INDIA

PROJECT: DETAILED FEASIBILITY STUDY FOR CAPACITY AUGMENTATION OF NATIONAL WATERWAY-1 AND DETAILED ENGINEERING FOR ITS ANCILLARY WORKS AND PROCESS BETWEEN HALDIA TO ALLAHABAD (JAL VIKAS PROJECT)

CONSULTANT: HOWE, PMC PROJECTS (INDIA)PRIVATE LIMITED from vision to reality...

	NAME	SIGN	DATE
DRN	KS		01/03/2016
CHD	VK		01/03/2016
APD	SD		01/03/2016

TITLE: BORE HOLES LOCATIONS PLAN
NEW NAVIGATION LOCK, FARAKKA

JOB. NO. I-525 | DRG. NO. FL-002

COORDINATE SYSTEM USED: ENTER CO-ORD SYSTEM HERE

UNIT | DWG SCALE | Size : A1 | REV. R1

ENVIRONMENT MANAGEMENT PLAN : FARAKKA LOCK

INTRODUCTION

Inland waterways Authority of India (IWAI) has proposed to augment the navigation capacity of waterway NW-1 (Haldia to Allahabad) and continue to maintain the entire stretch. Under this project, IWAI has proposed to develop the infrastructure facility like Locks, Multimodal terminals, Navigation aids for day & night navigation, River information system with all hardware and software, Ro-Ro jetties, Bank & slope protection, River training works, Equipment like tow barges, inland vessels, survey vessels including rescue boats & survey equipment and Dredging of the navigation channel, to augment the navigation capacity of the waterway.

A new lock is proposed to be developed at Farakka adjacent to the existing locks as one of the means of improving navigation in NW-1. Existing lock of Farakka is not working at optimal efficiency and it takes 2-3 hours to complete one operation there by reducing the possible nos. of ships which can cross through and ultimately the freight transportation efficiency. Maintenance of the existing lock would keep the lock in non operational condition for entire maintenance period thereby stopping the movement of barges/vessels in that period. Thus IWAI has proposed to construct a new lock at Farakka to ensure efficient movement of vessels/barges. Location map of the project site is given in **Figure 1** below.

Figure 1: Location Map

PROJECT BRIEF

New Farakka Lock is proposed to be developed at Farakka, District Murshidabad, West Bengal on River Ganga. Proposed project would be set up in 14.4 ha of leased land of Farakka Barrage Project. Proposed site is being used for agricultural purpose by nearby villagers. Site is almost flat with gentle slope and elevation varies from 25-31m amsl. Project involves construction of lock which requires excavation of earth. Also leveling of site will be done to achieve finished level of 21 m which again will require earth cut and fill operations. It is estimated that 11.76 lakh cum of earth will be cut and out of this 4.13 lakh cum of earth will be filled and remaining of the soil requires to be disposed off in safe manner to prevent environmental pollution. Site is connected to NH-80 the road passing along western boundary of the proposed lock gate.

Lock is proposed to facilitate the movement of barges/vessels across the river with the significant level difference. There is no unloading and loading of material associated with lock facility. Components of the lock facility include counter fort retaining wall, inlet/outlet structure and base slab. Other developments include realignment of road connecting Farakka town to Rajmahal (FBP inspection road) of 675 m, boundary wall of length 1180 m and 2.4 m high around the lock site, internal roads and control room building.

ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

Effective measures are required to be proposed and implemented during design, preconstruction and construction stage to eliminate or minimize the impact of the project development. **Table 1 & 2** provides details of mitigation measures with implementation and supervision responsibility. Since project is likely to have impact on various components of environment, the monitoring requirement covering soil erosion, tree plantation, air quality, water quality noise, river sedimentation has been defined and included under respective head at **Table 3.**

It will be essential for contractor to comply with applicable regulations and World Bank safeguard requirements. Contractor will also have to comply with applicable standards with respect to Water, air, Noise, Dredge Material, soil and biodiversity as applicable to this project.

ENVIRONMENT HEALTH AND SAFETY CELL

It is essential to establish environment health and safety cell for the project by contractor to ensure the health & safety of workers and environmental management of study area through effective implementation of EMP. Highly qualified and experienced persons in the field of Environmental Management of Similar projects shall be considered to man the cell who shall ensure the effective implementation of the environment management plan.

REPORTING REQUIREMENTS:

It is required that contractor will submit quarterly compliance report to Project Management Consultants (PMC) as well as to PMU (Project Management Unit) of IWAI. PMC will analyze the report and notify the corrective action if any required to contractor under intimation to IWAI.

TABLE 1: ENVIRONMENT MANAGEMENT PLAN OF FARAKKA LOCK DURING CONSTRUCTION PHASE

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
DESIGN AND CONSTRUCTION PHASE							
1. Climate							
❖ Project is unlikely to cause negative effect on climate. However, project can contribute positively for climate	• No tree cutting shall be carried out without obtaining permission from Forest department • Greenbelt should be developed all around the boundary of the project. Trees at the site shall be retained as green belt • Provision of alternative energy options like solar energy • Adoption of best practices to cut down resources and energy requirement	Kyoto Protocol, National Water Policy, 2012 & National Forest Policy	Construction site	During Design, and construction stage.	Compensatory /Additional Plantation	Contractor,	IWAI/PMU /PMC[1]
2. Natural & Man-made Hazard							
❖ Earthquake-Seismic Zone –III	• Adoption of Relevant IS codes while designing the civil onshore & off-shore structures to sustain the earthquake of moderate to high	NBC, 2005, local building bye laws, state factory rules,	Construction site & Navigation	During Design and construction stage.	Part of Project Costs	Contractor	IWAI/PMU /PMC

[1] It is proposed to set up Social and Environmental Management Unit (PMU) in IWAI to manager social and environmental aspect of NW1 augmentation. PMC (Project Management Consultants) anticipated to be appointed for project management and quality check.

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
damage risk zone[2] ❖ Risk of flood	magnitude. • Designing of structures above the HFL • Preparation of emergency preparedness and response plan for natural and man-made hazards like earthquake, floods, fires, shocks, explosion of hazardous materials etc.	Petroleum Rules and MSIHC Rules, 1989	Channel				
3. Site Preparation:Levelling Lock gate Site, Construction Camp, Construction Works							
❖ Leveling of lock gate site & Removal of vegetation	• Tree cutting is very less however tree cutting if any required should be carried out only after obtaining NOC from forest department. • Excavation and filling operations	Municipal Solid Wastes (Management and Handling) Rules, 2015	Construction site	During design and Construction Stage	Part of Project Costs	Contractor.	IWAI/PMU /PMC

[2] *IS:1893 (Part 1): 2002 Indian Standard Criteria for Earthquake Resistant Design of Structures Part 1 General Provisions and Buildings Fifth Revision divides the Indian subcontinent into five seismic zones (II to V) depending on the magnitude and damage intensity of seismic activity.*

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	should be carried out in parallel so as to minimize the soil erosion • Water sprinkling to be carried out for dust suppression • Top soil (15 cm) should be stripped and preserved under covered conditions for landscaping purpose in later stage. This should be stored in the form of the heap with the slide slopes covered with grass. Excavated soil should be used within the site for filling purpose and remaining (7.63 lakh cum) should be used for realignment of the existing road. Additonal sloil hm • Green belt should be developed at the site and as per the Green Belt management Plan (Annexure 7.1). • Survival rate of tree should be regularly monitored. It is should be minimum 70%. • Work timings should be restricted from 6:00 AM to 10:00 PM. Adequate illumination should be provided at site during evening hours • Rest area should be provided for workers at site and sleeping/lying	Social Impact Assessment requirements					

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	down at site should be strictly prohibited • Safety guidelines as per operation, health & safety management plan **(Annexure 7.2)** should be followed **Municipal Solid Waste Management:** • Excavated soil should be stored in covered conditions only • Arrangement should be made for segregation of waste into recyclable and non-recyclable waste • Non-recyclable waste generated should be disposed regularly through authorized agency. Recyclable waste should be sold to authorized vendors. • Construction waste generated should be segregated at site into recyclable, reusable & rejected fraction. Recyclable should be sold to authorized vendor, reusable waste should be stored at site for usage and rejected fraction should be disposed at designated sites by the municipal authority • If no debris or waste disposal site exists in the area then a site should be identified for debris disposal,						

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	should be approved by IWAI and should be used & manage for the same as per the Debris Management Plan **(Annexure 7.3)**						
❖ Setting of Labor Camps : Loss of agriculture land, contamination of land and water resources from municipal waste from Camps, worker's health, Pressure on natural resources due to establishment of labour camps	**Location of Camp:** • Construction camp siting, establishment, location and management should be as per proposed Construction & Labour Camp Management Plan **(Annexure 7.4)** • Labour camps should be located close to the construction sites to the extent possible **Sanitation and Worker's Health:** • Hygiene in the camps should be maintained by providing good sanitation and cleaning facilities. Soak Pits can be provided only if labour camp is located away from river. • Camp should be well ventilated. It should have adequate provision for illumination, kitchen and safe drinking water facility. Proper drainage to be maintained around the sites to avoid water logging	The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act 1996 and Cess Act of 1996 and The Water (Prevention & Control of Pollution) Act, 1974 and amendments thereof. Municipal Solid Wastes (Management and Handling) Rules, 2000	Labour Camp Locations	During design and Construction Stage		Contractor.	IWAI/PMU /PMC

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	leading to disease • Preventive medical care to be provided to workers • Segregated, collection and disposal of solid waste on regular basis at identified municipal solid waste disposal location. If municipal solid waste site not available than waste should be land fill following the regulations. • Provision should be made essential material supply like cooking fuel (gas) • Provision should be made for day crèche for children						
❖ Setting up construction Camp: Concert Mix Plant, Hot Mix Plant, Mechanical Workshop, Fuel storages, Lubricant	• All these facilities should be installed at proposed lock gate site itself. In case these are to be set up away from site than these should be located at minimum distance of 500 m from habitation, water bodies. • All maintenance facilities, hot mix plant and concrete mixing plant should be established with prior consent to establish to be obtained from SPCB. • All such equipment/plant should be	Air (Prevention and Control of Water Pollution) Act, 1981 and Water (Prevention and Control of Water Pollution) Act, 1974	Site construction Camp	During design and construction Stage		Contractor.	IWAI/PMU /PMC

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
storages	fitted with air pollution control system and should comply with condition of consent to establish. • Periodic monitoring should be carried as per consent conditions.						
4. Site Preparation : Power supply, Water Supply, and Drainage , disposal of piling muck and debris							
❖ Power supply and Energy Conservation : Air Pollution , energy loss	• Power should be sourced from State electricity board in the area during construction stage as well operation phase. • DG sets should be used only in case of power failure • Back-up power should be set up with all provisions of containment for fuel leakages, air pollution control (stack height as per regulation) and with acoustic enclosure. • Solar energy should be used in the project. • Energy Conservation Building Code should be used as applicable to various office and other structures.	Air (Prevention and Control of Water Pollution) Act, 1981 & ECBC Norms, 2007	Construction Sites and Labour Camp Locations	During design and construction stage	Part of Project Costs	Contractor.	IWAI/PMU /PMC
❖ Water Supply, Drainage and effluent discharge	• Supply water shall be used for drinking water. • Water required for construction should be sourced from river for which necessary permission should	Central Ground Water Board , Water (Prevention and Control of	Construction Sites and Labour Camp Locations	During design and construction stage		Contractor.	IWAI/PMU /PMC

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	be obtained. • Caution sign should be placed at site for optimal use of water • Garland storm water temporary drains should be developed around the site to prevent any direct discharge of contaminated or soiled water to river. It should be passes through de-siltation chamber and water collection pit. Collected water should be used for construction purposes. • All washing and maintenance effluent from the workshop area of vehicle maintenance area should Darin to separate collection areas fitted with oil and grease trap and de- siltation chamber. The treated water should be used for dust separation and green belt development. This water should not be discharged to river at all.	Water Pollution) Act, 1974					
❖ Disposal of excavated earth, muck and debris: uncontrolled	• Provision should be made for collection and draining of water from the excavated earth. It should be used for embankment protection or road construction depending on its suitability.	Solid Waste (Management & Handling) Rules, 2015	River Bank along the lock gate site	Pre-Construction and construction Stage	Part of Project Costs	Contractor.	IWAI/PMU /PMC

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
disposal may leads to increased sedimentation of the river.	• Provision should be made for geo Synthetic Screen for arresting silt flowing down stream.						
5. Embankment Design and Construction, Drainage Pattern							
❖ Navigational channel Bank Erosion Protection: Construction of Embankment and construction of inlet and out let structure: may lead to accumulation of sediments on the updrift side and erosion of the downdrift	• Stone pitching should be provided on left bank of the River for protection • The river bank slope of U/S and D/S approach channel should be provided with two layers of pitching with PCC blocks of size of 1 m x 1m x 0.6 m. 6 m wide. • Guide walls on U/S and D/S of the lock are tied to those of existing lock and cut offs to a depth of 5 m have been provided for protection against scour • During block pitching, the block should be placed at suitable distance and should not by dropping from height. Block should be placed by making grid in pitching area. • Erosion monitoring should be carried out periodically	Water (Prevention and Control of Water Pollution) Act, 1974	1500 meter stone pitching River Bank along the lock gate site & 40 m apron inside the river	During design, Pre-Construction and construction Stage	Part of Project Costs	Contractor.	IWAI/PMU /PMC

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
side . Contamination of river water quality and land may happen due to river bed material	downstream as well. • River Bed material/dredged soil if any should be tested for contaminants before its use or disposal for land fill site. If any level of heavy metal contamination is found than it should be disposed off in a secure manner to TSDF.						
❖ Drainage Pattern	• Natural Drainage pattern of area around should be maintained. • Storm water management drains should be provided at site for management of storm water management		Construction Sites, Access road, and Labour Camp Locations	During construction stage	Part of Project Costs	Contractor.	IWAI/PMU /PMC
6. Construction Material Sourcing							
❖ Borrow areas for sourcing earth for filling as required (erosion, loss of productive land, land degradation,	As surplus soil is available from excavation of the site, no borrow area may be required.	IRC Guidelines on borrow areas EIA Notification 2006(under Environmental Protection Act and Rules, 1986;)	-	During design and construction stage	Part of Project Costs	Contractor	IWAI/PMU /PMC

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
air pollution)							
❖ Quarries for sourcing stone and aggregates (loss of productive land, land degradation, air pollution. Any illegal quarrying may lead to land use change, unstable rock formation)	• Aggregates required for embankment stone pitching and roads should be procured from licensed quarries. • It should be ensures that selected quarries are having requisite environment clearance, and comply with Air Pollution Control and Noise level requirements as per the law. • Copy of Environmental Clearance letter and Consent to operate and should be obtained from the quarry owner and submitted to IWAI. • Material should be transported under covered trucks only. • No new quarry should be opened without due permissions. If new quarry is opened then it is require to obtain environment clearance from MoEFCC/SEIAA • Each Quarry should be visited prior to its selection to ensure its compliance with lease conditions, EC and consent conditions.	EIA Notification 2006(under Environmental Protection Act and Rules, 1986;)	Quarry Site	During design and construction stage	Part of Project Costs	Contractor	IWAI/PMU /PMC
7. Protection of Flora and Fauna							

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
❖ Protection of impact on aquatic Fauna & Flora due to Increased sedimentation downstream of construction site	• To avoid the siltation in water 100m distance has been kept between existing and and proposed lock gate. • No breeding ground is noticed around the project site. However construction activity should be restricted during spawning & breeding period of fishes, i.e. June to August • To avoid the construction debris wash or blown into the water the construction area shall be surrounded by silt screens. • The screens should also be placed around storage areas, to prevent waste from blowing away and to prevent sediment run-off into the river. • All the material and debris shall be stored at least 20 meters away from the high water mark and construction equipment must not be cleaned or washed within 50 meters of the high water mark. • Run-off from site should pass through oil/grease traps and sedimentation tank before its	Wild Life (Protection) Act, 1972	Around Pilling Area	During design and construction stage	Part of project costs	PMU through DFO	IWAI/PMU /PMC

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	reuse. All efforts shall be made for its reuse to avoid its discharge to river. • Construction activities shall be carried out rapidly. Culvert construction should not be carried out during breeding and spawning season means during rainy season. • Maintaining equipment in good condition to prevent leaks or spills of potentially hazardous materials like hydraulic fluid, diesel, gasoline and other petroleum products • Positioning water borne equipment in a manner that will minimize damage to fish habitat. • Turbidity traps/curtains should be provided or Geo-Textile synthetic sheet curtain shall be placed around the construction area to prevent movement of sediments and construction waste. • Excavation activities onshore shall not be undertaken during monsoon season so as to minimize sediment load of run-off. • All workers should be made aware						

