B I D D I N G D O C U M E N T

National Competitive Bidding - NCB
(Two-Envelope Bidding Process with e-Procurement)

Renovation/Modification of Building /Infrastructure works at National Inland Navigation Institute (NINI) at Patna.

BIDDING DOCUMENT
RFB: IN-IWAI-381129-CW-RFB
Issued on July 2024

Employer: Inland Waterways Authority of India,
Ministry of Shipping, Government of India
A-13, Sector -1, Noida

Country: India

GOVERNMENT OF INDIA PROJECT

INVITATIONS FOR BIDS (IFB)

E-Procurement Notice

(Two-Envelope Bidding Process with e-Procurement)

NATIONAL COMPETITIVE BIDDING FOR SMALL WORKS

Date: 11.07.2024
Bid No.: IN-IWAI-381129-CW-RFB

1. The Inland Waterways Authority of India, Ministry of Ports, Shipping & Waterways, Government of India has received financing from the International Bank for Reconstruction and Development toward the cost of Capacity Augmentation of National Waterway – 1 (Jal Marg Vikas Project) and intends to apply a part of the funds to cover eligible payments under the contract for construction of works as detailed below:

   "Renovation/Modification of Building /Infrastructure works at National Inland Navigation Institute (NINI) at Patna."

   Bidding is open to all bidders from eligible source countries as defined in the *IBRD Guidelines for Procurement.* **Bidders are advised to note the minimum qualification criteria specified in Clause 3 of the Instructions to Bidders to qualify for the award of the contract.** In addition, please refer to paragraphs 1.6 and 1.7 of the World Bank's Guidelines setting forth the World Bank's policy on conflict of interest.

2. The Inland Waterways Authority of India, Ministry of Ports, Shipping & Waterways, Government of India) invites online bids for the construction of works detailed below in the table. The bidders may submit bids of the works indicated therein.

Package No.	Name of work	Bid Security (Rs.)	Cost of Document (Rs.)	Period of Completion
IN-IWAI-381129-CW-RFB	Renovation/Modification of Building /Infrastructure works at National Inland Navigation Institute (NINI) at Patna.	6,02,160/-	Rs 5,900.00 including GST	180 days

3. Bidding documents are available online on e-procurement portal, https://eprocure.gov.in/eprocure/app from 11.07.2024 to 12.08.2024, for a non-refundable fee as indicated, in the form of cash or Demand Draft/RTGS/NEFT on any Nationalized/Scheduled bank payable at **Noida** in favour of '**IWAI Fund Jal Marg Vikas'** (Payment documents are to be submitted subsequently as per the procedure described in

paragraph 7 below). Bidders will be required to register on the website, which is free of cost. The bidders would be responsible for ensuring that any addenda available on the website is also downloaded and incorporated. Interested bidders may obtain further information at the address given below during office hours or may request clarifications online through e-procurement portal.

4. For submission of the bid, the bidder is required to have Digital Signature Certificate (DSC) from one of the Certifying Authorities authorised by Government of India for issuing DSC. Aspiring bidders who have not obtained the user ID and password for participating in e-procurement in this Project, may obtain the same from the website https://eprocure.gov.in/cppp/download/disp. A non-refundable fee of **Rs 5,900.00** (inclusive of tax) is required to be paid (to be submitted along with other documents listed in paragraph 7 below) before the bid submission deadline i.e. before 12.08.2024. The mode of payment shall be in the form of DD/RTGS/NEFT drawn in favour of '**IWAI Fund Jal Marg Vikas',** payable at **Noida**, from any Nationalized/Scheduled Bank.

5. Bids must be accompanied by a bid security of the amount specified for the work in the table below, drawn in favour of **Inland Waterways Authority of India, Ministry of Ports, Shipping & Waterways, Government of India**. Bid security will have to be in any one of the forms as specified in the bidding document and shall have to be valid for 45 days beyond the validity of the bid. Bids should be valid for 120 days after the deadline date specified for submission. Procedure for submission of bid security is described in Para 7.

6. Bids, both Technical and Financial Parts, must be submitted online on https://eprocure.gov.in/eprocure/app on or before 1500 hours on 12.08.2024 and the 'Technical Part' of the bids will be publicly opened online on the same day at 1530 hours, in the presence of the bidders who wish to attend. The "Financial Part" shall remain unopened in the e-procurement system until the second public Bid opening for the financial part. Any bid or modifications to bid (including discount) received outside e-procurement system will not be considered. Record of bid opening will be electronically shared with bidders. If the office happens to be closed on the date of opening of the bids as specified, the technical parts of bids will be opened on the next working day at the same time and venue. The electronic bidding system would not allow any late submission of bids.

7. The bidders are required to submit (a) original payment documents towards the cost of bidding document and registration on e-procurement website (if not previously registered); and (b) original bid security in approved form (c) original affidavit regarding correctness of information furnished with bid document (if any) with Vice-Chairman and Project Director, Project Management Unit, Jal Marg Vikas Project, **Inland Waterways Authority of India, A-13, Sector -1, Noida – 201 301 (UP)** before the bid submission deadline, either by registered post/speed post/courier or by hand, failing which the bids will be declared non-responsive and will not be opened.

8. The Employer shall not be held liable for any delays due to system failure beyond its control. Even though the system will attempt to notify the bidders of any bid updates, The Employer shall not be liable for any information not received by the bidder. It is the bidders' responsibility to verify the website for the latest information related to this bid.

9. An on-line pre-bid meeting will be held on 22.07.2024 at 1500 hours at the office of

Vice-Chairman and Project Director, JMVP, Project Management Unit, Jal Marg Vikas Project
Address: A–13, Sector – 1 Noida, Gautam Buddha Nagar, Uttar Pradesh, ZIP Code: 201301
Country: India
to clarify the issues and to answer questions on any matter that may be raised on the bidding document. Bidders are advised to download the bidding document prior to the pre-bid meeting in order for bidders to have a good understanding of the scope of work under this contract for discussion and clarification at the pre-bid meeting. The link of the pre-bid meeting as follows:

Join Zoom Meeting
https://us06web.zoom.us/j/86982865909?pwd=kUWkPgbqWgkztJXqfbWavOJD3Oazay.1

Meeting ID: 869 8286 5909
Passcode: 6942eK

10. Other details can be seen in the bidding documents.

Seal of office
Name & Designation of Officer: Vice-Chairman and Project Director, JMVP
(Official Address: Project Management Unit, Jal Marg Vikas Project, A–13, Sector – A–13, Sector – 1 Noida, Gautam Buddha Nagar, Uttar Pradesh, India- 201301
Email: vc.iwai@nic.in
Telephone: +91 120- 2424544

(Employer)

Instructions to Bidders

SECTION - A

1. Scope of Works (In brief)

The Inland Waterways Authority of India, Ministry of Ports, Shipping & Waterways, Govt of India (Employer/ Client) invites Percentage rate bids for the construction/renovation/ modernization of works as detailed in the below table through central e-procurement portal (https://eprocure.gov.in/eprocure/app).

Brief Description of the Works	Approximate value of Works (Rs.)	Period of Completion
Renovation/Modification of Building /Infrastructure works at National Inland Navigation Institute (NINI) at Patna.	3,01,07,985 + GST	180 days

The successful bidder ("Contractor") is expected to complete the works by the intended completion timeline specified above.

2. Qualification of the bidder: The bidder shall provide qualification information which shall include: -

a) Total monetary value of construction works performed for each year of the last 3 years;

b) Report on his financial standing; and

c) Details of any litigation, current or during the last 3 years in which the bidder is involved, the parties concerned and disputed amount or awards in each case.

3. To qualify for award of the contract, the bidder: -

(a) Should have satisfactorily completed as a prime contractor at least one similar work of value not less than Rs 2.40 crores or two similar works of value not less than Rs. 1.50 Crores or three similar works of value not less than Rs. 1.20 Crores in the last seven years.

Similar works means experience in undertaking Renovation & modernization of buildings.

(b) should have achieved an average annual financial turnover (in civil Engineering construction works of similar nature only) of value not less than Rs 0.91 Cr. in the last three financial years (FY 2022-23, FY 20e21-22 & FY 2020-21);

(c) Deleted

(d) Deleted

(e) should not have been debarred or suspended on the date of bid opening by the World Bank Group.

(f) No contract should have been suspended or terminated and/or performance security called by an employer(s) for reasons related to Environmental, Social (including sexual exploitation and abuse (SEA) and gender-based violence (GBV)), Health, or Safety (ESHS) requirements or safeguards in the past five years.

(g) availability of liquid assets and/or credit facilities, net of other contractual commitments and exclusive of any advance payments which may be made under the Contract, of not less than Rs 1.20 crores.

3.1 Eligibility - Conflict of Interest*

Any Bidder found to have a conflict of interest shall be disqualified. A Bidder may be considered to have a conflict of interest for the purpose of this bidding process, if the Bidder:

i. directly or indirectly controls, is controlled by or is under common control with another Bidder; or

ii. receives or has received any direct or indirect subsidy from another Bidder; or

iii. has the same legal representative as another Bidder; or

iv. has a relationship with another Bidder, directly or through common third parties, that puts it in a position to influence the bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or

v. any of its affiliates has been hired (or is proposed to be hired) by the Employer or Borrower as Engineer-in-Charge for the Contract implementation.

vi. Has a close business or family relationship with the concerned professional staff of the Borrower or of the project implementing agency.

(* for further details refer to Procurement Guidelines Clauses 1.6 to 1.8)

4. Bid Price

a) The contract shall be for the whole works as described in drawings and technical specifications. Corrections, if any, can be carried out by editing the information before electronic submission on e-procurement portal.

b) All duties, taxes and other levies payable by the Contractor ("successful bidder") under the contract shall be included in the total price.

c) The rates quoted by the bidder shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.

d) The Bidder shall fill in the prices for the Works in conformity with the Bidding Documents, both in figures and words.

5. Submission of Bids

5.1 The bidder is advised to visit the site of works at his own expense and obtain all information that may be necessary for preparing the bid.

5.2 Each bidder shall submit only one bid. Bidders should not contact other competing bidders in matters relating to this bid.

5.3 The set of bidding documents comprise of the following:

i. Layout Drawings of the works;
ii. Indicative Structural Details;
iii. Bill of Quantities;
iv. Technical Specifications;
v. Instructions to Bidders; and
vi. Draft Contract Agreement format which will be used for finalizing the agreement for this Contract.

5.4 The e-procurement system provides for online clarifications. Clarifications requested through any other mode shall not be considered by the Employer. Response of the Employer including a description of the inquiry, but without identifying its source, shall be uploaded on the e-procurement portal for information of all Bidders. It is the bidder's responsibility to check on the e- procurement portal, for any clarifications or amendments to the bidding documents.

5.5 The bid submitted by the bidder shall comprise two parts, namely the Technical Part and the Financial Part. These two Parts shall be submitted simultaneously.

5.5.1 The Technical Part shall contain the following: -

(a) Letter of Bid – Technical Part in the format given in Section B.

(b) Qualification information form given in Section B duly completed.

(c) Bidder's confirmation to comply with (i) the applicable Laws/ Rules/ Regulations for protection of environment, public health and safety; (ii) the regulatory authority conditions (if any) attached to any permits or approvals for the project; and (iii) the Management Strategies and Implementation Plan (MSIP) to manage the Environmental, Social (including sexual exploitation and abuse (SEA) and gender-based violence (GBV)), Health and Safety

(ESHS) risks, and ESHS Code of Conduct, that will apply to its employees and all subcontractors.

(d) Bid Security, in original form for the **amount Rs 6,02,160**/- in one of the following forms:

- A e-Bank Guarantee issued by a Nationalized/Scheduled bank located in India in the form given in Section B; or
- Certified cheque or Bank draft payable to Inland Waterways Authority of India, payable at Noida.
- Fixed Deposit/Time Deposit certificates/ E-Bank Guarantees issued by a Nationalized/Scheduled Bank located in India for equivalent or higher values are acceptable provided it is pledged in favour of Inland Waterways Authority of India, Noida, and such pledging has been noted and suitably endorsed by the bank issuing the deposit certificate**.**
- The details of the Bank are as under:
  Name of the Bank: Canara Bank
  Bank Account Number: 87781010014534
  Branch name & address: Morna Noida, B 16/17, Ground Floor, Sector 18, Noida 201301
  IFSC Code: CNRB0018778

5.5.2 The **Financial Part** shall contain the following: -

(a) Letter of Bid – Financial Part in the format given in Section B;

(b) Completed Bill of Quantities.

5.5.3 The Technical Part shall not include any information related to the Bid price. Where material financial information related to the Bid price is contained in the Technical Part, the Bid shall be declared non-responsive.

5.6 (a) The Letter of Bid – Technical Part, Letter of Bid – Financial Part, and all documents listed in Clause 5.5, shall be prepared using the relevant forms. The forms must be completed without any alterations to the text, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested. For this purpose, the bidders shall fill up online, the forms that are available for online filling on the e-procurement portal. The rest of the forms shall be download by the bidders and filled up.

(b) Bids, both Technical and Financial Parts, shall be simultaneously submitted online on the e-procurement system. Detailed guidelines for viewing bids and submission of online bids are given on the website. Any bidder can logon to this website and view the IFB and details of works for which bids are invited. However, the bidder is required to have enrolment/ registration in the website and should have valid Digital Signature Certificate (DSC) in the form of smart card/e-token obtained from any certifying agency authorised by the Government of India for class of DSC - **CLASS – III/II**. The bidder should register in the website using the relevant option. Then the Digital Signature registration has to be

done with the e-token, after logging into the website. The bidder can then login the website through the secured login by entering the password of the e-token & the user id/ password chosen during registration. After getting the bidding documents, the Bidder should go through them carefully and submit the specified documents along with the respective technical and financial parts of the bid, otherwise the bid will be rejected.

(c) The completed bid, both Technical and Financial Parts, comprising of documents indicated in ITB 5.5, should be uploaded on the e-procurement portal along with scanned copies of requisite certificates and scanned copies of the bid security and demand drafts for cost of bid document and registration on e-procurement website. All the documents are required to be signed digitally by the bidder. After electronic online 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.

(d) Any bid or modifications to bid (including discount) received outside e-procurement system will not be considered.

5.7 Bids, both Technical and Financial Parts, must be uploaded online no later than the time and date given in the Invitation for Bids. A bidder may modify his bid any number of times by using the appropriate option for bid modification on the e-procurement portal, before the deadline for submission of bids. No additional payment towards the cost of bid document is required for bid modifications.

5.8 The e-procurement system would not allow any late submission of bids after due date & time as per server time.

5.9 **Submission of Original Documents**: The bidders are required to submit (i) original demand drafts towards the cost of bid document and registration on e-procurement website (if not previously registered) (as per IFB); and (ii) original bid security in approved form, with the office specified in the IFB, before the bid submission deadline, either by registered/speed post/courier or by hand, failing which such bids will be declared non-responsive, and shall be rejected. Hard copy of bids or any other document are not to be submitted.

6. Validity of Bid

Bid shall remain valid for a period not less than 120 days after the deadline date specified for submission. If a Bidder withdraws/modifies/substitutes its bid during the period of bid validity specified by the Bidder on the Letter of Bid - Technical Part and repeated in the Letter of Bid - Financial Part, the Bid Security may be forfeited.

7. Online Public Opening of Technical Parts of Bids

The Technical Part of the Bids will be publicly opened online in the presence of bidders or their representatives who choose to attend on the date and time given in the Invitation for Bids, and at IWAI, Sector-1, Noida, and this could also be viewed by the bidders online. The Financial Part of the bids shall remain unopened in the e-procurement system, until the second online public opening, following the evaluation of Technical Parts of the Bids.

8. Evaluation of Bids – General provisions

8.1 Information relating to evaluation of bids and recommendations for the award of contract shall not be disclosed to bidders or any other persons not officially concerned with the process until the award to the successful bidder is announced.

9. Evaluation of Technical Parts of Bids

9.1 The Employer will evaluate the technical parts of the bids to determine to its satisfaction the Bids that are both substantially responsive to the bidding documents and meet the qualification criteria, i.e. which

(a) conform to the terms and conditions, specifications and drawings without material deviations;

(b) are properly signed; and

(c) meet the qualification criteria specified in clause 3 above.

9.2 If a Bid is not substantially responsive to the requirements of the bidding document and does not meet the qualifying criteria, it shall be rejected, and its Financial Part shall not be opened at the second public opening by the Employer.

10. Online Public Opening of Financial Parts of Bids

10.1 Following the completion of the evaluation of the Technical Parts of the Bids, the Employer shall notify in writing those Bidders whose Bids were considered non-responsive to the bidding document or failed to meet the Qualification Criteria, advising them (a) the grounds on which their Technical Part of Bid failed to meet the requirements of the bidding document; and (b) that their Financial Part of Bid shall not be opened.

10.2 The Employer shall, simultaneously, notify in writing those Bidders whose Technical Part of Bids have been evaluated as substantially responsive to the bidding document and met all Qualifying Criteria, advising them (a) that their Bid has been evaluated as substantially responsive to the bidding document and met the Qualification Criteria; and (b) that their Financial Part of Bid shall be opened at the second online public opening of the Financial Parts.

10.3 The Employer shall notify all bidders the date, time, and place of the second online public opening of the Financial Parts of the Bids. The opening date should allow Bidders sufficient time (normally not less than 7 days) to make arrangements for attending the opening. The Financial Parts of the Bids referred to in Clause 10.2 will be publicly opened online in the presence of bidders or their representatives who choose to attend, and this could also be viewed by the bidders online.

In the event of the specified date of the bid opening of financial parts being declared a holiday for the Employer, the bids will be opened at the appointed time and location on the next working day.

11. Evaluation of Financial Parts of Bids

11.1 Correction of Arithmetical Errors

Bids determined to be substantially responsive shall be checked for any arithmetic errors. Errors shall be corrected as follows:

(a) where there is a discrepancy between the amounts in figures and in words, the amount in words shall govern;

(b) where there is a discrepancy between the unit rate and the line-item total resulting frommultiplying the unit rate by the quantity, unit rate as quoted shall govern; and

(c) the amount stated in the Bid shall be adjusted in accordance with the above procedure for the correction of errors

If the Bidder does not accept the corrected amount, the Bid shall be rejected, and the Bid Security may be forfeited.

11.2 Comparison of Financial Parts

The Employer shall compare the evaluated prices of all substantially responsive bids to determine the lowest evaluated bid.

12. Award of contract

The Employer will award the contract to the bidder whose bid has been determined to be substantially responsive and who has offered the lowest evaluated bid price and who meets the specified qualification criteria.

12.1 Notwithstanding the above, the Employer reserves the right to accept or reject any bids and to cancel the bidding process and reject all bids at any time prior to the award of contract.

12.2 The bidder whose bid is accepted will be notified of the award of contract by the Employer prior to expiration of the bid validity period.

12.3 The Bid security of unsuccessful bidders will be returned as promptly as possible upon the successful Bidder's signing the contract and furnishing the performance security pursuant to ITB 13.

13. Performance Security

Within 15 days of receiving letter of acceptance, the successful bidder shall deliver to the **Inland Waterways Authority of India Ministry of Ports, Shipping & Waterways, Government of India** (Employer) the performance security (either a bank guarantee or a bank draft in favour of the Employer) for an amount equivalent of **5% of the contract price**.The Performance Security shall be valid until a date 28 days after the date of issue of the Certificate of Completion. Failure of the successful Bidder to furnish performance security and sign the agreement within the period stipulated shall constitute sufficient grounds for annulment of award and forfeiture of the Bid Security, in which case the Employer may make the award to the next lowest evaluated bidder or call for new bids.

14. Defects Liability:

The "Defects Liability Period" for the work is 12 months from the date of taking over possession or one full monsoon season whichever occurs later. During this period, the contractor will be responsible for rectifying any defects in construction free of cost to the Employer.

15. Supply of all construction materials including cement and steel as per the specifications (ISI certification marked goods wherever available) shall be the responsibility of the contractor.

16. Corrupt and Fraudulent Practices

The World Bank requires compliance with its policy in regard to corrupt and fraudulent practices as set forth in Section C. In further pursuance of this policy, Bidders shall permit and shall cause their agents (whether declared or not), sub-contractors, sub-consultants, service providers, or suppliers and any personnel thereof, to permit the Bank to inspect all accounts, records and other documents relating to any prequalification process, bid submission, and contract performance (in the case of award), and to have them audited by auditors appointed by the Bank.

SECTION - B

1. **Format for Qualification Information.**
2. **Format for Submission of Bid.**
3. **Format of Letter of Acceptance.**

Appendix to Technical Part

QUALIFICATION INFORMATION

1 For Individual Bidders

1.1 Principal place of business: _____

Power of attorney of signatory of Bid.
[Attach copy]

1.2 Total value of Civil Engineering construction work performed in the last three years (in Rs. Lakhs)

20 2020-21 _____
20___ 2021-22_____
20___ 2022-23_____

1.3 Work performed as prime contractor (in the same name) on works of a similar nature over the last seven years.

Project Name	**Name of Employer**	**Description of work**	**Contract No.**	**Value of contract (Rs. Lakhs)**	**Date of issue of Work order**	**Stipulated period of completion**	**Actual date of completion**	**Remarks explaining reasons for delay and work completed**

Existing commitments and on-going works:

Description of Work **(1)**	**Place & State** **(2)**	**Contract No. & Date** **(3)**	**Value of Contract (Rs. Lakh)** **(4)**	**Stipulated period of completion** **(5)**	**Value of works* remaining to be completed (Rs. Lakhs)** **(6)**	**Anticipated date of completion** **(7)**

* Enclose a certificate from concerned officials.
** Modify as appropriate.

1.4 Proposed subcontracts and firms involved.

Sections of the works	**Value of Sub-contract**	**Sub-contractor (name & address)**	**Experience in similar work**

1.5 Evidence of access to financial resources to meet the requirement of working capital: cash in hand, lines of credit, etc. List them below and attach copies of supporting documents.

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

1.7 Information on litigation history in which the Bidder is involved.

Other party(ies)	**Employer**	**Cause of dispute**	**Amount involved**	**Remarks showing present status**

1.8 Contract(s) suspended or terminated and/or Performance Security called by an employer(s) for reasons related to Environmental, Social (including sexual exploitation and abuse (SEA) and gender-based violence (GBV)), Health, or Safety (ESHS) performance during the last five years.

