



Tender No. MUM(S)/EL/405/OHE Balance Works/JNPT-Vaitarna

For

**Name of the Work: - “Execution of balance Works for 2x25 kV High Rise OHE in JNPT-Vaitarna
Section of DFCCIL in CGM/Mumbai South Unit (102 Km)”**

(PARTICIPATION THROUGH E-TENDER ONLY)

**Visit: - www.ireps.gov.in/ its link at www.dfccil.com
(Help Desk of IREPS: 011-23761525)**

E-TENDER DOCUMENT (TWO PACKET)

October-2024

Employer:

**DEDICATED FREIGHT CORRIDOR CORPORATION OF INDIA LIMITED
CGM-MUMBAI SOUTH UNIT
(A GOVERNMENT OF INDIA ENTERPRISE)
UNDER MINISTRY OF RAILWAYS**

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PART – I

Chapter – I

NOTICE INVITING E-TENDER

PART- I
Chapter I

NOTICE INVITING E-TENDER

1.1.0. Name of the work: -

“Execution of balance Works for 2x25 kV High Rise OHE in JNPT-Vaitarna Section of DFCCIL in CGM/Mumbai South Unit (102 Km)”

- 1.1.1. Office of the Chief General Manager, Dedicated Freight Corridor Corporation of India Limited, 7th Floor, New Administrative Building, D. N. Road, Mumbai – 400001 invites tenders in prescribed forms from firms/ Companies/ Joint Ventures (If Applicable) having requisite experience and financial capacity for execution of the following work:

1	Tender Notice No.	MUM(S)/EL/405/OHE Balance Works/ JNPT-Vaitarna
2	Name of Work	Execution of balance Works for 2x25 kV High Rise OHE in JNPT-Vaitarna Section of DFCCIL in CGM/Mumbai South Unit (102 Km)
3	Employer	Chief General Manager, Mumbai (South), 7th floor, Central Railway, New Administrative Building, D.N. Road, Mumbai-400001.
4	Engineer	Engineer shall be PMC-2R -OCG Consortium comprised by (i) Oriental Consultants Global Co. Ltd., Japan, (ii) Oriental Consultants India Pvt. Ltd., (iii) Nippon Koei Co. Ltd., (iv) Nippon Koei India Pvt. Ltd. And (v) RITES Ltd OR Any Authority Appointed by Employer
5	Type of Tender	Open E-Tender (Two Packet System)
6	Type of Contract	Work contract
7	Estimated Cost	Rs. 142,07,85,426.36/- (Rupees - One Hundred Forty-Two Crore - Seven Lakhs Eighty-Five Thousand Four Hundred Twenty-Six and Thirty-Six Paise only) Including GST.
8	Period of Contract/ Completion Period	12 Months (Twelve Months)

9	Bid Security/EMD	Rs. 72,53,900/- (Seventy-Two Lakh Fifty-Three Thousand Nine Hundred Only)) The Bid security shall be submitted in favor of DFCCIL in the form as detailed in para 1.3.8 of Preamble & General Instructions to Tenderers (Part I Chapter-III) The Original Bank guarantee of Bid security (Also called Earnest money) have to be dropped in Tender box at Employer's office before the schedule date & Time of submission of the Tender. The bid security may be accepted in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee [including e-Bank Guarantee].
10	Cost of Tender Document	Rs. 29,500/- (including GST) (Rs. Twenty-Nine Thousand Five Hundred Only) The cost of the tender document shall be deposited through payment gateway provided on http://www.ireps.gov.in on or before schedule date and time of submission of Bid. The proof of submission of cost of tender document should be uploaded along with the Technical Bid.
11	E-tendering website	www.ireps.gov.in For any help in connection with E-tendering & matter relating to Digital signature, please contact 'Help Desk available on left Navigation Block of home page of the site https://www.ireps.gov.in and phone No. 011-23761525
12	Date of uploading of NIT & Bid documents (online publishing date)	On Date 17.10.2024 at 16.00 Hrs
13	Date of document download/ Sale (Online)	From Date ---,---,20-- from ---,--- Hrs
14	Issue of Corrigendum, if any	Upto three days prior to the last date of submission of Bid (on websites http://www.ireps.gov.in and www.dfccil.com)
15	Pre-Bid Meeting	12:00 Hrs On dated 28.10.2024 at Chief General Manager, Mumbai (South), 7th floor, Central Railway, New Administrative Building, D.N. Road, Mumbai-400001.
16	Date & Time of Submission of Tender	On or before date 25.11.2024 and time upto 16:00 hrs
17	Date and Time of	Date 25.11.2024 at 16.30 hrs

	Opening of Tender (Technical bids -Packet A) online as well as tender box	Opening date of Financial Bid (Packet-B) will be notified later.
18	Validity of offer	120 days from the date of opening of the Technical Bid of the Tender
19	Security Deposit	5% of Contract value
20	Performance Bank Guarantee	Performance Guarantee (PG) have to be submitted within 21 (twenty-one) days from the date of issue of Letter of Acceptance (LOA), amounting to 5% of the contract value in the form as given in clause 16.4 of GCC
21	Defect Liability Period	12 Months (Twelve Months)

- 1.1.2. Eligibility shall be assessed on applicants, fulfilling the technical capability and competence as well as for financial and organizational resources as specified in clause no. 1.3.13 (i) & 1.3.13 (ii) of Preamble and General instruction to tenders (Part-I, Chapter III).
- 1.1.3. Tender document will be available on DFCCIL's website www.dfccil.com, <http://www.ireps.gov.in> & Central Procurement portal eprocure.gov.in. However, the tender shall be submitted only on <http://www.ireps.gov.in>. Tenderers are advised not to make any corrections, additions or alterations in the downloaded tender documents. In case, any corrections additions or alterations in the downloaded tender documents are made, such tender shall be summarily rejected.
- 1.1.4. DFCCIL may issue amendment(s) [addendum(s) / corrigendum(s)] to the tender documents. In such cases the amendment(s) shall be issued and placed on DFCCIL's website: www.dfccil.com and <http://www.ireps.gov.in> at least three days in advance of date of opening of tender. The tenderer who has downloaded the tender documents from the website before issue of amendment(s) must visit the website and ensure that such amendment(s) (if any) is also downloaded by them. Such amendment(s) (if any) shall also be uploaded duly stamped and signed / digitally signed along with the submission of tenders. Any tender submitted without amendment(s) (if any) shall be liable to be rejected.
- 1.1.5. The tender documents shall be submitted in online mode only through website <http://www.ireps.gov.in> in two e-Packets only viz Packet- A containing TECHNICAL BID and Packet- B containing FINANACIAL BID. Detailed credential as per the requirement of eligibility criteria and all tender papers except Bill of Quantities/quoted price are to be submitted in technical bid.
- Summary of Prices (Form No. 3) with % age above or below or at par on the amount of Schedules duly filled in along with Schedule of Prices (Form - 4) are to be submit online mode only in "Financial Bid".

Tenderer shall submit the Cost of Tender Document in favor of DFCCIL as detailed in Para 1.3.4.3 of Preamble & General Instructions to Tenderers (Part-I, Chapter-III).

Tenderer shall submit the BID SECURITY as detailed in Para 1.3.8 of Preamble & General Instructions to Tenderers (Part-I, Chapter-III) in original in the office of Employer (**Office of the Chief General Manager, Dedicated Freight Corridor Corporation of India Limited, 7th Floor, New Administrative Building, D. N. Road, Mumbai – 400001**) on or before the scheduled date and time of submission of tender.

Financial Bid (as specified in “Financial Bid” in Tender Document) duly filled in is to be uploaded in “Financial packet”. The rates must be filled after downloading the financial bid document in the prescribed format from the website <http://www.ireps.gov.in>. The financial bid should be downloaded & then filled up, saved and uploaded on the E-tendering website using digital signature for signing the document.

1.1.6. Procedure for e-tendering

1.1.6.1. Accessing/ purchasing of Tender Documents.

1.1.6.2. It is mandatory for all the Bidders to have class-III Digital Signature Certificate (DSC) from any of the licensed certifying agency (Bidders can see the list of licensed certifying agencies from the link www.cca.gov.in) to participate in e-tendering.

1.1.6.3. To participate in the Bidding, it is mandatory for the Bidders to register with IREPS portal to have user ID & password. IREPS portal is the only website for submission of Bid. Vender manual containing the detailed guidelines for e-tendering is available on IREPS portal. Following may kindly be noted:

- (a) Registration with IREPS portal should be valid at least up to the date of submission of bid.
- (b) Bids can be submitted only during the validity of registration.

It is also mandatory for the Bidders to get their firms registered with e-tendering portal.

1.1.6.4. If the firm / Joint Venture is already registered with e-tendering service provider, and validity of registration is not expired, then the firm/Joint Venture is not required a fresh registration.

1.1.6.5. The complete Bidding Documents can be viewed / downloaded by the Bidder from IREPS portal as per the time and date mentioned on the IREPS portal.

1.1.7. Tenders shall be opened at the address given below as mentioned in Para 1.1.1 above in the presence of the tenderers or their authorized representatives intending to attend the opening.

All the Bids received shall be opened on the date and time mentioned above in the tender notice. Bid of the bidders shall be opened through process of e-tendering. The sequence of opening

shall be:

- i) Cost of Tender Document and Bid Security Deposit Details
- ii) Technical offer- Technical Bid (Packet-A)
- iii) Financial offer. (On a later date after scrutiny/evaluation of Technical Bid)

- 1.1.8. Tender shall be submitted as per “Preamble & General Instruction to Tenderers” forming as part of the complete tender documents.
- 1.1.9. Any tender received without Bid Security and/or Cost of tender document in the form as specified in the tender documents shall not be considered and shall be summarily rejected.
- 1.1.10. DFCCIL reserves right to cancel the tender before submission / opening of tender, postpone the tender submission / opening date and to accept / reject any or all tenders without assigning any reason thereof. DFCCIL's assessment of suitability as per eligibility criteria shall be final and binding.
- 1.1.11. Tenderers may note that they are liable to be disqualified at any time during tendering process in case any of the information furnished by them is not found to be true. BID SECURITY of such tenderers shall be forfeited. The decision of DFCCIL in this regard shall be final and binding.
- 1.1.12. DFCCIL reserves the right to pre-qualify the bidder(s) provisionally based on the documents submitted by them and open financial bid(s), subject to their final verification. In the event of any document being found false, the provisional qualification shall stand withdrawn, and the next lower bidder shall automatically come to the position of such disqualified bidder. Action against such disqualified tenderers shall be taken as per above Clause No. 1.1.11 of Notice Inviting E-Tender.
- 1.1.13. Information as required as per various Forms to tender document should be submitted by the tenderers without fail strictly as per formats.
- 1.1.14. The validity of offer shall be 120 days from the date of opening of the Technical Bid of the tender.
- 1.1.15. Transfer of the tender document purchased by intending tenderer to another tenderer is not admissible. Tenderer can submit tenders only on the documents purchased / downloaded from the website <http://www.ireps.gov.in> by them.
- 1.1.16. Tenderers must read all instructions regarding e-tendering process as mentions in PREAMBLE & GENERAL INSTRUCTIONS TO TENDERERS Part-I, Chapter-III.
- 1.1.17. Tenderers are advised to visit the DFCCIL website regularly for information regarding tender.

Amendment(s) (if any) will be uploaded on DFCCIL website www.dfccil.com and / <http://www.ireps.gov.in> only.

- 1.1.18. The cost of tender document (tender fee) as mentioned in the notice inviting tender on website www.ireps.gov.in, should be accepted through net banking on payment gateway. The cost of tender document shall not be clubbed with the earnest money deposit. The tenders unaccompanied with the requisite cost of tender documents in appropriate form shall not be considered or as per instruction given on website www.ireps.gov.in.
- 1.1.19. The tenders shall be filled up after careful study of the documents and the site and any clarification required may be obtained from the tender inviting authority.
- 1.1.20. The tenderers downloading the documents from internet must keep themselves updated through the website from which the tender document is downloaded regarding corrigenda, if any, to the notice inviting tender or the tender document, which shall be uploaded in the same website. The offers received without such corrigenda published through website shall be liable to be rejected.
- 1.1.21. Any willful changes/deletion/addition in printing carried out in the tender documents shall be viewed very seriously, whether detected at the time of opening/award of tender or after award of work and the same may result in penal action including banning of further business with the defaulting tenderers. In addition, the tenderers are liable to be prosecuted for the same as per law.
- 1.1.22. E-Tenders shall be opened online at the time and given date as per NIT.

PART – I

Chapter II

GENERAL INFORMATION / DATA SHEET

PART – I**Chapter II****GENERAL INFORMATION/DATA SHEET**

S.N.	TENDER NOTICE NO.	MUM(S)/EL/405/OHE Balance Works/ JNPT-Vaitarna
1	Name of the work	“Execution of balance Works for 2x25 kV High Rise OHE in JNPT-Vaitarna Section of DFCCIL in CGM/Mumbai South Unit (102 Km)”
2	Employer	Chief General Manager, Mumbai (South), 7th floor, Central Railway, New Administrative Building, D.N. Road, Mumbai-400001
3	Engineer	Engineer shall be PMC-2R -OCG Consortium comprised by (i) Oriental Consultants Global Co. Ltd., Japan, (ii) Oriental Consultants India Pvt. Ltd., (iii) Nippon Koei Co. Ltd., (iv) Nippon Koei India Pvt. Ltd. And (v) RITES Ltd OR Any Authority Appointed by Employer
4	Type of Tender	Open E-Tender (Two Packet System)
5	Type of Contract	Works Contract
6	Estimated Cost	Rs. 142,07,85,426.36/- (Rupees - One Hundred Forty-Two Crore - Seven Lakhs Eighty-Five Thousand Four Hundred Twenty-Six and Thirty-Six Paise only) Including GST.
7	Period of Contract / Completion Period	12 Months (Twelve Months)
8	Bid Security/Earnest Money	Rs. 72,53,900/- (Seventy-Two Lakh Fifty-Three Thousand Nine Hundred Only) The Bid security shall be submitted in favor of DFCCIL in the form as detailed in para 1.3.8 of Preamble & General Instructions to Tenderers (Part I Chapter-III) The Original Bank guarantee of Bid security (Also called Earnest money) have to be dropped in Tender box at Employer’s office before the schedule date & Time of submission of the Tender. The bid security may be accepted in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit

		Receipt, Banker's Cheque or Bank Guarantee [including e-Bank Guarantee].
9	Cost of Tender Document	Rs. 29,500/- (25,000/- + 18% GST) Rs. 25,000/- (Rs. Twenty-Five Thousand only) + 18 % GST =29,500/- to be paid online through payment gateway provided at www.ireps.gov.in payable in favor of "Dedicated Freight Corridor Corporation of India Limited, Mumbai South"
10	E-Tendering Web site Address:	www.ireps.gov.in www.ireps.gov.in/ its link at www.dfccil.com (Help Desk of IREPS: 011-23761525) For any clarification, help and registration for E- Tendering & matter relating to Digital Signature, contact at Help Desk.
11	Date of uploading of NIT & Bid documents (online publishing date)	17.10.2024
12	Date of document download/Sale (Online)	As per IREPS
13	Issue of Corrigendum if any	As per IREPS
14	Pre-Bid Meeting	12.00 Hrs On dated 28.10.2024 at Chief General Manager, Mumbai (South), 7th floor, Central Railway, New Administrative Building, D.N. Road, Mumbai-400001
15	Date & Time of submission of Tender	On or before date 25.11.2024 and time upto 16:00 hrs
	Date & Time of opening of Tender (Technical Bid-Packet A) On line As well as Tender Box	Date 25.11.2024 at 16.30 hrs Opening date of Financial Bid (Packet-B) will be notified later.
16	Validity of offer	120 days
17	Security Deposit	5% of contract value as per Preamble and General Instruction to Tenderers.
18	Performance Bank Guarantee	Performance Guarantee (PG) have to be submitted within 21(Twenty-One) days from the date of issue of Letter of Acceptance (LOA), amounting to 5 % of the contract value in the form as given in clause 16. (4) of GCC.
19	Defect Liability Period	12 Months

20	DFCCIL's Bank Account	DFCCIL's Bank Account Details is as under for making deposit in cash for the purpose of Security Deposit /Performance Guarantee is as under:
	Name of Account	DFCCIL
	Name of Bank	Union Bank of India
	Bank account number	317301010036304
	Type of Account	Current Account
	IFSC code	UBIN0531731

PART- I
Chapter- III

PREAMBLE & GENERAL INSTRUCTION TO TENDERERS

PART-I
Chapter- III

PREAMBLE & GENERAL INSTRUCTIONS TO TENDERERS

1.3.1 Introduction

Background:

The Dedicated Freight Corridor Corporation of India Limited (DFCCIL) an SPV under the administrative control of Ministry of Railways, hereinafter referred to as “the Employer”, is implementing the Dedicated Freight Corridor Project (Western Corridor, Phase-2), hereinafter referred to as “the Project”, using JICA ODA loan proceeds provided under STEP conditions by the Loan Agreement No. **IDP-229 dated 28th March 2013** [Latest tranche-WDFC-Phase-2(III)-**ID P-297 dated 31-03-2022**]. The construction works of the Project will be carried out in eight contract packages, amongst which the captioned **Contract Package EMP-16**, consists of Design, Supply, Installation, Testing and Commissioning of 2x25 KV Overhead Equipment, Traction Sub-Stations, Auxiliary Stations, Switching Stations, Auto Transformer Stations And Scada System on Design-Build Lump Sum Price Basis for **JNPT - MAKARPURA** (Vadodara) Section (Approx. 422 Kms) of Western Dedicated Freight Corridor (Phase-2)Phase-2 of Western Dedicated Freight Corridor.-

The contract for the above Works has been awarded, vide Letter of Acceptance (LOA ref no-2015/HQ/ELPH-II/EMP16/Bid/Pt-1 dated 21-01-2016), to Sojitz-L&T Consortium (Contractor) [Contract Agreement no-2015/HQ/EL Ph-II/EM P-16/8 /SOJITZ-L&T dated 31-03-2016 (**CA-1**)]. **The Contract is at advanced stage of completion.**

The Engineer for the aforesaid Contract package is **OCG Consortium** [a consortium of Oriental Consultants Global Co. Ltd.-Japan, Oriental Consultants India Pvt. Ltd., Nippon Koei Co. Ltd., Nippon Koei India Pvt. Ltd. And RITES Ltd.] under PMC-2R Contract agreement HQ/EN/PWC/PMC-2R dated 21-03-2016. [**CA-2**]

Both the parties (to the above-mentioned Contract) have mutually agreed that the balance OHE works of Vaitarna-JNPT section, which are connected with the track work, maybe descoped from the scope of work of EMP-16 Contract, without any future liabilities on either side. The date of descoping has been agreed as 31-12-2023.

All prospective Bidders shall be deemed to have visited, inspected & examined the Site and its surroundings. Bidders shall be deemed to have obtained all necessary information as to the scope of the Works, associated risks, contingencies and other circumstances (which may influence the Works) and to have been reasonably satisfied before submitting their bid for this ‘balance OHE works of Vaitarna-JNPT section’ contract. No Claim shall be admissible in case of any information / Data, mentioned in this document, being, subsequently found at deviation.

(i) Dedicated Freight Corridor

Dedicated Freight Corridor Corporation of India Ltd. (DFCCIL), a public sector undertaking under MOR has been set up under the Indian Companies Act, 1956 for

implementation of Dedicated Freight Corridor Project. Government of India is the sole shareholder of the DFCCIL.

Ministry of Railways (MOR), Government of India has planned to construct Dedicated Freight Corridor (DFC) covering about 3338 route Kilometers on Eastern and Western Corridors. The coverage of Eastern Corridor is from Ludhiana to Dankuni (near Howrah) and Western Corridor is planned from Jawaharlal Nehru Port, Mumbai to Rewari/Tughlakabad/Dadri near Delhi. There is a linkage between two corridors at Dadri.

(ii) Project Description

The Proposed work shall be carried out between JNPT and Vaitarana (102km) along JNPT- Panvel - Diva - Vasai Road of Central Railway and Vasai Road – Vaitarana Section of Western Railway in Maharashtra State as per the defined scope. Detours have been planned at Kundevahal (1.5km), at Dativali (4.04 km) and at Vasai (16.8 km) totaling about 23 km. About 78% of the proposed DFC alignment between JNPT and Vaitarana is passing parallel to the existing Central and Western Railways and the remaining 22% of the alignment is passing through detours.

Western DFC Route will be approximately 1520 Km long from Dadri to JNPT via Rewari – Iqbalgarh - Vadodara- JNPT.

(iii) General instructions (for online tendering system)

Submission of Online Bids is mandatory for this Notice Inviting Tender. E-Tendering is a new methodology for conducting Public Procurement in a transparent and secured manner. Suppliers/ Vendors will be the biggest beneficiaries of this new system of procurement. An e-tendering portal of Dedicated Freight Corridor Corporation of India (DFCCIL) introduced for the process of e-tendering which can be accessed on <http://www.ireps.gov.in> (Refer in the BID DOCUMENTS)

Words in capital and not defined in this document shall have the same meaning as in “BIDDOCUMENTS”.

Benefits to Suppliers/service providers are outlined on the Homepage of the portal.

A. ACCESSING / PURCHASING OF BID DOCUMENTS:

The Bidder who wishes to view free Notification and tender documents can visit DFCCIL’s website www.dfccil.com or <http://www.ireps.gov.in> or Central Procurement Portal www.eprocure.gov.in. Interested bidders who wish to participate should visit website <http://www.ireps.gov.in>, which is the only website for bidding their offer. Further the procedure is as follows:

It is mandatory for all the Bidders to have class-III digital signature certificate (in the name of person who will sign the Bid) from any of the licensed certifying agency (“CA”)[Bidders can see the list of licensed CAs from the link www.cca.gov.in] to participate in e-tendering of DFCCIL.

To participate in the E-bid submission, it is mandatory for the Bidders to get themselves

registered with the <http://www.ireps.gov.in> and to have user ID & password.

The BID DOCUMENTS can be viewed /downloaded from the <http://www.ireps.gov.in> free of cost till one day prior to last date of submission of the tender upto 24.00 hrs.

Following may be noted-

1. Bids can be submitted only during the validity of registration with the <http://www.ireps.gov.in>.
2. The amendments/clarifications to the BID DOCUMENTS, if any, will be posted on the DFCCIL website www.dfccil.com which can also be seen on <http://www.ireps.gov.in>.
3. Registration with the <http://www.ireps.gov.in> should be valid at least upto the date of submission of bid.

B. PREPARATION & SUBMISSION OF APPLICATIONS:

Detailed BID DOCUMENTS may be downloaded from IREPS website and the Bid may be submitted online following the instructions appearing on the screen. A Vendor manual containing the detailed guidelines for e-tendering system is also available on IREPS website.

(Only Electronic Form (to be uploaded on the IREPS website))

Submission of Financial & Technical bid in prescribed Format in **ON LINE MODE ONLY**. No other mode of submission is accepted.

C. Document should be uploaded on the IREPS website (On line mode only)

- (a) Power of Attorney for signing the Application
- (b) If applicable, the Power of Attorney for Lead Member of JV;
- (c) An undertaking from the person having PoA referred in sub clause (a) above that they agree and abide by the bid documents uploaded by DFCCIL and amendments uploaded, if any.
- (d) SUBMISSION OF FIRMS CREDENTIALS in prescribed format mentioned in BID DOCUMENT
- (e) SUBMISSION OF TECHNICAL PROPOSAL in prescribed format mentioned in BID DOCUMENT,
- (f) Copy of Memorandum and Articles of Association, if the Applicant is a body corporate, and if a partnership then a copy of its partnership deed;
- (g) **Technical Bid Packet-A** (duly signed & scanned or digitally signed), **Financial Bid Packet-B** (in online format) and other relevant documents
- (h) Deleted
- (i) Memorandum of Understanding (in case of JV) as per Form-9 (Part-IV, Chapter- II of BID DOCUMENT.

- (j) Cost of BID DOCUMENT as detailed in Para 1.3.4.3 of Part-I, Chapter-III (Preamble & General Instructions to Tenderer) in favor of DFCCIL,
- (k) BID SECURITY DEPOSIT as detailed in Para 1.3.8 of Part-I, Chapter-III (Preamble & General Instructions to Tenderer) in the acceptable form in favor of DFCCIL.
- (l) The Bidder shall upload signed and scanned or digitally signed copies of the documents on the IREPS website before scheduled date and time of submission of Tender. No hard copy of the documents is required to be submitted (except original instruments of Bid Security deposit as detailed in BID DOCUMENT).

D. Modification / Substitution/ Withdrawal of bids:

- (i) The Bidder may modify, substitute or withdraw its e-bid after submission but prior to scheduled date and time of submission of tender. No Bid shall be modified, substituted or withdrawn by the Applicant after scheduled date and time of submission of tender.
- (ii) Any alteration/ modification in the Bid or additional information supplied subsequent to the scheduled date and time of submission of tender, unless the same has been expressly sought for by the Authority, shall be disregarded.
- (iii) For modification of e-bid, applicant/tenderer has to detach its old bid from e-tendering portal and upload / resubmit digitally signed modified bid.
- (iv) For withdrawal of bid, applicant/tenderer has to click on withdrawal icon at e-tendering portal and can withdraw its e-bid.
- (v) Before withdrawal of a bid, it may specifically be noted that after withdrawal of a bid for any reason, applicant/tenderer cannot re-submit e-bid again.

E. OPENING AND EVALUATION OF BIDS:

- (i) Opening of Bids will be done through online process.
- (ii) For participating in the tender, the authorized signatory holding Power of Attorney shall be the Digital Signatory. In case the authorized signatory holding Power of Attorney and Digital Signatory are not the same, the bid shall be considered non-responsive.

The DFCCIL Authority shall open bid documents received in electronic form at the scheduled date and time of opening of tender i.e. in the presence of the Bidders who choose to attend. The DFCCIL Authority will subsequently examine and evaluate the Bids in accordance with the provisions set out in the BID DOCUMENTS.

The Financial Bid will be opened of the pre-qualified and short-listed Bidders. The date of opening of Financial Proposal will be notified later on.

F. ONLINE E-BIDDING METHODOLOGY:

Online E- Bid System – Financial bids & Technical bids shall be submitted by the bidder at the same time. First the Technical Bid will be opened at the time and date notified in the tender notice. The Financial Proposal will be opened of the pre-qualified and short-listed

Bidders after technical evaluation of Bids. The date of opening of Financial Bid will be notified later on.

G. BROAD OUTLINE OF ACTIVITIES FROM BIDDER'S PERSPECTIVE:

For participating in this tender online, the following instructions are to be read carefully. These instructions are supplemented with more detailed guidelines on the relevant screens of the ETS.

- i) To participate in the E-Bid submission, it is mandatory for the bidders to have user ID & password from www.ireps.gov.in.
- ii) Procure a Digital Signing Certificate (DSC)
- iii) Registration Electronic Tendering System (ETS)
- iv) Create Users and assign roles on ETS
- v) View Notice Inviting Tender (NIT) on ETS
- vi) Download Official Copy of Tender Documents from ETS
- vii) Clarification to Tender Documents on ETS– Query to DFCCIL (Optional) – view response to queries posted by DFCCIL, through addenda.
- viii) Bid-Submission on ETS: Prepare & arrange all documents/papers for submission of bid & tender cost online and BID SECURITY deposit on online/offline as per instruction.
- ix) Attend Public Online Tender Opening Event (TOE) on ETS
- x) Post-TOE Clarification on ETS (Optional)-Respond to DFCCIL's post-TOE queries

Note 1: It is advised that all the documents to be submitted are kept scanned and converted to PDF format in a separate folder on your computer before starting online submission. The size of each document should not be more than 3.75 MB.

H. Digital Certificates

For integrity of data and its authenticity/non-repudiation of electronic records and to be compliant with IT Act 2000, it is necessary for each user to have a Class-III Digital Certificate (DC), also referred to as Digital Signature Certificate (DSC), of Class-III issued by a Certifying Authority (CA) licensed by Controller of Certifying Authorities (CCA) [refer <http://www.cca.gov.in>].

I. Registration

Intending bidders are requested to register themselves with IREPS portal through <https://www.ireps.gov.in> for obtaining user-id and password.

DFCCIL has decided to use process of e-tendering for inviting this tender and thus the physical copy of the tender would not be sold.

J. Help Desk for E-Tendering

For any assistance, IREPS helpdesk may be contacted. Helpdesk options are available at IREPS portal's Home Page. IREPS helpdesk contact no. is 011-23761525.

(iv) SCOPE OF WORK:

Scope of Works shall be as per details given in BOQ in Form No.4 Schedule of prices and total prices of Financial Bid Packet B and GCC, SCC, Specifications etc. detailed in technical Bid packet A. However, scope of works in brief are given below:

The Proposed work i.e., “**Execution of balance Works for 2x25 kV High Rise OHE in JNPT-Vaitarna Section of DFCCIL in CGM/Mumbai South Unit (102 Km)**” shall be carried out between JNPT and Vaitarana (102km) along JNPT- Panvel - Diva - Vasai Road of Central Railway and Vasai Road – Vaitarana Section of Western Railway in Maharashtra State as per the defined scope. Detours have been planned at Kundevahal (1.5km), at Dativali (4.04km) and at Vasai (16.8km) totaling about 23 km. About 78% of the proposed DFC alignment between JNPT and Vaitarana is passing parallel to the existing Central and Western Railways and the remaining 22% of the alignment is passing through detours.

The scope of work shall also be read along with Para 2 of Part-1 Chapter-6, Section 2 of this tender document.

- (v) **Cost of the work:** The estimated cost of the work is Rs. 142,07,85,426.36/- (Rupees - One Hundred Forty-Two Crore - Seven Lakhs Eighty-Five Thousand Four Hundred Twenty-Six and Thirty-Six Paise only) shown as per NIT which includes GST.
- (vi) The tenderer shall be governed by General Conditions of Contract (GCC), Preamble and General Instructions to Tenderers (ITT) and Special Conditions of Contract (SCC). Wherever, there is a conflict in any condition between GCC and Special Conditions of Contract mentioned in the tender documents, the condition mentioned in Special Conditions of Contract will prevail. However, decision of DFCCIL in this connection shall be final and binding to contract.

Part I, Chapter-IV and V of the tender document contains General Conditions of Contract and Special Conditions of Contract specific to this work and shall be applicable in the contract.

(vii) **Location:**

Works shall be executed in the jurisdiction of **Chief General Manager/ DFCCIL/Mumbai South Unit**. However, DFCCIL reserves right to change the site of work anywhere in adjacent / adjoining area of the work defined in the jurisdiction and the contractor shall be bound to execute the work without any extra cost.

1.3.2(a) Tender Bid:

The Tender Bid shall be submitted through online only on website www.ireps.gov.in as under: -

Packet -A

Eligibility/Qualifying element of the Tender Bid along with other documents mentioned

in para 1.3.2 (b) (i) and para 1.3.2 (b) (ii), here in after called “TECHNICAL BID “

Packet- B

Price elements of the Tender Bid as per para 1.3.2 (b) (iii), herein after called “FINANCIAL BID”. The TECHNICAL BID (Packet-A) shall be opened on the date of tender opening and the detailed scrutiny of TECHNICAL BID shall be carried out. The “FINANACIAL BID” (Packet-B) shall be opened only of those tenderers who qualify in “Technical bid”. The detailed procedure for tender opening and processing is given in Para 1.3.5.

1.3.2 (b) Form of Tender: The Tender documents shall be in Two separate packets viz: -

"Packet-A" containing technical bid and "Packet-B" containing financial bid. Detailed credentials as per the requirement of eligibility criteria and all tender papers except Summary of Prices and Schedule of Prices are to be submitted in "TECHNICAL BID" i.e. Packet-A. Summary of Prices and Schedule of Prices with percentage above/below/at par duly filled in are to be submitted in "FINANCIAL BID".

Tenders not submitted in the proper Forms are liable to be rejected.

(i) Documents to be submitted in the office of CGM/Mumbai/South/ DFCCIL:

S. No	Description	Documents
(1)	Bid Security Document (in case of Bid Security submitted in the form of Bank Guarantee, Insurance Surety Bond of Demand Draft)	Original instruments of BID SECURITY (Bank Guarantee, Insurance Surety Bond of Demand Draft) in sealed envelope to be dropped in Tender Box kept at Employer's office before closing date for submission of bids (i.e. excluding the last date of submission of bids)

(ii) Documents to be enclosed with the Technical BID (packet A): -

S. No	Description	Documents	Attached (Y/N)	Ref. Page No.
(1)	Offer letter complete.	Form No.1		
(2)	Tenderer's credentials in accordance With para 1.3.13 (i), (ii) & (iii) of Part-I Chapter-III of Preamble and General Instructions to Tenderers.	Form No. 2AI, 2B, 2C, 2C-I, 2C-II, 2C-III, 2C-IV and 2D		
(3) A	Affidavit for authenticity of Certificates/documents	Form No. 22		
(3) B	List of Plant & Machinery	Form No. 31		

(4)	Details of Bid Security in accordance with Para 1.3.8 and Cost of Tender Document in accordance with Para 1.3.4.3 of Part-I, Chapter-III (Preamble & General Instructions to Tenderers)		
(5)	Written confirmation authorizing the signatory of the tender to commit the tenderer and other documents as per format as applicable, in accordance with para 1.3.6 of Part I Chapter III Preamble and General Instructions to Tenderers.		
(6)	A copy of the tender papers including amendments duly signed & scanned or digitally signed by the tenderer on each and every page in token of his having studied the tender papers carefully shall be attached with the tender.		

(iii) Documents to be enclosed for Financial Bid:

S.N.	Description	Documents	Submitted Online (Y/N)
(1)	Summary of Prices, Schedule of Prices & Total Prices. (Financial schedule on www.ireps.gov.in)	Form No. 3 & 4	

Refer Part III for Tender Forms and Part-IV for Appendix-1 for checklist.

1.3.3 Tender Document:

	DESCRIPTION
PART – I	
Chapter I	Notice Inviting E-Tender
Chapter II	General Information / Data sheet
Chapter III	Preamble and General Instructions to Tenderers
Chapter IV	General Conditions of Contract
Chapter V	Special Condition of Contract
Chapter VI	Employer's Requirement
	Section-1: General Requirement
	Section-2: Scope of work & Site Details
	Section-3: Site Facilities & Temporary works
	Section-4: Contractor's Project Organization
	Section-5: Interface Management
	Section-6: Requirement during Construction Phase
	Section-7: Safety, Health & Environment (SHE) Requirement
	Section 7.1: SHE Framework
	Section 7.2: SHE Management
	Section 7.3: Labour Protection
	Section 7.4: Safety
	Section 7.5: Occupational Health and Welfare
	Section 7.6: Environmental and Social Management
Section 7.7: Penalty and Awards	
Attachment-1	
Attachment-2	
Attachment-3	
Attachment-4	
Attachment-5	
Attachment-6	
Attachment-7	
Attachment-8	
Section-8: Execution Programme	
Section 8.1: Project Program Requirement	
Section 8.2: Monthly Progress Report/Review	

	Section 8.3: Quality Management Programme
Chapter VII	Engineer's Authority
Chapter VIII	Prices and Payments
PART-II	Technical specifications
Chapter-1	Technical specifications of Overhead Equipments
Chapter-2	Equipment, Component & Material
Chapter-3	List of Design & Drawing
Chapter-4	List of Approved Method Statements
Chapter-5	Inspection and Testing
Chapter-6	Wiring Procedure/Methodology
Chapter-7	Specifications of OHE Items
Chapter-8	List of Standard Drawing
Chapter-9	List of Equipment, Machinery and Plant
Chapter-10	Explanatory notes on Schedule of Prices
Chapter-11	Priority of Documents
Chapter-12	Milestones and Time Schedule
PART-III	Tender Forms (including Schedule of Prices)
PART – IV	Checklist for Tenderers
PART – V	Drawings, LOPs and Method Statements

1.3.4 Sale and Submission of Tender Document

- 1.3.4.1** Tender document can be viewed from DFCCIL's website www.dfccil.com, <https://www.ireps.gov.in> & Central Procurement portal eprocure.gov.in. Amendment(s) (if any) will be uploaded on DFCCIL website www.dfccil.com and <https://www.ireps.gov.in> only. For submitting the tender, the Tender documents and amendment(s) can be downloaded from the <https://www.ireps.gov.in> by the registered tenderers only. The details of registration and online tendering process is mentioned in Para 1.3.1 (iii) above.
- 1.3.4.2** Clause applicable for tender documents downloaded from Internet. Tenderer/s is free to download tender documents at their own cost, for the purpose of perusal. Master copy of the tender document will be available in the **Office of the Chief General Manager, Dedicated Freight Corridor Corporation of India Limited, 7th Floor, New Administrative Building, D. N. Road, Mumbai – 400001** After award of the work, an agreement will be drawn up. The agreement shall be prepared based on the master copy available in the Office of the **Office of the Chief General Manager, Dedicated Freight Corridor Corporation of India Limited, 7th Floor, New Administrative Building, D. N. Road, Mumbai – 400001 India** and not based on the tender documents submitted by the Tenderer. In case of any discrepancy between the tender documents downloaded from the internet and the master copy, later shall prevail and will be binding on the Tenderers. No claim on this account shall be entertained.
- 1.3.4.3 Cost of Tender documents downloaded from internet**
For submitting the tender, the Tender documents and Amendment(s), if any, is/are available on <https://www.ireps.gov.in> and www.dfcc.com and the same can be downloaded and used as tender documents for submitting the offer. The cost of the tender document is indicated in NIT.
The cost of the tender document shall be deposited through payment gateway provided on <http://www.ireps.gov.in> on or before schedule date and time of submission of Bid. The proof of submission of cost of tender document should be uploaded along with the Technical Bid.
- 1.3.4.4** Complete tender documents must be submitted online duly completed in all respect **upto the scheduled date and time mentioned in the Para 1.1.1 of Notice Inviting E-Tender**. The **“Packet-A (TECHNICAL BID)”** will be opened on the scheduled day and time and read out in the presence of such tenderer(s) as is/are present. In case the intended date for opening of tenders is declared a holiday, the tenders will be opened on the next working day at the same time. Any modified date and time for submission of tenders shall be uploaded on DFCCIL website www.dfccil.com and <https://www.ireps.gov.in>. The detailed procedure of tender opening will be as per para 1.3.5.
- 1.3.4.5** Financial Bid shall be filled directly on the website <https://www.ireps.gov.in> through digital signature and not to be submitted in hard copy at all. ***The financial bids shall neither be scanned & uploaded, nor, the hard copy of the same*** should be submitted to the office of Employer.
- 1.3.4.6** The rates should be quoted in figures as well as in words. If there is variation between rates quoted in figures and in words, the rate quoted in ‘words’ shall be taken as correct. If more

than one or improper rates are tendered for the same item, the tender is liable to be rejected.

1.3.4.7 Each page of the tender papers is to be signed either physically or digitally by the tenderers or such person/s on his/their behalf that is/are legally authorized to sign for him / them.

1.3.4.8 Care in Submission of Tenders –

- i) Before submitting a tender, the tenderer will be deemed to have satisfied himself by actual inspection of the site and locality of the works, that all conditions liable to be encountered during the execution of the works are taken into account with that the rates he enters in the tender forms are adequate and all-inclusive to accord with the provisions in clause-37 of the General Conditions of Contract for the completion of works to the entire satisfaction of the Engineer.
- ii) Tenders will examine the various provisions of the Central Goods and Services Tax Act, 2017(CGST)/Integrated Goods and Services Tax Act, 2017(IGST)/Union Territory Goods and Services Tax Act, 2017(UTGST)/respective state's State Goods and Services Tax Act (SGST) also, as notified by Central/State Govt & as amended from time to time and applicable taxes before bidding. Tenders will ensure that full benefit of Input Tax (ITC) likely to be availed by them is duly considered while quoting rates.
- iii) The successful tenderer who is liable to be registered under CGST/IGST/UTGST/SGST Act shall submit GSTIN along with other details required under CGST/IGST/UTGST/SGST Act to DFCCIL immediately after the award of contract, without which no payment shall be released to the contractor. The contractor shall be responsible for deposition of applicable GST to the concerned authority.
- iv) In case, the successful tenderer is not liable to be registered under CGST/IGST/UTGST/SGST Act, the DFCCIL shall deduct the applicable GST from his/their bills under reverse charge mechanism (RCM) and deposit the same to the concerned authority.

1.3.4.9 Tenders containing erasures and/or alteration of the tender documents are liable to be rejected. Any correction made by Tenderer(s) in his/their entries must be attested by him/them. Any interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the bid.

1.3.4.10 The bid submitted / received after the time and date fixed for receipt of Bids as set out in the documents are liable to be rejected.

1.3.4.11 Conditional tenders are liable to be rejected straightway. DFCCIL reserves the right to reject such tenders summarily without assigning any reasons whatsoever. In case tenderer/s still decides to have conditional offer, all such conditions are required to be listed separately and shall be supplemented by the details of exact financial implications, if applicable. DFCCIL will not take cognizance of any other conditions / variations from the tender stipulations mentioned at any other place in the tender documents.

1.3.4.12 The bidder shall submit only one bid in the capacity of an individual or sole proprietor, partnership firm or company. Violation of this condition is liable to disqualify the tender in which bidder has participated and BID SECURITY of all such tenderers shall stand forfeited.

1.3.4.13 Withdrawal of Tender: No tender can be withdrawn after scheduled date and time of submission and during tender validity period.

1.3.5 Opening of Tender:

- (a) Tender will be opened at the scheduled date and time mentioned in the Para 1.1.1 of Notice Inviting E-Tender in the office of Employer's in the presence of the tenderers or their representatives as may be present at the prescribed date and time.
- (b) Bid of the bidders shall be opened through process of e-tendering. The sequence of opening shall be:
 - i) Cost of Tender Document and Bid Security Deposit Details
 - ii) Technical offer- Technical Bid (Packet-A)
 - iii) Financial offer- (On a later date after scrutiny/evaluation of Technical Bid)
- (c) **'TECHNICAL BID (Packet- A)'** only of all the tenderers shall be opened and the contents there of i.e. qualification details shall be read out.
- (d) After the opening of "TECHNICAL BID" (Packet-A) of all the tenderers, these bids shall be scrutinized and analyzed. If found necessary by the Employer, the tenderers shall be asked to furnish clarifications and the Employer may also hold discussions with the tenderers after giving due notice. The names of the tenderers whose bid are considered complete and meet eligibility criteria shall be shortlisted.
- (e) **The FINANCIAL BID (Packet-B)** shall be opened on a subsequent date and time duly notified well in advance. The Financial bids of only those tenderers shall be opened who are shortlisted after scrutiny of their technical bid. The Financial bid of the tenders who do not qualify during scrutiny of technical bid shall not be opened and these shall be returned by the employer. The time of opening, date and venue shall be advised to qualified tenderers well in advance to enable them to depute their representative. The Bid Security of non-qualifying tenderers will be returned back within a reasonable period after completion of results of technical bid.

1.3.6 Constitution of the Firm:

1.3.6.1 Tenderer shall clearly specify whether the tender is submitted on his own or on behalf of a partnership firm / Joint Venture (JV) / Company/ Registered Society /Registered Trust / Hindu Undivided Family (HUF) / Limited Liability Partnership (LLP) etc. The tenderer(s) shall enclose the attested copies of the constitution of their concern and copy of PAN Card along with their tender. Tender Documents in such cases are to be signed by such persons as may be legally competent to sign them on behalf of the firm, company, association, trust or society, as the case may be.

1.3.6.2 The tenderer shall give full details of the constitution of the Firm / JV / Company/

Registered Society /Registered Trust / Hindu Undivided Family (HUF) / Limited Liability Partnership (LLP) and shall also submit following documents (as applicable), in addition to documents mentioned above:

- (a) Sole Proprietorship Firm: The tenderer shall submit the notarized copy of the affidavit.
- (b) Partnership Firm : The tenderer shall submit self-attested copies of (i) registered / notarized Partnership Deed and (ii) Power of Attorney duly authorizing one or more of the partners of the firm or any other person(s), authorized by all the partners to act on behalf of the firm and to submit & sign the tender, sign the agreement, witness measurements, sign measurement books, receive payments, make correspondences, compromise /settle / relinquish any claim (s) preferred by the firm, Sign "No claim Certificate", refer all or any dispute to arbitration and to take similar action in respect of all tenders / contracts or said tender / contract. (iii) An undertaking by all partners of the partnership firm that they are not blacklisted or debarred by Railways or any other Ministry / Department of the Govt. of India from participation in tenders / contracts as on the date of submission of bids, either in their individual capacity or in any firm/LLP in which they were / are partners/members. Any Concealment / wrong information in regard to above shall make the bid ineligible or the contract shall be determined under Clause 62 of the General Conditions of Contract.
- (c) Joint Venture: The tenderer shall submit documents as mentioned in para 1.3.32 of this chapter.
- (d) Companies registered under Companies Act-1956/2013: The tenderer shall submit (i) the copies of Memorandum of Association (MOA)/ Articles of Association (AOA) of the company; (ii) Power of attorney duly registered / notarized by the company (backed by the resolution of Board of Directors) in favor of the individual, signing the tender on behalf of company; and (iii) A copy of Certificate of Incorporation.
- (e) HUF: A copy of notarized affidavit on Stamp Paper declaring that he who is submitting the tender on behalf of HUF is in the position of 'Karta' of Hindu Undivided Family (HUF) and he has the authority, power and consent given by other members to act on behalf of HUF.
- (f) LLP (Limited Liability Partnership):
 - (i) A copy of LLP Agreement
 - (ii) A copy of Certificate of Incorporation
 - (iii) A copy of Power of Attorney/Authorization issued by the LLP in favor of the individual to sign the tender on behalf of the LLP and create liability against the LLP.
 - (iv) An undertaking by all partners of the LLP that they are not blacklisted or debarred by Railways or any other Ministry / Department of the Govt. of India from participation in tenders / contracts as on the date of submission of bids, either in their individual capacity or in any firm/LLP or JV in which they were / are partners/members. Concealment / wrong information in regard to above shall make the contract liable for determination under Clause 62 of the General Conditions of Contract.

- (g) Registered Society & Registered Trust:
- (i) A copy of Certificate of Registration
 - (ii) A copy of Memorandum of Association of Society/Trust Deed
 - (iii) A copy of Power of Attorney in favor of the individual to sign the tender documents and create liability against the Society/Trust.
 - (iv) A copy of Rules & Regulations of the Society

1.3.6.3 If it is mentioned in the tender submission that it is being submitted on behalf of / by a sole Proprietorship Firm / Partnership Firm / Joint venture/registered Company etc. but above-mentioned documents (as applicable) are not enclosed along with tender, the tender shall be summarily rejected.

If it is NOT mentioned in the tender submission that it is being submitted on behalf of / by a Sole Proprietorship Firm / Partnership Firm / Joint Venture / Registered company etc., then the tender shall be treated as having been submitted by the individual who has signed the tender.

After opening of the tender, any document pertaining to the constitution of the Firm / Joint Venture etc. shall neither be asked nor be entertained / considered by DFCCIL.

1.3.6.4 A tender from Joint Venture / Partnership Firm etc. shall be considered only where permissible as per the tender conditions. (See para 1.3.25)

1.3.6.5 The DFCCIL will not be bound by any power of attorney granted by the tenderer or by changes in the composition of the Firm made subsequent to the submission of tender. It may, however, recognize such power of attorney and changes after obtaining proper legal advice.

1.3.7 Validity of Tender:

Tenderer shall keep his offer open for a minimum period of **120 days** from the date of opening of the Technical Bid of the tender or as mentioned in the Tender Notice.

1.3.8 Bid Security: -

- (a) The tender must be accompanied by Bid Security in favor of '**Dedicated Freight Corridor Corporation of India Limited, Office of the Chief General Manager, 7th Floor, New Administrative Building, D. N. Road, Mumbai – 400001**' deposited in any of the forms as mentioned in Sub-Para 1.3.8(c) below, failing which the tender will not be considered. Any firm recognized by Department of Industrial Policy and Promotion (DIPP) as 'Startups' shall be exempted from payment of the Bid Security. Labour Cooperative Societies shall submit only 50% of the Bid Security.
- (b) The Bid Security shall remain deposited with the DFCCIL for the period of validity of the offer prescribed in this tender i.e. 120 days from the date of opening of tender. In case of BID SECURITY being submitted in form of Bank Guarantees, the Bank Guarantee shall remain valid for 90 days beyond the validity of the bid. If the validity of the offer is extended, the validity of Bid Security should also be extended failing which the offer after the expiry of

the aforesaid period may not be considered by the DFCCIL. The proof of submission of BID SECURITY should be uploaded along with the Technical Bid.

(c) The Bid Security should be in **any** of the following forms:

(i) The Bid Security (Bid Security) shall be deposited either in cash through e-payment gateway on <https://www.ireps.gov.in>.

Or,

(ii) Bank Guarantee on format from Nationalized/Indian Scheduled Commercial Bank. Bank guarantees shall remain valid for 90 days beyond the validity of the bid. Sample format for Bank Guarantee for BID SECURITY is enclosed as Form No. 24 (Part-III of Bid Document).

Or,

(iii) Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee [including e-Bank Guarantee] from any of the Commercial Banks or payment online in an acceptable form are considered acceptable.

In case, submission of Bid Security in the form of Bank Guarantee, following shall be ensured:

- (a) A scanned copy of the Bank Guarantee shall be uploaded on e-Procurement Portal (<https://www.ireps.gov.in>) while applying to the tender.
- (b) The original Bank Guarantee should be delivered in person to the official nominated as indicated in the tender document before the scheduled time and date of submission of bids.
- (c) Non submission of scanned copy of Bank Guarantee with the bid on e-tendering portal (<https://www.ireps.gov.in>) and/or non-submission of original Bank Guarantee within the specified period shall lead to summary rejection of bid.
- (d) The Tender Security shall remain valid for a period of 90 days beyond the validity period for the Tender.
- (e) It shall be understood that the tender documents have been sold/issued to the tenderer and the tenderer is permitted to tender in consideration of stipulation on his part, that after submitting his tender he will not resile from his offer or modify the terms and conditions, thereof in a manner not acceptable to the Employer. Should the tenderer fail to observe or comply with the said stipulation, the aforesaid amount shall be liable to be forfeited by the DFCCIL.
- (f) The original instruments of Bid Security (Bank Guarantee - in original) have to be submitted to Employer's office before the scheduled date and time of submission of the tender otherwise the Bid may not be considered.
- (g) The Bid Security of the unsuccessful tenderer(s) will, save as here- in-before provided, be returned to the unsuccessful tenderer(s) within a reasonable time but the DFCCIL shall not be

responsible for any loss or depreciation that may happen for the due performance of the stipulation to keep the offer open for the period specified in the tender documents or to the Bid Security while in their possession or be liable to pay interest there on.

NOTE: No interest shall be paid by DFCCIL on Bid Security amount.