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	of not throwing any waste in the river or any drain • No construction debris/ already accumulated solid waste at site or waste generated from labour camp should be thrown in river or any drain • Sewage generated from labour camp should not be directed into river but should be disposed off through septic tank/soak pit. • Engineering controls modify the equipment or the work area to make it quieter. Examples of engineering controls are: use of quieter equipment; retro-fitting equipment with damping materials, mufflers, or enclosures; erecting barriers; and maintenance. • Aquatic ecology monitoring shall be carried out prior start of construction and after completion of construction so as to assess the impact of construction activities on aquatic life. • Soil stabilization works in the bank must consider implications on changes in hydrological flow,						

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	current and behavior of the river. Such changes may create new problems such as change of river course, erosion of river embankment, change in erosion and inundation pattern of the bank etc. which will in turn impact the habitat of aquatic life • Sedimentation and siltation should be prevented to maintain productivity of aquatic ecosystem and availability of food such as aquatic fauna, vegetation to the avian fauna. • •						
❖ Impact on Avifauna including Migratory birds	• Hunting, poaching and harming any animal (specially avi -fauna) by any worker or project related person shall be strictly prohibited and monitored. • The designated imported bird area is located more than 4 km from the however it is recommended that, to conserve the local biodiversity (migratory birds of Farakka bararege area) the construction activities may stop for migratory	Wild Life (Protection) Act	Around Project Site	During design and construction stage	Part of project costs	PMU	IWAI/PMU /PMC

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	periods of the birds if required. •						
❖ Impact on Terrestrial Flora & Fauna	• There are very few trees and some agricultural land scattered around the location, besides the green meadows around. Development of a green belt has been proposed all along the lock gate boundary. This would help in settlement of dust and keep atmospheric humidity under check. • As far as possible the existing trees present at site shall be retained under greenbelt • Permission should be obtained from forest department prior tree cutting if any. • Thick green belt should be developed around the periphery of the lock site. App. 900 trees will be planted at the site. Green belt should include native tree species like Pepal, Bargad, Arjun, Sheesham, Kaner, Neem etc. Green belt should be developed as per the CPCB guidelines proposed above climate section • 70 % survival rate for plantation shal	Wild Life Protection Act	In and Around Project Site	During design and construction stage	Part of project costs	Contractor	IWAI/PMU /PMC

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	be ensured. • Hunting, poaching and harming any animal (especially avi -fauna) by any worker or project related person shall be strictly prohibited and monitored. • The designated imported bird area is located more than 4 km from the however it is recommended that, to conserve the local biodiversity (migratory birds of Farakka bararege area) the construction activities may stop for migratory periods of the birds if required. • Construction activities should be restricted to 6:00 Am-10:00 Pm especially noise generating activities • Illumination at the site shall be reduced during the night time (if no activity is going on) as it may disturb the nocturnal animals. • Noise generating activity shall not be undertaken during night time to minimize disturbance to animals. • Noise levels shall be maintained within the prescribed CPCBs limits to the extent possible during the day time.						

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	• No hazardous material or waste should be disposed off in the other land or nearby area as it may harm the animals, if consumed accidently • Regular water sprinkling shall be done in dust prone areas and haul roads. • Construction site shall be barricaded to reduce the dust and noise generation. • Speed limit will be for construction vehicle shall regulate to control noise and dust emission. • Regular maintenance of the dumper and construction machineries shall be done • No timber usage should be allowed for cooking or any other purpose at site during design, construction phase of the project. Clean fuel like LPG should be used •						
8. Air Quality							
❖ Fugitive Dust Generation due to construction	• Barricading the site to prevent dust dispersion to nearby areas • Excavation and filling should be carried out in parallel. Excavation	Environmental Protection Act, 1986 and amendments	Construction sites, Loading areas,	During the Construction phase	Part of project Costs	Contractor	IWAI/PMU /PMC

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
activities	and filling should be carried out in phases • Excavated soil should be stored under covered conditions • Transport of loose and fine materials through covered vehicles. • Loading and unloading of construction materials in covered area. • Approach roads should be paved and widened. • Water spraying on earthworks, unpaved haulage roads, other dust prone areas and construction yard. • Make Provision of PPEs like face masks to workers. • Raw materials like cement, sand and construction debris should be stored under covered conditions • Wheel wash facility should be provided at exit points of the site • Monitoring of air quality should be carried out on monthly basis to check the level of pollutants and effectiveness of proposed EMP. • Development of green belt at the site efficient for arresting the	thereof; The Air (Prevention and Control of Pollution) Act, 1981 and amendments thereof	storage areas,				

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	particulate matter • Mixing Plant, crushers and batching plant should be located on downwind direction of the site fitted with adequate stack height to ensure enough dispersion of exit gases. with appropriate pollution control measures • Low sulphur diesel should be used for operating DG sets and construction equipment.						
❖ Exhaust gas emissions from machinery and vehicular traffic.	• Regular maintenance should be carried out of machinery and equipment. • Diesel Generating (DG) sets should be fitted with stack of adequate height as per regulations (Height of stack = height of the building + 0.2 √ KVA.) •	Environmental Protection Act, 1986 and amendments thereof; The Air (Prevention and Control of Pollution) Act, 1981 and amendments thereof	Construction camps and sites, batching plants, DG sets locations	During the Construction phase	Part of project Costs	Contractor	IWAI/PMU /PMC
❖ Emissions at access road : avoidance of traffic Jams	• Efforts should be made to move construction material early morning and late evening period. • Traffic regulators (Guard) should be posted in habitat area and at key	Environmental Protection Act, 1986 and amendments thereof;	Existing roads	During the Construction phase	Part of project Costs	Contractor	IWAI/PMU /PMC

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	junction areas to avoid congestion • No construction, material, equipment or vehicle should be stored or parked at any road or the non project area • Transportation vehicle should strictly adhere to the designated routes and timings and should avoid the peak traffic hours	The Air (Prevention and Control of Pollution) Act, 1981 and amendments thereof					
9. Noise and Vibration							
❖ Noise from construction vehicle, equipment and machinery.	• All equipment to be timely serviced and properly maintained to minimize its operational noise. • Construction equipment and machinery to be fitted with silencers and maintained properly. • Barricading the construction site to minimize the noise level outside the site boundary • Timely maintenance and servicing of construction equipment and vehicles to reduce the noise generation due to friction and abrasion • Protection devices (ear plugs or ear muffs) will be provided to the workers operating in the vicinity of	Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof	Lock gate site and accesses road.	During the Construction stage	Part of project Costs	Contractor	IWAI/PMU /PMC

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	high noise generating machines. • Honking should be prohibited at the project site • All safety measures and Job rotations should be practised for workers, working in high noise level areas. • No noise generating activity should be carried out between 6:00 AM to 10:00 PM. • Hearing test for the workers prior to deployment at site and high noise areas followed by periodic testing every six months. • Monitoring of Noise levels should be carried out on monthly basis to check the level of pollutants and effectiveness of proposed EMP.						
10. Land-use and Landscape							
❖ Land use Change and Loss of productive/top soil	• Efforts should be made to improve the Aesthetic of the area. No construction waste or other wastes should be dumped at unidentified areas. • Caution board in local language should be placed at different locations to prevent dumping of	Design requirement	Around project site area and borrow area	During construction Stage		Contractor	IWAI/PMU /PMC

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	Municipal solid waste and other waste all around the project site areas which is happening substantially at present. • Top soil should be preserved and laid over either on the embankment slope for growing vegetation to protect soil erosion or spread over in the proposed plantation areas. • Land earmarked for dumping of construction waste, setting up of construction camps, plant sites etc should be free from any social and R&R issue and away from settlements.						
❖ Soil erosion due to construction activities, earthwork	• Provision of cross drainage structure should be made in the access road if required to maintain the natural drainage pattern. • Provision of side drain should be made in access road if required to prevent water logging. • Measures like building of scouring protection structures, protection by geo-textiles matting etc should be made, if river bank erosion is found around the lock area.		Access road and river bank	During construction Stage	Part of project costs	Contractor	IWAI/PMU /PMC

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	• Bio-turfing of embankments should be made enhance the slop stabilization.						
❖ Soil erosion at earth stockpiles	• The earth stockpiles to be provided with gentle slopes to prevent soil erosion. • Shore protection through stone pitching and scouring of banks all along the channel in up steam and d/s of lock should be prevented by providing apron		At earth stockpiles	During construction Stage	Part of project costs	Contractor	IWAI/PMU /PMC
❖ Compaction and contamination of soil due to movement of vehicles and equipment	• Fuel and lubricants to be stored at the predefined storage location. • Storage area should be paved with gentle slope to a corner and connected with a chamber to collect any spills of the oils. • Provision of “oil interceptors” at wash-down and re-fuelling areas. • Oil and grease spill and oil soaked materials are to be collected and stored in labelled containers (Labelled: WASTE OIL; and hazardous sign be displayed) and sold off to SPCB/ MoEF authorized vendors. • Movement of construction vehicles,		lockgate site	During Design & Construction stage.	Part of project costs	Contractor	IWAI/PMU /PMC

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	machinery and equipment should be restricted to the designated haulage route.						
11. Water Resources							
❖ Depletion of Groundwater resources due to unregulated abstraction for construction purpose	• Water required for construction should be sourced from rivers with due permission from authorities. • Water required for domestic uses should be sourced from supply water. • Augmentation through incorporating water harvesting structures if technically feasible. • Efforts to restrict water intensive activities during summer period (April, May, June) • No dumping of waste/wastewater in the ground. waste or wastewater should not be stored in unlined ponds			During Construction stage	Part of project costs	Contractor,	IWAI/PMU /PMC
❖ Increase in water Siltation levels due to construction of lcok due to disposal of	• Restoration of changes in the stream, if any, made during construction to its original level. • Mobile toilets with anaerobic digestion facility should be fixed at construction site. No domestic		Lock gate site	During Construction stage	Part of project costs	Contractor	IWAI/PMU /PMC

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
domestic waste	waste should be discharged to river. • Excavation activity should not be carried out during monsoon season • Garland drains should be provided around excavated area so as to prevent entry of run-off to the excavated pits • Excavated areas should be covered to the extent possible to prevent entry of rainfall run-off in case of rains • The storm water drain should be connected to a collection cum sedimentation pond to collect the surface run of the construction area. The collected rain water should be used for dust suppression purposes at material handling area. Storm water drains should be provided for the parking areas also and these drains should be provided with oil & grease trap • No waste should be disposed off in river and ground while filling and excavating. • Washing of vehicle and equipment should not be carried out at river or any waterbody. Washing area						

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	should be provided with the storm water drains fitted with oil & grease trap. • Monitoring of surface water quality should be carried out on monthly basis to check the level of pollutants and effectiveness of proposed EMP • Storage of debris and raw material should be carried out in paved and covered areas. This will minimize interface of run-off with raw material and debris. • Water use should be minimized by using RMC, practicing curing by water sprinkling, maintaining flow of sprinklers, covering the water storage tanks to minimize water evaporation, creating awareness for water conservation and regular inspections at site to monitor the leakages in water storage area • In case RMC is not used then concrete transit mixer should be washed and cleaned daily. Wash from these mixers should be collected in block work tanks which will allow settling of concrete, removal of aggregates and allowing						

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	the waste to wastewater drain. This collected waste concrete can be dried and used for various purpose at site. • Wastewater generated from the washing/cleaning area after passing through oil & grease trap & curing area should be re-used for water sprinkling and wheel washing • Turbidity traps/curtains should be provide or Geo-Textile synthetic sheet curtain should be placed around pilling and construction area to prevent movement of sediments and construction waste. • Septic tank/soak pit should be provided at site for disposal of sewage from the toilets at site and from the labour camps. Adequate toilets & bathrooms should be provided to prevent open defecation. • Fuel should be stored in leak proof containers and containers should be placed on paved surfaces. • Proper collection, management and disposal of construction and municipal waste from site to prevent						

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	mixing of the waste in run-off and entering the water bodies • Natural Drainage pattern of area around should be maintained.						
12. Accident and Safety Risks							
❖ Accident risk from construction activities and health and safety of workers	• Contractors to adopt and maintain safe working practices. • Usage of fluorescent safety and cautionary signage, in local language at the construction sites • Training should be provided to workers, especially machinery operators, on safety procedures and precautions. • The Contractors to appoint a safety officer mandatory. • At every work place, a readily available first aid unit including an adequate supply of dressing materials, a mode of transport (ambulance), nursing staff, and doctor to be provided. • Required PPE should be provided to workers. • Periodic medical checkup should be carried of the workers. • Training should be given to workers	Central Motor and Vehicle Act 1988 EP Act 1986 Noise Rules 2002	Construction sites	Construction period	Part of project costs	Contractor	IWAI/PMU /PMC

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	to handle the heavy equipment so as to prevent accidents • Training should be given to workers to handle emergency situation like fire, earth quake and flood • Rest area should be provided at the site where labour can rest after lunch and should not lie on site anywhere • Adequate illumination should be maintained in the working area, in labour camps and plant site. • Working hours of labour should not exceed than standard norms as per state factory law • Construction labour camps and site should be properly cleaned and hygiene should be maintained • Proper sanitation facility like toilet and bathing facility should be provided at labour camps. Wastewater generated from these facilities should be disposed off through septic tanks and soak pit • Safety officers should be appointed at site so as to ensure all safety measures are taken at the site						

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	• Activity like smoking and consuming liquor should be prohibited at the site • Awareness on AIDS should be spread among the workers • Regular inspection for hygiene and safety in labour camps should be done • Speed limit of vehicles should be restricted at site to prevent any accidents. • Noise level in the work zone should be maintained and followed as per OSHAS norm • Employment should be provided preferable to local & affected people • Dustbins should be provided at labour camps for collection of waste and waste should be regularly disposed off through the concerned agency • Arrangement of fire-fighting should be made at site and workers should be trained to use the system in case of fire						
13. Shifting of Common Property Resources and Pressure on Existing Resources in Study Area							
Shifting of	• Any CPR, if removed should be		Project	Pre-	Part of	Contractor	IWAI/PMU

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
community properties and utilities	relocated at the earliest with consent of the villagers and the Gram Panchayat		Area	Construction	Project Costs		/PMC
Pressure on Existing resources	• Non-productive lands, barren lands, raised lands; wastelands should be used for setting up labour camps, plant sites and debris disposal site. The above sites will be located more than 500 m away from the settlement and other sensitive location. • Land should be used for establishment of construction camps, debris disposal site and plant site only after obtaining consent from land owner. • Necessary permits should be obtained from concerned authorities in case any quarry site, batching plant, hot mix plant, WMM plant etc. is set up. • Management, rehabilitation and closure of these sites should be as per the Management plans proposed for these sites. Records for starting, maintaining and closure should be maintained and should be approved by site engineers						

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	• Top soil should be stripped off from these sites prior to usage and should be sprayed back at the time closure. Top soil should be stored in covered condition • Entrance to any road/structure should not be blocked for construction of lock gate. • Site should be barricaded and should have entry guarded by security guard. Register should be maintained for entry of outsiders. No unauthorized person should be allowed to enter the site especially village children • A board should be displayed at entrance of site displaying name of project, area and hazards associated with the site on entrance and activities prohibited within and near site area in local language • All proposed environmental pollution measures should be taken during construction of phase of lock gate to minimize the harm to existing environmental quality of the area, which is being enjoyed by the residents of that area						

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	• Maintenance and repair of the road should be carried out both before and end of construction by contractor. • Sprinkling of water should be carried out in road also, so as to minimize dust generation due to movement of construction vehicles						

TABLE 2: ENVIRONMENT MANAGEMENT PLAN OF FARAKKA LOCK DURING OPERATION PHASE

Environmental Issue/ Component	Avoidance/Mitigation/ Compensation Measures	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
OPERATION AND MAINTENANCE STAGE								
1. Air Quality								
1.1 Air pollution due to Barrage /vessel movement	• • Use of low sulphur fuel by barges. • Regular maintenance of barges. • Electronic charting for proper schedunig of the inland traffic • Diesel Generating (DG) sets should be fitted with stack of adequate height as per regulations (Height of stack = height of the building + 0.2 √ KVA.) • Maintenance of green belt and maintaining survival rate of trees to minimum 70%	Environmental Protection Act, 1986; The Air (Prevention and Control of Pollution) Act, 1981	project area	MI: Ambient air quality (PM_{10}, CO,SO_2 NO_x)	• As per CPCB requirements	Included in Operation/ Maintenance cost	Contractor	IWAI/PMU/PMC L
2. Water Quality								
2.1 Siltation	• Regular checks should be made for soil erosion	Project requireme	Near banks	MI: TSS monitoring	Site observati	Included in	Contractor	IWAI/PM