Contract(s) suspended or terminated by an Employer(s)			
Year	Contract Identification, Name and address of the Employer, and reasons for suspension or termination	Amount of suspended or terminated portion of contract (Rs)	Total Contract Amount (Rs)
Performance Security called by an employer(s)			
Year	Contract Identification, Name and address of the Employer, and reasons for calling of performance security		Total Contract Amount (Rs)

LETTER OF BID – Technical Part

*

Description of the Works: Renovation/Modification of Building /Infrastructure works at National Inland Navigation Institute (NINI) at Patna.

Date: ……

Invitation for Bid No.: IN-IWAI-381129-CW-RFB

To:

Subject : Renovation/Modification of Building /Infrastructure works at National Inland Navigation Institute (NINI) at Patna.

Sir,

**We, the undersigned, hereby submit our bid, in two parts, namely:

(a) the Technical Part, and

(b) the Financial Part

In submitting our Bid, we make the following declarations:

We have no reservations to the Bidding Documents and offer to execute the Works in conformity with the Bidding Documents in accordance with the Conditions of Contract enclosed therein.

We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in bribery or collusive arrangements with competitors.

We hereby confirm that this bid is valid for 120 days as required in Clause 6 of the Instructions to Bidders.

We meet the eligibility requirements and have no conflict of interest in accordance with ITB 3.1

We have not been currently debarred or suspended by the World Bank Group.

Yours faithfully,

Authorized Signature : Date: _____

Name & Title of Signatory :_____
Name of Bidder :_____
Address : _____

* To be filled in by the Employer before issue of the bidding documents.

** To be filled in by the Bidder, together with his particulars and date of submission at the bottom of this Form.

LETTER OF BID – Financial Part

Description of the Works: Renovation/Modification of Building /Infrastructure works at National Inland Navigation Institute (NINI) at Patna.

Date: ……

Invitation for Bid No.: IN-IWAI-381129-CW-RFB

To:

Subject: Renovation/Modification of Building /Infrastructure works at National Inland Navigation Institute (NINI) at Patna.

Sir,

We, the undersigned, hereby submit the second part of our Bid and the Bid Price. This accompanies the Letter of Bid - Technical Part. In submitting our Bid, we make the following declarations:

We hereby confirm that this bid is valid for 120 days as required in Clause 6 of the Instructions to Bidders.

We have not been debarred/removed[1] from approved list (dealings suspended) by the Central or any State Government or any Government Undertaking or by the World Bank Group.

We have no reservations to the Bidding Documents, and offer to execute the Works in conformity with the Bidding Documents in accordance with the Conditions of Contract enclosed therein at a total Contract Price of –

Rs.**_____[in figures]
Percentage (+ or -)_____[Percentage]

Yours faithfully,

Authorized Signature : Date: _____

Name & Title of Signatory :_____
Name of Bidder :_____
Address : _____

* To be filled in by the Employer before issue of the bidding documents.
** To be filled in by the BFidder, together with his particulars and date of submission at thebottom of this Form.

[1] If debarred/removed, please provide further details.

LETTER OF ACCEPTANCE CUM NOTICE TO PROCEED WITH THE WORK

(LETTERHEAD OF THE EMPLOYER)

Dated: _____

To: _____ [Name and address of the Contractor]
_____
_____
_____
_____

Dear Sirs,

This is to notify you that your Bid dated_____for execution of the _____for the contract price of Rupees_____[amount in words and figures], is hereby accepted by us.

You are hereby requested to furnish performance security for an amount of Rs. _____(Equivalent to 5% of the contract price) within 15 days of the receipt of the letter. The Performance Security in the form of Bank guarantee or a Bank draft in favour of ..... (Employer) shall be valid until a date 28 days after the date of issue of the Certificate of Completion i.e. up to_____. Failure to furnish the Performance Security will entail cancellation of the award of contract.

You are also requested to sign the agreement form and proceed with the work not later than _____ under the instructions of the Engineer-in-Charge , _____and ensure its completion within the contract period.

With the issuance of this acceptance letter and your furnishing the Performance Security, contract for the above said work stands concluded.

Yours faithfully,

Authorized Signature

Name and title of Signatory

Draft Agreement form for Construction through Lump Sum Contract

ARTICLES OF AGREEMENT

1. This deed of agreement is made in the form of agreement on _____ day _____ month _____ 20 ___, between the _____ (Employer) or his authorized representative (hereinafter referred to as the first party) and_____(Name of the Contractor), S/O _____resident of_____[2](hereinafter referred to as the second party), to execute the work of construction of_____(hereinafter referred to as works) on the following terms and conditions.

2. Cost of the Contract

The total cost of the works (hereinafter referred to as the "total cost") is Rs.____ as reflected in Annexure - 1.

3.1 Payments under the contract:

Payments to the second party for the construction/ renovation work shall be paid on monthly Running bill basis based on the actual certification of measurement of the quantities by the Engineer-in-Charge.

[2] In case of a firm insert 'complete address of the firm'. In case of an individual contractor insert identification like 'son of and resident of' etc.

3.2 Deleted.

3.3 The Employer shall retain (Retention Money) 6% of the amount from each payment due to the Contractor subject to the maximum of 5% of total contract price. Half of the amount retained shall be released upon completion of the works, and other half shall be released on completion of Defects Liability Period (DLP) and the Engineer-in-Charge has certified that all Defects notified to the Contractor before the end of this period have been corrected. On completion of the whole works the Contractor may substitute the balance 50% retention money with an "on demand" Bank guarantee.

3.4 Payments at each stage will be made by the employer as per payment defined inclause no 3.1:

(a) on the second party submitting an invoice for an equivalent amount;

(b) on certification of the invoice (except for the first installment) by the Engineer-in-Charge nominated by the first party with respect to quality of works in the format in Annexure - 2; and

(c) upon proper and justified utilization of at least 50 % of the previous installment and 100 % of any prior installment.

4. Notice by Contractor to Engineer-in-Charge

The Contractor (Successful bidder)/ second party, on the works reaching each stage of construction, shall issue a notice to the Employer/ first party or the Engineer-in-Charge nominated by the first party [who is responsible for supervising the contractor, administering the contract, certifying payments due to the contractor, issuing and valuing variations to the contract, awarding extension of time etc.] to visit the site for certification of stage completion. Within 15 days of the receipt of such notice, the first party or the Engineer-in-Charge nominated by it, will ensure issue of stage completion certificate after due verification.

5. Completion time

The works should be completed in 180 days from the date of this contract Agreement. In exceptional circumstances, the time period stated in this clause may be extended in writing by mutual consent of both the parties.

6. Deleted.

7. Any willful delay on the part of the second party in completing the construction within the stipulated period will render him liable to pay liquidated damages. The liquidated damages shall be **0.5% per week** of the awarded price, which will be deducted from the payments due to the Contractor. The Employer may cancel the contract and take recourse to such other action as deemed appropriate once the total amount of liquidated damages exceeds 5% of the contract amount.

8. Duties and responsibilities of the first party

8.1 The first party shall be responsible for providing regular and frequent supervision and guidance to the second party for carrying out the works as per specifications & drawings. This will include written guidelines and regular site visit of the authorized personnel of the first party, for checking quality of material and construction to ensure that it is as per the norms.

8.2 The first party shall approve the drawings which shall be prepared & submitted by the Second party as per specifications and guidelines for the proposed works.

8.3 Possession of the site will be handed over to the second party within 10 days of signing of the agreement.

8.4 The Engineer-in-Charge or such other person as may be authorized by the first party shall hold meeting once in a month where the second party or his representative at site will submit the latest information including progress report and difficulties if any, in the execution of the work. The whole team may jointly inspect the site on a particular day to take stock of activities.

8.5 The Engineer-in-Charge shall record his observations/instructions at the time of his site

visit in a site register maintained by the second party. The second party will carry out the instructions and promptly rectify any deviations pointed out by the Engineer-in-Charge. If the deviations are not rectified, within the time specified in the Engineer-in-Charge 's notice, the first party as well as the Engineer-in-Charge nominated by it, may instruct stoppage or suspension of the construction. It shall thereupon be open to the first party or the Engineer-in-Charge to have the deviations rectified at the cost of the second party.

8.6 The Engineer-in-Charge shall issue a Certificate of Completion of the Works on the request of the second party, and upon deciding that the whole of the Works is completed.

9. Duties and responsibilities of the second party

9.1 The second party shall:

a) take up the works and arrange for its completion within the time period stipulated in clause 5; prepare the drawings;

b) employ suitable skilled persons to carry out the works;

c) regularly supervise and monitor the progress of work;

d) abide by the technical suggestions/ direction of supervisory personnel including Engineer-in-Charge etc. regarding building construction;

e) be responsible for bringing any discrepancy to the notice of the representative of the first party and seek necessary clarification;

f) ensure that the work is carried out in accordance with specifications, drawings and within the total of the contract amount without any cost escalation;

g) keep the first party informed about the progress of work;

h) correct the notified defects within the length of time specified by the Engineer-in-Charge ;

i) be responsible for all security and watch and ward arrangements at site till handing over of the works to the first party;

j) maintain necessary insurance against loss of materials/cash, etc. or workman disability compensation claims of the personnel deployed on the works as well as third party claims from the start date to the end of defect liability period;

k) pay all duties, taxes and other levies payable by construction agencies as per law under the contract (First party will effect deduction from running bills in respect of such taxes as may be imposed under the law);

l) abide by the regulatory authority conditions (if any) attached to any permits or approvals for the project; and the ESHS Management Strategies and Implementation Plan and ESHS Code of Conduct, as required.;

m) abide by all labour enactments and rules made there under, regulations, notifications

and bye laws of the State or Central Government or local authorities;

n) abide by all enactments on environmental protection and rules made there under, regulations, notifications and by-laws of the Sate or Central Government, or local authorities;

o) Be responsible for the safety of all activities on the Site.

10. Variations / Extra Items

The works shall be executed by the second party in accordance with the approved drawings and specifications. No variation in cost is acceptable. However, if the Engineer-in-Charge issues instructions for execution of extra items, the following procedure shall be followed:

a) The second party shall provide the Engineer-in-Charge with a bid/estimate for carrying out the extra items when requested to do so by the Engineer-in-Charge. The Engineer- in-Charge shall assess the bid, which shall be given within seven days of the requestbefore the extra items are ordered.

b) If the bid given by the second party is unreasonable, the Engineer-in-Charge may order the extra items and make a change to the Contract Price which shall be based on Engineer-in-Charge 's own forecast of the effects of the extra items on the Contractor's costs.

c) The second party shall not be entitled to additional payment for costs.

11. Securities

The Performance Security shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount and form and by a bank acceptable to the Employer. The Performance Security shall be valid until a date 28 days from the date of issue of the Certificate of Completion in the case of a Bank Guarantee.

12. Termination

12.1 The Employer may terminate the Contract if the other party causes a fundamental breach of the Contract.

12.2 Fundamental breaches of Contract include, but shall not be limited to the following:

(a) the contractor stops work for 28 days and the stoppage has not been authorized by the Engineer-in-Charge;

(b) the Contractor has become bankrupt or goes into liquidation other than for a reconstruction or amalgamation;

(c) the Engineer-in-Charge gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Engineer-in-Charge;

(d) the Contractor does not maintain a security which is required;

(e) the Contractor has engaged in corrupt, fraudulent, collusive, coercive or obstructive practices, in competing for or in executing the Contract; and

(f) the contractor has delayed the completion of the Works by the number of days for which the maximum amount of liquidated damages can be paid

12.3 Notwithstanding the above, the Employer may terminate the Contract for convenience.

12.4 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure and leave the Site as soon as reasonably possible.

13. Payment upon Termination

13.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Engineer-in-Charge shall issue a certificate for the value of the work done less advance payments received up to the date of the issue of the certificate, less other recoveries due in terms of the contract, less taxes due to be deducted at source as per applicable law.

13.2 If the Contract is terminated at the Employer's convenience, the Engineer-in-Charge shall issue a certificate for the value of the work done, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works and less advance payments received up to the date of the certificate, less other recoveries due in terms of the contract and less taxes due to be deducted at source as per applicable law.

14. Dispute settlement

If over the works, any dispute arises between the two parties, relating to any aspects of this Agreement, the parties shall first attempt to settle the dispute through mutual and amicable consultation.

In the event of agreement not being reached, the matter will be referred for arbitration by a Sole Arbitrator not below the level of retired Chief Engineer-in-Charge / Superintending Engineer-in-Charge, (not connected in part or whole with this Project in his service) to be appointed by the first party. The Arbitration will be conducted in accordance with the Arbitration and Conciliation Act, 1996. The decision of the Arbitrator shall be final and binding on both the parties.

15. Corrupt and Fraudulent Practices

The World Bank requires compliance with its policy in regard to corrupt and fraudulent practices as set forth in Section C. In further pursuance of this policy, the Contractor shall permit and shall cause its sub-contractors, agents, personnel, consultants, service providers, or suppliers, to permit the Bank to inspect all accounts, records and other documents relating to the submission of bids and contract performance, and to have them audited by auditors appointed by the Bank.

Appendix to Financial Part
Annexure I

BILL OF QUANTITIES

The approximate Bill of Quantities is indicated below to give an idea of the work which should be executed in accordance with the approved drawings and specifications to enable the bidder to furnish the quote percentage. Bidders may, however, note that no variations in the quoted rate is acceptable (except where extra items are ordered by the Engineer-in-Charge separately). The rates quoted by the bidders should include all the factors as per site condition.

Name of the Bidder/ Bidding Firm / Company:	

NUMBER #	TEXT #	NUMBER #	TEXT #	NUMBER	NUMBER #
Sl. No.	**Item Description**	**Quantity**	**Units**	**Estimated Rate in Rs. P**	**TOTAL AMOUNT Without Taxes in Rs. P**
1	**2**	**4**	**5**	**6**	**7**
1	**Summary of Heads**				
1.01	Construction of workshop at NINI Gaighat, Patna (as per Appendix-A)	1.000	Nos	6701616.10	6701616.10
1.02	Renovation / modification of Auditorium at NINI, Gaighat Patna (as per Appendix-B)	1.000	Nos	3229333.98	3229333.98
1.03	Renovation/modification of 4 No. hostel room at NINI, Gaighat Patna (as per Appendix-C)	1.000	Nos	2004763.64	2004763.64
1.04	Construction of boundary wall & Entrance Gate at NINI Gaighat, Patna (as per Appendix-D)	1.000	Nos	2647457.63	2647457.63
1.05	Construction of VIP Accommodation at NINI Gaighat, Patna (as per Appendix-E)	1.000	Nos	11711254.24	11711254.24
1.06	Façade work/Painting/Flooring etc as per requirement on LS basis.	1.000	LS	2118644.07	2118644.07
1.07	Miscellaneous Requirement and maintenance work (as	1.000	Nos	1694915.25	1694915.25

	per Appendix-G)				
Total in Figures					**3,01,07,984.90**
Quoted Rate in % Figures*			**Select (+/-)**		**0.00**
Quoted Rate in Words					

We agree to execute the works in accordance with the approved drawings and technical specifications at a total contract price of Rs.....(Amount in figures)
(Rs. .....amount in words).

**Note: The quoted percentage by the bidder shall be applicable uniformly to all the items mentioned in Appendices below i.e Appendix-A to F.*

Signature of Contractor

Appendix-A:

Name of work: Construction of workshop at NINI Gaighat, Patna

Sl. No	Particulars of item.	Unit	No.	Quantities	Rate per unit (without GST)	Amount (INR.) (Without GST)
	Workshop					
1	**Dismantling**					
1.1	Dismantling roofing including ridges, hips, valleys and gutters etc	sqm	1	90.00	139.79	12580.93
1.2	Dismantling wall made with GI sheet	sqm	1	210.00	139.79	29355.51
1.3	Dismantling steel work in built up sections in angles, tees, flats and channels (LS qty has been considered)	kg	1	3000.00	4.79	14364.41
2	**Construction of Workshop at NINI**					
2.1	Building Cost for composite structure for construction of workshop as per plinth area rate	sqm	2	20.40.00	22169.49	5320677.97
2.2	Electrification	LS	1	**1**		665084.75
2.3	Electrification extra for power wiring &	LS	1	**1**		212827.12

	plug					
2.4	Internal water supply & sanitary installation	LS	1	**1**		212827.12
2.5	Fire alarm and fighting system	sqm	2	240.00	1150.00	233898.31
					Total without GST	6701616.10

Appendix-B

Name of work: Renovation / modification of Auditorium at NINI, Gaighat Patna						
Sl. No	**Particulars of item.**	**Unit**	**No.**	**Quantities**	**Rate per unit (without GST)**	**Amount (INR.) (Without GST)**
1	**Dismantling**					
1.1	Dismantling wooden trellis work excluding frames but including stacking the serviceable material within 50 metres lead. **STAGE REMOVING**	sqm	1	44.00	54.96	2418.14
1.2	Demolishing brick work manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable material					
	Wall	cum	1	9.60		
	Parapet wall	cum	1	8.10		
				17.70	1745.93	30903.00
2	**Brick masonry work** with 1st class bricks including racking out joint and dewatering if necessary and curing in cement mortar 1:6, all complete as per drawing and technical specifications.					
	Wall (with parapet)	cum	1	21.60	7716.91	166685.19
3	**12mm thick cement plastering** in single coat in prop. 1:4 on brick wall/ concrete slab etc.. including arises, internal rounded angles and finish even and smooth including curing complete as directed.					
	wall	sqm	1	144.00	294.11	42351.86

4	**Washed stone grit plaster** on exterior walls height upto 10 metre above ground level, in two layers, under layer 12 mm cement plaster 1:4 (1 cement : 4 coarse sand), furrowing the under layer with scratching tool, applying cement slurry on the under layer @ 2 Kg of cement per square metre, top layer 15 mm cement plaster 1:1/ 2:2 (1 cement: 1/2 coarse sand : 2 stone chipping 10 mm nominal size), in panels with groove all around as per approved pattern, including scrubbing and washing the top layer with brushes and water to expose the stone chippings ,complete as per specification and direction of Engineer-in-charge (payment for providing grooves shall be made separately	sqm	**1**	72.00	984.96	70916.95
4.1	Forming groove of uniform size in the top layer of washed stone grit plaster as per approved pattern using wooden battens, nailed to the under layer, including removal of wooden battens, repair to the edges of panels and finishing the groove	**Rmt.**	**1**	474.00	64.24	30448.47
5	Providing and applying white cement based putty of average thickness 1 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete.	sqm	**1**	72.00	132.25	9521.69
6	Wall painting with premium acrylic emulsion paint of interior grade, having VOC (Volatile Organic Compound) content less than 50 grams/ litre of approved brand and manufacture, including applying additional coats wherever required to achieve even shade and colour. (Two coats)	sqm	**1**	72.00	121.02	8713.22
6.1	Applying priming coats with primer of approved brand and manufacture, having low VOC (Volatile Organic Compound) content.	sqm	**1**	73.95	54.62	4039.05
7	Providing fitting hoisting and fixing of roof trusses including purlins fabricated out of MS black tubes conf. to relevant IS code as per approved design and drawing including MS cleats, base plate, bolts and nuts and one coat of red oxide zinc chromate primer and two coats of approved enamel paints complete including					

	labour and material all complete. (TATA/SAIL/JSW etc)					
	(a) MS black pipe (80 x 4.8) mm circular hollow section for fabricating of truss L=10 m		3	298.80		
	(b) Longitudnal MS black pipe(50x3.6) mm circular hollow section (L=6) @5.04kg/m		6	181.44		
	(c) Fabrication of roof truss as per requirement made of MS black pipe(50x3.6) mm circular hollow section (L=13) @5.04kg/m		2	131.04		
		kg		611.28	174.87	106896.29
8	Providing & fixing at all heights, levels and locations colour finish Aluminium alloy roofing sheets 0.56 mm, Aluminium Color coated troughed profile characteristics of good formability and corrosion resistance. The profile sheets shall be fixed to truss members in slope or required pitch or curvature with Hex cap headed self drilling/tapping Stainless steel screws M6, 50 mm long with 3 mm EPDM seal washer etc. all inclusive of labour, scaffolding, T&P and sundries etc. complete as per directions of the Engineer-In-Charge.	sqm	1	60.00	997.20	59832.20
8.1	Providing and fixing of Pre-coated colour or mill finish Aluminium Roofing Accessories in 0.71 mm thickness using self drilling/tapping SS screws of size 6 x 50mm with 3mm thick EPDM seal and SS plain washer complete Precoated/mill finish aluminium Ridges plain (500-600mm)	m	1	8.00	903.56	7228.47

9	Providing and fixing **false ceiling** at all heights with integral densified calcium silicate reinforced with fibre and natural filler false ceiling tiles of Size 595x595mm of approved texture, design and patterns as per CPWD Specification 2019, to be laid in true horizontal level suspended on inter-locking metal T-Grid of hot dipped galvanised iron section of 0.33mmthick (galvanized @ 120 grams per sqm including both sides)comprising of main-T runners of size 24x38 mm of length 3000 mm,cross - T of size 24x32 mm of length 1200 mm and secondary intermediate cross-T of size 24x32 mm of length 600mm to formgrid module of size 600 x 600 mm, suspended from ceiling usinggalvanised mild steel items (galvanizing @ 80 grams per sqm) i.e. 12x50 mm long dash fasteners, 6 mm dia fully threaded hanger rod upto 1000 mm length and L-shape level adjuster of size 76x25x25x1.6 mm fixed with grid and Z cleat of size 25x37x25x1.6mm thick with precut hole on both 25mm flange to pierce into 12x50mm or even bigger size dash fastener if require, fixed with Glavanised iron perimeter wall angle or size 24x24x0.40 mm of length 3000 mm to be fixed on periphey wall / partition with the help of plastic rawl plugs at 450mm center to center and 40 mm long dry wall S.S screws. The workshall be carried out as per specifications, drawing and as per directionsof the Engineer-inCharge	sqm	1	35.00	1950.08	68252.97