1.3.9 Execution of Contract Agreement: -

The successful tenderer, whose tender has been accepted by the competent authority of DFCCIL, will be informed by the DFCCIL through a Letter of Acceptance (LoA). Letter of Acceptance after it is signed by the Contractor in token of his acceptance shall constitute a legal and binding contract between DFCCIL and the contractor till such time the contract agreement is signed.

The Tenderer whose tender is accepted shall be required to appear in person at the Employer's office or if a firm or corporation, a duly authorized representative shall so appear and execute the contract agreement within 30 days after notice that the contract has been awarded to him. Failure to do so shall constitute a breach of the agreement affected by the acceptance of the tender in which case the full value of the Bid Security accompanying the tender shall stand forfeited without prejudice to any other rights or remedies.

In the event of any tenderer whose tender is accepted refuses to execute the contract agreement as here in before provided, DFCCIL may determine that such tenderer has abandoned the contract and there upon his tender and acceptance thereof shall be treated as cancelled and DFCCIL shall be entitled to forfeit the full amount of the Bid Security.

1.3.10 Security Deposit on Acceptance of Tender:

The Security Deposit/rate of recovery/mode of recovery on acceptance of tender shall be as per the Para 16. (1) to 16. (3) of General Conditions of Contract (GCC).

1.3.11 Tenderer's Address

The tenderer should state in the tender his postal address legibly and clearly. Any communication sent in time, to the tenderer by post at his said address shall be deemed to have reached the tenderer duly and in time. Important documents should be sent by registered post.

1.3.12 Right of DFCCIL to Deal with Tenders

- (a) The DFCCIL reserves the right of not to invite tenders for any of DFCCIL work or works or to invite open or limited tenders and when tenders are called to accept a tender in whole or in part or to reject any tender or all tenders without assigning reasons for any such action.
- (b) The authority for the acceptance of the tender will rest with the DFCCIL. It shall not be obligatory on the said authority to accept the lowest tender or any other tender and no tenderer(s) shall demand any explanation for the cause of rejection of his/their tender nor the DFCCIL undertake to assign reasons for declining to consider or reject any particular tender

or tenders.

1.3.13 (i) Eligibility Criteria

(A) : Technical Eligibility Criteria

Criteria Requirement	
I	<p>(a) The tenderer /JV firm or Lead Member of JV firm must have satisfactorily completed or substantially completed any one of the following categories of work(s) during last 07 (seven) years, ending last day of month previous to the one in which tender is invited:</p> <p>(i) Three similar works each costing not less than the amount equal to 30% of advertised value <i>of the tender</i>.</p> <p>(ii) Two similar works each costing not less than the amount equal to 40% of advertised value of the tender.</p> <p>(iii) One similar work costing not less than the amount equal to 60% of advertised value of the tender.</p> <p>(b) (1) In case of tenders for composite works (e.g. works involving more than one distinct component, such as Civil Engineering works, S&T works, Electrical works, OHE works etc. and in the case of major bridges – substructure, superstructure etc.), tenderer must have successfully completed or substantially completed any one of the following categories of work(s) during last 07 (seven) years, ending last day of month previous to the one in which tender is invited: (i) Three similar works each costing not less than the amount equal to 30% of advertised value of each component of tender, or (ii) Two similar works each costing not less than the amount equal to 40% of advertised value of each component of tender, or (iii) One similar work each costing not less than the amount equal to 60% of advertised value of each component of tender.</p>
	<p>Note for b(1): Separate completed works of minimum required values shall also be considered for fulfillment of technical eligibility criteria for different components.</p> <p>(b) (2) In such cases, what constitutes a component in a composite work shall be clearly pre-defined with estimated tender cost of it, as part of the tender documents without any ambiguity.</p> <p>(b) (3) To evaluate the technical eligibility of tenderer, only components of work as stipulated in tender documents for evaluation of technical eligibility, shall be considered. The scope of work covered in other remaining components shall be either executed by tenderer himself if he has work experience as mentioned in clause 7 of the Standard General Conditions of Contractor through subcontractor fulfilling the requirements as per clause 7 of the Standard General Conditions of Contract or jointly i.e., partly himself and remaining through subcontractor, with prior approval of Chief Engineer in writing.</p> <p>However, if required in tender documents by way of Special Conditions, a formal agreement duly notarized, legally enforceable in the court of law, shall be executed by the main contractor with the subcontractor for the component(s) of work proposed to be executed by the subcontractor(s), and shall be submitted along with the offer for considering subletting of that scope of work towards fulfilment of technical eligibility.</p>

	<p>Such subcontractor must fulfill technical eligibility criteria as follows:</p> <p>The subcontractor shall have successfully completed at least one work similar to work proposed for subcontract, costing not less than 35% value of work to be subletted, in last 5 years, ending last day of month previous to the one in which tender is invited through a works contract.</p> <p>Note: for subletting of work costing up to Rs 50 lakh, no previous work experience of subcontractor shall be asked for by the Railway.</p> <p>In case after award of contract or during execution of work it becomes necessary for contractor to change subcontractor, the same shall be done with subcontractor(s) fulfilling the requirements as per clause 7 of the Standard General Conditions of Contract, with prior approval of Chief Engineer in writing.</p> <p>(b) (4) Work experience certificate from private individual shall not be considered. However, in addition to work experience certificates issued by any Govt. Organisation, work experience certificate issued by Public listed company having average annual turnover of Rs 500 crore and above in last 3 financial years excluding the current financial year, listed on National Stock Exchange or Bombay Stock Exchange, incorporated/registered at least 5 years prior to the date of closing of tender, shall also be considered provided the work experience certificate has been issued by a person authorized by the Public listed company to issue such certificates.</p> <p>In case tenderer submits work experience certificate issued by public listed company, the tenderer shall also submit along with work experience certificate, the relevant copy of work order, bill of quantities, bill wise details of payment received duly certified by Chartered Accountant, TDS certificates for all payments received and copy of final/last bill paid by company in support of above work experience certificate.</p>
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Note:

- (a) **Similar Work*** for this Tender is defined as:

“Execution of 25 KV or 2*25 KV OHE Work in Indian Railway/Metro Railway/NCRTC/ NHSRC and in other Railway PSUs”.

[* vide DFCCIL letter no. HQ/GGM/CM/Similar Nature (E file No. 16987) dated 09.10.2024]

- (b) It is clarified that the Technical Eligibility Criterion mentioned above is with composite component for fulfilment of criteria by a JV firm. Refer Clause 1.3.32.15.1 of Chapter III Part I of this Tender document.

(B) Financial Eligibility Criteria

Criteria
Requirement
<p>The tenderer must have minimum average annual contractual turnover of V/N or V whichever is less; were,</p> <p>V= Advertised value of the tender in crores of Rupees</p> <p>N= Number of years prescribed for completion of work for which bids have been invited.</p> <p>The average annual contractual turnover shall be calculated as an average of “total contractual payments” in the previous three financial years, as per the audited balance sheet. However, in case balance sheet of the previous year is yet to be prepared/ audited, the audited balance sheet of the fourth previous year shall be considered for calculating average annual contractual turnover.</p> <p>The tenderers shall submit requisite information as per Form 2B, along with copies of Audited Balance Sheets duly certified by the Chartered Accountant/ Certificate from Chartered Accountant duly supported by Audited Balance Sheet.</p>

Note:

1. Contractual payments received by a Member in an earlier JV firm shall be reckoned only to extent of the concerned member’s share in that JV Firm for the purpose of satisfying compliance of the above-mentioned financial eligibility criteria in tender for considerations.
2. In case the tenderer/s is a partnership firm, the turnover etc. shall be in the name of partnership firm only.

(C) Bid Capacity

For tenders having advertised value more than Rs 20 crore wherein eligibility criteria include bid capacity also, the tenderer will be qualified only if its available bid capacity is equal to or more than the total bid value of the present tender. The available bid capacity shall be calculated as under:

Available Bid Capacity = $[A \times N \times 2] - 0.33 \times N \times B$ Where,

A = Maximum value of construction works executed and payment received in any one of the previous three financial years or the current financial year (up to date of inviting tender), taking into account the completed as well as works in progress.

N= Number of years prescribed for completion of work for which bids has been invited.

B = Existing commitments and balance amount of ongoing works with tenderer as per Form No. 2C for statement of all works in progress and also the works which are awarded to tenderer but yet not started up to the date of inviting of tender.

Note:

- (a) The Tenderer(s) shall furnish the details of -
 - (i) Maximum value of construction works executed and payment received in any one of the previous three financial years or the current financial year (up to date of inviting tender) for

calculating A, and

- (ii) Existing commitments and balance amount of ongoing works with tenderer as per Form No. 2C for statement of all works in progress and also the works which are awarded to tenderer but yet not started upto the date of inviting of tender for calculating B. In case of no works in hand, a 'NIL' statement should be furnished.
- (iii) For evaluation of bid capacity, tenderer/bidder shall have to submit/upload requisite information in a Proforma as per **Form 2C, 2C-I, 2C-II, 2C-III & 2C-IV**. In case, tenderer/bidder is failed to submit the above **Forms (2C, 2C-I, 2C-II, 2C-III & 2C-IV)** along with tender bid, their offer shall be considered as incomplete and shall be **summarily rejected**.

The submitted details for (i), (ii) & (iii) above should be duly verified by Chartered Accountant.

- (b) In case if a bidder is JV, the tenderer(s) must furnish the details of
 - (i) Maximum value of construction works executed and payment received in any one of the previous three financial years or the current financial year (up to date of inviting tender) by each member of JV for calculating A, and
 - (ii) Existing commitments and balance amount of ongoing works with each member of JV either in individual capacity or as a member of other JV as per the Form No. 2C for statement of all works in progress and also the works which are awarded to each member of JV either in individual capacity or as a member of other JV but yet not started upto the date of inviting of tender for calculating B. In case of no works in hand, a 'NIL' statement should be furnished.

The submitted details for (i) and (ii) above should be duly verified by Chartered Accountant.

- (c) Value of a completed work/work in progress/work awarded but yet not started for a Member in an earlier JV shall be reckoned only to the extent of the concerned member's share in that JV for the purpose of satisfying his/her compliance to the above-mentioned bid capacity in the tender under consideration.
- (d) The arithmetic sum of individual "bid capacity" of all the members shall be taken as JV's "bid capacity".
- (e) In case, the tenderer/s failed to submit the above statement along with offer, their/his offer shall be considered as incomplete and will liable to be rejected.
- (f) The available bid capacity of tenderer shall be assessed based on the details submitted by the tenderer. In case, the available bid capacity is lesser than estimated cost of work put to tender, his offer shall not be considered even if he has been found eligible in other eligibility criteria/tender requirement.

The tender/technical bid will be evaluated based on details submitted in Form No. 2C.

Explanatory Notes for Clause 1.3.13 (i) -Eligibility Criteria:

1. *Substantially Completed Work means an ongoing work in which payment equal to or more than 90% of the present contract value (excluding the payment made for adjustment of Price variation (PVC), if any) has been made to the contractor in that ongoing contract and no proceedings of termination of contract on Contractor's default has been initiated. The credential certificate in this regard should have been issued not prior to 60 days of date of invitation of present tender.*

2. *In case a work is started prior to 07 (seven) years, ending last day of month previous to the one in which tender is invited, but completed in last 07 (seven) years, ending last day of month previous to the one in which tender is invited, the completed work shall be considered for fulfillment of credentials.*
3. *If a work is physically completed and completion certificate to this extent is issued by the concerned organization but final bill is pending, such work shall be considered for fulfillment of credentials*
4. *In case of completed work, the value of final bill (gross amount) including the PVC amount (if paid) shall be considered as the completion cost of work. In case final bill is pending, only the total gross amount already paid including the PVC amount (if paid) shall be considered as the completion cost of work.
In case of substantially completed work, the total gross amount already paid including the PVC amount (if paid), as mentioned in the certificate, shall be considered as the cost of substantially completed work.*
5. *If a bidder has successfully completed a work as subcontractor and the work experience certificate has been issued for such work to the subcontractor by a Govt. Organization or public listed company as defined in Notes of Para 1.3.13, the same shall be considered for the purpose of fulfillment of credentials.*
6. *In case a work is considered similar in nature for fulfillment of technical credentials, the overall cost including the PVC amount (if paid) of that completed work or substantially completed work, shall be considered and no separate evaluation for each component of that work shall be made to decide eligibility unless mentioned otherwise specifically.*

7. Partnership firm:

- 7.1. In case of newly formed partnership firm, the credentials of individual partners from previous propriety firm(s) or dissolved previous partnership firm(s) or split previous partnership firm(s), shall be considered only to the extent of their share in previous entity on the date of dissolution / split and their share in newly formed partnership firm. For example, a partner A had 30% share in previous entity and his share in present partnership firm is 20%. In the present tender under consideration, the credentials of partner A will be considered to the extent of 0.3×0.2 * value of the work done in the previous entity. For this purpose, the tenderer shall submit along with his bid all the relevant documents which include copy of previous partnership deed(s), dissolution deed(s) and proof of surrender of PAN No.(s) in case of dissolution of partnership firm(s) etc.
- 7.2. In case of existing partnership firm, if any one or more partners quit the partnership firm, the credentials of remaining partnership firm shall be re-worked out i.e., the quitting partner(s) shall take away his credentials to the extent of his share on the date of quitting the partnership firm (e.g. in a partnership firm of partners A, B & C having share 30%, 30% & 40% respectively and credentials of Rs 10 crore; in case partner C quits the firm, the credentials of this partnership firm shall remain as Rs 6 crore). For this purpose, the tenderer shall submit along with his bid all the relevant documents which include copy of previous partnership deed(s), dissolution deed(s) and proof of surrender of PAN No.(s) in case of dissolution of partnership firm(s) etc.
- 7.3. In case of existing partnership firm if any new partner(s) joins the firm without any

modification in the name and PAN/TAN no. of the firm, the credentials of partnership firm shall get enhanced to the extent of credentials of newly added partner(s) on the same principles as mentioned in item 7.2 above. For this purpose, the tenderer shall submit along with his bid all the relevant documents which include copy of previous partnership deeds, dissolution/splitting deeds and proof of surrender of PAN No.(s) in case of dissolution of partnership firm etc.

- 7.4. Any partner in a partnership firm cannot use or claim his credentials in any other firm without leaving the partnership firm i.e., In a partnership firm of A&B partners, A or B partner cannot use credentials of partnership firm of A&B partners in any other partnership firm or propriety firm without leaving partnership firm of A&B partners.
 - 7.5. In case a partner in a partnership firm is replaced due to succession as per succession law, the proportion of credentials of the previous partner will be passed on to the successor.
 - 7.6. If the percentage share among partners of a partnership firm is changed, but the partners remain the same, the credentials of the firm before such modification in the share will continue to be considered for the firm as it is without any change in their value. Further, in case a partner of partnership firm retires without taking away any credentials from the firm, the credentials of partnership firm shall remain the same as it is without any change in their value.
 - 7.7. In a partnership firm "AB" of A&B partners, in case A also works as propriety firm "P" or partner in some other partnership firm "AX", credentials of A in propriety firm "P" or in other partnership firm "AX" earned after the date of becoming a partner of the firm AB shall not be added in partnership firm AB.
8. In case a tenderer is LLP, the credentials of tenderer shall be worked out on above lines similar to a partnership firm.
 9. In case company A is merged with company B, then company B would get the credentials of company A also.

1.3.13 (ii) Credentials of Tenderer

The tenderer shall provide satisfactory evidence in support of their technical and financial eligibility, which are acceptable to DFCCIL, as follows:

- (a) For Technical eligibility criteria, the details will be submitted in Form No. 2AI along with supporting documents.
- (b) For Financial eligibility criteria, the details will be submitted in Form No.2B along with supporting documents.
- (c) For Bid Capacity, the details will be submitted in Form No. 2C, 2C-I, 2C-II, 2C-III & 2C-IV along with supporting documents.
- (d) Work experience certificate from private individual shall not be considered. However, in addition to work experience certificates issued by any Govt. Organization, work experience certificate issued by Public listed company having average annual turnover of Rs 500 crore and above in last 3 financial years excluding the current financial year, listed on National Stock Exchange or Bombay Stock Exchange, incorporated/registered at least 5 years prior to the date of closing of tender, shall also be considered provided the work experience certificate has been issued by a person authorized by the Public

listed company to issue such certificates.

In case tenderer submits work experience certificate issued by public listed company, the tenderer shall also submit along with work experience certificate, the relevant copy of work order, bill of quantities, bill wise details of payment received duly certified by Chartered Accountant, TDS certificates for all payments received and copy of final/last bill paid by company in support of above work experience certificate.

The following will be applicable for evaluating the eligibility:

- (i) The tenderer shall be considered disqualified/in-eligible if:
 - (a) The Tenderer or any of its partners and/or subcontractors included in the tender has been banned for business with Ministry of Railways/DFCCIL along with any of its attached and subordinate offices through an order issued by Ministry of Railways or DFCCIL pertaining to banning of Business, with the banning being valid as on the date of submission the Tender.
 - (b) The Tenderer or any of its partners has suffered bankruptcy / insolvency or it is in the process of winding-up or there is a case of insolvency pending before any Court on the deadline of submission of application.
- (ii) Credentials if submitted in foreign currency shall be converted into Indian currency i.e., Indian Rupee as under:

The conversion rate of US Dollars into Rupees shall be the daily representative exchange rates published by the Reserve Bank of India or entity authorized by RBI to do so for the relevant date or immediately previous date for which rates have been published. Where, relevant date shall be as on the last day of month previous to the one in which tender is invited. In case of any other currency, the same shall first be converted to US Dollars as on the last day of month previous to the one in which tender is invited, and the amount so derived in US Dollars shall be converted into Rupees at the aforesaid rate. The conversion rate of such currencies shall be the daily representative exchange rates published by the International Monetary Fund for the relevant date or immediately previous date for which rates have been published.

- (iii) For the purpose of evaluation of proposals, all values given in INR in eligible qualification criteria and the values provided by the applicants in the proposal in the currencies other than INR shall be converted into one i.e. INR as per exchange rate mentioned in para (vi) above.

1.3.13 (iii) System of Verification of Tenderer's Credential:

1. For the works tenders, it has been decided to adopt the affidavit-based system of credential verification. The tenderer shall submit along with the tender document, documents in support of his/their claim to fulfill the eligibility criteria as mentioned in the tender document. Each page of the copy of documents/certificates in support of certificates submitted by the tenderer, shall be self-attested/ digitally signed by the tenderer or authorized representative of the tendering firm. Self – attestation shall include signature, stamp and date (on each page).
2. (i) The tenderers shall submit a notarized affidavit on a non-judicial stamp paper stating that they

are not liable to be disqualified and all their statements/documents submitted along with bid are true and factual. Standard format of the affidavit to be submitted on IREPS portal by the bidder is enclosed as **Form-22**. Non submission of an affidavit (**Form-22**) by the **bidder shall result in summary rejection** of his/their bid. And it shall be mandatorily incumbent upon the tenderer to identify, state and submit the supporting documents duly self-attested by which they/he is qualifying the Qualifying Criteria mentioned in the Tender Document. It will not be obligatory on the part of Tender Committee to scrutinize beyond the submitted documents of tenderer as far as his qualification for the tender is concerned.

2. (ii) The tender document also includes the provisions for specialized machinery (i.e., Rail Auger, RRV, Wiring Train with driving unit and RRV (Rail cum road vehicle), Rail based man lift (scissor lift) & Conductor Drum Rail Trolley) required for execution of OHE works to suit site condition. Contractors is required to confirm the availability of these vital machineries either on **owner basis or submission of MOU** from the vendors (owners) for mobilization of these machinery as per the requirement at the site of work. Accordingly, **Form-31** has been incorporated in the Tender document for submission by the tenderer(s). Non submission of **Form-31** by the **bidder shall result in summary rejection** of his/their bid.
3. The DFCCIL reserves the right to verify all statements, information and documents submitted by the bidder in his tender offer, and the bidder shall, when so required by the DFCCIL, make available all such information, evidence and documents as may be necessary for such verification. Any such verification or lack of such verification, by the DFCCIL shall not relieve the bidder of its obligations or liabilities hereunder nor will it affect any right of the DFCCIL thereunder.
4. In case of any wrong information submitted by tenderer, the contract shall be terminated, Bid Security Deposit, Performance (PG) and Security Deposit (SD) of contract forfeited and agency barred for doing business on entire DFCCIL for 5(five) years.

1.3.14 Period of Completion

The entire work is required to be completed in all respects within **12 months** from the date of issue of the acceptance letter. Time is the essence of contract. The contractor shall be required to maintain steady and regular progress to the satisfaction of the Engineer to ensure that the work will be completed in all respects within the stipulated time.

1.3.15 Pre-Bid Meeting

A pre-bid meeting has been planned. Tenderer should give their queries in writing at least 3 days prior to Pre-bid meeting. All interested firms / contractors may attend the Pre-bid conference. DFCCIL response to queries will be posted on the DFCCIL's website www.dfccil.com. Non-attendance at the pre-bid conference will not be a cause for disqualification of the bidder. All communication between the Employer and the tenderer shall be in writing. For the purposes of seeking clarification, the Employer's address is:

**Chief General Manager /General Manager- Coordination/ DFCCIL,
Office of the Chief General Manager, Dedicated Freight Corridor Corporation of India
Limited, 7th Floor, New Administrative Building, D. N. Road, Mumbai – 400001**

Mobile: 9004443303
Email address: bprattipati@dfcc.co.in

1.3.16 If the Tenderer/s deliberately gives any wrong information about credentials/documents in his/ their tenders and thereby create(s) circumstances for acceptance of his/their tender, DFCCIL reserves the right to reject such tender at any stage, besides, shall suspend business with such tenderer. The BID SECURITY of such tenderers shall also be forfeited.

1.3.17 (a) Provisions of Make in India Policy 2017 issued by Govt. of India, as amended from time to time, shall be followed for consideration of tenders.

The Bidder must indicate the percentage of local content as stipulated in Public Procurement (preference to Make in India), order 2017 as amended from time to time and its subsequent orders/ notification issued by concerned Nodal Ministry for specific Goods/Products. The minimum local content to qualify as class I local supplier is 50% and to qualify as Class II local supplier would be 20%. Nonlocal suppliers are not eligible to participate as per provisions of the public Procurement (Preference to Make In India), Order 2017 and its subsequent amendment. The bidder shall be required to upload a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or by a practicing cost accountant or practicing chartered accountant (if bidder is other than companies), giving the percentage of local content. Preference shall be given to class I local suppliers as per provisions of the Public Procurement (Preference to Make in India), order 2017 and its subsequent amendments.

(b) Permission to Bid for a bidder from a country which shares Land boundary with India:
Any bidder from the countries sharing a land border with India will be eligible to bid in any procurement of works (including turnkey projects) only if the bidder is registered with the Competent Authority. The Competent Authority for registration will be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT), Government of India. For interpretation of this para, Department of Expenditure, Ministry of Finance, Government of India letter F.No.6/18/2019-PPD dated 23/07/2020 shall be referred.

1.3.18 Quantum of work and materials:

The indicative schedule of quantities of various items of works is included in Form – 3 and Form- 4 as well as part-II, Chapter 10 of the tender documents.

1.3.19 Employer not bound to accept any tender:

The employer shall not be bound to accept the lowest or any tender or to assign any reason for non-acceptance or rejection of a tender. The employer reserves the right to accept any tender in respect of the whole or any portion of the work specified in the tender papers or to reduce the work or to accept any tender for less than the tendered quantities without assigning any reason whatsoever.

1.3.20 Schedule of Prices

The Form-3 and Form-4 of Part-III of BID DOCUMENTS lists out the Schedule of Prices for various items. Based on these, the total tender value has also been worked out.

1.3.21 Performance Guarantee: Refer relevant clause of GCC.

1.3.22 The tenderer shall furnish information for making payment through ECS/NEFT/RTGS (Tender Form No. 8 placed at Part III of the tender documents).

1.3.23 Negotiation:

Should DFCCIL decide to negotiate with a view to bring down the rates, the tenderer called for negotiations should furnish the following form of declaration before commencement of negotiations?

"I. do declare that in the event of failure of contemplated negotiations relating to Tender No..... dated my original tender shall remain open for acceptance on its original terms and conditions,".

1.3.24 Site Inspection:

Tenderers are requested to inspect the site and carry out careful examination to satisfy them as to the nature of work involved and facilities available at the site. They should note carefully all the existing structures and those under construction through other agencies. They should also study the suitability of utilizing the different equipment and the machinery that they intend to use for the execution of the work. The tenderers should also select suitable sites for the purpose of locating their store yard, laboratory, staff quarters etc., and satisfy themselves with regard to the feasibility of transporting the girders, etc. from the yard to the final site of placement etc.

The tenderers submitting the online bids shall be deemed to have inspected and examined the Site, its surroundings, the data given in the tender document and other available - information, and the tenderer shall be deemed to have been satisfied before submitting the Tender as to all relevant matters including without limitation;

- a. the extent and nature of the work and Goods necessary for the execution and completion of the Works and the remedying of any defects,
- b. the Laws, procedures and labor practices of the region forming the Site, and
- c. the Contractor's requirements for access, accommodation, facilities, personnel, power, transport, water and other services.

1.3.25 Tenderer(s) who can participate for this tender/Bid are Person, Company, Firm, Joint Venture/Partnership Firm/ Limited liability partnership/HUF/Registered Society and Registered Trust as per their eligibility detailed in this tender document.

1.3.26 Preliminary examination of bids

- a) The DFCCIL shall examine the bids to determine whether they are complete, whether any computational errors have been made, whether the documents have been properly signed and whether the bids are generally in order.
- b) Arithmetical errors shall be rectified on the following basis if found. If there is a discrepancy between the unit price and the total price, which is obtained by multiplying the unit price and quantity, or between subtotals and the total price, the unit or subtotal price shall prevail, and

the total price shall be corrected.

- c) The rates should be quoted in figures as well as in words. If there is variation between rates quoted in figures and in words, the rate quoted in 'words' shall be taken as correct. If more than one or improper rates are tendered for the same item, the tender is liable to be rejected.
- d) Prior to the detailed evaluation, DFCCIL shall determine whether each bid is of acceptable quality, is generally complete and is substantially responsive to the bidding documents. For purposes of this determination, a substantially responsive bid is one that conforms to all the terms, conditions and specifications of the bidding documents without material deviations, objections, conditionality or reservation. A material deviation, objections, conditionality or reservation is one:
 - (i) That affects in any substantial way the scope, quality or Performance of the contract.
 - (ii) That limits in any substantial way, inconsistent with the bidding documents, the DFCCIL's rights or the successful Bidder's obligations under the contracts; or
 - (iii) Whose rectification would unfairly affect the competitive position of other Bidders who are presenting substantially responsive bids.
- e) If a bid is not substantially responsive, it shall be rejected by the DFCCIL.
- f) In case of tenders containing any conditions or deviations or reservations about contents of tender document. DFCCIL can summarily reject such tender.
- g) **Clarification of Bids:** To assist in the examination, evaluation & comparison and prequalification of the Tender, the DFCCIL may, at its discretion, ask any Bidder for a clarification of its Bid. Any clarification submitted by a Bidder that is not in response to a request by the DFCCIL shall not be entertained or considered. The DFCCIL request for clarification and the response of the bidder in this regard shall be in writing.
If a Bidder does not provide clarifications of its bid by the date and time set in the Employer's request for clarification, its bid may be rejected.

1.3.27 Evaluation and comparison of tenders

In case of open tenders, bids, which are determined as substantially responsive, shall be evaluated based on criteria as given in Eligibility Criteria" and as given in Notice Inviting E-Tender. The tenderer must submit all necessary authentic data with necessary supporting certificates of the various items of evaluation criteria failing which his tender is liable to be rejected.

1.3.28 Canvassing

No tenderer is permitted to canvass to DFCCIL on any matter relating to this tender. Any tenderer found doing so may be disqualified and his bid may be rejected.

1.3.29 Award of Contract

1. DFCCIL shall notify the successful tenderer in writing by a Registered Letter/Courier/Speed Post/ through bearer or through E-mail that his tender has been accepted.
2. Letter of Acceptance after it is signed by the Contractor in token of his acceptance shall constitute a legal and binding contract between DFCCIL and the contractor till such time the contract agreement is signed.

1.3.30 Understanding and Amendments of Tender Documents:

1. The bidder must own all responsibilities and bear all cost for obtaining all the information including risks, contingencies & other circumstances in execution of the work. It shall also carefully read and understand all its obligations & liabilities given in tender documents.
2. Deleted.
3. At any time prior to the deadline for submission of bids, DFCCIL may for any reason whether at its own initiative or in response to any request by any prospective bidder amend the bidding documents by issuing Amendment, which shall be part of the Tender documents.
4. DFCCIL may at its discretion extend the deadline for submission of the bids at any time before the time of submission of the bids.

1.3.31 Deleted.

1.3.32 JOINT VENTURE (JV) FIRMS IN WORKS TENDERS:

Participation of Joint Venture (JV) in Works Tender: This para shall be applicable for works tenders wherein tender documents provide for the same.

- 1.3.32.1 Separate identity/name shall be given to the Joint Venture.
- 1.3.32.2 Number of members in a JV shall not be more than three, if the work involves only one department (say Civil or S&T or Electrical or Mechanical) and shall not be more than five, if the work involves more than one Department. One of the members of the JV shall be its Lead Member who shall have a majority (at least 51%) share of interest in the JV. The other members shall have a share of not less than 20% each in case of JV with upto three members and not less than 10% each in case of JV with more than three members. In case of JV with foreign member(s), the Lead Member has to be an Indian firm/company with a minimum share of 51%.
- 1.3.32.3 A member of JV shall not be permitted to participate either in individual capacity or as a member of another JV in the same tender.
- 1.3.32.4 The tender form shall be purchased and submitted only in the name of the JV and not in the name of any constituent member. The tender form can however be submitted by JV or any of its constituent member or any person authorized by JV through Power of Attorney to submit tender.
- 1.3.32.5 Bid Security Deposit shall be submitted by JV or authorized person of JV either as:
 - (i) Cash through e-payment gateway or as mentioned in tender document, or
 - (ii) Bank Guarantee bond either in the name of JV, or in the name of all members of JV as per MOU irrespective of their share in the JV if the JV has not been constituted legally till the date of submission of tender.
- 1.3.32.6 A copy of Memorandum of Understanding (MoU) duly executed by the JV members on a stamp paper, shall be submitted by the JV along with the tender. The complete details of the members of the JV, their share and responsibility in the JV etc. particularly with reference to financial, technical and other obligations shall be furnished in the MoU.
- 1.3.32.7 Once the tender is submitted, the MoU shall not normally be modified / altered / terminated during the validity of the tender. In case the tenderer fails to observe/comply with this stipulation, the full Bid Security shall be liable to be forfeited.
- 1.3.32.8 Approval for change of constitution of JV shall be at the sole discretion of the DFCCIL. The constitution of the JV shall not normally be allowed to be modified after submission of the

bid by the JV, except when modification becomes inevitable due to succession laws etc., provided further that there is no change in qualification of minimum eligibility criteria by JV after change of composition. However, the Lead Member shall continue to be the Lead Member of the JV. Failure to observe this requirement would render the offer invalid.

- 1.3.32.9 Similarly, after the contract is awarded, the constitution of JV shall not be normally allowed to be altered during the currency of contract except when modification become inevitable due to succession laws etc. and minimum eligibility criteria should not get vitiated. Failure to observe this stipulation shall be deemed to be breach of contract with all consequential penal action as per contract conditions.
- 1.3.32.10 On award of contract to a JV, a single Performance Guarantee shall be submitted by the JV as per tender conditions. All the Guarantees like Performance Guarantee, Bank Guarantee for Mobilization Advance, Machinery Advance etc. shall be accepted only in the name of the JV and no splitting of guarantees amongst the members of the JV shall be permitted.
- 1.3.32.11 On issue of LOA (Letter of Acceptance), the JV entity to whom the work has been awarded, with the same shareholding pattern as was declared in the MOU/JV Agreement submitted along with the tender, shall be got registered before the Registrar of the Companies under 'The Companies Act - 2013' (in case JV entity is to be registered as Company) or before the Registrar/Sub-Registrar under the 'The Indian Partnership Act, 1932' (in case JV entity is to be registered as Partnership Firm) or under 'The LLP Act 2008' (in case JV entity is to be registered as LLP). A separate PAN shall be obtained for this entity. The documents pertaining to this entity including its PAN shall be furnished to the DFCCIL before signing the contract agreement for the work. In case the tenderer fails to observe/comply with this stipulation within 60 days of issue of LOA, contract is liable to be terminated. In case contract is terminated DFCCIL shall be entitled to forfeit the full amount of the Bid Security and other dues payable to the Contractor under this contract. The entity so registered, in the registered documents, shall have, inter-alia, following Clauses:
- 1.3.32.11.1 Joint and Several Liability - Members of the entity to which the contract is awarded, shall be jointly and severally liable to the DFCCIL for execution of the project in accordance with General and Special Conditions of Contract. The members of the entity shall also be liable jointly and severally for the loss, damages caused to the DFCCIL during the course of execution of the contract or due to non-execution of the contract or part thereof.
- 1.3.32.11.2 Duration of the Registered Entity - It shall be valid during the entire currency of the contract including the period of extension, if any and the maintenance period after the work is completed.
- 1.3.32.11.3 Governing Laws - The Registered Entity shall in all respect be governed by and interpreted in accordance with Indian Laws.
- 1.3.32.12 Authorized Member - Joint Venture members in the JV MoU shall authorize Lead member on behalf of the Joint Venture to deal with the tender, sign the agreement or enter into contract in respect of the said tender, to receive payment, to witness joint measurement of work done, to sign measurement books and similar such action in respect of the said tender/contract. All notices/correspondences with respect to the contract would be sent only to this authorized member of the JV.
- 1.3.32.13 No member of the Joint Venture shall have the right to assign or transfer the interest right or

liability in the contract without the written consent of the other members and that of the DFCCIL in respect of the said tender/contract.

1.3.32.14 Documents to be enclosed by the JV along with the tender:

1.3.32.14.1 In case one or more of the members of the JV is/are partnership firm(s), following documents shall be submitted:

- (i) A notarized copy of the Partnership Deed or a copy of the Partnership deed registered with the Registrar.
- (ii) A copy of consent of all the partners or individual authorized by partnership firm, to enter into the Joint Venture Agreement on a stamp paper,
- (iii) A notarized or registered copy of Power of Attorney in favor of the individual to sign the MOU/JV Agreement on behalf of the partnership firm and create liability against the firm.
- (iv) An undertaking by all partners of the partnership firm that they are not blacklisted or debarred by Railways or any other Ministry / Department of the Govt. of India /DFCCIL from participation in tenders / contracts as on the date of submission of bids, either in their individual capacity or in any firm/LLP in which they were / are partners/members. Any Concealment / wrong information in regard to above shall make the bid ineligible or the contract shall be determined under Clause 62 of the General Conditions of Contract.

1.3.32.14.2 In case one or more members is/are Proprietary Firm or HUF, the following documents shall be enclosed:

- (i) A copy of notarized affidavit on Stamp Paper declaring that his Concern is a proprietary Concern and he is sole proprietor of the Concern OR he who is signing the affidavit on behalf of HUF is in the position of 'Karta' of Hindu Undivided Family (HUF) and he has the authority, power and consent given by other members to act on behalf of HUF.

1.3.32.14.3 In case one or more members of the JV is/are companies, the following documents shall be submitted:

- (i) A copy of resolutions of the Directors of the Company, permitting the company to enter into a JV agreement,
- (ii) The copies of MOA (Memorandum of Association) / AOA (Articles of Association) of the company
- (iii) A copy of Certificate of Incorporation
- (iv) A copy of Authorization/copy of Power of Attorney issued by the Company (backed by the resolution of Board of Directors) in favour of the individual, to sign the tender, sign MOU/JV Agreement on behalf of the company and create liability against the company

1.3.32.14.4 In case one or more members of the JV is/are LLP firm/s, the following documents shall be submitted:

- (i) A copy of LLP Agreement
- (ii) A copy of Certificate of Incorporation of LLP
- (iii) A copy of resolution passed by partners of LLP firm, permitting the Firm to enter into a JV agreement

- (iv) A copy of Authorization /copy of Power of Attorney issued by the LLP firm (backed by resolution passed by the Partners) in favour of the individual, to sign the tender and/or sign the MOU/ JV agreement on behalf of the LLP and create liability against the LLP.
- (v) An undertaking by all partners of the LLP that they are not blacklisted or debarred by Railways or any other Ministry / Department of the Govt. of India /DFCCIL from participation in tenders / contracts as on the date of submission of bids, either in their individual capacity or in any firm/LLP or JV in which they were / are partners/members. Any Concealment / wrong information in regard to above shall make the contract liable for determination under Clause 62 of the General Conditions of Contract.

1.3.32.14.5 In case one or more members of the JV is/are Society/s or Trust/s, the following documents shall be submitted:

- (i) A copy of Certificate of Registration
- (ii) A copy of Memorandum of Association of Society/Trust Deed
- (iii) A copy of Rules & Regulations of the Society
- (iv) A copy of Power of Attorney, in favour of the individual to sign the tender documents and create liability against the Society/Trust.

1.3.32.15 Credentials & Qualifying Criteria: Technical, financial eligibility and Bid capacity of the JV shall be adjudged based on satisfactory fulfillment of the following criteria:

1.3.32.15.1 Technical Eligibility Criteria ('a' or 'b' mentioned hereunder):

(a) For Works without composite components

The technical eligibility for the work as per para 1.3.13(i)(A)I of Chapter III Part I, shall be satisfied by either the 'JV in its own name & style' or 'Lead member of the JV'.

Each other (non-lead) member(s) of JV, who is/ are not satisfying the technical eligibility for the work as per para 1.3.13(i)(A)I of Chapter III Part I, shall have technical capacity of minimum 10% of the cost of work i.e., each non-lead member of JV member must have satisfactorily completed or substantially completed during last 07 (seven) years, ending last day of month previous to the one in which tender is invited, one similar single work for a minimum of 10% of advertised value of the tender.

(b) For works with composite components

The technical eligibility for major component of work as per para 1.3.13(i)(A) I of Chapter III Part I, shall be satisfied by either the 'JV in its own name & style' or 'Lead member of the JV'.

Each other (non-lead) member(s) of JV, who is/ are not satisfying the technical eligibility for any component of the work as per para 1.3.13(i)(A) of Chapter III Part I, shall have technical capacity of minimum 10% of the cost of any component of work mentioned in technical eligibility criteria. i.e., each other (non- lead) member of must have satisfactorily completed or substantially completed during last 07 (seven) years, ending last day of month previous to the one in which tender is invited, one similar single work for a minimum of 10% of cost of any component of work mentioned in technical

eligibility criteria in para 1.3.13(i)(A) I.

- (c) *The Major component of the work for this purpose shall be the component of work having highest value. In cases where value of two or more component of work is same, any one work can be classified as Major component of work.*
- (d) *Value of a completed work done by a Member in an earlier JV shall be reckoned only to the extent of the concerned member's share in that JV for the purpose of satisfying his/her compliance to the above-mentioned technical eligibility criteria in the tender under consideration.*

1.3.32.15.2 Financial Eligibility Criteria

The JV shall satisfy the requirement of “Financial Eligibility” mentioned at para 1.3.13(i)(B) of Chapter III Part I. The “financial capacity” of the lead member of JV shall not be less than 51% of the financial eligibility criteria mentioned at para 1.3.13(i)(B) of Chapter III Part I.

The arithmetic sum of individual “financial capacity” of all the members shall be taken as JV’s “financial capacity” to satisfy this requirement.

Note: Contractual payment received by a Member in an earlier JV shall be reckoned only to the extent of the concerned member’s share in that JV for the purpose of satisfying compliance of the above-mentioned financial eligibility criteria in the tender under consideration.

1.3.32.15.3 Bid Capacity

The JV shall satisfy the requirement of “Bid Capacity” requirement mentioned at para 1.3.13(i)(C) of Chapter III Part I. The arithmetic sum of individual “Bid capacity” of all the members shall be taken as JV’s “Bid capacity” to satisfy this requirement.

1.3.33 Participation of Partnership Firms in works tenders:

- 1.3.33.1 The Partnership Firms participating in the tender should be legally valid under the provisions of the Indian Partnership Act.
- 1.3.33.2 The partnership firm should have been in existence or should have been formed prior to submission of tender. Partnership firm should have either been registered with the Registrar or the partnership deed should have been notarized as per the Indian Partnership Act, prior to submission of tender.
- 1.3.33.3 Separate identity / name should be given to the partnership firm. The partnership firm should have PAN / TAN number in its own name and PAN / TAN number in the name of any of the constituent partners shall not be considered. The valid constituents of the firm shall be called partners.
- 1.3.33.4 Once the tender has been submitted, the constitution of the firm shall not normally be allowed to be modified / altered / terminated during the validity of the tender as well as the currency of the contract except when modification becomes inevitable due to succession laws etc., in which case prior permission should be taken from DFCCIL and in any case the minimum eligibility criteria should not get vitiated. The re-constitution of firm in such cases should be followed by a notary certified Supplementary Deed. The approval for change of constitution of the firm, in any case, shall be at the sole discretion of the DFCCIL and the tenderer shall have no claims what-so-ever. Any change in the constitution of Partnership firm after submission of tender shall be with the consent of all partners and with the signatures of all

partners as that in the Partnership Deed. Failure to observe this requirement shall render the offer invalid and full Bid Security shall be forfeited.

If any Partner/s withdraws from the firm after submission of the tender and before the award of the contract, the offer shall be rejected and Bid Security of the tenderer will be forfeited. If any new partner joins the firm after submission of tender but prior to award of contract, his / her credentials shall not qualify for consideration towards eligibility criteria either individually or in proportion to his share in the previous firm. In case the tenderer fails to inform DFCCIL beforehand about any such changes / modification in the constitution which is inevitable due to succession laws etc. and the contract is awarded to such firm, then it will be considered a breach of the contract conditions liable for determination of the contract under Clause 62 of the General Conditions of Contract.

- 1.3.33.5 A partner of the firm shall not be permitted to participate either in his individual capacity or as a partner of any other firm in the same tender.
- 1.3.33.6 The tender form shall be submitted only in the name of partnership firm. The Bid Security shall be submitted by partnership firm. The Bid Security submitted in the name of any individual partner or in the name of authorized partner(s) shall not be considered.
- 1.3.33.7 On issue of Letter of Acceptance (LOA) to the partnership firm, all the guarantees like Performance Guarantee, Guarantee for various Advances to the Contractor shall be submitted only in the name of the partnership firm and no splitting of guarantees among the partners shall be acceptable.
- 1.3.33.8 On issue of Letter of Acceptance (LOA), contract agreement with partnership firm shall be executed in the name of the firm only and not in the name of any individual partner
- 1.3.33.9 In case the Letter of Acceptance (LOA) is issued to a partnership firm, the following undertakings shall be furnished by all the partners through a notarized affidavit, before signing of contract agreement.
- (a) Joint and several liabilities:
The partners of the firm to which the Letter of Acceptance (LOA) is issued, shall be jointly and severally liable to the DFCCIL for execution of the contract in accordance with General and Special Conditions of the Contract. The partners shall also be liable jointly and severally for the loss, damages caused to the DFCCIL during the course of execution of the contract or due to non- execution of the contract or part thereof.
- (b) Duration of the partnership deed and partnership firm agreement:
The partnership deed/partnership firm agreement shall normally not be modified/alterd/ terminated during the currency of contract and the maintenance period after the work is completed as contemplated in the conditions of the contract. Any change carried out by partners in the constitution of the firm without permission of DFCCIL, shall constitute a breach of the contract, liable for determination of the contract under Clause 62 of the General Conditions of Contract.
- (c) Governing laws:
The partnership firm agreement shall in all respect be governed by and interpreted in accordance with the Indian laws.
- (d) No partner of the firm shall have the right to assign or transfer the interest right or liability in the contract without the written consent of the other partner/s and that of the DFCCIL.
- 1.3.33.10 The tenderer shall clearly specify that the tender is submitted on behalf of a partnership firm. The following documents shall be submitted by the partnership firm, with the tender:

- (i) A notarized copy of the Partnership Deed or a copy of the Partnership deed registered with the Registrar.
- (ii) A notarized or registered copy of Power of Attorney in favour of the individual to tender for the work, sign the agreement etc. and create liability against the firm.
- (iii) An undertaking by all partners of the partnership firm that they are not blacklisted or debarred by Railways or any other Ministry / Department of the Govt. of India /DFCCIL from participation in tenders / contracts as on the date of submission of bids, either in their individual capacity or in any firm/LLP in which they were / are partners/members. Any Concealment / wrong information in regard to above shall make the bid ineligible or the contract shall be determined under Clause 62 of the General Conditions of Contract.

1.3.33.11 Evaluation of eligibility of a partnership firm:

Technical and financial eligibility of the firm shall be adjudged based on satisfactory fulfillment of the eligibility criteria laid down in para 1.3.13(i) of Chapter III Part I of the Tender document.

1.3.34 The DFCCIL has appointed 2 (two) independent external monitors for the purpose of monitoring the Bidding Process and execution of the Contract Agreement for compliance with the principles specified in the integrity pact enclosed as Form no. 20. The details of the independent external monitors can be obtained from DFCCIL office.

PART- I

Chapter- IV

GENERAL CONDITIONS OF CONTRACT (GCC)

PART-I**Chapter-IV****GENERAL CONDITIONS OF CONTRACT****DEFINITIONS AND INTERPRETATION**

1. (1) **Definition:** - In these General conditions of Contract, the following terms shall have the meaning assigned hereunder except where the context otherwise requires: -

- (a) "DFCCIL"/ "Employer" shall mean Dedicated Freight Corridor Corporation of India Limited (DFCCIL), a company incorporated under the companies Act, 1956 and having its Registered & Corporate office at Supreme Court Metro Station Building Complex, New Delhi 110001 which expression shall also include its legal successors and permitted assigns." Acting through CGM/GM(Co) or official specified in tender document.
- (b) Deleted
- (c) Deleted
- (d) Deleted
- (e) Deleted
- (f) "Engineer" means the person appointed by the Employer to act as the Engineer for the purposes of the Contract and named as below.

Engineer shall be PMC-2R -OCG Consortium comprised by (i) Oriental Consultants Global Co. Ltd., Japan, (ii) Oriental Consultants India Pvt. Ltd., (iii)Nippon Koei Co. Ltd., (iv)Nippon Koei India Pvt. Ltd. And (v) RITES Ltd.

OR

Any Authority Appointed by Employer

- (g) Deleted
- (h) "Contractor" shall mean the Person, Company, Firm, Joint Venture/Partnership Firm/ Limited liability partnership/HUF/Registered Society and Registered Trust who enters into the contract with the DFCCIL and shall include their executors, administrators, and successors and permitted assigns.
- (i) "**Contractor' s Representative**" means the person appointed by the Contractor who acts on behalf of the Contractor and whose lawful actions towards execution of this Contract, Contractor ratifies as if done by Contractor himself. He must possess minimum Bachelor degree in Electrical Engineering with minimum Three years of Railway OHE related Experience.
- (j) "Contract" shall mean and include the Agreement of Work Order, the accepted schedule of rates of the Schedule or Rates of DFCCIL modified by the tender percentage for items of work

quantified, or not quantified, General Conditions of Contract, Special Conditions of Contracts, if any, Drawings, Specifications, Additional / Special Specifications, if any and tender forms, if any, and all other documents included as part of contract.

- (k) “Works” shall mean the works to be executed in accordance with the contract.
- (l) “Specifications” shall mean the Specifications for materials and works referred / mentioned in tender documents.
- (m) **Drawings** shall mean maps, drawings, plans and tracings or prints there of including any modifications of such drawings, as annexed to the contract and / or supplied by the Engineer.
- (n) **Construction plan**-means the highest precedent detailed resource loaded programme, as developed by the Contractor covering the whole scope of the Contract for execution of the Works within the specified Completion period and approved by the Engineer.
- (o) **"Temporary Works"** means all temporary works of every kind (other than Contractor's Equipment) required on Site for the execution and completion of the Works and the remedying of any defects.
- (p) **"Site"** means the places where the Works are to be executed and to which Plant and Materials are to be delivered, and any other places as may be specified in the Contract as forming part of the Site.

"Plant" means the apparatus, machinery and vehicles intended to form or forming part of the Works.

"Materials" means things of all kinds (other than Plant) intended to form or forming part of the Works, including the supply-only materials (if any) to be supplied by the Contractor under the Contract.

"Goods" means Contractor's Equipment, Materials, Plant and Temporary Works, or any of them as appropriate.

- (q) **“Period of Maintenance”** shall mean the defect liability period (DLP) from the date of completion of the works as certified by the Engineer.
- (r) **“Bid” or “Tender”, “Bidder” or “Tenderer”** wherever appearing in this document shall have the same and interchangeable meaning.
- (s) Date of inviting tender shall be the date of publishing tender notice on IREPS website if tender is published on website or the date of publication in newspaper in case tender is not published on website.
- (t) **“Bill of Quantities”** shall mean Schedule of Item(s) included in the tender document along with respective quantities and rates, accepted by the DFCCIL.
- (u) Standard Schedule of Rates (SSOR) shall mean the schedule of Rates adopted by the Railway, which includes-
 - (i) **“Unified Standard Schedule of Rates of the Railway (USSOR)”** i.e. the Standard Schedule of Rates of the Railway issued under the authority of the Chief Engineer from time to time, updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents;

- (ii) “Delhi Schedule Of Rates (DSR)” i.e. the Standard Schedule of Rates published by Director General/ Central Public Works Department, Government of India, New Delhi, as adopted and modified by the Railway under the authority of the Chief Engineer from time to time, updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents.

1. (2) Singular and Plural: - Words importing the singular number shall also include the plural and vice versa where the context requires.

1. (3) Headings & marginal headings: -The headings and marginal headings in these general conditions are solely for the purpose of facilitating reference and shall not be deemed to be part thereof or be taken into consideration in the interpretation or construction thereof or the contract.

GENERAL OBLIGATION

2. (1) Execution Co-relation and intent of contract Documents: -The contract documents shall be signed in triplicate by the DFCCIL and the Contractor. The contract documents are complementary, and what is called for by any one shall be as binding as if called for by all, the intention of the documents is to include all labour and materials, equipments and transportation necessary for the proper execution of work. Materials or work not covered by or properly inferable from any heading or class of the specifications shall not be supplied by the DFCCIL to the contractors unless distinctly specified in the contract documents. Materials or works described in words which so applied have a well-known technical or trade meaning shall be held to refer to such recognized standards.

2.(2) If a work is transferred from the jurisdiction of one Railway to another Railway or to a Project Authority/DFCCIL or vice versa while contract is in subsistence, the contract shall be binding on the Contractor and the Successor Railway/Project in the same manner & take effect all respects as if the Contractor and the Successor Railway/Project were parties there to from the inception and the corresponding officer or the Competent Authority in the Successor Railway/Project will exercise the same powers and enjoy the same authority as conferred to the Predecessor Railway/Project under the original contract/agreement entered into.