Environmental Issue/ Component	Avoidance/Mitigation/ Compensation Measures	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	and turfing conditions of channel/ river bank structures for its effective maintenance.	nt	of the navigation channel	of water	on	Operation/ Maintenance cost		U/PMC L
2.2 Waste Water treatment and conservation	• Sewage generated from site should disposed off in soak pit and septic tank. • Storm water drainage system should be provided with jute filtration at the site Water conservation fixtures should be installed in toilets. Some of the water conservation fixtures which can be installed are dual flushing cisterns, sensor taps, low water urinals etc. • No wastewater should be received from vessels and vessels	Project requirement	Project area	MI: Proper treatment				

Environmental Issue/ Component	Avoidance/Mitigation/ Compensation Measures	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	should not be allowed to discharge their wastewater and solid waste in river. • No waste/wastewater should be discharged in river or dumped into the ground • Fuel should be stored in leak proof containers and containers should be placed on paved surfaces • Monitoring of surface water quality should be carried out on six monthly basis to check the level of pollutants and effectiveness of proposed EMP							
3. Land and Soil								
3.1 Soil erosion due to barge movement and soil contamination	• Periodic checking to be carried to assess the effectiveness of the stabilization measures viz. turfing, stone pitching, river training	Project requirement	Along banks and embankment	MI: Existence of soil erosion sites	On site observation	Included in Operation/ Mainten	Contractor	IWAI/PMU/PMC L

Environmental Issue/ Component	Avoidance/Mitigation/ Compensation Measures	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
due to waste spillage	structures etc. • Necessary measures to be followed wherever there are failures. • Two separate waste bins should be placed to collect the daily waste as organic and inorganic. All plastic materials would be sold to secondary users for recycling. Biodegradable waste could be compost and later use as fertilizer. • Adequate numbers of sanitary latrines with septic tank and soak pit will be installed for the workers during the operational phase.		slopes and other probable soil erosion areas.	Number of soil erosion sites PT: Minimal occurrences of soil erosion		ance cost		
4. Flora & Fauna								
5.1 Impact on terrestrial and aquatic flora & fauna	• Green belt as trees, shrubs, and grasses to be properly maintained	Forest Conservation Act	Project tree plantati	MI: Tree/plants	Records and field observatio	Operation/ Mainte	Contractor/ Forest	IWAI/PMU/PMC L

Environmental Issue/ Component	Avoidance/Mitigation/ Compensation Measures	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
due to water pollution and barge movement and bank erosion	• No wastewater or waste shall be disposed off in river from project site or from vessel into the water. Penalty shall be imposed on the vessels reported of disposing waste/wastewater in the river • Sewage generated from the site shall be disposed in soak pit and septic tank. • Precautionary measures viz., use of better/ fool proof handling equipments, transportation of coal in closed barges to be strictly followed to ensure zero spillage of coal particles during loading, transport and unloading. In addition, strict measures to be implemented to prevent spillage/leakage of oil	1980, Wild Life Protection Act, 1972	on sites. Dolphin movement locations	survival rate PT: Minimum rate of 70% tree survival and observations	ns. Regular monitoring	nance Cost	Department	

Environmental Issue/ Component	Avoidance/Mitigation/ Compensation Measures	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	and grease at filling, handling and servicing points of vessels in order to protect environment, and biota. Care should be taken so that the sewages and garbage generated are disposed at designated sites only after necessary treatment. • During night operations, the barges should use powerful search lights and horns so as to warn the fishers of the incoming barges well in advance at least from 500 m away. • Standard Operating Procedures (SOPs) to prevent spillage of oil/ fuel/ grease will be followed. • Reducing speed of barges in the curved							

Environmental Issue/ Component	Avoidance/Mitigation/ Compensation Measures	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	and narrow stretches from its normal speed of 7-8 nautical miles/h to 5-6 nautical miles/h is recommended for reducing the wave action and thereby minimizing possibilities of bank erosion. • To prevent bank erosion the vessels should navigate only through the designated navigation. • In case of damage of fishing nets, fishing crafts and other gears of fishers, arising due to barge operation, appropriate and quick compensations may be given to the aggrieved fishers • Preparation and publishing barge movement schedule, pre-signaling of							

Environmental Issue/ Component	Avoidance/Mitigation/ Compensation Measures	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	movement, fixed timing, generation of awareness on barge movement among public, specifically the fishers and ferry operators may be made. • Instruction should be given to all vessels and all employee and staff that no aquatic fauna shall be harmed due to any reason • Quick cleanup operations should be carried out in case of accidents. Vessel owner should be responsible for paying the clean up expenses in case of the accidents and pollution of river water quality •							

Environmental Issue/ Component	Avoidance/Mitigation/ Compensation Measures	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
5. Safety								
51 Accident Risk due to uncontrolled growth of vegetation	• Regular maintenance of plantation along the roadside • No invasive plantation near the road	Project requirement	Access Road	MI: Presence and extent of vegetation growth on either side of road. Number of accidents. PT: No accidents due to vegetation growth	Visual inspection Check accident records	Included in operation/Maintenance cost	IWAI	IWAI
5.2.Transport of Dangerous Goods	• Existence of spill prevention and control and emergency responsive system • Emergency plan for vehicles carrying hazardous material	-	Throughout the project stretch	MI: Status of emergency system – whether operational	Review of spill prevention and emergency response	Included in operation/Maintenance	Contractor	IWAI/PMU/PMC L

Environmental Issue/ Component	Avoidance/Mitigation/ Compensation Measures	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
				or not PT: Fully functional emergency system	plan Spill accident records	cost.		
5.3 Accidents Risks Due to Movement of Vessels and other hazards associated with site	• Implementation of the environment management plan as proposed to prevent the environmental pollution during operation phase • Ships should comply with safety norms and should maintain the speed so as to prevent the accidents. In case of accidents, ship owner should be responsible for cleanup operations • Safety norms should be followed for all operational phase activities at site	-	Throughout the project stretch	MI: Status of emergency system – whether operational or not PT: Fully functional emergency system	Review of spill prevention and emergency response plan Spill accident records	Included in operation/Maintenance cost.	IWAI	IWAI

Environmental Issue/ Component	Avoidance/Mitigation/ Compensation Measures	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	• Safety training should be given to the lock site staff for managing the floods, earthquake, fire, ship accidents like situation. Emergency collection area should be designated at the site which is safe. All workers should be directed to collect at this area in case of emergency. • Firefighting facility should be provided at site and trained personnel should be available at site who can operate the fire extinguishers and other fire-fighting equipment.							
5.4 Welfare of Society	• Employment should preferably be given to local people. Women should be given equal opportunity for work. • Development activities	-	Throughout the project stretch	MI: CSR Activities PT: CSR Action Plan	Review of CSR Activities through NGO	Included in operation/Maintena	IWAI	IWAI

Environmental Issue/ Component	Avoidance/Mitigation/ Compensation Measures	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	should be carried out in the village and nearby areas for development of area				accident records	nce cost.		

TABLE 3: ENVIRONMENT MONITORING PLAN OF FARAKA LOCK FOR CONSTRUCTION & OPERATION PHASE

S. No.	Aspect	Parameters to be monitored	No of sampling locations & frequency	Standard methods for smapling and analysis	Role & Responsibility	
					Implementation	Supervision
Construction Period						
1.	Air Quality (Ambient & Stack)	PM_{10}, $PM_{2.5}$, SO_2, NO_2, HC and CO	Three Locations including project site, labour camp and nearest habitation-once in two months	• Fine Particulate Samplers for $PM_{2.5}$ • Respirable Dust Sampler fitted PM_{10} • Respirable Dust Sampler fitted with Gaseous sampling arrangements for SO_2 and NO_2, CO analyser /portable CO meter for CO portable HC meter or tubes for HC; TO-14A, TO-15, USEPA method for sampling	Contractor	IWAI & PMC

				and analysis of VOCs in ambient air		
2.	Surface Water Quality	Physical, chemical and biological	River Ganga- upstream & downstream-Once a month	Grab sampling and analysis by using standard methods	Contractor	IWAI & PMC
3.	Drinking water Quality	Physical, chemical and biological	Drinking water for labour camps Once a month	Grab sampling and analysis by using standard methods	Contractor	IWAI & PMC
4.	Noise Level	Day time and night time noise level (max, min & Leq levels)	Construction labour camp, construction site and nearest village Once a month	Noise meter	Contractor	IWAI & PMC
5.	Soil Quality, Erosion & Siltation	Soil texture, type, Electrical conductivity, pH, infiltration, porosity, etc.,	Construction site, labour camps and debris disposal site Once in 6 months	Collection and analysis of samples as per IS 2720	Contractor	IWAI & PMC
6.	Greenbelt development	Plantation survival rate	Lock gate premises	Survey, counting, recording & reporting	Contractor	IWAI & PMC
7.	Soil Erosion	---	Upstream & downstream of project site near river bank--Once a month	Survey & observation; Extent and degree of erosion; Structures for controlling soil erosion	Contractor	IWAI & PMC
8.	Aquatic ecology	Phytoplankton, Zooplankton	River Ganga Six monthly	Species diversity index.	Contractor	IWAI & PMC
9.	Integrity of embankment	---	Upstream & downstream of lock gate site-Once a month	Survey & observation; Extent and degree of erosion; Structures for controlling soil erosion	Contractor	IWAI & PMC

Operation Phase						
1.	Air Quality (Ambient & Stack)	PM_{10}, $PM_{2.5}$, SO_2, NO_2, HC and CO	Two locations- project site, and nearest habitation Six monthly	• Fine Particulate Samplers for $PM_{2.5}$ • Respirable Dust Sampler fitted PM_{10} Respirable Dust Sampler fitted with Gaseous sampling arrangements for SO_2 and NO_2, CO analyzer /portable CO meter for CO portable HC meter or tubes for HC; TO-14A, TO-15, USEPA method for sampling and analysis of VOCs in ambient air	NABL Lab to be contracted by IWAI	IWAI
2.	Surface Water Quality	Physical, chemical and biological	River Ganga- Once in quarter (Upstream & Downstream)	Grab sampling and analysis by using standard methods	NABL Lab to be contracted by IWAI	IWAI
3.	Drinking water Quality	Physical, chemical and biological	Drinking water for staff- Once a quarter	Grab sampling and analysis by using standard methods	NABL Lab to be contracted by IWAI	IWAI
4.	Noise Level	Day time and night time noise level (max, min & Leq levels)	Two locations- project site, and nearest habitation Once a quarter	Noise meter	NABL Lab to be contracted by IWAI	IWAI
5.	Greenbelt	Plantation survival rate	Site premises	Survey, counting, recording & reporting	IWAI	IWAI
6.	Soil Quality, Erosion & Siltation	---	Upstream & downstream of project site near river channel	Physio chemical parameters of soil Survey & observation; Extent and degree of	IWAI	IWAI

			bank-Monthly	erosion; Structures for controlling soil erosion		
7.	Aquatic ecology	Phytoplankton, Zooplankton	River Ganga-Six monthly	Species diversity index	IWAI	IWAI
8.	Integrity of embankment	---	Upstream & downstream of lock gate site-Once a month	Survey & observation; Extent and degree of erosion; Structures for controlling soil erosion	IWAI	IWAI

Annexure 1: Tree Plantation and Management Plan

1.0 Introduction

Site has various mango orchards and development of project will involve tree cutting. Tree cutting shall be carried out only after obtaining clearance from forest department. Only identified & permitted tree species shall be cut.

As per state forest policy compensatory afforestation should be carried out in ratio of 1:2 minimum. Compensatory affoestation shall be carried out by forest department. It is preferable that compensatory afforestation is carried out in nearby land patch. Survival rate of the afforestation carried out by forest department shall be monitored by IWAI.

Apart from above compensatory plantation as part of environmental management, it is proposed to develop 15-20 m thick green belt all along the site boundary and along the roads within the site. Green belt shall be developed as per the following guidelines

1.1 Selection of Tree Species

The Project involve movement of vehicle for transportation of material Thus emissions like particulate matter, SO_2, NO_x & CO shall be generated at site. Also there is potential of generation of coal dust while unloading the materials at stock piles. Thus the plantation species tolerant to these pollutants and mitigate these from air shall be planted. Species selecting criteria is given below:

1. Tolerant to expected pollutants at site
2. Longer duration of foliage
3. Freely exposed foliage (adequate height of crown, openness of foliage, big leaves, small stomata apertures, stomata well exposed)
4. Leaves supported on firm petioles

1.2 Recommended Plant species

Based on nature of pollutants following tree species are recommended to be planted

S. No.	Plant Species	Common Name	Habit
1.	Termanilia catappal	Jagali Badam	Tree
2.	Anthocephalus cadamba	Kadam	Tree
3.	Ficus bengalensis	Badh	Tree
4.	Magnifera indica	Aam	Tree
5.	Tectona grandis	Teak	Tree
6.	Ficus religiosa	Peepal	Tree
7.	Hibiscus rosa sinensi	Hibiscus	Shrub
8.	Wrightia arboriea	Dudhi	Shrub
9.	Tabernaemontana divaricata	Chandani	Shrub
10.	Bougainvillea glavra	Bougainvillea	Shrub

11.	Codium variegates	Cockscomb	Herb
12.	Celosia argentea	Croton	Herb
13.	*Ilex rotunda*	Kurogane holly	Tree
14.	*Cassia surattensis*	Golden Senna	Tree
15.	*Cinnamomum camphora*	Camphor tree	Tree
16.	Lagerstroemia flos-reginae	Lagerstroemia	Tree
17.	Alstonia scholaris	Devil tree	Tree
18.	Cassia fistula	Golden shower	Tree
19.	Delonix regia	Gulmohar	Tree
20.	Pongamia pinnata	Indian beech	Tree
21.	Terminalia arjuna	Arjun	Tree
22.	Terminalia belerica	Baheda	Tree
23.	Butea superb	Tesu	Tree
24.	Cassuarina sp.	Cassuarina	Tree
25.	Bahunia acuminate	White orchid green	Tree
26.	Swetania mohogini	Cuban Mahagony	Tree
27.	Azadiracta indica	Neem	Tree
28.	Artocarpus integrifolia	Jackfruit	Tree
29.	Gmelina arborea	Gamhar	Tree
30.	Putranjiba roxburghii	Putranjiba	Tree

1.3 Plantation Methodology

Components of green belts on roadside fence should be both absorbers of gases as well as of dust particles, including even lead particulates. Thus the choice of plants should include pollution tolerant shrubs of height 1 to 1.5 m and trees of 3 to 5m. The intermixing of trees and shrubs should be such that the foliage area density in vertical is almost uniform. For effective removal of pollutants, it is necessary that (i) plants should grow under conditions of adequate nutrient supply, (ii) absence of water stress and (iii) plants arewell exposed to atmospheric conditions (light & breeze).

Multiple rows of green belt shall be developed. Green belt should be pyramidal in shape.

Plantation pattern shall be kept as given below:

- Short trees and tall shrubs shall be planted as first row (from road) followed by tall tree plantation which will be followed by another row of medium and small trees and tall shrubs.
- Planting of trees should be in appropriate encircling rows, each rows alternating the previous one to prevent further fanning and horizontal pollution dispersion;
- Since tree trunks are normally devoid of foliage, it would be appropriate to have small shrubs in front and in between the tree spaces;

- The open areas between the process installations where trees cannot be planted should be covered with lawn grasses for effective trapping and absorptions of air pollutants.
- Fast growing trees with thick canopy and perennial foliage should be selected so that the effective tree height with envisaged objective will be attained in minimum span of time

1.4 Plantation Pattern

A standard horticultural practice involving planting of saplings in pits of substantial dimensions i.e., 1m × 1m × 1m for big trees and along half of these dimensions for smaller trees and shrubs. The pits are then filled with earth, sand, silt and manure in pre-determined proportions. Saplings planted in such pits are watered liberally during dry months.

1.5 Time of Plantation

Plantation of the tree sapling should be done only after the first shower during the rainy season. The best time for plantation is after 15 days from the day of first shower during rainy season.