10	Providing and laying rigid EPS (cellular plastic material) blocks conforming to ASTM standards/specifications of minimum density 21.60 Kg/cum on **floors, steps, stage etc.** of required size and shape as per direction of the Engineer-in-Charge. This shall include the following operation. "The EPS blocks shall be cut to required shape and sizes including cuttings for passing of services, joined together with synthetic resin adhesives as per relevant specifications and packed/placed in position **for stepped floor or platform formation**. The top and sides surfaces to be provided with GI woven wire mesh of aperture 5.45 mm (with wire dia 0.90 mm) secured to EPS blocks with wire pins/clips. Horizontal top surface to be provided with 20 mm thick cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate upto 6mm chippings) and vertical surface to be provided with 12mm cement plaster 1:4 (1 cement : 4 coarse sand). The concrete/plastered surfaces so prepared shall be scratched with wire brushes to form burrs, so as to act as base for flooring or veneering/panelling to be done later as per approved design (which shall be paid for separately complete as per direction of the Engineer-in-Charge.	sqm	1	29.25	1943.47	56846.63
11	Providing and fixing 2nd class teak wood plain lining tongued and grooved, including wooden plugs complete with necessary screws and priming coat on unexposed surface. (25 mm thick)	sqm	1	35.00	3760.85	131629.66
12	Providing and fixing in position wall panelling at all heights with integral densified calcium silicate panels/tiles of size 595 x 595mm, having NRC (Noise Reduction coefficient) of 0.50 (minimum) as per IS 8225:1987, Light reflectance of 85% (minimum). Noncombustible as per BS:476 (part-4), fire performance as per BS:476 (part 6 &7), humidity resistance of 100%, thermal conductivity **(15 mm thick) For newly built portion**	sqm	1	72.00	2642.03	190226.44
13	Installation of Gravity tip-up chairs		108	108.00	16055.08	1733949.15
14	Lighting and other accessories	Lumpsu		1		508474.58

		m				
					Total without GST	3229333.98

Appendix-C

Name of work: Renovation of 4 No. hostel room at 1st floor of NINI Hostel

Sl. No	Particulars of item.	Unit	No.	Quantities	Rate per unit (without GST)	Amount (INR.) (Without GST)
1	Making the opening in brick masonry including dismantling in floor or walls by cutting masonry	sqm	2	5.28	1071.48	5657.43
1.1	Demolishing brick work manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable material	cum	1	4.80	1745.93	8380.47
2	Brick masonry work with 1st class bricks including racking out joint and dewatering if necessary and curing in cement mortar 1:6, all complete as per drawing and technical specifications.					
	wall	cum	1	19.20	7716.91	148164.61
3	12mm thick cement plastering in single coat in prop. 1:4 on brick wall/ concrete slab etc.. including arises, internal rounded angles and finish even and smooth including curing complete as directed.					
	wall	sqm	1	142.40	294.11	41881.29
4	Providing and laying Ceramic glazed floor tiles of size 300x300 mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS : 15622 of approved make in colours such as White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick cement mortar 1:4 (1 Cement : 4 Coarse sand), Jointing with grey cement slurry @ 3.3 kg/sqm including pointing the joints with white cement and matching pigment etc., complete.	sqm	1	23.22	929.28	21577.87
5	Washed stone grit plaster on exterior walls height upto 10 metre above ground level, in two layers, under layer 12 mm cement plaster 1:4 (1 cement : 4 coarse sand), furrowing the under layer with scratching tool, applying cement slurry on the under layer @ 2 Kg of cement per square metre, top layer 15 mm cement plaster 1:1/ 2:2 (1 cement: 1/2 coarse sand : 2 stone chipping 10 mm nominal size), in panels with groove all around as per approved pattern, including scrubbing and washing the top layer with brushes and water to expose the stone chippings ,complete as per specification and direction of Engineer-in-charge (payment for providing grooves	sqm	1	64.00	984.96	63037.29

	shall be made separately					
5.1	Forming groove of uniform size in the top layer of washed stone grit plaster as per approved pattern using wooden battens, nailed to the under layer, including removal of wooden battens, repair to the edges of panels and finishing the groove	Rmt.	1	420	64.24	26979.66
6	Providing and applying white cement based putty of average thickness 1 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete.	sqm	1	78.40	132.25	10368.07
7	Wall painting with premium acrylic emulsion paint of interior grade, having VOC (Volatile Organic Compound) content less than 50 grams/ litre of approved brand and manufacture, including applying additional coats wherever required to achieve even shade and colour. (Two coats)	sqm	1	78.40	121.02	9487.73
7.1	Applying priming coats with primer of approved brand and manufacture, having low VOC (Volatile Organic Compound) content.					
7.1.1	Applying ready mixed pink or grey primer on wood work (hard and soft wood) having VOC content less than 50 grams/ litre	sqm	6	12.60	59.62	751.19
7.1.2	With water thinnable cement primer on wall surface having VOC content less than 50 grams/litre	sqm		78.40	62.67	4913.29
7.2	Providing and applying two coats of fire retardant paint on cleaned wood / ply surface @ 3.5 sqm per litre per coat including preparation of base surface as per recommendations of manufacturer to make the surface fire retardant.	sqm	6	12.60	283.47	3571.78
8	Providing and fixing ISI marked flush door shutters conforming to IS : 2202 (Part I) non-decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters:					
	(a) 35 mm thick including ISI marked Stainless Steel butt hinges with necessary screws, (Door, 1200X1200)	Sqm	3	6.30	2027.67	12774.32
9	Two track two panels sliding window made of (small series) frame 52 x 44 mm &sash 32 x 60 mm both having wall thickness of 1.9 ± 0.2 mm and single glazing bead of appropriate dimension.	sqm	2	3.90	11187.46	43631.08
10	Providing and laying plain/ reinforced cement concrete in prop. 1:1.5:3 with coarse sand and 20mm down graded stone agg. including dewatering necessary, and curing complete excluding reinforcement and form work.					
	column	cum	6	2.16		
	beam	cum	2	2.88		
	slab	cum	1	2.90		

				7.94	9197.42	73050.47
11	Providing formwork of ordinary timber planking so as to give a rough finish including centering, shuttering and propping etc., removal of the same for in- situ reinforcement and plain/reinforced concrete work:					
	column	sqm	6	28.80	814.66	23462.24
	beam	sqm	2	38.40	624.07	23964.20
	slab	sqm		23.22	785.81	18246.39
12	Provision of furniture/AC's etc.		2	2.00	211864.41	423728.81
13	Reinforcement in Structure: Supplying, fitting and placing TMT bar reinforcement in sub-structure & super-structure including splicing complete as per drawing and technical specifications	Kg	1	424.01	91.40	38753.61
					Total for 2 Nos	1002381.82
					Total for 4 Nos	**20,04,763.64**
					Total without GST	**20,04,763.64**

Appendix-D

S.No.	Name of Work	Unit	Quantity (approx.)	Rate per unit (without GST)	Amount
1	Construction of Boundary wall at bridge side at NINI Gaighat, Patna	mtr.	200	9211.86	1842372.88
2	Construction of Entrance Gate at NINI, Gaighat Patna				805084.75
				Total without GST	**2647457.63**

Appendix-E

Name of work: Construction of VIP Accommodation at NINI Gaighat, Patna						
Sl. No	**Particulars of item.**	**Unit**	**No.**	**Quantities**	**Rate per unit (without GST)**	**Amount (INR.) (Without GST)**
	VIP Accommodation					

1	Composite partially load bearing and partially RCC framed structure (Upto six storeys), floor height 3.60 meter	sqm	1	400	22169	8867600.00
2	Internal water supply & sanitary installations.	LS	1	1	354908.86	354908.86
3	Internal electric installations	LS	1	1	1108474.58	1108474.58
4	Power wiring and plugs	LS	1	1	354711.86	354711.86
5	Telephone conduits	**LS**	**1**	**1**	22359.32	22359.32
6	Footpath with PCC base, 60mm thick paver blocks and kerb stone edging.	sqm	**1**	400.00	2508	1003200.00
					Total without GST	11711254.24

Appendix-F

		Repairing & Maintenance of Building /Infrastructure at NINI			
S.No.	**Name of Work**	**Qty**	**Unit**	**Rate per unit (without GST)**	**Amount without GST (INR. in Lakhs)**
1	Repairing and maintenance of internal pathway, sloping ramps, edges of pathways, boundary of flower queues at NINI Gaighat, Patna	1	L.S.	423728.81	423728.81
2	Repairing and maintenance/replacement of plumbing system, sanitaryware, internal drainage facilities and other fitting works at NINI Gaighat, Patna	1	L.S.	423728.81	423728.81
3	Repairing and maintenance/replacement of electric supply systems, cabling, internal wiring where ever required at NINI Gaighat, Patna	1	L.S.	338983.05	338983.05
4	Repairing and maintenance of Display Sign Board of NINI with Neon/LED Light at NINI Gaighat, Patna	1	L.S.	508474.58	508474.58
	Grand Total without GST				**1694915.25**

Annexure - 2

Format of certificate

Certified that the works up to----------level in respect of construction of ..... at ..... have been executed in accordance with the approved drawings and technical specifications.

Signature
Name & Designation
(Official address)

Place:
Date:

Office seal

Annexure-3

Terms of Reference & Technical Specifications

1. Background & Introduction

1.1 Jal Marg Vikas Project (JMVP) for capacity augmentation of navigation on national Waterway -1(NW-1) is being implemented at a cost of Rs. 5369.18 crore with the technical assistance and investment support of the World Bank. The major impact of this project are alternate mode of transport that will be environment friendly and cost effective which will contribute in bringing down the logistics cost of the country, socio economic impetus, huge employment generation and mammoth infrastructure development like multi-modal/inter-modal terminals/Ro-Ro facilities/ferry services/navigation aids etc. This project will lead to direct employment generation to approximately 46,000 and indirect employment to 84,000 which will be generated by the vessel construction industry. The states which covers this project are Uttar Pradesh, Jharkhand, Bihar and West Bengal.

1.2 Inland Waterways Authority of India (IWAI) (hereinafter referred to as "the **Employer**"/ "the Client") is a statutory body of the Ministry of Ports, Shipping & Waterways (MoPSW), Government of India (GoI). The Client was set up in 1986 and is primarily responsible for the regulation and development of inland waterways for purposes of shipping and navigation for Inland Water Transport (IWT). With five (5) National Waterways (NWs) up to 2016 and today, with the enactment of NWs Act, 2016, there are a total of one-hundred eleven (111) waterways that have been declared as NWs.

2. JMVP-II (Arth Ganga) and its alignment with JMVP's objective

2.1 India, with a huge network of rivers and interconnecting canals is ideal for an efficient inland waterways system which has multifarious advantages and is the cheapest mode of transportation. However, this potential could not be tapped to its full extent as development of inland waterways as a means for passenger & cargo transportation, had not been a focus area till recently.

2.2 In India, almost half the population lives around the Ganges river belt. In terms of trade, $1/5^{th}$ of all India's freight originates, and $1/3^{rd}$ terminates in the states around the Ganges belt. Due to the congestion faced by the cities and space constraints, there is hardly any scope for land-based development in the region. Hence, river Ganga can play a pivotal role in generating growth prospects for sustainable economic development of the regions.

2.3 The project was conceptualized with the objective of energizing economic activities in the overall ecosystem along the river Ganga that can lead to inclusive growth and play a key role in improving the livelihoods of the population.

2.4 JMVP-II (Arth Ganga) is being developed on an approach based on principles of sustainable development model that focus on economic activities in & around the hinterland of river Ganga by providing infrastructure to local communities to transport their goods / produce and passenger & tourist movements through waterways and opportunity for skill development and public / private sector capability developments to support the following.

(a) Economic benefits to the farmers, traders and public living around the Ganga belt;

(b) Growth of small-scale industries;

(c) Employment opportunities;

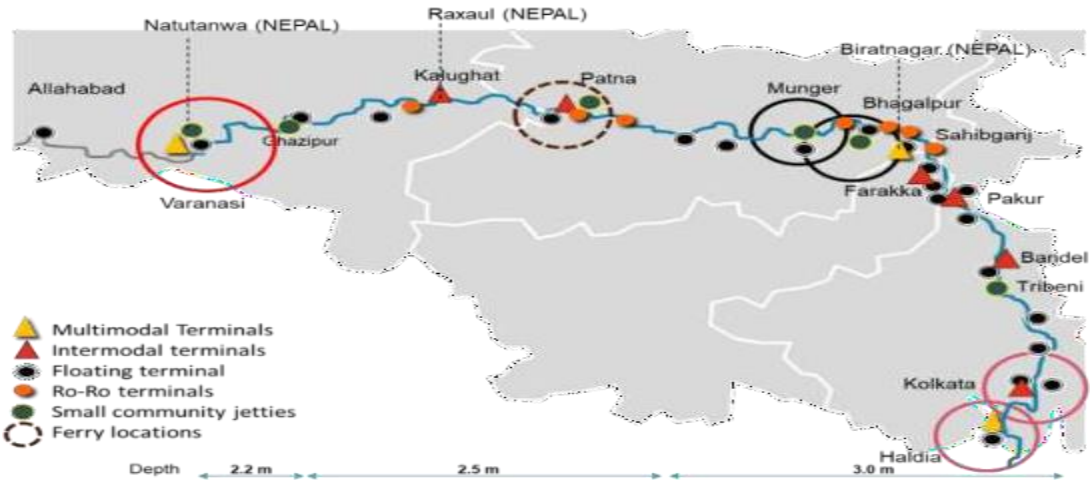
(d) Easy, cost-effective and environment friendly transportation of cargo; Improved logistics through small jetties; and

(e) Wider choice of logistics mode for cargo movement

Efficient logistics and transport systems are a critical enabler for sustaining as well as accelerating the economic growth along river Ganga. In this regard, JMVP has the potential to greatly channelize economic activities along river Ganga, thus also aligning to the objective of JMVP-II (Arth Ganga~~).~~

2.5 The development works under JMVP-II (Arth Ganga) will be implemented as part of JMVP through the technical assistance & investment support of the Bank. The following major components have been envisaged under JMVP-II (Arth Ganga):

(i) Fairway development through dredging including bandalling and navigational aids;
(ii) River Training works;
(iii) Construction of Ro-Ro terminals;
(iv) Construction of new community jetties;
(v) Modernization / Rehabilitation of existing jetties;
(vi) Modernization / Rehabilitation of existing Navigational Lock at Farakka;
(vii) River Information System and DGPS;
(viii) Hydrographic equipment, HDP Software, Automatic Gauge Stations etc.; and
(ix) IWT Promotional activities



3. Objective of the Services

3.1 NINI-CoE (IWT) is propose to be a dedicated capacity building institute to promote, develop and efficiently use inland waterways for sustainable transportation. The center will create a platform for benchmarking, collaboration and knowledge-sharing among various stakeholders, including governments, industry players, and academia, to develop manpower to ensure the safe and efficient use of inland waterways in the region.

3.2 NINI-CoE (IWT) plans to undertake a range of activities, including research and

development, training and education, advocacy, and networking. The objectives include:

i. To develop pool of informed professional experts, regulators and administrators to develop strategy and policy for development, maintenance and management of waterways, terminals and inland vessels for sustainable IWT to global standards and practices.

ii. To develop technically competent staff having specific expertise in development, maintenance and management of fairway and IWT infrastructure

iii. To develop well trained and competent manpower for safe operation and efficient management of inland vessels and terminals.

iv. To have well informed facilitators for development of ecosystem for safe, efficient movement of cargo and passengers on the IWT network

v. To conduct research in IWT sector and create new pathways for further research in matters relating to IWT including development of craft design, technique of towage, terminal facilities, port installations, alternate fuels, dredging, green logistics, and survey techniques

vi. To develop consultancy services and provide such services in India and abroad in relation to planning and development of waterways for shipping and navigation or any facility on IWT.

3.3 Based on a number of studies on training in IWT sector and training requirements as per Inland Vessel manning rules the training is planned in the following areas:

i. Hydrographic Survey

ii. River training works and dredging

iii. Vessel Operations and management

iv. Terminal operations and management

v. River pilotage and river information system

vi. Vessel design and green energy solutions

vii. Environment protection

4. Scope of Work

4.1 The Employer's Requirements are that the Contractor shall carryout the Design Engineering, Construction / Installation of all the items listed in this tender document as per the scope, specifications anddrawings outlined in this tender document on item/ percentage rate basis. For this purpose, the Tenderer shall conduct all necessary field tests and surveys to satisfy / verify himself regarding the correctness of the data furnished vis-à-vis actual condition. The tenderer may also carry outsuch surveys and investigations even before the submission of tender. No claim whatsoever will be entertained for any variation between the actual site condition met with during the execution of the work and those indicated herein.

4.2 The overall responsibility of the Contractor will encompass all the jobs required for carrying out this project from concept to commissioning, adhering to the time schedule, quality

parameters and with no time and cost overrun. The Contractor will have to work in close co-ordination with Engineer-in-Charge (EIC) and its deputed team and all major decisions shall be taken in consultation with them. Further, the Contractor shall be responsible for completion of works as stipulated within time & cost parameters. The area mentioned in the BoQ is indicative which may vary as per actual site condition. The contractor shall design all components mentioned in the Scope of Work in consideration of actual area available at site & take the approval from Engineer-in-Charge (EIC). The detailed designs & drawings are to be submitted by the Contractor within 21 days from date of signing of contract.

4.3 The broad scope of work of the Contractor is as below, but not limited to this. In case any associated work is required for successful execution of the project then the same shall also be organized by him. The scope work are the following brief scope of work:

a) Workshop for IC Engines, fitting, machining, welding, cutting, plumbing, machining, hydraulic and pneumatic.
b) Laboratory for Navigation, Aids to Navigation, Survey and hydrography and Meteorology, Soil Testing and River Engineering.
c) Auditorium extension and upgrade.
d) Existing building moisture/damp proofing.
e) Sound proofing of partitioning in classrooms and simulation centre.
f) Flooring of the main and hostel building

5. General Information

5.1 Background

This call for percentage rate bid being addressed to potential Contractors for the Construction/ Renovation/Modification of Building /Infrastructure works at National Inland Navigation Institute (NINI) at Patna. JMVP-II.

6. Employer's Requirements

6.1 Generals

The Employer's Requirements are that the Contractor shall carryout the Design Engineering, Construction / Installation of all the items listed below, along with associated works as outlined in this tender document. For this purpose, the Tenderer shall conduct all necessary field tests and surveys to satisfy / verify himself regarding the correctness of the data furnished vis-à-vis actual condition. No claim whatsoever will be entertained for any variation between the actual site condition met with during the execution of the work and those indicated herein as per drawing and specifications. Considering the item rate contract any kind of price increase are not allowed. However, in case of any change in scope or increase of areas, the same may be considered subject to approval by IWAI with proper justification. The contractor needs to understand the actual site conditions by visiting sites before bidding & quote their rates including all factors of risks, increase in quantities (if any) etc.

The broad items of works covered are listed below:

- **Civil Works**

- **Maintenance Works**
- **Electrical Works**
- **Plumbing Works**
- **Dismantling works**
- **Any other works as directed by the Employer.**

6.2 Site/ Location Details

National Inland Navigation Institute (NINI), Patna, IWAI.

6.3 Technical Specifications:

Technical specifications shall be followed as per CPWD standard manual.

Note: Relevant drawings are attached.