2.(3) If for administrative or other reasons the contract is transferred to the Successor Railway/Successor Project Authority of DFCCIL the contract shall notwithstanding any things contained herein contrary there to, be binding on the Contractor and the Successor Railway /Project Authority/ DFCCIL in the same manner and take effect in all respect as if the Contractor and the Successor Railway/ successor Project Authority of DFCCIL had been parties thereto from the date of this contract. The contract shall be Administered/Managed by GGM/CGM/GM/CPM/nominated by DFCCIL.

3.(1) Law governing the contract: - “This agreement and the relationship between the parties shall be governed, construed and interpreted in accordance with applicable laws of India. Applicable laws shall mean all laws, bye-laws, statutes, rules, regulations, orders, ordinances, codes, guidelines, notices, directions, judgements, decrees or other requirements or official directives and/or of any statutory authority in the Republic of India.”

- 3.(2) Compliance to regulations and bye-laws:-**The contractor shall conform to the provision of any statute relating to the works and regulations and by-laws of any location authority and of any water and lighting companies or undertakings, with whose system the work is proposed to be connected and shall before making any variation from the drawings or the specifications that may be necessitated by so confirming give to the Engineer notice specifying the variation proposed to be made and the reasons for making the variation and shall not carry out such variation until he has received instructions from the Engineer in respect thereof. The contractor shall be bound to give all notices required by statute, regulations or bye-laws as aforesaid and to pay all fees and taxes payable to any authority in respect hereof.
- 4. Communications to be in writing: -** All notices, communications, reference and complaints made by the DFCCIL or the Engineer or the Engineer's representative or the contractor inters concerning the work shall be in writing and no notice, communication, reference or complaint not in writing shall be recognized.
- 5. Service of Notices on Contractors:-**The contractor shall furnish to the Engineer the name designation and address of Contractor's Representative as nominated by the Contractor and all complaints, notices, communications and references shall be deemed to have been duly given to the contractor if delivered to the contractor or Contractor's Representative as nominated by the Contractor or left at or posted to the address so given and shall be deemed to have been so given in the case of posting on day on which they would have reached such address in the ordinary course of post or on the day on which they were so delivered or left. In the case of contract by partners, any change in the constitution of the firm shall be forthwith notified by the contractor to the Engineer.
- 6. Occupation and use of land: -** No land belonging to or in the possession of the Railway/ DFCCIL shall be occupied by the Contractor without the permission of the Railway / DFCCIL. The Contractor shall not use, or allow to be used, the site for any purposes other than that of executing the works. Whenever non-railway bodies / persons are permitted to use railway premises with competent authority's approval, conservancy charges as applicable from time to time may be levied.
- 7. Assignment or subletting of contract: -**
The Contractor shall not assign or sublet the contract or any part thereof or allow any person to become interested therein in any manner whatsoever without the special permission in writing of the CGM/GM DFCCIL, save as provided below. Any breach of this condition shall entitle the DFCCIL to rescind the contract under Clause 62 of these Conditions and also render the Contractor liable for payment to the DFCCIL in respect of any loss or damage arising or ensuing from such cancellation; provided always that execution of the details of the work by petty Contractor under the direct and personal supervision of the Contractor or his agent shall not be deemed to be sub-letting under this clause.
In case Contractor intends to subcontract part of work, he shall submit a proposal in writing seeking permission of CGM/GM DFCCIL for the same. While submitting the proposal to DFCCIL, Contractor shall ensure the following:
(a) (i) Total value of work to be assigned to sub-contractor(s) shall not be more than 50% of total contract value.

- (a) (ii) The subcontractor shall have successfully completed at least one work similar to work proposed for subcontract in last 5 years, ending date of submission of proposal by Contractor to DFCCIL, costing not less than 35% value of work to be subletted, through a works contract. For fulfilment of above, Work Experience Certificate issued by a Govt. Department/Organization shall be considered. Further, Work Experience Certificate issued by a Public listed company shall be considered provided the company is having average annual turnover of Rs 500 crore and above in last 3 financial years excluding the current financial year, listed on National Stock Exchange or Bombay Stock Exchange, registered at least 5 years back from the date of submission of proposal by Contractor to DFCCIL and work experience certificate issued by a person authorized by the Public Listed Company to issue such certificates.

Note: For subletting of work costing up to Rs 50 lakh no previous work experience shall be asked for by the DFCCIL.

In case contractor submits subcontractor's work experience certificate issued by public listed company, the contractor shall also submit along with work experience certificate, the relevant copy of work order, bill of quantities, bill wise details of payment received duly certified by Chartered Accountant, TDS certificates for all payments received and copy of final/last bill paid by company in support of above work experience certificate.

- (a) (iii) There is no banning of business with the sub-contractor in force over IR/DFCCIL.
- (b) The Contractor shall provide to the Engineer a copy of the agreement to be entered into by Contractor with subcontractor. No subcontractor shall be permitted without a formal agreement between Contractor and subcontractor. This agreement shall clearly define the scope of work to be carried out by subcontractor and the terms of payment in clear & unambiguous manner.
- (c) On receipt of approval from CGM/GM DFCCIL, Contractor shall enter into a formal agreement legally enforceable in Court of Law with subcontractor and submit a copy of the same to the Engineer.
- (d) The Contractor shall intimate to the Engineer not less than 7 days in advance, the intended date of commencement of subcontractor's work.
- (e) Once having entered into above arrangement, Contractor shall discontinue such arrangement, if he intends to do so at his own or on the instructions of DFCCIL, with prior intimation to CGM/GM DFCCIL.
- (f) The Contractor shall indemnify DFCCIL against any claim of subcontractor.
- (g) The Contractor shall release payment to the Sub-contractor(s) promptly and shall endeavor to resolve all issues amicably and speedily with the Sub-contractor(s), so that the execution of work is not affected in any manner whatsoever.
- (h) In addition to issuance of work experience certificate to Contractor, the Engineer, when, based on documents, is satisfied that subcontracted work has been carried out by subcontractor, shall issue work certificate to the subcontractor also for the portion of work subcontracted and successfully completed by the sub-contractor.
- Note: Work Experience Certificate to the subcontractor shall be issued only when the contractor's work is complete and contractor is entitled for the issuance of Work Experience Certificate. However, in the same contract, when the CGM/GM DFCCIL, based on documents, is satisfied that the subcontractor has successfully carried out

sublated work; without issuance of work experience certificate to subcontractor at this stage, the CGM/GM DFCCIL can, only once, consider the successfully completed sublated work for the fulfilment of eligibility for further subletting of work to the subcontractor in the same contract. When the contractor's work is complete and contractor is entitled for the issuance of work experience certificate, the subcontractor shall be issued one Work Experience Certificate for the total scope of work executed by the subcontractor in the contract.

- (i) The responsibility of successful completion of work by subcontractor shall lie with Contractor. Subcontracting will in no way relieve the Contractor to execute the work as per terms of the Contract.
- (j) Further, in case Engineer is of the view that subcontractor's performance is not satisfactory, he may instruct the Contractor to remove the subcontractor from the work and Contractor has to comply with the above instructions with due promptness. Contractor shall intimate the actual date of discontinuation of subcontract to Engineer. No claim of Contractor whatsoever on this account shall be entertained by the DFCCIL and this shall be deemed as 'excepted matter' (matter not arbitrable).
- (k) The permitted subcontracting of work by the Contractor shall not establish any contractual relationship between the sub-contractor and the DFCCIL and shall not relieve the Contractor of any responsibility under the Contract.

8. Assistance by the DFCCIL for the Stores to be obtained by the Contractor: - Owing to difficulty in obtaining certain materials (including Tools & Plant) in the market, the DFCCIL may have agreed without any liability therefore to endeavor to obtain or assist the contractor in obtaining the required quantities of such materials as may be specified in the tender. In the event of delay or failure in obtaining the required quantities of the aforesaid material the contractor shall not be deemed absolved of his own responsibility and shall keep in touch with day to day positions regarding their availability and accordingly adjust progress of works including employment of labour and the DFCCIL shall not in any way be liable for the supply of materials or for the non-supply thereof for any reasons whatsoever nor for any loss or damage arising in consequence of such delay or no supply.

9. Deleted

10. Carriage of materials: - No forwarding orders shall be issued by the DFCCIL for the conveyance of contractor's materials, tools and plant by Rail which may be required for use in the works and the contractor shall pay full freight charges at public tariff rates therefore.

11. Deleted

12. Representation on Works: -The contractor shall, when he is not personally present on the site of the works place and keep a Contractor's Representative at the works during working hours who shall on receiving reasonable notice, present himself to the Engineer and orders given by the Engineer or the engineer's representative to the agent shall be deemed to have the same force as if they had been given to the Contractor. Before absenting himself, the contractor shall furnish the name and address of his agent for the purpose of this clause and

failure on the part of the Contractor to comply with this provision at any time will entitle the DFCCIL to rescind the contract under clause 62 of these conditions.

- 13. Relics and Treasures:** -All gold, silver, oil and other minerals of any description and all precious stones, coins, treasures relics antiquities and other similar things which shall be found in or upon the site shall be the property of the DFCCIL and the Contractor shall duly preserve the same to the satisfaction of the DFCCIL and shall from time to time deliver the same to such person or persons as the DFCCIL may appoint to receive the same.
- 14. Excavated material:**-The contractor shall not sell or otherwise dispose of or remove except for the purpose of this contract, the sand, stones, clay, ballast, earth, rock or other substances or materials which may be obtained from any excavation made for the purpose of the works or any building or produced upon the site at the time of delivery of the possession thereof but all the substances, materials, buildings and produce shall be the property of the DFCCIL provided that the contractor may, with the permission of the Engineer, use the same for the purpose of the works either free of cost or pay the cost of the same at such rates as may be determined by the Engineer.
- 15. Indemnity by Contractors:** - The contractor shall indemnify and save harmless the Railway/DFCCIL from and against all actions, suit proceedings losses, costs, damages, charges, claims and demands of every nature and description brought or recovered against the Railways /DFCCIL by reason of any act or omission of the contractor, his agents or employees, in the execution of the works or in his guarding of the same. All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to the actual loss or damage sustained or likely to be sustained.
- 16.(1) Security Deposit:** The Security Deposit shall be 5% of the contract value. The Bid Security submitted by the Contractor with his tender will be retained/encashed by the DFCCIL as part of security for the due and faithful fulfilment of the contract by the Contractor. Provided further that, if Contractor submits the Cash or Term Deposit Receipt issued from a Scheduled commercial bank of India, Insurance Surety Bond, account payee Demand Draft or irrevocable Bank Guarantee Bond from a Scheduled commercial bank of India in the form of Form 28, either towards the Full Security Deposit or the Part Security Deposit equal to or more than Bid Security, the DFCCIL shall return the Bid Security, to the Contractor.

Balance of Security Deposit may be deposited by the Contractor in cash or Term Deposit Receipt issued from Scheduled commercial bank of India or irrevocable Bank Guarantee bond issued from Scheduled commercial bank of India in the form of Form 28 or may be recovered at the rate of 6% of the bill amount till the full Security Deposit is recovered. Provided also that in case of defaulting Contractor, the DFCCIL may retain any amount due for payment to the Contractor on the pending "on account bills" so that the amounts so retained (including amount guaranteed through Performance Guarantee) may not exceed 10% of the total value of the contract.

The Irrevocable Bank Guarantee submitted towards Security deposit shall be initially valid up to the stipulated date of Maintenance period plus 60 days and shall be extended from time to time, depending upon extension of contract granted in terms of Clause 17A and 17B of the General Conditions of Contract.

Note: Security Deposit deposited in cash by the Contractor or recovered from the running bills of a Contractor or submitted by contractor as Term Deposit Receipt(s) can be refunded/returned to the contractor, in lieu of irrevocable Bank Guarantee bond issued from scheduled commercial bank of India, to be submitted by him, for an amount equal to or more than the already available Security Deposit, provided however that, in a contract of value less than Rs. 50 Crore, such refund/ return of the already available Security Deposit is permitted up to two times and in a contract of value equal to or more than Rs. 50 Crore, such refund / return of the already available Security Deposit is permitted up to three times.

16.(2)(i) Refund of Security Deposit: Security Deposit mentioned in sub clause (1) above shall be returned to the Contractor along with or after, the following:

- (a) Final Payment of the Contract as per clause 51. (1) and
- (b) Execution of Final Supplementary Agreement or Certification by Engineer that DFCCIL has No Claim on Contractor and
- (c) Maintenance Certificate issued, on expiry of the maintenance period as per clause 50. (1), in case applicable.

16. (2)(ii) Forfeiture of Security Deposit: Whenever the contract is rescinded as a whole under clause 62 (1) of these conditions, the Security Deposit already with DFCCIL under the contract shall be forfeited. However, in case the contract is rescinded in part or parts under clause 62 (1) of these conditions, the Security Deposit shall not be forfeited.

16.(3) No interest shall be payable upon the Bid Security (Bid Security) and Security Deposit or amounts payable to the Contractor under the Contract, but Government Securities deposited in terms of Sub-Clause 16. (4)(b) of this clause will be payable with interest accrued thereon.

16.(4) Performance Guarantee (P.G.)

The procedure for obtaining Performance Guarantee is outlined below:

- (a) The successful bidder shall have to submit a Performance Guarantee (PG) within 21 (Twenty-one) days from the date of issue of Letter of Acceptance (LOA). Extension of time for submission of PG beyond 21 (Twenty-one) days and upto 60 days from the date of issue of LOA may be given by the Authority who is competent to sign the contract agreement. However, a penal interest of 12% per annum shall be charged for the delay beyond 21(Twenty-one) days, i.e. from 22nd day after the date of issue of LOA. Further, if the 60th day happens to be a declared holiday in the concerned office of the DFCCIL, submission of PG can be accepted on the next working day.

In all other cases, if the Contractor fails to submit the requisite PG even after 60 days from the date of issue of LOA, the contract is liable to be terminated. In case contract is terminated DFCCIL shall be entitled to forfeit Bid Security Deposit and other dues payable against that contract. In case a tenderer has not submitted Bid Security Deposit on the strength of their registration as a Startup recognized by Department of Industrial Policy and Promotion (DIPP) under Ministry of Commerce and Industry, DIPP shall be informed to this effect.

The failed Contractor shall be debarred from participating in re-tender for that work.

- (b) The successful bidder shall submit the Performance Guarantee (PG) in any of the following forms, amounting to 5 % (Five percent) of the contract value:
- i. A deposit of cash through e-payment gateway in DFCCIL's Account;
 - ii. Irrevocable Bank Guarantee (including e-Bank Guarantees);
 - iii. Government Securities including State Loan Bonds at 5% below the market value;
 - iv. Pay Orders and account payee Demand Drafts issued by Scheduled Commercial Bank of India;
 - v. Guarantee Bonds executed by any Scheduled Commercial Bank of India;
 - vi. Deposit receipts/FDR in favour of DFCCIL (free from any encumbrance) issued by Scheduled Commercial Bank of India;
 - vii. Deposit in the Post Office Saving Bank;
 - viii. Deposit in the National Savings Certificates;
 - ix. Twelve years National Defense Certificates; (ix) Ten years Defense Deposits;
 - x. National Defense Bonds and
 - xi. Unit Trust Certificates at 5% below market value or at the face value whichever is less.
 - xii. Insurance Surety Bonds
- (c) The Performance Guarantee shall be submitted by the successful bidder after the Letter of Acceptance (LOA) has been issued, but before signing of the contract agreement. This P.G. shall be initially valid upto the stipulated date of completion plus 60 days beyond that. In case, the time for completion of work gets extended, the Contractor shall get the validity of P.G. extended to cover such extended time for completion of work plus 60 days.
- (d) The value of PG to be submitted by the Contractor will not change for variation upto 25% (either increase or decrease). In case during the course of execution, value of the contract increases by more than 25% of the original contract value, an additional Performance Guarantee amounting to 5% (Five percent) for the excess value over the original contract value shall be deposited by the Contractor. On the other hand, if the

value of contract decreases by more than 25% of the original contract value, Performance Guarantee amounting to 5% (Five percent) of the decrease in the contract value shall be returned to the Contractor. The PG amount in excess of required PG for decreased contract value, available with DFCCIL, shall be returned to Contractor as per his request duly safeguarding the interest of DFCCIL.

- (e) The Performance Guarantee (PG) shall be released after physical completion of the work based on 'Completion Certificate' issued by the competent authority stating that the Contractor has completed the work in all respects satisfactorily.
- (f) Whenever the contract is rescinded, the Performance Guarantee already submitted for the contract shall be encashed in addition to forfeiture of Security Deposit available with DFCCIL.
- (g) The Engineer shall not make a claim under the Performance Guarantee except for amounts to which the DFCCIL is entitled under the contract (not withstanding and/or without prejudice to any other provisions in the contract agreement) in the event of:
 - (i) Failure by the Contractor to extend the validity of the Performance Guarantee as described herein above, in which event the Engineer may claim the full amount of the Performance Guarantee.
 - (ii) Failure by the Contractor to pay DFCCIL any amount due, either as agreed by the Contractor or determined under any of the Clauses/Conditions of the Agreement, within 30 days of the service of notice to this effect by Engineer.
 - (iii) The Contract being determined or rescinded under clause 62 of the GCC.
- (h) The tenderer who has offered lower total cost as compared to tender value by more than 10 %, shall be required to submit additional Performance Guarantee of value equal to percentage of tender value by which offer is lower than 10%.

17. Force Majeure Clause:- If at any time, during the continuance of this contract, the Performance in whole or in part by either party of any obligation under this contract shall be prevented or delayed by reason of any war, hostility, acts of public enemy, civil commotion, sabotage, serious loss or damage by fire, explosions, epidemics, strikes, lockouts or act of God (hereinafter, referred to events) provided, notice of the happening of any such event is given by either party to the other within 30 days from the date of occurrence thereof, neither party shall by reason of such event, be entitled to terminate this contract nor shall either party have any claim for damages against the other in respect of such non-performance or delay in performance, and works under the contract shall be resumed as soon as practicable after such event has come to an end or ceased to exist, and the decision of the Engineer as to whether the works have been so resumed or not shall be final and conclusive, PROVIDED FURTHER that if the performance in whole or in part of any obligation under this contract is prevented or delayed by reason of any such event for a period exceeding 120 days, either party may at

its option terminate the contract by giving notice to the other party.

17-A Extension of time in Contracts: - Subject to any requirement in the contract as to completion of any portion or portions of the works before completion of the whole, the Contractor shall fully and finally complete the whole of the works comprised in the contract (with such modifications as may be directed under conditions of this contract) by the date entered in the contract or extended date in terms of the following clauses: -

- (i) **Extension due to modification:** - If any modifications have been ordered which in the opinion of the Engineer have materially increased the magnitude of the work, then such extension of the contracted date of completion may be granted as shall appear to the Engineer to be reasonable in the circumstances, provided moreover that the Contractor shall be responsible for requesting such extension of the date as may be considered necessary as soon as the cause thereof shall arise.
- (ii) **Extension for delay not due to DFCCIL or Contractor:-** If in the opinion of the Engineer, the progress of work has any time been delayed by any act or neglect of DFCCIL's employees or by other Contractor employed by the DFCCIL under Sub-Clause (4) of Clause 20 of these Conditions or in executing the work not forming part of the contract but on which Contractor's performance necessarily depends or by reason of proceeding taken or threatened by or dispute with adjoining or to neighboring owners or public authority arising otherwise through the Contractor's own default etc. or by the delay authorized by the Engineer pending arbitration or in consequences of the Contractor not having received in due time necessary instructions from the DFCCIL for which he shall have specially applied in writing to the Engineer or his authorized representative then upon happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the Engineer within 15 days of such happening, but shall nevertheless make constantly his best endeavors to bring down or make good the delay and shall do all that may be reasonably required of him to the satisfaction of the Engineer to proceed with the works. The Contractor may also indicate the period for which the work is likely to be delayed and shall be bound to ask for necessary extension of time.
- (iii) **Extension for delay due to DFCCIL:-** In the event of any failure or delay by the DFCCIL to hand over the Contractor possession of the lands necessary for the execution of the works or to give the necessary notice to commence the works or to provide the necessary drawings or instructions or any other delay caused by the DFCCIL due to any other cause whatsoever, then such failure or delay shall in no way affect or vitiate the contract or alter the character thereof or entitle the Contractor to damages or compensation therefor, but in any such case, the DFCCIL may grant such extension or extensions of the completion date as may be

considered reasonable.

The Contractor shall indicate the period for which the work is likely to be delayed and shall seek extension of time as may be considered necessary under clause 17 A(i) or/and 17 A(ii) or/ and 17 A(iii) above, as soon as the cause thereof shall arise and, in any case, not less than 15 days before the expiry of the date fixed for completion. of the works. The Engineer shall consider the same and shall grant and communicate such extension of time as in his opinion is reasonable having regard to the nature and period of delay and the type-and quantum of work affected thereby. No other compensation shall be payable for works so carried forward to the extended period of time; the same rates, terms and conditions of contract being applicable, as if such extended period of time was originally provided in the original contract itself.

The non-submission of request for extension or submission of request within less than 15 days before the expiry of the date fixed for completion of the works, shall make him ineligible for extension under these sub clauses, subject to final decision of Engineer.

17-B Extension of Time with Liquidated Damages (LD) for delay due to Contractor: -The time for the execution of the work or part of the works specified in the contract documents shall be deemed to be the essence of the contract and the works must be completed not later than the date(s) as specified in the contract. If the Contractor fails to complete the works within the time as specified in the contract for the reasons other than the reasons specified in Clause 17 and 17 A, the DFCCIL may, if satisfied that the works can be completed by the Contractor within reasonable short time thereafter, allow the Contractor for further extension of time (Proforma at Form no.14) as the Engineer may decide. On such extension the DFCCIL will be entitled without prejudice to any other right and remedy available on that behalf, to recover from the rate of Liquidity Damages as decided by the Engineer, between 0.05% to 0.3% of contract value of works for each week or part of the week.

For the purpose of this Clause, the contract value of the works shall be taken as value of work as per contract agreement including any supplementary work order/contract agreement issued. Provided also, that the total amount of liquidated damages under this condition shall not exceed 5% of the contract value or of the total value of the item or groups of items of work for which a separate distinct completion period is specified in the contract.

Provided further, that if the DFCCIL is not satisfied that the works can be completed by the Contractor and in the event of failure on the part of the contractor to complete the work within further extension of time allowed as aforesaid, the DFCCIL shall be entitled without prejudice to any other right or remedy available in that behalf, to appropriate the contractor's

Security Deposit and rescind the contract under Clause 62 of these Conditions, whether or not actual damage is caused by such default.

NOTE:

In a contract, where extension(s) of time have been allowed once under clause 17B, further request(s) for extension of time under clause 17 A can also be considered under exceptional circumstances. Such extension(s) of time under clause 17 A shall be without any Liquidated damages, but the Liquidated damages already recovered during extension(s) of time granted previously under clause 17B shall not be waived. However, Price variation during such extension(s) shall be dealt as applicable for extension(s) of time under clause 17B.

- 17-C Bonus for Early Completion of Work:** In open tenders having advertised value more than Rs.50 crore and original period of completion 12 months or more, when there is no reduction in original scope of work by more than 10%, and no extension granted on either DFCCIL or Contractor's account, Contractor shall be entitled for a bonus of 1% for each 30 days early completion of work. The period of less than 30 days shall be ignored while working out bonus. The maximum bonus shall be limited to 5% of original contract value. The completion date shall be reckoned as the date of issuance of completion certificate by Engineer.
- 18.(1) Illegal Gratification:-** Any bribe, commission, gift or advantage given, promised or offered by or on behalf to the contractor or his partner, agent or servant or, anyone on his behalf, to any officer or employee of the DFCCIL, or to any person on his behalf in relation to obtaining or execution of this or any other contract with the DFCCIL shall, in addition to any criminal liability which he may incur, subject contractor to the rescission of the contract and all other contracts with the DFCCIL and to the payment of any loss or damage resulting from such decision and the DFCCIL shall be entitled to deduct the amounts so payable from any moneys due to the Contractor(s) under this contract or any other contracts with the DFCCIL.
- 18.(2)** The contractor shall not lend or borrow from or have or enter into any monetary dealings and transactions either directly or indirectly with any employee of the DFCCIL and if he shall do so, the DFCCIL shall be entitled forthwith to rescind the contract and all other contracts with the DFCCIL. Any question or dispute as to the commission or any such offence or compensation payable to the DFCCIL under this clause shall be settled by the General Manager/CPM/GM/CGM of the DFCCIL, in such a manner as he shall consider fit and sufficient and his decision shall be final and conclusive. In the event of rescission of the contract under this clause, the contractor will not be paid any compensation whatsoever except payments for the work done up to the date of rescission.

EXECUTION OF WORKS

- 19.(1) Contractor's understanding:-** It is understood and agreed that the contractor has, by careful examination, satisfied himself as to the nature and location of the work, the conformation of the ground, the character, quality and quantity of the materials to be encountered, the character of equipment and facilities needed preliminary to and during the progress of the works, the general and local conditions, the labour conditions prevailing therein and all other matters which can in any way affect the works under the contract.
- 19.(2) Commencement of works: -**The contractor shall commence the works within 28 days from the date of issue of Letter of Acceptance (LOA) in writing to this effect from the Engineer and shall proceed with the same with due expedition and without delay.
- 19.(3) Accepted Programme of work: -** The contractor who has been awarded the work shall as soon as possible but not later than 28 days after the date of receipt of the acceptance letter in respect of contracts with initial completion period of two years or less or not later than 90 days for other contracts have to submit the detailed programme of work indicating the time schedule of various items of works in the form of Bar Chart/PERT/CPM. He shall also submit the details of organization (in terms of labour and supervisors) plant and machinery, that he intends to utilize (from time to time) for execution of the Work within stipulated date of completion. The programme of work amended as necessary by discussions with the Engineer, shall be treated as the agreed programme of the work for the purpose of this contract and the contractor shall endeavor to fulfil this programme of work. The progress of work will be watched accordingly and the liquidated damages will be with reference to the overall completion date. Nothing stated herein shall preclude the contractor in achieving earlier completion of item or whole of the works than indicated in the programme.

In Contracts for works Tenders having advertised value more than **Rs.100 crores**, the Contractor shall submit a detailed time programme to the Engineer within 30 days after issue of LOA. The program shall include the physical and Financial Progress vis-à-vis program and forecast cash flow adopting Project Management Software such as **Primavera**. The program must identify the milestones, interface requirements and program reporting elements. The Contractor shall supply, free of cost one set of authorized software to the Engineer and the soft copy of structured program for the project. This shall be updated every month. The Contractor shall also submit a revised programme whenever the previous programme is inconsistent with actual progress. Each programme shall include:

The order in which the Contractor intends to carry out the Works, including the anticipated timing of each stage, Contractor's Documents, procurement, manufacture of Plant, delivery to Site, construction, erection and testing, each of these stages for work by each

Subcontractor, if any, the sequence and timing of inspections and tests specified in the Contract, and a supporting report which includes:

a general description of the methods which the Contractor intends to adopt, and of the major stages, in the execution of the Works, and details showing the Contractor's reasonable estimate for the number of each class of Contractor's Personnel & Equipment, required on the Site for each major stage.

Unless the Engineer, within 21 days after receiving a programme, gives notice to the Contractor stating the extent to which it does not comply with the Contract, the Contractor shall proceed in accordance with the programme, subject to his other obligations under the Contract. The Engineer shall be entitled to rely upon the programme when planning their activities.

If, at any time, the Engineer gives notice to the Contractor that a programme fails (to the extent stated) to comply with the Contract or to be consistent with actual progress and the Contractor's stated intentions, the Contractor shall submit a revised programme to the Engineer within 15 days in accordance with this Sub-Clause.

19.(4) Deleted

20.(1) **Compliance to Engineer's instructions:** -The Engineer shall direct the order in which the several parts of the works shall be executed and the contractor shall execute without delay all orders given by the Engineer from time to time but the contractor shall not be relieved thereby from responsibility for the due performance of the works in all respects.

20.(2) **Alterations to be authorized:** -No alterations in or additions to or omissions or abandonment of any part of the works shall be deemed authorized, except under instructions from the Engineer, and the contractor shall be responsible to obtain such instructions in each and every case in writing from the Engineer.

20.(3) **Extra works:** - Should works over and above those included in the contract require to be executed at the site, the contractor shall have no right to be entrusted with the execution of such works which may be carried out by another contractor or contractors or by other means at the option of the DFCCIL.

20.(4) **Separate contracts in connection with works:** - The DFCCIL shall have the right to let other contracts in connection with the works. The contractor shall afford other contractors' reasonable opportunity for the storage of their materials and the execution of their works and shall properly connect and coordinate his work with theirs. If any part of the contractor's work depends for proper execution or result upon the work of another contractor(s), the contractor shall inspect and promptly report to the Engineer any defects in such works that

render it unsuitable for such proper execution and results. The contractor's failure so-to inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of his work, except as to defects which may develop in the other contractor's work after the execution of his work.

21. Instruction of Engineer's Representative: - Any instructions or approval given by the Engineer's representative to contractor in connection with the works shall bind the contractor as though it had been given by the Engineer provided always as follows:

- a. Failure of the Engineer's representative to disapprove any work or materials shall not prejudice, the power of the Engineer thereafter to disapprove such work or material and to order the removal or breaking up thereof.
- b. If the Contractor shall be dissatisfied by reason of any decision of the Engineer's representative, he shall be entitled to refer the matter to the Engineer who shall there upon confirm or vary such decision.

22.(1) Adherence to specifications and drawings: - The whole of the works shall be executed in perfect conformity with the specifications and drawings of the contract. If contractor performs any works in a manner contrary to the specifications or drawings or any of them and without such reference to the Engineer, he shall bear all the costs arising or ensuing therefore and shall be responsible for all loss to the DFCCIL.

22.(2) Drawings and specifications of the works: - The contractor shall keep one copy of drawings and specifications at the site, in good order, and such contract documents as may be necessary available to the Engineer or the Engineer's representative.

22.(3) Ownership of drawings and specifications: - All drawings and specifications and copies thereof furnished by the DFCCIL to the Contractor are deemed to be the property of the DFCCIL. They shall not be used on other works and with the exception of the signed contract set, shall be returned by the contractor to the DFCCIL on completion of the work or termination of the contract.

22.(4) Compliance with Contractor's request for details: - The Engineer shall furnish with reasonable promptness, after receipt by him of the contractor's request for the same, additional instructions by means of drawings or otherwise, necessary for the proper execution of the works or any part thereof. All such drawing and instructions shall be consistent with the contract Documents and reasonably inferable there from.

22.(5) Meaning and intent of specification and drawings:- If any ambiguity arises as to the

meaning and intent of any portion of the specifications and drawings or as to execution or quality of any work or material, or as to the measurements of the works the decision of the Engineer thereon shall be final subject to the appeal (within 7 days of such decision being intimated to the contractor) to the General Manager or CPM/CGM/GM who shall have the power to correct any errors, omissions, or discrepancies in aforementioned items and whose decision in the matter in dispute or doubt shall be final and conclusive.

23. **Working during night:** - The Contractor shall not carry out any work between sun-set and sun-rise without the previous permission of the Engineer. However, if the Engineer is satisfied that the work is not likely to be completed in time except by resorting to night work, he may order the same without confirming any right on the Contractor for claiming any extra payment for the same.
24. **Damage to Railway / DFCCIL property or private life and property:-**The contractor shall be responsible for all risk to the work and for trespass and shall make good at his own expense all loss or damage whether to the works themselves or to any other property of the Railway /DFCCIL or the lives, persons or property of others from whatsoever cause in connection with the works until they are taken over by the Railway / DFCCIL and this although all reasonable and proper precautions may have been taken by the contractor, and in case the Railway / DFCCIL shall be called upon to make good any costs, loss or damages, or to pay an compensation, including that payable under the provisions of the Workmen's Compensation Act or any statutory amendments thereof to any person or persons sustaining damages as aforesaid by reason of any act, or any negligence or omissions on the part of the contractor the amount of any costs or charges including costs and charges in connection with legal proceedings, which the Railway / DFCCIL may incur in reference thereto, shall be charged to the contractor. The Railway / DFCCIL shall have the power and right to pay or to defend or compromise any claim of threatened legal proceedings or in anticipation of legal proceedings being instituted consequent on the action or default of the contractor, to take such steps as may be considered necessary or desirable to ward off or mitigate the effect of such proceedings, charging to contractor, as aforesaid any sum or sums of money which may be paid and any expenses whether for reinstatement or otherwise which may be incurred and the propriety of any such payment, defence or compromise, and the incurring of any such expenses shall not be called in question by the contractor.
25. **Sheds, stores houses and Yards:-**The contractor shall at his own expense provide himself with sheds, stores houses and yards in such situations and in such numbers as in the opinion of the Engineer is requisite for carrying on the works and the contractor shall keep at each such sheds, stores houses and yard a sufficient quantity of materials and plant in stock as not

to delay the carrying out of the works with due expedition and the Engineer and the Engineer's representative shall have free access to the said sheds, store houses and yards at any time for the purpose of inspecting the stock of materials or plant so kept in hand, and any materials or plan which the Engineer may object to shall not be brought upon or used in the works, but shall be forthwith

removed from the sheds, store houses or yards by the contractor. The contractor shall at his own expenses provide and maintain suitable mortar mills, soaking vats or any other equipments necessary for the execution of the works.

26. Provision of efficient and competent Staff at work sites by the Contractor: -

26.1 The contractor shall place and keep on the works at all times efficient and competent staff to give the necessary direction to his workmen and to see that they execute their work in sound and proper manner and shall employ only such supervisors, workmen and labourers in or about the execution of any of these works as are careful and skilled in the various trades.

26.2 The contractor shall at once remove from the works any agents, permitted sub-contractor, supervisor, workman or labourer who shall be objected to by the Engineer and if and whenever required by the Engineer, he shall submit a correct return showing the names of all staff and workmen employed by him.

26.3 In the event of the Engineer being of the opinion that the contractor is not employing on the works a sufficient number of staff and workmen as is necessary for the proper completion of the works within the time prescribed, the contractor shall forthwith on receiving intimation to this effect deploy the additional number of staff and labour specified by the Engineer within seven days of being so required and failure on the part of the contractor to comply with such instructions will entitle the DFCCIL to rescind the contract under clause 62 of these conditions.

26A. Deployment of Qualified Engineers at Work Sites by the Contractor:

26A.1 The contractor shall also employ Qualified Graduate Engineer or Qualified Diploma Holder Engineer.

26A.2 In case the contractor fails to employ the Engineer, as aforesaid in Para 26A.1, he shall be liable to pay penalty at the rates, as may be prescribed by the DFCCIL through separate instructions from time to time for the default period for the provisions, as contained in Para 26A.1.

26A.3 Deleted

27.(1) Workmanship and testing:- The whole of the works and / or supply of materials specified and provided in the contract or that may be necessary to be done in order to form and complete any part thereof shall be executed in the best and most substantial workman like manner with materials of the best and most approved quality of their respective kinds, agreeable to the particulars contained in or implied by the specifications and as referred to in and represented by the drawings or in such other additional particulars, instructions and drawings may be found requisite to be given during the carrying on of the works and to the entire satisfaction of the Engineer according to the instructions and directions which the contractors may from time to time receive from the Engineer. The materials may be subjected to tests by means of such machines, instruments and appliances as the Engineer may direct and wholly at the expense of the contractor.

27.(2) Removal of improper work and materials: - The Engineer or the Engineer's Representative shall be entitled to order from time to time:

- (a) The removal from the site, within the time specified in the order, of any materials which in his opinion are not in accordance with the specifications or drawings.
- (b) The substitution of proper and suitable materials, and
- (c) the removal and proper re-execution, notwithstanding any previous tests thereof or on account payments therefor, of any work which in respect of materials or workmanship is not in his opinion in accordance with the specifications and in case of default on the part of the Contractor in carrying out such order, the DFCCIL shall be entitled to rescind the contract under Clause 62 of these conditions.
- (d) The provision of Construction and Demolition Waste Management Rule 2016 issued by Ministry of Environment Forest and Climate Change dated 29.03.2016 and published in the Gazette of India, Part – II, Section -3, Sub-section (ii) are binding upon the Contractor. Contractor shall implement these provisions at worksites, for which no extra payment will be payable.

28. Facilities for inspection:- The contractor shall afford the Engineer and the Engineer's Representative every facility for entering in and upon every portion of the work at all hours for the purpose of inspection or otherwise and shall provide all labour, materials, planks, ladders, pumps, appliances and things of every kind required for the purpose and the Engineer and the Engineer's Representative shall at all times have free access to every part of the works and to all places at which materials for the works are stored or being prepared.

29. Examination of work before covering up:- The contractor shall give 7 days' notice to the

Engineer or the Engineer's representative whenever any work or materials are intended to be covered up in the earth, in bodies or walls or otherwise to be placed beyond the reach of measurements in order that the work may be inspected or that correct dimensions may be taken before being so covered, placed beyond the reach of measurement in default whereof, the same shall at the option of the Engineer or the Engineer's representative be uncovered and measured at the contractor's expense or no allowance shall be made for such work or materials.

- 30. Temporary Works:** -All temporary works necessary for the proper execution of the works shall be provided and maintained by the contractor and subject to the consent of the Engineer shall be removed by him at his expenses when they are no longer required and in such manner as the Engineer shall direct. In the event of failure on the part of the contractor to remove the temporary works, the Engineer will cause them to be removed and cost as increased by supervision and other incidental charges shall be recovered from the contractor. If temporary huts are provided by the contractor on the Railway / DFCCIL land for labour engaged by him for the execution of works, the contractor shall arrange for handing over vacant possession of the said land after the work is completed; if the contractor's labour refuse to vacate, and have to be rejected by the Railway / DFCCIL necessary expenses incurred by the Railway / DFCCIL in connection therewith shall be borne by the contractor.
- 31.(1) Contractor to supply water for works:** - Unless otherwise provided in the contract, the contractor shall be responsible for the arrangements to obtain supply of water necessary for the works.
- 31.(2) Deleted**
- 31.(3) Deleted**
- 31.(4)(a) Contractor to arrange supply of Electric power for works:-** Unless otherwise provided in the contract, the contractor shall be responsible for arrangements to obtain supply of electric power for the works.
- 31.(4)(b) Deleted**
- 32. Property in materials and plant:** - The materials and plant brought by the Contractor upon the site or on the land occupied by the Contractor in connection with the works and intended to be used for the execution thereof shall immediately, they are brought upon the site of the said land, be deemed to be the property of the DFCCIL. Such of them as during the progress of the works are rejected by the Engineer under Clause 25 of these conditions or are declared

by him not to be needed for the execution of the works or such as on the grant of the certificate of completion remain unused shall immediately on such rejection, declaration or grant cease to be deemed the property of the DFCCIL and the Contractor may then (but not before) remove them from the site or the said land. This clause shall not in any way diminish the liability of the Contractor nor shall the DFCCIL be in any way answerable for any loss or damage which may happen to or in respect of any such materials or plant either by the same being lost, stolen, injured or destroyed by fire, tempest or otherwise.

- 33.(1) **Tools, Plant and Materials Supplied by DFCCIL:** - The Contractor shall take all reasonable care of all tools, plant and materials or other property whether or a like description or not belonging to the DFCCIL and committed to his charge for the purpose of the works and shall be responsible for all damage or loss caused by him, his agents, permitted subcontractor, or his workmen or others while they are in his charge. The Contractors shall sign accountable receipts for tools, plants and materials made over to him by the engineer and on completion of the works shall hand over the unused balance of the same to the Engineer in good order and repair, fair wear and tear excepted, and shall be responsible for any failure to account for the same or any damage done thereto.
- 33.(2) **Hire of DFCCIL/Railway's Plant:** - such plant as concrete mixers, compressors and portable engines, tower wagon etc. for use during execution of the works on such terms as may be specified in the special conditions or in a separate agreement for Hire of Plant.
- 34.(1) **Precaution during progress of works:** - The provision should be limited to Contractor being mandated to do, at his own cost, anything implied in the contract or even in case not mentioned in the contract, do whatever is necessary for the safety, stability or for the completion, or safe and proper operation, of the Works. Contractor shall, at the same time, ensure that no damage, injury or loss is caused or likely to be caused to any person or property.
- 34.(2) **Roads and Water courses:** - Existing roads or water courses shall not be blocked, cut through, altered, diverted or obstructed in any way by the Contractor, except with the permission of the Engineer. All compensations claimed for any unauthorized closure, cutting through, alterations, diversion or obstruction to such roads or water courses by the Contractor or his agent or his staff shall be recoverable from the Contractor by deduction from any sums which may become due to him in terms of contract, or otherwise according to law.
- 34.(3) **Provision of access to premises:-** During progress of work in any street or thoroughfare, the Contractor shall make adequate provision for the passage of traffic, for securing safe

access to all premises approached from such street or thoroughfare and for any drainage, water supply or means of lighting which may maintain at his own cost barriers, lights and other safeguards as prescribed by the Engineer, for the regulation of the traffic, and provide watchmen necessary to prevent accidents. The works shall in such cases be executed night and day if so, ordered by the Engineer and with such vigor so that the traffic way be impeded for as short a time as possible.

34.(4) Safety of Public: - The Contractor shall be responsible to take all precautions to ensure the safety of the public whether on public or DFCCIL/Railway property and shall post such look out men as may in the opinion of the Engineer be required to comply with regulations pertaining to the work.

35. Deleted.

36.(1) Suspension of works: - The Contractor shall on the order of the Engineer, suspend the progress of the works or any part thereof for such time or times and in such manner as the Engineer may consider necessary and shall during such suspension properly protect and secure the work so far as is necessary in the opinion of the Engineer.

36.(2) The Contractor shall not be entitled to the extra costs, if any, incurred by him during the period of suspension of the works, but in the event of any suspension ordered by the Engineer for reasons other than aforementioned and when each such period of suspensions exceeds 14 days, the contractor shall be entitled to such extension of time for completion of the work as the Engineers may consider proper having regard to the period or periods of such suspensions and to such compensations as the Engineer may consider reasonable in respect of salaries or wages paid by the Contractor to his employees during the periods of such suspension.

36.(3) Suspension lasting more than 3 months:- If the progress of the works or any part thereof is suspended on the order of the Engineer for more than three months at a time, the Contractor may serve a written notice on the Engineer requiring permission within 15 days from the receipt thereof to proceed with the works or that part thereof in regard to which progress is suspended and if such permission is not granted within that time the Contractor by further written notice so served may, but is not bound to, elect to treat the suspension where it affects part only of the works as an omission of such part or where it affects the whole of the works, as an abandonment of the contract by the DFCCIL.

37. Rates for items of works:- The rates, entered in the accepted Schedule of Rates of the

Contract are intended to provide for works duly and properly completed in accordance with the general and special (if any) conditions of the contract and the specifications and drawings together with such enlargements, extensions, diminutions, reductions, alterations or additions as may be ordered in terms of Clause 42 of these conditions and without prejudice to the generality thereof and shall be deemed to include and cover superintendence and labour, supply, including full freight, all type of insurance of materials, stores, patterns, profiles, moulds, fittings, centring, scaffolding, shoring props, timber, machinery, barracks, tackle, roads, pegs, posts, tools and all apparatus and plant required on the works, except such tools, plant or materials as may be specified in the contract to be supplied to the Contractor by the DFCCIL, the erection, maintenance and removal of all temporary works and, buildings, all watching, lighting, bailing, pumping and draining, all prevention of or compensation for trespass, all barriers and arrangements for the safety of the public or of employees during the execution of works, all sanitary and medical arrangements for labour camps as may be prescribed by the DFCCIL, the setting of all work and of the construction, site clearance, all fees duties, royalties, rent and compensation to owners for surface damage or taxes and impositions payable to local authorities in respect of land, structures and all material supplied for the work or other duties of expenses for which the Contractor may become liable or may be put to under any provision of law for the purpose of or in connection with the execution of the contract, and all such other incidental charges or contingencies as may have been specially provided for in the specifications.

38. Deleted

39.(1) Rates for extra items of works:-

- (a) Standard Schedule of Rates (SSOR) Items: Any item of work carried out by the Contractor on the instructions of the Engineer which is not included in the accepted Bill(s) of Quantities but figures for the Standard Schedule of Rates (SSOR), shall be executed at the rates set forth in the "Standard Schedule of Rates (SSOR)" modified by the tender percentage as accepted in the contract for that chapter of Standard Schedule of Rates (SSOR).
For item(s) not covered in this sub clause, the rate shall be decided as agreed upon between the Engineer and the Contractor before the execution of such items of work as per sub clause (b).
- (b) Other Items: For any item of work to be carried out by the Contractor but not included in the accepted Bill(s) of Quantities and also not covered under sub clause (a) above, the Contractor shall be bound to notify the Engineer at least seven days before the necessity arises for the execution of such items of works that the accepted Bill(s) of Quantities does not include rate or rates for such extra work involved. The rates payable for such items shall be decided at the meeting to be held between the Engineer and Contractor, in as short a period as possible after the need for the special item has come to the notice. In case the Contractor fails to attend the meeting after being notified to do so or in the event of no

settlement being arrived at, the DFCCIL shall be entitled to execute the extra works by other means and the Contractor shall have no claim for loss or damage that may result from such procedure.

The assessment of rates for extra item(s) shall be arrived at based on the prevailing market rates of labour, machinery & materials and by taking guidance from the following documents in order of priority:

- i. Analysis of Rates for “Unified Standard Schedule of Rates of Indian Railways (USSOR)”
- ii. Analysis of Rates for “Delhi Schedule of Rates issued by CPWD (DSR)”
- iii. Market Analysis

39.(2) Provided that if the Contractor commences work or incurs any expenditure in regard thereto before the rates as determined and agreed upon as lastly hereunto fore-mentioned, then and in such a case the Contractor shall only be entitled to be paid in respect of the work carried out or expenditure incurred by him prior to the date of determination of rates as aforesaid according to the rates as shall be fixed by the Engineer. However, if the Contractor is not satisfied with the decision of the Engineer in this respect he may appeal to the CGM/CPM/General Manager within 30 days of getting the decision of the Engineer, supported by analysis of the rates claimed. The CGM/CPM’s/ General Manager's decision after hearing both the parties in the matter would be final and binding on the Contractor and the DFCCIL.

40.(1) Handing over of works: - The Contractor shall be bound to hand over the works executed under the contract to the DFCCIL complete in all respects to the satisfaction of the Engineer. The Engineer shall determine the date on which the work is considered to have been completed, in support of which his certificate shall be regarded as sufficient evidence for all purposes. The Engineer shall determine from time to time, the date on which any particular section of the work shall have been completed, and the contractor shall be bound to observe any such determination of the Engineer.

40.(2) Clearance of site on completion: - On completion of works, the Contractor shall clear away and remove from the site all constructional plant, surplus materials, rubbish and temporary works of every kind and leave the whole of the site and works clean and in a workman like condition to the satisfaction of the Engineer. No final payment in settlement of the accounts for the works shall be paid, held to be due or shall be made to the, Contractor till, in addition to any other condition necessary for final payment, site clearance shall have been affected by him, and such clearance may be made by the Engineer at the expense of the Contractor in the event of his failure to comply with this provision within 7 days after receiving notice to that effect. Should it become necessary for the Engineer to have the site cleared at the expenses of the Contractor, the DFCCIL shall not be held liable for any loss or damage to such of the Contractor’s property as may be on the site and due to such removal, there from which

removal may be affected by means of public sales of such materials and property or in such a way as deemed fit and convenient to the Engineer.

40.(3) Offloading of Part(s) of Work: At the final stage of completion/ commissioning of work, in case the contractor fails to complete the final part(s) of the work and the value of such part(s) of the work is limited to 5% of the original contract value, the Engineer may allow/decide for offloading of such part(s) of works, either after the Contractor's request in writing to do so or after serving a (Fourteen) days suo-moto notice (as per **Form-25**), if the Engineer is of the opinion that :-

- (i) Such Offloading of works (up to 5% of original contract value) would enable successful completion of contract/work,
- (ii) Termination/ Part termination of the contract at this stage is not be in the interest of the DFCCIL/work; and
- (iii) The anticipated additional cost for execution of such works through other mode would not be substantial and can be recovered from the pending dues of the contractor;

The Contractor shall be informed, in due course, by the Engineer of the mode and cost of execution of such offloaded work through other agency(ies) (as per **Form-26**). The extra expenditure so incurred in execution of the offloaded work, shall be recovered from subsequent Bill(s) or any other dues of the Contractor, but not exceeding the value of Performance Guarantee available in the contract. There shall be no other repercussion of such offloading on execution of the balance contract. The Contractor shall have no claim on account of above-mentioned offloading of works.

VARIATIONS IN EXTENT OF CONTRACT

- 41. Modification to contract to be in writing:** - In the event of any of the provisions of the contract requiring to be modified after the contract documents have been signed, the modifications shall be made in writing and signed by the DFCCIL and the Contractor and no work shall proceed under such modifications until this has been done. Any verbal or written arrangement abandoning, modifying, extending, reducing or supplementing the contract or any of the terms thereof shall be deemed conditional and shall not be binding on the DFCCIL unless and until the same is incorporated in a formal instrument and signed by the Contractor, and till then the DFCCIL shall have the right repudiate such arrangements.
- 42.(1) Powers of modification to contract:-** The Engineer on behalf of the DFCCIL shall be entitled by order in writing to enlarge or extend, diminish or reduce the works or make any

alterations in their design, character position, site, quantities, dimensions or in the method of their execution or in the combination and use of materials for the execution thereof or to order any additional work to be done or any works not to be done and the contractor will not be entitled, to any compensation for any increase/reduction in the quantities of work but will be paid only for the actual amount of work done and for approved materials supplied against a specific order.