1.6 Protection of Tree saplings

Circular tree guard should be placed after the plantation of the saplings for the protection of these young plants from the ravages of cattle, sheep and goat and other animals. If tree saplings died or damage occur after placing the circular tree guard, timely replacements of damaged plant and thereafter care is important.

1.7 After Care & Monitoring

The growing plants are cared at least for the first two years under favorable conditions of climate and irrigation. Nutrients in pits are supplemented and the juveniles provided protection.

Thinning shall start after the stand is 3-4 years old and repeated every 4 years until the stand is 15 years old. Between 15-25 years old, thinning should be conducted every 5 years and after 25 years old, thinning shall be done after every 10 years. When the canopy closes, at about 6 years, 30-40% of the stems shall be thinned to selectively remove suppressed, diseased and badly formed trees.

Periodic assessment shall be carried for survivability of the trees. Minimum 70% survival rate shall be achieved.

1.8 Records Keeping & Reporting

The following records shall be maintained:

1. Record of Tree plantation
2. Record of Survivability rate

Inspection shall be carried out at site to know the survival rate of the plantation. The tree plantation and survivability report shall be prepared every six monthly.

1.9 Responsibility

Compensatory plantation shall be carried out by forest department. Survival rate of plantation shall be inspected of the by IWAI. Plantation within the lock site shall be carried out by IWAI and shall be monitored by IWAI.

Appendix 2: Guidelines for On Site and Off Site Emergency Management

1.0 INTRODUCTION

Many emergencies can occur on any construction site and need to be effectively handled. The environmental and occupational health and safety aspects and related emergency can include incidence such as Collapse / subsidence of soil / Fire / Explosion / Gas Leak, Collapse of Building / Equipment and other Occupational Accidents. On site and off site emergency management plan shall be developed to effectively handle them.

Thus every contractor shall have an approved on-site emergency plan. The contractor should submit a copy of this plan to PIU and Supervision consultant before the start of the work. Contractor shall develop the onsite emergency plan considering the potential environmental, occupational health and safety emergency situation at site and activities involved. This plan shall include a list of these potential emergency situations in the onsite emergency preparedness & response plan. Contractor shall get the plan approved from IWAI/PMC

1.1 ANTICIPATED EMERGENCIES AT CONSTRUCTION SITE

The potential emergency situations have been defined below for guidance purposes. The contractors can follow these for developing site specific on site emergency preparedness plan.

Emergency conditions / situations	Sources
Collapse / subsidence of soil	▪ Civil structures
Bulk spillage	▪ Hazardous substance / inflammable liquid storage ▪ Vehicular movement on highway
Fire and explosion	▪ Inflammable Storage Areas ▪ Gas Cylinder Storage Areas ▪ Electrical Circuits ▪ Isolated Gas Cylinders (LPG / DA) ▪ Welding / Gas Cutting Activity
Electrical Shock	▪ HT line ▪ LT distribution ▪ Electrically Operated Machines / Equipment / Hand Tools / Electrical Cables
Gaseous Leakage	▪ Gas Cylinder Storage Areas ▪ Gas Cylinder used in Gas Cutting / Welding Purposes
Accidents due to Vehicles	▪ Heavy Earth Moving Machinery ▪ Cranes ▪ Fork Lifts ▪ Trucks ▪ Workman Transport Vehicles (cars / scooters / motor cycles / cycles) ▪ Collapse, toppling or collision of transport equipment

Slips & Falls (Man & Material)	▪ Work at Height (Roof Work, Steel Erection, Scaffold, Repair & Maintenance, Erection of equipment, Excavation etc.) ▪ Slips (Watery surfaces due to rain) ▪ Lifting tools & Tackles (Electric Hoist & Forklifts)
Collision with stationary/ moving objects	▪ Vehicular movement
Other Hazards	▪ Cuts & Wounds ▪ Confined Space (under & inside machinery etc.) ▪ Hot Burns ▪ Pressure Impacts (Plant contains several Pressure Vessels & pipefitting containing CO_2, air, water, product & steam, which can cause accidents & injuries to person around.)

1.2 DESIGN OF 'ON-SITE EMERGENCY PLAN'

The 'On-site emergency plan' to be prepared by contractor and shall include minimum the following information:

- Name & Address of Contractor
- Updation sheet
- Project Location
- Name, Designation & Contact Numbers of the organization, nearby hospitals, fire agencies etc. and key personnel including their assigned responsibilities in case of an emergency.
- The roles and responsibilities of executing personnel
- Site Layout Diagram showing location of fire extinguishers, emergency collection area and fire alarm
- Identification of Potential Emergencies Situations/ preventive measures / control & response measures
- Location of Emergency Control Centre (or designated area for emergency control / coordination) with requisite facilities.
- Medical services / first aid
- List of emergency equipment including fire extinguishers, fire suits etc.

1.3 EMERGENCY CONTROL CENTRE

The emergency control centre shall be equipped with following facilities

- Copy of current on-site emergency plan
- Display of the name of site emergency controller
- Two numbers of artificial respiratory sets
- Two numbers of Stretchers
- Vehicle for 24 hours (for large construction sites)
- Inter personnel/section telephone (2 numbers)
- Site layout diagram with entry and exit routes / Assembly points
- Directory of internal / external emergency phone Numbers

- A set of fire extinguishers (DCP type / Foam Type / CO2)
- List of fire extinguishers installed in the construction site including maintenance record
- A set of personal protective equipment (PPE)
- Two numbers of first-aid boxes with prescribed first-aid medicines
- List of competent first-aiders
- List of fire trained personnel
- Two numbers of blankets
- Drinking water
- Two numbers of rescue ropes
- Two numbers of high beam torches
- Two numbers of gas leak detectors
- Life boat & jackets (if working in or near water course)

1.4 RECORDS

The following records shall be maintained:

1. Record of emergency preparedness plan with emergency contact numbers
2. Mock drill/emergency preparedness exercise records
3. Corrective preventive action record after emergency is occurred

1.5 REPORTING

The accident and incident records and emergency preparedness drill reports shall form part of quarterly report to EA

1.6 RESPONSIBILITY

Contractor shall be responsible to handle emergency condition and shall be liable to compensate the damage against accident, if any occurs at site.

Appendix 3: Guidelines for Debris and Solid Waste Management

1.0 INTRODUCTION

Waste will be generated from the construction site and labour camps during the construction phase. Type of the waste to be generated during construction phase is given below.

Excavated Soil

Site is undulating and thus will require cut & fill for levelling. Finished level of the soil will be 37 m. Top excavated soil of 15 cm shall be stripped and shall be stored separately under covered sheds. This soil shall be used for green belt plantation.

Lower layers of excavated soil shall be re-used within the site for filling purpose, construction of approach & internal roads & railway link. If any extra soil is remained, then that should be disposed of to the approved debris disposal site or for mines rehabilitation located in the nearby areas.

Dredged Material

Dredging shall be carried out in the river for construction of off-shore structures like jetty & berths (pilling) and navigation channels. Dredged soil shall not be disposed off along the river bank as they are sensitive habitat for various aquatic species and provide as the spawning and breeding grounds also. Dredged material shall be tested for its quality. If non-toxic then should be disposed off at disposal site but if toxic & contains heavy metals, then it should be disposed off to TSDF site.

Construction Waste

Construction waste will comprise of broken bricks, dry cement, discarded timber, metal piece, cement bag, dry asphalt/bitumen, glass, paint/varnishes box etc. These wastes should be segregated into recyclable and non-recyclable waste. Recyclable waste shall be stored in the covered area and shall be sold to authorized vendors regularly. Non-recyclable waste shall be disposed off at approved debris site in covered vehicles.

Municipal Waste

Municipal waste will be generated from labour camp. Dustbins for recyclable and non-recyclable waste shall be provided in labour camp area. Recyclable waste shall be sold to authorized vendors and non-recyclable shall be disposed off through authorized agency in area responsible for waste collection and management.

Waste generated requires proper management so as to minimize the negative impacts on environment. Concept of reduce, re-use and recycle shall be followed at site. The rejected waste should be disposed off in a secured manner. Thus a site should be identified for disposal of the rejected waste.

1.1 SELECTION OF DISPOSAL SITES:

The locations of Disposal sites have to be selected such that:

- Disposal sites are located at least 1000 m away from sensitive locations like settlements, water body, notified forest areas, wildlife/bird/dolphin sanctuaries or any other sensitive locations.
- Disposal sites shall not contaminate any water sources, rivers etc so the site should be located away from water body and disposal site should be lined properly to prevent infiltration of water.
- Public perception about the location of debris disposal site has to be obtained before finalizing the location.
- Permission from the village/local community is to be obtained for the Disposal site selected.
- Environment Engineer of PMC and Executive Engineer of Contract Management Unit must approve the Plan before commencement of work.

1.2 PRECAUTIONS TO BE ADOPTED DURING DISPOSAL OF DEBRIS / WASTE MATERIAL

The Contractor shall take the following precautions while disposing off the waste material.

- During the site clearance and disposal of debris, the Contractor will take full care to ensure that public or private properties are not affected, there is no dwellings around the dumpsite and that the traffic is not interrupted.
- The Contractor will dispose off debris only to the identified places or at other places only with prior permission of Engineer-in-Charge of works.
- In the event of any spoil or debris from the sites being deposited on any adjacent land, the Contractor will immediately remove all such spoil debris and restore the affected area to its original state to the satisfaction of the Engineer-in-Charge of works.
- The Contractor will at all times ensure that the entire existing canal and drains within and adjacent to the site are kept safe and free from any debris.
- Contractor will utilize effective water sprays during the delivery and handling of materials when dust is likely to be created and to dampen stored materials during dry and windy weather.
- Materials having the potential to produce dust will not the loaded to a level higher than the side and tail boards and will be covered with a tarpaulin in good condition.
- Any diversion required for traffic during disposal of debris shall be provided with traffic control signals and barriers after the discussion with local people and with the permission of Engineer-in-Charge of works.
- During the debris disposal, Contractor will take care of surrounding features and avoid any damage to it. The debris should not be disposed along the bridges & culverts and near the water bodies.
- While disposing debris / waste material, the Contractor will take into account the wind direction and location of settlements to ensure against any dust problems.
- Contractor should display the board at disposal site stating the name of project, usage of the site and type of debris being disposed.
- A guard shall be kept at disposal site to prevent any unauthorized disposal of waste at the debris disposal site
- Material should be disposed off through covered vehicles only

- No contaminated/hazardous/e-waste shall be disposed off at the debris disposal site

1.3 RECORD KEEPING

Site approved by site engineer only can be used as disposal site. Record of all such site should be maintained along with the area of disposal site, type & quantity of material disposed off daily and capacity of disposal site.

1.4 GUIDELINES FOR REHABILITATION OF DISPOSAL SITES

The dumpsites filled only up to the ground level could be rehabilitated as per guidelines below and to be decided by the Engineer and the supervision consultant.

- The dumpsites have to be suitably rehabilitated by planting local species of shrubs and other plants. Local species of trees has also to be planted so that the landscape is coherent and is in harmony with its various components.
- In cases where a dumpsite is near to the local village community settlements, it could be converted into a play field by spreading the dump material evenly on the ground. Such playground could be made coherent with the landscape by planting trees all along the periphery of the playground.
- Closure of the disposal site should be upto the satisfactory level of site engineer

1.5 PENALTIES

Stringent action & penalties should be imposed off on contractor for dumping of materials in locations other than the pre-identified locations. Grievance Redressal mechanism should be in place for taking note and action on such complaints.

Annexure 4: Selection and Management of Construction/Labour Campsite

1.0 Selection and layout of construction camp

Labour camps, plant sites and debris disposal site shall not be located close to habitations, schools, hospitals, religious places and other community places. A minimum distance of 500 m shall be maintained for setting up such facilities.

2.0 Facilities at workers camps

During the construction stage of the project, the construction contractor will construct and maintain necessary (temporary) living accommodation, rest area and ancillary facilities for labour. Facilities required are listed and elaborated below.

- Site barricading
- Clean Water Facility
- Clean kitchen area with provision of clean fuel like LPG
- Sanitation Facilities
- Waste Management Facilities
- Rest area for workers at construction site
- Adequate Illumination & ventilation
- Safe access road is required at camps
- Health Care Facilities
- Creche Facility & Play School
- Fire-fighting Facility
- Emergency Response Area

2.1 Site Barricading

Site should be completely barricaded from all the sides to prevent entry of outsiders and animals into the site. Entry gate should be provided at the site and labour camp which should be guarded by security guard. All workers should be issued ID cards and entry of outsiders shall be maintained in the register at the gate. Board should be displayed at the site and the labour camp, the name of project, capacity of project, authority carrying our projects, restriction of entry without authorization, no smoking zone and associated risks. Plant operation shall be restricted to 6:00 Am to 10:00 PM

2.2 Clean Water Facility

Potable water shall be provided for construction labour for drinking & cooking purpose. Clean water shall be provided for bathing, cleaning and washing purpose. Water quality testing for water shall be carried out on monthly basis.

2.3 Clean Kitchen Area

Provision of clean kitchen area for cooking and storage of etables shall be provided. Clean fuels like LPG shall be provided for cooking purpose. Burning of firewood, garbage, paper

and any other material for cooking or any other purpose shall strictly be prohibited at the site.

2.4 Sanitation Facilities

Construction camps shall be provided with sanitary latrines and urinals. Toilets provided should have running water availability all the time. Bathing, washing & cleaning areas shall be provided at the site for construction labour. Washing and bathing places shall be kept in clean and drained condition. Workers shall be hired especially for cleaning of the toilets and bathing area. Septic tanks and soak pits shall be provided at site for disposal of the sewage generated.

2.5 Waste Management Facilities

Waste generated should be segregated at the site by providing the different color bins for recyclable and non-recyclable waste. Recyclable waste shall be sold to authorized vendors and non-recyclable shall be handed over to authority responsible in area for waste management. Waste management for construction site shall be as per waste management plan proposed in EMP.

2.6 Rest Area For Workers at Site

A rest area/shelter shall be provided at the site for construction workers where they can rest after lunch time and shall not lay down at site anywhere. The height of shelter shall not less than 3m from floor level to lowest part of the roof. Sheds shall be kept clean and the space provided shall be on the basis of at least 1.0 Sq.m per head.

2.7 Adequate Illumination & Ventilation

Construction worker camps shall be electrified and adequately illuminated. Illumination level shall be maintained after 5.30 Pm at the site to minimum 200 lux. Labour camps shall be adequately ventilated. Fans shall be provided for ventilation purpose.

2.8 Safe Access Road for Labour Camps

Temporary paved surface shall be constructed to approach the labour camp from the site. Movement shall not be hampered during monsoon season due to water logging and muddiness.

2.9 Health care Facilities:

First aid box, first aid room and personnel trained in first aid shall be available at labour camp and site all the time (24X7). Equipment in first-aid box shall be maintained as pet State Factory's Law. Ambulance/ 4 wheeler motorized vehicle shall be available at the site for carrying injured to the nearby hospital. Tie-ups should be made with nearby hospital to handle emergency, if any. Nos. of ambulance, doctors and nearby hospital s hall be displayed in first-aid room, site office & labour camps. Workers shall be made aware about the causes, symptoms and prevention from HIV/AIDS through posters and awareness programs

2.10 Crèche Facility & Play School

Crèche facility and play school should be constructed at the site temporarily so as children of construction labour can be kept there. Care takers should be hired for taking care of children. Attendance records of children shall be maintained. Children should not be allowed to enter active work areas.

2.11 Fire-Fighting facilities

Fire-fighting facility such as sand filled buckets and potable fire-extinguishers shall be provided at labour camps and at site. Fire-extinguishers shall be provided as per NBC norms.

2.12 Emergency Collection Area

Area shall be demarcated as emergency collection area near the gate where all the workers shall be guided to collect in case of any emergency like fire, flood and earthquake.

3.0 Activities prohibited at site

Activities which should be strictly prohibited at site shall include

- Open burning of wood, garbage and any other material at sit for cooking or any other purpose
- Disturbance to the local community.
- Operation of the plant and machinery between 10 pm to 6 am unless approved by team leader
- No animal (wild or domestic or bird) shall be harmed by any construction worker in any condition at site and nearby areas
- Cutting of tree without permission of team leader/authorized person
- No indigenous population shall be hurt or teased

4.0 Guidelines for night time working at the site.

No activity generating noise shall be carried out at the site after 10:00 PM. Night working protocol should be followed (if required) as per guidelines prepared by IWAI. Site should be well illuminated to maintain minimum illumination level of 200 lux. Personnel working shall obtain permit to work from the team leader prior carrying out any work in night time and the record of such working shall be maintained in register. Any accidents, if occurs at site during night time working shall be immediately reported and recorded. Penalty shall be imposed on the contractor for the accident. Analysis shall be carried out to find the reason for such accidents for future learning.