Environmental, Social, Health and Safety (ESHS)

Metrics for Progress Reports

Metrics for regular reporting:

a. environmental incidents or non-compliances with contract requirements, including contamination, pollution or damage to ground or water supplies;

b. health and safety incidents, accidents, injuries and all fatalities that require treatment;

c. interactions with regulators: identify agency, dates, subjects, outcomes (report the negative if none);

d. status of all permits and agreements:

   i. work permits: number required, number received, actions taken for those not received;

   ii. status of permits and consents:

   - List areas/facilities with permits required (, asphalt & batch plants), dates of application, dates issued (actions to follow up if not issued), dates submitted to resident Engineer (or equivalent), status of area (waiting for permits, working, abandoned without reclamation, decommissioning plan being implemented, etc.);
   - list areas with landowner agreements required (borrow and spoil areas, camp sites), dates of agreements, dates submitted to resident Engineer (or equivalent);
   - identify major activities undertaken in each area in the reporting period and highlights of environmental and social protection (land clearing, boundary marking, topsoil salvage, traffic management, decommissioning planning, decommissioning implementation);
   - For quarries: status of relocation and compensation (completed, or details of activities and current status in the reporting period).

e. health and safety supervision*:*

   i. safety officer: number days worked, number of full inspections & partial inspections, reports to construction/project management;

   ii. number of workers, work hours, metric of PPE use (percentage of workers with full personal protection equipment (PPE), partial, etc.), worker violations observed (by type of violation, PPE or otherwise), warnings given, repeat warnings given, follow-up actions taken (if any);

f. worker accommodations:

   i. number of expats housed in accommodations, number of locals;

   ii. date of last inspection, and highlights of inspection including status of accommodations' compliance with national and local law and good practice, including sanitation, space, etc.;

   iii. actions taken to recommend/require improved conditions, or to improve conditions.

g. HIV/AIDS: provider of health services, information and/or training, location of clinic, number of non-safety disease or illness treatments and diagnoses (no names to be provided);

h. gender (for expats and locals separately): number of female workers, percentage of workforce, gender issues raised and dealt with (cross-reference grievances or other sections as needed);

i. training:

i. number of new workers, number receiving induction training, dates of induction training;

ii. number and dates of toolbox talks, number of workers receiving Occupational Healthand Safety (OHS), environmental and social training;

iii. number and dates of HIV/AIDS sensitization and/or training, no. workers receiving training (this reporting period and in the past); same questions for gender sensitization, flag person training.

iv. number and date of GBV /SEA sensitization and/or training, number of workers receiving training on code of conduct (in the reporting period and in the past), etc.

j. environmental and social supervision*:*

i. environmentalist: days worked, areas inspected and numbers of inspections of each (road section, work camp, accommodations, quarries, borrow areas, spoil areas, swamps, forest crossings, etc.), highlights of activities/findings (including violations of environmental and/or social best practices, actions taken), reports to environmental and/or social specialist/construction/site management;

ii. sociologist: days worked, number of partial and full site inspections (by area: road section, work camp, accommodations, quarries, borrow areas, spoil areas, clinic, HIV/AIDS center, community centers, etc.), highlights of activities (including violations of environmental and/or social requirements observed, actions taken), reports to environmental and/or social specialist/construction/site management; and

iii. Community liaison person(s): days worked (hours community center open), number of people met, highlights of activities (issues raised, etc.), reports to environmental and/or social specialist /construction/site management.

k. *Grievances*: list new grievances (e.g. allegations of GBV / SEA) received in the reporting period and unresolved past grievances by date received, complainant, how received, to whom referred to for action, resolution and date (if completed), data resolution reported to complainant, any required follow-up (Cross-reference other sections as needed):

i. Worker grievances;

ii. Community grievances

l. Traffic and vehicles/equipment:

i. traffic accidents involving project vehicles & equipment: provide date, location, damage, cause, follow-up;

ii. accidents involving non-project vehicles or property (also reported under immediate metrics): provide date, location, damage, cause, follow-up;

iii. overall condition of vehicles/equipment (subjective judgment by environmentalist); non-routine repairs and maintenance needed to improve safety and/or environmental performance (to control smoke, etc.).

m. Environmental mitigations and issues (what has been done):

i. dust: number of working bowsers, number of waterings/day, number of complaints, warnings given by environmentalist, actions taken to resolve; highlights of quarry dust control (covers, sprays, operational status); % of rock/spoil lorries with covers, actions taken for uncovered vehicles;

ii. erosion control: controls implemented by location, status of water crossings, environmentalist inspections and results, actions taken to resolve issues, emergency repairs needed to control erosion/sedimentation;

iii. quarries, borrow areas, spoil areas, asphalt plants, batch plants: identify major activities undertaken in the reporting period at each, and highlights of environmental and social protection: land clearing, boundary marking, topsoil salvage, traffic management, decommissioning planning, decommissioning implementation;

iv. blasting: number of blasts (and locations), status of implementation of blasting plan (including notices, evacuations, etc.), incidents of off-site damage or complaints (cross-reference other sections as needed);

v. spill clean-ups, if any: material spilled, location, amount, actions taken, material disposal (report all spills that result in water or soil contamination;

vi. waste management: types and quantities generated and managed, including amount taken offsite (and by whom) or reused/recycled/disposed on-site;

vii. details of tree plantings and other mitigations required undertaken in the reporting period;

viii. details of water and swamp protection mitigations required undertaken in the reporting period.

n. compliance:

i. compliance status for conditions of all relevant consents/permits, for the Work, including quarries, etc.): statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance;

ii. compliance status of ESMP/C-ESMP/ESIP requirements: statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance

iii. compliance status of GBV/SEA prevention and response action plan: statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance

iv. compliance status of Health and Safety Management Plan re: statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance

v. Other unresolved issues from previous reporting periods related to environmental and social: continued violations, continued failure of equipment, continued lack of vehicle covers, spills not dealt with, continued compensation or blasting issues, etc. Cross-reference other sections as needed.

Special Conditions of Contract	
SCC 01	The documents forming the Contract shall be interpreted in the following order of priority: (a) Agreement, (b) Letter of Acceptance, (c) Particular Conditions of Contract, (d)General Conditions of Contract, including Appendices, (e) Specifications, (f) Drawings, (g) Environmental, Social, Health and Safety – ESHS (i) Management Strategies and Implementation Plans and (ii) Code of Conduct. (h) Contractor's Bid & Priced Bill of Quantities, (i) Joint Venture Agreements (where applicable).
SCC 02	**Key Personnel & Equipment** The Contractor shall employ the key personnel and deploy required equipment, to carry out the Works or other personnel and equipment approved by the EIC. The EIC shall approve any proposed replacement of key personnel and equipment only if their relevant qualifications or characteristics are substantially equal to or better than those proposed in the Bid. The name/s of agreed each Key Personnel agreed by the Employer prior to Contract signature, Schedule of Key Personnel and equipment as proposed by the contractor during bidding stage & construction methodology shall be included.
SCC 03	**Code of Conduct (ESHS)** "The reasons to remove a person include behavior which breaches the Code of Conduct (ESHS) (e.g. spreading communicable diseases, sexual harassment, gender-based violence, illicit activity or crime)."
SCC 04	a) The Performance Security and an Environmental, Social, Safety and Health (ESHS) Security shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount specified in the SCC (for Article 7.1.1), and shall be issued by a Nationalized or Scheduled bank in India. The Performance Security and, if applicable, the ESHS Security, shall be valid until a date 28 days from the date of issue of the Certificate of Completion.

	b) The Performance security & ESHS security shall be submitted in two separate Bank Guarantees in the Standard Form of Bank Guarantee of the Employer as detailed here under. (i) The Performance Security amount is 5.0 percent of the Contract Amount. (ii) Environmental, Social, Health and Safety (ESHS) Security amount is 1.5 Percent of Contract Amount. The standard forms of Performance Security and ESHS Security acceptable to the Employer shall be unconditional Bank Guarantees from Scheduled or Nationalized banks in India of the types as presented in Section X of the Bidding Document.
SCC 05	"In addition to the progress report, the Contractor shall also provide a report on the Environmental, Social, Health and Safety (ESHS) metrics set out in Part 3. In addition to Part 3 reports, the Contractor shall also provide immediate notification to the EIC of incidents in the following categories. Full details of such incidents shall be provided to the E I C within t h e timeframe agreed with the EIC. (a) confirmed or likely violation of any law or international agreement; (b) any fatality or serious (lost time) injury; (c) significant adverse effects or damage to private property (e.g. vehicle accident, damage from fly rock, working beyond the boundary) (d) major pollution of drinking areas aquifer or damage or destruction of areas, endangered areas, (including protected areas) or species; or any allegation of sexual harassment or sexual misbehavior, child abuse, defilement, or other violations involving children
SCC 06	**Strategies and Implementation Plans** (i)The ESMP plan is attached as Annexure-A. The Contractor shall not commence any Works, including mobilization and/or pre-construction activities (e.g. limited clearance for haul roads, site accesses and work site establishment, geotechnical investigations or investigations to select ancillary features such as quarries and borrow pits), unless the EIC is satisfied that appropriate measures are in place to address environmental, social, health and safety risks and impacts. At a minimum, the Contractor shall apply the Management Strategies and Implementation Plans and Code of Conduct, submitted as part of the Bid and agreed as part of the Contract. The Contractor shall submit, on a continuing basis, for the EIC's prior approval, such supplementary Management Strategies and Implementation Plans as are necessary to manage the ESHS risks and impacts of ongoing

	works. These Management Strategies and Implementation Plans collectively comprise the Contractor's Environmental and Social Management Plan (C-ESMP) updated based on the ESMP plan attached as Annexure-A. The C-ESMP shall be approved prior to the commencement of construction activities (e.g. Excavation, earth works, quarrying or extraction of materials, concrete batching etc.). The approved C-ESMP/ ESMP shall be reviewed, periodically (but not less than every three (3) months), and updated in a timely manner, as required, by the Contractor to ensure that it contains measures appropriate to the Works activities to be undertaken. The updated C-ESMP shall be subject to prior approval by the EIC." (ii)The Contractor shall be instructed through written site order for commencement of indivisible / item works or part of works. Such work or works shall be completed within 60 days from the date of placement of the written order.
SCC 07	Additional Clause Progress Monitoring and supervision shall be undertaken by the EIC or his nominated representative/authorised representative or any third-party agency appointed by the Employer. The supervision and monitoring shall not relieve the contractor to perform his responsibilities under the Contract. The contractor shall submit regular progress reports at the intervals decided by the EIC or his nominated representative/authorised representative or any third-party agency appointed by the Employer. The progress of the work at each stage (as per the Bill of Quantities) shall be subject to the approval of the EIC whose decision as to the rate of progress at each stage shall be final and binding on the Contractor. The EIC reserves himself to the right to cancel the contract for unsatisfactory progress in the work at any stage
SCC 08	(c) The Contractor shall maintain one Inspection Register in duplicate for recording details of materials and to be produced by the Contractor or his agent whenever called upon to do so by the EIC or his representative during their inspection of the work. One copy of the register shall be retained in the office of EIC. (d) The Contractor shall intimate in writing the placement of materials / Arrangement after completion within 2 days to enable EIC for arranging for the inspection of the same. The EIC or his representative shall inspect immediately and file a certificate accordingly.
SCC 09	(d) The Contractor shall bear full responsibility for the intimation to the EIC forthwith of any accident and take all necessary action required under relevant Acts and Rules, Marine Rules etc. as the case may be. The Contractor shall also report such accidents to the Competent Authority wherever such reports are required under rules.

	The EIC or his representative must however, be informed immediately in the event of any marine accident. The Contractor should also bear full responsibility for all accident, damages or injury caused to any of the IWAI's employee, cause of which is established as due to Contractor's carelessness or negligence.
SCC 10	"The Contractor shall also provide information of any ESHS risks and impacts of the Variation."
SCC 11	The Contractor shall also have to ensure that with the rise and fall of water level and with the changes of site condition i.e. erosion, de-siltation of the area, change the location / shift of the site and the Contractor shall have to change the location accordingly as per the directions of the EIC. The Contractor shall make his own arrangements for protecting the works / materials during the course of execution of the work. During the process of work, the Contractor shall provide such precautionary and protective works at his own cost to protect arrangements from the weather conditions and the Contractor shall be solely responsible for any damage, which may occur due to the Contractor not taking necessary protective steps. The Contractor shall forthwith dispatch, raise and remove any plant (floating or otherwise) belonging to him or any person employed by him which may be sunk in the course of execution and completion of the works or otherwise deal with the same as the EIC or his representative may direct, until the same shall be raised and removed, the Contractor shall display at night, search lights and do all such arrangements for the safe navigation nearby terminal area as may be required by the department. In the event of the Contractor not carrying out the obligations imposed by him under this clause, the EIC shall raise and remove the same (without prejudice to the right of the department to hold the contractor liable) and the Contractor shall pay to the department all costs incurred in connection herewith.
SCC 12	The Service Provider / Contractor shall submit an undertaking that they shall pass on the input tax credit in GST, if availed by them, during the course of the contract or afterwards and shall compensate the Employer for any losses suffered on this account by the Employer.
SCC 13	(i)The Contractor shall submit Interim Milestone Stage Payment Bills on the actual work executed by the Contractor. The Contractor shall be paid as per the Milestone Stage Payment Bills submitted after verification & certification by the EIC.
SCC 14	If the Contractor was, or is, failing to perform any ESHS obligations or work under the Contract, the value of this work or obligation, as

	determined by the EIC, may be withheld until the work or obligation has been performed, and/or the cost of rectification or replacement, as determined by the EIC, may be withheld until rectification or replacement has been completed. Failure to perform includes, but is not limited to the following: (i) failure to comply with any ESHS obligations or work described in the Works' Requirements which may include: working outside site boundaries, excessive dust, failure to keep public roads in a safe usable condition, damage to offsite vegetation, pollution of water courses from oils or sedimentation, contamination of land e.g. from oils, human waste, damage to archeology or cultural heritage features, air pollution as a result of unauthorized and/or inefficient combustion; (ii) failure to regularly review ESMP/C-ESMP and/or update it in a timely manner to address emerging ESHS issues, or anticipated risks or impacts; (iii) failure to implement the ESMP/ C-ESMP; (iv) failing to have appropriate consents/permits prior to undertaking Works or related activities; (v) failure to submit ESHS report/s (as described in Part 3), or failure to submit such reports in a timely manner; (vi) failure to implement remediation as instructed by the Engineer-in-Charge within the specified timeframe (e.g. remediation addressing non-compliance/s).
SCC 15	Quality Control The contractor shall prepare and submit for the EIC's approval, not later than fifteen (15) days prior to the commencement of works, his detailed proposals for a quality control system for execution of works. The EIC's written approval of the system shall be obtained prior to commencement of work and the system shall not be altered by the contractor without the written permission of the EIC. The quality control system shall clearly indicate, inter-alia: (a) Contractor's personnel responsible for quality control. (b) Method of monitoring and determining the type of material being used; (c) Method of determining whether the material is suitable for works; and (d) System for obtaining approval from the EIC or his representative for all the works being carried out.

SCC 16 New Clause (Force Majeure)	**1.** "Force Majeure" shall mean any event beyond the reasonable control of the Employer or of the Contractor, as the case may be, in so far as they directly affect the execution of the Services and Works included in this Contract and which is unavoidable notwithstanding the reasonable care of the party affected, and shall include, without limitation, the following: (a) war, hostilities or warlike operations (whether a state of war be declared or not), invasion, act of foreign enemy and civil war; (b) rebellion, revolution, insurrection, mutiny, usurpation of civil or military government, conspiracy, riot, civil commotion and terrorist acts; (c) confiscation, nationalization, mobilization, commandeering, requisition by or under the order of any government or de jure or de facto authority or ruler or any other act or failure to act of any local state or national government authority; (d) strike, sabotage, lockout, embargo, import restriction, port congestion, lack of usual means of public transportation and communication, industrial dispute, shipwreck, shortage or restriction of power supply, epidemics, quarantine and plague; (e) earthquake, landslide, volcanic activity, fire, flood or inundation, tidal wave, typhoon or cyclone, hurricane, storm, lightning, or other inclement weather condition, nuclear and pressure waves or other natural or physical disaster; (f) shortage of labor, materials or utilities where caused by circumstances that are themselves Force Majeure. **2**. If either party is prevented, hindered or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within fourteen (14) days after the occurrence of such event. **3**. The party who has given such notice shall be excused from the performance or punctual performance of its obligations under the Contract for so long as the relevant event of Force Majeure continues and to the extent that such party's performance is prevented, hindered or delayed. The Time for Completion shall be extended in accordance with GC Clause 12. **4.** The party or parties affected by the event of Force Majeure shall use reasonable efforts to mitigate the effect thereof upon its or their performance of the Contract and to fulfill its or their obligations under the Contract, but without prejudice to either party's right to terminate the Contract under GC Clause 12. 5. No delay or nonperformance by either party hereto caused by the occurrence of any event of Force Majeure shall (a) constitute a default or breach of the Contract; give rise to any claim for damages or additional cost or expense occasioned thereby; if and to the extent that such delay or nonperformance is caused by the occurrence of an event of Force Majeure. **6.** If the performance of the Contract is substantially prevented, hindered or delayed for a single period of more than sixty (60) days or an aggregate period of more than one hundred and twenty (120) days

	on account of one or more events of Force Majeure during the currency of the Contract, the parties will attempt to develop a mutually satisfactory solution, failing which either party may terminate the Contract by giving a notice to the other, but without prejudice to either party's right to terminate the Contract under GC Clause 12. **7.** Notwithstanding GC Clause 12, Force Majeure shall not apply to any obligation of the Employer to make payments to the Contractor herein.
SCC 17 **- New Clause (Variation/ Extra Items)**	**Variations and Extra Items** The works shall be executed by the second party (Contractor) in accordance with the approved drawings and specifications. No variation in cost is acceptable. However, if the Engineer-in-Charge issues instructions for execution of extra items, the following procedure shall be followed: a. The second party (Contractor) shall provide the Engineer-in-Charge with a bid/estimate for carrying out the extra items when requested to do so by the Engineer-in-Charge. The Engineer- in-Charge shall assess the bid, which shall be given within seven days of the requestbefore the extra items are ordered. b. If the bid given by the second party is unreasonable, the Engineer-in-Charge may order the extra items and make a change to the Contract Price which shall be basedon Engineer-in-Charge 's own forecast of the effects of the extra items on the Contractor's costs. c. The second party shall not be entitled to additional payment for costs.

Appendix to Technical Part

Form of Bid Security - Bank Guarantee

[Guarantor letterhead or SWIFT identifier code]

Bid Guarantee No…..... *[insert guarantee reference number]*
Date… .....*[insert date of issue of the guarantee]*

WHEREAS,_____*[name of Bidder]*[3] (hereinafter called "the Bidder") has submitted his Bid dated_____*[date]* or will submit his Bid for the construction of_____*[name of Contract]* (hereinafter called "the Bid") under Request for Bids No……*[insert number]* (hereinafter called "the RFB")

KNOW ALL PEOPLE by these presents that We_____*[name of bank]* of_____*[name of country]* having our registered office at _____ (hereinafter called "the Bank") are bound unto _____*[name of Employer]* (hereinafter called "the Employer") in the sum of_____[4] for which payment well and truly to be made to the said Employer the Bank binds itself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this_____day of_____20___.

THE CONDITIONS of this obligation are:

(1) If after Bid opening the Bidder (a) withdraws his bid during the period of Bid validity specified in the Letters of Bid, or any extension thereto provided by the Bidder; or (b) does not accept the correction of the Bid Price pursuant to ITB 11.1;

or

(2) If the Bidder having been notified of the acceptance of his Bid by the Employer during the period of Bid validity:
   (a) fails or refuses to execute the Form of Agreement in accordance with the Instructions to Bidders, if required; or
   (b) fails or refuses to furnish the Performance Security, in accordance with the Instruction to Bidders.

we undertake to pay to the Employer up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by him is due to him owing to the occurrence of one or any of the four conditions, specifying the occurred condition or conditions.

[3] *Insert name of the Bidder, which in the case of a joint venture shall be (a) the name of the joint venture that submits the bid if the JV has been constituted into a legally enforceable JV, or (b) the names of all future members of the JV as named in the letter of intent to execute the JV Agreement submitted by the bidder alongwith its bid.*
[4] *The Guarantor should insert the amount of the guarantee in words and figures denominated in Indian Rupees. This figure should be the same as shown in Clause 5.5 of the Instructions to Bidders.*

This Guarantee will remain in force up to and including the date_____[5] days after the deadline for submission of Bids as such deadline is stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this guarantee should reach the Bank not later than the above date.

DATE_____ SIGNATURE OF THE BANK _____

WITNESS_____ SEAL _____

_____
[signature, name, and address]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

[5] *45 days after the end of the validity period of the Bid.*

PERFORMANCE SECURITY - BANK GUARANTEE

[Guarantor letterhead or SWIFT identifier code]

Performance Guarantee No… .....*[insert guarantee reference number]*
Date… .....*[insert date of issue of the guarantee]*

To: _____*[name of Employer]*
_____*[address of Employer]*

WHEREAS_____*[name and address of Contractor]* (hereinafter called "the Contractor") has undertaken, in pursuance of Contract No._____dated_____to execute _____*[name of Contract and brief description of Works]* (hereinafter called "the Contract");

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of _____ [6] *[amount of guarantee]* _____ *[in words]*, such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of _____ *[amount of guarantee]*[1] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed thereunder or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until ……. (i.e.) 28 days after the date of issue of the Certificate of Completion, and any demand for payment under it must be received by us at this office on or before that date.

Signature and seal of the guarantor _____
Name of Bank _____
Address _____
Date _____

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product

[6] An amount shall be inserted by the Guarantor, representing the percentage of the Contract Price specified in the Contract and denominated in Indian Rupees.

BANK GUARANTEE FOR ADVANCE PAYMENT
[Guarantor letterhead or SWIFT identifier code]

Advance Payment Guarantee No….....*[insert guarantee reference number]*
Date… .....*[insert date of issue of the guarantee]*

To: _____*[name of Employer]*
_____*[address of Employer]*
_____*[name of Contract]*

Gentlemen:

In accordance with the provisions of the Conditions of Contract, subclause 3.1 of the above-mentioned Contract,_____*[name and address of Contractor]* (hereinafter called "the Contractor") shall deposit with_____*[name of Employer]* a bank guarantee to guarantee his proper and faithful performance under the said Clause of the Contract in an amount of _____ *[amount of guarantee]* [7] _____*[in words]*.

We, the_____*[bank or financial institution]*, as instructed by the Contractor, agree unconditionally and irrevocably to guarantee as primary obligator and not as Surety merely, the payment to_____*[name of Employer]* on his first demand without whatsoever right of objection on our part and without his first claim to the Contractor, in the amount not exceeding _____ [*amount of guarantee*][1] _____*[in words]*.

We further agree that no change or addition to or other modification of the terms of the Contract or of Works to be performed thereunder or of any of the Contract documents which may be made between_____*[name of Employer]* and the Contractor, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall remain valid and in full effect from the date of the advance payment under the Contract until_____*[name of Employer]* receives full repayment of the same amount from the Contractor. Consequently any demand for payment under this guarantee must be received by us at this office on or before that date.

Yours truly,
Signature and seal: _____
Name of Bank: _____
Address:_____
Date: _____

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

[7] An amount shall be inserted by the bank representing the amount of the Advance Payment, and denominated in Indian Rupees.

Retention Money Security

Demand Guarantee

[Guarantor letterhead or SWIFT identifier code]

_____*[Bank's name and address of issuing branch or office]*

Beneficiary: _____*[Name and Address of Employer]*

Date: _____

RETENTION MONEY GUARANTEE NO.: _____

We have been informed that _____*[name of contractor]* (hereinafter called "the Contractor") has entered into Contract No. _____*[reference number of the contract]* dated _____ with you, for the execution of _____ *[name of contract and brief description of Works]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, when the Taking-Over Certificate has been issued for the Works and the first half of the Retention Money has been certified for payment, payment of _____*[insert* the second half of the Retention Money*]* is to be made against a Retention Money guarantee.

At the request of the contractor, we _____*[name of Bank]* hereby irrevocably undertake to pay you the sum or sums not exceeding in total an amount of _____*[amount in Rupees]* (_____) *[amount in words*[8]*]* upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract without cavil or argument.

It is a condition for any claim and payment under this guarantee to be made that the payment of the second half of the Retention Money referred to above must have been received by the Contractor on its account number _____ at _____*[name and address of Bank]*.