- 42.(2)** (i) Unless otherwise specified in the contract, the accepted variation in quantity of each individual item of the contract would be up to 25% of the quantity originally contracted, except in case of foundation work.
- (ii) The contractor shall be bound to carry out the work at the agreed rates and shall not be entitled to any claim or any compensation whatsoever up to the limit of 25% variation in quantity of individual item of works.
- (iii) In case of earthwork, the variation limit of 25% shall apply to the gross quantity of earth work and variation in the quantities of individual classifications of soil shall not be subject to this limit.
- (iv) In case of foundation work, no variation limit shall apply and the work shall be carried out by the contractor on agreed rates irrespective of any variation.
- 42.(3) Valuation of variations:-** The enlargements, extensions, diminution, reduction, alterations or additions referred to in sub-clause (2) of this clause shall in no degree affect the validity of the contract but shall be performed by the Contractor as provided therein and be subject to the same conditions, stipulations and obligations as if they had been originally and expressly included and provided for in the specifications and drawings and the amounts to be paid therefore shall be calculated in accordance with the accepted schedule of rates. Any extra items / quantities of work falling outside the purview of the provisions of sub-clause (2) above shall be paid for at the rates determined under clause-39 of these conditions.
- 42.(4) Variations in Quantities During Execution of Works Contracts: -** The procedure detailed below shall be adopted for dealing with variations in quantities during execution of works contracts:
1. Individual NS items in contracts shall be operated with variation of plus or minus 25% and payment would be made as per the agreement rate.
 2. In case an increase in quantity of an individual item by more than 25% of the agreement quantity is considered unavoidable, the same shall be got executed by floating a fresh tender. If floating a fresh tender for operating that item is considered not practicable, quantity of that item may be operated in excess of 125% of the agreement quantity subject to the following conditions:
 - (a) Operation of an item by more than 125% of the agreement quantity needs the approval of DFCCIL;

- (i) Quantities operated in excess of 125% but upto 140% of the agreement quantity of the concerned item, shall be paid at 98% of the rate awarded for that item in that particular tender;
 - (ii) Quantities operated in excess of 140% but upto 150% of the agreement quantity of the concerned item shall be paid at 96% of the rate awarded for that item in that particular tender;
 - (iii) Variation in quantities of individual items beyond 150% will be prohibited and would be permitted only in exceptional unavoidable circumstances with the concurrence of associate finance and shall be paid at 96% of the rate awarded for that item in that particular tender.
- (b) The variation in quantities as per the above formula will apply only to the Individual items of the contract and not on the overall contract value.
- (c) Execution of quantities beyond 150% of the overall agree-mental value should not be permitted and, if found necessary, should be only through fresh tenders or by negotiating with existing contractor, with approval of DFCCIL.
3. In cases where decrease is involved during execution of contract:
- (a) The contract signing authority can decrease the items upto 25% of individual item.
 - (b) For decrease beyond 25% for individual items or 25% of contract agreement value, the approval of competent authority, after obtaining 'No Claim Certificate' from the contractor and with finance concurrence, giving detailed reasons for each such decrease in the quantities.
 - (c) It should be certified that the work proposed to be reduced will not be required in the same work.
4. The limit for varying quantities for minor value items shall be 100% (as against 25% prescribed for other items). A minor value item for this purpose is defined as an item whose original agreement value is less than 1 % of the total original agreement value.
5. No such quantity variation limit shall apply for foundation items.
6. As far as SOR items are concerned, the limit of 25% would apply to the value of SOR schedule as a whole and not on individual SOR items. However, in case of NS items, the limit of 25% would apply on the individual items irrespective of the manner of quoting the rate (single percentage rate or individual item rate).
7. **Handling Vitiatio**n during Variation in Contract Quantities:
- As a result of variations, a contract shall be considered "vitiatio
- n" only when, there is more than 05 (FIVE) percentage difference between present Contractor and new L-1 as a result of variation in contract value are noticed. Percentage shall be calculated with base as the revised contract quantities multiplied by the rates of the present contractor.

When the percentage difference between present Contractor and new L-1 is noticed as becoming beyond the values specified above, the following action shall be taken:

- (i) The DFCCIL administration should immediately examine whether it is practicable to bring in a new agency to carry out the extra quantity of work keeping in view the progress of the work in accordance with the original contract and the nature and lay- out of the work. If it is found that there will be no serious practical difficulty in meeting the additional quantity of work done by another agency, then fresh tenders for the extra quantity may be invited otherwise negotiating the rate with the existing contractor for arriving at a reasonable rate for the additional quantities of work, may be adopted.
- (ii) The above shall be regulated as under:
 - a) The case shall be decided by the tender accepting authority (competent for the revised quantity) and shall not be treated as a case of single tender.
 - b) Executives while executing the work shall make all efforts to ensure that no vitiation takes place in normal circumstances. Vitiating should be an exception rather than a routine affair. Efforts should be made to invite bids on the basis of percentage above/below/at par.
 - c) Vitiating should always be computed with respect to the items, rates, quantities and conditions as available at the time of Tender Opening and subsequent changes/ additions by way of new items will not be counted for computing Vitiating.

Note: Variation to be approved should be limited so as not to completely change the scope, character and purpose of the original contract.

CLAIMS

43.(1) Monthly Statement of Claims: - The Contractor shall prepare and furnish to the Engineer once in every month an account giving full and detailed particulars of all claims for any additional expenses to which the Contractor may consider himself entitled to and of all extra or additional works ordered by the Engineer which he has executed during the preceding month and no claim for payment for and such work will be considered which has not been included in such particulars.

43.(2) Signing of “No Claim” Certificate: - The Contractor shall not be entitled to make any claim

whatsoever against the DFCCIL under or by virtue of or arising out of this contract, nor shall the DFCCIL entertain or consider any such claim, if made by the Contractor, after he shall have signed a “No Claim” Certificate in favour of the DFCCIL in such form as shall be required by the DFCCIL after the works are finally measured up. The contractor shall be debarred from disputing the correctness of the items covered by “No Claim” Certificate or demanding a clearance to arbitration in respect thereof.

MEASUREMENTS, CERTIFICATES AND PAYMENTS

44. Quantities in schedule annexed to Contract: -The quantities set out in the accepted schedule of rates with items of works quantified are the estimated quantities of the work to be executed by the Contractor in fulfilment of his obligations under the contract.

45.(i) Measurement of works by DFCCIL :- The Contractor shall be paid for the works at the rates in the accepted schedule of rates and for extra works at rates determined under Clause 39 of these conditions on the measurements taken by the Engineer or the Engineer’s representative in accordance with the rules prescribed for the purpose by the DFCCIL. The quantities for items the unit of which in the accepted schedule of rates is 100 or 1000 shall be calculated to the nearest whole number, any; fraction below half being dropped and half and above being taken as one; for items the unit of which in the accepted schedule of rates is single, the quantities shall be calculated to two places of decimals. Such measurements will be taken of

the work in progress from time to time and at such intervals as in the opinion of the Engineer shall be proper having regard to the progress of works. The date and time on which “on account” or final measurements are to be made shall be communicated to the Contractor who shall be present at the site and shall sign the results of the measurements (which shall also be signed by the Engineer or the Engineer’s representative) recorded in the official measurements book as an acknowledgement of his acceptance of the accuracy of the measures. Failing the Contractor’s attendance the work may be measured up in his absence and such measurements shall, notwithstanding such absence, be binding upon the Contractor whether or not he shall have signed the measurement books provided always that any objection made by him to measurement shall be duly investigated and considered in the manner set out below:

(a) It shall be opened to the Contractor to take specific objection to any recorded measurements or Classification on any ground within seven days of the date of such measurements. Any re- measurement taken by the engineer or the Engineer’s representative in the presence of the Contractor or in his absence after due notice has been given to him in consequence of objection made by the Contractor shall be final and binding on the Contractor and no claim whatsoever shall thereafter be entertained regarding the accuracy and classification of the measurements.

(b) If an objection raised by the Contractor is found by the Engineer to be incorrect the Contractor shall be liable to pay the actual expenses incurred in measurements.

45.(ii) Measurement of works by Contractor's Authorized Representative (If so allowed or instructed):-

(a) The Contractor shall be paid for the works at the rates in the accepted schedule of rates and for extra works at rates determined under Clause 39 of these conditions on the measurements taken by the Contractor's Authorized Engineer in accordance with the rules prescribed for the purpose by the DFCCIL. The quantities for items the unit of which in the accepted schedule of rates is 100 or 1000 shall be calculated to the nearest whole number, any; fraction below half being dropped and half and above being taken as one; for items the unit of which in the accepted schedule of rates is single, the quantities shall be calculated to two places of decimals. Such measurements will be taken of the work in progress from time to time. The date and time on which 'on account' or 'final' measurements are to be made shall be communicated to the Engineer.

The date and time of test checks shall be communicated to the contractor who shall be present at the site and shall witness the test checks, failing the contractor's attendance the test check may be conducted in his absence, and such test checks shall notwithstanding such absence be binding upon contractor provided always that any objection made by contractor to test check shall be duly investigated and considered in the manner set out below:

(b) Incorrect Measurement, actions to be taken:

If in case during test check or otherwise, it is detected by Engineer that agency has claimed any exaggerated measurement or has claimed any false measurement for the works which have not been executed; amounting to variation of 5% or more of claimed gross bill amount, action shall be taken as following:

(i) On first occasion of noticing exaggerated/false measurement, Engineer shall impose a penalty of 10% of the claimed gross bill value.

(ii) On any next occasion of noticing any exaggerated / false measurement, DFCCIL shall impose penalty of 15% of claimed gross bill value. In addition, the facility of recording of measurements by contractor as well as release of provisional payment shall be withdrawn. Once withdrawn, measurement shall be done by DFCCIL as per Clause 45(i) above.

46.(1) "On-Account" Payments: - The Contractor shall be entitled to be paid from time to time by way of "On-Account" payment only for such works as in the opinion of the Engineer he has executed in terms of the contract.

All payments due on the Engineer's or the Engineer's representative's certificates of measurements or Engineer's certified "Contractor's authorised Engineer's measurements" shall be subject to any deductions which may be made under these presents and shall further be subject to, unless otherwise required by Clause 16 of these conditions, a retention of six percent by way of security deposits, until the amount of Security Deposit by way of retained

Bid Security and such retentions shall amount to 5% of the total value of the contract provided always that the Engineer may by any certificate make any correction or modification in any previous certificate which shall have been issued by him and that the Engineer may withhold any certificate if the works or any part thereof are not being carried out to his satisfaction.

- 46.(2) Rounding off amounts:** - The total amount due on each certificate shall be rounded off to the nearest rupee i.e. sum less than 50 paise shall be omitted and sums of 50 paise and more upto Re. 1/- will be reckoned as Re. 1/-
- 46.(3) On Account Payments not prejudicial to final settlement:** - “On-Account” payments made to the Contractor shall be without prejudice to the final making up of the accounts (except where measurements are specifically noted in the Measurement Book as “Final Measurements” and as such have been signed by the Contractor and Engineer’s/Engineer’s Representative) and shall in no respect be considered or used as evidence of any facts stated in or to be inferred from such accounts nor of any particular quantity of work having been executed nor of the manner of its execution being satisfactory.
- 46.(4)** Advances to the Contractor shall be paid as per Chapter-V Part-I Special Conditions of Contract of the Tender Document.
- 46.(5) Manner of payment:** - Unless otherwise specified payments to the Contractor will be made by RTGS/NEFT only.

46A PRICE VARIATION CLAUSE:

- (i) Price variation on account of variation in the prices of various materials required for supply of various equipment/fittings/components used in the tendered work will be reimbursable/ recoverable on basic price on each bill submitted by the contractor as per the following formulae for different items: -

1.0 Formula for price variation for following schedule items

Sr No	Item No	
1	1	For Items at Sr No. 1 to 8: Percentage variation payable on the net amount of material bill = $[(W - W_o)/W_o] \times 85$
2	13.2, & 13.3	
3	15.2, 15.3, 15.5 & 15.6	
4	16, 17 & 18	
5	21.1 to 21.3	
6	22.1 to 22.3	
7	25.1, 25.2 & 25.3	
8	27, 28 & 29	
9	13.1 & 13.4	
		For Items at Sr No. 9: Percentage variation payable on the net amount of material bill = $[(W - W_o)/W_o] \times 85 \times 0.5$ (Please note the factor of 0.5 placed additionally)

Percentage variation payable on the net amount of material bill = $[(W - W_o)/W_o] \times 85$		
Where	W =	Index Number of Wholesale Prices - By Groups and Sub-Groups - All commodities – as published in the R.B.I. Bulletin for the average price index of the 3 months of the quarter under consideration.
	W _o =	Index Number of Wholesale Prices - By Groups and Sub-Groups - All commodities – as published in the R.B.I. Bulletin for the base period.

2.0 Formula for price variation for following schedule items (Concreting)

Sr No	Item No
1	2.1, 2.2 and 2.3

Percentage variation on the net amount of material bill of this Section		$= [(C_s - C_o) / C_o \times 0.4136] \times 85$
Where	C _s =	R.B.I. wholesale price index for cement & Lime for the month which is six months prior to date of casting of foundation.
	C _o =	R.B.I. wholesale price index for cement & Lime for the month which is one month prior to date of opening of tender.

3.0 Formula for price variation for following schedule items (Ferrous)

Sr No	Item No
1	3.1, 3.2, & 4
2	6.1, 6.2, 6.3
3	7, 10,
4	11.1, 11.2, 11.3 & 11.4
5	12
6	14.1 & 14.2
7	23 & 24
8	26.1, 26.2 & 26.3

Percentage variation on the net amount of material bill of above items shall be		$= [(S_f - S_{fo}) / S_{fo} + (Z - Z_o) / Z_o \times 0.06] \times 85$
Where	S _f =	IEEMA price for Steel Blooms (size 150 mm x 150 mm) for the month which is Two months prior to date of inspection of material.
	S _{fo} =	IEEMA price for Steel Blooms (size 150 mm x 150mm) for the month which is one month prior to date of opening of tender

	Z =	IEEMA price for Zinc for the month which is two months prior to date of inspection of material.
	Z _o =	IEEMA price for Zinc for the month which is one month prior to date of opening of tender

4.0 Formula for price variation for following schedule items (Non-Ferrous)

Sr No	Item No
1	8, 9
2	15.1, 15.4, 15.7, 15.8, 15.9
3	19.1 & 19.2
4	20.1 & 20.2

Percentage variation on the net amount of material bill of this section		= [(Cu - C _{uo})/C _{uo}] x 85
Where	Cu =	IEEMA price for copper wire bar for the month which is two months prior to date of inspection of material.
	C _{uo} =	IEEMA price for copper wire bar for the month which is one month prior to date of opening of tender

5.0 Formula for price variation for following schedule items (Insulators)

Sr No	Item No
1	5.1, 5.2, & 5.3

Percentage variation on the net amount of material bill of this section		= [(In - I _{no})/I _{no}] x 85
Where	In =	R.B.I. wholesale price index for Structural Clay Products for the month which is two months prior to date of inspection of material.
	I _{no} =	R.B.I. wholesale price index for Structural Clay Products for the month which is one month prior to date of opening of tender.

(ii) Price variation on erection: -

Sr No	Item No
1	Applicable for 100% erection value of all items except for items 13.1

	and 13.4 and it will be only 50% of the value of items 13.1 and 13.4.
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Formula for the <u>Price-Variation</u> on erection will be reimbursable/recoverable on each monthly bill submitted by the contractor:		$= ((I - I_o)/I_o) \times 85$
Where	$I_o =$	Consumer Price Index Number for Industrial Workers - All India - Published in R.B.I. Bulletin for the base period.
	$I =$	Consumer Price Index Number for Industrial Workers - All India - Published in R.B.I. Bulletin for the average price index of the 3 months of the quarter under consideration.

In case, due to unavoidable reasons, measurements of work executed during the quarterly period are delayed beyond the next quarterly period, the benefit of the price variation in erection due to such delay shall not be allowed to the contractor.

NOTES:

(i) Rates accepted by Employer shall hold good till completion of work and no additional individual claim shall be admissible on account of fluctuations in market rates, increase in taxes/any other levies/tolls etc. except that payment/recovery for overall market situation shall be made as per Price Variation Clause.

(ii) No cognizance will be given for any sort of fluctuations in taxes and other market conditions etc. for any individual items for the purpose of making adjustments in payment except as provided for in the under noted clauses.

(iii) Price Variation clause (PVC) shall be applicable only for contracts of value (contract agreement value) Rs. 2 crore and more, irrespective of the contract completion period. Materials supplied free of cost to the contractors shall fall outside the purview of Price Variation Clause. If, in any case, accepted offer includes some specific payment to be made to consultants or some materials supplied by Railway free or at fixed rate, such payments shall be excluded from the gross value of the work for the purpose of payment/recovery of price variation.

(iv) Price Variation during Extended Period of Contract: The price adjustment as worked out above, i.e. either increase or decrease shall be applicable upto the stipulated date of completion of work including the extended period of completion where such extension has been granted under Clause 17-A of the General Conditions of Contract. However, where extension of time has been granted due to contractor's failure under Clause 17-B of the General Conditions of Contract, price adjustment shall be done as follows:

(a) In case the indices increase above the indices applicable to the last month of original completion period or the extended period under Clause 17-A, the price adjustment for the period of extension granted under Clause 17-B shall be limited to the amount payable as per Indices applicable to the last month of the original completion period or the extended period under Clause 17-A of the General Conditions of Contract; as the case may be.

(b) In case the indices fall below the Indices applicable to the last month of original/extended

period

of completion under Clause 17-A, as the case may be; then the lower indices shall be adopted for the price adjustment for the period of extension under Clause 17-B of the General Conditions of Contract.

(v) The Base Month for 'Price Variation Clause' shall be taken as month of opening of tender including extensions, if any, unless otherwise stated elsewhere. The quarter for applicability of PVC shall commence from the month following the month of opening of tender. The Price Variation shall be based on the average Price Index of the quarter under consideration. Base month for applicability of PVC shall be only from the date of opening of the tender and not from the date of negotiation, if any.

(vi) The price variation as calculated for materials other than concreting materials will be calculated to the extent of 85% only of the total under supply column of Schedule-1 for respective sections (for which on account payment is admissible). The value of price variation shall be increased on pro-rata basis for the remaining 15% of such materials for which on account payment is not admissible.

Similarly, the value of price variation shall be reduced pro-rata in case of unused materials, but for which ONA payment has already been made.

(vii) Adjustment for variation in prices of material, labour, fuel, explosives, detonators, steel, concreting, ferrous, non-ferrous, insulators, zinc, and cement shall be determined in the manner prescribed.

(viii) Components of various items in a contract on which variation in prices be admissible, shall be Material, Labour, Fuel, Steel, Cement, Concreting, Ferrous, Non-ferrous, Insulator, Zinc, Erection etc. However, for fixed components, no price variation shall be admissible.

(ix) The demands for escalation of cost shall be allowed on the basis of provisional indices made available by Reverse Bank of India. Any adjustment needed to be done based on the finally published indices shall be made as and when they become available.

(i) EXPLANATORY NOTES

Explanatory notes for various items of work included in Schedule of Price are given in Part-II, Chapter 10.

47.0 Maintenance of works:- The Contractor shall at all times during the progress and continuance of the works and also for the period of maintenance specified in the Tender Form after the date of passing of the certificate of completion by the Engineer or any other earlier date subsequent to the completion of the works that may be fixed by the Engineer be responsible for and effectively maintain and uphold in good substantial, sound and perfect condition all and every part of the works and shall make good from time to time and at all times as often as the Engineer shall require, any damage or defect that may during the above period arise in or be discovered or be in any way connected with the works, provided that such damage or defect is not directly caused by errors in the contract documents, act of providence or insurrection or civil riot, and the contractor shall be liable for and shall pay and make good to

the DFCCIL or other persons legally entitled thereto whenever required by the Engineer so to do, all losses, damages, costs and expenses they or any of them may incur or be put or be liable to by reasons or in consequence of the operations of the Contractor or of his failure in any respect.

- 48.(1) Certificate of completion of works:-** As soon as in the opinion of the Engineer, the works passing the tests on completion and completing all work which is stated in the Contract as being required for the Works to be considered to be completed for the purposes of taking over and Contractor submitting all ‘ as built documents’ and ‘operation and Maintenance Manual’, as required under the contract for the purpose of taking over. The Engineer shall issue a certificate of completion duly indicating the date of completion in respect, of the work and the period of maintenance of the work shall commence from the date of completion mentioned in such certificate. The Engineer may also issue such a certificate indicating date of completion with respect to any part of the work (before the completion of the whole of work), which has been both completed to the satisfaction of the Engineer and occupied or used by the DFCCIL. When any such certificate is given in respect of part of a work, such part shall be considered as completed and the period of maintenance of such part shall commence from the date of completion mentioned in the completion certificate issued for that part of the work.
- 48.(2) Contractor not absolved by completion Certificate:-** The Certificate of completion in respect of the works referred to in sub-clause (1) of this clause shall not absolve the Contractor from his liability to make good any defects imperfections, shrinkages or faults which may appear during the period of maintenance specified in the tender arising in the opinion of the Engineer from materials or workmanship not in accordance with the drawings or specifications or instruction of the Engineer, which defects, imperfections, shrinkages or faults shall upon the direction in writing of the Engineer be amended and made good by the Contractor at his own cost: and in case of default on the part of Contractor the Engineer may employ labour and materials or appoint another Contractor to amend and make good such defects, imperfections, shrinkages and faults and all expenses consequent thereon and incidental thereto shall be borne by the Contractor and shall be recoverable from any moneys due to him under the contract.
- 48.(3) Final Supplementary Agreement:** After the work is completed or otherwise concluded by the parties with mutual consent and taken over by DFCCIL as per terms and conditions of the contract agreement, and there is unequivocal no claim on either side under the Contract other than as mentioned in item 4 of Form 30, the parties shall execute the Final Supplementary Agreement as per Form 30.
- 49.0 Approval only by maintenance Certificate:-** No certificate other than Maintenance Certificate, if applicable, referred to in Clause 50 of the Conditions shall be deemed to constitute approval of any work or other matter in respect of which it is issued or shall be taken as an admission of the due performance of the contract or any part thereof.
- 50.(1) Maintenance Certificate:** - The Contract shall not be considered as completed until a

Maintenance Certificate shall have been signed by the Engineer stating that the works have been completed and maintained to his satisfaction. The Maintenance Certificate shall be given by the Engineer upon the expiration of the period of maintenance or as soon thereafter as any works ordered during such period pursuant to sub clause (2) Clause 48 of these conditions shall have been completed to the satisfaction of the Engineer and full effect shall be given to this Clause notwithstanding the taking possession of or using the works or any part thereof by the DFCCIL.

- 50.(2) Cessation of DFCCIL Liability:** - The DFCCIL shall not be liable to the Contractor for any matter arising out of or in connection with the contract of the execution of the works unless the contractor shall have made a claim in writing in respect thereof before the issue of the Maintenance Certificate under this clause.
- 50.(3) Unfulfilled Obligations:-** Notwithstanding the issue of the Maintenance certificate the Contractor and (subject to sub-clause 2 of this clause) the DFCCIL shall remain liable for the fulfillment of any obligation incurred under the provision of the contract prior to the issue of the maintenance Certificate which remains unperformed at the time such certificate is issued and for the purposes of determining the nature and extent of any such obligations the contract shall be deemed to remain in force between the parties thereto.
- 51.(1) Final Payment:-** On the Engineer's certificate of completion in respect of the works, adjustment shall be made and the balance of account based on the Engineer or the Engineer's representative's certified measurements or Engineer's certified "Contractor's authorized Engineer's measurements" of the total quantity of work executed by the contractor upto the date of completion and on the accepted schedule or rates and for extra works on rates determined under Clause 39 of these conditions shall be paid to the Contractor subject always to any deduction which may be made under these presents and further subject to the Contractor having delivered to the Engineer either a full account in detail of all claims he may have on the DFCCIL in respect of the works or having delivered "No Claim Certificate" and the Engineer having after the receipt of such account given a certificate in writing that such claims are not covered under excepted matter i.e. Clauses 7(j), 8, 18, 22(5), 39.1, 39.2, 40A, 43(2), 45(i)(a), 55, 55-A(5), 57, 57A, 61(1), 61(2) and 62(1), 63(iv) and 63.2.11 of the General Conditions of Contract or in any Clause (stated as excepted matter) of the Special Conditions of the Contract, that the whole of the works to be done under the provisions of the Contracts have been completed, that they have been inspected by him since their completion and found to be in good and substantial order, that all properties, works and things, removed, disturbed or injured in consequence of the works have been properly replaced and made good and all expenses and demands incurred by or made upon the DFCCIL for or in the respect of damage or loss by from or in consequence of the works, have been satisfied agreeably and in conformity with the contract.
- 51(2) Post Payment Audit:-** It is an agreed term of contract that the DFCCIL reserves to itself the right to carry out a post-payment audit and or technical examination of the works and the final bill including all supporting vouchers, abstracts etc. and to make a claim on the contractor for the refund any excess amount paid to him if as a result of such examination any over-payment to him is discovered to have made in respect of any works done or alleged

to have been done by him under the contract.

51.A Production of vouchers etc. by the Contractor: -

- (i) For a contract of more than one crore of rupees, the contractor shall, whenever required, produce or cause to be produced for examination by the Engineer any quotation, invoice, cost or other account, book of accounts, voucher, receipt, letter, memorandum, paper of writing or any copy of or extract from any such document and also furnish information and returns verified in such manner as may be required in any way relating to the execution of this contract or relevant for verifying or ascertaining cost of execution of this contract (the decision of the engineer on the question of relevancy of any documents, information or return being final and binding in the parties). The contractor shall similarly produce vouchers; etc., if required to prove to the Engineer, that materials supplied by him, are in accordance with the specifications laid down in the contract.
- (ii) If any portion of the work in a contract of value more than one crore of rupees be carried out by a sub-contractor or any subsidiary or allied firm or company (as per Clause 7 of the General Conditions of Contract), the Engineer shall have power to secure the books of such sub-contract or any subsidiary or allied firm or company, through the contractor, and such books shall be open to his inspection.
- (iii) The obligations imposed by sub clause (i) & (ii) above is without prejudice to the obligations of the contractor under any statute rules or orders binding on the contractor.

52.0 Withholding and lien in respect of sums claimed:- Whenever any claim or claims for payment of a sum of money arises out of or under the contract against the contractor, the DFCCIL shall be entitled to withhold and also have a lien to retain such sum or sums in whole or in part from the security, if any, deposited by the contractor and for the purpose aforesaid, the DFCCIL shall be entitled to withhold the said cash security deposit or the security if any, furnished as the case may be and also have a lien over the same pending finalization or adjudication of any such claim. In the event of the security being insufficient to cover the claimed amount or amounts or if no security has been taken from the contractor, the DFCCIL shall be entitled to withhold and have a lien to the extent of the such claimed amount or amounts referred to supra, from any sum or sums found payable or which at any time thereafter may become payable to the contractor under the same contract or any other contract with this or any other DFCCIL or any Department of the Central Government pending finalization or adjudication of any such claim.

It is an agreed term of the contract that the sum of money or moneys so withheld or retained under the lien referred to above, by the DFCCIL will be kept withheld or retained as such by the DFCCIL till the claim arising out of or under the contract is determined by the arbitrator (if the contract governed by the arbitration clause) or by the competent court as the case may be and that the contractor will have no claim for interest or damages whatsoever on any account in respect of such withholding or retention under the lien referred to supra and duly notified as such to the contractor. For the purpose of this clause, where the contractor is a partnership firm or a limited company, the DFCCIL shall be entitled to withhold and also

have a lien to retain towards such claimed amount or amounts in whole or in part from any sum found payable to any partner/limited company, as the case may be whether in his individual capacity or otherwise.

52A. Lien in respect of claims in Other Contracts: -

(i) Any sum of money due and payable to the contractor (including the security deposit returnable to him) under the contract may be withheld or retained by way of lien by the DFCCIL, against any claim of this or any other DFCCIL or any other Department of the Central Government in respect of a payment of a sum of money arising out of or under any other contract made by the contractor with this or any other Department of the Central Government.

(ii) However, recovery of claims of DFCCIL in regard to terminated contracts may be made from the Final Bills, Security Deposits and Performance Guarantees of other contract or contracts, executed by the contractor. The Performance Guarantees submitted by the Contractor against other contracts, if required, may be withheld and encashed. In addition, 10% of each subsequent 'on-account bill' may be withheld, if required, for recovery of DFCCIL's dues against the terminated contract.

(iii) It is an agreed term of the contract that the sum of money so withheld or retained under this clause by the DFCCIL will be kept withheld or retained as such by the DFCCIL till the claim arising out of or under any other contract is either mutually settled or determined by arbitration, if the other contract is governed by arbitration clause or by the competent court as the case may be and contractor shall have no claim for interest or damages whatsoever on this account or on any other ground in respect of any sum of money withheld or retained under this clause and duly notified as such to the contractor.

53.0 Signature on Receipts for Amounts:- Every receipt for money which may become payable or for any security which may become transferable to the Contractors under these presents, shall, if signed in the partnership name by anyone of the partners of a Contractor's firm be a good and sufficient discharge to the DFCCIL in respect of the moneys or security purported to be acknowledged thereby and in the event of death of any of the Contractor, partners during the pendency of the contract it is hereby expressly agreed that every receipt by anyone of the surviving Contractor partners shall if so signed as aforesaid be good a sufficient discharge as aforesaid provided that nothing in this clause contained shall be deemed to prejudice or effect any claim which the DFCCIL may hereafter have against the legal representative of any contractor partner so dying for or in respect to any breach of any of the conditions of the contract, provided also that nothing in this clause contained shall be deemed to prejudice or effect the respective rights or obligations of the Contractor partners and of the legal representatives of any deceased Contractor partners interse.

LABOUR

54.0 Wages to Labour :- The Contractor shall be responsible to ensure compliance with the provision of the Minimum Wages Act, 1948 (hereinafter referred to as the “said Act” and the Rules made there under in respect of any referred to as the “said Act” and the Rules made there under in respect of any employees directly or through petty contractors or subcontractors employed by him on road construction or in building operations or in stone breaking or stone crushing for the purpose of carrying out this contract. If, in compliance with the terms of the contract, the Contractor supplied any labour to be used wholly or partly under the direct orders and control of the DFCCIL whether in connection with any work being executed by the Contractor or otherwise for the purpose of the DFCCIL such labour shall, for the purpose of this clause, still be deemed to be persons employed by the Contractor.

If any moneys shall, as a result of any claim or application made under the said Act be directed to be paid by the DFCCIL, such money shall be deemed to be moneys paid by it as aforesaid within seven days after the same shall have been demanded, the DFCCIL shall be entitled to recover the same from any moneys due or accruing to the Contractor under this or any other Contract with the DFCCIL.

54A. Apprentices Act:-The Contractor shall be responsible to ensure compliance with the provisions of the Apprentices Act, 1961 and the Rules and Orders issued there under from time to time in respect of apprentices directly or through petty contractors or sub-contractors employed by him for the purpose of carrying out the Contract.

If the contractor directly or through petty contractors or sub-contractors fails to do so, his failure will be a breach of the contract and the DFCCIL may, in its discretion, rescind the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation of the provisions of the Act.

Note: The contractors are required to engage apprentices when the works undertaken by them last for a period of one year or more and / the cost of works is rupees one lakh or more.

55.0 Provisions of payments of Wages Act: -The Contractor shall comply with the provisions of the Payment of Wages Act, 1936 and the rules made there under in respect of all employees directly or through petty contractors or sub-contractors employed by him in the works. If in compliance with the terms of the contract, the Contractor directly or through petty contractors or sub-contractors shall supply any labour to be used wholly or partly under the direct orders and control of the Engineer whether in connection with the works to be executed hereunder or otherwise for the purpose of the Engineer such labour shall never the less be deemed to comprise persons employed by the contractor and any moneys which may be ordered to be paid by the Engineer shall be deemed to be moneys payable by the Engineer on behalf of the Contractor and the Engineer may on failure of the contractor to repay such money to the DFCCIL deduct the same from moneys due to contractor in the terms of contract. The DFCCIL shall be entitled to deduct from any moneys due to the contractor (whether under this contract or any other contract) all moneys paid or payable by the DFCCIL by the way of compensation

of aforesaid or for costs of expenses in connection with any claim thereto and the decision of the Engineer upon any question arising out of the effect or force of this clause shall be final and binding upon the Contractor.

55A. Provisions of Contract labour (Regulation and Abolition) Act, 1970:

55A. (1) The contractor shall comply with the provision of the contract labour (Regulation and Abolition) Act, 1970 and the Contract labour (Regulation and Abolition) Central Rules 1971 as modified from time to time, wherever applicable and shall also indemnify the DFCCIL from and against any claims under the aforesaid Act and the Rules.

55A. (2) The Contractor shall obtain a valid licence under the aforesaid Act as modified from time to time before the commencement of the work and continue to have a valid licence until the completion of the work. Any failure to fulfill the requirement shall attract the penal provision of the Contract arising out of the resultant non-execution of the work.

55A. (3) The Contractor shall pay to the labour employed by him directly or through subcontractors the wages as per provision of the aforesaid Act and the Rules wherever applicable. The Contractor shall notwithstanding the provisions of the contract to the contrary, cause to be paid the wages to labour indirectly engaged on the works including any engaged by subcontractors in connection with the said work, as if the labour had been immediately employed by him.

55A. (4) In respect of all labour directly or indirectly employed in the work for performance of the contractor's part of, the contract, the Contractor shall comply with or cause to be complied with the provisions of the aforesaid Act and Rules wherever applicable.

55A. (5) In every case in which, by virtue of the provisions of the aforesaid Act or the Rules, the DFCCIL is obliged to pay any amount of wages to a workman employed by the Contractor or his sub-contractor in execution of the work or to incur any expenditure on account of the Contingent, liability of the DFCCIL due to the contractor's failure to fulfil his statutory obligations under the aforesaid Act or the rules the DFCCIL will recover from the Contractor, the amount of wages so paid or the amount of expenditure so incurred, and without prejudice to the rights of the DFCCIL under the section 20, sub-section (2) and section 2, sub-section (4) of the aforesaid Act, the DFCCIL shall be at liberty to recover such amount or part thereof by deducting it from the security deposit and/ or from any sum due by the DFCCIL to the contractor whether under the contract or otherwise. The DFCCIL shall not be bound to contest any claim made against it under sub-section of section 20 and sub-section (4) of section 21 of the aforesaid Act except on the written request of the contractor and upon his giving to the DFCCIL full security for all costs for which the DFCCIL might become liable in contesting such claim. The decision of the DFCCIL regarding the amount actually recoverable from the contractor as stated above shall be final and binding on the Contractor.

55B. Provisions of Employees Provident Fund and Miscellaneous Provisions Act, 1952 :

The Contractor shall comply with the provisions of Para 30 & 36- B of the Employees Provident Fund Scheme, 1952; Para 3 & 4 of Employees' Pension Scheme, 1995; and Para 7 & 8 of Employees Deposit Linked Insurance Scheme, 1976; as modified from time to time

through enactment of 'Employees Provident Fund & Miscellaneous Provisions Act, 1952', wherever applicable and shall also indemnify the DFCCIL from and against any claims under the aforesaid Act and the Rules.

- 55C.** (i) Contractor is to abide by the provisions of various labour laws in terms of above clause 54, 55, 55-A and 55-B of the General Conditions of Contract. In order to ensure the same, an application has been developed and hosted on website. Contractor shall register his firm/company etc. and upload requisite details of labour and their payment in this portal. These details shall be available in public domain. The registration/ updation in Portal shall be done as under:
- a) Contractor shall apply for onetime registration of his company/firm etc. in the Shramik Kalyan portal with requisite details subsequent to issue of Letter of Acceptance. Engineer shall approve the contractor's registration in the portal within 7 days of receipt of such request.
 - b) Contractor once approved by any Engineer, can create password with login ID (PAN No.) for subsequent use of portal for all Letter of Acceptances (LoAs) issued in his favour.
 - c) The contractor once registered on the portal, shall provide details of his Letter of Acceptances (LoAs) / Contract Agreements on shramik kalyan portal within 15 days of issue of any LoA for approval of concerned Engineer. Engineer shall update (if required) and approve the details of LoA filled by contractor within 7 days of receipt of such request.
 - d) After approval of LoA by Engineer, contractor shall fill the salient details of contract labours engaged in the contract and ensure updating of each wage payment to them on shramik kalyan portal on monthly basis.
 - e) It shall be mandatory upon the contractor to ensure correct and prompt uploading of all salient details of engaged contractual labour & payments made thereof after each wage period.
- (ii) While processing payment of any 'On Account Bill' or 'Final Bill' or release of 'Advances' or 'Performance Guarantee / Security Deposit', contractor shall submit a certificate to the Engineer or Engineer's representatives that "I have uploaded the correct details of contract labours engaged in connection with this contract and payments made to them during the wage period in Shramik kalyan portal till ___ Month, ___ Year."

55D. Provisions of "The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996" and "The Building and Other Construction Workers' Welfare Cess Act, 1996":

The tenderers, for carrying out any construction work, must get themselves registered with the Registering Officer under Section-7 of the Building and Other Construction Workers Act, 1996 and rules made thereto by the concerned State Govt. and submit certificate of Registration, issued from the Registering Officer of the concerned State Govt. (Labour Dept.). The Cess shall be deducted from contractor's bills as per provisions of the Act.

56.0 Reporting of Accidents of Labour: -The Contractor shall be responsible for the safety of all

employees directly or through petty contractors or sub- contractor employed by him on the works and shall report serious accidents to any of them however and wherever occurring on the works to the Engineer or the Engineers Representative and shall made every arrangement to render all possible assistance.

57.0 Provision of Workmen's Compensation Act: - In every case in which by virtue of the provisions of section 12 sub-section (1) of the Workmen's Compensation Act 1923, DFCCIL is obliged to pay compensation to a workman directly or through petty contractor or subcontractor employed by the Contractor in executing the work, DFCCIL will recover from the Contractor the amount of the compensation so paid, and, without prejudice to the rights of DFCCIL under Section 12 Sub-section (1) of the said Act, DFCCIL shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by DFCCIL to the Contractor whether under these conditions or otherwise, DFCCIL shall not be bound to contest any claim made against it under Section 12 Sub-section (1) of the said Act except on the written request of the Contractor and upon his giving to DFCCIL full security for all costs for which DFCCIL might become liable in consequence of contesting such claim.

57A. Provision of Mines Act:- The contractor shall observe and perform all the provisions of the Mines Act, 1952 or any statutory modifications or re-enactment thereof for the time being in force and any rules and regulations made there under in respect of all the persons directly or through the petty contractors or sub-contractors employed by him under this contract and shall indemnify the DFCCIL from and against any claims under the Mines Act, or the rules and regulations framed there under, by or on behalf of any persons employed by him or otherwise.

58.0 DFCCIL not to provide quarters for Contractors: -No quarters shall normally be provided by the DFCCIL for the accommodation of the contractor or any of his staff employed on the work.

59.(1) Labour Camps: - The contractor shall at his own expense make adequate arrangements for the housing, supply of drinking water and provision of latrines and urinals for his staff and workmen, directly or through the petty contractors or sub-contractors and for temporary crèche (Bal-mandir) where 50 or more women are employed at a time. Suitable sites on DFCCIL land, if available, may be allotted to the contractor for the erection of labour camps, either free of charge or on such terms and conditions that may be prescribed by the DFCCIL. All camp sites shall be maintained in clean and sanitary conditions by the contractor at his own cost.

59.(2) Compliance to rules for employment of labour: - The contractor(s) shall conform to all laws, by- laws rules and regulations for the time being in force pertaining to the employment of local or imported labour and shall take all necessary precautions to ensure and preserve the health and safety of all staff employed directly or through petty contractors or sub-contractors on the works.

59.(3) Preservation of peace: - The contractor shall take requisite precautions and use his best endeavors to prevent any riotous or unlawful behavior by or amongst his workmen and other employed directly or through the petty contractors or sub-contractors on the works and for the

preservation of peace and protection of the inhabitants and security of property in the neighborhood of the works. In the event of the DFCCIL requiring the maintenance of a special Police Force at or in the vicinity of the site during the tenure of works, the expenses thereof shall be borne by the contractor and if paid by the DFCCIL shall be recoverable from the contractor.

59.(4) Sanitary arrangements: - The contractor shall obey all sanitary rules and carry out all sanitary measures that may from time to time be prescribed by DFCCIL and permit inspection of all sanitary arrangements at all times by the Engineer, the Engineer's Representative of the DFCCIL. Should the contractor fail to make the adequate sanitary arrangements, these will be provided by the DFCCIL and the cost therefore recovered from the contractor.

59.(5) Outbreak of infectious disease: - The contractor shall remove from his camp such labour and their families as refuse protective inoculation and vaccination when called upon to do so by the Engineer or the Engineer's representative on the advice of the DFCCIL. Should cholera, plague or other infectious disease break out, the contractor shall burn the huts, beddings, clothes and other belongings of or used by the infected parties and promptly erect new huts on health sites as required by the engineer, failing which within the time specified in the Engineer's requisition, the work may be done by the DFCCIL and the cost therefore recovered from the contractor.

59.(6) Deleted

59.(7) Medical facilities at site: - The Contractor shall provide medical facilities at the site as may be prescribed by the Engineer on the advice of the DFCCIL in relation to the strength of the Contractor's resident staff and workmen.

59.(8) Use of intoxicants: - The sale of ardent spirits or other intoxicating beverages upon the work or in any of the buildings, encampments or tenements owned, occupied by or within the control of the contractor or any of his employees shall be forbidden and the Contractor shall exercise his influence and authority to the utmost extent to secure strict compliance with this condition.

59.(9) Non-employment of female labour: - The Contractor shall see that the employment of female labour on / in Cantonment areas, particularly in the neighborhood of soldier's barracks, should be avoided as far as possible.

59.(10) Restrictions On The Employment of Retired Engineers of Railway Services /DFCCIL within one Year of their Retirement : The Contractor shall not, if he is a retired Government Engineer of Gazetted rank, himself engage in or employ or associate a retired Government Engineer of Gazetted rank, who has not completed one year from the date of retirement, in connection with this contract in any manner whatsoever without obtaining prior permission of the MD DFCCIL and if the Contractor is found to have contravened this provision it will constitute a breach of contract and administration will be entitled to terminate the contract and forfeit Bid Security Deposits, Performance Guarantee (PG) and Security Deposits (SD) of that contract.

- 60.(1) Non-employment of labours below the age of 15:** - the Contractor shall not employ children below the age of 15 as labourers directly or through petty contractors or subcontractors for the execution of work.
- 60.(2) Medical Certificate of fitness for labour:** - It is agreed that the contractor shall not employ a person above 15 and below 19 years of age for the purpose of execution of work under the contract unless a medical certificate of fitness in the prescribed form (Proforma at Form No.15) granted to him by a certifying surgeon certifying that he is fit to work as an adult is obtained and kept in the custody of the contractor or a person nominated by him in this behalf and the person carries with him, while at work; a token giving a reference to such certificate. It is further agreed that the responsibility for having the adolescent examined medically at the time of appointment or periodically till he attains the age of 19 years shall devolve entirely on the contractor and all the expenses to be incurred on this account shall be borne by him and no fee shall be charged from the adolescent or his parent for such medical examination.
- 60.(3) Period of validity of medical fitness certificate:** - A certificate of fitness granted or renewed for the above said purposes shall be valid only for a period of one year at a time. The certifying surgeon shall revoke a certificate granted or renewed if in his opinion the holder of it is, no longer fit for work in the capacity stated therein. Where a certifying surgeon refuses to grant or renew a certificate or revoke a certificate, he shall, if so, required by the person concerned, state his reasons in writing for doing so.
- 60.(4) Medical re-examination of labourer:-** Where any official appointed in this behalf by the Ministry of labour is of the opinion that any person employed in connection with the execution of any work under this contract in the age group 15 to 19 years is without a certificate of fitness or is having a certificate of fitness but no longer fit to work in the capacity stated in the certificate, he may serve on the Contractor, or on the person nominated by him in the regard, a notice requiring that such persons shall be examined by a certifying surgeon and such person shall not if the concerned official so directs, be employed or permitted to do any work under this contract unless he has been medically examined and certified that he has been granted a certificate of fitness or a fresh certificate of fitness, as the case may be.

EXPLANATIONS: -

- (1) Only qualified medical practitioners can be appointed as “Certifying Surgeons” and the term “Qualified Medical Practitioners” means a person holding a qualification granted by an authority specified in the Schedule to the Indian Medical Degrees Act, 1916 (VII to 1916) or in the Schedule to the Indian Medical Council Act, 1933 (XXVII) of 1933.
- (2) The Certifying surgeon may be a medical officer in the service of State or Municipal Corporation.

DETERMINATION OF CONTRACT

- 61.(1) Right of DFCCIL of determine the contract:-** The DFCCIL shall be entitled to determine and terminate the contract at any time should, in the DFCCIL’s opinion, the cessation of work

becomes necessary owing to paucity of funds or from any other cause whatever, in which case the value of approved materials at site and of work done to date by the Contractor will be paid for in full at the rate specified in the contract. Notice in writing from the DFCCIL of such determination and the reasons therefor shall be conclusive evidence thereof.

61.(2) Payment on determination of contract:- Should the contract be determined under sub clause (1) of this clause and the Contractor claims payment for expenditure incurred by him in the expectation of completing the whole of the work, the DFCCIL shall admit and consider such claims as are deemed reasonable and are supported by vouchers to the satisfaction of the Engineer. The DFCCIL's decision on the necessity and propriety of such expenditure shall be final and conclusive.

61.(3) The contractor shall have no claim to any payment of compensation or otherwise, howsoever on account of any profit or advantage which he might have derived from the execution of the work in full but which he did not derive in consequence of determination of contract.

62.(1) Determination of contract owing to default of contractor:- If the Contractor should:-

- (i) Becomes bankrupt or insolvent, or
- (ii) Make an arrangement with of assignment in favour of his creditors, or agree to carry out the contract under a Committee of Inspection of his creditors, or
- (iii) Being a Company or Corporation, go into liquidation (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), or
- (iv) Have an execution levied on his goods or property on the works, or
- (v) Assign the contract or any part thereof otherwise than as provided in Clause 7 of these conditions, or
- (vi) Abandon the contract, or
- (vii) Persistently disregard the instructions of the Engineer, or contravene any provision of the contract, or
- (viii) Fail to adhere to the agreed programme of work by a margin of 10% of the stipulated period, or
- (ix) Fail to Execute the contract documents in terms of Para 1.3.9 of the Instructions to Tenderers.
- (x) Fail to submit the documents pertaining to identity of JV and PAN in terms of Para 65.11 of Chapter IV General Conditions of Contract (GCC) Part I.
- (xi) Fail to remove materials from the site or to pull down and replace work after receiving from the Engineer notice to the effect that the said materials or works have been condemned or rejected under clause 25 and 27 of these conditions, or
- (xii) Fail to take steps to employ competent or additional staff and labour as required under clause 26 of the conditions
- (xiii) Fail to afford the Engineer or Engineer's representative proper facilities for inspecting the work or any part thereof as required under clause 28 of the conditions, or
- (xiv) Promise, offer or give any bribe, commission, gift or advantage either himself or through his partner, agent or servant to any officer or employee of the DFCCIL or to any person on his or on their behalf in relation to the execution of this or any other contract with DFCCIL.
- (xv)(A) At any time after the tender relating to the contract, has been signed and submitted by the

Contractor, being a partnership firm admit as one of its partners or employee under it or being an incorporated company elect or nominate or allow to act as one of its directors or employee under it in any capacity whatsoever any retired engineer of the Gazetted rank or any other retired gazette officer working before his retirement, whether in the executive or administrative capacity, or whether holding any pensionable post or not, in the DFCCIL for the time being owned and administered by the President of India before the expiry of one year from the date of retirement from the said service of such Engineer or Officer unless such Engineer or Officer has obtained permission from the DFCCIL or any officer duly authorized in this behalf to become a partner or a director or to take employment under the contract as the case may be, or

(xv) (B) Fail to give at the time of submitting the said tender: -

- (a) The correct information as to the date of retirement of such retired engineer or retired officer from the said service, or as to whether any such retired engineer or retired officer was under the employment of the Contractor at the time of submitting the said tender, or
- (b) The correct information as to such engineers or officers obtaining permission to take employment under the contractor, or
- (c) Being a partnership firm, the correct information as to, whether any of its partners was such a retired engineer or a retired officer, or
- (d) Being in incorporated company, correct information as to whether any of its directors was such a retired engineer or a retired officer, or
- (e) Being such a retired engineer or retired officer suppress and not disclose at the time of submitting the said tender the fact of his being such a retired engineer or a retired officer or make at the time of submitting the said tender a wrong statement in relation to his obtaining permission to take the contract or if the contractor be a partnership firm or an incorporated company to be a partner or director of such firm or company as the case may be or to seek employment under the contractor.

Then and in any of the said clause, the Engineer on behalf of the DFCCIL may serve the Contractor with a notice (Proforma at Form No.16) in writing to that effect and if the contractor does not within seven days after the delivery to him such notice proceed to make good his default in so far as thereof being made good and carry on the work or comply with such directions as aforesaid of the entire satisfaction of the Engineer, the DFCCIL shall be entitled after giving 48 hours' notice (Proforma at Form No. 17 or 17A) in writing under the hand of the Engineer to rescind the contract as a whole or in part or parts (as may be specified in such notice) and after expiry of 48 hours' notice, a final termination notice (Proforma at Form No. 18 or 18A) should be issued and adopt the following courses:

To measure up or the whole or part of the work from which the contractor has been removed and get it completed by another contractor, the manner and method in which such work is completed shall be in the entire discretion of the Engineer whose decision shall be final.

Note: Engineer at his discretion may resort to the part termination of contract with notices (Proforma

at Form No. 16, 17 & 18), only in cases where progress of work is more than or equal to 80% of the original scope of work.

62.(2) Right of DFCCIL after, rescission of contract owing to default of contractor:

In the event of any or several of the courses, referred to in sub-clause (1) of the clause, being adopted.

- (a) the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any commitments or made any advances on account of or with a view to the execution of the works or the performance of the contract and contractor shall not be entitled to recover or be paid any sum for any work thereto for actually performed under the contract unless and until the Engineer shall have certified the performance of such work and the value payable in respect thereof and the contractor shall only be entitled to be paid the value so certified.
- (b) In the contract which has been rescinded as a whole, the Security Deposit already with DFCCIL under the contract shall be encashed/ forfeited and the Performance Guarantee already submitted for the contract shall be encashed. The balance work shall be got done independently without risk & cost of the failed Contractor. The failed Contractor shall be debarred from participating in the tender for executing the balance work. If the failed Contractor is a JV or a Partnership firm, then every member/partner of such a firm shall be debarred from participating in the tender for the balance work in his/her individual capacity or as a partner of any other JV /partnership firm.
Further the authorized representative of failed Contractor cannot be accepted as authorized representative in new contract.
- (c) In the contract rescinded in part or parts,
 - (i) The full Performance Guarantee available for the contract shall be recovered. No additional Performance Guarantee shall be required for balance of work being executed through the part terminated contract. The contract value of part terminated contract stands reduced to the balance value of work under the contract.
 - (ii) The Security Deposit of part terminated contract shall be dealt as per clause 16(2) of these Conditions.
 - (iii) The defaulting Contractor shall not be issued any completion certificate for the contract.
 - (iv) The balance work shall be got done independently without risk & cost of the failed Contractor. The failed Contractor shall be debarred from participating in the tender for executing the balance work. If the failed Contractor is a JV or a Partnership firm, then every member/partner of such a firm shall be debarred from participating in the tender for the balance work in his/her individual capacity or as a partner of any other JV /partnership firm.
 - (v) Further the authorized representative of failed Contractor will not be accepted as authorized representative in new contract.
- (d) The Engineer or the Engineer's representative shall be entitled to take possession of any materials, tools, implements, machinery and buildings on the works or on the property on which these are being or ought to have been executed, and to retain and employ the same in

the further execution of the works or any part thereof until the completion of the works without the contractor being entitled to any compensation for the use and employment thereof or for wear and tear or destruction thereof.