5.0 Record keeping & Maintenance

Record of entry/exit of the people in the construction site and labour camp area shall be maintained in register at gate. Record of material coming in and going out from site also shall be maintained.

6.0 Auditing & Inspection

Conditions of labour camp and site shall be inspected and audit report shall be submitted to IWAI on monthly basis.

7.0 Closure of the Construction Site and Construction labour Camps

Construction site and labour camps shall be restored back to the original site conditions. Following measures are required to be taken during closure

1. Septic tanks/soak pits should be dismantled
2. Any temporary/permanent structure constructed shall be dismantled
3. Construction/demolition waste, hazardous waste and municipal waste at site and labour camp site shall be disposed off as per waste management plan in EMP
4. The site shall be cleaned properly
5. Tree plantation to be carried out, if any required for stabilizing the area
6. Any pit excavated shall be filled back
7. Closure of the site and labour camp shall be approved by authorized person.

Pre-Bid Queries for ''Engineering Procurement and Construction Contract for New Navigational Lock at Farakka, West Bengal"

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
1	EPC - Draft Agreement	Art - 3.1.2, Pg. – 86	**Obligations of the Contractor** *The Contractor shall comply with all Applicable Laws and Applicable Permits (including renewals as required) in the performance of its obligations under this Agreement. The Contractor shall comply with all environmental clearances required during construction and maintenance including implementation of Environmental Management Plan (EMP).*	The Bidder understands that the Employer have already obtained all required clearances from statutory body including Environmental Clearance or shall be obtained before issuance of LOA to the successful Bidder. The Bidder has considered that in the event any delay occurs during the contract period due to non-availability of such clearances, the contractor shall be entitled for an Extension of Time for Completion and Payment of any additional cost by the Employer that incurred by the Contractor due to such delay.	No environmental clearance is required (Bill no.14, Volume-2). The EMP is given in Bid document for the terminal and contractor shall comply with Environmental Protection Provision given under technical specification Cl.-3.3 (Pg-67) Volume-2. Tender conditions Prevail.
2	EPC - Draft Agreement	Art - 3.2.1, Pg. - 87	**Obligations relating to sub-contracts and any other agreements** *The Contractor shall not sub-contract any Works in more than 20% (twenty per cent) of the contract price and shall carry out Works directly under its own supervision and through its own personnel in at least 80% (eighty per cent) of the contract price. Provided, however, that in respect of the Works carried out directly by the Contractor, it may enter into contracts for the supply and installation of Materials,..... Contractor.*	The bidder requests the Employer for modification of the referred provision as per below *The Contractor shall not sub-contract any Works in more than 30% (thirty percent) of the contract price and shall carry out Works directly under its own supervision and through its own personnel in at least 70% (seventy percent) of the contract price. Provided, however, that in respect of the Works carried out directly by the Contractor, it may enter into contracts for the supply and installation of Materials,..... Contractor.*	Agreed, the percentage now increased to 25%.
3	EPC - Draft Agreement	Art - 4.1.5, Pg. – 90	**Unforeseeable difficulties** *Except as otherwise stated 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*	The bidder requests for deletion of the referred provision from Draft Agreement as follows;	Being an EPC Contract bidder should assess the cost of work based on available data such as topographic survey, hydrological and meteorological data, geotechnical investigations etc. Bidders have to assess the risk on account of all foreseen and unforeseen difficulties. The amendment suggested by the bidder cannot be accepted.

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
			difficulties or costs.		Tender conditions prevail.
4	EPC - Draft Agreement	Art - 4.1.5, Pg. – 90	**Obligations of the Employer** *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 1% (one per cent) of the Contract Price. For the avoidance of doubt, the Damages payable by the Employer 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 Navigational Lock.*	The bidder requests the Employer for modification of the referred provision as per below *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 be as per actual cost incurred by the Contractor. For the avoidance of doubt, the Damages payable by the Employer 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 Navigational Lock.*	The bidder's suggestions are not acceptable. Tender conditions prevail.
5	EPC - Draft Agreement	Art - 7.5, Pg. – 97	**Retention Money** *7.5.1 From every payment for Works due to the Contractor in accordance with the provisions of Clause 19.5, the Employer shall deduct 6% (six per cent) 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 5% (five per cent) of the Contract Price.* *7.5.3 The Contractor may, upon furnishing an irrevocable and unconditional bank guarantee substantially in the form provided at Annex-II of Schedule-G, require the Employer to refund the Retention Money deducted by the Employer under the provisions of Clause 7.5.1. Provided that the refund hereunder shall be made in tranches of not less than 1% (one per cent) of the Contract Price.*	In view of nature of the project and to obtain smooth cash flow for the project, the bidder requests the Employer to modify the referred provision to allow the Contractor for submission of Bank Guarantee equal to 5% of Contract Price in four parts in lieu of Cash Retention and the same shall be released after achievement of substantial completion of the Project. Please Confirm.	As per the clause 7.5.3, the contractor can get back the retention money in trenches of 1% on submission of bank guarantee. Since this amount is on account of the performance guarantee not to be released before completion of work in all respects. Tender conditions prevail.
6	EPC - Draft Agreement	Art - 7.5.5, Pg. – 97	**Retention Money** *The Parties agree that in the event of Termination of this Agreement, the Retention*	The bidder requests the Employer for deletion of the referred provision from tender conditions.	Tender conditions Prevail.

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
			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 23.6.		
7	EPC - Draft Agreement	Art - 8.2.2, Pg. -98	**Handing over of Right of Way-** ''The Employer shall provide the Right of Way to the Contractor in respect of all land included in the Appendix by the date specified in Schedule-A….''	The Bidder requests the Employer to provide date of handing over of the work site free from all encroachments and encumbrances to the Contractor. Since there is no such dates available in schedule -A as referred in the article 8.2.2.	The entire site is already available with the Employer, and it can be handed over to the contractor on his request soon after signing the agreement.
8	EPC - Draft Agreement	Art - 8.3.1, Pg. - 99	**Damages for delay in handing over the site** CL.8.3.1-Deleted	The Bidder requests the Employer for incorporation of the following under the referred Article; The Employer shall give the Contractor right of access to, and possession of, all parts of the Site along with Letter of Award (LoA). If, under the Contract, the Employer is required to give (to the Contractor) possession of any foundation, structure, plant or means of access the Employer shall do so in the time and manner stated in the Specification. If the Contractor suffers delay and/or incurs Cost as a result of a failure by the Employer to give any such right or possession within such time, the Contractor shall give notice to the Engineer and shall be entitled to: (a) an extension of time for any such delay, if completion is or will be delayed, under Article 10.5.1 [Extension of Time for Completion], and (b) payment of any such Cost plus reasonable profit, which shall be included in the Contract Price.	The entire site is already in possession of the Employer, and it can be handed over to the contractor on his request soon after signing the agreement. Tender conditions Prevail.
9	EPC - Draft Agreement	Art - 8.3.3, Pg. – 99	Notwithstanding anything …..... equal to 10(ten) percent of the Contract Price. Provided that if any.....within 240 (two hundred and forty) days of the Appointed	The bidder's basis of pricing shall be based on the scope of work as stipulated in the EPC Draft Agreement and that will be the minimum work to be carried out by the	Tender conditions Prevail.

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
			date, the affected Works shall be deemed to be withdrawn under the provisions of this Clause 8.3.3 unless the Parties agree to the contrary, and such Works shall not be computed for the purposes of the aforesaid ceiling of 10% (ten per cent) hereunder.	Contractor after award of the work. In view of above, any reduction/withdrawal of work under any circumstance will be an impact on the contractor and such withdrawal cannot be absorbed by executing the remaining scope of work. Kindly modify the referred provision which shall entitle the Contractor for an additional payment of overheads and profits @20% of the reduced value of Work.	
10	EPC - Draft Agreement	Art - 10.2.5, Pg. – 106	**Design and Drawings** *10.2.5 Any cost or delay in construction arising from review by the Employer's Engineer shall be borne by the Contractor.*	The bidder requests the Employer for modification of the referred provision as per below *Any cost or delay in construction arising from review by the Employer's Engineer for the reasons not attributable to the Contractor shall be borne by the Employer.*	This an EPC contract for which the Employer has assigned his Engineer to review and approve the design. Delays happen if designs given by the contractor are incomplete or inadequate. Tender conditions prevail.
11	EPC - Draft Agreement	Art - 10.3.3, Pg. – 107	**Construction of the Navigational Lock** *10.3.3 The Employer shall notify the Contractor of its decision to impose Damages..... ..... The Parties expressly agree that the total amount of Damages under Clause 10.3.2 shall not exceed 10% (ten percent)of the Contract Price.*	In view of nature of the project the bidder requests the Employer to reduce the Maximum limit of delay Damages from 10% to 5%. The bidder understands that the delay damages shall be imposable only on delay in achievement of overall completion of the work i.e. 30 months together with approved extension under the contract. Please Confirm.	The clause 10.3.3 read with clause 10.3.2 are self-explanatory. However, it is confirmed that bidder's assumption is right and the delay damages shall be imposable only on delay in achievement of overall completion of the work beyond the scheduled date i.e. 30 months together with approved extensions if any, under the contract. If delayed damages are recovered for delay in completion of individual milestones, the same shall be refunded, if there is no delay in overall completion of the work.
12	EPC - Draft Agreement	Art - 10.5.1, Pg. -108	**Extension of Time for Completion** *Without prejudice to any other provision of this Agreement for and in respect of extension of time....., namely:* *a) Delay in providing the Right of Way,*	The bidder requests the Employer to incorporate the following points at the end of referred clause *(f) abnormal increase/decrease in water levels* *(g) Any local issues pertaining to labor and/or*	Please refer force majeure clause (Article 21, Volume 1). Delays for the reasons covered in this clause are eligible for time extension under point (c) of Clause 10.5.1.

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
			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 Employer, the Employer's personnel or the Employer's other contractors if any 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.*	*quarrying and/or borrow pit and/or labour union strike which effects the contractor's obligations under the contract.* *(h) Exceptionally adverse climatic conditions* *(i) Unforeseeable shortages of personnel or Goods caused by epidemic or governmental actions* *(j) Delay in approval of Contractor's Design and Drawings* *(k) any other reasons which is not attributable to the contractor and prevents performing the Obligations under the Agreement.*	Bidders points (f), (h), (i) & (k) are already covered under this clause. Point (g) is partly covered therein to the extent that the delay is not on account of contractor's/sub-contractors, employees/ representatives. For the point (j), please refer to the explanation under point 10 above. Tender conditions prevail.
13	EPC - Draft Agreement		**Reimbursement of Cost Overrun**	The bidder requests the Employer to incorporate suitable provision under the Draft Agreement for reimbursement of additional cost incurred by the Contractor due to the events specified in Art. 10.5.1. Please Confirm	Price adjustment Clause 19.10.4, Vol. 1 takes care of cost overrun due to events specified in clause 10.5.1.
14	EPC - Draft Agreement	Art - 13.1.2, Pg. – 119	*Change of Scope of shall mean:* *(a) change in specifications of any item of Works;* *(b) omission..... and / or* *(c) any additional.....construction.*	The bidder requests the Employer to clarify whether the change in scope is a result of change of specification as referred under sl.no. (a) due to which the Contractor may be required to re-design the structure and/or element due to which the Contractor incurs additional cost then the same shall be paid as per actual plus 20% for overhead and margin for such change of scope. Please Confirm.	Please refer to clause 13.2, 13.3 and 13.4 which gives the modalities for execution of items under change in scope and payment to the contractor. No change to the clauses are required. Tender conditions Prevail.
15	EPC - Draft Agreement	Art - 13.4.2, Pg. – 120	**Restrictions on Change of Scope** *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.*	The bidder requests the Employer for Clarification on referred provision of change of scope, if the change of scope exceeds by more than 10 (ten) percent, what will be the method for valuation of such change order. Whether it will form a new agreement or additional order to the existing agreement? Please Clarify.	The limit to change of scope is capped at 10%. In case the limit is exceeded under explicit orders of the Employer, valuation will be decided on mutual agreement. Tender conditions prevails.

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
16	EPC - Draft Agreement	Art - 19.1.1, Pg. – 130	Cost of Maintenance-''….the Contract Price shall not include the cost of Maintenance which shall be paid separately in accordance with the provisions of Clause 19.7.''	Clause 19.7 is deleted. Please reinstate the clause for **''Payment for Maintenance of the Navigational Lock.''**	Tender conditions Prevail.
17	EPC - Draft Agreement	Art - 19.1.3, Pg. – 130	**Contract Price** *The Contract Price shall not be adjusted for any change in costs stated in Clause 19.1.2 above, except as stated in Clauses 19.10 and 19.17.*	The bidder requests the Employer to provide suitable provision for price adjustment due to increase cost of materials, labour, fuel etc. Please Confirm.	Price adjustment clause is attached as amendment.
18	EPC - Draft Agreement	Art - 19.2, Pg. – 130	**Advance Payment** *19.2.1 The Employer shall make an interest-free advance payment (the "Advance Payment") equal in amount to 10 (ten) percent of the Contract Price, for mobilization expenses and for ..... Contract Price.* *19.2.6 Each installment of Advance Payment shall be repaid by the Contractor to the Employer no later than 365 (three hundred and sixty five) days from the respective date of Advance Payment.*	The bidder requests the Employer to modify the referred provision as per below; 19.2.1 Mobilization Advance shall be in two equal installments The Employer shall make an interest-free advance payment equal to 10% of the Contract Price. The Advance shall be paid within 30 days after the Appointed date in the following manner 1.) First installment equal to 5% (five percent) of Contract Price shall be paid immediately on submission of Performance Bank Guarantee together with Advance Bank Guarantee from a Bank for an amount equal to 110% of such installment. 2.) Second installment of remaining 5% (five percent) within 30 days from appointed date against submission of Bank Guarantee from a Bank for an amount equal to 110% of such installment. 19.2.6 Each installment of Advance Payment shall be repaid on pro-rata basis by the Contractor to the Employer and shall commence only after 20% of Contract Price paid to the Contractor and complete till the time 90% of progress achieved or within no later than 365 (three hundred and sixty five) days whichever is later from the respective date of Advance Payment.	Agreed, please refer amendment sheet.

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
19	EPC - Draft Agreement	Art - 23.6, Pg. – 150	**Termination Payment** *23.6.1 Upon Termination on account.....Employer shall:* *(a) encash and appropriate.....if any;* *(b) encash and appropriate the bank guarantee..... and* *(c) pay to the Contractor, by way of Termination Payment, an amount equivalent to the... .....provisions of this Agreement.* *23.6.2 Upon Termination..... under Clause 23.3, the Employer shall:* *(a) return the Performance Security and Retention Money forthwith;* *(b) encash and appropriate the bank guarantee, if any, for and in respect of the outstanding Advance Payment; and* *(c) pay to the Contractor, by way of Termination Payment, an amount equal to:* *(i) Valuation of Unpaid Works;* *(ii) the reasonable cost, as..... and Standards;* *(iii) the reasonable cost of .....Engineer; and* *(iv) 10% (ten per cent) of the cost..... not completed and shall adjust from the sum thereof (i) any..... at source.*	The Bidder requests the Employer for modification of the referred provision as per below; *23.6.1 Upon Termination on account..... .....Employer shall:* *(a) encash and appropriate.....if any;* *(b) pay to the Contractor, by way of Termination Payment, an amount equivalent to the... .....provisions of this Agreement.* *(c) encash and appropriate the bank guarantee..... and* *23.6.2 Upon Termination.....under Clause 23.3, the Employer shall:* *(a) return the Performance Security and Retention Money forthwith;* *(b) pay to the Contractor, by way of Termination Payment, an amount equal to:* *(i) Valuation of Unpaid Works;* *(ii) the reasonable cost, as..... and Standards;* *(iii) the reasonable cost of .....Engineer; and* *(iv) 10% (ten per cent) of the cost..... not completed* *(c) encash and appropriate the bank guarantee, if any, for and in respect of the outstanding Advance Payment; and shall adjust from the sum thereof (i) any..... at source.*	Tender conditions Prevail.
20	Bidding Documents-Vol-1.	Sch. - D, Pg. – 181	**Applicable Permits**	The bidder understands that all license, permits, approval & clearances pertaining to development of the subject work shall be responsibility of the Employer. However the Contractor shall take all necessary license, permits, approval & clearances required with	No environmental clearance is required (Bill no.14, Volume-2). The EMP is given in Bid document for the terminal and contractor shall comply with Environmental Protection Provision given under technical

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
				assistance of Employer for construction of the terminal as per the list provided under Schedule - D of Bidding Documents-Vol-1. Please confirm.	specification Cl.-3.3 (Pg-67) Volume-2. However, the contractor will have to obtain necessary license, permits, approval & clearances pertaining to development of the subject work, as listed in schedule D. The employer will facilitate him by writing letters to concerned authorities / departments / Organisations on specific request by the contractor. Tender conditions Prevail.
21	EPC - Draft Agreement	Sch. - E, Pg. - 182 – 190	*Form of Bank Guarantee* *1. Performance Security* *2. Form for Guarantee for Withdrawal of Retention Money* *3. Form for Guarantee for Advance Payment*	The bidder requests the Employer to incorporate the following NWC Clause under the referred Bank Guarantee formats which is a mandatory clause to be incorporated at the end of Bank Guarantee as per the procedural requirement of Indian Banking Institutions / RBI Guidelines:-. NOTWITHSTANDING anything contained hereinabove: a) Our liability under this guarantee shall not exceed Rs. ……. /- (Rupees in Words). b) This Bank Guarantee shall be valid up to (Date), and c) We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only and only if you serve upon us a written claim or demand on or before (Date). Please Confirm.	Tender conditions prevail.