This guarantee shall expire, at the latest, 21 days after the date when the Employer has received a copy of the Defects Liability Certificate issued by the Engineer-in-Charge . Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

_____

[Signature(s) and seal of the guarantor]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

[8] *The Guarantor shall insert an amount representing the amount of the second half of the Retention Money.*

Section C. World Bank Policy - Corrupt and Fraudulent Practices

(Text in this Appendix shall not be modified)

Guidelines for Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers, dated January 2011 Revised July 2014:

"**Fraud and Corruption:**

1.16 It is the Bank's policy to require that Borrowers (including beneficiaries of Bank loans), bidders, suppliers, contractors and their agents (whether declared or not), sub-contractors, sub-consultants, service providers or suppliers, and any personnel thereof, observe the highest standard of ethics during the procurement and execution of Bank-financed contracts. [9] In pursuance of this policy, the Bank:

(a) defines, for the purposes of this provision, the terms set forth below as follows:

(i) "corrupt practice" is the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;[10];

(ii) "fraudulent practice" is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;[11]

(iii) "collusive practice" is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;[12]

(iv) "coercive practice" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;[13]

(v) "obstructive practice" is

[9] In this context, any action to influence the procurement process or contract execution for undue advantage is improper.

[10] For the purpose of this sub-paragraph, "*another party*" refers to a public official acting in relation to the procurement process or contract execution. In this context, "*public official*" includes World Bank staff and employees of other organizations taking or reviewing procurement decisions.

[11] For the purpose of this sub-paragraph, "party" refers to a public official; the terms "benefit" and "obligation" relate to the procurement process or contract execution; and the "act or omission" is intended to influence the procurement process or contract execution.

[12] For the purpose of this sub-paragraph, "parties" refers to participants in the procurement process (including public officials) attempting either themselves, or through another person or entity not participating in the procurement or selection process, to simulate competition or to establish bid prices at artificial, non-competitive levels, or are privy to each other's bid prices or other conditions.

[13] For the purpose of this sub-paragraph, "party" refers to a participant in the procurement process or contract execution.

(aa) deliberately destroying, falsifying, altering, or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or

(bb) acts intended to materially impede the exercise of the Bank's inspection and audit rights provided for under paragraph 1.16(e) below.

(b) will reject a proposal for award if it determines that the bidder recommended for award, or any of its personnel, or its agents, or its sub-consultants, sub-contractors, service providers, suppliers and/or their employees, has, directly or indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question;

(c) will declare misprocurement and cancel the portion of the loan allocated to a contract if it determines at any time that representatives of the Borrower or of a recipient of any part of the proceeds of the loan engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices during the procurement or the implementation of the contract in question, without the Borrower having taken timely and appropriate action satisfactory to the Bank to address such practices when they occur, including by failing to inform the Bank in a timely manner at the time they knew of the practices;

(d) will sanction a firm or individual, at any time, in accordance with the prevailing Bank's sanctions procedures, [14] including by publicly declaring such firm or individual ineligible, either indefinitely or for a stated period of time: (i) to be awarded a Bank-financed contract; and (ii) to be a nominated[15];

(e) will require that a clause be included in bidding documents and in contracts financed by a Bank loan, requiring bidders, suppliers and contractors, and their sub-contractors, agents, personnel, consultants, service providers, or suppliers, to permit the Bank to inspect all accounts, records, and other documents relating to the submission of bids and contract performance, and to have them audited by auditors appointed by the Bank."

[14] A firm or individual may be declared ineligible to be awarded a Bank financed contract upon: (i) completion of the Bank's sanctions proceedings as per its sanctions procedures, including, inter alia, cross-debarment as agreed with other International Financial Institutions, including Multilateral Development Banks, and through the application the World Bank Group corporate administrative procurement sanctions procedures for fraud and corruption; and (ii) as a result of temporary suspension or early temporary suspension in connection with an ongoing sanctions proceeding. See footnote 14 and paragraph 8 of Appendix 1 of these Guidelines.

[15] A nominated sub-contractor, consultant, manufacturer or supplier, or service provider (different names are used depending on the particular bidding document) is one which has either been: (i) included by the bidder in its pre-qualification application or bid because it brings specific and critical experience and know-how that allow the bidder to meet the qualification requirements for the particular bid; or (ii) appointed by the Borrower.

SAMPLE PLAN FOR BIDDERS FOR PREPARATION OF MSIP TO MANAGE ESHSRISKS & ESHS CODE OF CONDUCT

Management Strategies and Implementation Plan (MSIP) to manage the ESHS risks and ESHS Code of Conduct

The policy goal, as a minimum, shall be to integrate environmental protection, occupational and community health and safety, gender, equality, child protection, vulnerable people (including those with disabilities), sexual harassment, gender-basedviolence (GBV), sexual exploitation and abuse (SEA), HIV/AIDS awareness and prevention in the planning processes, programs, and various activities involved in theexecution of the Works.

The Bidder shall accordingly submit a comprehensive and concise Management Strategies and Implementation Plan (MSIP) to manage the Environmental, Social (including sexual exploitation and abuse (SEA) and gender-based violence (GBV)), Health and Safety (ESHS) risks, and ESHS Code of Conduct. The plan shall describethe actions, materials, equipment, management processes etc. that will be implementedby the Contractor, and its subcontractors.

The Plan shall include at the minimum (i) construction traffic management plan to ensure safety of local communities from construction traffic; (ii) water resource protection plan to prevent contamination of drinking water; (iii) boundary marking andprotection strategy to prevent depositing on private land and offsite adverse impacts;
(iv) gender based violence and sexual exploitation and abuse (GBV/SEA) prevention and response action plan; (v) program to address regulatory authority conditions attached to any permits or approvals for the project; (vi) mobilization strategy; (vii) worker's camp management plan including the process for mitigating construction related impacts on local community etc.

The Bidder shall document and submit the Code of Conduct that will apply to its employees and subcontractors, to mitigate ESHS risks and to ensure compliance with its Environmental, Social, Health and Safety (ESHS) obligations under the contract. In addition, the Bidder shall submit an outline of how this Code of Conduct will be implemented and availability of qualified and trained personnel to supervise and implement the action plan. This will include: how it will be introduced into conditions of employment/engagement, what training will be provided, how it will be monitoredand how the Contractor proposes to deal with any breaches.

ANNEXURE A

"CAPACITY AUGMENTATION OF NATIONAL WATERWAY-1" BETWEEN HALDIA AND VARANASI

(JAL MARG VIKAS PROJECT)

ENVIRONMENT MANAGEMENT PLAN FOR MAINTENANCE WORKS OF NATIONAL INLAND NAVIGATION INSTITUTE AT PATNA , BIHAR

July-2024

ENVIRONMENT MANAGEMENT PLAN: NINI CENTRE OF EXCELLENCE (IWT)

INTRODUCTION

Inland Waterways Authority of India (IWAI) is augmenting the navigation capacity of National Waterway (NW-1) and continue to maintain the entire stretch. Under the Jal Marg Vikas Project, IWAI is developing the infrastructure facility like Multimodal Inland Water Transport (IWT) 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 maintenance dredging of the navigation channel, to augment the navigation capacity of the National Waterway -1.

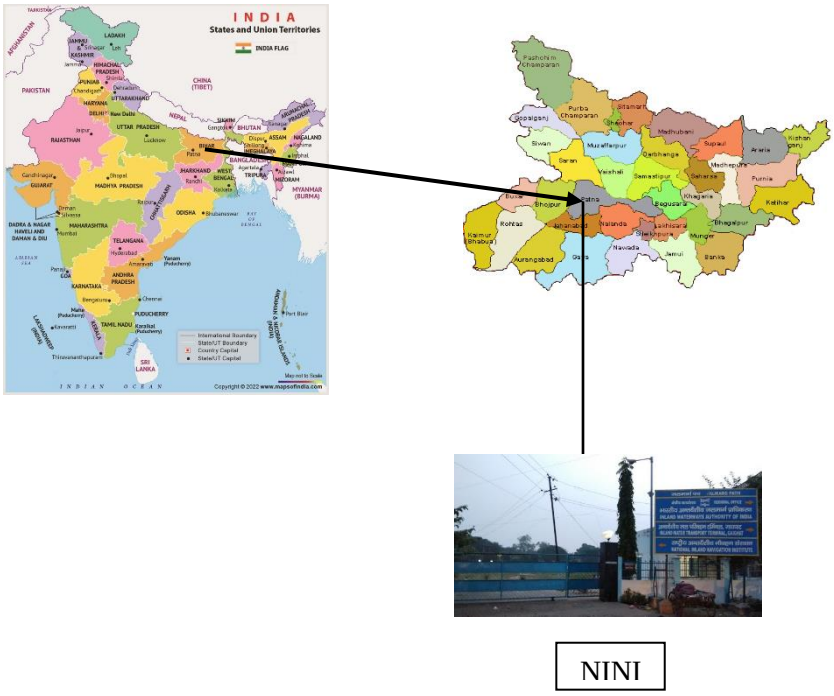


Figure 1: Location Map

PROJECT BRIEF

NINI-CoE (IWT) is propose to be a dedicated capacity building institute to promote, develop and efficiently use inland waterways for sustainable transportation. The center will create a platform for benchmarking, collaboration and knowledge-sharing among various stakeholders, including governments, industry players, and academia, to develop manpower to ensure the safe and efficient use of inland waterways in the region.

NINI-CoE (IWT) plans to undertake a range of activities, including research and development, training and education, advocacy, and networking. The objectives include:

I. To develop pool of informed professional experts, regulators and administrators to develop strategy and policy for development, maintenance and management of waterways, terminals and inland vessels for sustainable IWT to global standards and practices.

II. To develop technically competent staff having specific expertise in development, maintenance and management of fairway and IWT infrastructure

III. To develop well trained and competent manpower for safe operation and efficient management of inland vessels and terminals.

IV. To have well informed facilitators for development of ecosystem for safe, efficient movement of cargo and passengers on the IWT network

V. To conduct research in IWT sector and create new pathways for further research in matters relating to IWT including development of craft design, technique of towage, terminal facilities, port installations, alternate fuels, dredging, green logistics, and survey techniques

VI. To develop consultancy services and provide such services in India and abroad in relation to planning and development of waterways for shipping and navigation or any facility on IWT.

Based on a number of studies on training in IWT sector and training requirements as per Inland Vessel manning rules the training is planned in the following areas:

i. Hydrographic Survey
ii. River training works and dredging
iii. Vessel Operations and management
iv. Terminal operations and management
v. River pilotage and river information system
vi. Vessel design and green energy solutions
vii. Environment protection

ENVIRONMENTAL LEGAL FRAMEWORK

Various environmental regulations and policies of Government of India & State Government, International conventions and the World Bank's safeguard policies are applicable. Some of the applicability & requirements of clearances and permits for different activities as per the GoI and the World Bank Policy requirement have been identified for the project as listed below in Table 1. Apart from the listed legislation, various international conventions are applicable on the project which includes MARPOL Convention, 1973/78, Ballast Water Management, 2004, List of Safety Related Regulations, United Nations Convention on the Law of the Sea, Montego Bay, (1982), International Maritime Dangerous Goods Code (IMDG-code), SOLAS and PIANC guidelines. International Maritime Conventions, Protocols and Agreements Relevant to the Project are given in **Annexure-1.**

Some of the environmental standards and guidelines applicable on the project are Standards for discharge of effluent in inland surface water bodies and Marine Coastal Areas, Classification of Surface water Bodies on basis of Quality, Water Quality Standards for Coastal Waters, Standards for permissible level of water quality indicators, Permissible limit for off-shore dumping of dredged material, Criteria for harmful bottom sediments, Approximate Quantity of Suspended Sediments Generated by Dredging or Dumping Operations which should be followed to maintain the environmental pollution load within the specified limits. The applicable Environmental Standards / Norms are presented in **Annexure-2**.

Table 1: List of the Permits/Clearances Required as per GoI Legislations

Name	Applicability	Type of permit and stage of applicability	Responsibility
Environment Protection Act-1986 and Rules there under including EIA Notification 14th Sep 2006 and amendment till date	Considered Not Applicable (EIA Notification 2006 does not classify IWT terminals on river or maintenance dredging in the river as a project requiring environmental clearance. The non-applicability of this legislation has been confirmed by MoEF&CC. Borrowing of earth for road construction & terminal condition (if any required) should fall under mining category and would require prior environmental clearance.	Environment Clearance Construction stage for EC for borrowing earth	EPC Contractor for obtaining environmental clearances as applicable. EPC contractor shall also be responsible for EMP implementation and compliance to environmental clearance conditions.
Air (Prevention and Control of Pollution) Act, 1981, 1987	Applicable. The applicability is due to emission from operation of construction equipment like DG sets related aspects.	Consent to Establish & Consent to Operate	EPC contractor. .
Water Prevention and Control of Pollution) Act, 1974, 1988	Applicable. It is applicable for the projects having potential to generate effluent during any stage of the project. Effluents are expected to be generated during both the construction and Demolition phase of the project.	Consent to Establish & Consent to Operate	CTE/CTO should be taken by contractor for disposal of sewage and construction of septic tank/soak pit prior to start of construction from SPCB.
Noise Pollution (Regulation and Control Act) 2000 and amendment till date	Applicable due to generation of noise during construction and Demolition stage.	No permits issued under this act	EPC contractor and IWAI to ensure compliance to Ambient Noise Level Standards.
Hazardous & Other Waste Rules, 2016 .	Applicable. Project has potent to generate hazardous waste (Waste	Authorization for storage and handling hazardous waste	EPC Contractor shall obtain authorization for handling, storage and

	Oil) during both construction and Demolition phase.		disposal of hazardous waste (Waste Oil) along with CTE/CTO for air and water act.
MSIHC Rules, 1989	Applicable only for storage of highly inflammable liquids like HSD/LPG	License if the storage of hazardous material exceeds the threshold quantity	EPC contractor
The Bio Medical Waste Management Rules, 2016	Applicable for the disposal of bio-medical waste from first aid centres and dispensaries	No specific permit is required. Just comply with the handling and disposal requirements of the rule	EPC contractor
Construction and Demolition Waste Management Rules, 2016	Applicable Applies to all those waste resulting from Construction, re-modelling, repair & demolition of any civil structure of individual or organization who generates construction and demolition waste such as building material, rubble, debris.	Approval required from local authorities, if waste generation is >20 tons in a day or 300 tons per project in month	EPC contractor. Compliance to the rules should be ensured
Plastic waste Management Rules, 2016 as amended	Applicable Rule applies to every waste generator, local body, Gram Panchayat, manufacturer, Importers and producer.	No authorization to be obtained. Waste management and minimization to be done. Fee to be paid to local bodies, if applicable	EPC contractor. Compliance to the rules should be ensured
The Batteries (Management and Handling) Rules 2001	Applicable for disposal of used led acid battery if likely to be used in any equipment during construction and operation stage.	No specific registration required. Compulsion to buy and sale through registered vendor only.	EPC contractor
e Forest (Conservation) Act, 1980 and amendments e Forest (conservation) Rules 1981 and amendments date	No forest land is being diverted thus forest clearance will not be required.	Permission for tree cutting.	Permission for tree cutting from Forest Department should be taken by EPC contractor if required
Petroleum Rules, 2002	Applicable as storage of HSD/LPG or any other petroleum product may be required for the project purpose	License to store petroleum beyond prescribed quantity.	EPC Contractor
ntral Motor Vehicle Act	Applicable, for all the	No permit issued under	EPC Contractor to follow

1988 and amendment ntral Motor Vehicle Rules, 1989 and amendments till date	vehicles at site during construction phase	this Act	Rules for all the construction vehicles being used at site during construction purpose.
The Gas Cylinder Rules 2004	Applicable if contractor store more than the exempted quantity of gas cylinder.	License to store gas cylinder more than the regulated quantity	EPC Contractor
Guidelines for evaluation of proposals/requests for ground water abstraction for drinking and domestic purposes in Notified areas and Industry/Infrastructure project proposals in Non-notified areas, 2012	Applicable if bore well is done for extracting water for meeting drinking/domestic water needs of Institute.	No objection certificate	EPC Contractor shall obtain NOC from CGWA/CGWB prior digging any bore well during construction and operation of Institute.

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 2** provides details of mitigation measures with implementation and supervision responsibility of contractor during construction and demolition phase. Implementation of all mitigation measures require for environmental management plan and environmental monitoring during construction and demolition stage is the responsibility of EPC contractor under supervision of IWAI through TSSC.

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 the World Bank safeguard requirements. Contractor will also have to comply with applicable national standards with respect to Water, Air, Noise, Dredge Material, Soil, Biodiversity and Inland Vessels Act 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 during construction and demolition phase. 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 monthly, quarterly and six-monthly compliance report to Project Management Consultant (PMC)/Technical Support Services Consultant (TSSC) as well as to PMU (Project Management Unit) of IWAI. TSSC will analyze the report and notify the corrective action if any required to contractor under intimation to IWAI. Reports to be submitted by contractor includes monthly SHE reports, Monthly environmental reports, Monthly progress report, Monthly accident report and monthly, quarterly & six-monthly compliance reports for compliance to regulatory permits and EMP requirements.

TABLE 2: ENVIRONMENT MANAGEMENT PLAN OF NATIONAL INLAND NAVIGATION INSTITUTE (DURING DESIGN, CONSTRUCTION AND DEMOLITION PHASE)[1][2]

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
DESIGN AND CONSTRUCTION PHASE				
1. Permission and Clearances				
1.1 Obtaining Statutory Clearances	• Obtaining environmental clearance for borrow areas as applicable. • Obtaining consent to establish and operate for DG sets from SPCB under Air Act and Water Act. • Obtaining authorization for generation, storage and disposal of hazardous waste (used oil). • Obtaining permission from CGWB if ground water withdrawal is undertaken.	EIA Notification, 2006 Air(Prevention and Control of Pollution) Act 1981/1987 Water (Prevention and Control of Pollution) Act, 1974/1988 Guideline for Ground Water Withdrawal, Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016 (as amended) Solid Waste Management Rules, 2016.	Construction Area	During Pre-construction phase
2. Climate				
2.1 Project is unlikely to cause	• As far as possible trees along the Institute boundary retains as a greenbelt.	-	Construction site	During Design, and construction

[1]The Project Management Unit (PMU) and Project Implementation Unit (PIU) in IWAI to manage social and environmental aspect of NW1 augmentation. Technical Support Services Consultant (TSSC) anticipated to be appointed for project management and quality check.

[2]Implementation of all mitigation measures and statutory clearances require for environmental management plan and environmental monitoring during design and construction stage is the responsibility of EPC contractor. Supervision of implementation of environmental management plan and environmental monitoring will be carried out by IWAI through TSSC.

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
negative effect on climate. However, project can contribute positively for climate	• Green belt shall be developed as per the **Annexure:3**			and Demolition stage.
3. Natural & Man-made Hazard				
3.1 Earthquake- Seismic Zone –III damage risk zone[3]and Risk of floods	• Relevant IS code for structures shall be adopted for designing the civil structures to sustain the earthquake of medium to high intensity. As per building code the institute buildings are required to be designed for structure requirement of one higher (seismic zone IV) zone. . • All facilities developed shall be above HFL. River embankment protection measures shall be strengthened considering high flood levels to prevent soil erosion. • In addition to natural hazard, operational hazard like fire, accidents and grounding of cargo can happen at the site. Provision of adequate fire protection measures as per standard code and practices should be provided in institute buildings and storage areas. Adequate safety provisions like caution sign boards, emergency hooter; designation of assembly points shall be made. International	NBC, 2005, local building bye laws, state factory rules, Petroleum Rules and MSIHC Rules, 1989 as amended till date	Construction site& Navigation Channel	During Design and construction stage.