- (e) The Engineer shall as soon as may be practicable after removal of the contractor fix and determine ex-parte or by or after reference to the parties or after such investigation or enquiries as he may consider fit to make or institute and shall certify what amount (if any) had at the time of rescission of the contract been reasonably earned by or would reasonably accrue to the contractor in respect of the work then actually done by him under the contract and what was the value of any unused, or partially used materials, any constructional plan and any temporary works upon the site. The legitimate amount due to the contractor after making necessary deductions and certified by the Engineer should be released expeditiously.

STATEMENT OF DISPUTES - DFCCIL ARBITRATION RULES

63.0 Conciliation of Disputes:

- (i) This clause is applicable in the tender having advertised value less than or equal to Rs 50 (Fifty) Crore.
- (ii) All disputes and differences of any kind whatsoever arising out of or in connection with the contract, whether during the progress of the work or after its completion and whether before or after the determination of the contract, shall be referred by the Contractor to the " Director /Chief General Manager/CPM, DFCCIL " through "Notice of Dispute" provided that no such notice shall be served later than 30 days after the date of issue of Completion Certificate by the Engineer. Director /Chief General Manager/CPM, DFCCIL shall, within 30 days after receipt of the Contractor's "Notice of Dispute", notify the name of conciliator(s) to the Contractor.
- (iii) The Conciliator(s) shall assist the parties to reach an amicable settlement in an independent and impartial manner within the terms of contract.
- (iv) In case the total value of all claims in dispute added together does not exceed Rs. One Crore, the number of Conciliator shall be one. For claims more than Rs. One Crore and upto Rs. Fifty Crore, the number of Conciliators shall be three.
- (v) The Sole Conciliator shall be nominated by the MD DFCCIL from the List of Empaneled Arbitrators /Conciliators maintained by DFCCIL. The sole arbitrator shall be appointed within 60 days from the day when a written and valid demand for arbitration is received by CGM/Director/MD DFCCIL.
- (vi) In case, the Conciliation process consist of a panel of three members, the DFCCIL will send a panel of at least four (4) names from the List of Empaneled Arbitrators /Conciliators with DFCCIL empaneled to work as Arbitrator /Conciliator to the Contractor within 60 days from the day when a written and valid demand for arbitration is received by the CGM/Director/MD

DFCCIL. Contractor will be asked to suggest to MD DFCCIL at least 2 names out of the panel for appointment as Contractor's nominee within 30 days from the date of dispatch of the request by DFCCIL. The MD shall appoint at least one out of them as the Contractor's nominee and will, also simultaneously appoint the balance number of arbitrators either from the panel or from outside the panel, duly indicating the 'presiding conciliator' from amongst the 3 conciliators so appointed. MD DFCCIL shall complete this exercise of appointing the Conciliation Panel within 30 days from the receipt of the names of Contractor's nominees.

- (vii) If the parties reach agreement on a settlement of the dispute, they shall draw up and sign a written settlement agreement duly signed by Engineer In-charge, Contractor and conciliator(s). When the parties sign the settlement agreement, it shall be final and binding on the parties.
- (viii) The parties shall not initiate, during the conciliation proceedings, any arbitral or judicial proceedings in respect of a dispute that is the subject matter of the conciliation proceedings.
- (ix) The conciliation proceedings shall be subject to the provisions of the Arbitration and Conciliation Act 1996 and its amendments thereof.

63.1 Matters Finally Determined by the DFCCIL: All disputes and differences of any kind whatsoever arising out of or in connection with the contract, whether during the progress of the work or after its completion and whether before or after the determination of the contract, shall be referred by the Contractor to the MD/ Director /Chief General Manager/CPM, DFCCIL and the MD/ Director /General Manager/CPM, DFCCIL shall, within 120 days after receipt of the Contractor's representation, make and notify decisions on all matters referred to by the Contractor in writing provided that matters for which provision has been made in Clauses 7(j), 8, 18, 22(5),39.1, 39.2, 40A,43(2), 45(i)(a), 55, 55-A(5), 57, 57A,61(1), 61(2),62(1), 63(iv) and 63.2.11 of the General Conditions of Contract or in any Clause (stated as excepted matter) of the Special Conditions of the Contract, shall be deemed as 'excepted matters' (matters not arbitrable)and decisions of the DFCCIL authority, thereon shall be final and binding on the Contractor; provided further that 'excepted matters' shall stand specifically excluded from the purview of the Conciliation, Dispute Adjudication Board (DAB) and Arbitration.

63.2 Dispute Adjudication Board (DAB): This clause is applicable in the tender having advertised value more than Rs 50 Crore.

63.2.1 Any dispute/s if not settled with the Engineer, shall be referred to DAB. The DAB shall consist of a panel of three Adjudicators from the List of Empaneled Arbitrators/Conciliators maintained by DFCCIL. The DAB shall be formed within 90 days of signing of Contract Agreement. For this purpose, a panel of DAB members shall be maintained in the DFCCIL Corporate Office, New Delhi. The complete panel, which shall not be less than five members, shall be sent by CGM/GM DFCCIL to the Contractor to nominate one member of the DAB

from the panel as Contractor's nominee within two weeks of receipt of the panel. On receipt of Contractor's nominee, the MD DFCCIL shall nominate one member from the same panel as DFCCIL nominee for the DAB. Both above nominees shall jointly select presiding member of the DAB from the same panel.

- 63.2.2 The appointment of DAB shall be effectuated by way of a tri-partite agreement among the DFCCIL, Contractor and the respective DAB members. The terms of the remuneration of each member shall be as fixed by DFCCIL from time to time. Each party shall be responsible for paying one-half of this remuneration.
- 63.2.3 If one or more of the members appointed refuses to act as DAB member, or is unable or unwilling to perform his functions as DAB member for any reason whatsoever or dies or in the opinion of the Director/MD fails to act without undue delay, the parties shall terminate the mandate of such DAB member and thereupon new DAB member shall be appointed in the same manner, as the outgoing DAB member had been appointed.
- 63.2.4 The appointment of any member may be terminated by mutual agreement of both Parties, but not by the DFCCIL or the Contractor acting alone. Unless otherwise agreed by both the Parties, the appointment of the DAB (including each member) shall expire upon expiry of this Contract Agreement.
- 63.2.5 Before start of DAB proceedings, each DAB member shall give the following certificate to the DFCCIL and the Contractor:
- "I have no any past or present relationship in relation to the subject matter in dispute, whether financial, business, professional or other kind. Further, I have no any past or present relationship with or interest in any of the parties whether financial, business, professional or other kind, which is likely to give rise to justifiable doubts as to my independence or impartiality."*
- 63.2.6 DAB proceedings shall be conducted as decided by the DAB. The DAB shall give its decision within 84 days of a Dispute referred to it by any of the Parties, duly recording the reasons before arriving at the decision. The DAB shall decide the issue within terms and conditions of the contract. This time limit shall be extendable subject to the Parties mutual agreement.
- 63.2.7 In case any party is not satisfied by the decision of DAB, then the aggrieved party may, within 28 days after receiving the decision, give notice to the other Party of its dissatisfaction. If the DAB has given its decision as to a matter in dispute to both Parties, and no notice of dissatisfaction has been given by either Party within 28 days after its received the DAB's decision, then the decision shall become final and binding upon the Parties.

- 63.2.8 No dispute shall be referred to Arbitral Tribunal unless the same has been referred to DAB for adjudication. However, in case DAB is not formed due to any reason, the disputes can be directly referred to Arbitral Tribunal to adjudicate the dispute.
- 63.2.9 In the specific cases of any misconduct by any of the members of the DAB, the parties shall have the right to specifically bring it to the notice of the DAB such conduct, through a statement filed with necessary documents in proof of such misconduct and the DAB, after taking NOTICE of such conduct initiate the replacement of the member concerned, in the same manner the member to be replaced was appointed.
- 63.2.10 Once the decision is given by DAB, DAB cannot review the decision at its own or on the request of one party, unless both parties agree for review of decision by DAB.
- 63.2.11 In case DAB decision is not challenged, or no Notice of Dissatisfaction has been issued by either Party within 28 days of receipt of decision of DAB, the decision shall be considered as final and parties would be barred for referring the same to Arbitral Tribunal for adjudication.
- 63.2.12 The obligation of the DFCCIL and the Contactor shall not be altered by reasons of issue being or under reference to DAB.
- 63.2.13 The DAB shall conduct the proceedings at any convenient venue which shall be decided by DAB in consultations with parties.
- 63.2.14 It is a term of this contract that the Parties shall not approach any Court of Law for settlement of such disputes or differences unless an attempt has first been made by the parties to settle such disputes or differences through DAB and Arbitral Tribunal.

64. Demand for Arbitration:

64. (1) (i) (a) In the event of any dispute or difference between the parties hereto as to the construction or operation of this contract, or the respective rights and liabilities of the parties on any matter in question, dispute or difference on any account or as to the withholding by the DFCCIL of any certificate to which the contractor may claim to be entitled to, or if the DFCCIL fails to make a decision within 120 days, then and in any such case, but except in any of the ‘**excepted matters**’ referred to in clause 63 of these conditions, the contractor, after 120 days but within 180 days of his presenting his final claim on disputed matters shall demand in writing that the dispute or difference be referred to arbitration.

64. (1) (i) (b) A dispute, unless settled through Conciliation or in which DAB’s decision has become final and binding, shall be finally settled by Arbitration as per Arbitration and Conciliation Act 1996 and its amendments thereof.

- 64. (1) (i) (c)** Such disputes or differences shall be settled by arbitration in accordance with the **Rules of Domestic Commercial Arbitration of the DELHI INTERNATIONAL ARBITRATION CENTRE (DIAC) (ARBITRATION PROCEEDINGS) RULES 2023** and the award made in pursuance thereof shall be binding on the parties.
- 64.(1) (ii)** The demand for arbitration shall specify the matters which are in question, or subject of the dispute or difference as also the amount of claim item wise. Only such dispute or difference, in respect of which the demand has been made, together with counter claims or set off, given by the DFCCIL, shall be referred to arbitration and other matters shall not be included in the reference.
- 64.(1)(iii) The parties may waive off the applicability of Sub-Section 12(5) of Arbitration and Conciliation (Amendment) Act 2015, if they agree for such waiver in writing, after dispute having arisen between them, in the format given at Form No. 29.
- 64.(1) (iv) (a)** The arbitration proceedings shall be assumed to have commenced from the day, a written and valid demand for arbitration is received by the DFCCIL.
- (b) The seat of arbitration would be New Delhi. However, the venue for arbitration meetings or hearings can be any other place with the consent of parties.
- (c) Both the parties shall submit to the jurisdiction of the courts situated at New Delhi for the purpose of actions and proceedings arising out of the contract and the courts at Delhi shall have the sole and exclusive jurisdiction to hear and decide such actions and proceedings.
- 64.(1)(v)** No new claim shall be added during proceedings by either party. However, a party may amend or supplement the original claim or defense thereof during the course of arbitration proceedings subject to acceptance by Tribunal having due regard to the delay in making it.
- 64.(1)(vi)** If the contractor(s) does/do not prefer his/their specific and final claims in writing, within a period of 90 days of receiving the intimation from the DFCCIL that the final bill is ready for payment, he/they will be deemed to have waived his/their claim(s) and the DFCCIL shall be discharged and released of all liabilities under the contract in respect of these claims.
- 64.(2) Obligation During Pendency of Arbitration:** – Work under the contract shall, unless otherwise directed by the Engineer, continue during the arbitration proceedings, and no payment due or payable by the DFCCIL shall be withheld on account of such proceedings, provided, however, it shall be open for Arbitral Tribunal to consider and decide whether or not such work should continue during arbitration proceedings.

- 64.(3):** Where the arbitral award is for the payment of money, no interest shall be payable on whole or any part of the money for any period till the date on which the award is made.
- 64.(4):** The cost of arbitration shall be borne by the respective parties. The cost shall inter-alia include fee of the arbitrator(s), as per the rates fixed by DFCCIL from time to time and the fee shall be borne equally by both the parties, provided parties sign an agreement in the format given at Form no.29 to these conditions after/ while referring these disputes to Arbitration.
- 64.(5)** Subject to the provisions of the aforesaid Arbitration and Conciliation Act 1996 (as amended up to date) and the rules thereunder and relevant para of the General Conditions of Contract and any statutory modifications thereof shall apply to the appointment of arbitrators and arbitration proceedings under this Clause.
- 64.(6)** In case arbitration award is challenged by a party in the Court of Law, 75% of award amount, pending appeal in Court of Law, shall be made by losing party to other party. In case payment is to be made by DFCCIL to Contractor, the terms & conditions as incorporated in the DFCCIL Policy as amended from time to time, shall be followed. In case Contractor has to pay to the DFCCIL, then 75% of the award amount shall be deducted by DFCCIL from the Contractor's bills, Performance Guarantee/ Security Deposit, or any other dues of Contractor with the Government of India.

PART- I

Chapter- V

SPECIAL CONDITIONS OF CONTRACT

PART - I
CHAPTER V

SPECIAL CONDITIONS OF CONTRACT

- 1.5.1** This Tender shall be governed by Preamble & General instructions to tenderers, General condition of Contract, Special conditions of contract, Technical Specifications, Additional Technical specifications (if any), Drawings, Forms, Annexures, etc.
- 1.5.2** If there are varying or conflicting provisions in the documents forming part of the contract, Engineer shall be deciding authority with regard to the intentions of the provision and decision of Engineer will be final and binding on the contractor.
- 1.5.3** **Scheme of work:** -Within a period of 28 days beginning from the date of issue of Letter of Acceptance of Tender, the Contractor shall submit the detailed time schedule for execution of work and various documents enumerated in tender papers to the employer.
- 1.5.4** **Quality Assurance Plan for Substructure and foundation**
All materials used in the work shall be of the best quality as per codes. Quality Assurance Plan shall include for materials used and for workmanship of work. The contractor shall submit Quality Assurance Plan for the substructure and foundation. The contractor shall also ensure that the Employer's prescribed Quality Assurance Standards are rigidly followed in for the construction of substructure and foundation. These are to be approved from the client / DFCCIL
- 1.5.5** **Quality Assurance Plan for 2x25 kV High Rise OHE**
- (a) All materials used in the work shall be of the best quality as per codes / Specifications for Fabrication and Erection of Mast/Portal/SPS/Bracket/Conductors/Fittings amended till date. Quality Assurance Plan shall include for materials used and for workmanship of work. Quality Assurance Plan shall also be prepared for erection of OHE Equipment. The contractor shall submit Quality Assurance Plan for the OHE. The contractor shall also ensure that the Employer's prescribed Quality Assurance Standards are rigidly followed for the construction of superstructure. If the OHE is designed by RDSO / RITES, Quality Assurance Plan shall be in line with Quality Assurance plans approved by RDSO. These plans are to be approved from the IR/ DFCCIL.
- (b) The contractor shall ensure quality at all necessary points, whether at manufacturers' works, or in his depot or at work site as well as during erection through Quality Assurance Plan.

- (c) The Contractor shall adopt a suitable Quality Assurance Programme according to approved instructions, drawings, specifications, etc.
 - (d) The erection and wiring scheme of OHE shall be approved by Railway/DFCCIL before start of erection.
 - (e) Fabrication of Steel Structures will be inspected by DFCCIL's Engineer in Charge / RDSO / PMC's representative as per approved QAP.
- 1.5.6 Expenses of Employer' Representative**– All the expenses of Employer's/Engineer's representative shall be borne by the Employer whether the inspected material is finally utilized in work or not.
- 1.5.7** The decision of the Engineer shall be final in respect of acceptability or otherwise of any material, fittings, component or equipment required for the work.
- 1.5.8** This programme of the Contractor shall generally cover the following: -
- 1.5.8.1** The organization to manage and implement the Quality Assurance Programme.
 - 1.5.8.2** The documentation control system:
 - (i) Basic control system.
 - (ii) Adopted at manufacturer's work
 - (iii) Adopted at the Contractor Depot and work site.
 - 1.5.8.3** Procedure adopted for:
 - (i) Source Inspection.
 - (ii) In coming raw material inspection.
 - (iii) Verification of material purchased.
 - (iv) Fabrication Controls.
 - (v) Site erection controls.
 - 1.5.8.4** Inspection and Test Procedure for:
 - (i) Manufacture and quality control procedure.
 - (ii) Field activity.
 - 1.5.8.5** System of handling and storage.
 - 1.5.8.6** System of quality audit.
 - 1.5.8.7** System of maintenance of records.

1.5.8.8 For the purpose of obtaining On Account Payment, the Contractor shall submit along with the invoice, the documents indicated in the prescribed quality Assurance standards which should inter alia cover the following as may be applicable in each case.

- (i) Material test reports on raw materials used.
- (ii) Material type and routine test report on components specification.
- (iii) Inspection Plan with reports of the inspection Plan check points.
- (iv) Routine test report.
- (v) Factory test results as required under the specification.
- (vi) Quality audit report including test check report of Employer's representative if any.

1.5.9 Traffic Blocks / Power Blocks / Shut Down:

- (a) The contractor shall obtain Power / Traffic / block in the name of authorized representative of DFCCIL. Engineer/Engineer's representative will facilitate obtaining power/traffic blocks / for works to be carried out along or adjacent to the running lines. Works such as foundations, erection and wiring shall generally be done without blocks. However if block is required due to safety considerations, the foundations, erection and wiring shall be done under block. The requirement of power/traffic blocks etc. shall be assessed by the contractor based on reasonable prudence and will be submitted to the Engineer/Engineer's representative. The works requiring power/traffic block should be done within minimum duration as possible and the decision of Engineer/Engineer's representative shall be final in respect to the requirement of block. Contractor shall arrange gangs of labours for TRD works along with Supervisors and sufficient tools and tackles required as per site conditions. The strength and compositions of such gangs shall be decided by Engineer/Engineer's representatives. The Contractor shall also arrange stand by gangs, tools, tackles, plants and equipment as per direction of Engineer/Engineer's representative Work will be done day & night with war foot level with the approval of the Engineer/Engineer's representative.
- (b) Blocks may be granted during day & night hours continuous. The Contractor shall confirm that he will equip himself to carry out all construction during night blocks efficiently by suitable special lighting equipment without any extra cost.
- (c) Block period shall be counted from the time the TR-line is placed at the Contractors disposal at the work-spot till it is cleared by the Contractor.
- (d) Blocks will be subject to normal operating conditions and rules of the Railway /DFCCIL. All formalities of exchanging private number etc. with the traffic control/traction power controller will be carried out by the Engineer staff and for this purpose the Engineer will depute a representative, who will be responsible for imposing power blocks/shut down and also removing the same after men, material and equipment have been cleared by the Contractor from running tracks and the same declared safe for traffic by Engineer/Engineer's representative in case of works involving safety of running tracks.

- (e) The works required to be done under traffic block shall be carried out only in the presence of DFCCIL officials. The DFCCIL supervisor shall certify safe conditions for passage of trains before resumption of traffic. The works to be done under traffic block shall be carried out under the provision of banner flag and protection of engineering flagman.
- (f) Any charges which may be levied by IR on account of "Possessions" shall be payable by the contractor but shall be reimbursed by the Employer. However, penalties, if any, levied by Indian Railways caused due to any careless working or otherwise of violation of the Terms and Conditions of the track block, shall be payable by the contractor.

1.5.10 Work By Other Agencies

- (a) Any other works undertaken at the same time by the Engineer direct or through some other agency at the same time or section where the contractor is carrying out his work will not entitle the contractor to prefer any claim regarding any delays or hindrances, he may have to face on this account but the Employer shall grant a reasonable extension of time to the contractor. The contractor shall comply with any instruction which may be given to him by the Employer in order to permit simultaneous execution of his own works and those undertaken by other contractors or the DFCCIL without being entitled on this account on any extra charge.
- (b) The contractor shall not be entitled to any extra payment due to hindrance resulting from normal Railway /DFCCIL Train operations, such as delay on account of adequate number of and duration of blocks not being granted, operational delay in movement of work trains extension of time to the contractor.

1.5.11 Infringement of patents:

- (a) The Contractor is forbidden to use any patents or registered drawings, process or pattern in fulfilling his contract without the previous consent in writing of the owner of such patent, drawing, pattern or trade mark, except where these are specified by the Employer himself. Royalties where payable for the use of such patented processes, registered drawings of patterns shall be borne exclusively by the Contractor. The contractor shall advise the Employer of any proprietary right that may exist on such processed drawings or patterns which he may use of his own accord.
- (b) In the case of patent taken out by the Contractor of the drawings or patterns registered by him, or of those patents, drawings, or patents for which he holds a licence, the signing of the Contract automatically gives the Employer the right to repair by himself the purchased articles covered by the patent or by any person or body chosen by him and to obtain from any sources he desires the component parts required by him in carrying out the repair work. In the event of infringement of any patent rights due to above action of the Employer, he

shall be entitled to claim damages from the contractor on the grounds of any loss of any nature which he may suffer

e.g. in the case of attachment because of counterfeiting.

- (c) **Indemnification by contractor:-** In the event of any claim or demand being made or action being brought against the Employer for infringement of later patent in respect of any equipment, machine, plant, work or thing used or supplied by the Contractor under this contract or in respect of any methods of using or working by the Employer of such equipment machine, plant work or thing, the contractor shall indemnify the employer and keep him indemnified and harmless against all claims, costs, charges and expenses arising from or incurred by reason of such claim provided that the Employer shall notify the contractor immediately any claim is made and that the contractor shall be at liberty, if he so desires with the assistance of the Employer if required but at the Contractor's expense, to conduct all negotiations for the settlement of the same or any litigation that may arise there from and provided that no such equipment, machine, plant work or thing, shall be used by the Employer for any purpose or in any manner other than that for which they have been supplied by the Contractor and specified under this contract.

1.5.12 Insurance: - (CAR policy)

Before commencing of works, it shall be obligatory for the contractor to obtain, at his own cost, insurance cover in the joint name of the contractor and employer from reputed companies under the following requirements:

- (a) **Insurance against Injury to Persons and Damage to Property**

The Contractor, as insuring Party, shall insure against each Party's liability for any loss, damage, death or bodily injury which may occur to any physical property (except things insured under Sub-Clause 1.5.12 (b) [*Insurance for Works and Contractor's Equipment*]) or to any person / animal (except persons insured under Sub-Clause 1.5.12 (c) [*Insurance for Contractor's Personnel*]), which may arise out of the Contractor's performance of the Contract and occurring before the issue of the Performance Certificate.

This insurance shall be for a limit per occurrence of not less than the **Rs. 100 Lakh (Rs Hundred Lakh)**, with no limit on the number of occurrences.

The insurances specified in this Sub-Clause:

- (i) shall be effected and maintained by the Contractor as insuring Party,
- (ii) shall be in the joint names of the Contractor and Employer,
- (iii) shall be extended to cover liability for all loss and damage to the Employer's property (except things insured under Sub-Clause 1.5.12 (b)) arising out of the Contractor's performance of the Contract

The insurance policy shall include a cross-liability clause such that the insurance shall apply to the Employer, the Contractor and Subcontractors (wherever applicable) as separately insured.

The Employer shall not be liable for or in respect of any damages or compensation payable to any workman or other person in the employment of the Contractor or any Sub-Contractor (whether applicable), other than death or injury resulting from any act or default of the Employer, his agents or employees. The Contractor shall indemnify and keep indemnified the Employer against all such damages and compensation, other than those for which the Employer is liable as aforesaid, and against all claims, proceedings, damages, costs, charges and against all claims, proceedings, damages, costs, charges, and expenses whatsoever in respect thereof or in relation thereto.

(b) Insurance for Works and Contractor's Equipment

The Contractor, as insuring Party, shall insure the Works, Plant, Materials and Contractor's Documents for not less than the full reinstatement cost including the costs of demolition, removal of debris and professional fees and profit. This insurance shall be effective from the Date of Commencement, until the date of issue of the Taking-Over Certificate for the Works.

The Contractor shall maintain this insurance to provide cover until the date of issue of the Performance Certificate, for loss or damage for which the Contractor is liable arising from a cause occurring prior to the issue of the Taking-Over Certificate, and for loss or damage caused by the Contractor in the course of any other operations.

The Contractor shall insure the Contractor's Equipment for **not less than the full replacement value, including delivery to Site plus 15% of replacement cost.** For each item of Contractor's Equipment, the insurance shall be effective while it is being transported to the Site and until it is no longer required as Contractor's Equipment.

The insurances specified in this Sub-Clause:

- (a) shall be effected and maintained by the Contractor as insuring Party,
- (b) shall be in the joint names of the Parties, who shall be jointly entitled to receive payments from the insurers, payments being held or allocated between the Parties for the sole purpose of rectifying the loss or damage,
- (c) shall cover all loss and damage from any cause not listed as Employer's Risks,
- (d) shall also cover loss or damage to a part of the Works which is attributable to the use or occupation by the Employer of another part of the Works, and loss or damage from the Employer's Risks, excluding (in each case) risks which are not insurable at commercially reasonable terms may however exclude loss of, damage to, and reinstatement of:

- (e) a part of the Works which is in a defective condition due to a defect in its design, Materials or workmanship (but cover shall include any other parts which are lost or damaged as a direct result of this defective condition and not as described in subparagraph (ii) below),
 - (f) a part of the Works which is lost or damaged in order to reinstate any other part of the Works if this other part is in a defective condition due to a defect in its design, Materials or workmanship
 - (g) a part of the Works which has been taken over by the Employer, except to the extent that the Contractor is liable for the loss or damage, and
- (c) **Insurance for Contractor's Personnel**

The Contractor shall effect and maintain insurance against liability for claims, damages, losses and expenses (including legal fees and expenses) arising from injury, sickness, disease or death of any person employed by the Contractor or any other of the Contractor's Personnel.

The Employer and the Engineer shall also be indemnified under the policy of insurance, except that this insurance may exclude losses and claims to the extent that they arise from any act or neglect of the Employer or of the Employer's Personnel.

The insurance shall be maintained in full force and effect during the whole time that these personnel are assisting in the execution of the Works. For a Subcontractor's employees, the insurance may be effected by the Subcontractor, but the Contractor shall be responsible for compliance with this Clause.

(d) **Automobile Liability Insurance**

The contractor shall effect and maintain an insurance covering use of all vehicle used by the contractor or its sub contractors (whether or not owned by them) in connection with the design, construction, testing and commissioning of the facilities under the contract in accordance with statutory requirements.

(e) **Professional Indemnity Insurance**

The Contractor shall provide evidence of professional indemnity insurance carried by its Designer for the Works. The professional indemnity insurance shall cover the risk of professional negligence in the design of the Works. This insurance shall be for a limit of not less than Rs. 50 Lakh and shall be maintained in full force and effect from the Commencement Date of the Works until 03 years after the date of completion of the Defect Notification period.

The Engineer will not issue any payment certificate until the Contractor has provided evidence of this insurance and its period of effectiveness.

The contractor shall provide evidence to the Employer / Engineer before commencement of work at site that the insurances required under the contract have been effected and shall within 60 days of the commencement date, provide the insurance policies to the Employer/Engineer, the contractor shall, whenever, called upon, produce to the engineer or his representative the evidence of payment of premiums paid by him to ensure that the policies indeed continue to be in force.

The Contractor shall also obtain any additional insurance cover as per the requirements of the Contract or Law of the Country.

The Employer/Engineer shall not be liable for or in respect of any damages or compensation payable to any workman or other person in the employment of the Contractor or his sub-contractor or petty contractor / other contractor working there. The Contractor shall indemnify and keep indemnified the employer / Engineer against all such damages and compensation for which the contractor is liable.

The Policies of the contractor shall remain in force throughout the period of execution of the works and till the expiry of the defect liability period except for any specific insurance covers necessary for shorter period.

If the Contractor fails to effect or keep in force or provide adequate cover as acceptable to the engineer in the insurance policies mentioned above, then in such cases, the engineer may effect and keep in force any such insurance or further insurance on behalf of the Contractor. The recovery shall be made at the rate of 1.5 times the premium/premiums paid by the engineer in this regard from the payment due to the Contractor or from the contractor's Performance security. However, the Contractor shall not be absolved from his responsibility and /or liability in this regard.

1.5.13 Accident:-

- (a) The contractor shall, in respect of all staff engaged by him or by his sub-contractor, indemnify and keep the employer at all times indemnified and protected against all claims made and liabilities incurred under Workman's Compensation Act, the Factories Act and the Payment of Wages Act, and rules made there under from time to time or under any other labour and Industrial Legislation made from time to time.
- (b) The contractor shall indemnify and keep the employer indemnified and harmless against all actions, suits, claim demands, costs, charges or expenses arising in connection with any death or injury sustained by any person or persons sustained due to the acts or omission of the contractor, his sub-contractors, his agents or his staff during the executions of this contract irrespective of whether such liability arises under the Workman's Compensation Act, or Fatal Accident Act or any other statute in force for the time being.

- (c) The contractor' liability to meet third party claims of the type outlined above will be applicable only in cases where accidents have been caused by workmanship, material, execution or negligence on the part of the contractor and further the liability of the contractor will be limited to Rs.50 lakh for any one accident without any limit on the number of accidents.
- (d) The contractor shall be responsible for all repairs and rectification of damages to completed works or works under execution due to DFCCIL accidents, thefts, pilferage or any other cause, without delay to minimize or to avoid traffic detentions, in a section until the installation are provisionally handed over to the employer.

1.5.14 Safety Measures: -

- (a) The contractor shall take all precautionary measures in order to ensure the protection of his own personnel moving about or working on the railway /DFCCIL premises, but shall then conform to the rules and regulations of the Railway /DFCCIL if and when, in the course of the work there is likely to be any danger to persons in the employment of the contractor due to running traffic while working in the Railway /DFCCIL siding and premises, the contractor shall provide flagman or look out men for protection of such persons. The employer shall remain indemnified by the contractor in the event of any accident occurring in the normal course of work, arising out of the failure of contractor or his men to exercise reasonable precaution at all places of work.
- (b) Blasting of rocks for foundation work shall be done only after due notice is given to the employer and time/s and date /s for blasting operations agreed to by the employer. Blasting, if required to be done in the vicinity of the track, shall not be undertaken until the Employer's flagmen on duty take necessary step to protect trains and the track is adequately protected by the contractor against damage by blasted rock. The contractor shall follow detailed instructions which will be issued to him regarding blasting operations in the vicinity of tracks
- (c) The contractor shall abide by all DFCCIL regulations in force for the time being and ensure that the same are followed by his representatives, Agents or sub -contractors or workmen. He shall give due notice to his employees and workers about provision of this para.
- (d) The works must be carried out most carefully without any infringement of the Indian Railway Act or the General and Subsidiary Rules in force on the Railway /DFCCIL, in such a way that they do not hinder Railway / DFCCIL train operation or affect the proper functioning of or damage any DFCCIL equipment, structure or rolling stock except as agreed to by the employer, provided that all damage and disfiguration caused by the contractor at his own cost failing which cost of such repairs shall be recovered from the contractor.
- (e) If safety of track or track drainage etc. is affected as a consequence of works undertaken by the contractor, the contractor shall take immediate steps to restore normal conditions. In

case of delay, the employer shall, after giving due notice to the contractor in writing, take necessary steps and recover the costs from the contractor.

1.5.15 Guarantee / Defect Liability Period: -

- (a) The Contractor shall guarantee that all the works executed under this contract shall be free from all defects and faults in material, workmanship and manufacture and shall be of acceptable standards for the contracted work and in full conformity with the technical specifications, drawings and other contract stipulations, for **a period of 12 months** from the date of taking over by the Employer
- (b) During the period of guarantee the Contractor shall keep available an experienced engineer/manpower to attend to any defective works/installations resulting from defective erection and/or defect in the installation supplied by the Contractor. This engineer shall not attend to rectification of defects which arise out of normal wear and tear and come within the purview of routine maintenance work. The contractor shall bear the cost of modifications, additions or substitutions that may be considered necessary due to faulty materials or workmanship for the satisfactory working of the equipment. The final decision shall rest with the Engineer his successor(s)/Nominee.
- (c) During the period of Guarantee the Contractor shall be liable for the replacement at site of any parts which may be found defective in the executed work whether such parts / structural elements of his own manufacture or those of his sub-contractor / supplier whether arising from faulty materials, workmanship or negligence in any manner on the part of the Contractor provided always that such defective parts as are not repairable at site are promptly returned to the Contractor if so required by him at his (Contractor's) own expenses. In case of parts of executed work detected during guarantee period, contractor should replace all such items irrespective of the fact whether all such items have failed or not. The Contractor shall bear the cost of repairs carried out on his behalf by the Employer at site. In such a case, the contractor shall be informed in advance of the works proposed to be carried out by the Employer.
- (d) If it becomes necessary for the Contractor to replace or renew any defective portion of the structural elements until the expiration of six month from the date of such replacement or renewal or until the end of the above-mentioned period whichever is later.

Such extension shall not apply in case of defects of a minor nature, the decision of the General Manager / CPM or his successor/nominee being final in the matter. If any defect be not remedied within a reasonable time during the aforesaid period the Employer may proceed to do work at the Contractor's risk and expense, but without prejudice to any other rights and remedies which the Employer may have against the Contractor in respect of such defects or faults.

- (e) The repaired or renewal parts structure shall be delivered / supplied and erected / executed on site free of charge to the employer.

- (f) Any materials, fittings, components or equipment's / structure supplied under items for supplying / providing and fixing in schedule shall also be covered by the provisions of this paragraph. The liability of the Contractor under the guarantee will be limited to re-supply of components / structure installation and fittings.

1.5.16 Final Acceptance:

- (a) The final acceptance of the entire work executed shall take effect from the date of expiry of the period of guarantee / Defect Liability Period as defined in paragraph 1.5.15 above of the expiry of the last of the respective periods of guarantee of various items, provided in any case that the Contractor has complied fully with his obligations under clause 1.5.15 in respect of each item, provided also that the attention has been paid by way of maintenance by the Employer.
- (b) If on the other hand the contractor has not so complied with his obligation under Para 1.5.15 above in respect of any work, the Employer may either extend the period of guarantee in respect of that work until the necessary works are carried out by the Contractor or carry out those works or got them carried out suo-moto on behalf of the Contractor at the Contractor's expenses. After expiry of the period of guarantee for each work, a certificate of final acceptance for the section shall be issued by the Employer and the last of such certificate will be called the last and final acceptance certificate. The contract shall not be considered as completed until the issue of final acceptance certificate by the Employer.
- (c) The Employer shall not be liable to the Contractor for any matter arising out of or in connection with the contract or execution of the work unless the Contractor shall have made a claim in writing in respect thereof before the issue of final acceptance certificate under this clause.

Notwithstanding the issue of final acceptance certificate, the Contractor and the Employer (subject to sub-clause as above) shall remain liable for fulfilment of any obligation incurred under the provision of the contract prior to the issue of final acceptance certificate which remains unperformed at the time such certificate is issued and for determining the nature and extent of such obligation the contract shall be deemed to remain in force between the parties hereto.

1.5.17 Payment

Payment will be governed by the terms specified in Part-I, Chapter IV /Chapter- V (GCC/SCC) and in accordance with accepted schedule of prices, read with relevant para of the other parts and Chapters of the Tender Document. The employer retains the right to withhold money due to the contractor arising out of this contract for any default of the contractor.

- (i) The Contractor shall, whenever required, produce or cause to be produced for examination by the Employer any quotation / invoice, cost of other account, book of account, voucher,

receipt letter, memorandum paper or writing or any copy of or extract from any such document and also furnish information and returns verified in such manner as may be required in anyway relating to the execution of this contract or relevant for verifying or ascertaining the cost of the execution of this Contract (the decision of the employer on the question of relevancy of any documents, information or return being final and binding on the parties). The Contractor shall similarly produce vouchers etc., if required, to prove to the Employer that materials supplied by him are in accordance with the specifications laid down in the contract.

- (ii) If any portion of the work be carried out by a sub-contractor or any subsidiary or allied firm or company the Employer shall have power to secure the books of such sub-contractor or any subsidiary or allied firm or company, through the Contractor, and such books shall be open to his inspection. The Contractor should seek prior permission from the employer for subletting whole and/or part of the work to any sub-contractor.
- (iii) The obligations imposed by sub-clause (i) and (ii) above are without prejudice to the obligation of the Contractor under any statute, rules or order binding to the Contractor or other conditions of the contract.
- (iv) It is an agreed term of the contract that the employer reserves the right to carry out post-payment Audit and/or technical examination of the works and the final bill, including all supporting vouchers, abstracts etc. and to make a claim on the Contractor for the refund of any excess amount paid to him if as a result of such examination any over payment to him is discovered to have been made in respect of any work done or alleged to have been done by him under the contract.

1.5.18 All payments in respect of the contract during the currency of the contract shall be made through Electronic Clearing System (ECS)/National Electronic Funds Transfer (NEFT/RTGS). The successful tenderer on award of contract must submit ECS/NEFT/RTGS Mandate Form complete in all respects as detailed at Form No. 8 of the tender document. However, if the facility of ECS/NEFT/RTGS is not available at a particular location, the payments shall be made by cheque.

1.5.19 Performance Guarantee: -

- (i) The Bank Guarantee for performance Guarantee shall remain valid until a date 60 days (or as specified in the Contract) after expiry of Defects Liability Period.
- (ii) The Bank Guarantee for performance Guarantee shall be submitted invariably in the format given in the bidding document.
- (iii) The performance Guarantee shall be released after issue of performance certificate.

1.5.20 Advances to Contractor: - Applicable in this Contract**(a) Mobilization advance:**

This shall be limited to 10% of the contract value and payable in 2 stages, as indicated below:

Stage I -5% of Contract Value on signing of the contract agreement.

Stage II - 5% on mobilization of site-establishment, setting up offices, bringing in equipment and actual commencement of work.

The 1st stage of advance shall be payable immediately after signing of contract agreement.

The 2nd stage of advance shall be payable at the time of mobilization, after submission of a utilization certificate by the contractor that the stage 1 advance has been properly utilized in the contract.

These Advances shall be payable against irrevocable guarantee (Bank Guarantee, FDRs) from a scheduled commercial bank of India of at least 110% of the value of the sanctioned advance amount (covering principal plus interest).

(b) Advance Against Machinery and Equipment:

This advance shall be limited to a maximum of 10% of the contract value against new Machinery & Equipment, involving substantial outlay, brought to site and essentially required for the work. This advance shall not exceed 75% of the purchase price of such Equipment and shall be payable when hypothecated to the DFCCIL by a suitable bond or alternatively covered by an irrevocable Bank Guarantee for full cost of the Plant & Equipment from a Nationalized Bank in India or the State Bank of India in a form acceptable to DFCCIL. The Plant & Equipment shall be insured for the full value and for the entire period, these are required for the work. This plant & Equipment shall not be removed from the site of work without prior written permission of the Engineer. No advance should be given against old Plant & Machinery.

(c) Advances for accelerating progress of the work during course of execution of Contract:

This advance is to be decided on the merits of each case and shall be restricted to a maximum of 5% of contract value. This is to be granted by the Managing Director on the recommendations of the Engineer in-charge, in consultation with the Associate Finance. While recommending this advance for sanction of Managing Director, the Engineer in-charge shall also confirm that progress of the contract work has been as per milestones/targets laid down and no extension to Date of completion of the contract has been given on contractor's account.

(d) Advances in Exceptional Cases:

Managing Director is further empowered to grant advances in exceptional cases upto a maximum of Rs. 20 lacs in respect of even contract of value less than Rs. 25 crore, if

considered absolutely essential, depending on the merits of each case and circumstances in each situation, to be recommended by the Engineer in-charge and in consultation with the Associate Finance.

(e) The above advances are subject to the following conditions:

- (i) The advances shall carry an interest of **10% (Ten Percent)**.
- (ii) Advances except those against machinery and equipment shall be payable against irrevocable guarantee (Bank Guarantee, FDRs, KVPs/NSCs) of at least 110% of the value of the sanctioned advance amount (covering principal plus interest). The Bank Guarantee shall be from a Nationalized / Schedule Commercial Bank in India in a form acceptable to the DFCCIL. Format for BG is similar to Tender Form-26 placed at Part-III of Tender Document.
- (iii) The recovery shall commence when the value of contract executed reaches 15% of original contract value and shall be completed when the value of work executed reaches 85% of the original contract value. The instalments on each "on account bill" will @ 15% of each gross bill amount.
- (iv) That the grant of advance is primarily in DFCCIL's own interest.
- (v) That a contractor does not receive advances for same work from different officers.
- (vi) That arrangements are made with the Accounts Officer for proper accounts being kept with regard to payment and recovery of these advances; and
- (vii) That all necessary precautions are taken to secure Government/DFCCIL from the possibility of loss and for preventing the system becoming more general or continuing longer than what may be absolutely necessary for proper progress of the work.

(f) Method of Recovery of Interest –

Interest shall be recovered on the advance outstanding for the period commencing from the date of payment of advance till date of particular on-account bill (through which recovery of date of principal is effected) and adjusted fully against on-account bill along with principal recovery. In the event of any short-fall, the same shall be carried forward to the next on-account bill and shall attract interest.

The Bank Guarantee for such advance shall clearly cover at least 110% of the value of the sanctioned advance amount (covering principal plus interest).

1.5.21 Statement of Dispute: - Refer to clause 63 and 64 of GCC.

1.5.22 Integrity Pact:-

As per office memorandum no F.No DPE/13(12)/11-Fin Dated 09.09.2011 issued by Ministry of Heavy Industries (DPE) all PSU should enter into Integrity pact in the required proforma in their procurement transaction/ Contracts with suitable changes specific to the situation in which the pact is to be used. The pact, entering into which would be a

preliminary qualification for any bidder, essentially envisages an agreement between the prospective vendors / bidders and the DFCCIL, committing the persons/ officials on both sides not to resort to any corrupt practices in any aspect / stage of the contract.

A copy of pre contract integrity pact is enclosed as Form No. 20 for signature of bidder as acceptance. The details of Independent External monitor (IEM) shall be collected from the office of CGM DFCCIL whenever required.

PART - I
CHAPTER VI

EMPLOYER'S REQUIREMENT

PART - I

Chapter-VI

EMPLOYER'S REQUIREMENT

Section-1: GENERAL REQUIREMENT

1. Introduction

- 1.1 The Second Phase of the Western Dedicated Freight Corridor consists of 550km of double line electrified track with 2x25 kV AC, 50 Hz. Overhead Catenary System from JNPT to Vadodara (422 Km) and Rewari to Dadri (128 Km).

The proposed tender is under the jurisdiction of CGM/South/Mumbai. Following other Contracts are already in place under CGM/South/Mumbai.

CTP-11	Civil, Building and Track Works (JNPT- Vaitarana) (Terminated).
CTP-15A	Special Steel Bridges in JNPT- Vadodara Section
EMP-16	Electrical & Mechanical (E&M) Works (JNPT- Vadodara)
STP-17	Signal and Telecommunication (S&T) Works (JNPT- Vadodara)
STP-5A	Train Protection Warning System

- 1.2 The jurisdiction of CGM/Mumbai (South) is located at the start of Southern Section from JNPT to Vaitarana of JNPT - Vadodara Section of Phase-2 Project. The Works shall be carried out between JNPT and Vaitarana (102km) along JNPT- Panvel - Diva - Vasai Road of Central Railway and Vasai Road – Vaitarana Section of Western Railway in Maharashtra State as per the defined packages. Detours have been planned at Kundevahal (1.5km), at Dativali (4.04km) and at Vasai (16.8km) totaling about 23 km. About 78% of the proposed DFC alignment between JNPT and Vaitarana is passing parallel to the existing Central and Western Railways and the remaining 22% of the alignment is passing through detours.

The Existing EMP-16 Contract for CTP-11 portion for OHE works has been descope. The following contract package are in progress for various works:

CTP-15A: Special Steel Bridges in JNPT-Vaitarna Section.
 EMP-16: Electrical & Mechanical (E&M) works (JNPT-Vadodara).
 STP-17: Signal and Telecommunication (S&T) works (JNPT-Vadodara).

- 1.3 The Employer's Requirements in this Chapter are divided into Eight (8) sections as follows:
- (1) Section-1: General Requirement; These apply throughout the Contract.
 - (2) Section -2: Scope of work and Site Details; These include the specific requirement for the works and site availability details in the Contract.
 - (3) Section -3: Site Facilities & Temporary Works
 - (4) Section -4: Contractor's Project Organization;
 - (5) Section -5: Interface Management;

- (6) Section -6: Requirement during construction Phase; This includes requirements relating to Construction of work phase.
- (7) Section -7: **SAFETY, HEALTH AND ENVIRONMENT (SHE) REQUIREMENT** having Section 7.1, 7.2,7.3, 7.4, 7.5, 7.6, & 7.7
- (8) Section-8: Execution Program, Section 8.1, 8.2 & 8.3

2. Definitions and Interpretations

2.1 In addition to the words and expressions defined in the General Conditions of the Bid Documents, following words and expressions shall have the meaning assigned to them except where the context otherwise requires:

- **As-Built Drawings:** mean those drawings produced and endorsed by the Contractor as true records of construction of the Permanent Works. The As-Built Drawings are subject to confirmation and issue of a "Notice of No Objection by the Engineer".
- **Contractual Construction Programme:** means the highest precedent detailed programme above all sub-programme as developed by the Contractor covering the whole scope of the Contract and based on the Bid Programme for execution of the Works within the specified completion period. Contractual Construction Programme has been further detailed in Section-8, Chapter-VI, Part-I [Execution program] to the Employer's Requirements.
- **Bill of Quantities:** shall mean Schedule of Item(s) included in the tender document along with respective quantities.
- **Drawings:** shall mean the maps, drawings, plans and tracings, or prints thereof annexed to the Tender Forms.
- **Interfacing Parties:** includes but shall not be limited to other contractors and the designated contractors/consultants/service providers other than Other Contractors, who are engaged in part of the Works, relevant statutory authorities, relevant public utility agencies and the contractors or sub-contractors who are or may be working within or adjacent to the Site.
- **Other Contractors:** means any party or parties having a direct contract with the Employer for work on the project outside the scope of this Contract, and shall include any subcontractor of the Other Contractors.
- **Railway:** means Railway or any portion of a Railway for public carriage of passenger and goods as defined in the Indian Railway Act 1989.
- **Railway Envelope:** means the area within the Right of Way (ROW) as required for the safe operation of the railway.

- **Right of Way:** means the width/area of the land as required and/or acquired for the operations of the railway. Right of Way for DFC shall be as indicated in the Scope of Works included in the Section -6 of Employer's Requirements -
- **SHE Requirements:** contain major items with respect to environmental and social considerations, and safety and health considerations for all parties involved in the Contract.
- **Site:** means the area where the Permanent Works are executed in the Right of Way (see the Work Areas).
- **Specialist Subcontractor:** means any person so named in the Prequalification Application as a Specialist Subcontractor for a part of the Works which requires highly specialized inputs such as mechanized track laying, specialist design consultant etc. and the legal successors in title to such person, but not any assignee of any such person.
- **Specifications:** Specification shall mean the specification for material and works of the DFCCIL or as mentioned with tender documents or as implied, added to or superseded by Special Specification if any appeared to the tender forms.
- **Work Areas:** comprise the Site (see "Site") and areas for the Temporary Works within and outside the Right of Way.
- **Works Segment:** means the subdivided section/stretch of the DFC Right of Way identified by the Contractor for ease of managing and optimum utilization of resources for Construction of the Permanent Works. Size of the Work Segment shall be as consented by the Engineer and approved by the Employer.
- **Works Programme :** means the programme showing the sequence and timing of investigations, , execution, manufacture, installation, testing, commissioning of the Works (including Integrated Testing and Commissioning), indigenization (where applicable) and related activities in the form and content prescribed by the Employer's Requirements, or any amended or varied version thereof, as submitted by the Contractor in accordance with Project Programme Requirements and for which the Employer/Engineer has issued a Notice of No Objection.
- **Yard/Station Yard:** Yard/Station Yards are defined by the layouts within the advance starter of UP track and advance starter of DN track.
- The words "Notice to Commence" is synonymous with "Notice to Proceed" or "Order to Commence" or "Instruction to Commence".
- The words "Defects Notification Period" is synonymous with "Defects Liability Period" The words "Delay Damages" is synonymous with "Liquidated Damages"

3. Employer's Drawings

Employer/DFCCIL has provided following drawings prepared during execution of work by the earlier Contractor whose scope of work descope and new Contractor can make use of these drawing for fresh submission of drawings for approval the Engineer. The list is as follows:

- a. General Power Supply Diagram (GPSD) and Sectioning Diagram
- b. LOP/CSD/SED
- c. Method Statements for all major activities
- d. Set of DFCCIL approved Drawings wherever RDSO/CORE approved drawings are not available.
- e. List of suppliers approved by the Employer/DFCCIL wherever RDSO/CORE approved suppliers are not available.
- g. Approved drawings stated in this tender document implies that work is to be done as per DFCCIL approved drawings, and latest RDSO/CORE approved drawings are to be followed if DFCCIL approved drawings, are not available.

The Employer's Data and Drawings are attached in this Contract document to express the Employer's concept and/or intent bearing functions, purposes and structural forms of the Permanent Works.

Validation of Data & Additional Surveys

- (1) The Contractor shall plan and programme for the validation of the drawings and data provided by the Employer and conduct additional surveys if required.
- (2) The Contractor shall plan for submission drawings for execution after due diligence and validation to the Engineer for approval.
- (3) All submission shall be made in compliance with the latest RDSO/CORE drawings/instructions for compliance for new works. DFCCIL instructions will prevail over RDSO instructions if found different.
- (4) Non-Standard Work, will not be acceptable and the underlying factor of above description is that standard arrangement as per approved drawing using standard fittings, components and standard fasteners will be the only acceptance criteria.
- (5) Provision of base plate for erection of OHE mast on bridges and retaining wall wherever required is being provided by the CTP-11 Contractor.
- (6) Contractor shall adopt safety earthing and bonding as per bonding and earthing management plan.

Details mentioned above shall be treated as set of reference drawings which show the Employer's concept of each Permanent Works above and are indicative and for reference only. These shall be further developed by the Contractor for execution.

4. Codes and Standards

- 4.1 The construction of the Works shall comply with the Specification, Relevant Documents and other relevant codes and standards as applicable and consented by the Engineer.

- 4.2 In the event of a conflict between the Design documents and any other standards or specifications, the Design documents shall prevail.
- 4.3 The Contractor is responsible for obtaining prior Notice of No Objection from the Engineer and approval from Employer for any alternative or additional codes of practice and standards.
- 4.4 Notwithstanding the precedence specified above, the Contractor shall always seek advice from the Engineer in the event of any conflict, immediately for a final decision.

5. Deleted.

6. Specifications

- 6.1 The specification shall be defined in Part-II.
- 6.2 The Contract shall utilize the SI system of units, Codes and Standards in imperial units shall not be used unless the Engineer has given his consent.
- 6.3 Conversion between metric units and imperial units shall be in accordance with Indian Standard.

7. Deleted.

8. Programme Requirements

- (1) The Contractor shall develop a detailed programme covering the whole scope of the Contract to be executed within the completion period as specified in the Contract and based on the Bid Program and submit the same to the Engineer for his consent within 28 days after the Commencement Date. Upon consent by the Engineer to the programme, it shall be referred to as the **Contractual Construction Programme**, and become an integral part of the Contract. The Engineer shall seek the consent of the Employer before communicating the acceptance of the **Contractual Construction Programme** to the Contractor.
- (2) Based on the Contractual Construction Programme, the Contractor shall submit sub-divided and further detailed **Works Programme** to the Engineer for checking and monitoring the Works.