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
22	EPC - Draft Agreement	Sch. - G, Pg. – 193	*1. Project Completion Schedule* *Project Implementation Schedule* *2. Scheduled Completion Period* *The Scheduled Completion Period shall be 30 Months from the Appointed Date.*	The Bidder understands that there is an ambiguity in scheduled time for completion of the project as follows and requests the Employer to clarify the same. 1) The Bar Schedule under Clause. No. 1 ends at 28 months from commencement. 2) Clause. No. 2 states that the Scheduled Completion Period shall be 30 months from the Appointed Date.	The two months after completion of works in 28 months are left for rectifications of detects, if any, found by the employer during testing and retesting by the Employer before handing over. Tender Conditions prevail.
23	EPC - Draft Agreement	Sch.- H, Cl. 3, Pg. – 195	Agency for conducting Tests All Tests shall be conducted by the Employer's Engineer set forth in Schedule-K or such other agency or person as it may specify in consultation with the Employer.	The bidder understands that the Arrangement and/or carrying out of Test and Cost of all test on completion shall be borne by Employer. Please Confirm.	The arrangement for carrying out of tests listed therein will be made by the Contractor and the cost there of including the charges of External Agency shall also be borne by contractor.
24	Vol-II-Technical Specification	Cl-4.1.7.2, Pg. -84	Reinforcement bars, to be used for civil and structural works shall be Thermo-mechanically treated corrosion resistant steel of grade equivalent to Fe-500, conforming to IS: 1786.	Please confirm whether Normal TMT Fe500 bars to be used or CRS Fe 500 bars to be used.	TMT CRS Fe 500 bars shall be used.
25	Vol-II-Technical Specification	Cl-2.1.15.5, Pg. -35	Reinforcement shall be mild steel bars conforming to IS: 432, high yield strength deformed bars conforming to IS: 1786, TMT 500 bars manufactured by SAIL or CRS 500 manufactured by TISCO or equivalent.		TMT CRS Fe 500 bars shall be used.
26	Vol-II-Technical Specification	Cl-3.7.2, Pg. -77	''The Employer shall provide land area limited to 2 acres within the Project Site for the Contractor’s working area. No space for the labour camp shall be provided.''	Bidder requests Employer to provide minimum 3 Ha of Land free of Cost for Contractors site establishments and Labour camp etc. Please confirm.	Tender conditions Prevail.
27	Vol-II-'Schedule A' - Items of Work	Cl-2.27.1, Pg. -29	Items of Work	Please confirm that, Bidder need not to furnish the quantities along with his Bid in 'Schedule A' - Items of Work. Successful bidder will provide his quantities in this format before signing of the Agreement.	Tender conditions Prevail.
28	Vol-II-Technical Specification	Cl.3.6.5, Pg.-76	Model Studies	Please Confirm whether the Physical Model Study is mandatory.	Physical Model Study is not mandatory. However, mathematical model studies as per cl. 3.6.5, pg. 76, volume 2, tender documents are

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
					required to be carried out before the issue of construction drawings.
29	General		**Secured Advance**	The bidder requests the Employer to amend a suitable provision for payment of secured advance: Secured Advance shall be paid to the maximum of 5% of Contract Price. (i) payment of secured material advance up to 75% of actual value against submission of invoice along with monthly Running Account bill for non-perishable materials. (ii) payment of secured advance up to 75% of actual value against submission of invoice along with monthly running account bill for perishable materials and also against submission of equivalent amount of Bank Guarantee. (iii) recovery shall commence from next running account bill. (iv) no advance shall be paid after 80% of contract price paid to the contractor.	Tender conditions Prevail.
30	General		**Service Tax and Labour Cess**	Kindly confirm whether bidder's quote shall exclude the Service Tax Swachh Bharat Cess and Labour Cess.	BID for EPC shall be all inclusive of all the taxes including Service tax, Swachh Bharat cess and labour cess etc.)
31	General		**Contractor's Entitlement for Suspension of Work**	The bidder requests the Employer for incorporation of the following under tender conditions; *If the Engineer fails to certify in accordance with Article 19.5.2 [Stage Payment for Works] or Article 19.9 [Time for Payment and Interest], the Contractor may, after giving not less than 21 days' notice to the Employer, suspend work (or reduce the rate of work) unless and until the Contractor has received the Payment Certificate, reasonable evidence or payment, as the case may be and as described in the notice.*	Tender conditions Prevail.

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
				If the Contractor subsequently receives such Payment Certificate, evidence or payment (as described in the relevant Article and in the above notice) before giving a notice of termination, the Contractor shall resume normal working as soon as is reasonably practicable. *If the Contractor suffers delay and/or incurs Cost as a result of suspending work (or reducing the rate of work) in accordance with this Article, the Contractor shall give notice to the Engineer and shall be entitled to:* *(a) an extension of time for any such delay, if completion is or will be delayed, under Article 10.5.1 [Extension of Time for Completion], and* *(b) payment of any such Cost plus reasonable profit, which shall be included in the Contract Price.*	
32	General		**Substantial Divergence**	In view of nature of the project, the bidder requests the Employer to add the referred clause as per below: *In the event the soil and sub-surface conditions actually encountered at Site be substantially different from those provided in the Tender Documents including tender data, background information etc., and the Contractor has incurred additional cost thereof, the Contract Price shall be adjusted accordingly with such amount of additional cost.*	Tender conditions Prevail.
33	General		Land Acquisition	Please confirm whether the land acquisition for the entire Project area is completed or not.	Land has already been acquired.
34	General		Fine Aggregate	Please confirm whether we can use crushed sand/manufactured sand for concreting work	Sand as per relevant IS codes may be used.
35	General		Cement	Bidder understands that all IS certified manufacturers of Cement may be used.	IS certified manufacturers of cement as approved by Engineer-in-Charge

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
				Please confirm.	are allowed.
36	General		Reinforcement Steel	Bidder understands that the Employer shall allow the Contractor to procure Reinforcement Steel from all primary producers like M/s SAIL, RINL, TISCO, JSW, JSSPL etc. Please confirm.	IS certifications of reinforcement steel as approved by Engineer-in-Charge are allowed.
37	General		Land for Disposal of Materials	Bidder requests the Employer to allot an available land area in the vicinity of the site for disposal of debris arising out of Excavation / Construction during execution of the Contract.	Area for disposal has been tentatively indicated near the u/s end of the acquired land (DRG no. FL 029). However, at the time of execution, the area for disposal shall be identified by Engineer-in-Charge in consultation with Farakka Barrage Project Authority.
38	General		Further Prebid Queries	The Bidder requests the Employer to allow them to submit further prebid queries if any, till 1 week prior to last date for submission of bid. Please Confirm.	Tender conditions Prevail.
39	General		Due Date of Submission of Bid	The due date of submission of the bid is 11th July, 2016 which is 1 month away. Considering the magnitude of the design work, site visits involved, data verification, collection of various vendors rate including electro Mechanical items etc., you are kindly requested to extend the due date of the submission of bid at least up to 11th August, 2016 to enable to submit our most competitive techno-commercial bid.	Please refer to amendment sheet. The date is extended till 11.08.2016.
40	General		Site Visit	Bidder requests IWAI to arrange for a Site visit together with IWAI personnel at the earliest.	Bidders should request via sending an email confirming the names and details of their officials with copies of their identify cards to visit the site. The site visit will be organised by the IWAI accordingly.
41		2.4.2	a) Participation as contractor, joint venture	There are many varieties of Gate Structures	Tender conditions prevail.

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
		Specific Experience	member, management contractor, or subcontractor, in at least one (1) contracts within the last ten (10) years from 1st April..... Fabrication / installation / commissioning of caisson gates / mitre gate requires a special skills. Either a member of JV or sub-contractor should have necessary experience in construction / installation / commissioning of atleast one of each gate.	used in the Dry Docking System. For Example, in addition to Caisson/ Mitre, there are other type of special gates such as Flap Gate, Radial Gates also require special skills for fabrication / installation. Hence it is more appropriate to consider such gates also for pre-qualification. Accordingly, we request for the following modification in this Clause:- Fabrication / installation / commissioning of Flap Gates/ Radial Gates/ caisson gates / mitre gate requires a special skills. Either a member of JV or sub-contractor should have necessary experience in construction / installation / commissioning of atleast one of these gates.	
42.		Cl. 1.2.1	Tenderer shall conduct all necessary tests and survey to satisfy/ verify himself regarding the correctness of data furnished vis a vis actual condition	Within the limited tender time permitted, no detailed study like topography survey, geotechnical investigation and other data collection for Rainfall, Temperature, Water level at/ near existing river/ barrage etc. can be carried out by the bidder and he has to depend of information furnished in the tender. During detailed design any difference found should be considered as variation of tender information. Please confirm.	Tender conditions Prevail.
43.		Cl. 1.2.3	Bank protection work	Can bidder propose alternative arrangement other than conventional rock pitching fulfilling technical requirements	Bank protection works are shown in Drg. No. Fl017 & Fl018. Alternative arrangement is not allowed.
44.		Cl. 1.2.10.4 (xi)	Coordination with other contractor, if any and supplying necessary engineering data, information to the Employer to ensure satisfactory installation of equipment/ execution of work.	Please inform who are the other contractors and what type of information mentioned here in this clause	At present there are no other contractors except the sub-contractors of the contractor. However, if such an eventuality arises, this clause comes into play.
45.		Cl. 1.2.12:	Firefighting system	Please clarify what detailed firefighting system is required for control building and other such conventional structures.	Tender conditions Prevail.

<table>
<tr><td>46.</td><td></td><td>Cl. 2.1.11</td><td>Earth quake resistance structure and ductile detailing</td><td>Code such as IS: 13920 and IS: 4320 mentioned in the document. Do you require application of such provision for the control building or for other structure as well, though are area in under seismic zone 3.</td><td>The structure shall be designed in accordance with IS: 1893:2002.</td></tr>
<tr><td>47.</td><td></td><td>Cl. 2.1.8</td><td>Scour depth</td><td>Since new lock structure is not on river, please inform whether scour depth criteria to be considered and if so where.</td><td>Scour depth criteria needs to be considered for bank protection works, guide walls u/s & d/s and u/s & d/s ends of Base slab of Navigation lock and other related structures if any.</td></tr>
<tr><td>48.</td><td></td><td>Drawing no FL 019</td><td>Storm water drainage</td><td>Please specify the catchment area to be considered in the drainage design consideration</td><td>Catchment area for drainage shall be worked out by the designer based on the topography and rainfall of that area.</td></tr>
<tr><td>49.</td><td></td><td>Drawing no FL019</td><td>Sewerage System</td><td>There are control building like structure only. Please clarify what detailed sewerage treatment plant is required.</td><td>Sewage Treatment Plant is to be provided. (Refer clause 1.2.9, Pg-22, Volume-2 & Bill no.11.2, Volume-3, Tender Document)</td></tr>
<tr><td>50.</td><td>Volume-1,
Section III, Equipment</td><td>Cl-2.6,
Pg.-42</td><td><table>
<tr><td>Sl. No</td><td colspan="3">Equipment Type and Characteristics</td><td>Minimum Number required</td></tr>
<tr><td></td><td>Equipment</td><td>Minimum Capacity</td><td>Max. age (years)</td><td></td></tr>
<tr><td>i.</td><td>Crane (Tyre mounted)</td><td>100T</td><td>5</td><td>1 no.</td></tr>
<tr><td>ii.</td><td>Crane (Tyre mounted)</td><td>50T</td><td>5</td><td>1 no.</td></tr>
<tr><td>iii.</td><td>Pile Driving Rigs with minimum 10 T winch complete with DMC/ Bater/ Chiesel etc.</td><td>-</td><td>5</td><td>2 nos.</td></tr>
<tr><td>iv.</td><td>Hydra</td><td>10 to 12 T</td><td>5</td><td>4 nos.</td></tr>
<tr><td>v.</td><td>Trailer</td><td>-</td><td>5</td><td>2 nos.</td></tr>
<tr><td>vi.</td><td>Winches</td><td>10 to 12T</td><td>5</td><td>2 nos.</td></tr>
<tr><td>vii.</td><td>Concrete Batching Plant</td><td>30 cum</td><td></td><td></td></tr>
<tr><td>viii.</td><td>Transit Mixer</td><td>5 cum</td><td></td><td></td></tr>
<tr><td>ix.</td><td>Concrete pump with adequate pipelines</td><td>30 cum</td><td></td><td></td></tr>
</table></td><td>We request the following.
1. To also accept crawler cranes having minimum capacity of 100 MT & 50 MT apart from tyre mounted cranes.
2. To modify the maximum age criteria of the equipments in Sl. No. 1 – 6 as 15 years.
3. For Sl.no. 3 & 6, please modify the minimum capacity of Winch to 5 T.
4. As per the footnote, the equipments mentioned in Sr. No. 3.4.5 & 6 must be owned by the bidder. We request you to kindly consider hired equipments as well.</td><td>1. Instead of Tyre mounted cranes, crawler cranes of the same capacity (100T/50T) can be also used.
2. The maximum age criteria of the equipment in Sl.No.1-6 of shall be 10 years.
3. The min. capacity of winch shall be 7.5T
4. The equipment mentioned in Sr. No.3,4,5 &6 can also be hired equipment.</td></tr>
<tr><td>51.</td><td>Volume-2,
Contractor working area</td><td>Cl-3.7.2,
Pg.-77</td><td>The Employer shall provide land area limited to 2 acres within the Project Site for the Contractor's working area. No space for the labour camp shall be provided.</td><td>Bidder request client to provide minimum of 5 acres of land within the project site for contractors working area.</td><td>Tender conditions prevail.</td></tr>
<tr><td>52.</td><td>Volume-2, MS Liner</td><td>Cl-4.3.2.7,
Pg.-121</td><td>For Piles Permanent MS casing/ Liner up to its required levels shall be provided.</td><td>Provide the Minimum thickness (to be used for Liner).</td><td>Liner is not required here.</td></tr>
<tr><td>53.</td><td>Volume-1 Section VII,</td><td>Cl-19.2.6,</td><td>Each instalment of Advance Payment shall be</td><td>We request you to modify the clause as</td><td>Tender conditions prevail.</td></tr>
</table>

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
	Mobilisation Advance	Pg.-131	repaid by the Contractor to the Employer no later than 365 (three hundred and sixty five) days from the respective date of Advance Payment.	below: The repayment of advance payment shall commence when the work progress reaches 20% of contract value on prorate basis and to be completed by the time 90% of work is completed.	
54.	Volume-1 Subcontracting	Cl-ITB34.3, Pg.-29	Contractor's proposed subcontracting: Maximum percentage of subcontracting permitted is: 20% by value of contract Works and not whole of Works or any particular length / stretch.	The maximum percentage of subcontracting allowed is too low. The project scope includes electrical & mechanical works, which will require specialised subcontractor. We request you to remove this criteria or raise the maximum limit to 50%.	Please refer amendment sheet. The maximum percentage of subcontracting permitted is increased to 25%.
55.	Volume-1 Project Completion Schedule	Schedule G, Pg.-193	Project Milestone no. 2.C.i & 2.C.iv - identification of existing Boundry wall & demolition of the boundry Wall.	Please Confirm that demolition is in bidders scope? If yes then provide the details of Existing Boundary Wall locations to be demolition.	Demolition is in Bidder's scope. The existing Boundary Wall can be seen by the bidder during site visit.
56.	Volume-1 Project Completion Schedule	Schedule G, Pg.-193	Project Milestone no.2.C.------4g.- Dredging of Approach Channels	Please Confirm that whether dredging is in bidders scope?	Yes, dredging is in the scope of bidder. The extent of dredging will be marked in Drawing No.FL 002 Addendum.
57.	Volume-1 Project Completion Schedule	Schedule G, Pg.-193	Project Milestone Mo. 2.C.i & 2.C.iv - Identification of existing Boundary wall & demolition of the Boundary Wall	Please provide the lead distance & location where debris of demolition material to be dispose.	Debris to be disposed by the Contractor ref. Cl.-1.2.10.4 (vi), Cl.7.2.2, Cl.-3.3.4. Location for such debris shall be as per Cl.-4.2.12 Vol.-2, Tender Document.
58.	Volume-1, Part II, Construction of the Navigational Lock	Cl. 10.3.2, Pg.-107	In the event that the Contractor to achieve any Project Milestone or the Scheduled Completion Date within a period of 30 (thirty) days from the date set forth in Schedule-J, unless such failure has occurred due to Force Majeure or for reasons solely attributable to the Employer, it shall pay Damages to the Employer of a sum calculated at the rate of 0.05% (zero point zero five percent) of the Contract Price for delay of each day reckoned from the date specified in Schedule-J and until such Project Milestone is achieved or the Works are	We request you to kindly consider that in the event, the final project milestone is achieved within or before the Scheduled Completion Date including any Time Extension, then the damages paid under this clause for the intermediate milestones shall be refunded by the Employer to the Contractor without any interest.	Tender conditions prevail.