[3]*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
	environmental and occupational health and safety management systems as per ISO14001/OHSAS18001 shall be adopted. Standard safety guidelines covering most probable accident scenarios shall be developed and followed. Adequate provision shall be made for first aid facilities at the institute building and periodic health check-ups.			
4. Site Preparation, Levelling Institute Site, Construction Camp, Construction Works				
4.1 Levelling of Institute site & Removal of vegetation	• Tree cutting should be carried out only after obtaining NOC from forest department • Site levelling works shall be immediately started after removal of the vegetation • Filling shall be followed by compaction and water sprinkling to prevent dust emission • Top soil (15 cm) should be stripped and preserved under covered conditions for landscaping purpose. This should be stored in the form of the heap with the slide slopes covered with grass. • If borrow areas are excavated for obtaining the soil then environmental clearance shall be obtained prior excavating the borrow areas. Borrow areas shall preferably be located on waste land and agricultural land should be avoided. Borrow areas should be made along the river as the borrow areas may get filled quickly with the sediments brought by river water. Excavation should not be carried out more than 1.5 m or till the ground water is obtained (whichever is lesser). • Green belt should be developed at the site and as per the Green Belt management Plan (**Annexure 4**) • Survival rate of tree should be regularly monitored. It is should be minimum 70%. • Work timings should be restricted between 10:00 PM to 6:00 AM. Adequate illumination should be	Solid Waste Management Rules, 2016 Hazardous& Other Wastes(Management & Transboundary Movement Rules), 2016as amended Construction and Demolition Waste Management Rules, 2016	Construction site	During design and Construction and Demolition Stage

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
	provided at site during evening hours • Rest area should be provided for workers at site and sleeping/lying down at site should be strictly prohibited to prevent accidents • Develop and obtain approval from IWAI for occupational health & safety management. The plan should follow safety guidelines as given at **Annexure 5** and other tools such as OSHAS 18001 • Movement of construction vehicles shall be restricted to the designated haulage roads only to prevent compaction of soil in other areas • The earth stockpiles to be provided with gentle slopes to prevent soil erosion. • Sedimentation tanks shall be provided with storm water drain to arrest the sediments and these sediments shall be removed and stored with remaining excavated soil. • Shore protection works like stone pitching along the bank shall be undertaken. • Wash-off from concrete mixing tanks and wash from washing area shall not be allowed to enter the soil. This wash shall be collected through drains into tanks and concrete shall be settled, collected, dried and re-used in the site again. **Solid Waste Management:** • 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 and demolition 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			

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
	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, should be approved by IWAI and should be used & manage for the same as per the Debris Management Plan **(Annexure 6).** • Any waste oil generated from construction machinery, should be stored on concrete platform and disposed off to authorized recyclers.			
4.2 Setting of Labour 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 sitting, establishment, location and management should be as per proposed Construction & Labor Camp Management Plan **(Annexure 7).** • Labour camps should be located close to the construction sites to the extent possible. **Sanitation and Worker's Health& Safety:** • 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 leading to disease. • Proper sanitation facility like toilet and bathing facility should be provided at site and labor camps. Wastewater generated from these facilities should be disposed off through septic tanks and soak pit. Septic tank/soak pit should be constructed at min 100 m distance from river/water body. • Preventive medical care to be provided to workers. • Segregated, collection and disposal of solid waste	The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act 1996 and The Water (Prevention & Control of Pollution) Act, 1974 and amendments thereof. Solid Waste Management Rules, 2016, Hazardous & Other Waste (Management and Transboundary Movement) Rules, 2016	Labour Camp Locations	During design and Construction and Demolition Stage

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
	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. • First aid facilities, first aid room, first aid trained personnel and ambulance should be provided at the site 24 X 7. Also, tie-ups with local hospital should be done to handle emergency case, if any. • Rest area should be provided at the site where labour can rest after lunch and should not lie on site anywhere. • Working hours of labour should not exceed the standard norms as per The Building and Other Construction Workers' (Regulation of Employment and Conditions of Service) Central Rules, 1998 and The Contract Labour (Regulation and Abolition) Act, 1970. • Wastewater from construction site should not be allowed to accumulate at site as standing water may lead to breeding of mosquitoes. Septic tanks/soak pits should be provided for its disposal. • Temporary storm water drainage system should also be provided at camp site and construction site so as to drain the storm water and prevent accumulation of storm water at site and thus breeding of mosquitoes/flies.			
5. Site Preparation : Power supply, Water Supply, and Drainage, disposal of piling muck and Debris				
5.1 Power supply and Energy Conservation: Air Pollution, energy	• DG sets shall be used only in case of power failure. DG sets shall be enclosed in acoustic enclosures and shall be provided with stacks as per CPCB	Air (Prevention and Control of Water Pollution) Act, 1981	Construction Sites and Labour Camp	During design, construction and demolition stage

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
loss	norms to discharge exhaust gases. • Solar energy shall be used in common lighting area on 1:3 bases. • Energy Conservation Building Code shall be used as applicable to various office and other structures.	& ECBC Norms, 2016	Locations	
5.2 Water Supply, Drainage and effluent discharge	• The Area is under safe category as per Central Ground Water Board. However, necessary permission shall be taken to drawl ground water. • Caution signage shall be placed at site for optimal use of water. Applicable discharge standard provided in **Annexure- 7** • Storm water drain network should be developed. Storm water drains shall be connected to sedimentation tank for arresting the sediments before discharging into the river. • Rain water should be collected into temporary ponds which should be used for various construction activities and dust suppression. • All washing and maintenance effluent from the workshop area of vehicle maintenance area should drain to separate collection areas fitted with oil and grease trap and de- siltation chamber. The treated water shall be used for dust separation and green belt development. This water shall not be discharged to river at all. • No wastewater should be discharged to river at all during construction and demolition phase of the institute building, and as such should be provided in the design of the entire Institute facility. • Vehicle washing and maintenance workshops shall be located away from river. • Rain water should be collected into temporary ponds which should be used for various construction activities and dust suppression.	Water (Prevention and Control of Water Pollution) Act, 1974	Construction Sites and Labour Camp Locations	During design and construction stage
5.3 Disposal of	• Construction and demolition waste should be	Hazardous & Other	Project site	Pre-Construction,

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
construction & demolition debris: uncontrolled disposal may leads to Degradation of Land.	follow the hierarchy of Prevention, reduction, Reuse, and recycle. • Construction and demolition waste should be disposed at the waste processing facility nearby at the project site for the further use of recycled product. • Reusable construction and demolition waste upto quantity of 20% shall be used in the project as per the C & D waste management rule 2016 • Construction and demolition waste should be used preferably for filling the site shall be tested for toxicity, if toxic shall not be disposed off back in water and should be send for disposal to nearest Sentry landfill site .	Waste (Management and Transboundary Movement) Rules, 2016 Construction and demolition waste management rule 2016		construction and demolition Stage
5.4 Drainage Pattern	• Natural Drainage pattern of area around the Institute area shall be maintained. • Storm water management drains shall be provided at site.		Construction Sites, Access road, and Labour Camp Locations	During construction stage
6. Construction Material Sourcing				
6.1 Borrow areas for sourcing earth for filling as required (erosion, loss of productive land, land degradation, air pollution)	Material shall be sourced from nearby area and local markets nearby Patna to the extent possible. Sand purchased from local market can be used for filling the site and borrow area may not be required to be established. However, if borrow areas will be required following guidelines should be followed. if borrow area is required then it should be as per following: • Non-productive lands, barren lands, raised lands; wastelands shall be used for borrowing earth with the necessary permissions/consents. • Agricultural areas not to be used as borrow areas unless requested by the landowner for lowering the land for making it cultivable.	IRC Guidelines on borrow areas and for quarries. EIA Notification 2006(under Environmental Protection Act and Rules, 1986;) as amended till date	All Identified Borrow sites	During design and construction stage

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
	• Excavation depth should not exceed 1.5 m bgl • Environmental Clearance from State Environmental Impact Assessment Authority under EIA Notification, 2006 and required permission from District Magistrate shall be obtained prior to excavation& establishing borrows areas. Copy of this permission shall be submitted to IWAI before start of excavation. • Record of location, area, accessibility to the location and photograph of borrow area should be maintained prior to excavation. • Site selected for borrow area should be approved by PMC/PMU & IWAI expert prior to excavation • Ridges of not less than 8m width will be left at intervals not exceeding 300m. Small drains will be cut through the ridges, if necessary, to facilitate drainage. • The slope of the edges will be maintained not steeper than 1:4 (vertical: Horizontal). • Topsoil to be stockpiled and protected for use at the rehabilitation stage. • Rehabilitation shall be satisfactorily undertaken immediately after the use has ceased and at least three weeks prior to monsoon. • Unpaved surfaces used for the haulage of borrow materials to be maintained. • Transportation of earth materials shall be through covered vehicles.			
7. Protection of Flora and Fauna				
7.1 Protection of terrestrial flora & fauna	• Thick and 10 m wide green belt shall be developed as per the CPCB guidelines at the periphery and along the approach & internal roads on the project site which will prevent spread of dust and reduce noise propagation. • Green belt development should be started during	--	Project site, labour camp site, plant site	During design and construction stage

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
	construction phase only. • Survival rate for green belt to be developed at the site shall be monitored regularly and measures shall be taken so as to achieve minimum rate of 70%.Provision shall be made for strict penalty for hunting/harming any animal/bird/aquatic fauna. • Construction activities shall be restricted to 6:00 AM to 10:00 PM especially noise generating activities. • Workers should not use any timber or firewood as fuel for any purpose. LPG should be made available to workers in construction camp. • Tree present along the Institute building boundary shall retained as greenbelt. Trees retained at the site (after site clearance) should not be disturbed, cut or harmed in anyway. These trees should be maintained. • No hazardous material or waste shall be disposed off in the other land or nearby area as it may harm the animals, if consumed accidently. • Speed limit will be regulated to prevent any accidents of animals. • Regular maintenance of the dumper shall be done to prevent leakage of oil so as to prevent pollution of the soil and impact on fauna and flora dependant on soil. • Regular Water Sprinkling shall be carried out to minimize dust generation and settling the dust on surface of flora. • Adequate parking space should be provided within the site for construction vehicle and equipment so as they are not parked in other areas like road side, others agricultural field, open areas etc to avoid any harm to flora of that area due to movement of heavy vehicles.			

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
	• Site should be barricaded to prevent entry of the animal in the site. • Hunting, poaching and harming any animal (wild or domestic) by any worker or project related person should be strictly prohibited and monitored • Illumination at the night time should be reduced during the night time (if no activity is going on) as it may disturb the nocturnal animals • Noise generating activity should not be undertaken during night time to minimize disturbance to animals. Noise levels should be maintained within the prescribed CPCBs limits to the extent possible during the day time.			
8. Air Quality				
8.1 Fugitive Dust Generation due to construction and demolition activities	• Barricading the site to prevent dust dispersion to nearby areas. • Areas to be earmarked for delivery / deposition of C & D wastes • Water sprinkling to suppress the dust generated to be carried out at site, approach road & haulage roads. • Controlled flow of the sprinklers to avoid ponding of water • Excavation and filling to be carried out in parallel and in phases. • Proper servicing and maintenance of excavators/levellers/loaders and other machinery to minimize the emission generation • Top soil stripping before excavating the soil and storage under covered conditions for usage in landscaping at later stages • To develop 10 m wide and dense (as space available) greenbelt all around the institute premises as well as all along the approach road. • Ensuring survival rate of plantation carried out at	Environmental Protection Act, 1986 and amendments thereof; The Air (Prevention and Control of Pollution) Act, 1981 and amendments thereof	Construction sites, Loading areas, storage areas,	During the Construction and demolition phase

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
	Institute building should have survival rate of at least 70% and periodic monitoring and reporting should be carried out on half yearly basis • Vehicles transporting the loose and fine materials like sand and aggregates shall be covered. • Masks and other PPE shall be provided to people working in high dust generation area • Loading and unloading of construction materials shall be made at designated locations in project area with provisions of water sprinkling around these locations • Construction vehicle, machinery & equipment shall be regularly serviced and maintained and should comply with emission standards as per CPCB norms. Vehicles entering the construction site shall carry valid PUC certificate. • Wheel wash facility shall be provided at exit points of the site. • LPG should be used as fuel source in construction camps instead of wood. Tree cutting shall not be allowed for fuel wood. • Monitoring of air quality shall be carried out on monthly basis to check the level of pollutants and effectiveness of proposed EM.P			
8.2 Exhaust gas emissions from machinery and vehicular traffic.	• Regular maintenance shall be carried out of machinery and equipment. • For long distance, transportation routes of C & D wastes to be selected after discussion with local authorities. • Earmark areas for parking vehicles • Smooth movement of incoming & out going vehicles / trucks • Roads within premise tarred • Weigh bridge (to be operational) • Dust suppression systems in place (fugitive	Environmental Protection Act, 1986 and amendments thereof; The Air (Prevention and Control of Pollution) Act, 1981 and amendments thereof	Construction camps and sites, DG sets locations	During the Construction and demolition phase

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
	emissions): Dust for roads , regular water sprinkling on haul road will suppress the dust • Low sulphur diesel should be used for operating DG sets and construction equipment. • Diesel Generating (DG) sets shall be fitted with stack of adequate height as per regulations (Height of stack = height of the building + 0.2 √ KVA). • Periodic monitoring of air quality for PM_{10}, $PM_{2.5}$, SO_x, NO_x, and CO shall be carried out quarterly at construction site.			
8.3 Emissions at access road : avoidance of traffic Jams	• No construction, material, equipment or vehicle shall be stored or parked at any road or the non-project area. • Transportation vehicle shall strictly adhere to the designated routes and timings and shall avoid the peak traffic hours. • Parking space for dumpers shall be provided within the site so as to prevent parking of vehicles on road and other area and thus preventing traffic jams.	Environmental Protection Act, 1986 and amendments thereof; The Air (Prevention and Control of Pollution) Act, 1981 and amendments thereof	Existing roads	During the Construction and Demolition phase
9. Noise and Vibration				
9.1 Noise from construction and demolition vehicle, equipment and machinery.	• Protection devices (earplugs or earmuffs) shall be provided to the workers operating near high noise generating machines. • Construction equipment and machinery shall be fitted with silencers and maintained properly. • Barricading (Temporary noise barrier) the construction and demolition site to minimize the noise level outside the site boundary. • All equipment shall be fitted with silencers and will be properly maintained to minimize its operational noise. • Hearing test for the workers prior to deployment at site and high noise areas followed by periodic testing every six months. • Restriction of high noise generating activity	Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof	Project site and accesses road.	During the Construction and demolition stage

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
	between 10:00 PM to 6:00 AM. • Restriction on Honking at the project site • Job rotations systems for workers, working in high noise level areas. • Periodic monitoring (monthly level) of noise levels to check the level of pollutants and effectiveness of proposed EMP.			
10. Land-use and Landscape				
10.1 Loss of agricultural land and productive top soil	• Agricultural land shall not be selected for setting up construction camps, borrow area and Hot mix plant. • 15 cm of top soil layer shall be stripped off prior to filling in built-up areas and shall be stored separately in covered condition and used for landscaping purpose within the site.	Design requirement	Project site area and borrow area	During construction Stage
10.2 Soil erosion due to construction and demolition activities, earthwork	• The earth stockpiles to be provided with gentle slopes to prevent soil erosion. • Sedimentation tanks shall be provided with storm water drain to arrest the sediments and these sediments shall be removed and stored with remaining excavated soil • Provision of side drain shall be made in access road if required to prevent water logging.	Solid Waste Management Rules, 2016, Hazardous & Other Waste (Management and Transboundary Movement) Rules, 2016	Access road, Project site and river bank	During construction and demolition Stage
10.3 Compaction and contamination of soil due to movement of vehicles and equipment	• Filling of the site should be carried out by dividing site into various activity areas. Filling should be followed by the compaction to minimize the erosion. • Water shall be sprinkled on the compacted soil to further minimize soil erosion due to wind • 15 cm of top soil shall be stripped off prior filling and this top soil should be used for landscaping & green belt development. • Soil for filling should be sourced from authorized vendors and from the local areas only to prevent illegal mining and minimize emissions during	Solid Waste Management Rules, 2016, Hazardous & Other Waste (Management and Transboundary Movement) Rules, 2016	Project site	During Design & Construction and demolition stage.

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
	transportation. • The earth stockpiles to be provided with gentle slopes to prevent soil erosion. • Fuel shall be stored in HDPE containers on paved surfaces with provision of catchment pit to prevent soil contamination from oil spillages. • Arrangement should be made for segregation of municipal solid waste into recyclable and non-recyclable waste at the labour camp site. 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. This construction waste should preferably be used for filling of the site. • If no debris or waste disposal site exists in the area then a site should be identified by contractor for debris disposal, should be approved by IWAI and should be used & manage for the same as per the Debris Management Plan. No waste should be dumped in the river or low lying areas near the River/water body. • Hazardous waste like used oil from DG sets shall be stored in HDPE containers and shall be stored on paved surfaces in isolated location to prevent its spillage and contamination of soil. Used oil shall be disposed off through authorized vendors only. • Septic tank or mobile toilets fitted with anaerobic treatment facility shall be provided at construction and labour camp site. Septic tank/soak pit should			

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
	be constructed at min 100 m distance from river/water body. • Wash-off from concrete mixing tanks and wash from washing area shall not be allowed to enter the soil. This wash shall be collected through drains into tanks and concrete shall be settled, collected, dried and re-used in the site again. • Movement of construction vehicles shall be restricted to the designated roads only to prevent compaction of soil in other areas • Sedimentation tanks shall be provided with storm water drain to arrest the sediments and these sediments shall be removed and stored with remaining excavated soil. • Provision of side drain & cross drainage structure like culverts shall be made in the approach road if required to maintain the natural drainage pattern and prevent soil erosion. • Shore protection works like stone pitching etc should be provided along the river bank to prevent the erosion due to water action.			
11. Water Resources				
11.1 Depletion of Groundwater resources due to unregulated abstraction for construction purpose	• Preference shall be given to source water from rivers with due permission from authorities. • The depth to water level in the study area during pre-monsoon season varies from 2 mbgl to 5 m bgl and in post monsoon season depth to water table remains <2 m. Stage of Ground water development in the Sonepur block is 40.09%. Overall the study area including Sonepur block fall under the safe category. • Temporary rain water storage structures should be provided at the site to store rain water and this water should be used for sprinkling and construction activities. This structure can be	Water (Prevention and Control of Pollution) Act, 1974	Project site	During Construction stage

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
	retained in the operation phase also as the rain water storage sump. • No dumping of waste/wastewater in the ground. Hazardous waste or wastewater shall not be stored in unlined ponds. • Permission shall be obtained from irrigation department in case river water is used and from CGWA/CGWB in case ground water is used.			
11.2 Increase in water Siltation levels due to construction of Institute Building and contamination due to disposal of domestic waste	• Natural Drainage pattern of area shall be maintained by making a proper drainage network in project site. • Permission shall be obtained from irrigation department in case river water is used and from CGWA/CGWB in case of ground water. • Washing of vehicle and equipment shall not be carried out at river or near any water body. Washing area should be provided with the storm water drains fitted with oil & grease trap. • Piling of the raw materials & debris shall be avoided at the site. Storage of debris and raw material shall be carried out in paved and covered areas. This will minimize interface of run-off with raw material and debris. • Site should be cleaned regularly. • Septic tank/soak pit shall be provided at site for disposal of sewage from the toilets at site and from the labour camps. Adequate toilets & bathrooms shall be provided to prevent open defecation. No septic tank shall be provided within 100 m of the water body. In such area, mobile toilets with anaerobic digestion facility shall be provided. No domestic waste shall be discharged to river. • Water use shall be minimized by using RMC, practicing curing by water sprinkling, maintaining flow of sprinklers, covering the water storage tanks	Water (Prevention and Control of Pollution) Act, 1974	Project Site	During Construction stage

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
	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 shall be collected in block work tanks which will allow settling of concrete, removal of aggregates and allowing the waste to wastewater drain. This collected waste concrete can be dried and used for various purposes at site like construction of temporary roads at site and labour colony. • Wastewater generated from the washing/cleaning area after passing through oil & grease trap & curing area shall be re-used for water sprinkling and wheel washing. • Fuel shall be stored in leak proof containers and containers shall be placed on paved surface. • Restoration of changes in the stream, if any, made during construction to its original level. • The piling work in river shall be undertaken during low flow period. • Provision shall be made for collection and draining of water for the piling earth. It shall be used for embankment protection or road construction depending on its suitability. • Turbidity traps/curtains should be provided or Geo-Textile synthetic sheet curtain shall be placed around pilling and construction area to prevent movement of sediments and construction waste. • Sedimentation tanks shall be provided at the site so as run-off from site shall enter the sedimentation tanks before discharging into the river. Sedimentation tanks will trap the sediments in the run-off.			

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
	• Proper collection, management and disposal of construction, demolition and municipal waste from site shall be made to prevent mixing of the waste in run-off and entering the water bodies. • Monitoring of surface water quality shall be carried out on monthly basis to check the level of pollutants and effectiveness of proposed EMP.			
12. Accident and Safety Risks				
12.1 Impact on Social life	• Local labour should preferably be employed for construction purpose. • Site should be barricaded and should have entry guarded by security guard. • Resister 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. • Implementation of EMP adequately so as to prevent environmental pollution and its impact on socio-economy due to project development. • Non-productive lands, barren lands, raised lands; wastelands should be used for setting up labour camps, plant sites and debris disposal site. Labour camps, plant sites and debris disposal site should not be located close to habitations, schools, hospitals, religious places and other community places. A minimum distance of 500 m should be maintained for setting up such facilities.	BOCWA 1996 & BOCWR, 1998	Project Site and the material source areas and haulage roads	During Construction and Demolition stage
12.2 Accident risk from construction activities and health & safety of workers	• Adequate illumination should be provided at site during evening and night time till the work is being carried out. • Rest area should be provided at site in which	Central Motor and Vehicle Act 1988 as amended, The Environment	Construction sites	Construction period

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
	workers can take rest. • Personal protective equipment like helmet, gum boots, safety shoes, safety jackets, ear plugs, gloves etc to be provided to worker while working. Fines should be imposed if they are found not wearing PPE. • Noise level in the work zone should be maintained and followed as per OSHAS norms. • Contractors should adopt and maintain safe working practices. SOPs should be prepared for each and every activity and all activities should be undertaken as per SOPs under supervision of site engineer. • Training should be given to workers to handle the heavy equipment so as to prevent accidents. • Complete medical check-up should be done for workers prior to joining and after six months of joining. • First aid facilities, first aid room, first aid trained personnel and ambulance should be provided at the site 24 X 7. Also tie-ups with local hospital should be done to handle emergency case, if any. • List of emergency nos., hospital contacts, ambulance contacts and doctors contacts should be displayed in first aid room, rest area and at all required location. • Working hours of labour should not exceed the standard norms as per The Building and Other Construction Workers' (Regulation of Employment and Conditions of Service) Central Rules, 1998 and The Contract Labour (Regulation and Abolition) Act, 1970. • Labour camps should be located at neat and clean location with no water logging issues and should be well ventilated with adequate illumination, kitchen,	(Protection) Act 1986 and Noise Rules 2000 as amended		

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
	toilet and bathroom facility, and safe drinking water facility. • Wastewater generated from these facilities should be disposed off through septic tanks and soak pit. Septic tank/soak pit should be constructed at min 100 m distance from river/water body. • LPG should be provided as fuel for cooking to workers and open burning of fuel should not be allowed. • Temporary storm water drainage system should also be provided at camp site and construction site so as to drain the storm water and prevent accumulation of storm water at site and thus breeding of mosquitoes/flies. • Dustbins should be provided at labour camps for collection of waste and waste should be regularly disposed off through the concerned agency. • Safety officers should be appointed at site so as to ensure all safety measures are taken at the site. • Job rotation should be carried out for workers exposed to high noise and dust areas. • Activity like smoking and consuming liquor should be prohibited at the site. • Awareness on AIDS should be spread among the workers. • Traffic manager should be present at the site all the time to manage incoming and outgoing traffic to prevent accidents. • Speed limit of vehicles should be restricted at site to prevent any accidents and fines should be imposed on vehicles if same is not maintained. All construction vehicles should follow the designated routes & timings only. • Construction vehicle movement should be restricted to non-peak hours, i.e late evening (7-12:00 pm)			

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
	only. Villagers should also be given intimation of these timings. • All construction vehicles should be regularly serviced and maintained and carry pollution under control certificate. • Crèche facility should be provided for kids if female workers are employed. • Regular inspection for hygiene and safety in labour camps should be done. • Arrangement of fire-fighting should be made at site and workers should be trained to use the system in case of fire. • Site should be barricaded and should have entry guarded by security guard. • 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 and demolition of phase of Institute building to minimize the harm to existing environmental quality of the area, which is being enjoyed by the residents of that area/ • Maintenance and repair of the village road should be carried out both before and end of construction by contractor. • Sprinkling of water should be carried out in village road also, so as to minimize dust generation due to movement of construction vehicles.			
12.3 Construction of Pollution control and resource conservation system for use in operation stage	• Storm water drainage system should be provided at the site to manage storm water generation during operation phase. Arrangement shall be made to collect the roof water from the building and other areas like storage areas/sheds and roads shall be	-	Contractor	Construction and Demolition stage.