The Works Programme for all Work Segments produced and submitted to the Engineer shall be strictly in compliance with the Contractual Construction Programme. Requirements for the programme are detailed in Project Programme Requirements to the Employer's Requirements.

- (3) In compiling its Works Programme_ and in all subsequent updating and reporting, the Contractor shall make provision for the time required for coordinating and completing the work including testing, commissioning and integrated testing of the Works.
- (4) Deleted

9. Deleted.

10. Quality Assurance Requirements

The Contractor shall establish and implement the Project Quality Assurance Plan for construction of the Works as described in Section-8.3 of Part-1 Chapter VI [Quality Assurance] to the Employer's Requirements. This Quality Management System detailed in the plan shall be applied without prejudice to, or without in any way limiting, any quality systems that the Contractor already maintains.

11. Safety, Health and Environment (SHE) Requirements

- 11.1 The SHE requirements contain major items with respect to environmental and social considerations, and safety and health considerations for all parties including, people affected by the Works, Contractor's Employees, and the party involved in the Contract. Measures to the SHE requirements shall be taken by the Contractor in accordance with the requirements of various applicable Legislations, Acts, Statutes, Regulations, Rules, Codes & Standards etc. Key requirements are detailed in Section-7 of Part-I, Chapter VI of Employer's Requirement.
- 11.2 Under the SHE requirements, the Contractor shall establish measures to carry out his design and construction process in highest standards of international environmental practice in compliance with all relevant Indian environmental and social laws, standards, codes and regulations. The Contractor shall incorporate the principles of good environmental practice and minimizing negative environmental and social impacts into the Works contained in the Contract.
- 11.3 The Contractor shall at all times be solely responsible for maintaining the health and safety of all his employees and safety of the general public whilst exposed to construction activities whether on or off-site. The Contractor shall at all times take all the precautions as necessary to maintain health and safety of all his employees during working hours and during hours in his employee's camp. His Employee's camp shall meet the requirements detailed in Section-3 of Part-I, Chapter VI [Temporary Works] to the Employer's Requirements.
- 11.4 Under the requirement of this Contract or package, the Contractor shall strictly comply with all mandatory terms and conditions including recommendations throughout the entire construction period, as imposed by the competent authorities (i.e. Ministry of Environment, Forests & Climate Change, State and National Wild Life Board, Central Empowered Committee of the Hon'ble Supreme Court of India, Hon'ble High Court of Bombay, Maharashtra Coastal Zone Management Authority, State Pollution Control Board, State Forest Department etc.) via final

clearance letters or any other mechanism for Coastal Regulation Zone Clearance, Forest Clearance (Stage- I & II), Sanjay Gandhi National Park Clearance, etc.

12. Deleted.

13. Contractor's Coordination with Other Contractors

The Contractor shall take in to account the interface coordination requirements of Other Contractors who will be working at site and or duly constituted authorities who will be employed or required by the Employer to execute the work within or adjacent to site in connection with or ancillary to the works. In this regard, the Employer/Engineer shall organize coordination meetings to sort out any interfacing issues amongst the interfacing Contractors. In addition to the coordination meetings to be arranged by the Employer/Engineer. The Contractor may also arrange his own coordination meetings with the Other Contractors.

The Contractor shall fully integrate and coordinate the construction of the Works with Other Contractors, Interfacing Parties and related bodies parties and entities including but not limited to Indian Railways, Railway Board, RDSO, as well as the designated contractors/consultants/service providers, other than other contractors who are engaged in part of the Works, relevant statutory authorities, relevant public utility agencies and adjacent contractors who are or may be working adjacent to the Site.

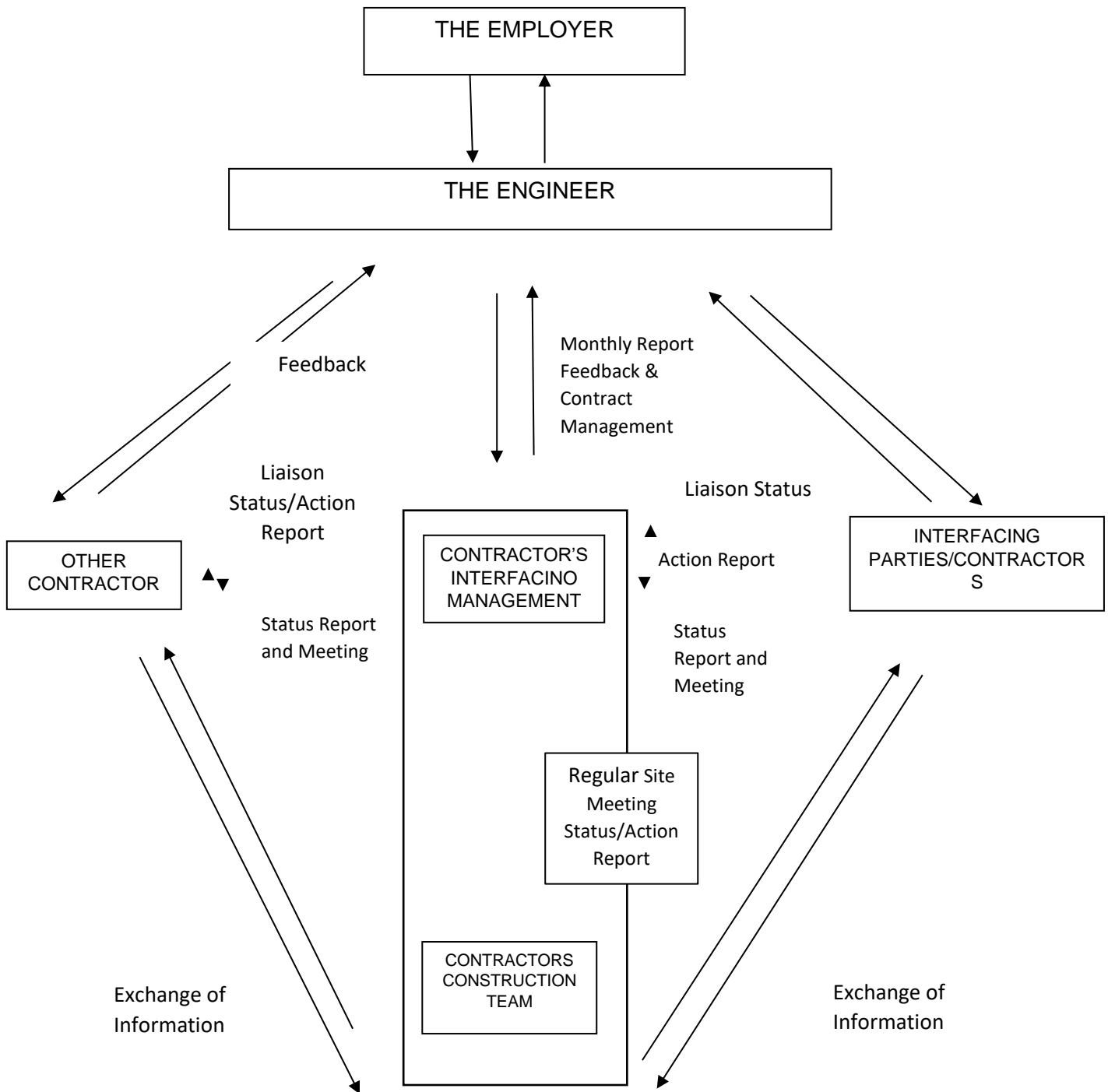
The Contractor shall be responsible for keeping Other Contractors fully informed on all matters of progress insofar as those may affect the progress of Other Contractors and for all coordination with such Other Contractors.

The Contractor shall actively seek out solutions to integration issues, and to anticipate, to plan for, and to comply with the needs of these related parties, which are properly required and consistent with the obligations under the Contract. The Contractor shall comply in this respect with the requirements of Section-5, Part-1, Chapter VI of Employer's requirement [Interface Management]

In case of the Other Contractor is not in place, the Contractor shall co-ordinate with the Engineer for the Interfacing issues.

The Employer shall facilitate in drawing up the Interface Management Plan amongst the interfacing contractors.

The interface Communication and Co-ordination Model is graphically shown as below:



14. Site Installation and Demobilization

- 14.1 Within twenty-eight days of the Commencement Date, the Contractor shall establish a temporary office at the Site duly equipped for the Contractor's Representative and his supervisory personnel. All correspondence shall continue to be addressed to the Contractor's registered head office but shall be sent to this office at the Site and shall be deemed to have been sent to the Contractor's head office.
- 14.2 All necessary Temporary Works regarding site installation such as Temporary Facilities and Temporary Utility Services shall be provided, equipped, and maintained by the Contractor for his own use, for his sub-contractors, for the Engineer and the Employer. The detailed requirements are described in Section-3 [Site Facilities & Temporary Works] of Part-1, Chapter VI of Employer's Requirements.
- 14.3 All the Temporary Facilities and Temporary Utilities Services including but not limited to those defined in Section-3 [Site Facilities & Temporary Works] of Part-1, Chapter VI of Employer's Requirements shall be provided, equipped, and maintained in good conditions and shall not be discontinued without the consent of the Engineer but not later than the issue of Taking-Over Certificate.

15. Project Management Information System (PMIS)

The Contractor shall devise and utilize a PMIS such that all documents generated by the Contractor can be transmitted to the Engineer by electronic means (and vice versa) and that all documents generated by either party are electronically captured at the point of origin and can be reproduced later, electronically and in hard copy. A similar link shall also be provided between the Engineer Office at site and the Employer's site office and Headquarters Office by the Contractor.

16. Deleted.**17. Contractor's Project Organizations**

- 17.1 The Contractor shall have a competent team of managers, engineers, technical staff, experts and support staff etc. so as to complete the work in a satisfactory manner in compliance with Employer's Requirements and Specifications. The designations of the various project organizations team members shall be accepted by the Engineer before adoption.
- 17.2 The Contractor shall establish an organizational and procedural scheme which ensures all the Works are carried out strictly in compliance with the Employer's Requirements and Specifications and for the benefit of the Employer throughout the Contractor's construction implementation as required in Employer's Requirement - Section-8.3 of Part-1, Chapter VI to the Employer's Requirements.

17.3 A control room with round the clock radio communication or telephone switch board links with all safety offices, Work Areas including but not limited to site offices, batching plants, casting yards workshops, fabrication yard, off site offices, Engineer's Site Office and Huts, Quarry Areas, Borrow Areas, etc. shall be maintained and manned round the clock. Residences of all senior project team members shall also be linked with the control room. Vehicles for emergency use shall be on standby at the control room around the clock.

18. Deleted.

19. Deleted.

20. Monitoring of Progress

20.1 The Contractor shall submit to the Engineer 6 copies of a Monthly Progress Report (MPR), as described in Section-8.2 of Part-1, Chapter VI [Monthly Progress Report] to these Employer's Requirements, describing the progress and current status of the Works. The MPR shall address the matters set out in the Works Programme.

20.2 The MPR shall cover progress and current status relating to physical progress and current status relating to construction including co-ordination, procurement and other miscellaneous items.

20.3 A monthly meeting to monitor the progress of the project shall be conveyed by Engineer. Contractor' representative and Representative of all other Contractors / interfacing parties (as required) shall also attend the meeting. The meeting shall be chaired by the Employer.

20.4 The Engineer shall record the proceedings of the monthly meeting and shall circulate the record to all concerned and as instructed by the Employer.

20.5 Management Meetings

(1) The Employer or the Engineer shall require the Contractor to attend a management meeting in order to review the resource mobilization for future work, works progress or other issues. The Engineer shall record the proceedings of the management meetings and shall supply copies of records of to all those in attendance and as instructed by the Employer.

(2) The items to be discussed at the management meetings shall be set out at the first meeting with the concurrence of the Contractor, the Employer and the Engineer.

(3) The minutes of the meeting signed by the Contractor, the Employer and the Engineer shall constitute an official record of matters discussed, but shall not replace any requirement in the Contract for consents, approvals, instructions or decisions to be submitted in writing.

(4) The Contractor shall copy all correspondence, notices and documents related to the management meetings and send them to the Employer, the Engineer and those parties as instructed by the Employer prior to the meeting.

(5) The Contractor shall, when requested with reasonable notice, attend any other meetings convened by the Employer, the Engineer to review works progress or other relevant issues.

20.6 A copy of all the reports, as submitted by the Contractor to the Engineer shall be submitted to the Employer by the Engineer along with his comments within 7 days of its submission by the Contractor.

20.7 Intellectual Property Rights (IPR)

In so far as the copyright or other intellectual property right in any plans, calculations, drawings, documents materials, plant, know-how and other information relating to the works shall be vested in the contractor, the contractor grants to the employer his successors and assigns a loyalty free, non-exclusive and irrevocable license (carrying the right to grant sub-licensees) to use and reproduce any the of the works designs or inventions incorporated and referred to in such documents or materials and any such know-how and information for all purposes relating to the works including without limitation the design, execute, complete, test and commission (including integrated testing and commission) reinstatement, extension and the remedy of any defect in the works. To the extent that beneficial ownership of any such copyright or other intellectual property right is vested in anyone other than the contractor, the contractor shall use best endeavours to procure that the beneficial owner thereof shall grant a like to the employer. For the avoidance of doubt, any such license granted shall not be determined if the contractor shall for any reason cease to be employed in connection with works.

Section-2: SCOPE OF WORK AND SITE DETAILS

SCOPE OF WORK:

1. Name of Work:

“Execution of balance Works for 2x25 kV High Rise OHE in JNPT-Vaitarna Section of DFCCIL in CGM/Mumbai South Unit (102 Km)”.

2. SCOPE OF WORK:

The scope of work involves, Execution, including Testing & Integrated Commissioning, as per approved Design made available by the Engineer (PMC-2R) and in complete satisfaction of the stipulated Employer’s Requirement, using after procuring (to the extent required) the material of appropriate specifications and using the material made available by the Engineer (PMC-2R), 2X25 KV Traction high rise OHE, capable of running double stack containers on flat wagons for running trains, hauled by 9000 h.p. electric locomotives, on the double line Railway Tracks, on the Western Dedicated Freight Corridor section from the JNPT – Vaitarna (102 Route km) under jurisdiction of CGM/Mum/S.

2.1 Introduction

2.1.1 Western DFC Route will be approximately 1520 Km long from Dadri to JNPT via Rewari – Iqbalgarh - Vadodara- JNPT.

The Proposed work shall be carried out between JNPT and Vaitarna (102km) running parallel to JNPT- Panvel - Diva - Vasai Road of Central Railway and Vasai Road – Vaitarna Section of Western Railway in Maharashtra State except in 23 km long detour sections at Kundevahal (1.5km), at Dativali (4.04km) and at Vasai (16.8km). About 78% of the proposed DFC alignment between JNPT and Vaitarna is running parallel to the existing railway tracks and the remaining 22% of the alignment is passing through detours.

2.1.2 Total scope & progress of 2x25 kV OHE in CTP-11 section is as under:

S.N.	Activity	Scope	Already completed	Scope of the work in this tender
1	Design & Drawing Unit: TKM	240	Almost all LOP completed and will be shared with contractor	Contractor is required to do Verification before submission for approval to start work
2	Mast Foundation	5698	600	5098
3	Mast/Portal/SPS Unit: MT	Supply: 5250 Erection: 5250	Supply: 1800 Erection: 150	Supply:3450 Erection: 5100

Catenary and Contact wire				
4	Catenary wire 125 mm ²	Supply: 361 Erection: 361	Supply: 295.46 Erection: 0	Supply: 64.32 Erection: 361
5	Contact wire 150 mm ²	Supply: 361 Erection: 361	Supply: 295.46 Erection: 0	Supply: 84.16 Erection: 361
6	Catenary wire 65 mm ²	Supply: 361 Erection: 361	Supply: 295.46 Erection: 0	Supply: 1 Erection: 361
7	Contact wire 107 mm ²	Supply: 361 Erection: 361	Supply: 295.46 Erection: 0	Supply: 34 Erection: 361
8	Feeder wire 288 mm ²	Supply: 205 Erection: 361	Nil	Supply: 205 Erection: 361
9	AEC 93.3 mm ²	Supply: 205 Erection: 205	Supply: 120 Erection: 0	Supply: 85 Erection: 205
10	BEC 19 strands of 3.5 mm	Supply: 215 Erection: 215	Supply: 180 Erection: 0	Supply: 35 Erection: 215
11	Cantilevers			
	Modular Type	Supply: 2688 Erection: 2688	Supply: 1538 Erection: 0	Supply: 1150 Erection: 2688
	IR Modified Type	Supply: 2808 Erection: 2808	Supply: 440 Erection: 0	Supply: 2368 Erection: 2808
	IR Conventional	Supply: 912 Erection: 912	Supply: 0 Erection: 0	Supply: 912 Erection: 912

- 2.1.3 Power supply installation in CTP-11 section (i.e., JNPT-Vaitarna section), there are 2 numbers of TSSs and 9 numbers of SPs/SSPs that has been mentioned in the General Power Supply Diagram (GPSD) are being executed by SLT-16 Contractor and in advance stage of completion.
- 2.1.4 Integrated Testing and Commissioning of OHE along with Eleven numbers of PSI (2 TSS + 9 SP/SSP) with SCADA and AFL (Auto Fault Locator) at Seven locations TSS/SP/SSP(A).
- 2.1.5 As on date, status of OHE works is as under:
- Most of the Design and drawing works are completed.
 - OHE foundations 600 Nos. and Mast erection 300 Nos. is completed till date.
 - Some of the OHE materials are available for handing over to the Contractor and Contractor is required to supply only balance quantity. Summary is included as free supply items in Para 2.1.2.
- 2.1.6 Special features of the work to be carried out by the Contractor is as under:
- 2x25 KV traction in place of conventional OHE of 1x25 KV.
 - Heavier OHE design with use of 125 sq.mm catenary wire and 150 sq.mm contact wire.
 - For bonding and earthing, separate earthing management plan has been envisaged which has a provision of Arial-Earth-Conductor and Buried-Earth Conductor.
 - 288 sq.mm AAAC conductor has been used for negative feeder of 2x25 kV system.
 - No drilling is permitted on rails of the track in view of prevention of ill effects drilling holes at every OHE mast as per IR practice.
 - Five pulley and three ATD are used for main lines and yard lines respectively.
 - Light weight section insulator.

- h. Bonding is provided at every 425 meters between buried earth conductor, OHE mast/structure and rails of the track. For connection of earth specially designed rail clamp is used to avoid hole drilling.
- i. Provision of Modular type cantilever assembly in polluted zones.
- j. Provision of IR Modified type cantilever assembly in main lines.
- k. Current carrying droppers of 10 sq.mm in lieu of 5 mm diameter copper dropper used in conventional OHE.
- l. IR modified brackets with provision of 70mm bracket tube to make it suitable to take load of heavier OHE.

2.1.7 Number of imported items are to be used as under:

- a. Catenary and Contact wires.
- b. PTFE Neutral Section
- c. Light weight Section Insulator
- d. Current Carrying droppers
- e. Modular Cantilever in polluted zones
- f. Termination clamps used for catenary/contact wires and negative feeder wires.

2.1.8 Contractor is required to make submission of all working drawings to the Engineer for approval before execution of works. Though, most of the working drawing are approved but it is important for Contractor to reviews all working drawings so as to get satisfied with the correctness of drawing before submission. This exercise will avoid conflict at a later stage of work i.e., Construction phase and the Defects Liability Period (DLP).

2.1.9 CLIMATIC CONDITIONS

- (i) **WIND PRESSURE:** This section falls in the Green wind pressure zone (IS: 875). Vide letter No. TI/CIV/MS/14 dated 14.07.2014, the standard employment schedule of OHE structures is to be designed for 155 kgf/sqm for zone having a basic wind speed of 47 meter per second which confirms to survey of India map for Green zones. Accordingly, the basic wind pressure in terms of IS: 875(Part-III)-1987(reaffirmed during 1997) is to be adopted
- (ii) **Monsoon period in the area:** Normally, Monsoon period in the project area is from 04 to 05 months. It is desirable that the contractor plans his works accordingly.

2.1.10 CTP-11 Contractor who is executing Civil works and the Current Status is summarized as under:

1. Progress of Formation Work:

Cumulative Progress till date					
Formation Activities in (Km)	JNPT to Nilje	Nilje to Kharbao	Kharbao to Vaitarna	Total qty in (M)	Total qty in (KM)
Cutting	6607	3138	3515	13260	13.260
Embankment	18054	11757	8805	38616	38.616

Subgrade	24141	12081	7853	44075	44.075
Blanket	21585	9862	7360	38807	38.807

2. Progress of Track laying work

Progress till date					
Formation Activities in (TKm)	JNPT to Nilje	Nilje to Kharbao	Kharbao to Vaitarna	Total qty in (M)	Total qty in (TKM)
Track Laying	14667	6280	12625	33572	33.572

3. Work under Progress for Major/Minor Structures

Structure Status					
SN	Component	Scope (Nos)	Structure Completed	Work in Progress	Yet to Start
1	Viaducts	11	2 Nos (Kundevahal Viaduct, 163C)	8 Nos (172,166,163D,159, 152-153, Kharbao, Kopar, Kalamboli)	1 No (163E)
2	RFO	3	0	3 Nos Kharbao, Kalamboli, 1 UP connecting	0
3	Major Bridges	25	4 Nos (66, 83, 88, 106)	20 Nos (68E, 114, 119A, 125B, 137, 138, 139, 141, 145, 151, 157, 169 C&D, 177, 178, 134, 136, 2 UP Co, 142, 147, 169A)	1 No (157C)
4	ROB	11	2 Nos (KD2, Bhiwandi Pipeline)	9 Nos (NH-4B, Vahale Dhumale, Bhiwandi, VS2, Gavan phata pipeline, 142B, Gavan Phata, sheel phata, DT-1)	0
5	Major RUB	3	0	2 Nos (146 & 147B, 67)	1 No (127)
6	Minor Bridges	200	82 Nos	69 Nos	49 Nos
7	Minor RUB	41	11 Nos	8 Nos	22 Nos

			(156,161A, 162, 163, 167B, 169B,167A,161,158, 157A,145B)	(68F, 106A, 117B,119C, 104A, 119B, 155, 162A)	(49(KD3), 68, 117A, 117B, 118, 118A, 118B, 121, 123, 132, 133E, 141B, 153A, 157B, 157D, 160, 161B, 162B, 162A, 169E, 169F, 171)
8	Pedestrian Subway	7	2 Nos (56A1, 94A)	1 No (149B)	4 Nos (68G1, 68N, 119F, 160A)

4. Details of Retaining Wall

S.N.	Chainages		Side	Length (M)
	From	To		
1	0.310	0.470	LHS	160
2	4.077	4.132	LHS	55
3	4.000	4.240	RHS	240
4	4.132	4.202	LHS	70
5	6.860	6.973	RHS	113
6	6.500	6.600	LHS	100
7	7.400	7.460	LHS	60
8	7.380	7.420	RHS	40
9	7.540	7.680	RHS	140
10	7.940	8.000	RHS	60
11	8.000	8.420	RHS	420
12	8.460	9.000	LHS	540
13	8.000	9.000	RHS	1000
14	9.348	9.560	LHS	212
15	9.000	9.200	LHS	200
16	9.000	9.030	RHS	30
17	9.720	9.980	LHS	260
18	10.800	11.000	RHS	200
19	10.863	11.000	LHS	137
20	11.000	12.000	LHS	1000
21	11.000	11.400	RHS	400

22	13.153	13.220	LHS	67
23	14.470	14.615	LHS	145
24	14.470	14.615	RHS	145
25	15.630	16.000	LHS	370
26	15.800	16.000	RHS	200
27	15.510	15.550	RHS	40
28	16.000	16.317	LHS	317
29	16.000	16.125	RHS	125
30	17.006	17.180	RHS	174
31	18.216	18.323	LHS	107
32	18.233	18.265	RHS	32
33	18.465	18.520	LHS	55
34	19.800	20.000	LHS	200
35	20.000	20.148	LHS	148
36	20.307	20.400	LHS	93
37	20.520	20.820	LHS	300
38	21.050	21.360	RHS	310
39	21.285	21.423	LHS	138
40	21.612	21.665	LHS	53
41	22.015	22.363	LHS	348
42	22.015	22.470	RHS	455
43	22.537	22.822	LHS	285
44	22.847	22.867	LHS	20
45	23.380	23.510	RHS	130
46	24.803	25.000	LHS	197
47	24.686	25.000	RHS	314
48	25.000	25.078	LHS	78
49	25.520	25.665	LHS	145
50	25.000	25.600	RHS	600
51	26.000	26.220	RHS	220
52	26.260	26.468	LHS	208
53	26.596	26.669	LHS	73
54	26.724	27.000	LHS	276
55	27.000	27.570	LHS	570
56	27.400	27.570	RHS	170
57	29.503	29.555	LHS	52
58	29.565	29.800	LHS	235
59	29.682	29.928	RHS	246
60	30.080	30.240	RHS	160
61	30.000	30.180	LHS	180
62	31.500	32.000	LHS	500

63	33.133	33.424	LHS	291
64	33.915	34.000	LHS	85
65	33.452	33.478	RHS	26
66	33.568	33.600	RHS	32
67	34.000	34.064	LHS	64
68	36.060	36.260	LHS	200
69	36.519	36.575	RHS	56
70	37.795	38.000	LHS	205
71	38.858	38.914	RHS	56
72	39.360	40.474	LHS	1114
73	40.530	40.666	LHS	136
74	41.683	41.868	LHS	185
75	42.070	42.107	RHS	37
76	48.090	48.545	RHS	455
77	48.140	48.640	LHS	500
78	48.660	48.728	RHS	68
79	49.560	49.970	RHS	410
80	49.660	50.000	LHS	340
81	49.850	50.000	RHS	150
82	50.04	50.5	RHS	460
83	51.400	51.607	RHS	207
84	52.371	52.883	RHS	512
85	52.980	53.360	RHS	40
86	54.350	56.000	RHS	1029
87	55.370	55.600	RHS	558
88	59.470	55.600	RHS	130
89	59.426	61.000	RHS	968
90	61.000	62.650	RHS	751
91	61+882 to 51+914 & 61+923 to 61+967 (RHS)		RHS	76
92	63.375	63.435	RHS	60
93	65.600	65.770	RHS	170
94	66.660	67.500	RHS	840
95	67.210	67.500	RHS	290
96	67+600 to 67+800 & 68+560 to 68+780		RHS	420
97	67.000	68.000	LHS	500
98	67.500	68.260	LHS	500
99	67.500	68.000	LHS	500
100	67.500	68.560	RHS	929

101	67.500	68.260	LHS	712
102	70.600	74.500		2129
103	79.150	79.340		181
104	84.480	88.340		6725
105	94.800	96.460		450
Total Length (in Km)				37465

2.1.11 Approaches to the project site:

Approach to project length is available through level crossings and through revenue land from existing road, at reasonable number of locations. The contractor shall survey for approach roads to the various sites of work after conducting detailed site survey.

2.1.12 Status of Clearances / Permits required for construction

- a. **Forest Clearance:** Not Applicable.
- b. **Wildlife Clearance:** Not Applicable
- c. **Clearance under National Monuments Act:** Not Applicable.
- d. **CRZ clearance:** Not Applicable

2.1.13 Traffic on existing lines:

The construction of the proposed track is to be done in the adjacent to existing IR double line. The traffic on the adjacent line is designated as UP / DN / bi-directional line and is used primarily for mixed / passenger / goods traffic.

2.1.14 The DFCCIL alignment between JNPT to Vaitarna is running parallel to the existing Indian railway track. Detours have been planned at Kundevahal (1.5km), at Dativali (4.04km) and at Juchandra (16.8km) totaling about 23 km. About 78% of the proposed DFC alignment between JNPT and Vaitarana is passing parallel to the existing Central and Western Railways and the remaining 22% of the alignment is passing through detours.

2.1.15 Formation works of CTP-11 Contractor are work under progress and nearly 50 Km formation work in stretches are completed and wherever formation is completed, track laying work is also under progress. To get access to work, interface is to be done with CTP-11 Contractor.

2.1.16 The access to the Indian Railway formation will be provided after getting approval from the Indian Railway and for DFCCIL formation the access will be provided by the DFCCIL.

2.1.17 The Site as well as Contractor's equipment shall not be used by the Contractor for any purposes other than for carrying out the Works, except that, with the consent in writing of the Engineer.

Section-3: SITE FACILITIES & TEMPORARY WORKS**1. Scope of Work**

- 1.1 All necessary Temporary Works adequate for the realization of the Works such as Temporary Facilities and Temporary Utility Services shall be provided and maintained by the Contractor for his own use, for his sub-contractors, the Engineer and the Employer unless otherwise authorized by the Engineer.
- 1.2 The Temporary Facilities including, but not limited to, offices, warehouses and material stock areas as well as the Temporary Utility Services including, but not limited to, power, lighting, water and communication shall be provided, equipped, and maintained in good conditions until the issue of Taking-Over Certificate.
- 1.3 The Contractor shall ensure that the Temporary Facilities and Services do not interfere with the Permanent Works or prevent the installation, commissioning and testing of the OHE Works and works and services of Other Contractors. Where necessary the Contractor shall divert or relocate the temporary facilities / services in the course of the works at his own cost. The Contractor shall locate his Temporary Facilities except the Borrow Pits and the quarries in the Right of Way (ROW) within the land earmarked for the purpose upon consent of the Engineer.
- 1.4 All the requirements and provisions as specified in Section-7 of Part-1 of Chapter VI shall be complied with.

2. Submittals**2.1 Technical Design Submission**

1. The contractor shall submit the Temporary Works Drawings and the Temporary Works Design Report which detail adequate scale, location and all arrangements of the Temporary Works to the Engineer for review within 14 days after the Commencement Date except for the items as described in para 2.1 (4), (7) and (8) herein below, submissions in respect of the same shall be made by the time when the Final Technical Design Submission is made.
2. The Temporary Works to be carried out shall be consistent with the plan submitted by the Contractor with his technical proposal in his Bid together with any subsequent developments and/or changes subsequently agreed to by the Employer/Engineer. The Temporary Works shall include but not limited to the following:
 - (a) Engineer and Employees' camp: Detailed drawings at scale 1:500 showing the camp layout, buildings, roads, recreation areas, all public utilities, etc., and drawings at scale 1:50 showing typical building construction details with specifications.

- (b) Offices, parking areas, warehouses, storage areas, and medical care services: Drawings and specifications for the establishments and facilities with appropriate details and First Aid Station as detailed in Section-7 of Part-1 of Chapter VI.
3. Water supply, sewerage, sewage treatment and disposal, power supply and illumination, communication services (basically mobile phones and land phones), and firefighting services:
 - (a) Detailed design for industrial and potable water supply to the camps and working areas as well as sewerage systems, sewage treatment and disposal system based upon estimated number of users in compliance with the SHE requirements given in Section-7 of Part-1 of Chapter VI.
 - (b) Detailed layout drawings for electrical installations and distribution system at the Site and Work Areas, showing power sources, voltages, outlets, and routing of power lines
4. Transporting, handling and launching system for the steel fabricated elements including design and drawings.
5. Material testing laboratories
Detailed breakdown of all equipment to be used for material testing in field and in laboratories in accordance with the requirements of the pertinent provisions of the Specifications.
6. Security and safety arrangements Layout and drawings for offices for the Employer's and the Engineer's staff.
7. Project sign boards and diversion boards
8. Barricades and other temporary walls and alike with pertinent design considerations & drawings containing details such as height, material, color scheme, Logo, anchoring mechanism etc. complying the requirements specified in Section-7 of Part-1 of Chapter VI.
9. All arrangements shall comply with the relevant provisions prepared in this Employer's Requirements.
10. The cost of such drawings and reports shall be considered to be included in the relevant items of the Schedule.

3. Temporary Facilities for the Contractor's Use

3.1 Contractor's Site Offices, Warehouses, Material Yards

- (1) The Contractor shall provide and equip, for his own and his subcontractors' use, main and secondary offices, warehouses, materials stock areas, fuel storage areas and explosives magazines, all of which shall be constructed and furnished for use within 45 days after the

Commencement Date and maintained in good conditions until the issue of Taking-Over Certificate.

(2) Listed hereunder are the buildings, shops and warehouses expected to be constructed and equipped by the Contractor for his use in the performance of the Work under this Contract, in addition to facilities explicitly specified elsewhere in this Contract:

- (a) Steel assembly and fabrication shop.
- (b) Electrical and mechanical repair shop, Test Facility and site laboratory
- (c) Bracket and other SPS assembly and test shop.
- (d) Main warehouse, Cement, component, and tools & parts stores
- (e) Steel structure Storage area
- (f) High Value Security storage shed and area.
- (g) Load Testing Facilities (mechanical load)
- (h) Facility for Storage of Conductor Drums, fittings etc.
- (i) Wiring train and other vehicles parking facilities

3.2 Land for temporary facilities for Contractor's Use:

The approximate area of land available for Temporary Works has been marked on the Reference Drawings. The Contractor shall be allowed to use this land for carrying out his Temporary Works including stock of OHE Materials subject to the consent by the Engineer.

3.3 Material Testing Laboratories

1. The Contractor shall build and equip adequate Assembly and Material Testing facility on the Site for the Work including that for concrete for foundations as required.
2. The facility shall be located in a temporary building properly ventilated and equipped with electricity, water, and shall have enough room for all the activities.
3. The Test Equipment and apparatus shall be calibrated before the testing starts and at regular intervals as specified by the manufacturer and as directed by the Engineer. The Contractor shall submit the results of the calibration to the Engineer regularly.
4. The Contractor shall complete the construction and installation of the facility for operation at least 2 weeks prior to the stage of works where such facilities are required to be taken up and operate and maintain the facility until the issue of Taking-Over Certificate unless otherwise authorized by the Engineer. The Contractor shall also make all facilities and services available to the Engineer as required. All sampling and testing to be undertaken shall be under the direct supervision of the Engineer. The Material Testing Laboratory shall be run by Contractor's personnel fully experienced in sampling and testing of materials, and quality control.

3.4 Communication Systems

The Communication System to be applied to the project shall be basically the Mobile Phone Base Communication System. The Contractor shall establish the Mobile Phone Base Communication System Plan solely dependent on ready-to-use mobile phones for internal and external communication and submit the plan to the Engineer for consent.

The Contractor shall ensure that his Communication System is available for communication with the Engineer and Employer within 28 days after Commencement Date and shall maintain the same until completion of the Defect Notification Period.

3.5 Employee's Camp

- (1) The Contractor shall provide adequate camping facilities for the use of his employees / staff and those of his sub-contractors. Camping facilities shall have adequate sanitary facilities including sewage disposal system, medical service, drainage, fire control and all utility services (potable water, power etc.) and shall comply with statutory requirements.
- (2) Contractor's Employee's Camp shall be located at the land available within the ROW at each Station identified for the Temporary Works and indicated on the Reference Drawings. If any additional area is required by the Contractor for the purpose, the same shall have to be arranged by the Contractor at his own cost.
- (3) No camp construction shall commence until the Contractor's drawings and specifications have been consented by the Engineer.
- (4) Camp facilities shall be provided to meet the requirements of the maximum anticipated workload and labour force. These facilities shall be available and fully operational within 45 days from issue of LOA and maintained in good conditions until the issue of Taking-Over Certificate unless otherwise authorized by the Engineer.
- (5) The Contractor's camp shall comply with the application laws, Codes and standards.
- (6) The Contractor shall be responsible for keeping the camp, and the buildings within it, in good hygienic conditions. The standards and regulations presently in force in India with regard to personnel treatment, sanitary conditions, and fire and accident prevention shall be duly taken into account.

3.6 First Aid Stations

- (1) The Contractor shall comply with the applicable laws and health standards presently in force in India. His contractual obligations to this end are stipulated in Section-7 of Part-1 of Chapter VI of the Conditions of Contract. In the event of an epidemic breaking out, the

Contractor shall carry out and comply with all orders, arrangements or regulations which may be issued by the Government or local authorities.

- (2) The Contractor shall construct, equip, and maintain the First Aid Station at adequate locations on the Site and at every camp each.
- (3) These facilities shall be fully equipped and staffed as per the applicable regulations in force. These facilities shall be available and fully operational within 45 days from issue of LOA and maintained in good conditions until the issue of Taking-Over Certificate unless otherwise authorized by the Engineer.
- (4) Medical services in the First Aid Stations shall be under the direction of a licensed doctor and nurses on the same working hours as the Works throughout the duration of the construction.
- (5) Standing arrangements shall have to be made with the nearest general hospital for providing treatment in case of emergencies and serious cases
- (6) All the other requirements as specified in Section-7 of Part-1 of Chapter VI of the Employer's Requirement shall be complied with.

4. Temporary Utility Services for the Contractor's Use

4.1 Power Supply and Illumination

- (1) The electric power supplies for the Temporary Facilities including but not limited to Contractor's camps, offices, Site, Work Areas and other facilities as described herein shall be arranged by the Contractor at his own cost.
- (2) The Contractor shall install, operate and maintain its own electrical distribution systems for the power supply for his Temporary Facilities including Site, Work Areas.
- (3) The Contractor shall also furnish, install and keep operational the diesel power generating facilities of such capacity what he considers necessary to prevent the interruption of the Works.
- (4) The Contractor shall ensure adequate illumination for all his operations at the Site and at the camp. According to National Building Code of India (2005) the minimum intensities for illumination in general shall be as follows:

	Area of Operation	Luminous Intensity
(a)	General construction areas, outdoor concrete placement, active storage areas, loading, platforms, refueling, and field maintenance areas	20 Lux

(b)	Indoor construction areas	150 Lux
(c)	General construction plant and shops, e.g. batching plants, mechanical and electrical, equipment rooms, carpentry shops, active storerooms, barracks or living quarters, lockers or dressing rooms, mess halls, and indoor toilets	100 Lux
(d)	First aid stations, infirmaries, and offices	300 Lux
(e)	General interiors warehouses, corridors, hallways and exit ways	100 Lux
(f)	Welding	150 Lux

4.2 Water Supply

- (1) The Contractor shall design, install, operate and maintain water supply systems including pumps, piping system, valves, storage tanks etc., at the Site with respect to:
 - a) Industrial water supply system;
For construction use meeting the quality requirements as specified in Specifications
 - b) Potable water supply system:
For supply to all the Temporary Facilities including but not limited to Contractor's camps, offices, Site, Work Areas and other facilities for human consumption and use

In case the Contractor plans to install bore well for water supply, he shall thoroughly investigate the relevant legislation and regulations imposed by the competent authorities and the installation shall be subject to approval by the said competent authorities and/or consent of the Engineer.

- (2) Throughout the duration of the construction, the Contractor shall take samples from all water supplies at regular intervals and test it for its suitability for the intended use.

4.3 Sanitation and Sewerage

- 1) All Sites, offices, workshops, laboratory, camp and other buildings etc. shall be provided with sanitation and sewage handling & disposal system complying with the statutory requirements and applicable laws, Codes & Standards.
- 2) If required, portable chemical toilets shall be provided and maintained by the Contractor for the use of all personnel at all work locations.
- 3) All the requirements detailed in Section-7 of Part-1 of Chapter VI of the Employer's Requirement shall also be complied with.

4.4 Waste and Garbage Disposal

- (1) The Site and the Work Areas shall be kept clean and free of refuse at all times.
- (2) The Contractor shall collect waste material and garbage from Site, camp, offices yards and workshops on a daily basis and dispose off the same in the approved area and as per the

guidelines prescribed by the local authorities. No waste of any kind shall be deposited in any watercourses.

(3) All the requirements of Section-7 of Part-1 of Chapter VI shall also be complied with.

4.5 Fencing and Site Security and Safety

- 1) The Contractor shall be responsible for the security and safety of the site. Accordingly, the Contractor's office, workshops and storage compounds, campsites all construction areas storage areas shall be adequately fenced, gated, lighted and guarded round the clock. Firefighting equipment shall be provided in accordance with the applicable Codes and requirements of local authorities.
- 2) The Contractor shall be responsible for any losses occurring within the Site premises.

4.6 The Contractor shall install, furnish all these facilities 45 days from issue of LOA Date and maintained in good conditions until the issue of Taking-Over Certificate.

4.7 Inspection by the Employer or Engineer

The Employer and the Engineer have the right at any time to inspect any part of the Contractor's Temporary Facilities and to require immediate rectification to comply with the specified requirements.

4.8 Final Clean-up

- 1) Upon the Completion of Works, or when any of the plants and facilities have completed its functions, the Contractor shall dismantle and demobilize the temporary facilities and remove all refuse, debris, objectionable material, and fill, grade and dress all the areas to its original condition as it was before commencement of the Work.
- 2) No demobilization or removal of temporary facilities and equipment shall be made without prior consent of the Engineer.

5. Temporary Facilities for the Use by Employer and Engineer

5.1 Site Office and Huts

5.1.1 Requirements

The Contractor shall design, equip and furnish the site office and huts for the Employer's and Engineer's use at the time specified below. The Contractor shall also maintain the site office and the huts in good conditions and provide services including, but not limited to maintenance of the office equipment and furniture, repairing and mending, cleaning, consumable replenishment in respect of toiletries, cartridges for the plotter and color laser writers, first aid box, batteries / battery cells, drinking water etc. Details of the Engineer's site office including a provisional site office and huts are described in the following paragraphs.

All furniture, furnishings, fittings & fixture and equipment etc. shall be of the configuration, make and quality as consented by the Engineer.

Unless otherwise stated herein below, all the site office and huts including all furniture, furnishings, fittings & fixture and equipment etc. as provided by the Contractor for the use of Engineer / Employer shall be the property of the Employer after issue of Taking-over Certificate.

Provisional Site Offices

Within 45 days from issue of LOA one provisional site office shall be constructed and furnished and maintained in good condition for use while the main site office is being constructed.

5.1.2 Survey Equipment

- 1) The surveying instruments, to be provided for as when required for verification of work by the Employer's and Engineer's site staff, shall be brand new, of the latest design and of reputed make. The instruments shall include all items necessary for the Engineer to be able to establish horizontal and vertical control both on the surface and underground and to check the Contractor's surveying work.
- 2) The Contractor shall present to the Engineer for consent the proposed make, type, and models with parts and performance catalogues and manufacturer's warranty, prior to purchase.

6.1 Electricity and Water Supply

Power and potable water supply systems for the Employer and Engineer's site offices (Provisional Site Office, Main Site Office and Site Huts) shall be installed and made operational within the specified period of construction as mentioned above in respect of the respective site offices. The Contractor shall maintain and provide continuous and adequate supplies unless otherwise authorized by the Engineer.

6.2 Use of Contractor's First Aid Stations

The Contractor's emergency medical care and first aid services shall be made available, for use by the Employer's and Engineer's site staff and their families living at the Site or the Work Areas, free of charge,

Section-4: CONTRACTOR'S PROJECT ORGANIZATION

Project Organization Plan: The Contractor's Personnel shall be deployed as described below:

S. No.	Key Position	Minimum No. of Personnel	Qualification	Minimum Experience in Similar Work [years]
1	Project Manager	1	Graduate/ Diploma Engineer	10 years, out of which 3 years in-charge of Railway project (for Graduate). 16 years, out of which 3 years in-charge of Railway project (for Diploma).
2	Sr. Engineers i) for Civil work	2	Graduate or / Diploma in Engg.	5 Years (for Graduate) 10 years for Diploma
	ii) for OHE	2	Graduate/Diploma in Electrical Engg.	5 Years (for Graduate) 10 years for Diploma
3	Technicians/ Supervisors			
	(a) Civil	4	Minimum Diploma in Civil Engineering	5 years
	(b) OHE	4	Minimum Diploma in Electrical Engineering	5 years
4	Surveyor for setting out Lines and levels periodically.	1	Minimum Diploma in Civil Engg.	5 years
5	Material Testing Engineer	1	Minimum Diploma in Electrical Engg.	5 years
6	Liaison Manager for liaison with Govt. Dept. and local bodies.	1	Graduate. Preferably retired Govt. Official of local area.	5 years
7	Safety Officer	1	Preferably Graduate in any discipline But must have completed Diploma in industrial safety management OR	5 years

S. No.	Key Position	Minimum No. of Personnel	Qualification	Minimum Experience in Similar Work [years]
			construction management.	
8	Quality Officer	1	Graduate/ Diploma in Civil Engineering	5 years (for Graduate) / 8 years (for Diploma) experience as a Quality Control Engineer.
9	Material Manager	1	Graduate/ Diploma in Engineering	5 years (for Graduate) / 8 years (for Diploma) experience of material handling and accounting of material for Project of this size
10	Draftsman with knowledge of AutoCAD			
	(a) Civil/Electrical Engineering	1	Minimum Diploma in Civil/Electrical Engineering	3 years

Note:

1. Project Manager is to be deployed within 30 days of issue of Letter of Acceptance. The program for deployment of other personnel shall be mutually decided, keeping in view the agreed program, and shall be conveyed by PMC/Employer. The personnel shall be deployed within 30 days of the stated requirement. In case of failure to deploy any personnel within 30 days of the stated requirement, a penalty shall be imposed for each day of delay as under:
 - a. Rs. 50,000 per person per day for Project Manager & Safety Officer.
 - b. Rs. 25,000 per person per day for Sr. Engineers; Quality Assurance Specialist/ Quality Officer
 - c. Rs. 10,000 per person per day for other personnel.
2. On completion/likely completion of activities concerned to particular personnel, demobilization of that personnel shall be requested by the Contractor at least 30 days in advance and demobilization shall be done with the approval of PMC/Employer only. In case demobilization is done without approval of PMC/Employer, the penalty mentioned in note (1) above, as relevant, shall be imposed for each day of absence of the personnel.
3. The professional qualification requirement can be relaxed by concerned CGM/South in case of ex-Railwayman who has worked in Electrical department of Railway / PSU (Like RVNL/RITES/IRCON) in a position of Gazetted officer /Sr. Manager & above for Sr Engineer

/ Junior Engineer /Sr. Technician or above for Supervisor and has relevant experience not less than that prescribed for minimum professional qualification.

4. The professional qualification requirement and experience requirement can be relaxed by concerned CGM/GM In-charge of the contract, if the contractor submits a request with the undertaking that the personnel being proposed is highly competent to perform the required functions and the CGM/GM in-charge of the contract is satisfied that the proposed personnel is having enough experience and technical competence to perform the required functions. The performance of such personnel shall be reviewed by the concerned CPM/GM in charge after a period of 3 months and in case performance is found satisfactory, the personnel may be allowed to continue or if the performance is found otherwise, the contractor shall be asked to replace the personnel within next one month.

Section-5: INTERFACE MANGEMENT

1. General:

- 1.1. Contractor's Coordination with Others: The Contractor shall take in to account the interface coordination requirements of Other Contractors, who will be working at site and or duly constituted authorities who will be employed or required by the Employer to execute the work within or adjacent to site in connection with or ancillary to the works. In this regard, the Employer/Engineer shall organize coordination meetings to sort out any interfacing issues amongst the interfacing Contractors. In addition, the Contractor may also arrange his own coordination meetings with the Other Contractors.
- 1.2. The Contractor shall fully integrate and coordinate the design and construction of the Works with Other Contractors and entities including but not limited to Indian (Zonal) Railways, Railway Board, RDSO, State Electricity Authorities for Supply of Traction Power, as well as the designated contractors / consultants / service providers, other than Other Contractors who are engaged in part of the Works, relevant statutory authorities, relevant public utility agencies and adjacent contractors who are or may be working adjacent to the Site and may be affected physically or through Electromagnetic Induction Effects from Traction currents.
- 1.3. The Contractor shall be responsible for keeping Other Contractors fully informed on all matters of progress which may affect the progress of Other Contractors and for all coordination with such Other Contractors during stages of survey, design, work execution, as well as finally during tests and commissioning stages.
- 1.4. Interfacing Parties and Related Parties the Contractor shall fully coordinate the design of the Works with Other Contractors and Interfacing Parties, all relevant bodies, parties and entities, in particular government authorities, departments and regulatory bodies, public utility companies, Power Supply Authorities and the consultants, and contractors of adjacent projects whether ongoing or planned, as advised by the Employer/Engineer. The Contractor shall identify all such related parties, bodies and entities including but not limited to those included in the Interface Matrix given at the end of the chapter.
- 1.5. The Contractor shall actively seek out solutions to integration issues, and to anticipate, to plan for, and to comply with the needs of these related parties, which are properly required and consistent with the obligations under the Contract. The Contractor shall comply in this respect with the Design and Construction requirements with the other related entities and parties identified by him.
- 1.6. In case the Other Contractor is not in place, the Contractor shall co-ordinate with the Engineer for the Interfacing issues.
- 1.7. The Engineer shall actively facilitate in drawing up the Interface Management Plan amongst the interfacing contractors.

2. Interface requirements:

The careful coordination of all technical and programming matters between the relevant parties is a critical element in achieving a fully coordinated design and construction. This clause describes the Contractor's responsibilities with regard to interface management and coordination with those who are considered to be related with the Work. The Contractor's responsibility for interface coordination shall not only include interfacing with the Other Contractors and Other independent parties such as local authorities, statutory bodies, public utility companies including Power Supply Authorities, Indian Railways but also others who may be identified in future. Such as private service providers, consultants or contractors whether or not specifically mentioned in the Contract. This responsibility is not limited to a particular number of interfacing parties but includes all interfaces required for successful completion of the Contract which is the sole responsibility of the Contractor.

2.1 General Responsibility of the Contractor:

- 2.1.1** The Contractor shall not impede but shall afford the Other Contractors and the Interfacing parties with all reasonable opportunities & facilities, access to the site and / or services to any related parties in the Contract including Other Contractors, Interfacing Parties and the Engineer / Employer so as to ensure the whole project including envisaged Other Contractor's works as well as his Works be executed in the most efficient manner for the best interest of the Employer as a whole.
- 2.1.2** The Contractor shall, in accordance with the Employer's Requirements, coordinate and integrate the Contractor's own Works under the Contract with works of the Other Contractors and Interfacing Parties. In addition, the Contractor shall take all necessary means and steps to ensure that the Works are coordinated and integrated with the works of the Other Contractors and Interfacing Parties, and shall comply with any directions which the Engineer may give. Such responsibilities shall neither be mitigated nor in any way affected by virtue of similar responsibilities being placed on Other Contractors.
- 2.1.3** The Contractor is responsible for the detailed co-ordination of his design, manufacturing, installation, construction, testing and commissioning activities. The lead part to be taken by the Contractors of the Project has been indicated in the Matrix Chart. The Engineer may decide to direct Contractor and the Other Contractors to abide by it or modify it to be coordinated by another Contractor if the progress of Works demands. The Engineer's decision shall be final the Contractor shall carefully review pertinent information made available by the Engineer relating to the nature and programming of the related parties' contracts and use such information in his planning of the Works.
- 2.1.4** The Contractor shall communicate, coordinate and exchange information directly with the Other Contractors and Interfacing Parties, on initial authorization by the Employer and under intimation to the Engineer. Information necessary to fulfill the Contractor's interface obligations shall be directly requested and obtained from the Other Contractors and Interfacing Parties under intimation to the Engineer and receipt acknowledged. Conversely, the Contractor shall provide directly to the Other Contractors and Interfacing Parties with the information within the

Contractor's scope that is required by them to meet their contractual obligations and proceed with their co-ordination under intimation to the Engineer. The Independent Interfacing Parties such as The Power Supply Authorities and the Adjacent Indian Railway Organization shall be coordinated through the Engineer / Employer.