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
			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-J shall be deemed to be modified accordingly and the provisions of this Agreement shall apply as if Schedule-J 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, applicable for that work or section, the Damages paid under this Clause 10.3.2 shall be refunded by the Employer to the Contractor, but without any interest thereon.		
59.	Volume-1, Part II, Construction of the Navigational Lock	Cl. 10.3.2, Pg.-107	The Contractor shall construct the Navigational Lock in accordance with the Project Completion Schedule set forth in Schedule-J	The reference to Schedule J seems to be a typo error. Please clarify/correct the referred schedule.	Accepted Schedule-J should be read as Schedule-G.
60.	Volume-1, Section II-Bid Data Sheet, Tender Submission	Cl-ITB22.1, Pg.-28	The deadline for bid submission is: Date: 11th July 2016 Time: 1500 hours 1ST Bidders have to submit their bids electronically.	Kindly confirm whether we have to submit hard copy or complete lender submission (Technical + Price), other than the original Bid Security, tender fee. JV agreement (if applicable), power of attorney, Affidavit. If yes, then please let us know number of copies to be submitted and deadline for the delivery of hard copies.	Please refer to amendment sheet. The date is extended till 19.08.2016.
61.	Volume-1, Section II-Bid Data Sheet, Extension of Time	Cl- I Cl-ITB22.1, Pg.-28	The deadline for bid submission is: Date: 11th July 2016 Time: 1500 hours 1ST Bidders have to submit their bids electronically.	Considering the quantum of work and inputs to be received from Consultant, vendors and further clarification, request you to extend the bid submission date by another 6 weeks.	Please refer to amendment sheet. The date is extended till 19.08.2016.
62.	General			We request to clarify whether Service Tax is exempted for the subject project or the same shall be paid / reimbursed separately in addition to the Contract value.	Please refer to query no. 30.

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
63.	Volume -2, Technical specification and drawings	Cl-1.2.2 III & Fl-003, Pg.-19	General arrangement of 1.2.2 Lock Structure including all associated facilities I. The length and width of the new lock are as follows: Length = 179.0 m Width = 25.148 m III. The general arrangement of proposed lock with approach channels showing typical plan are presented in the Drawings Fl-003	We request you to clarify the Length of approach channel on U/S and D/s. The approach extent from feeder canal to existing navigation lock is not defined in drawing FL-003.	Length of Approach channels on U/s and D/s are indicated as given in Drg. No FL 003 (Revised) given in Addendum
64.	Volume -2, Technical specification and drawings	Cl-1.2.2 IV & Fl-003, Pg.-19	a) Mitre gates (2.0 nos. one each in U/S and D/S) b) Radial gates (4.0 nos. Two each in U/S and D/S inlets) c) Bulkhead gates (8.0 nos. Two each in U/S and D/S inlets and Two each in U/S and D/S outlets)	Referring to employer requirement for Locks, three types of gates has been defined. Request you to clarify whether Cassions gates are EPC scope?	All the four types of gates, i.e. Cassion gates, Mitre Gates, Radial gates & Bulk head gates are in EPC Scope. Refer Bill No.8. clause 2.8.3. Cassion gates specifications are covered in Clause 6.3.
65.	Volume -2, Technical specification and drawings	Cl-2.1.4, Pg.-32	Fendering system and Design vessel Fendering System Considering the level variation of the order of 8m between high water level and low water level in the lock and also the variation in the sizes of vessels to be handled, the fendering system is designed such that sufficient contact area between the hull of the vessel and the fender face is ensured at all water levels,	Request you to kindly provide the range of vessels to be operated along with loaded draft and molded depth anticipated at the gate. Please provide the light weight draft of the vessels also.	300-3000 DWT vessel is to be considered.
66.	Volume -2, Technical specification and drawings	Cl-2.3.5, Pg.-60	• Accident impact from 3000 DWT fully loaded barge on Caisson and Mitre gate.	Referring to employer requirement, Vol-2, it is stated that Impact from 3000DWT fully loaded barge shall be considered for gate design. Request you to confirm the range of vessels for design civil structures.	The civil structure (retaining walls of navigation lock shall be designed for the berthing load for 300-3000 DWT fully loaded vessel.
67.		FL-003 & FL-005	600 Dia. Piles 15.0m Deep @ 3.0m c/c	Referring to FL-003, the pile detail mentioned as "600mm Dia. Piles 15.0m Deep @ 3.0m c/c" whereas in detailed cross sections drawings FL-004 and FL-005 All sheets dia of pile is mentioned as 900mm, Request you to clarify. Please specify	This is a typographical error, the dia meter of piles is 900 mm.

<table>
<tr><th>S No</th><th>Document Ref</th><th>Reference Clause No.</th><th>Existing Provision</th><th>Bidder's Query</th><th>Reply</th></tr>
<tr><td></td><td></td><td></td><td></td><td>whether dia of pile is mandatory or contractor can change the dia.</td><td></td></tr>
<tr><td>68.</td><td>Volume -2, Technical specification and drawings</td><td>CL-1.2.6 & FL-004, FL-005 and FL-020, Pg.-21</td><td>Details of Roads as planned have been provided herein below:<table><tr><td>Roads</td><td>Carriageway Width</td><td>Length</td></tr><tr><td>External</td><td>7 m</td><td>460 m</td></tr><tr><td>Internal</td><td>5 m</td><td>900 m</td></tr></table></td><td>The clause 1.2.6 of Volume 2, the width of carriageway mentioned as 7m for external roads and 5m for internal roads. Referring to drawings FL-004, FL-005 and FL-020, the road width shown as 8000mm and 10000mm. Pease clarify the carriage width and shoulder and also specify the total width required.</td><td>Carriage width for External roads is 7.0m and for internal roads is 5.0m with 1.5m shoulder on both the sides.</td></tr>
<tr><td>69.</td><td>Volume -1 Schedule H</td><td>Schedule H, Pg.-179</td><td>Model Studies</td><td>Please specify whether the model study is mandatory or not. If yes then please specify the details.</td><td>Mathematical model studies as per cl. 3.6.5, pg. 76, volume 2, tender documents is required to be carried out before the issue of construction drawings.</td></tr>
<tr><td>70.</td><td>Volume-1,
ITB, Section II: Bid data sheet</td><td>Cl-13.1</td><td>Alternative bid shall be permitted. The bids will be evaluated on basic technical requirements...</td><td>Please specify the minimum technical requirements that are to be complied with while preparing the alternative bid (e.g.: length and width, number of gates, etc.). Also please confirm if only alternative bid can be submitted or submission of base bid compliant with lender drawings is also required to be submitted.</td><td>Alternative design is limited to the design of retaining wall only. Bidders have to submit the base bid along with alternative bid.</td></tr>
<tr><td>71.</td><td>Volume-1,
ITB, Section II: Bid data sheet</td><td>Cl-13.2</td><td>Alternative line for completion shall be permitted.</td><td>Please elaborate how this will be considered for evaluation. For e.g. a bid with less completion time and a bid with more completion time.</td><td>Bids with larger completion time will not be acceptable. However, shorter time of completion will not get any preference in evaluation of technical bids.</td></tr>
<tr><td>72.</td><td>Volume-1,
ITB, Section II: Bid data sheet</td><td>Cl-14.7</td><td>Excise/ Custom duty exemption.</td><td>We presume that the bidder shaft indicate in his bid tentative list of materials and quantities. After award of work, the contractor shall submit a detailed list materials/ and quantities to the Employer for obtaining exemption certificates. Please confirm if this is acceptable.</td><td>There is no exemption.</td></tr>
<tr><td>73.</td><td>Volume-1, EPC Agreement</td><td>Article 4.3</td><td>Environmental clearances .... but the proposed EMP is lo be implemented by the Contractor.</td><td>Please provide details of proposed EMP or Guidelines for the same</td><td>The EMP is given in Bid document for the lock and contractor shall comply with Environmental Protection Provision given under</td></tr>
</table>

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
					technical specification Cl.-3.3 (Pg-67) Volume-2. Also refer Bill no.14, Vol.-3
74.	Volume-1, EPC Agreement	Article 8	Right of Way.	Please provide the status of land acquisition.	Land has already been acquired.
75.	Volume-1, EPC Agreement	Article 9.2	Shitting of obstructing utilities.	Please provide the details of existing utilities with project Right of Way.	Following utilities fall within the project area and need to be shifted: i) Road ii) Boundary Wall iii) Transmission line The cost of shifting Road and Boundary Wall is covered in EPC contract however the cost required for shifting of Transmission line shall reimbursed to the EPC Contractor by IWAI on production of receipts of actual expenses.
76.	Volume-1, EPC Agreement, Schedule-A	Article 3.4	Water level: The water levels u/s and d/s are given below:	Please provide the monthly water levels on u/s and d/s side for the past 3 years.	Monthly max. & min water level are available in Annex-A of this document.
77.	Volume-1, EPC Agreement, Schedule-C	Article 3.4	The other facilities such as power supply, water supply and other requirements for "Construction of New Navigational Lock "shall be arranged by the contractor.	This is an open ended requirement and cannot be anticipated by the bidder at this stage. The scope shall include for provisions of water supply and power, however the actual drawing of water line, power line and sourcing shall be the responsibility of the Employer.	Tender conditions prevail.
78.	Volume-1, EPC Agreement, Schedule-G	Article 3.4	Project Completion Schedule: Milestones.	The actual phasing of works will depend upon the design and methodology adopted by the Contractor We request that the Contractor be allowed to submit the project milestones based on their design and methodology which shall be reviewed and approved by the Employer. Please confirm.	The bidder can submit the project milestones along with their designs and construction methodology for review & approval by the Employer. However, overall completion date cannot be delayed.
79.	Volume-2, Drawings	Article 3.4	Topographic survey. Drg. No.FL-001	Please provide the Autocad drawing for assessment of earthwork quantities.	Auto cad drawings cannot be provided.
80.	Volume-2, Annexure-A	Article 3.4	Geotechnical investigation report.	Field permeability test. Only results of two tests of NH-9 have been provided. You will	For permeability, field permeability tests for BH 9 have been given as

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
				appreciate that correct assessment of drawing requirements is a major critical activity for the success of project We request you lo provide more details of field permeability test and also, provide the assessment done by DPR consultant as a guidance to the bidders.	representative to the area. In this regard, please refer to clause 1.1.3.1 of Volume II of tender documents..
81.	Volume-2, Annexure-A	Article 3.4	Extension of bid due date.	Considering the special nature of work, time required for preliminary design, site visit etc., we request you to extend the bid submission date by at least 30 days.	Tender conditions prevail.
82.	Volume-1, Bidding Document, Specific Experience	Cl-2.4.2, Pg-38 of 206	a) Participation5 as contractor, joint venture member6, management contractor, or subcontractor, in at least one (1) Contracts within the last ten (10) years from 1st April 2005 to 31st March 2015. With a value of at least one contract of at least INR 3024 Million or USD 50.4 Million / two contracts each with the value of at least INR 2268 Million or USD 37.8 Million / three contracts each with the value of at least INR 1512. Million or USD 25.2 Million or an equivalent amount in a Freely convertible currency that have been successfully and substantially7 completed and that are similar8 to the proposed Works within last ten (10) years. The similarity shall be based on the physical size, complexity, methods/technology or other characteristics as described in Part 2, Employer's Requirements. Harbour with pile foundation/ diaphragm wall/ retaining wall in river/sea with executed under BOQ contracts shall also be considered as similar works. Fabrication/ installation/ commissioning of caisson gates/ mitre gate requires a special skills. Either a member of JV or sub-contractor should have necessary experience in construction/ installation/	With regard to similar work specific experience criterion, we would like to bring to your kind notice that the complexity, methodology, technology and other characteristics for Construction of "Jetty / Wharf / Bridges along with approaches built on stilts upon water bodies such as Sea " will be similar to the construction of subject mentioned project as described in Tender Documents Part 2 of Technical Specification and Drawings. Therefore we request you kindly consider the experience of "construction of Jetty / Wharf / Bridges" as part of the similar works and modify the PQ suitably as heightened below: Director General Naval Projects, Visakhapatnam (DGNP(V)) under Indian Navy, upon representation, considered the Jetty / bridge experience as qualifying criterion for the work of "Construction of Loading Jetty" during the pre-qualification stage. Copy of NIT and revised PQ condition are enclosed herewith for your reference as (Annexure - 1) <u>Modification requested as follows:</u> The similarity shall be based on the physical size, complexity, methods / technology or other characteristics as described in Part 2,	Tender conditions prevail.