Environmental Issue/ Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame
	directed into a collection pond. • Water conservation fixtures shall be installed in toilets and kitchen area of institute building. Some of the water conservation fixtures which can be installed are dual flushing cisterns, sensor taps, low water urinals etc. • Solar Lighting provisions of 1:3 basis. • Maintenance of village road before and after completion of construction. • Adoption of zero pollution discharge concept at Institute bbuilding. • Development of thick green belt(10-15 m wide) as per provision in the design. Species selected for development of green belt shall also be tolerant to expected pollutants and shall have the ability to adsorb the pollutants. Suggested species are suitable for different areas are also listed under CPCB guidelines for green Belt development[4]. • Provision of system for water sprinkling for dust suppression during loading and unloading of material in operation stage. • Development of waste reception and treatment facility as per design.. • Construction of Room for e-waste storage. • Construction of oil interceptor in the storm water drain around parking and loading and unloading areas			

TABLE 3: ENVIRONMENT MONITORING PLAN OF NATIONAL INLAND NAVIGATION INSTITUTE (DURING DESIGN,

[4] CPCB guidelines for green Belt development http://cpcb.nic.in/upload/Publications/Publication_513_GuidelinesForDevelopingGreenbelts.pdf

CONSTRUCTION AND DEMOLITION PHASE)

S. No.	Aspect	Parameters to be monitored	No of sampling locations & frequency	Standard methods for sampling and analysis	Role & Responsibility	
					Implementation	Supervision
Construction Period						
1.	Air Quality (Ambient & Stack)	PM_{10}, $PM_{2.5}$, SO_2, NO_x, CO	Three Locations including project site, once in two months considering upwind and downwind direction	• 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_x • CO analyser; TO-14A, TO-15, USEPA method for sampling	Contractor through NABL Accredited Lab	IWAI &TSSC
2.	Surface Water Quality	Physical, chemical and biological	River Ganga Once a month (upstream & downstream of the Project site)	Grab sampling and analysis by using standard methods	Contractor through NABL Accredited Lab	IWAI &TSSC
3.	Drinking water Quality	Physical, chemical and biological	Drinking water for labour camps Once in six month	Grab sampling and analysis by using standard methods	Contractor through NABL Accredited Lab	IWAI &TSSC
4.	Ground water quality	Physical, chemical and biological	Site and nearest village -Once in three month	Grab sampling and analysis by using standard methods	Contractor through NABL Accredited Lab	IWAI &TSSC
5.	Noise Level	Day time and night time noise level (max, min &Leq levels)	Three locations Construction labour camp, construction site and nearest village Once a month	Noise meter (24 hourly for Day and night time noise)	Contractor through NABL Accredited Lab	IWAI &TSSC
6.	Soil Quality & River bed sediments	Soil texture, type, Electrical conductivity, pH, infiltration, porosity, etc.	Construction site, labour camps and debris disposal site -Annually	Collection and analysis of samples as per IS 2720	Contractor through NABL Accredited Lab	IWAI &TSSC
7.	Plantation	Plantation survival	Project site-	Survey, counting, recording	Contractor	IWAI &TSSC

		rate	Annually	& reporting	through NABL Accredited Lab	
* Test of Environment Monitoring parameters shall be carried out by NABL/MOEF Accredited Laboratory						

Annexure 1: International Maritime Conventions, Protocols and Agreements Relevant to the Project

S. No.	Issues	International Maritime Conventions, Protocols and Agreements	Remarks
1.	International Maritime	IMO Convention, 1948	The Convention establishing the IMO was adopted in 1948 but the Organization started life as the Inter-Governmental Maritime Consultative Organization (IMCO) until it was changed to the IMO in 1982. The Aims of the IMO include a range of objectives: 1. To provide machinery for cooperation among Governments in the field of governmental regulation and practices relating to technical matters of all kinds affecting shipping engaged in international trade, and to encourage the general adoption of the highest practicable standards in matters concerning maritime safety and efficiency of navigation; 2. To provide for the consideration by the Organization of any matters concerning shipping that may be referred to it by any organ or specialized agency of the United Nations; 3. To provide for the exchange of information among Governments on matters under consideration by the Organization. There have been a series of amendments to the Convention which are 1975 amendments, 1977 amendments, 1991 amendments.
2.	Maritime safety	SOLAS Convention, 1974	The SOLAS Convention in its successive forms is generally regarded as the most important of all international treaties concerning the safety of merchant ships. The 1974 version includes the tacit acceptance procedure - which provides that an amendment shall enter into force on a specified date unless, before that date, objections to the amendment are received from an agreed number of Parties. The Convention came into force on May 25, 1980
3.	Measurement of ships	Load Lines Convention,1966	It has long been recognized that limitations on the draught to which a ship may be loaded make a significant contribution to her safety. These limits are given in the form of freeboards, which constitute, besides external weather tight and watertight integrity, the main objective of the Convention.
4.	Preventing collisions at sea	Convention on International Regulations for Preventing Collisions at Sea (COLREG), 1972	The 1972 Convention was designed to update and replace the Collision Regulations of 1960 which were adopted at the same time as the 1960 SOLAS Convention. One of the most important innovations in the 1972 COLREGs was the recognition given to traffic separation schemes - Rule 10 gives guidance in determining safe speed, the risk of collision and

			the conduct of vessels operating in or near traffic separation schemes.
5.	International Maritime Satellite System	Convention on International Maritime Satellite Organization (INMARSAT), 1976	IMO recognized the potential for satellite communications to assist in distress situations at sea soon after the launch of the world's first telecommunications satellite, Telstar, in 1962. In February 1966, IMO's Maritime Safety Committee (MSC) decided to study the operational requirements for a satellite communications system devoted to maritime purposes. In 1973, IMO decided to convene a conference with the object of establishing a new maritime communications system based on satellite technology.
6.	Prevention of Pollution from Ships	International Convention for the Prevention of Pollution from Ships (MARPOL), 1973, as modified by the Protocol of 1978 relating thereto and by the Protocol of 1997(MARPOL)	The MARPOL Convention is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes. It is a combination of two treaties adopted in 1973 and 1978 respectively and also includes the Protocol of 1997 (Annex VI). It has been updated by amendments through the years.
		Convention on Facilitation of International Maritime Traffic (FACILITATION), London, 1965	The Convention's main objectives are to prevent unnecessary delays in maritime traffic, to aid cooperation between Governments, and to secure the highest practicable degree of uniformity in formalities and other procedures. In particular, the Convention reduces the number of declarations which can be required by public authorities.
7.	Safety of maritime navigation	Convention for The Suppression of Unlawful Acts of Violence Against the Safety of Maritime Navigation (SUA convention), 1988	The main purpose of the convention is to ensure that appropriate action is taken against persons committing unlawful acts against ships. These include: • the seizure of ships by force; • acts of violence against persons on board ships; and • The placing of devices on board a ship which are likely to destroy or damage it. The convention obliges Contracting Governments either to extradite or prosecute alleged offenders.
8.	Environmental Safety	Convention Relating to Intervention on the High Seas, 1969	Contracting States are empowered to act against ships of other countries which have been involved in an accident or have been damaged on the high seas if there is a grave risk of oil pollution occurring as a result.

9.	Standards of Training, Certification and Watch keeping for Seafarers	International Convention on Standards of Training, Certification and Watch keeping for Seafarers (STCW) as amended, including the 1995 and 2010 Manila Amendments	The main purpose of the convention is to ensure the safety of seagoing personnel. Convention in explained in two codes A & B. Code A is mandatory while Code B is recommendation. It intends to help parties implement the convention.
10.	Maritime Search and Rescue (SAR)	SAR Convention 79	Aimed at developing an international SAR plan, so that, no matter where an accident occurs, the rescue of persons in distress at sea will be coordinated by a SAR organization and, when necessary, by co-operation between neighbouring SAR organizations.
11.	Safe containers	International Convention for Safe Containers (CSC) 72/77	The 1972 Convention for Safe Containers has two goals. • to maintain a high level of safety of human life in the transport and handling of containers by providing generally acceptable test procedures and related strength requirements • to facilitate the international transport of containers by providing uniform international safety regulations, equally applicable to all modes of surface transport to avoid proliferation of divergent national safety regulations The requirements of the Convention apply to the great majority of freight containers used internationally, except those designed especially for carriage by air. As it was not intended that all containers or reusable packing boxes should be affected, the scope of the Convention is limited to containers of a prescribed minimum size having corner fittings - devices which permit handling, securing or stacking.
12.	Safety of Fishing vessel	The Torremolinos International Convention for the Safety of Fishing Vessels (SFV),1977, superseded by the 1993 Torremolinos Protocol; Cape Town Agreement of 2012 on the Implementation of the Provisions of the 1993 Protocol relating to the Torremolinos International Convention for the Safety of Fishing Vessels	The Protocol applies to fishing vessels of 24 meters in length and over including those vessels also processing their catch. The general trend in modern designed fishing vessels, if they are to be economically profitable, must include improvements in machinery and fishing gear, improvements in safety features as a whole and better working conditions for fishermen. The safety provisions include automatically controlled machinery spaces, improved life-saving appliances, immersion suits and thermal protective aids, satellite communication systems and other components of the global maritime distress and safety system.

13.	Standards of Training, Certification and Watch keeping for Fishing Vessel Personnel	International Convention on Standards of Training, Certification and Watch keeping for Fishing Vessel Personnel (STCW-F), 1995	General Provisions & certifications of Safety of Skippers, Officers, Engineer Officers and Radio Operators.
14.	Space Requirements for Special Trade Passenger Ships, 1973	Special Trade Passenger Ships Agreement (STP), 1971 and Protocol on Space Requirements for Special Trade Passenger Ships, 1973	Following the International Conference on Special Trade Passenger Ships, 1971, IMO, in cooperation with other Organizations, particularly the World Health Organization (WHO), developed technical rules covering the safety aspects of carrying passengers on board in special trade passenger ships (ships carrying large nos. of unberthed passengers such as in pilgrim area)
15.	Prevention of Marine Pollution by Dumping of Wastes and Other Matter	Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (LC), 1972 (and the 1996 London Protocol)	London Convention, one of the first international conventions for the protection of the marine environment from human activities, came into force on 30 August 1975. Since 1977, it has been administered by IMO. It contributes to the international control and prevention of marine pollution by prohibiting the dumping of certain hazardous materials. In addition, a special permit is required prior to dumping of a number of other identified materials and a general permit for other wastes or matter.
16.	Oil Pollution Preparedness, Response and Co operation	International Convention on Oil Pollution Preparedness, Response and Cooperation (OPRC), 1990	As per convention, Ships are required to carry a shipboard oil pollution emergency plan. Operators of offshore units under the jurisdiction of Parties are also required to have oil pollution emergency plans or similar arrangements which must be coordinated with national systems for responding promptly and effectively to oil pollution incidents. Ships are required to report incidents of pollution to coastal authorities and the convention details the actions that are then to be taken. The Convention calls for the establishment of stockpiles of oil spill combating equipment, the holding of oil spill combating exercises and the development of detailed plans for dealing with pollution incidents. Parties to the convention are required to provide assistance to others in the event of a pollution emergency and provision is made for the reimbursement of any assistance provided.
17.	Preparedness, Response and Co-operation to pollution Incidents by Hazardous and Noxious Substances	Protocol on Preparedness, Response and Co-operation to pollution Incidents by Hazardous and Noxious Substances, 2000 (OPRC-HNS Protocol)	Convention aims to establish national systems for preparedness and response and to provide a global framework for international co-operation in combating major incidents or threats of marine pollution. Parties to the OPRC-HNS Protocol are required to establish measures for dealing with pollution incidents, either nationally or in co-operation with other countries. Ships are required to carry a shipboard pollution emergency plan to deal specifically with incidents involving hazardous and noxious substances. The OPRC-HNS Protocol ensures that ships

			carrying hazardous and noxious substances are covered by preparedness and response regimes similar to those already in existence for oil incidents.
18.	Control of Harmful Anti-fouling Systems	International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS), 2001	Under the terms of the AFS Convention, Parties to the Convention are required to prohibit and/or restrict the use of harmful anti-fouling systems on ships flying their flag, as well as ships not entitled to fly their flag but which operate under their authority and all ships that enter a port, shipyard or offshore terminal of a Party. Anti-fouling paints are used to coat the bottoms of ships to prevent sea life such as algae and mollusks attaching themselves to the hull – thereby slowing down the ship and increasing fuel consumption. The early days of sailing ships, lime and later arsenic were used to coat ships' hulls, until the modern chemicals industry developed effective anti-fouling paints using metallic compounds. These compounds slowly "leach" into the sea water, killing barnacles and other marine life that have attached to the ship. But studies have shown that these compounds persist in the water, killing sea-life, harming the environment and possibly entering the food chain. One of the most effective anti-fouling paints, developed in the 1960s, contains the organotin tributyltin (TBT), which has been proven to cause deformations in oysters and sex changes in whelks.
19.	Safe and Environmentally Sound Recycling of Ships	The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009	Convention aimed at ensuring that ships, when being recycled after reaching the end of their operational lives, do not pose any unnecessary risk to human health and safety or to the environment. It intends to address all the issues around ship recycling, including the fact that ships sold for scrapping may contain environmentally hazardous substances such as asbestos, heavy metals, hydrocarbons, ozone depleting substances and others. It will address concerns about working and environmental conditions in many of the world's ship recycling facilities. Regulations in the new Convention cover: the design, construction, operation and preparation of ships so as to facilitate safe and environmentally sound recycling, without compromising the safety and operational efficiency of ships; the operation of ship recycling facilities in a safe and environmentally sound manner; and the establishment of an appropriate enforcement mechanism for ship recycling, incorporating certification and reporting requirements. Ships to be sent for recycling will be required to carry an inventory of hazardous materials, which will be specific to each ship.

20.	Control and Management of Ships' Ballast Water and Sediments	International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004	Convention aims to prevent the spread of harmful aquatic organisms from one region to another, by establishing standards and procedures for the management and control of ships' ballast water and sediment. Under the Convention, all ships in international traffic are required to manage their ballast water and sediments to a certain standard, according to a ship-specific ballast water management plan. All ships will also have to carry a ballast water record book and an international ballast water management certificate. The ballast water management standards will be phased in over a period of time. As an intermediate solution, ships should exchange ballast water mid-ocean. However, eventually most ships will need to install an on-board ballast water treatment system
21.	Tonnage convention	International Convention on Tonnage Measurement of Ships 69/82	The Convention, adopted by IMO in 1969, was the first successful attempt to introduce a universal tonnage measurement system. The Convention provides for gross and net tonnages, both of which are calculated independently.
22.	Salvage Convention, 1989	International Convention on Salvage (SALVAGE), 1989	As per convention, "special compensation" to be paid to salvors who have failed to earn a reward in the normal way (i.e. by salving the ship and cargo). The compensation consists of the salvor's expenses, plus up to 30% of these expenses if, thanks to the efforts of the salvor, environmental damage has been minimized or prevented. The salvor's expenses are defined as "out-of-pocket expenses reasonably incurred by the salvor in the salvage operation and a fair rate for equipment and personnel actually and reasonably used".

1. **Ambient Air Quality Standards:** The MoEF&CC has the overall responsibility to set policy and Standards for the protection of environment along with Central Pollution Control Board (CPCB). Ambient Air Quality Standard given below:

REVISED NATIONAL AMBIENT AIR QUALITY STANDARDS (16TH NOVEMBER 2009)

Pollutants	**Time Weighted Average**	**Concentration in Ambient Air**	
		Industrial, Residential, Rural, other areas	**Ecologically Sensitive Area (Notified by Central Government)**
Sulphur Dioxide (SO_2), $\mu g/m^3$	Annual * 24 Hours **	50 80	20 80
Nitrogen Dioxide (NO_2), $\mu g/m^3$	Annual * 24 Hours **	40 80	30 80
PM_{10}, $\mu g/m^3$	Annual * 24 Hours **	60 100	60 100
$PM_{2.5}$, $\mu g/m^3$	Annual * 24 Hours **	40 60	40 60
Ozone (O_3) $\mu g/m^3$	8 Hours * 1 Hour **	100 180	100 180
Lead (Pb) $\mu g/m^3$ in particulate matter	Annual * 24 Hours **	0.50 1.0	0.50 1.0
Carbon Monoxide (CO), mg/m^3	8 Hours ** 1 Hour **	02 04	02 04
Ammonia (NH_3), $\mu g/m^3$	Annual * 24 Hours **	100 400	100 400
Benzene (C_6H_6), $\mu g/m^3$	Annual *	05	05
Benzo(a)Pyrene (BaP) ng/m^3 in particulate matter	Annual *	01	01
Arsenic (As), ng/m^3 in particulate matter	Annual *	06	06
Nickel (Ni), ng/m^3 in particulate matter	Annual *	20	20

* Annual Arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

2. Ambient Noise Standards

Ambient standard with respect to noise have been notified by the Ministry of Environment and forest vide gazette notification dated 26th December 1989 (amended in February 2000). It is based on 'A' weighted equivalent noise level (Leq). The ambient noise standards are presented in table below:

AMBIENT NOISE QUALITY STANDARDS

Area code	**Category of Area**	**Limits in dB(A) Leq**	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45

D	Sensitive Area	50	40

Note: *Day time is from 6 am to 10 pm, Night time is 10 pm to 6.00 am; ** Silence zone is defined as area up to 100 meters around premises of hospitals, educational institutions and courts. Use of vehicle horns, loud speakers and bursting of crackers are banned in these zones.

3. Ground Water Quality Standards

BIS STANDARDS FOR DRINKING WATER (IS:10500)

	Parameters	Unit	Acceptable Limit IS:10500	Permissible Limit IS:10500
1	Colour	Hazen units	5	15
2	Odour	-	Agreeable	Agreeable
3	Taste	-	Agreeable	Agreeable
4	Turbidity	NTU	1	5
5	Total Dissolved Solids	mg/l	500	2000
6	pH	-	6.5 to 8.5	No Relexation
7	Total Hardness as $CaCO_3$	mg/l	200	600
8	Iron as Fe	mg/l	0.3	No Relexation
9	Aluminium	mg/l	0.03	0.2
10	Copper as Cu	mg/l	0.05	1.5
11	Manganese as Mn	mg/l	0.1	0.3
12	Zinc as Zn	mg/l	5	15
13	Magnesium as Mg	mg/l	30	No Relexation
14	Barium	mg/l	0.7	No Relexation
15	Calcium as Ca	mg/l	75	200
16	Silver	mg/l	0.1	No Relaxation
17	Selenium as Se	mg/l	0.01	No Relaxation
18	Molybdenum	mg/l	0.07	No Relaxation
19	Boron	mg/l	0.5	1.0
20	Nitrates as NO	mg/l	45	No Relaxation
21	Sulphate	mg/l	200	400
22	Sulphide		0.01	No Relaxation
23	Fluoride as F	mg/l	1.0	1.5
24	Chlorides as Cl	mg/l	250	1000
25	Ammonia	mg/l	0.5	No Relaxation
26	Chloramines	mg/l	0.2	No Relaxation
27	Residual, Free chlorine	mg/l	0.2	1.0
28	Total Alkalinity as calcium Carbonate	mg/l	200	600
29	Phenolic compounds (as C_6H_5OH)	mg/l	0.001	0.002
30	Mineral Oil	mg/l	0.03	No Relaxation
31	Anionic detergents (as MBAS)	mg/l	0.2	1.0
32	Chromium	mg/l	0.05	No Relaxation
33	Arsenic as As	mg/l	0.01	0.05
34	Mercury as Hg	mg/l	0.001	No Relaxation
35	Cadmium as Cd	mg/l	0.003	No Relaxation
36	Lead as Pb	mg/l	0.01	No Relaxation
37	Nickel as Ni	mg/l	0.02	No Relaxation
38	Cyanide as CN	mg/l	0.05	No Relaxation
39	Polynuclear Aromatic Hydrocarbons (as PAH)	mg/l	0.0001	No Relaxation
40	Polyclorinated biphenyls	mg/l	0.0005	No Relaxation

41	Total Coliform	MPN/100ml	Nil	No Relaxation

4. Surface Water Quality

BEST DESIGNATED USE CRITERIA FOR SURFACE WATERS STREAMS

Designated-Best-Use	Class	Criteria
Drinking Water Source without conventional treatment but after disinfection	A	Total Coliforms Organism MPN/100ml <50 pH between 6.5 - 8.5 Dissolved Oxygen > 6mg/l Biochemical Oxygen Demand < 2mg/l
Outdoor bathing (Organised)	B	Total Coliforms Organism MPN/100ml < 500 pH between 6.5 - 8.5 Dissolved Oxygen > 5mg/l Biochemical Oxygen Demand < 3mg/l
Drinking water source after conventional treatment and disinfection	C	Total Coliforms Organism MPN/100ml < 5000 pH between 6 - 9 Dissolved Oxygen > 4 mg/l Biochemical Oxygen Demand < 3mg/l
Propagation of Wild life and Fisheries	D	pH between 6.5 - 8.5 Dissolved Oxygen > 4mg/l Free Ammonia (as N) < 1.2 mg/l
Irrigation, Industrial Cooling, Controlled Waste disposal	E	pH between 6.0 - 8.5 Conductivity at 25^{o}C:.< 2250 umhos/cm Sodium Absorption Ratio < 26 Boron < 2mg/l

5. Soil Quality

STANDARD SOIL CLASSIFICATION

The standard soil classification is shown below:

Sr. No.	Soil test	Classification
1.	Ph	5.51 - 6.0 Moderately acidic 6.01 - 6.50 Slightly acidic 6.51 - 7.30 Neutral 7.31 - 7.80 Slightly alkaline 7.81 - 8.50 Moderately alkaline
2.	Salinity as electrical conductivity (milli mhos/cm)	Up to 1.00 Average 1.01-2.00 Harmful to germination 2.01-3.00 Harmful to crops
3.	Organic carbon (%)	0.21-0.4 Less 0.41-0.5 Medium 0.51-0.8 On an average sufficient 0.81-1.00 sufficient
4.	Nitrogen (kg/ha)	51-100 Less 101-150 Good 151-300 Better >300 Sufficient
5.	Phosphorus (kg/ha)	16-30 Less 31-50 Medium 51-65 On an average sufficient
6.	Potassium (kg/ha)	120-180 Less

		181-240 Medium 241-300 Average 301-360 Better

Annexure 3: Tree Plantation and Management Plan

1.0 Introduction

It is proposed to develop 10 m thick peripheral green belt all around the site and also green belt will be developed along approach road& internal roads. Total green area will be provided at the project site.. As extent possible the trees present on the boundary of the institute building shall maintained as greenbelt. 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. 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.	*Pongamia pinnata*	Indian beech	Tree
2.	*Anthocephalus cadamba*	Kadam	Tree
3.	*Ficus benghalensis*	Badh	Tree
4.	*Mangifera indica*	Aam	Tree
5.	*Tectona grandis*	Teak	Tree
6.	*Ficus religiosa*	Peepal	Tree
7.	*Dalbergia sissoo*	Shisham	Tree
8.	*Tabernaemontana divaricata*	Chandani	Shrub
9.	*Cassia fistula*	Golden shower	Tree
10.	*Delonix regia*	Gulmohar	Tree
11.	*Bougainvillea glabra*	Bougainvillea	Shrub
12.	*Nerium indicum*	Kaner	Shrub
13.	*Celosia argentea*	Croton	Herb
14.	*Hibiscus rosasinensis*	Hibiscus	Shrub
15.	*Azadirachta indica*	Neem	Tree
16.	*Swetania mohogini*	Cuban Mahagony	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 are well 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 favourable 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 responsibility of the contractor which may be carried out through Forest department and all the associated costs shall be borne by the contractor for the same. Survival rate of plantation shall be inspected by IWAI. Plantation within the institute building shall be carried out by the contractor and shall be monitored by IWAI.