- 2.1.5** The Contractor shall ensure that the Contractor's requirements are provided to all the related members of the Other Contractors and the Interfacing Parties before the cut off dates as identified in the Overall Interface Management Plan to be developed by the Lead Contractor/ Co-ordinating Contractor and approved by the Engineer.
- 2.1.6** Where the other contracts requiring interface are yet to be awarded, the Contractor shall proceed with the coordination activities with the Engineer, until such time the related parties including Other Contractor / Interfacing Party is engaged by the Employer.
- 2.1.7** The Contractor shall take all reasonable steps to ensure that the Works are coordinated and integrated with the design, manufacture, installation, execution and testing of such other works and shall in particular (but without limitation) to:
- (a) comply with any direction which the Engineer may give for the integration of the design of the Works with the design of any other part of the Project;
 - (b) consult, liaise and co-operate with those responsible for carrying out such other works, including where necessary, in the preparation of the respective designs and drawings, the preparation of coordinated programme, method statements, co-ordination drawings and specifications together with arrangements of service priorities and zoning; and
 - (c) participate in Integrated Testing and Commissioning of the system with the Other Contractors and Interfacing Parties and demonstrate to the satisfaction of the Engineer that the Works have been designed and constructed in a manner compatible with the works of the Other Contractors and Interfacing Parties.
- 2.1.8** As soon as the Contract is awarded the Contractor shall undertake design and Work in co-ordination with Other Contractors, who shall be carrying out works forming part of this project. There will be a continuous requirement of coordination amongst all the Contractors in respect of, but not limited to the Items shown in the Interface Matrix given at the end of the chapter. Other interface requirement which may crop up during Design and construction phase shall be promptly resolved and informed to the Engineer.
- 2.1.9** At the end of each such co-ordination period, the Contractor, Other Contractors and Interfacing Parties with whose works the interface period refers, shall jointly state in writing that their design co-ordination activities are complete and that their respective designs are integrated and can be finalized without interference with each other's designs or the designs with which their designs have already been integrated. A copy of this joint written statement shall be provided to the Engineer within 7 days of the end of the said design co-ordination period. Unless and until copies of all relevant and necessary design co-ordination statements have been submitted to the Engineer, the Engineer shall be entitled to suspend any review or further review of the

Contractor's or the Other Contractor's and Interfacing Party's design submissions. Such suspension shall not be grounds for any claim by the Contractor nor the Contractor shall be entitled to receive an extension of time or additional payments. The interface coordination with independent parties such as the Power Supply Authorities and adjacent Indian Railways alignments of CR and WR the interface coordination will be through the Engineer/Employer.

- 2.1.10 During construction the Civil and Track Works (Other) Contractor shall provide within the Site, staging, storage and unloading and temporary storage areas for structural steel, insulators etc. and enclosed for secured high value items and space for tracks for sidings for Traction Overhead Construction trains for the temporary use of the Contractor to a reasonable extent during construction, erection and commissioning process. Separate locations at different points of the route as required by logistics of timely construction completion of the work shall be provided for each of the Other Contractors. Specific details shall be coordinated and agreed during the design interface period amongst the Contractors.
- 2.1.11 Any other contract which depends for its execution on the Contract or upon which the Contract is dependent for its own execution shall be identified by the Engineer as an "Interface Contract". The Contractor shall provide attendance on Other Contractors and Interfacing Parties (if necessary) on meetings and correspondences in this regard in accordance with the Employer's Requirements and / or as instructed by the Engineer. The identity of the Other Contractor(s) for the Interface Contract may not be known before the execution of the Contract but this shall not be a ground for the Contractor to object to the subsequent appointment of an Other Contractor.
- 2.1.12 The Contractor shall in accordance with the requirements of the Contract and instructions of the Engineer coordinate his own Works with the works of Other Contractors strictly adherent to the Coordinated Construction Programme and shall afford the Other Contractors all reasonable opportunities for carrying out their works.
- 2.1.13 The Contractor shall, while carrying out his co-ordination responsibilities, provide sufficient information for the Engineer to decide on any disagreement between the Contractor and the Other Contractors / Interfacing Parties as to the extent of services or information required to pass between them.
- 2.1.14 If the Contractor suffers delay by reason of failure caused by any Other Contractor/ Interfacing Parties to meet the specified installation interfacing, co-ordination, and / or completion dates resulting in delay beyond the extent which could be reasonably foreseen by an experienced contractor at the time when the Coordinated Construction Programme is formulated and consented by the Engineer , then the Engineer shall take such delay into account in determining any extension of time to which the Contractor is entitled under the Contract.
- 2.1.15 If any act or omission of the Contractor whether directly or indirectly results in the delay in execution of the works of the Other Contractor and / or Interfacing Parties associated with the execution of the project, the matter will be settled by the Engineer as described in Part-I, Chapter-VII on 'Engineer's Authority'.

- 2.1.16 The Civil and Track Works (Other) Contractor shall co-ordinate the access and delivery routes and ensure that all provisions for access and delivery of the, materials, components and plant of the Contractor is coordinated with and reflected in the delivery route drawings of the all Contractor and Interfacing Parties to the work sites on all .. Other Contractors and Interfacing Parties shall furnish the details with to be provided for access to work site or passage for their construction materials, plant & equipment in accordance with Coordinated Construction Programme.
- 2.1.17 All requests for information (RFI), acknowledgement of receipt of information and any official communication between the Contractor and the Other Contractors and Interfacing Parties shall be made in writing with a copy to the Engineer for information.
- 2.1.18 The Contractor shall advise the Engineer in writing of any problems encountered in obtaining necessary information and/or lack of cooperation from the Other Contractors. In the event that the Engineer considers that the resolution of the interface is not proceeding satisfactorily, the Engineer will review the matter and establish a coordinated plan directing the Contractor and the Other Contractor / Interfacing Parties as to the required action. In such a case, the decision of the Engineer shall be final and binding.
- 2.1.19 For the items of Co-ordination for which the Contractor is the Co-ordinating Agency as shown in the Interface Matrix given at the end of the chapter, the Contractor shall conduct regular meetings with the Other Contractors and Interfacing Parties, under intimation to the Engineer to clarify particular aspects of the interface requirements of the Works.
- 2.1.20 The coordinating Party who convenes the meeting shall prepare minutes recording all matters discussed and agreed at the meeting. The Contractor shall advise the Engineer in advance the date, time and location of such meetings as he may decide to attend.
- 2.1.21 The work required to be done by other independent parties or those independent parties affected by the work to be done by the Contractor shall be interfaced and coordinated by the Engineer.
- 2.1.22 For the Items of Coordination for which the Contractor is The Coordinator the Contractor shall ensure that copies of all correspondence, drawings, meeting minutes, programme, etc. relating to amongst the Contractors / Interfacing Parties to the coordination, are issued to all concerned parties and the Engineer no later than two calendar days from the date of such correspondence and meetings.
- 2.1.23 All interfacing Contractors shall note that the information exchange is an iterative process requiring the exchange and up-dating of information at the earliest opportunity and shall be carried out on a regular and progressive basis in order for the process to be completed for each design and construction stage.
- 2.1.24 The Contractor shall for the Items of Coordination for which the Contractor is The Coordinator establish a detailed Interface Management System and participate in the activities with the Other

Contractors and Interfacing Parties. The Contractor shall include in his coordination activities but not limited to the following:

- (a) provide an Interface coordinator who has the responsibility, and authority with substantial experience to resolve interface matters to the satisfaction of the Engineer, and provide the necessary support team for the Interface Co-ordination;
- (b) respond to, confirm and make written agreements with regard to interfaces; Attend interface meetings that may be arranged by the Engineer, with a representative empowered to make agreements on interfaces.
- (c) The Engineer may arrange regular meetings to monitor the status of interfaces, and may require special meetings as may be necessary to resolve specific issues. The Contractor may request assistance from the Engineer to arrange meetings on particular subjects;
- (d) provide the Engineer with regular status information and/or details of interfaces, including copies of relevant correspondence and material; and
- (e) Provide the Engineer with access to information for the purpose of conducting audits on interface compliance and for confirming that interface coordination is proceeding consistently with the Employer's Requirements.
- (f) For other items for which the Contractor is an interfacing party the Interface coordinator shall provide an authorized Contractor's Representative's attendance to conclude a meaningful interface.

2.1.25 Should it appear to the Engineer that the Work Programme or three-month rolling programme does not conform with the Coordinated Construction Programme, the Contractor shall be required to revise all such programme so as to conform to Contractual Construction Programme.

2.2 Dedicated Co-ordination Team:

- 2.2.1 The Contractor shall establish a dedicated co-ordination team led by an Interface coordinator reporting to the Contractor's Representative. The primary function of the team is to provide a vital link between the Contractor's design & construction teams and the Other Contractors / Interfacing Parties.
- 2.2.2 The Interface coordinator shall assess the progress of the co-ordination with Other Contractors / Interfacing Parties by establishing lines of communications as per pre-defined co-ordination model and promote regular exchange and updating of the information so as to maintain the Contractor's Programme.
- 2.2.3 The complexity of the project and importance of ensuring that the work is executed within the time limitations, requires detailed programming and monitoring of the progress so that early programme adjustments can be made in order to minimize the effects of potential delays.
- 2.2.4 The Interface coordinator in conjunction with the Other Contractors and Interfacing parties shall identify necessary provisions in the Works for plant, equipment and facilities of the Other Contractors and Interfacing Parties. These provisions shall be allowed by the Contractor in his design of the Works

2.3 Construction Interface

- 2.3.1 Construction interfacing shall be necessary throughout the duration of the Contract and shall commence from the time the Contractor mobilizes on the site to the completion of the Works. Construction interfacing will overlap the design interface and involve the Other Contractors' and Interfacing Parties' requirements for provision of cast-in and buried items in the Contractor's works such as pipes for the Other Contractors' and Interfacing Parties' services, supports including support brackets, plinths, ducts, service buildings, openings, cableways, trenches etc., that are to be incorporated at the initial stages of the Contractor's installation up to provision of attendance during the testing and commissioning stage.
- 2.3.2 The Contractor shall coordinate with the Other Contractors / Interfacing Parties to allow the efficient execution of the respective construction activities.
- 2.3.3 The Contractor shall coordinate and cooperate with Other Contractors and Interfacing Parties on all site- related matters including but not limited to site access and occupation, safety, verification of work compatibility and survey control etc. The Contractor shall advise the Other Contractors and Interfacing Parties in advance when a construction item is ready for field inspection to verify compatibility with the Other Contractors and Interfacing Parties' needs, and shall facilitate access to the site for the interfacing parties.
- 2.3.4 The Contractor shall ensure that there is no interference with the works of the Other Contractors / Interfacing Parties' and shall maintain close co-ordination with them to ensure that his Work progresses in a smooth and orderly manner.
- 2.3.5 The Contractor shall carry out and complete the Works, or any part thereof, in such order as may be agreed by the Engineer or in such revised order as may be instructed by the Engineer from time to time. The Contractor shall, be liable for and shall indemnify the Employer against all costs, charges, expenses and the like resulting from the failure of the Contractor to coordinate the Works.
- 2.3.6 on a works element basis covering the period of the Interfacing Contract access. It shall fully conform to the Contractual Construction Programme as specified in Section-8, Chapter-VI, Part-I [Execution program] to the Employer's Requirements.
- 2.3.7 The Coordinated Construction Programme shall allow adequate time periods for all the Contractors / Interfacing Parties to install their plant and equipment in the designated areas and interfacing components such as earthing and Bonding.
- 2.3.8 The Coordinated Construction Programme shall be agreed with and signed off by the concerned all Other Contractors / Interfacing Parties and then submitted to the Engineer no later than six (6) months before the earliest access date to the Site. At or near the completion of the construction of any interface-related element of the Contractor's Work, the Contractor shall:
- a) advise Other Contractors and Interfacing Parties that the as-constructed interface related Work can be inspected, and provide the necessary access to the Site and its occupation.
 - b) agree in writing to the Other Contractors and Interfacing Parties and as consented by the Engineer on the adoption of any applicable comments on the constructed Work.
 - c) On erection of Overhead equipment Conductors prior to their commissioning these conductors will need to be charged with 2.2 kV power to prevent their being stolen. During this period and until commissioning of the route the members of the construction teams of the Contractor and those of the Other Contractors will need to be regulated to prevent risk of electrocution if they come within 2 meters of the charged live lines. For this purpose, the

Contractor will propose a system of Permit to Work on discharged line during working periods. These rules will be finalized in consultation with the Interfacing Other Contractors and approved by the Engineer.

- 2.3.9 On advice from the Other Contractors and Interfacing Parties that an as-constructed interface-related element is ready for inspection, the Contractor shall:
- a) conduct on-site inspections of the Work elements, and give comments in writing to the Other Contractors and Interfacing Parties.
 - b) agree in writing to the Other Contractors and Interfacing Parties that the as constructed Work meets the interface requirements.
- 2.3.10 Prior to applying for a Taking-Over Certificate, the Contractor shall obtain written confirmation from each applicable Other Contractors and Interfacing Parties, that the interface elements meet the requirements of the Other Contractors and Interfacing Parties. If any Other Contractor and Interface Party withholds such confirmation, the Engineer shall decide on further action, as requested by the Contractor prior to the issue of a Taking-Over Certificate.
- 2.3.11 Where Contractor's Works are identified as failing to meet the requirements of the Contract and which shall impact the Other Contractors' and Interfacing Parties' works, the Contractor shall submit the proposed remedial measures to the Engineer for review and shall copy the same to the Other Contractors and Interfacing Parties.

2.4 Interface Documents and Drawings

- 2.4.1 For Items of Interface for which the Contractor is the Co-ordinating Agency, the Contractor shall prepare as required the following interface documents which shall be used to completely define the Contractor's interface coordination details relating to:
- (a) Interface Matrix;
 - (b) Coordinated Construction Programme
- 2.4.2 Combined Services Drawings (CSD) covering Traction Installations, earthing and Bonding Conductors, Ground earths and other installations of all the Other Contractors to the Project on the common base of the Approved Final Route Alignment Plans on different designated layers of the Soft Copy of the Plans developed by the (Other) Civil and Track Contractor as Working Drawing. This Drawing will automatically delimit the jurisdiction of each Contractor based on the Layers on the Drawing allotted to them in the Drawing interface arrangements. The Construction Plans shall be based on these drawings signed by each Contractor to the Interface and shall be accepted at each stage of completion of each stage provided in the layers used by the interfacing Contractors.
- 2.4.3 Soon after the signing of the Contract Agreement, without loss of any time, Contractor shall start interfacing with other interfacing Contractors and get all the important details regarding and understanding evolved among all interfacing Contractors since the beginning of works.

2.5 Interface Management Plan (IMP)

- 2.5.1 Based on the Interface Matrix but not limited to it, the Contractor shall develop and submit to the Engineer within the specified schedule, an IMP for all the interface issues that may arise during the construction, testing and commissioning of the project in consultation with the Other Contractors and/or Interfacing Parties. The Contractor shall prepare an Interface Management Plan (IMP) for each segment of the Work on a works element basis covering the period of Interfacing Contract access. The IMP shall allow adequate time periods for each of the Other Contractor / Interfacing Party and the Contractor to install their structure, plant and equipment in the station area and the route alignment including on the bridges and viaducts.
- 2.5.2 The IMP shall be agreed with and signed off by each of the Other Contractor / Interfacing Party and then submitted to the Engineer as described in 'Milestone MS-1'. The IMP shall:
- (a) Identify all the systems and sub-systems including the civil construction, bridges, viaducts, traction and signaling and Telecom works, earthing and bonding and facilities with interfacing requirements;
 - (b) Define the authority and responsibility of the Contractor's and the Other Contractor's and Interfacing Party's (and any relevant sub-contractors') staff involved in interface management and development;
 - (c) Identify the information to be exchanged, together with the management and technical skills required for the associated development of the works, at each phase of the Contractor's and the Other Contractor's and Interfacing Party's (and any relevant sub-contractors') project life-cycles;
 - (d) Address the Works Programme of the Contractor to meet the Coordination Dates of the of the Other Contractors and Interfacing Parties and highlight any programme risks requiring the Engineer's attention;
 - (e) Include considerations of the requirements of the System Safety Management;
 - (f) Specify the configuration and version control procedures in accordance with the Contractor's and Other Contractors' and Interfacing Parties' (and any relevant sub-contractors') quality management system;
 - (g) Address the design, supply, installation, testing and commissioning programme of the Contract to meet the coordination dates of Other Contractor's and Interfacing Party's contract, and highlight any programme risks requiring management attention;
 - (h) Indicate dates for commencement and completion of each principal activity by the Contractor and those of the Other Contractor and Interfacing Party, and delivery and installation of equipment.
- 2.5.3 In case of any disagreement between the Contractor and Other Contractors / Interfacing Parties on the interface issues, the decision of the Engineer shall be final and binding; and
- 2.5.4 The Interface Matrix which describes relations between Contractor and Other Contractors and Interfacing Parties and their roles and responsibilities as a key document and should be submitted to the Engineer for consideration as an overview of all subsequent interface related documents and drawings.

- 2.5.5 The Engineer will coordinate the activities of all the Contractors with reference to interfacing with third parties during all the phases of the Contract. The Employer/Engineer, within the scope of the relevant Contract provisions, will support and assist all the Contractors in the following fields:
- (a) Interfacing Indian Railways, Power Supply Authorities, execution of interfacing works by them and state and local authorities for timely receipt of the required permits, certificates and approvals related to the design and construction process;
 - (b) Interfacing state and local tax authorities for the Value Added Tax (VAT) reimbursement arrangements;
 - (c) Interfacing state and local authorities for implementation of the additional land acquisition procedures; and
 - (c) Any other fields of activities related to the Contract as may be required with the purpose of facilitating all the Contractor's performance.
 - (d) This support and assistance of the Employer/Engineer shall not relieve the Contractors of any of their obligations under this Contract.
- 2.5.6 The Contractor shall coordinate with the Engineer / Employer on all matters relating to the Works that may affect the existing Indian Railway (IR) operations. Such Works shall be carried out as per IR rules and regulations in close coordination and under the directions of Engineer/Employer.
- 2.5.7 Accepted Contract Price and Contractual Construction Programme shall be deemed to have included the provision in respect of the obligations relating to coordination and interface management activities. No separate payment will be made with regard to the activates as described herein above.

Matrix of Interface Requirement for the Contractor with Other Contracts and Interfacing Parties

S N	Item of Work	DFCC Contractor			Independent Authority			Coordinating Contractor	Remarks	
		CTP-11	CTP-15A	STP17 / STP5A	Traction Power Supply	Indian Railway				
					MSEB	WR	CR			
1	Access to Worksite (Embankment, Cess, Tracks, Bridges, Viaducts, TUNNELS & IMD.	YES	YES					OHE & Civil. track and Bridge contractors		
2	Provision of OHE mast on Viaduct, Major Bridge, Major RUB, Tunnel, Retaining Wall etc.	YES	YES					OHE & Civil. track and Bridge contractors		
3	Site facilities, temporary storage sites, siding for Traction Construction Trains	YES	YES	YES				OHE & Civil. track and Bridge contractors		
4	Design & Drawing Coordination	YES	YES	YES	YES	YES	YES	OHE & Civil, Bridges, Signal, rolling stock, State power utility owners, IR and concerned zonal Railways		
5	EMI Mitigation Measures Earthing & Bonding: Track, Bridges, Viaducts, Tunnels, Buried Earth Conductors, Structures, Fencing, Continuous metal work	YES	YES	YES			YES	YES	Electrical, Civil, bridge and S&T Contractor, CR and WR	
6	Traction Return Current connection to tracks along with Earthing and Bonding with rails	YES	YES	YES					Electrical, Civil, bridge and S&T Contractor, CR and WR	
7	Location of Signals vis-à-vis (OHE Neutral Sections)	YES		YES					Electrical, Civil, bridge and S&T Contractor	
8	Location of Signals vis-à-vis (OHE Structures)		YES	YES					Electrical, Civil, bridge and S&T Contractor	

9	Power Supply to S&T Installation on open route			YES				Electrical and S&T Contractor, Employer/Engineer	
10	Telecom facilities for SCADA: OFC Terminals at on Route (TSS & Switching posts and stations) and at OCC			YES				Electrical and S&T Contractor, Employer/Engineer	
11	Video wall in OCC			YES				Electrical and S&T Contractor	
12	OHE configuration and Sectioning to IR Electrified Sections					YES	YES	Electrical Contractor, CR and WR	
13	Traction Power Cable across the Tracks at Traction Supply control post	YES	YES	YES		YES	YES	Electrical, Civil, bridge and S&T Contractor, CR and WR	
14	Execution of Construction work after anti-theft charging of OHE Conductors prior to test & commissioning	YES	YES	YES		YES	YES	Electrical, Civil, bridge and S&T Contractor, CR and WR	In formulation of Rules for safe working Employer & Engineer in framing Rules for Operation - OHE Contractor for day-to-day operation
15	Commissioning of PSI, SCADA, AFL			YES	YES	YES	YES		
16	System Integration, Testing and Commissioning	YES	YES	YES	YES	YES	YES	Electrical & all the contractor of Phase II along with state Electricity Utilities and CR & WR.	Coordination through Employer/ Engineer

Section-6: REQUIREMENT DURING CONSTRUCTION PHASE**1. The Site**

The Work Areas comprises the Site and areas for the Temporary Works within and outside the Right of Way (ROW). In this part, further clarification is made with respect to the construction execution.

1.1 Use of the Site and Work Areas

- 1) The Site or Contractor's Temporary Facilities including Contractor's equipment shall not be used by the Contractor for any purposes other than for carrying out the scope of work.
- 2) The Employer shall hand over the Site to the Contractor free of encumbrances as per the agreed schedule. Once the Site is handed over to the Contractor, its integrity, safety and security etc. shall be the responsibility of the Contractor until the issue of Taking Over Certificate.
- 3) Following the handover of the railway envelope (as defined in the Employer's Requirement — General), the Contractor shall control the railway envelope and shall be responsible for all matters relating to its integrity, safety and security etc. until the issue of Taking Over Certificate unless otherwise directed by the Engineer.
- 4) Entry to and exit from the Site shall be controlled in line with the Contractor's Site Safety Plan and shall be only available at the locations for which the Engineer has given his consent.
- 5) The Contractor shall perform sufficient investigation in these Temporary Facilities to carry out the Works in a most efficient manner with the best quality assurance and summarize it into the Temporary Works Report and other required documents and drawings during the Technical Design development.

1.2 Access to the site

- 1) The Contractor shall make its own arrangements, subject to the consent of the Engineer, for access required to the Site. The Contractor shall negotiate with the landowners or other appropriate government agencies to seek temporary occupation of land and seeking necessary permission for construction of temporary access roads.
- 2) The existing access roads may be used by the Contractor for transport of his men material and equipment. However, these shall be maintained by the Contractor to satisfactory level to allow uninterrupted flow of traffic including the public traffic otherwise using these roads.
- 3) In addition, the Contractor shall ensure that access to every portion of the Site is continuously available to the Employer and the Engineer and other entities authorized by the Employer / Engineer.

1.3 Access/Egress through Work Areas

The Contractor shall be responsible for ensuring that any access or egress through the Work Areas boundaries are controlled such that no disturbance to residents or damage to public or private property occur as a result of the use of such access or egress by his employees and Sub-Contractors.

1.4 Survey of the Work Areas

In addition to the validation of the data provided by the Employer and additional survey, as considered necessary by the Contractor, to check the Right of Way (ROW) and to accommodate Alignment within the available ROW and the Contractor shall carry out survey to identify any encumbrance infringing the Permanent Works and shall advise the Engineer / Employer accordingly.

The survey shall be carried out before the site clearance wherever possible and in any case prior to the commencement of the Work in any Work Areas. The survey shall be carried out by the Contractor and agreed with the Engineer.

1.5 Temporary Fencing and Signboards

- 1) The Contractor shall erect hoardings, temporary fences and/or gates around the Work Areas specifically near the populated areas to prevent entry by unauthorized persons to his Work Areas as long as they are deemed to be necessary. The Contractor shall issue all his personnel including the personnel working with Sub-contractors, identity cards for entering the Work Areas. Necessary arrangements to ensure that no unauthorized person enters the Work Areas and shall be made by the Contractor by way of posting of security guards. Use of hoardings / temporary fencing / signboards etc. shall not be permitted for any kind of advertisement / publicity etc., without the consent of the Employer.
- 2) The Contractor shall submit proposals for the fencing of the Work Areas to the Engineer for review. No Work shall be commenced in any Works Area until the Engineer has been satisfied that the fencing installed by the Contractor is sufficient to prevent any unauthorized entry.
- 3) Project signboards shall be erected at the Site 28 days prior to the commencement of the construction activities of the relevant Work Area. The types, sizes and locations of project signboards shall be agreed with the Engineer before manufacture and erection of the signboards. Other advertising signs shall not be erected on the Site.
- 4) The consent of the Engineer shall be obtained before hoarding, fences, gates or signs are removed. Hoardings, fences, gates and signs which are to be left in positions after the issue of Taking-Over Certificate shall be repaired and repainted as instructed by the Engineer.
- 5) Hoardings, fences, gates and signs shall be maintained in good order by the Contractor until issue of Taking-Over Certificate.

- 6) Hoarding/fencing can be reused after removing from one place to other locations / sites provided they are in good condition and consented by the Engineer.

Damage/worn-out fencing/hoarding shall be replaced by the Contractor within 24 hours. Engineer's decision regarding need for replacement shall be final and binding and if no action is taken by Contractor the same shall be got done by the Engineer and cost of any repairs shall be deducted by the Engineer from any payment due to the Contractor.

1.5.1 Clearance of the site

All Temporary Works shall be removed by the Contractor upon issue of the Taking Over Certificate except the Temporary Facilities with necessary utility services required for completing his obligations, after the issue of Taking-Over Certificate unless otherwise directed by the Engineer. The Contractor shall dismantle and remove all Temporary Works and the land in which the Temporary Works have been located shall be properly treated to complete the Works as shown in the Construction Drawings.

2. Care of the Works

2.1 General

- 1) Unless otherwise permitted by the Engineer all works shall be carried out in dry conditions.
- 2) The Works, including materials for use in the Works, shall be protected from damage due to water. Water on the Site and water entering the Site shall be promptly removed by temporary drainage or pumping system or by other methods capable of keeping the Works free of water.
- 3) The discharge points of the temporary drainage / pumping systems shall be as per the consent of the Engineer. The Contractor shall make all arrangements with and obtain the necessary approval from the relevant authorities for discharging water to drains and watercourses etc. meeting all the requirements as described in Section-7, Part-1, Chapter VI of the Employer's Requirement. The relevant work shall not be commenced until the consented arrangements for disposal of the water have been implemented.
- 4) The methods to be used for keeping the Works free of water shall be carefully chosen so that any settlement of or damage to the Works and / or adjacent existing structures shall not occur.

2.2 Protection of the Works from Weather

- 1) Works shall not be carried out in weather conditions that could adversely affect the Works unless proper protection is provided to the satisfaction of the Engineer.

- 2) Permanent Works, including materials for such Works, shall be protected from exposures of weather conditions that could adversely affect such Permanent Works or materials.
- 3) During construction of the Works, storm restraint systems shall be provided where appropriate. These systems shall ensure the security of the partially completed and ongoing stages of construction in all weather conditions. Such storm restraint systems shall be installed as soon as practicable and shall be compatible with the site conditions.
- 4) The Contractor shall at all times programme and carry out the Works duly ensuring protective arrangements such that the Works can be made safe in the event of storms.

2.3 Protection of the Finished Works

The finished Works shall be protected from theft pilferage or any damage that could arise due to any reason. If required, sections of route may be antitheft charged at 2.2kV, but only on following a street protocol as laid down in relevant portion of ACTM and as modified for use on DFCC by the employer and after having completed all steps laid down on Employer's approval.

3. Other Interference

3.1 Alternative Access

Alternative access shall be provided by the Contractor at his own cost to all public or private premises when interference with the existing access occurs to enable the Works to be carried out. The arrangements for the alternative access shall be as agreed by the Engineer and the concerned agencies.

The permanent access shall be reinstated as soon as practicable after the Works are complete and the alternative access shall be removed and reinstated immediately as soon as it is no longer required. Proper signage and guidance shall be provided for the traffic / users regarding diversions

3.2 Deleted

3.3 Removal of Trees, Graves and Other Obstructions

If any trees, graves and other obstructions are required to be removed in order to execute the Works and such removal has not already been arranged for, the Contractor shall draw the Engineer's attention to them in good time to make necessary arrangement for authorizations for such removal. The Contractor shall not itself remove them unless the Engineer has given consent.

3.4 Protection of the Adjacent structures work

Protection of the Adjacent Structures and Works. The Contractor shall take all necessary precautions to protect the structures or works being carried out by others adjacent to and, for the time being, within the Site from the effects of vibrations, undermining and any other earth movements or the diversion of water flow arising from its work.

4. Use of Roads

4.1 General:

- 1) Measures shall be taken to prevent the excavated materials, silt or debris from entering gullies on roads and footpaths; entry of water to gullies shall not be obstructed.
- 2) All surfaced roads (public / private) which are chosen for construction activities in the Traffic Management Plan shall not be used by the Contractor's tracked vehicles unless protection against damage is provided by the Contractor and / or appropriate remedial measures are prepared and agreed with the concerned parties

4.2 Traffic Management Plan - The Contractor shall develop a detailed Traffic Management Plan for the Works under the Contract. The purpose is to develop a Traffic Management Plan to cope with the traffic disruption as a result of construction activities by identifying strategies for traffic management on the roads and neighborhoods impacted by the construction activities. The Contractor shall implement the Traffic Management Plan throughout the whole period of the Contract.

The basis for the Plan shall take into consideration four principles:

- 1) to minimize the inconvenience of road users and the interruption to surface traffic through the area impacted by the construction activities;
- 2) to ensure the safety of road users in the impacted area;
- 3) to facilitate access to the Work Areas, and to maintain scheduled construction progress.
- 4) to ensure traffic safety at each Work Area. Wherever applicable, the Contractor shall obtain necessary approval from the transport authorities and police department for temporary traffic arrangement and control on public roads.

4.3 Reinstatement of Public Roads and foot paths

- 1) Temporary diversions, pedestrian access and lighting, signage's, guarding and traffic control equipment, if any, shall be removed immediately when these are no longer required for the construction activities.
- 2) Roads, footpaths and other items affected by temporary traffic arrangements and control shall be reinstated to the same condition as existed before the work started or as consented

by the Engineer immediately after the relevant work is complete or at other times permitted by the Engineer.

- 3) Wherever required, the Contractor shall submit his plan for reinstatement to relevant authorities and obtain their prior approval to carry out the work

5. Security

- 1) The Contractor shall be responsible for the security of the Site for the full time till the issue of Taking Over Certificate except for specific cases of railway envelope after it is handed over to the Employer and / or as directed by the Engineer. The Contractor shall set up and operate a system whereby only those persons entitled to be involved in the construction activities in the Contract could enter the Work Areas. For the Site located near the populated areas, the Contractor shall with the consent of Engineer provide the specific points only at which entry through the security fence can be affected, and shall provide gates and barriers at such points of entry and maintain a twenty-four (24) hours security guard. The Contractor shall also arrange for such other security personnel and patrols elsewhere as may be necessary to maintain security.
- 2) The Contractor shall maintain all site boundary fences, wherever provided, in good condition, and shall so arrange site boundary fences and security measures that the drainage arrangement is not affected. Notices shall be displayed at intervals around the Work Areas to warn the public of the dangers of entering the Work Areas.
- 3) During the progress of the Works the Contractor shall maintain such additional security patrols over the Works Areas as may be necessary to protect his own and his sub-contractor's facilities and equipment as well as the Works. In addition, the Contractor shall coordinate and plans the security of both the Works under the Contract and works of the Other Contractors including Interfacing Parties requiring access to the Site.
- 4) In order to operate such a security system, it will be necessary to institute the issue of unique passes to personnel and vehicles entitled to be on the Work Areas and a system of separately identifiable according to the shifts being worked on the Work Areas. The Contractor shall at the outset determine, together with the Engineer, a system including the design of passes to suit the requirements of the foregoing and to suit the methods of activities to be adopted by the Contractor for these purposes. The Contractor shall at all times ensure that the Engineer has an up-to-date list of all persons entitled to be on each Work Area at any time. The Contractor shall also introduce a system for issue of passes to any outsider or person/vehicles belonging to agencies other than Employer/ Engineer who shall have to visit each of the Work Areas in connection with the Works.
- 5) The Contractor shall liaise with the Other Contractors and the Interfacing Parties responsible for security of the adjacent areas and ensures that coordinated security procedures are operated, in particular in respect of vehicles permitted to pass through the Site and/or the adjacent sites. The security of the erected Conductors of the OHE as an

antitheft charging with 2.2 kV supply shall be carried out in full liaison with Other Contractors.

- 6) Security and checking arrangements, as felt necessary shall be provided with advice and help of the Police.

6. Testing of Works

6.1 Testing

- 1) The Contractor shall submit the Project Quality Assurance Plan and its sub-plans as described in Section 8.3 Chapter VI, Part-I [Quality Assurance] to the Employer's Requirements. According to the plans, the Contractor shall implement tests which are listed, but not limited to, in the Section 8.3 Chapter VI, Part-I [Quality Assurance].
- 2) The Contractor shall be responsible for all on-site and off-site testing and for all in-situ testing. All appropriate laboratory tests may be carried out in the Contractor's laboratory, or tests shall be carried out in other laboratories if consented by the Engineer provided that:
 - a) the identified laboratory is accredited by NABL for the relevant work; and
 - b) particulars of the proposed laboratory are submitted to the Engineer for his consent.
- 3) All site specific and in-situ tests shall be done in the presence of the Engineer. The Employer may also be present if he so desires.
- 4) Equipment, apparatus and materials for all on site, off site and in-situ tests including laboratory compliance tests to be carried out [by the Contractor and / or by the Engineer] shall be provided by the Contractor. The equipment and apparatus shall be maintained by the Contractor and shall be calibrated before the testing starts, at regular intervals as specified and as directed by the Engineer.
- 5) Attendance on tests, including that by the Engineer, the Contractor and the designer shall be as laid down in the Quality Assurance Procedures.

6.2 Batches, Samples and Specimens

- 1) A batch of material is a specified quantity of the material that satisfies the specified conditions. If one of the specified conditions is that the material is to be delivered to the Site at the same time, then the material delivered to the Site over a period as consented by the Engineer shall be considered as part of the same batch if in the opinion of the Engineer there is sufficient proof that the other specified conditions applying to the batch apply to all of the material delivered over this period.

- 2) A sample is a specified quantity of material that is taken from a batch for testing and which consists of a specified amount, or a specified number of pieces or units, of the material.
- 3) A specimen is the portion of a sample that is to be tested.

6.3 Samples for Testing

- 1) Samples shall be of sufficient size and in accordance with relevant Standards to carry out all specified tests.
- 2) Samples taken on the Site shall be selected by, and taken in the presence of the Engineer and shall be suitably marked for their identification. An identification marking system shall be evolved at the start of works in consultation with the Engineer.
- 3) Samples shall be protected, handled and stored in such a manner that they are not damaged or contaminated and such that the properties of the sample do not change.
- 4) Samples shall be delivered by the Contractor, under the supervision of the Engineer, to the specified place of testing. Samples on which non-destructive tests have been carried out shall be collected from the place of testing after testing and delivered to the Site or other locations by the Contractor and as instructed by the Engineer.
- 5) Samples that have been tested may be incorporated in the Permanent Works provided that:
 - a) the sample complies with the specified requirements
 - b) the sample is not damaged; and
 - c) the sample is not required to be retained under any other provision of the Contract.
 - d) consent of the Engineer is obtained
- 6) Additional samples shall be provided for testing if in the opinion of the Engineer:
 - a) material previously tested no longer complies with the specified requirements;
or
 - b) material has been handled or stored in such a manner that it does not comply with the specified requirements.

6.4 Compliance of Batch

- 1) The results of tests on samples or specimens shall be considered to represent the whole batch from which the sample was taken.
- 2) A batch shall be considered as complying with the specified requirements for a material if the results of specific tests for the specified properties comply with the specified requirements for the properties.

- 3) If additional tests are permitted or required by the Engineer but separate compliance criteria for the additional tests are not stated in the Contract, the compliance criteria for the same shall be mutually decided by the Engineer and the Contractor.
- 4) Cost of all such tests shall be borne by the Contractor.

6.5 Records of Tests

- 1) Records of in-situ tests and laboratory compliance tests carried out by the Contractor shall be kept by the Contractor on the Site and a report shall be submitted to the Engineer within seven (7) days, or such other time stated in the Contract or in the Quality Assurance Programme, after completion of each test. In addition to any other,
 - a) material or part of Works tested;
 - b) location of the batch from which the samples were taken or location of the part of the Works;
 - c) place of testing;
 - d) date and time of tests
 - e) weather conditions in the case of in-situ tests;
 - f) technical personnel supervising or carrying out the test
 - g) size and description of samples and specimens;
 - h) method of sampling;
 - i) properties tested;
 - j) method of testing;
 - k) readings and measurements taken during the tests
 - l) test results, including any calculations and graphs;
 - m) specified-acceptance criteria; and
 - n) other details stated in the Contract and / or as required by the Engineer
- 2) Reports of tests shall be signed by the Contractor's site representative, or by any other representative authorized by the Contractor.
- 3) If requested, records of tests carried out by the Employer's staff or by the Engineer shall be given to the Contractor.

6.6 Production Tests

- 1) Should the Contractor propose or the Contract includes use of any equipment not previously proven in service, the Contractor shall undertake a thorough testing of pre-production units to the entire satisfaction of the Engineer. The Contractor shall identify such equipment which differs significantly from that which is already in service elsewhere.

- 2) All materials, components, sub-assemblies, unit assemblies including software, cables, wiring etc. shall be subject to testing and certification. Notification of these tests shall be submitted to the Engineer twenty-eight (28) days in advance of carrying out any tests. The Engineer shall then determine which items, if any shall be accepted based on previous supply or experience.
- 3) Where processor-based equipment is to be used for the Works, test shall include also verification of software used in this application.
- 4) Works Tests shall include but not limited to:
 - a) Physical Inspection
 - b) Dimensional check
 - c) Electrical check
 - d) Calibration
 - e) Output check
 - f) Operational performance
 - g) Full load test
 - h) Flash over test
 - i) Insulation test
 - j) Soak test
 - k) Non-destructive test to assess integrity or strength of parts
 - l) Tests on bearings as specified
 - m) Tests on production of rails as prescribed in IRS T-12 — 2009

7. Records

7.1 Records Produced by The Contractor

All the documents produced by the Contractor including drawings of site layouts, Temporary Works etc. and the number of copies to be submitted to the Engineer shall be as per the requirements and standards specified in this Document.

7.2 Progress Photographs

- 1) The Contractor shall provide monthly progress photographs, which have been properly recorded to show the progress of the works to the Engineer. The photographs shall be taken on locations agreed with the Engineer to record the exact progress of the Works. Two sets

of photographs shall be provided on CD-ROM format with two sets of color prints of suitable size.

- 2) The Contractor shall mount each set of each month's progress photographs in a separate album of a type to which the Engineer has given his consent and shall provide for each photograph two typed self-adhesive labels, one of which shall be mounted immediately below the photograph and one on the back of the photograph. Each label shall record the location, a brief description of the progress recorded and the date on which the photograph was taken.
- 3) All photographs shall be taken by a skilled photographer whose name and experience shall be submitted to the Engineer for consent. Processing shall be carried out by a competent processing firm to the satisfaction of the Engineer.
- 4) The Contractor shall ensure that no photography other than meeting the contractual obligation is permitted on the Site without the specific consent of the Employer
- 5) The said photographs shall become the property of the Employer and shall not be reproduced for any purpose without the consent of the Employer.

7.3 Records of Wage Rates

The Contractor shall keep monthly records of the average, high and low wage rates for each trade/tradesman employed on the Site and records shall be made available to the Engineer during inspection.

8. Materials

- 8.1** Materials and goods for inclusion in the Permanent Works shall be new and complies with the relevant specifications. Preference shall be given to local materials where available.
- 8.2** Certificates of tests by manufacturers which are to be submitted to the Engineer shall be current and shall relate to the batch of material delivered to the Site.
- 8.3** True copies of certificates duly certified by the manufacturer and the Contractor shall be submitted if the original certificates could not be obtained from the manufacturer.
- 8.4** Parts of materials which are to be assembled on the Site shall be marked to identify the different parts.
- 8.5** Materials which are specified by means of trade or proprietary names may be substituted by materials from a different manufacturer which has received the consent of the Engineer provided that the materials are of the same or better quality and comply with the specified requirements.

- 8.6** Samples of materials submitted to the Engineer for information or consent shall be kept on the Site and shall not be returned to the Contractor or used in the Permanent Works unless permitted by the Engineer.
- 8.7** The samples shall be used as a mean of comparison which the Engineer shall use to determine the quality of the materials subsequently delivered. Materials delivered to the Site for use in the Permanent Works shall be of the same or better quality as the samples which have received consent.
- 8.8** All excavated material shall be utilized for the subsequent Works (to the extent meeting the quality requirements) and / or stockpiled in the designated stockpile areas for the use at later stages within the Contract. All the surplus serviceable material (if not required by the Employer and unserviceable material shall be carried away from the Site by the Contractor and disposed of in the manner consented by the Engineer.

9. Treatment and Disposal of surplus Material

The disposal of surplus material, waste material, bentonite fluid and material contaminated with bentonite, debris of demolished existing structures or buildings and unsuitable material etc. shall be the full responsibility of the Contractor and these materials shall be treated and disposed of by the Contractor at an approved location(s) at his own cost. The disposal plan and programme shall be subject to consent by the Engineer.

10. Contractor's Labour Camp

10.1 General

- 1) The Contractor shall comply with all requirements for Contractor's labour Camp in Section 7, Chapter VI, Part-I.
- 2) The Employer will not provide living accommodation for the use of the Contractor or any of his staff or labour employed on the Works.

10.2 Provision of Labour Camp

- 1) The Contractor, shall, at his own expense, make adequate arrangements for the housing, supply of drinking water and provision of bathrooms, latrines and urinals, with adequate water supply, for his staff and workmen at the location authorized by Engineer.
- 2) No labour camp shall be allowed at Site without the consent of the Engineer / Employer or any unauthorized place. The Contractor shall prepare a detailed labour camp plan to obtain the consent from the Engineer/ Employer.

- 3) The Contractor at his own cost shall maintain all camp sites in a clean and sanitary condition.
- 4) The Contractor shall obey all health and sanitary rules and regulations and carry out at his cost all health and sanitary measures that may from time to time be prescribed by the Local/Medical Authorities and permit inspection of all health and sanitary arrangements at all times by the Employer, Engineer and the staff of the local municipality or other authorities concerned.
- 5) Should the Contractor fail to provide adequate health and sanitary arrangements these shall be provided by the Employer and the cost recovered from the Contractor.
- 6) The Contractor shall at his own cost, provide First Aid Stations as described in Section 7, Chapter VI, Part-I..
- 7) The Contractor shall at his own cost, provide the following minimum requirements for fire precautions at suitable locations complying with the requirements of applicable codes:
 - a) Portable Fire Extinguishers
 - b) Manual Fire Alarms
 - c) Water Supply for use by the Fire Service
- 8) The Contractor at his own cost shall provide necessary arrangements for keeping the camp area sufficiently lighted to avoid accidents to the workers.
- 9) The Contractor shall ensure that electrical installations are done by trained electricians and as per the applicable Codes and Standards and these installations shall be maintained and daily maintenance records shall be made available for inspection of the Engineer.

10.3 Camp Discipline

- 1) The Contractor shall take requisite precautions, and use his best endeavors to prevent any riotous or unlawful behaviour by or amongst his workmen, and others, employed directly or through sub-contractors.
- 2) These precautions shall be for the preservation of the peace and protection of the inhabitants and security property in the neighborhood of the Works.
- 3) In the event of the Employer requiring the maintenance of a Special Police Force at or in the vicinity of the site, during the tenure of the work, the expenses thereof shall be borne by the Contractor.
- 4) The sale of alcoholic drinks or other intoxicating drugs or beverages upon the work, in any labour camp, or in any of the buildings, encampments or tenements owned or occupied by, or within the control of, the Contractor or any of his employees directly or

through sub-contractors employed on the work shall be strictly prohibited and the Contractor shall ensure strict compliance with this condition.

- 5) The Contractor shall also ensure that no labour or employees are permitted to work at the site in an intoxicated state or under the influence of drugs.
- 6) The Contractor shall remove from his camp such labour and their families, who refuse protective inoculation and vaccination when called upon to do so by the Employer / Engineer on the advice of the Medical Authority.
- 7) Should Cholera, Plague or any other infectious disease break out, the Contractor shall at his own cost burn the huts, bedding, clothes and other belongings of or used by the infected parties.
- 8) The Contractor shall promptly erect new accommodation on healthy sites as required by the Employer / Engineer, within the time specified by the Employer / Engineer, failing which the work shall be done by the Employer and the cost recovered from the Contractor.

10.4 Labour Accommodation

- 1) The Contractor shall provide living accommodation for all staff employed by himself or his subcontractors that is equal to or exceeds the minimum criteria established in the following sub-sections.
- 2) The buildings shall be constructed so as to have a minimum life of not less than the period of the Contract.
- 3) The roofs shall be leak proof and laid with suitable non-flammable materials permissible for residential use under local regulations and for which the consent of the Engineer has been obtained.
- 4) Each unit shall have suitable ventilation with all doors, windows and ventilators provided with security leaves and fasteners and back-to-back units are to be avoided.
- 5) The minimum height of each unit shall be 2.10m.
- 6) The Contractor shall provide a suitable cooking area.
- 7) The number of common toilet/bath/urinals shall be provided as per the provision in Section 7, Chapter VI, Part-I.

10.5 Water supply

- 1) The Contractor shall make his own arrangements to provide adequate potable water supply in the Camp.
- 2) Where piped water supply is available, supply shall be at stand posts and where the supply is from wells or river, storage tanks of metal or other consented material shall be provided.
- 3) The Contractor shall also at his expense make arrangements for the provision and laying of water pipe lines from the existing mains wherever available.

10.6 Drainage

- 1) The Contractor shall provide efficient arrangements for draining away surface water so as to keep the camp neat and tidy.
- 2) Surface water shall be drained away from paths and roads and shall not be allowed to accumulate into ditches or ponds where mosquitoes can breed.

10.7 Sanitation

- 1) The Contractor shall make arrangements for conservancy and sanitation in the labour camps according to the rules and regulations of the Local Public Health and Medical Authorities.
- 2) The Contractor shall provide a sewage disposal system that is adequate for the number of residents in the camp, and which meets the norms of the local authorities.
- 3) The provision of the latrines and wash places shall be in accordance with Section 7, Chapter VI, Part-I [SHE Requirements] of the Employer's Requirement and as per applicable Codes and Standards. However the layout shall be subject to consent by the Engineer.
- 4) The Contractor shall be responsible for maintaining all latrines and wash places on the Site in a clean and sanitary condition and for ensuring that they do not pose a nuisance or a health threat.
- 5) The Contractor shall also take such steps and make such provisions as may be necessary or directed by the Engineer to ensure that vermin, mosquito breeding etc. are at all times controlled.
- 6) The Contractor shall be responsible for providing water, electricity, communication, sewage disposal arrangements, drainage, roads, paths and parking facilities etc. for all the site accommodations, structures and buildings in accordance with Section-3, Chapter VI,

Part-I [Site Facilities & Temporary Works] and meeting all the requirements as specified in Section 7, Chapter VI, Part-I [SHE Requirements] of the Employer's Requirement. The Contractor shall also be responsible to obtain the necessary approval from the relevant civic and utility authorities and shall maintain all such services that are necessary for satisfactory performance of the Works.

11. Safety, Health and Environment (SHE) Requirements

11.1 The Contractor shall comply with all the requirements as specified in the Section 7, Chapter VI, Part-I.

11.2 The Contractor shall prepare and submit to the Engineer for review his proposed SHE plan including Site Safety Plan and Programme within the period as specified in Section 7, Chapter VI, Part-I. The Contractor's SHE Policy, SHE Plan and Site Safety Plan shall be got approved from the Engineer and other concerned authorities before start of the Work at Site.

11.3 The Contractor's site safety plan shall cover the following aspects

- a) Statement of Contractor's Safety Policy.
- b) Senior management responsibilities.
- c) Appointment, duties and responsibilities of Site safety staff.
- d) Policy for identifying Hazards.
- e) Safety training.
- f) Safety equipment.
- g) Safety of the Contractor's construction and office equipment.
- h) Safety of the workmen and staff at site.
- i) Safety procedures for sub-contractor.
- j) Disciplinary procedures.
- k) Accident reporting.
- l) First aid and emergencies.
- m) Safety promotion and awareness.
- n) Site security.
- o) Labour safety

11.4 The Contractor's Site Safety Plan shall also incorporate the requirement of Safety while having interface with the running tracks of Indian Railways and complying with

- a) Indian Railway's rules and regulations for track, signaling and operations possessions.
- b) operating a system of permit to work for all works which may affect the operations of the existing railway and
- c) requirements of safety aspects for working near the running tracks of Indian Railways as specified herein below

- 11.5** Engineer reserves the right to order (in writing) the immediate removal and replacement of any of the Contractor's equipment or temporary works which in his opinion is unsatisfactory or not required for the Work for its purpose and/or is in unsafe condition.
- 11.6** Contractor shall be fully responsible for safety of the Works and shall treat safety measures as a priority in all his activities throughout the execution of the Works.
- 11.7** Contractor shall have full regard for the safety of all his personnel, sub-contractor's personnel, the public and all the personnel directly or indirectly associated with the Works on or in the vicinity of the Site and the Work Areas (including without limitation to the persons to whom access to the Site has been allowed by the Contractor), to comply with all relevant safety regulations, including provision of safety gear, and insofar as the Contractor shall be in occupation or otherwise is using areas of the Site and the Work Areas, to keep the Site and the Work Areas (so far as the same are not completed and occupied by the Employer) in an orderly state appropriate to the avoidance of injury to all persons and shall keep the Engineer/ Employer indemnified against all the injuries to such persons.
- 11.8** Contractor shall provide and maintain all lights, guards, fences and warning signs and watchmen when and where necessary or required by the Engineer or by laws or by any relevant authority for the protection of the Works and for the safety and convenience of the public and all persons on or in the vicinity of the Site and the Work Areas.
- 11.9** When the work would otherwise be carried out in darkness, the Contractor shall ensure that all parts of the site and work Areas where the work is being carried out are so lighted as to ensure the safety of all the persons on or the vicinity of the sites, the work areas and of such work to the satisfaction of the Engineer.
- 11.10** Contractor shall be required to take note of all the necessary provisions in the Employer's Safety, Health and Environment requirements as specified in Section 7, Chapter VI, Part-I and the Contract Price shall be deemed to be inclusive of all the necessary costs to meet the standards and requirements as prescribed therein. In case the Contractors fails to meet the above requirements, the Employer shall provide the necessary arrangements and recover its costs from any bills due to the Contractor.