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
			commissioning of atleast one of each gate. *Cost of works of previous years shall be increased by 7% per year based on Rupee value to bring them to 2014-15 price level.	Employer's Requirements. Harbour/ Jetty / What / Bridges along with approaches built on stilts upon water bodies such as Sea with pile foundation / diaphragm wall / retaining wall in river/sea with executed under BOQ contracts shall also be considered as similar works. Fabrication / installation / commissioning of caisson gates / mitre gate requires a special skills. Either a member of JV or sub-contractor should have necessary experience in construction / installation / commissioning of atleast one of each gate.	
83.	Volume-1, Bidding Document, Specific Experience	Cl-2.4.2, Pg-38 of 206	Foot note 7: Substantial completion shall be based on 80% or more works completed under the contract	Construction of such type of projects are now coming up in India and a very few projects of such type of construction works witnessed in recent years. Therefore we request you to consider "The completed portion of the ongoing project experience of similar Marine works" to meet the requirements of the similar work specific experience criterion. This will enable Indian companies to qualify on their own without opting for Joint Venture of the foreign companies.	Tender conditions prevail.
84.	Employers Requirements Volume-2 (Doc#CANW-1/IWAI/JMV/16)	Cl-1.2.10.2, Pg-23	Detailed Electrical Scope of Work	Bidder understating: (a) Main 11 kV out going cable from existing substation to new IWAI Farakka project site will be supplied, installations, tested and commissioned by M/s. WBSEDCL- Kindly confirm ? (b)Double Pole Structure at new IWAI Farakka project site (near to the proposed IWAI Farakka Project boundary) will be supplied, installations, tested and commissioned by M/s. WBSEDCL- Kindly confirm? (c) 11 kV cable from Double Pole Structure to Metering cubicle will be supplied, installations, tested and commissioned by	a) Confirmed that this will be executed by WBSEDCL but all the coordination work with WBSEDCL will be in the scope of EPC Contractor. The fees of such activities as charged by Electricity Band will be reimbursed by IWAI based on production of actual receipts (in addition to EPC Cost). . b) Confirmed that this will be executed by WBSEDCL but all the coordination work with WBSEDCL will be in the scope of EPC Contractor. The fees of such activities as charged by Electricity

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
				M/s. WBSEDCL- Kindly confirm? (d) Bidder understating Metering cubicle will be installed, inside the new substation building- Kindly confirm? (e) 11 kV cable from Metering cubicle to 11 kV switchgear incomer shall be supplied, installations, cable testing and commissioning by bidder scope- Kindly confirm? (f) Company to confirm, distance from metering cubicle to new 11kV substation Incomer feeder (these distance is required bidder to calculate the 11kV cable length)? Kindly confirm above points?	Bond will be reimbursed by IWAI based on production of actual receipts (in addition to EPC Cost). . c) Confirmed that this will be executed by WBSEDCL and all the coordination work with WBSEDCL will be in the scope of EPC Contractor. The fees of such activities as charged by Electricity Bond will be reimbursed by IWAI based on production of actual receipts (in addition to EPC Cost). d) Confirmed same shall be under EPC Contractor's scope. e) Confirmed same shall be under EPC Contractor's scope. f) Please refer to drawing I-525/FL-023 provided with the tender.
85.	Employers Requirements Volume-2 (Doc#CANW-1/IWAI/JMV/16)	Cl-1.2.10.2, Pg-25	Detailed Electrical Scope of Work	Kindly provide (mentioned in s.no: 21) local control room building (as mention in the FL-003, Rev-0 tender drawing, kindly provide the civil building drawings) equipment layout drawing, plan, sections etc.	Local control Panel rooms shown at various locations shall house the RIO Panels & Hydraulic power pack cylinders. Size of the room shown in the drawing FL-003 is indicative and EPC Contractor is required to determine size and building drawing depending on the equipment to be accommodated and get approval from the Engineer-in-Charge.
86.	Employers Requirements Volume-2 (Doc#CANW-1/IWAI/JMV/16)	Cl-1.2.10.4, Pg-27	Miscellaneous/General Works/Services-Electrical Works.	Bidder understanding temporary power and water supply to successful EPC contractor shall be provided by employer-Kindly confirm?	Please refer Cl.1.2.10 (iv), the arrangement of temporary power and water supply is within the EPC Contractor's scope.
87.	Employers Requirements Volume-2 (Doc#CANW-1/IWAI/JMV/16)	Cl-1.2.10.4, Pg-25	Miscellaneous/General Works/Services-Electrical Works.	As mentioned in the employer requirements, Supply of Lubricants, Oil, etc. for Initial fill, flushing, cleaning, refill, topping up & maintenance of Material handling system till the Works is put into satisfactory and	Taken over shall be considered after issuance of completion certificate by the Employer.

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
				continuous commercial use and has been "Taken Over" by the Employer. However employer shall confirm taken over period after commissioning of the equipments?	
88.	Employers Requirements Volume-2 (Doc#CANW-1/IWAI/JMV/16)	Cl-1.2.11, Pg-27	Control and Automation Works	Bidder scope consider in the control management software (in the central control room) interface provision (in the Ethernet switch) for SAP system only, however required hardware, software and modifications in the SAP server/software are not in the EPC contractor scope-Kindly confirm ?	Whole Control and Automation works including software and hardware and customization of the software, as necessary, is within the scope of the EPC Contractor.
89.	Control and Automation Works Volume-2 (Doc#CANW-1/IWAI/JMV/16)	Cl-1.2.11, Pg-27	Control and Automation Works	Bidder understating control room, local control room and substation building furniture are not in the bidder scope of supply-kindly confirm?	The bidder scope shall be as per clause no. 5.3.3.3 & clause no. 1.2.11 Point no. 20.
90.	Employers Requirements Volume-2 (Doc#CANW-1/IWAI/JMV/16)	Cl-1.2.11, Pg-28	Control and Automation Works	Bidder understating there is no any requirement of conveyor system in the project, (however it is mentioned in the tender document conveyor page # 28, 98, 99 & 261)-Kindly confirm?	Confirmed there is no conveyor system in the project.
91.	Design Criteria Volume-2 (Doc#CANW-1/IWAI/JMV/16)	Cl-2.2.4, Pg-45	Standards and Regulations	Terminal electrical installations, inspections and approvals from local government authority are not consider in the bidder scope. Kindly confirm?	The approvals of all Installations by government authorities shall be under EPC Contractor's Scope.
92.	Design Criteria Volume-2 (Doc#CANW-1/IWAI/JMV/16)	Cl-2.2.5.4, Pg-49	Earthing System	Bidder understating instrument/telecom equipments are connected to common electrical earthing grid/system or it is required to consider separate earthing system-Kindly confirm?	Separate earthing system is required for instrument/telecom equipment. Refer clause no. 2.2.5.3.
93.	Design Criteria Volume-2 (Doc#CANW-1/IWAI/JMV/16)	Cl-2.2.82, Pg-55/56	Cable Laying and Terminations	Bidder understating proposed IWAI Farakka project new project development, however in the tender document it is mentioned While laying the new cables or rerouting the existing cables, successful contractor shall take all safety measures and manual excavation operations are preferred.	This is a new project and nothing is required to be done with respect to the existing system.

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
				Kindly provide existing electrical equipments/utilities list and drawings etc. of above ground and underground installations details?	
94.	Design Criteria Volume-2 (Doc#CANW-1/IWAI/JMV/16)	Cl-2.2.83, Pg-56	Laying in Concrete Trench	Bidder understating as per tender requirement Ladder type & Perforated type FRP cable trays shall be used for cables in the RCC trench, this requirement is in the inside Control Room only, however bidder shall consider other areas cables are laid in the trenches (i.e.: bidder is not consider above requirement). Kindly confirm?	Refer clause no. 2.2.8.2. Wherever RCC trenches are proposed for laying of cable, cable trays shall be installed.
95.	Design Criteria Volume-2 (Doc#CANW-1/IWAI/JMV/16)	Cl-2.3.3, Pg-59	Design Life	Bidder consider design life of all electrical systems, instrumentation & control systems and telecom systems shall be consider as per manufacturer recommendations. Kindly confirm?	Confirmed
96.	Specifications	Cl-4.16, Pg-191	Monitoring Instruments	As mentioned in the specification documents (doc# volume-2/page-191 & Instrument details drawing# FL-021, Rev-0) instruments for existing lock and new lock shall be in the bidder scope, however in the drawing # FL-024, Rev-0 (Basic Control Architecture document) shall be provided by third party scope of supply (i.e.: instruments-water level indicators, bore hole pipe piezometer, settlement gauge, tilt meter, inter connecting cables, VDU+TS+ADAS, interface modules and inter face to ETHC switch etc.).- Kindly confirm? Kindly provide approved vendor list for (instruments) water level indicators, bore hole pipe piezometer, settlement gauge, tilt meter/incline meter, VDU+TS_ADAS etc.	This being an EPC contract, third party supply, erection, commissioning & performance shall be the responsibility of the EPC contractor only. As this is an EPC contract, the EPC contractor shall select the vendor which will comply the specifications for instruments & shall take approval from the Engineer-in-charge for the approval of vendor.
97.	Drawings, Drawing# FL-003,Drawing# FL-021-025,		General arrangement plan new navigation lock. Instrumentation details new navigation lock, Control room equipment layout new	Request you to provide the Mentioned drawings in Auto CAD format.	AutoCAD format drawings will not be shared.

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
			navigation lock, High most & cable layout new navigation lock.		

<table>
<tr><th>S No</th><th>Document Ref</th><th>Reference Clause No.</th><th>Existing Provision</th><th>Bidder's Query</th><th>Reply</th></tr>
<tr><td>98.</td><td>Financial Capabilities</td><td>Cl-2.3.1</td><td>
<table>
<tr><th>Requirement</th><th>Single Entity</th><th>All partners combined</th><th>Each partner</th><th>At least one partner (This shall be Lead Partner)</th></tr>
<tr><td>The Bidder shag demonstrate that it has access to, or has available, liquid assets, unencumbered real assets, lines of credit, and older financial means as INR1512 Million / USD 25.2 Million for the subject contract(s) net of the Bidders other commitments</td><td>Must meet requirement</td><td>Must meet requirement</td><td>NA</td><td>NA</td></tr>
</table>
</td><td>
<table>
<tr><th>Requirement</th><th>Single Entity</th><th>All partners combined</th><th>Each partner</th><th>At least one partner (This shall be Lead Partner)</th></tr>
<tr><td>The Bidder shall demonstrate that it has access to, or has available, liquid assets, unencumbered real assets, lines of credit, and other financial means as INR 1512 Million / USD 25.2 Million for the subject contract(s) net of the Bidders other commitments</td><td>Must meet Require-ment</td><td>Must meet requirement</td><td>NA</td><td>NA</td></tr>
</table>
</td><td>No change sought.</td></tr>
<tr><td>99.</td><td>Average Annual Turnover</td><td>Cl-2.3.2</td><td>
<table>
<tr><td>Minimum average annual turnover of INR 1134 Million</td><td>Must meet requirement</td><td>Must meet requirement</td><td>Must meet twenty five percent (25%) of the requirement</td><td>Must meet Fifty percent (50%) of the requirement</td></tr>
</table>
</td><td>
<table>
<tr><td>Minimum average annual turnover of INR 1134 Million</td><td>Must meet requirement</td><td>Must meet twenty five percent (25%) of the requirement</td><td>Must meet twenty five percent (25%) of the requirement</td><td>Must meet Fifty percent (50%) of the requirement</td></tr>
</table>
</td><td>No change sought.</td></tr>
<tr><td>100.</td><td>Specific Experience</td><td>Cl-2.4.2</td><td>
<table>
<tr><td>a) Participation as contractor, joint venture member, management contractor or subcontractor in at least one (1) contracts within the last ten (10) years from 1st April 2005 to 31st March 2015 With a value of at least one contract of at least INR 3024 Million or USD SO 4 Million / two contracts each with the value of at least INR 2268 Million or USD 37.8 Million /three contracts each with the value of at least INR 1512 Million or USD 25.2 Million or an equivalent amount in a freely convertible currency that have been successful and substantially? Completed and that are similar B to the proposed Works within last ten (10) years. The similarity shall be based on the physical size, complexity, methods / technology or other characteristics as described in Part 2, Employer's Requirements Harbour with pile foundation diaphragm wall/ retaining wall in river/sea with executed under BOQ contracts shall also be considered as similar works. Fabrications /installation/ commissioning of caisson gales I mitre gate requires a special skills Either a member of JV or sub-contractor should have necessary experience in construction / installation I commissioning of at least one of each gate 'Cost of works of previous years shall be Increased by 7% per year based on Rupee value to bring them to 2014-15 price level</td><td>Must meet requirement</td><td>Must meet requirement</td><td>Must meet twenty five percent (25%) of the requirement</td><td>Must meet Fifty percent (50%) of the requirement</td></tr>
</table>
</td><td>
<table>
<tr><td>a) Participation as contractor, Joint venture member, management contractor, or subcontractor. In at least one (1) contracts within the last ten (10) years from 1st April 2005 lo 31st March 2015. With a value of at least one contract of at least WR 1024 Million or USD 50.4 Million / two contract* each with the value of at least INR 22811 Million or USD 37.8 Million /three contracts each with the value of at least INR 1512 Million or USD 26.2 Million or an equivalent amount In a freely convertible currency that have been successfully and substantially 7 completed and that are similar)) to the proposed Works within last ten (10) years. The similarity shall be based on the physical site, complexity, methods f technology or other characteristics as described In Part 2, Employer's Requirements. Harbour with pile foundation/ diaphragm wall /retaining wall In river/sea executed under BOQ contracts OR RCC Dam I Barrage shall also tie considered as similar works Fabrication/ installation / commissioning of caisson gates /mitre gate requires a special skills. Either a member of JV or sub-contractor should have necessary experience in construction/ installation / commissioning of atleast one of each gate. Cost of works of previous years shall be increased by 7% per year based on Rupee value to bring them to 2014-15 price level</td><td>Must meet requirement</td><td>Must meet requirement</td><td>Must meet twenty five percent (25%) of the requirement</td><td>Must meet Fifty percent (50%) of the requirement</td></tr>
</table>
</td><td>Tender conditions prevail.</td></tr>
</table>

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101.	Specific Experience	Cl-2.4.2	b) For the above or other contract* executed during the period stipulated In 2.4.2(a) above, a minimum experience in one of (he following key activities. • Design of navigation lock of size 200m (length) x 25m (width). • Design of dry dock of size 250 m x 20 m. • Design of hydropower project having pit type power house; Irrigation structure with gates of size 15 m x 14 m remote control system with hydraulic operation. • Underground metro nation constructed by cut and cover method • He should have either in-house design capability or associate with reputed design consultant for authentication of survey and investigation details and complete design of various components of the lock. Details to be furnished in Form2C	Must meet requirement	Must meet requirement	NA	Must meet requirements or can be a specialist Subcontract	b) For the above or other contracts executed during the period stipulated in 2.4.2(a) above, a minimum experience in one of the following key activities: • Design of a navigation lock of slit 200m (length) x 25 m(width). • Design of dry dock of size 200m x 20 m. • Design of hydropower project having type power house/ Irrigation structure with gates of size 15 m X14 m with hydraulic operation. • Underground metro station constructed by cut and cover method • He should have either in-house design capability or associate with reputed design consultant for authentication of survey and investigation details and complete design of various components of the lock. Details to be furnished in Form 2C.	Must meet Requirements or can be specialist Sub-contract	Must meet requirements or can be a specialist Subcontract	NA	Must meet requirements or can be a specialist Subcontract	Tender conditions Prevail.

S No	Document Ref	Reference Clause No.	Existing Provision	Bidder's Query	Reply
102.	Tender Document	Clause 2.4.2, Specific Experience	Design of Hydropower Projects having pit type power/ irrigation structure with gate size of 15m x 15m.	We have manufactured gate with width upto 15.5 m and height upto 15.5 m in the qualify criteria on the basis of width and height executed in different projects.	Design of Hydropower Projects having pit type power/ irrigation structure with gate size of **12m x 12m**, shall be considered eligible. The list of projects completion/ under construction with comparable gate size is attached as Annexure – B.
103.	Tender Document			The scope of dredging in approach channel was discussed	It was clarified that the dredging in the approach channel is in the contractor's scope.
104.	Tender Document			Weather permission of Boring will be given for Potable water	It was clarified that the contractor needs to take required permissions from the concerned Govt. department for undertaking boring for potable water.
105.	Tender Document			Is there any approve vendors list for the Gates suppliers.	No there is no such list, but the vendor should be approved by Engineer-in-Charge.
106.	Tender Document			Whether Alternative Technical solution is permitted.	The alternative Technical solution is limited to the retaining walls of lock structure.

Annexure - 1

Water levels in feeder canal at IWAI Gate Station				
	Monthly Max		Monthly Min	
Month	U/S Farakka Lock (m)	D/S Farakka Lock (m)	U/S Farakka Lock (m)	D/S Farakka Lock (m)
Aug-14	23.797	20.448	22.037	19.828
Sep-14	22.347	20.448	22.067	19.918
Oct-14	22.437	20.618	21.987	19.958
Nov-14	22.207	20.158	21.977	20.008
Dec-14	22.197	20.148	22.037	19.968
Jan-15	22.187	20.248	22.067	20.008
Feb-15	22.227	20.318	22.057	19.778
Mar-15	22.267	20.628	21.957	19.518
Apr-15	22.127	20.358	21.907	20.188
May-15	22.097	20.368	21.837	20.158
Jun-15	22.087	20.578	21.637	19.828
Jul-15	22.267	20.108	21.745	19.308

Annexure – 2

Sl. No.	Name of Projects	Size of spillway gate
1.	Pare H.E. Project	10.4m x 12.0m
2.	Kameng H.E. Project	9m x 12.5 m
3.	Tanga Dam Project	14m x 14.0m
4.	Koldam H.E. Project	17m x 17m
5.	Shongtong Karcham H.E. Project	12m x 10m
6.	Maheshwar H.E. Project	20m x 19.35m
7.	Kolar Project	15m x 8.8m
8.	Koteshwar H.E. Project	18m x 16m
9.	Kishanganga H.E. Project	7 m x 9.5m
10.	Srinagar H.E. Project	14.5m x 24m