Annexure 4: 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.)

- **1.1 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.
-
- **1.2 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)
- **1.3 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

- **1.4 REPORTING**

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

- **1.5 RESPONSIBILITY**

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

Annexure 5: 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.

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 used for filling the site. If not found suitable then it 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 and notified forest areas.
- 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 up to 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 Redressed mechanism should be in place for taking note and action on such complaints.

Annexure 6: 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, and no smoking zone and associated risks. Plant operation shall be restricted to 10:00 PM to 6:00 AM.

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 eatables 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 shall is 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

- Septic tanks/soak pits should be dismantled
- Any temporary/permanent structure constructed shall be dismantled
- 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
- The site shall be cleaned properly
- Tree plantation to be carried out, if any required for stabilizing the area
- Any pit excavated shall be filled back
- Closure of the site and labour camp shall be approved by authorized person.

Annexure 7: Environmental Standards for water/ waste water Applicable to the Project

Standards for Discharge of Effluents: Under EPA Act, 1986, standards are prescribed for discharge of effluents in inland water bodies and marine coastal area and are given in **Table 1**.

Table 1: Standards for Discharge of Effluents

Sr. No.	Parameters	Standards	
		Inland Surface Waters	Marine Coastal Areas
1	Color & odour	All efforts shall be made to remove colour and unpleasant odour as far as practicable	All efforts shall be made to remove colour and unpleasant odour as far as practicable
2	Suspended solids mg/l, Max	100	1. For process wastewater-100 2. For cooling water effluent 10% above total suspended matter of influent
3	Particle size of suspended solids	Shall pass 850 Micron IS sieve	1. Floatable solids max. 3 mm 2. Settleable solids max. 850 microns
4	pH Value	5.5-9.0	5.5-9.0
5	Temperature	Shall not exceed 5^0 C above the receiving water temperature	Shall not exceed 5^0 C above the receiving water temperature
6	Oil and grease mg/ l Max.	10	20
7	Total residual chlorine mg/l Max.	1.0	1.0
8	Ammonical Nitrogen (as N), mg/l Max.	50	50
9	Total Kjeldahl nitrogen (as NH3), mg/l Max.	100	100
10	Free ammonia (as NH_3) mg/l Max.	5.0	5.0
11	Bio-chemical oxygen demand (3 days at 270 C), mg/l max.	30	100
12	Chemical oxygen demand, mg/l max	250	250
13	Arsenic (as As), mg/l max.	0.2	0.2
14	Mercury (as Hg), mg/l max.	0.01	0.01
15	Lead (as Pb), mg/l max.	0.1	2.0
16	Cadmium (as Cd), mg/l max.	2.0	2.0
17	Hexavalent chromium (as Cr +6), mg/l max	0.1	1.0
18	Total chromium (as Cr) mg/l max	2.0	2.0
19	Copper (as Cu), mg/l max.	2.0	3.0
20	Zinc (as Zn), mg/l max	5.0	15.0
21	Selenium (as Se), mg/l max.	0.05	0.05
22	Nickel (as Ni), mg/l max	3.0	5.0
23	Cyanide (as CN), mg/l max.	0.2	0.2
24	Fluoride (as F), mg/l max.	2.0	15
25	Dissolved phosphates (as P), mg/l max.	5.0	--
26	Sulphide (as S), mg/l	2.0	5.0

Sr. No.	Parameters	Standards	
		Inland Surface Waters	Marine Coastal Areas
	max.		
27	Phenolic compounds (as C6 H5OH), mg/l max.	1.0	5.0
28	Radioactive materials: a. Alpha emitter micro curie/ml b. b. Beta emitter micro curie/ml	10^{-7} 10^{-6}	10^{-7} 10^{-6}
29	Bio-assay test	90% survival of fish after 96 hours in	90% survival of fish after 96 hours in
30	Manganese (as Mn), mg/l	2	2
31	Iron (as Fe), mg/	3	3
32	Vanadium (as V), mg/l	0.2	0.2
33	Nitrate nitrogen (mg/l)	10	20

Standards Classification of Inland Surface Water Bodies: Surface water bodies are classified on the basis of use by CPCB and the classification is given in **Table 2**.

Table 2: Surface Water Body Classification, CPCB

Designated – Best – Use	Class of Water	Criteria
Drinking Water Source without conventional treatment but after disinfection	A	1. Total Coliforms or Organism MPN / 100 ml shall be 50 or less 2. pH between 6.5 and 8.5 3. Dissolved Oxygen 6mg/l or more 4. Biochemical Oxygen Demand 5 days 20ºC 2mg/l or less
Outdoor bathing (Organized)	B	1. Total Coliforms Organism MPN / 100 ml shall be 500 or les 2. pH between 6.5 and 8.5 3. Dissolved Oxygen 5 mg/l or more 4. Biochemical Oxygen Demand 5 days 20ºC 3 mg/l or less
Drinking water source after conventional treatment and disinfection	C	1. Total Coliforms Organism MPN / 100 ml shall be 5000 or less 2. pH between 6 to 9 3. Dissolved Oxygen 4 mg / l or more
Propagation of Wild life and Fisheries	D	1. pH between 6.5 to 8.5 2. Dissolved Oxygen 4 mg / l or more 3. Free Ammonia (as N) 1.2 mg / l or less
Irrigation, Industrial Cooling, Controlled Waste Disposal	E	1. pH between 6.0 to 8.5 2. Electrical Conductivity at 25ºC micro mhos / cm Max. 2250 3. Boron Max. 2 mg/l

Standards for permissible level of water quality indicator: The permissible level of indicators for assessing water quality, in port development in India is given below in **Table 4**.

Table 3: Standard for Permissible Level of Water Quality Indicator

Country	Purpose / Place	Indicator					
		Ph	DO (mg/l)	COD (mg/l)	BOD (mg/l)	Oil (mg/l)	Coliform bacteria (MPN / 100 ml)
India	Polluted area ○ Recreation ○ Harbor	 6.5 – 9.5 6.5 – 9.0	 ≥ 3 ≥ 4	 - -	 ≤ 5 ≤ 5	 ≤ 0.1 ≤ 10	 ≤ 1000 ≤ 2500

	Non-polluted area ○ Bathing ○ Aquatic biota	- -	 ≥ 5 ≥ 4	- -	 ≤ 3 ≤ 6	- -	 ≤ 500 ≤ 500
Indonesia	Coastal Water ○ Bathing ○ Aquaculture ○ Marine Park ○ Industry	 6.0 – 9.0 6.0 – 9.0 6.0 – 9.0 6.0 – 9.0	 ≥ 5 ≥ 4 ≥ 4 -	 ≤ 40 ≤ 80 ≤ 80 ≤ 40	 ≤ 20 ≤ 45 ≤ 45 ≤ 20	 ≤ 3 ≤ 5 ≤ 5 ≤ 2	 ≤ 1000 ≤ 1000 ≤ 1000 ≤ 1000
Japan	Sea ○ Bathing ○ Industry (B) ○ Industry (B)	 7.8 – 8.3 7.8 – 8.3 7.0 – 8.3	 ≥ 7.5 ≥ 5 ≥ 2	 ≥ 2 ≥ 3 ≥ 8	 - - -	 ≤ 0.5 ≤ 0.5 -	 ≤ 1000 - -
Malaysia	Sea ○ Natural ○ Aquatic biota ○ Recreation ○ Common	 6.5 – 8.5 6.0 – 9.0 6.0 – 9.0 6.0 – 9.0	 ≥ 7 5 - 7 5 - 7 3 - 7	 ≤ 10 ≤ 25 ≤ 25 ≤ 25	 ≤ 1 ≤ 3 ≤ 3 ≤ 6	 ND - - -	 ≤ 100 ≤ 5000 ≤ 5000 ≤ 50,000
Philippines	Sea ○ Recreation ○ Aquatic biota ○ Industry ○ Navigation	 6.5 – 8.5 6.5 – 8.5 6.5 – 8.5 6.0 – 9.0	 ≥ 5 ≥ 5 ≥ 3 ≥ 2	 - - - -	 - - - -	 ≤ 2 ≤ 5 ≤ 5 ≤ 10	 ≤ 1000 ≤ 5000 – –
Thailand	Sea ○ Swimming ○ Conservation	 6.5 – 8.3 7.5 – 8.9	 ≥ 4 ≥ 5	 - -	 - -	 ND ND	 ≤ 1000 -

RISK ASSESSMENT & HAZARD MANAGEMENT PLAN

National Disaster Management Act, 2005 (DM Act, 2005) is the basic legislation in the purview of Disaster Management (DM). DM Act defines a disaster as "a catastrophe, mishap, calamity or grave occurrence in an area, arising from natural or manmade causes, by incidence or negligence which results in substantial loss of life or human suffering or damage to and destruction of property or damage to, or degradation of the environment of such a nature or magnitude as to be beyond the coping capacity of the affected area". They can be natural, manmade or hybrid based on the cause of their occurrence.

DM Act defines disaster management as a "continuous and integrated process of planning, organizing and coordinating and implementing measure which are necessary or expedient". It can be divided into the following steps:

- **Prevention:** Preventing threat of any disaster which is possible to a great extent inthe case of a manmade disaster.
- **Preparedness:** Contingency planning, stockpiling of equipment and supplies, arrangements for inter-agency coordination, preparation of evacuation plans and public awareness, capacity building and associated training and mock drills.
- **Response:** Prompt response to any threatening disaster situation or disaster including evacuation, rescue and immediate relief.
- **Recovery & Mitigation:** Assessing the severity or magnitude of effects of any disaster. Rehabilitation and Reconstruction and implementing measures for reduction of severity or consequences of a disaster

So, in case of disaster management, the phase wise activities required could be summarized as in
Figure 1.

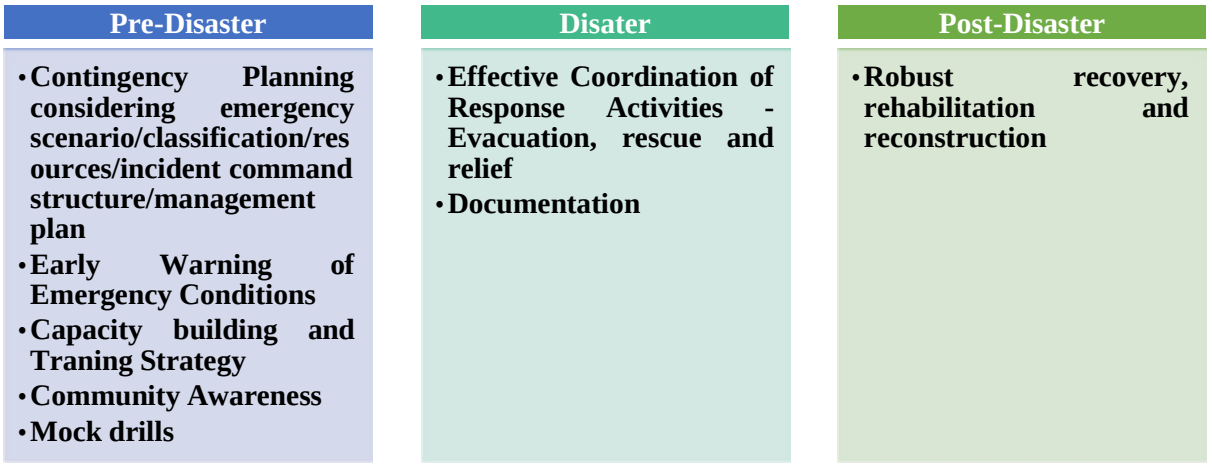


Figure 1: Various Phase of Disasters and Activities Involved – On a Broader Profile

Towards identification of the probable disasters associated with the project, a hazard risk, vulnerability and capacity analysis was carried out as presented below.

1. Hazard, Risk, Vulnerability and Capacity Analysis (HRVCA)

The project component include construction of community jetties, associated ancillary facilities and vessel operation. Hazards due to the project may be natural or manmade which may turn out in to a disaster during operation phase. Towards deriving the disaster management plan, the probable hazards along the project area and activities were identified followed by risk assessment.

A hazard is defined as an agent, which has the potential to cause harm or damage to a vulnerable target

i.e. people, property or environment. Historical analysis has been carried out based on the literature review to understand the hazards associated with IWT operation. The accident data were analyzed to delineate the major hazard as well as the causes of hazard and further the same was analyzed w. r. to their applicability for vessel operation in NW-1 route.

The hazards could be categorized as natural and manmade. Natural hazard include flood, tsunami, earth quake etc., and manmade hazards include chemical disasters, road /vessel accidents etc. The project area vulnerability w.r.to the prominent natural and manmade disasters were primarily assessed which will have impact on operation of various facilities and activities on land and cruise operations. W r to the cruise vessel apart from the natural and disasters, the various risk factors w. r. to vessel operation was analyzed in detail.

An extensive literature review was carried out for the various causes and contributing factors of inland vessel accidents worldwide and probability of the same w.r.to the project region and cruise operation was assessed with specific reference to the local factors which may have an additional influence on the risk profile. The analysis is summarized in **Table 1.**

Table 1: Probable Disasters due to Natural Hazards

Sl.No	Risk Factors	Disaster
1	Bad Weather Condition /Natural Hazard	
2	Storm	Destruction of structures Collision/Contact/grounding of Vessel leading to Capsize
	Flood	
	Earth Quake	
	Cyclone	
	Tsunami	

In case of cruise operation of various facilities the risk factors and resultant probable disasters are presented in **Table 2.**

Table 2: Probable Disasters along the Infrastructure facilities in Operational Phase

Sl.No	Facility	Risk Factor	Disaster
1	Community Jetties at all 08 locations	Overcrowding / slipping while boarding and unboarding from vessel	Structural collapse and accident due to fall into river.

Risk factors w r.to vessel operation include channel related risk as well as vessel related risk and leadingto the probable disasters are as presented in **Table .3**

Table 3: Probable Disasters during Vessel Operation

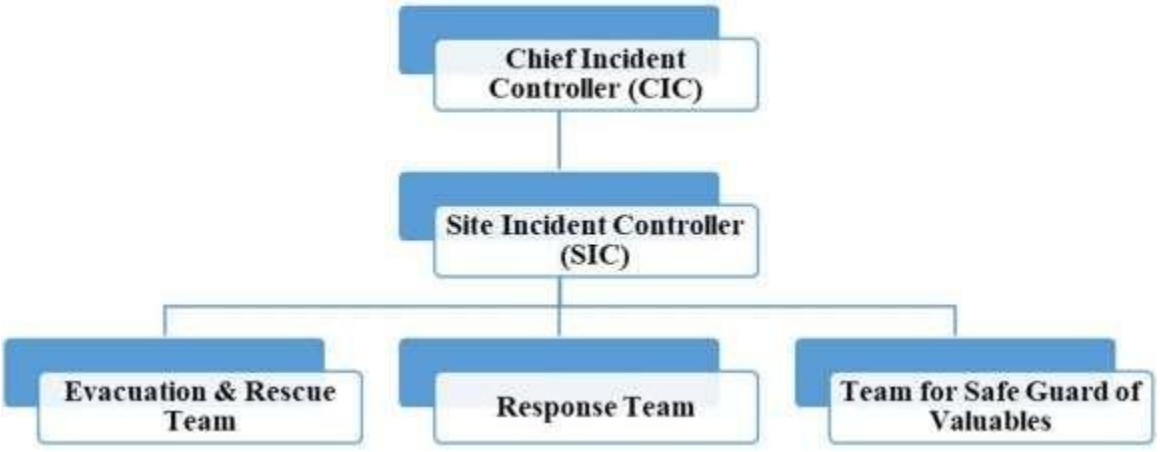
Sl No	Risk Factors	Probable Disaster
1	Careless Vessel Operation	Collision / contact / grounding for vessel leading to vessel Capsize
2	Overloading	Vessel Capsize
3	Loss of Vessel Control	Collision/contact/grounding for vessel leading to vessel Capsize
4	Equipment failure leading to mis navigation	Collision/contact/grounding for vessel leading to vessel Capsize
5	Stability Failure due to unbalanced allotment of people on board	Collision/contact/grounding for vessel leading to vessel Capsize
6	Fire on Vessel due to use of flammable materials	Accident due to human escape to river.
6	River Piracy / Sabotage	Collision/contact/grounding for vessel leading to vessel Capsize

2. Disaster Management Measures

Management Measures to be adopted for the reducing the impact of the expected disasters are discussed in the following section.

- **Constitution of Onsite Disaster/ Emergency Management Cell (EMC)**

An Emergency Management Cell (EMC) will be constituted before the operation phase towards the better coordination and implementation of disaster management measures. The



EMC proposed is as presented in

Figure 2: Emergency Management Cell Proposed for the Facility

The EMC will meet at least once in 3 months to review the working of the contingency plan, the problem faced in recent disasters and amendment modifications to be adopted in future. The Committee will be responsible for overall managing the disaster situation, take administrative decisions as and when required, reviewing the disaster plan and to inform the Government on the situation. An Emergency Response Centre (ERC) should be maintained

and put in action within the facility whichwould co-ordinate with various state departments to ensure planning, response and recovery. The responsibility allocation of each member EMC during a disaster management is presented in **Table 4.**

Table 4: Responsibilities of EMC Members

Sl. No.	Designation	Responsibilities
1		▪ Overall In charge of the Incident.
Sl. No.	Designation	Responsibilities
	Chief Incident Controller	▪ Coordination with Management/ mother Department District Disaster Management Authorities, external agencies, media etc.,
		▪ Appraise the incident and give proper directions to the SIC and his team from time to time.
		▪ Declare emergency as well as issue 'ALL Clear' order after emergency.
2	Site Incident Controller (SIC)	▪ Analyse the onsite emergency response requirement and request for the same to CIC from time to time.
		▪ Deploy the team members and supervise their operations.
		▪ Support CIC for coordination internal and external communication and administration.
3	Response Team headed	▪ Initiate response with equipment and facilities available at site.
		▪ Report regarding the adequacy of existing equipment and provide the requirement for additional facilities.
		▪ Identifying safe route for firefighting, ambulance, medical team etc.,
4	Evacuation & Rescue Team	▪ Alert the occupants about the emergency
		▪ Blow siren
		▪ Show evacuation paths, Assembly points and cite self-protection measures.
		▪ Arrange for rescue and first aid with the help local and occupant volunteers.
		▪ Arrange for sending causalities to hospitals.
5	Team for Safe Guard of Valuables headed	▪ Take appropriate actions for the safe guard of valuables and assets such as important documents, cash chests etc.,
		▪ Take head count (Live/Injury/ Death) after emergency.

- **Emergency Response Centre (ERC) for Disaster Management**

The Emergency Response Centre will be earmarked to function as a Control Room for disaster management. A Control Room will respond immediately during an emergency situation and isequipped with State of the Art communication equipment which enables it to communicate quickly to the affected area and provide immediate support during the Golden Hour of the disaster. This room should also consist of announcing system, fire extinguishers, smoke detectors and sensors.

- **Establishing Local Coordinating Group**

Coordination group at the local level shall be constituted to be mobilize at the time of major disasters.

- **Early Warning System w r to Natural Hazards**

The early warning system is useful to detect, forecast and issue the alert when the disaster occurs. A liasoning with the nodal agencies of Government of UP / India responsible for the natural disaster will be done for getting the warning on the natural hazards.

- **Proper Crowd Management**

Towards ensuring safety and security to crowd coming to the of the proposed tourism circuitfollowing guidelines shall be followed

  - Sufficient CCTV shall be established in terminals to monitor the crowd
  - Entire circuit area shall be provided with proper communication channels (PA system) to send message to crowd shall be implemented.
  - A mini UAV shall be deployed for observing the crowd in case of crowd spared istoo big
  - Sufficient safety measures shall be provided in each cruise to be utilized at the time of disaster. And the detailing of the same shall be provided to the victors before starting of each trip.
  - A detailed narration of the emergency measure provided will be displayed to the commutators before starting of the trip.

- **Development and Display of Evacuation Plan**

A well-planned assembling point within the route will be detailed so that easy evacuation of the crowd during the disaster can be achieved.

- **Fire Alarms / Other Measures**

Sufficient fire and smoke alarms at common areas shall be provided, so that visitors and all the staff will be are informed in the event of the disaster for initiating appropriate measures forrescue.

- **DO's and Don'ts Pamphlets**

Dos and Don'ts pamphlets for the visitors towards each disaster will be prepared and displayed intourists' places.