12. Safety Requirements for Working Near Running Tracks of Indian Railways

12.1 Operational Safety

Where the work to be executed is in proximity of the running railway track, the Contractor shall be required to observe all precautions and carry out all works that may be necessary to ensure the safety of the running track/trains etc. without imposition of any speed restriction thereon as may be directed by the Engineer. No claim whatsoever shall be entertained for either any inconvenience caused to the Contractor or for the re-scheduling of the operations or for any other reasons on this account. The Contractor shall ensure that the materials are not stacked close to the railway track, which may endanger the safety of trains and workmen.

12.2 Where the Schedule of Dimensions of Indian Railways for the running tracks of IR are likely to be infringed by the Contractor, the following safety measures shall be ensured;

12.3 Measures prior to start of the Work:

- i. Contractor shall arrange to provide necessary training to their supervisors and staff including lookout man / flagman etc. for safety requirements as per IRPWM for working near IR tracks. Such training can be arranged at ZEC/DTC or any other authorized institute of Indian Railways. Employer shall assist the Contractor in organizing such training and all the charges for such training shall be borne by the Contractor. The Contractor shall ensure that the safety norms are followed for working in the premises of IR and in the vicinity of running tracks and electrified territories.
- ii. Inform the Engineer/Employer about:
 - a) Name and address of the Contractor's supplier/sub-contractor assigned to execute the work
 - b) Name of the vehicle drivers/equipment operators identified for the work
 - c) Location, duration and timings during which the SOD of IR is to be infringed
- iii. Provide the Engineer/Employer with
 - a) copy of detailed planning of work including protection of IR track and safety measures proposed (duly consented by the Engineer and approved by the Employer).
 - b) Copy of the competency certificate of the Contractor's Supervisor In-charge of the work (to be issued by the Engineer).
- iv. Demarcate the working area at site in consultation with the Engineer/Employer.
- v. Barricading / Temporary fencing along the stretch of the concentration of the work area along the IR Track, as consented by the Engineer.
- vi. Provide adequate watch and ward, flagmen, lighting etc. including signage boards

12.4 Measures during execution of Work

- (i) It shall be ensured that no workmen and staff is working on line/tracksides unless proper 'Permit to Work' shall be issued for those lines by the Indian Railways and Engineer.
- (ii) It shall be ensured that the moving dimensions of IR shall not be infringed. The track crossing work shall not be carried out without permission from the Engineer and IR. Safety of all the existing fixed structures near the vicinity of the Site shall also be ensured.
- (iii) No vehicles shall be plied within 6m of the centre of the IR track without the specific approval from Engineer/Employer. Individual vehicle/construction equipment shall not be left un-attended. No vehicle shall ply from sun-set to sunrise and during the period when the visibility is impaired, except in case of emergency and with the consent of the Engineer.
- (iv) Where the construction vehicles are required to ply along the existing running tracks of IR, the Contractor shall deploy the adequate patrolmen to prevent tendency of the vehicle drivers to come close to the tracks and infringe.
- (v) All the drivers of the road vehicles/machines plying near the running tracks of IR shall be provided with a red flag / red lamp so that in the event of any obstruction, they shall stop the incoming train.
- (vi) It shall be ensured that the line of demarcation shall not be infringed by the road vehicles/ construction equipment.
- (vii) It shall be ensured that only eligible and competent staff shall be employed for the work and they must wear identity card while working near running tracks of IR.
- (viii) For working during night, sufficient illumination shall be provided for the entire work area for safety of the workmen and public.
- (ix) Temporary Engineering signals as required shall be provided.
- (x) Existing engineering indicator boards shall be lit as per Permanent Way Manual (PWM) of Indian Railways.
- (xi) Lookout man with red and green flags/hand signals and whistle shall be deployed wherever required.
- (xii) No part of the stacked material shall infringe the moving dimensions of IR. Material shall be stacked to such a height that it does not lead to infringement of SOD in case of accidental toll off.

- (xiii) Any temporary arrangement shall not infringe with the moving dimensions of IR.
- (xiv) Where the work is planned to be done within 3.5m from the centre of the IR tracks, it shall require traffic block and all the necessary safety precautions shall be ensured as per the requirements of Para No. 806 and 807 of PWM of Indian Railways.
- (xv) First aid kit shall be readily available at the site.
- (xvi) In case any cable / Utility is found while working, the Contractor shall inform the Engineer immediately. In case a large number of cables / utilities are found during excavation the work shall be carried out in the presence of representative from the concerned owning agency of the utility / cable.
- (xvii) It shall be ensured that the existing emergency sockets of IR are not damaged

12.5 Additional measures required during traffic block

- (i) Any work when infringing the moving dimensions of IR shall be started only after traffic block has been imposed and IR track is protected.
- (ii) All the work intended to be completed during traffic block shall be completed within the duration of the traffic block and the duration of the traffic block shall not be exceeded.
- (iii) Traffic block shall be considered as cleared only when all the temporary arrangements/machinery are cleared of the moving dimensions and the IR track is left with proper track geometry to allow IR trains to run safely.

12.6 Safety measures while working in OHE area

- (i) While working near the OHE area, the safety guidelines as specified in para 20301, 20327, 20334, 20335, 20529, 20612, 20614, 20714, 20825, 20833, 21206 and 21207 of Volume II, Part 1 of AC Traction Manual of Indian Railways shall be followed.
- (ii) No electric work close to the live OHE shall be carried out without power block and specific approval from Engineer/Employer.
- (iii) A minimum distance of 2m shall be maintained between live OHE wire and any body part of the workmen or tools or metallic support etc.
- (iv) No electric connection shall be tapped from OHE.

12.7 Excavation Affecting Existing Tracks

While doing excavation near the vicinity of the existing tracks including for bridges and other structures, special care has to be taken to ensure that formation of the existing Railway line is not excavated, for that matter any activity involved in construction/execution of the project shall not endanger the safety of existing running line of Indian Railways. If excavation or any other activity involving working and or modification and or alteration of the existing permanent way then, before execution of such work, the Contractor shall prepare a drawing clearly indicating such alternation/modification of the existing permanent way, and the protection measure intended to be taken by the Contractor to ensure safety of the existing running line. The effectiveness of design of such protection measures is the sole responsibility of the Contractor and the Contractor shall indemnify the Engineer/Employer towards the losses incurred due to failure of such protection measure. These protection measures duly indicating the extent of alternation/modification to the existing formation shall be incorporated in the design and drawing submitted during preliminary design submission as per the Contract. Such work shall not be undertaken unless and until these drawings are consented by the Engineer.

12.8 Excavation Affecting Existing Tracks

The Contractor shall indemnify the Engineer / Employer against any damage to the existing track / structures / utilities etc. caused by the action of the Contractor or his Sub-contractors, and shall make good the same, as directed by the concerned authorities, at his own cost and shall also pay any penalty(ies) / demurrages if levied by the concerned authorities.

13. Safety Requirements for Electrical Works

- (i) The Indian Electricity Rules 1956, as amended up to date, shall be followed. The detailed instructions on safety procedures given in I.S.S. and Indian Electricity Rules, respective State Electricity Authorities' regulation with up-to-date amendment shall be applicable.
- (ii) The L T/HT distribution diagrams of sub stations shall be prominently displayed. The substation premises, main switch rooms and D.B. enclosure shall be kept clean whenever works are carried either inside or outside.
- (iii) No inflammable materials shall be stored in places other than the rooms specially constructed for this purpose in accordance with the provisions of Indian Explosives Act.
- (iv) Rubber insulating mats of suitable size and thickness shall be provided in front of the main switch boards of sub-station or any other control equipment of medium voltage and above.
- (v) Protective and safety equipment such as rubber gauntlets or gloves, earthing rods, linemen 's belt, portable artificial respiration apparatus, safety goggles etc., shall be provided as per the requirement of the Work.

- (vi) Necessary number of caution boards such as "Man working on line, don't switch on" shall be readily available in the vicinity of electrical installation.
- (vii) Standard first aid boxes containing materials as prescribed by the St. John's Ambulance Brigade or Indian Red Cross shall be made available.
- (viii) Charts displaying methods of giving artificial respiration to a recipient of electrical shock (one in English and another one in the regional language) shall be prominently displayed at appropriate places.
- (ix) No work shall be undertaken on live installations, or on installation, which could be energized unless one another person is present to immediately isolate the electric supply in case of any accident and to render first aid, if necessary.
- (x) No work on live LT. bus bar or pedestal switch board in the sub stations shall be handled by a person below the rank of a Licensed Wireman and such a work shall preferably be done in the presence of a qualified engineer.
- (xi) When working on or near live installations, suitable insulated tool shall be used, and special care shall be taken to see that those tools accidentally do not drop on live terminals causing shock or dead short.
- (xii) The electrical switch controls in distribution boards shall be clearly marked to indicate the areas being controlled by them.
- (xiii) Before starting any work on the existing installation, it shall be ensured that the electric supply to that portion is cut off. Precautions, like displaying "Men at Work" caution boards on the controlling switches, removing fuse carrier from these switches shall be taken against accidental operation. Caution boards shall be kept with the person working on the installation.
- (xiv) All electrical panels & switchgear shall conform to relevant IEC standard.
- (xv) All external enclosures shall have degree of protection not less than IP-5
- (xvi) All equipment / system shall conform to relevant IEC standard on Electromagnetic Compatibility (EMC).
- (xvii) Cable routes of all the newly laid cables by the Contractor shall be identified with electronic or concrete markers.

14. Legislation and Codes of Practice

- 14.1** The Contractor shall comply with all the safety and industrial health legislation including without limitation to the Rules and Regulations of National Safety Council of India. The Contractor shall keep at each site office sufficient copies of Safety and Industrial Health Regulations and related documents."
- 14.2** All regulations and documents as referred above shall be translated in to languages which are understood by the operators engaged by the Contractor or sub-contractor and such translations shall be displayed or kept alongside those in Hindi, English and Regional language.

15. Protection for Indian Railway Lines

The Contractor shall design and install the temporary fencing/barricades for protection of the existing Indian Railway (IR) lines where the construction activities, adjacent to the line, are taking place. The fencing/barricades shall be installed as indicated in the Reference Drawings and the fencing shall be movable and reusable and stable enough not to lean and infringe the structure gauge of the IR lines. The fencing pole/barricades shall be colored to enhance visual precautionary effects. The Contractor shall develop the design of the temporary fencing/barricades as part of the Technical Design and submit to the Engineer for consent.

16. Damage and Interference

- 16.1** Works shall be carried out in such a manner that there shall be no damage to or interference with:
- a) watercourses or drainage systems;
 - b) public utilities;
 - c) structures (including foundations), roads, including street fixtures, or other properties;
 - d) public or private vehicular or pedestrian access,
 - e) monuments, graves or burial grounds other than to the extent that shall be necessary for them to be removed or diverted to permit the execution of the Works, and
 - f) Existing tracks, Bridges, Fixtures/OHE Masts of the existing tracks of Indian Railways
- 16.2** Heritage structures shall not be damaged or disfigured on any account. The Contractor shall inform the Engineer as soon as practicable of any items which are not stated in the Contract to be removed or diverted but which the Contractor considers necessary to be removed or diverted to enable the Works to be carried out. Such items shall not be removed or diverted until the consent of the Engineer to such removal or diversion has been obtained.

- 16.3** Assets/items of the Employer, Indian Railway, Other Contractors and any other entities which are damaged due to Contractor's operations/negligence during construction or are interfered with or removed to enable the Works to be carried out, shall be replaced/reinstated by the Contractor at his own cost to the same condition as existed before the Work started and to the satisfaction of the Engineer and the concerned entity.

In case of damage to the existing cables, the Contractor shall have suitable arrangement of joining the cable under technical supervision of IR / relevant authority. In addition to this the Contractor shall also be responsible for any penal action or any claim as a result of the damage and shall indemnify the Engineer, Employer, Indian Railway, Other Contractors and any other entities in this regard.

- 16.4** In case of obstructions due to interference, the Contractor shall comply with the requirements described in Section 8.1, Chapter VI, Part-I. Followings are the major required items as detailed therein;

- (a) Uncharted Public utilities
- (b) Alternative Access
- (c) Protection of Trees
- (d) Removal of trees, graves and other obstructions
- (e) Protection of adjacent structures

17. Care of Works

Care of Works, including protection of Works from weather and protection of finished Works from weather, damage or theft.

18. Handling of Public Utilities and Interferences: Deleted

19. Use of Roads: Deleted

20. Security

The Contractor shall be responsible for the security of the Site.

21. Site Establishments

1. The Contractor shall provide and maintain the Temporary Facilities and Temporary Utility Services, which comprise part of the Temporary Works for use of the Employer and Engineer.
2. The Contractor shall provide and maintain all Temporary Works as required by him and as specified but not limited to those detailed in this Document elsewhere.
3. **Latrines and wash places:**

- (a) Contractor shall provide latrines and wash places for the use of his personnel and all persons who will be on the site as per the requirements specified in Section 7, Chapter VI, Part-I and in accordance with the local laws and regulations.
- (b) The size and dispositions of the latrines and wash places shall be according to the numbers of persons entitled to be on Site and Work Areas, which may necessitate their locations on structures and, where necessary there shall be separate facilities for male and females.
- (c) The capacity and layout shall be subject to consent of the Engineer.
- (d) The Contractor shall arrange regular disposal of effluent and salvage in a manner that shall be in accordance with the local laws and regulations.
- (e) The Contractor shall be responsible for maintaining all the latrines and wash places on the site in a clean and sanitary conditions for ensuring that they do not poses a nuisance or health threat.
- (f) Contractor shall also take such measures and make such provisions as may be necessary or directed by the Engineer to ensure that vermin, mosquito's breeding etc. is prevented or controlled at times.

4. **Drinking water**

The Contractor shall arrange for adequate potable drinking water to his workmen at site of works.

22. **Testing of Works**

- 22.1 The Contractor shall be responsible for all on-site and off-site testing and for all in-situ testing. A programme of proposed tests shall be provided, at least one week in advance of such events. For off-site testing the programme shall be provided at least 2 weeks in advance.
- 22.2 Notification of required Factory testing shall be made in writing to the Engineer, including full details of test requirement, at least 15 days in an advance of the test.
- 22.3 The Contractor shall comply with all requirements described in Employer's Requirements Manufacturing, Installation, Testing and Section 8.1 & 8.3 Chapter-VI [Project Programme Requirements] and [Quality Assurance]

23. **Provisions for Other Contractors**

- 23.1 The Contractor shall construct the Works in full coordination with the Other Contractors and shall comply with the requirements described in this Document.
- 23.2 **Provision of OHE on Viaducts and Bridges**
For the support of Overhead Equipment on bridges and viaducts for which the work is to be done by Other Contractors the Contractor shall furnish full details and properly co-ordinate with them so that this requirement is fully integrated in the design of works of the Other Contractors. This shall be an important design and physical Interface requirement to be performed by the Contractor as given in this Document.

24. **Restoration of Work Areas Disturbed by Construction**

Unless otherwise directed by the Engineer, any areas disturbed by the construction activity, either inside or outside the Right of Way, shall be reinstated to their original state.

25. Safety and Security Miscellaneous

25.1 The works included in this contract are to be carried out close to the running tracks and public utilities, therefore, safety of running trains and the public is paramount. Therefore, all activities undertaken by the Contractor/his Sub-contractors shall ensure safety at all times. The contractor shall comply with the instructions issued by the Railway/ Engineer/Employer from time to time to ensure safe running of trains while carrying out works. The rates quoted by the Contractor shall be deemed to include all expenditure incurred in compliance with the same.

25.2 Before starting any excavation work adjacent to existing track, the contractor shall ensure that necessary permissions has been obtained and required precautions have been taken for doing such work in terms Joint Procedure Order reproduced below:

“Joint procedure order for undertaking digging work in the vicinity of underground signaling, electrical and telecommunication cables”

- A. A number of Engineering works in connection with gauge conversion/doubling/third line are in progress on various railways, which require extensive digging work near the running track, in close vicinity of the working S&T cables carrying vital safety circuits as well as electrical cables feeding the power supply to cabins. ASM room, RRI Cabin, Intermediate Block Huts (IBH) etc. Similarly, S&T organization under open line or construction units under CAO/C, are executing various Signaling and Telecom works requiring digging of earth for laying of cables or casting of foundations for the erection of signal posts etc. RailTel is also executing the work of laying of quad cable and OFC on various Railways as a part of sanctioned works for exclusive use of Railways for carrying voice and data i.e. administrative and control communication, PRS, FOIS etc. or shared by RailTel Corporation of India Ltd. On certain sections digging is also required for laying of electrical cable and casting of foundation for the erection of OHE masts by Electrical Deptt. Generally, these works are executed by contractors employed by these organizations.
- B. However, while carrying out these works in the vicinity of working signaling, telecommunication and electrical cables, at times, cable cuts take place due to JCB machines working along the track or during the digging work being done by contractors carrying out the Civil Engineering Works. Similarly, such cable cuts are also resulting due to works undertaken by S&T or Electrical departments. Such cable faults results in the failure of vital signaling and telecommunication circuits & electrical installations.
- C. Henceforth, the following joint procedure shall be followed by Engineering, Electrical and S&T (and RailTel organization, wherever such works are being done by them) officers of the respective divisions and by the construction organization, while carrying out any digging work near to existing signaling & telecommunication and electrical cables, so that the instances of cable cut due to execution of works, can be controlled and minimized.
1. S&T Department (and RailTel, where they have laid the cables) and Electrical department shall provide a detailed cable route plan showing exact location of cable at

an interval of 200m or wherever there is change in alignment so that the same is located easily by the Engineering official/contractor. In addition, S&T department and Electrical department shall also provide cable markers along the alignment of the cable. These cable route plans shall be made available to the Sr.DEN/DEN or Dy.CE/C, as the case may be, by Sr. DSTE/DSTE or Sr. DEE/DEE of the divisions or Dy.CSTE/C or Dy.CEE/C within 15 days in duplicate. Sr.DEN/DEN or Dy.CE/C will send copies to their field unit i.e. AEN/SE/P.Way & Works.

2. Before taking up any digging activity on a particular work by any agency, Sr.DSTE/DSTE or Sr.DEE/DEE of the section shall be approached in writing by the concerned Engg. or S&T or Electrical officer for permitting to undertake the work. Sr.DSTE/DSTE or Sr.DEE/DEE, after ensuring that the concerned executing agencies including the contractor have fully understood the S&T and Electrical cable route plan shall permit the work in writing within 7 days of the request by concerned department.
3. After getting the permission from S&T or Electrical department as the case may be, the relevant portion of the cable route plan shall be attached to the letter through which permission is issued to the contractor by concerned Engg. official for commencement or work and ensuring that the contractors have fully understood the cable route plan and precautions to be taken to prevent damage to the underground cables. The contractor shall be asked to study the cable plan and follow it meticulously to ensure that the safety of the cable is not endangered. Such a provision, including any penalty for default, should form part of agreement also. It is advisable that a suitable post of SE/Sig or SE/Tele or SE/Electrical(TRD or G) shall be created chargeable to the estimates of doubling/gauge conversion, who can help Engg. agencies in the execution of the work. However basic responsibility will be of the department executing the work and the Contractor. Creation of posts is not mandatory.
4. The SE/P.Way or SE/Works shall pass on the information to the concerned SE/Sig SE/Tele or SE/Electrical(TRD or G) about the works being taken up by the contractors in their sections at least 3 days in advance of the day of the work. In addition Engineering control shall also be informed by SE/P.Way or SE/Works, who in turn shall pass on the information to the test room/network operation centre of RailTel/TPC/Electrical control.
5. On receiving the above information, SE/Sig or SE/Tele or SE/Electrical (TRD or G) shall visit the site on or before the date of taking up the work and issue permission to the contractor to commence the work after checking that adequate precautions have been taken to avoid the damage to the cables. The permission shall be granted within 3 days of submission of such requests.
6. The name of the contractor, his contact telephone number, the nature of the work shall be notified in the Engineering control as soon as the concerned Engineering officials issue the letter authorizing commencement of work to the contractor. Test room shall be given copies. Test room shall collect any further details from the Engineering

Control and shall pass it on to S&T/RailTel & Electrical officials regularly. In case the supervisors of concerned departments do not turn up on the day as advised in terms of para 4 and 5 above, the works of contractor should not be stopped on this account.

7. In case of works being taken up by the State Government, National Highway Authority etc., the details of the permission given i.e. the nature the work, kilometer etc. be given to the Engineering control including the contact person's number so that the work can be done in a planned manner. The permission letter shall indicate the contact numbers of Test room/network Operating Centre of RailTel/TPC/Elect. Control.
8. Where the nature of the work taken up by the Engineering department is such that the OFC or other S&T cables or Electrical cables is to be shifted and relocated, notice of minimum one week shall be given so that the Division/RailTel/Construction can plan the works properly for shifting. Such shifting works shall in addition, for security and integrity of the cables, be supervised by S&T supervisors/RailTel supervisors/Electrical Supervisors.
9. The concerned SE/P.Way/SE/Works/SE/Sig/SE/Tele/SE/Electrical (TRD or G) or RailTel supervisors supervising the work of the contractor shall ensure that the existing emergency sockets are not damaged in view of their importance in providing communication during accident/emergency.
10. In case of minor nature of works where shifting of cable is not required, in order to prevent damage to the cable, the Engineering contractor shall take out the S&T or optical fibre cable or Electrical cable carefully from the trench and place it properly alongside at a safe location before starting the earthwork under the supervision of SE/Sig or SE/Tele or SE/Electrical(TRD or G). The cable shall be reburied soon after completion of excavation with proper care including placement of the brick over the cable under the supervision of S&T or Electrical supervisors. However, the work will be charged to the concerned engineering works. The responsibility for ensuring availability of SE (Signal), SE (Electrical) as per para 4 and 5 above lies with the respective department. The contractor will go ahead with the shifting of cables as per the program decided and he will not be held responsible for any cable cut.
11. In all the sections where major project are to be taken up/going on RailTel/S&T department shall deploy their official to take preventive/corrective action at site of work. As regards Electrical Department, the official may be deputed on need basis.
12. No new OFC or quad cable shall be laid close to existing track. It shall be laid close to the Railway boundary on one side of the Railway track to the extent possible to avoid any interference with the future works (doubling etc.). It shall be ensured in the new works of cable laying that the cable route is properly identified with electronic or concrete markers. Wherever multiple cables are laid in a trench, RFID markers may be provided for easy identification of the cable. Henceforth, wherever cable laying is planned, before undertaking the cable laying work, the cable route plan of the same

shall be prepared by the Dy.CSTE/A or Dy.CEE/C and shall be got approved from the concerned Sr. DSTE/DSTE or Sr.DEE/DEE and also from the concerned Dy. CE/C for new lines and from the concerned Sr.DEN for all other projects including GC etc., to avoid possible damages in future. Such approvals shall be granted within 15 days of the submission of the request.

13. The works of excavating the trench and laying of the cable should proceed in quick succession, leaving a minimum time between the two activities.
14. In case damage caused to OFC/Quad cable or Electrical cable during execution of the work, the contractor is liable to pay a penalty for damaging the cable. Penalty shall not be levied in case of the following: -
 - i). Detailed cable route plan as per clause C-1 not provided by concerned department or cable is not protected as per laid down procedures.
 - ii). The alignment of the cable does not tally with the information provided to the contractor.
 - iii). The cable depth is found to be less than 800 mm from normal ground level.
 - iv). No representative of S&T department/RailTel was available at site guarding the cables on the fixed pre-determined date and time.
15. Penalty to be imposed for damages to cable shall be as under: -

Cable damaged	Penalty per location
Only Quad cable or Signaling cable	Rs.1.0 Lakh
Only OFC	Rs.1.25 Lakh
Both OFC & Quad	Rs.1.5 Lakh
Electrical Cable	Rs.1.0 Lakh

Necessary debit in this regard shall be raised on the department undertaking the work who shall in turn levy the penalty on the defaulting contractor. S&T department shall raise the debits in case of damage to OFC or Quad or Signaling cable and Electrical department shall raise the debits in case of damage to Electrical cable.

16. Railways will not lodge FIR with RPF in case of works being executed by authorized contractors of Railways who have been duly permitted to execute the works in accordance with this JPO. Joint note by the supervisors of the concerned department shall be prepared and the responsibility of the cable cut should be decided without involving RPF. The joint note deciding the fact whether the contractor should be penalized shall be completed in a day's time from the occurrence of cable cut. In all other cases, when the cable is cut by an agency that was not permitted to execute any work, FIR should be lodged with RPF.

17. While giving permission for taking up the works, concerned departments may note that earthwork by engineering contractors will normally be done by machines except in a few isolated locations where the quantity of earth work is very less.
18. Railways shall make necessary correction in their future contract so that this JPO can also be enforced contractually.
19. In case of damages to OFC, RailTel should be paid 5/6th of the penalty recovered. RailTel shall raise demands on the S&T department in this regard.
20. All types of signaling & OHE bonds i.e. rail bond, cross bond and structure bond shall be restored by the contractor with a view to keep rail voltage low to ensure safety of personnel.
21. Above joint circular shall be applicable for construction as well as open line organization of Engineering, S&T and Electrical.
22. S&T cable and electrical cable route plan should be prepared by the concerned S&T and Electrical officers respectively and got approved as stipulated in para-C-12 before undertaking the work. The completion cable route plan should be finalized block section by block section as soon as the work is completed.
23. All cable laying works shall be executed as per laid down technical specifications, such as protection measures/protective cover, compaction of refilled material etc

25.3 Working near running line

- a) The contractor shall not allow any road vehicle belonging to him or his suppliers etc. to ply in railway land next to the running line. If for execution of certain works viz. earth work for parallel railway line and supply of ballast for new or existing rail line, gauge conversion etc, road vehicles are necessary to be used in railway land next to the railway line, the contractor shall apply to the Engineer for permission giving the type & no. of individual vehicles, names & license particulars of the drivers, location, duration & timings for such work/movement. The Railways/Employer/ Engineer or his authorized representative will personally counsel, examine & certify, the road vehicle drivers, contractor's flag men & supervisor and will give written permission giving names of road vehicle drivers, contractor's flag men and supervisor to be deployed on the work, location, period and timing of the work. This permission will be subject to the following obligatory conditions:
- b) Road vehicles can ply along the track after suitable cordoning of track with minimum distance of 6 meters from the centre of the nearest track. For working of machinery close to the running tracks or plying of road vehicles during night hours, the contractor shall apply to the Engineer in writing for permission, duly indicating the site details in a neat sketch and safety measures proposed to be taken. Subject to the approval of concerned Railway authorities, the Engineer or his authorised representative will communicate permission to the

contractor/contractor's representative. The contractor and his men shall strictly adhere to the instructions given along with such permissions.

- c) Nominated vehicles and drivers shall be utilized for work in the presence of at least one flag man and one supervisor certified for such work. In order to monitor the activities during night hours, additional staff may have to be posted based on the need of the individual site.
- d) The Contractor's machinery, equipment and vehicles shall normally operate 6 m clear of track. Any movement/work at less than 6m and upto a minimum of 3.5m clear of track centre, shall be carried out only in the presence of a person (including any railway employee) authorized by the Engineer. No part of the road vehicle shall be allowed at less than 3.5m from track centre. Cost of such railway employee shall be borne by the Employer.
- e) The Contractor's machinery and equipment like Cranes, Flash Butt Welders, Ballasting machinery, Compactors, Track Laying Systems etc., are required to operate close to the existing line carrying traffic. Contractor is fully responsible for operating this machinery without endangering the safety of the running line and traffic.
- f) **Safety Fencing:**
 - I. Before commencing any work close to the running track, the Contractor shall provide safety fencing and obtain the specific permission of Engineer to commence the work in that stretch.
 - II. The fencing shall be for a height of 1.5 meters with wooden/Casurina balli posts of length 2.1 m at 3 m centre to centre spacing as per relevant BOQ item.
 - III. The Contractor shall maintain the safety fencing in good working condition throughout the period till the work in a given stretch is completed. He can remove the fencing after getting the approval of Engineer. The fencing material will be the property of the Contractor. Serviceable materials obtained from the released fencing can be re-used for providing fencing in subsequent stretches.
 - IV. The Contractor will be paid for providing safety fencing along the track as per the relevant item in the BOQ.

25.4 The contractor's special attention is drawn to Para 826 of Indian Railways Permanent Way Manual introduced under Advance Correction Slip no. 69 dated 23.05.2001, reproduced below which should invariably be complied with.

“826 Safe working of Contractors -- A large number of men and machinery are deployed by the contractors for track renewals, gauge conversions, doublings, bridge rebuilding etc. It is therefore essential that adequate safety measures are taken for safety of the trains as well as the work force. The following measures should invariably be adopted:

- a) The contractor shall not start any work without the presence of Railway supervisor at site.
- b) Wherever the road vehicles and/or machinery are required to work in the close vicinity of railway line, the work shall be so carried out that there is no infringement to the railway's schedule of dimensions. For this purpose the area where road vehicles and/or Machinery are required to ply, shall be demarcated and acknowledged by the contractor. Special care shall be taken for turning/reversal of road vehicles/machinery without infringing the running track. Barricading shall be provided wherever justified and feasible as per site conditions.
- c) The "look out and whistle" caution orders shall be issued to the trains and speed restrictions imposed where considered necessary. Suitable flag men/detonators shall be provided where necessary for protection of trains.
- d) The supervisors/workmen should be counseled about safety measures. A competency certificate to the contractor's supervisor as per proforma annexed shall be issued by Engineer which will be valid only for the work for which it has been issued.
- e) The unloaded ballast/rails/sleepers/other P. Way materials after unloading along track should be kept clear off moving dimensions and stacked as per the specified heights and distance from the running track.
- f) Supplementary site specific instructions, wherever considered necessary, shall be issued by the Engineer.

COMPETENCY CERTIFICATE

"Certified that Shri _____ P. Way supervisor of M/S _____ has been examined regarding P. Way working on _____ work. His knowledge has been found satisfactory and he is capable of supervising the work safely.

ASSISTANT

ENGINEER"

- 25.5** The work of formation in banks and cuttings throughout the length of doubling is adjacent to track under running traffic. Many of the bridges on the proposed double line are to be constructed either as extensions or just adjacent to the existing bridges under running traffic. The work of Installation of Track throughout the length of doubling is adjacent to track under running traffic. The work of Installation of Track and Signals in the Station yards including alterations to the existing Track and Signals has to be done adjacent to or in replacement of the existing Track and Signals which are under running traffic. The contractor shall ensure that the safety of the running lines and running traffic is not endangered, because of his work.

25.6 Any traffic/traction blocks, temporary speed restrictions and caution orders required in this connection shall also be got sanctioned from the Railway authorities well in advance, through the Engineer. The Railways may sanction the same for specific sites within the overall recovery time available in the Railway's time table. The contractor shall have to schedule his programme according to the convenience of the Railways. No claim from the contractor for any delay/inconvenience/loss on this account shall be entertained by the Employer.

25.7 The contractor shall provide at site at his own cost, all protection measures including exhibition and lighting of all Temporary Engineering Signals as per Railway rules, instructions and norms. All lights provided by the contractor shall be screened so as not to interfere with any signal light on the Railways or with any traffic or signal lights of any local or other authority.

25.8 Ancillary and Temporary works

- a) The Contractor's proposals for erection of all ancillary and temporary works shall be in conformity with the proposals submitted along with the tender and modifications thereto as approved by the Engineer.
- b) The Contractor shall submit drawings, supporting design calculations where called for by the Engineer and other relevant details of all such works to the Engineer for approval at least one month before he desires to commence such works. Approval by the Engineer of any such proposal shall not relieve the contractor of his responsibility for the sufficiency of such works.
- c) The contractor shall, at his own cost, design and provide any temporary arrangements including relieving/service girders required in connection with the above said works and remove the same, when no longer required. These arrangements shall conform to Railway norms. The contractor shall obtain all necessary approvals and sanctions of the concerned Railway authorities including Commissioner of Railway Safety through the Engineer in advance and well in time.
- d) The contractor shall ensure and be entirely responsible for proper design, fabrication, provision and upkeep of all temporary arrangements and all associated activities so as not to endanger safety of any assets, running track, traffic and traveling public and for following all extent instructions, norms, practice and procedures laid down by Railway authorities in this respect, which may be ascertained from the Railways through the Engineer.
- e) If required, Railways may, in order to ensure the safety of the running track, post at site Regular Railway staff to watch the efficacy and safety of temporary arrangements and protection measures round the clock for the period the same exist in the running line and till the running line is restored back to normal. Railways may also supervise the insertion, maintenance and removal of the temporary arrangements. The cost of such staff shall be borne by the Employer.

- f) Notwithstanding the above, the contractor shall not, however, be relieved of his responsibility and obligation as aforesaid.
- g) The contractor shall bear the cost of complying with all safety requirements. No extra payment will be made for complying with the safety provisions under this chapter and the cost of all such elements to meet the safety requirements shall be deemed to be included in the Bill of Quantities.

25.9 The contractor remains fully responsible for ensuring safety. In case of any accident, the Contractor shall bear cost of all damages to his equipment and men and also damages to Railway and its passengers.

25.10 Suitable barricading to forewarn road vehicle driver shall be provided by the contractor. The luminous tape, strung on bamboo or steel poles can be considered for such barricading. Barricading arrangement should be got approved by the Engineer.

25.11 Indemnity by Contractor

The Contractor shall indemnify and save harmless the Railway/Employer/Engineer from and against all actions, suit proceedings, losses, costs, damages, claims, and demands of every nature and description brought or recovered against the Railways/ Employer/Engineer by reason of any act or omission of the contractor, his agents or employees, in the execution of the works or in his guarding the same. All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to the actual loss or damage sustained, and whether or not any damage shall have been sustained.

25.12 Damage to Railway Property or Life or Private Property

The contractor shall be responsible for all risks to the works and for the trespass and shall make good at his own expense all loss or damage whether to the works themselves or to any other property of the Railway or the lives of persons or property of others from whatsoever cause in connection with the works until they are taken over by the Employer and this although all reasonable and proper precautions may have been taken by the Contractor, and in case the Railway/Employer/Engineer shall be called upon to make good any costs, loss or damages, or to pay any compensation, including that payable under the provisions of Workmen's compensation act or any statutory amendments thereof to any person or persons sustaining damages as aforesaid, by reason of any act, or any negligence or any omissions on the part of the contractor, the amount of any costs or charges including costs and charges in connection with legal proceedings, which the Railway/Employer/Engineer may incur in reference thereto, shall be charged to the contractor. The Railway/Employer/Engineer shall have the power and right to pay or to defend or compromise any claim of threatened legal proceedings or in anticipation of legal proceedings being instituted consequent on the action or default of the contractor, to take such steps as may be considered necessary or desirable to ward off or mitigate the effect of such proceedings, charging to Contractor, as aforesaid, any sum or sums of money

which may be paid and any expenses whether for reinstatement or otherwise which may be incurred and the propriety of any such payment, defence or compromise, and the incurring of any such expense shall not be called in question by the Contractor.

25.13 Safety of Public

- i. The Contractor shall be responsible to take all precautions to ensure the safety of the Public whether on Public or Railway property and shall post such look out men as may in the opinion of the Engineer be required to comply with regulations pertaining to the work.
- ii. The Contractor shall provide effective barricading using G.I. corrugated sheets around foundation pits, trenches, erection sites, demolition sites etc., to prevent accidents and injuries to the public. He shall erect barricading duly leaving safe passage for the movement of the public as per the directions of Engineer.
- iii. No payment will be made for providing such barricading and the rates quoted by the Contractor shall be inclusive of such safety measures.

25.14 Reporting of Accidents

The Contractor shall report to the Engineer details of any accidents as soon as possible after its occurrence. In the case of any fatality or serious accident, the Contractor shall, in addition, notify the Engineer and the Employer immediately by the quickest available means.

25.15 Life-saving Appliances and First-aid Equipment: The Contractor shall provide and maintain upon the Works sufficient, proper and efficient life-saving appliances and first-aid equipment to the approval of the Engineer and in accordance with the requirements of ILO Convention No. 62. The appliances and equipment shall be available for use at all time

25.16 Security Measure

- a) Security arrangements for the work shall be in accordance with general requirements and the contractor shall conform to such requirements and shall be held responsible for the action or inaction on the part of his staff, employees and the staff and employees of his subcontractors.
- b) Contractor's as well as Sub Contractor's employees and representatives shall wear identification Badges (cards), uniforms, helmets, gum boots and other safety/protection gadgets/accessories provided by the Contractor. Badges shall identify the Contractor and show the employee's name and number and shall be worn at all times while at site.
- c) All vehicles used by the contractor shall be clearly marked with the Contractor's name or identification mark.
- d) The contractor shall be responsible for security of works for the duration of the contract and shall provide and maintain continuously adequate security personnel to fulfill these

obligations. The requirements of security measures shall include, but not be limited to, maintenance of Law and Order at site, provision of all lighting, guard, flagmen, and all other measures necessary for protection of works within the colonies, camps and elsewhere at site, all materials delivered to the site and all persons employed in connection with the works continuously through out working and non-working periods including nights, Sundays and holidays, for the duration of the contract. However, at work sites in close proximity of traffic corridors where public and traffic are likely to come close to the work area, suitable barricading as proposed by contractor and approved by Engineer shall be provided.

- e) No separate payment will be made for providing security measures and will be deemed to be included in the rates quoted by the contractor.

Section-7: SAFETY, HEALTH AND ENVIRONMENT (SHE) REQUIREMENT

- Section 7.1: SHE Framework
- Section 7.2: SHE Management
- Section 7.3: Labour Protection
- Section 7.4: Safety
- Section 7.5: Occupational Health and Welfare
- Section 7.6: Environmental and Social Management
- Section 7.7: Penalty and Award

Section 7.1: SHE Framework**1 GENERAL**

- 1.1 The SHE requirements contain two major items: environmental and social protection; and accident prevention and health promotion for all persons involved in and affected by the Works under this contract. Measures relating to the SHE requirements shall be taken by the Contractor in accordance with the requirements detailed in the Clauses herein. The clauses hereunder set out the Employer's requirements regarding the maintenance of human health and safety, and protection of the natural and social environment, during design and implementation of the Works, until completion of the Contract.
- 1.2 First, under the SHE requirements, the Contractor shall establish measures to carry out his design and construction process to the highest standards of environmental and social practices and to comply with all relevant Indian environmental and social laws, standards, codes and regulations. The Contractor shall incorporate the principles of good environmental practice and minimizing negative environmental and social impacts into the Works contained in the Contract.
- 1.3 Second, the Contractor shall at all times be solely responsible for maintaining the safety and health of all his employees and of the general public whilst exposed to construction activities whether on or off-site. The Contractor shall take reasonable precautions to maintain the safety and health of all his employees during working hours in the Work Areas and during other hours in his employee's accommodation camps.

2 OBLIGATIONS**2.1 Scope**

- 2.1.1 The Contractor shall be solely and completely responsible for environmental and social impacts induced by the Works under consideration/investigation, design and construction, and also responsible for safety and health conditions in the Work Area, including the safety of all persons involved in and affected by the Works, until the completion of the Contract. These requirements shall not be limited to normal business hours or other time constraints, nor be reduced or diminished in any way because the Contractor is not given sole occupation of the Work Area after the possession of the Site and/or legitimate possession of the Work Areas outside the Right of Way (ROW) such as Contractor's Borrow Pits and/or Quarries.

2.2 Management Plans

- 2.2.1 The Contractor shall formulate a SHE Policy and submit it within a period of 28 days after the Commencement Date. He shall obtain approval from Director General (DG) of Ministry of Labour, Govt. of India within a period of 42 days of Engineer's No-objection of the Policy. He shall immediately thereafter, arrange to display it at conspicuous places at work sites in Hindi and a local language understood by the majority of construction workers.
- 2.2.2 Within 42 days after the commencement date, the Contractor shall submit a detailed and comprehensive SHE Plan. The SHE Plan shall include detailed policies, procedures and regulations which, when implemented, will ensure compliance of the contract provisions as specified in Attachment 1.
- 2.2.3 As to environmental and social protection, the following plans shall be supplemented to the SHE Plan.
- (1) Environmental and Social Management Plan (ESMP): The Contractor shall prepare an ESMP setting out in detail how he proposes to manage and minimize the environmental and social impacts of his activities throughout Design and Construction Phases until the completion of the Contract. The Contractor shall submit an ESMP for consent by the Engineer within 42 days after the Commencement Date. The ESMP shall have the content and format specified in Attachment 2. The Contractor shall amend and improve the ESMP addressing comments made by the Engineer and submit final ESMP within 28 days of the receipt of comments. Following receipt of the Engineer's written notice of "no objection", the plan will become the Contractor's ESMP with which the Contractor shall accomplish one of the obligations as required herein.
 - (2) Environmental and Social Monitoring Plan (ESMoP): The Contractor shall prepare an ESMoP setting out in detail how he proposes to monitor in order to: ensure that all specified mitigation measures that are the Contractor's responsibility are implemented; that the measures protect the environment as intended; and that the Contractor complies with all relevant legislation and the conditions of any environmental consents which is required to obtain. The ESMoP shall have the content and format specified in Attachment 3 of Specifications.
- 2.2.4 As to accident prevention, the following plans shall be supplemented to the SHE Plan.
- (1) Safety and Health Plan (SHP): The Contractor shall prepare a SHP to effectively implement the preventive measures taking into account envisaged conditions, situations, and particular activities of the Works which may induce accidents. Then the Contractor shall plan measures to be implemented in all Work Areas in various construction stages. The Contractor is responsible for incorporating the accident prevention measures against anticipated dangerous occurrences into the SHE activities to enable to efficiently carry out the measures in a practical manner. The SHP shall have the content specified in Attachment 4.
 - (2) Safety and Health Monitoring Plan (SHMoP): The Contractor shall prepare a SHMoP setting out in detail incompliance with the relevant clauses and paragraphs hereinafter

relevant to the SHE management.

2.3 INSPECTION AND AUDIT

2.3.1 The Contractor shall audit all of the activities described in his ESMP and ESMoP, and SP&P and SMO P at monthly intervals (as part of Monthly SHE Audit) or as otherwise required by the Engineer and shall keep appropriate records of this activity.

2.4 ORGANIZATION

2.4.1 The Contractor shall provide and maintain an organizational structure which is comprised of a team referred to as the Environmental Team being in charge of the environmental and social protection and a team referred to as the Safety and Health Team being in charge of the accident prevention and health promotion to effectively implement activities to fulfil the obligations as described hereinbefore.

2.4.2 The Contractor shall within 42 days after the Commencement Date nominate a fully qualified and experienced, SHE Director as having overall responsibility for SHE management. The SHE Director is responsible for directing and coordinating multiple disciplines in the Contractor's organization including the Environmental Team, and the Safety and Health Team as being in the SHE organization. The Contractor shall ensure that the Contractor's representatives shall be responsible and directly accountable to the SHE Director in all the concerned matters. The Contractor shall appoint SHE management officers and personnel in his Environmental Team and his Safety and Health Team. These appointments shall be subject to a statement of "no objection" by the Engineer.

2.4.3 Within 42 days after the Commencement Date, the Contractor shall appoint a suitably qualified and experienced full time Chief Environmental Officer (CEO) who will be responsible for day-to-day environmental and social management, supervision and monitoring in and outside the Work Area, and for implementing all aspects of the Contractor's ESMP and ESMoP. The CEO will have authority to stop construction works if environmental non-compliance is observed. The Contractor shall also appoint at least one Senior Environment Officer (SEO) at each site, who has delegated responsibility for environmental and social management on each shift at that site. The SEO shall be assisted by Environment Officers (EO) working under his direction as necessary. Environmental affairs include social issues, and the ESMP shall also identify a Community Liaison Officer (CLO) who will deal with community relations and liaise on behalf of the Contractor with people who may be affected by the construction process.

2.4.4 Within 42 days after the Commencement Date the Contractor shall also appoint a full time Chief Accident Prevention Officer (CAPO) who will be in charge of all matters concerning health and safety in relation to the Works. The CAPO shall be suitably qualified and experienced. His minimum qualifications shall be as per provisions contained in Building and Other Construction Workers' (Regulation of Employment and Conditions of Service) Central Rules, 1998. The CAPO shall be authorized to initiate accident prevention measures and monitor the workplace conditions in these respects. The Contractor shall also appoint at least one Senior Accident Prevention Officer (SAPO) at each site, who has delegated responsibility for the maintenance of safety and health on each shift at that site. The SAPO shall be assisted by Safety and Health

Officers (SHO) working under his direction as necessary.

- 2.4.5 In addition to the aforementioned location-based staffing, the Contractor shall provide the following function-based staffing, including but be not limited to:
- Occupational Health Officer(s) with Nursing Assistants for administration and operation of the Occupational Health Centre (First Aid Station);
 - Senior Traffic Engineer(s) for establishing the Traffic Management Plan and implementing/monitoring the Plan;
 - Senior SHE (Electrical) Engineer(s) for conducting monthly Electrical Safety Audit
 - House Keeping and Site Maintenance Squads for operating and maintaining the Temporary Facilities for the Contractor's use and for the Employer's and the Engineer's use.
 - Labour Welfare Officer(s) with supporting staff for overall general administration for SHE management.
- 2.4.6 The Contractor shall not remove the appointed the aforementioned officers without the prior written consent of the Engineer, and any replacement shall be nominated by the Contractor at the same time that the consent is sought.

2.5 CONDITIONS OF PROVISIONS

- 2.5.1 The provisions listed herein regarding environmental and social protection, and safety and health promotion shall apply to and be binding upon the Contractor, his employees, and any sub-contractors and their employees, for any activities related to the construction works whether in and outside the Work Area. The Contractor shall ensure that proper and adequate provisions to this end are included in all sub-contracts placed by him.
- 2.5.2 These provisions may be overridden in the event of an extreme emergency, where works or actions are necessary in order to save life or property, or to maintain the safety of the Works.
- 2.5.3 The Contractor shall also routinely observe and monitor the environmental and social impacts of the ongoing construction activities, and safety and health conditions of all his employees and of the general public whilst exposed to construction activities whether on or off-site. The Contractor shall take any further action as may be deemed necessary by the Engineer to mitigate and/or to prevent any additional unexpected impacts and/or results that may occur.
- 2.5.4 The Engineer will inspect the Contractor's environmental and social, and safety and health performances in the course of his normal supervision activities, and the Contractor will cooperate by providing access to the Work Area, and such sites, equipment, staff, records, etc. as may be requested by the Engineer either in writing or verbally.

Section 7.2: SHE Management

3 GENERAL

3.1 Scope

3.1.1 This document defines the principal requirements of the Employer on SHE associated with the Contactor / sub-contractor and any other agency to be practiced at construction worksites at all time.

3.2 Definition / Languages

3.2.1 In this document:

- i) BOCWA means Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996
- ii) BOCWR means Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Central Rules, 1998

3.3 Application of This Document

3.3.1 This document applies to all aspects of the Contactor's scope of work, including all aspects conducted by sub-contractors and all other agencies. There shall be no activity associated to the contract, which is exempted from the purview of this document.

3.4 Purpose of This Document

3.4.1 The objective of this document is to ensure that adequate precautions are taken to avoid accidents, occupational illness and harmful effects on the environment during construction.

3.4.2 This document:

- i) Describes SHE interfaces between the Employer/Engineer and the Contractor.
- ii) Details the processes by which the Contactor shall manage SHE issues while carrying out the works under the Contract.

3.4.3 These requirements shall be read together with OHSAS 18001-1999, Occupational Health and Safety Management System and ISO 14001: 2004 Environmental Management Systems.

3.5 'SHE' Targets and Goals

- i) The SHE targets, goals and aim for the Works are to achieve:
- ii) Zero total recordable injuries
- iii) Zero reportable environmental incidents
- iv) Induction of all personnel in accordance with the approved Contactor's SHE Plan
- v) Total compliance of conducting inspections and audits as per approved SHE Plan
- vi) 100% incident recording and reporting
- vii) 100% adherence of usage of appropriate personal protective equipments (PPEs) at work
- viii) Executing construction work with least disturbance to the environment, adjoining road users

and traffic.

4 COMPLIANCE

4.1 Employer's Policy on Labour Protection

4.1.1 The Contractor shall implement the Employer's Policy on Labour Protection for carrying out all the construction works under this contract whether directly or through a sub-contractor or through any other agency.

4.2 Indian Statutory Requirements

4.2.1 The Contractor shall develop a thorough understanding of BOCWA and BOCWR, not only to satisfy the Inspectors' perspective but the use of legislation as the strong tool for effective SHE management at construction worksites. The Contractor is strongly advised to practice the principle of voluntary compliance.

4.2.2 In order to facilitate the Contractor for better understanding on the various provisions of the above Act and Rules, a tabulated information highlighting the sections/rules referring to the corresponding registration of contractors, maintenance of registers and records, hours of work and wages, welfare, medical facilities and safety requirements are given in Attachment 6. It is an indicative one and not a limiting list.

4.2.3 The construction works shall be undertaken in accordance with all applicable legislation and Indian statutory requirements listed below but not limiting to:

- (1) Indian Electricity Act 2003 and Rules 1956
- (2) National Building Code, 2005
- (3) Factories Act, 1948 and concerned State Govt Factories Rules.
- (4) Motor Vehicles Act as amended in 1994, The Central Motor Vehicles Rules, 1989, and Motor Vehicle Rules of the concerned State Government as amended from time to time
- (5) Indian Road Congress Code IRC: SP: 55-2001 'Guidelines on Safety in Road Construction Zones.
- (6) The Petroleum Act, 1934 and Rules 1976
- (7) Gas Cylinder Rules, 2003
- (8) Indian Explosives Act. 1884, along with the Explosives substance Act 1908 and the Explosives Rules 1983
- (9) The (Indian) Boilers Act, 1923
- (10) The Public Liability Insurance Act 1991 and Rules 1991
- (11) Minimum Wages Act, 1948 and Rules 1950
- (12) Contract Labour (Regulation and Abolition) Act, 1970 and Rules 1971
- (13) Child Labour (Prohibitions & Regulations) Act, 1986 and Rules 1950
- (14) Environment Protection Act, 1986 and Rules 1986

- (15) Indian Wildlife (Protection) Act 1972, and its subsequent amendments
- (16) Forest (conservation) Act 1980 and rules there under
- (17) Air (Prevention and control of Pollution) Act, 1981
- (18) Water (Prevention and Control of Pollution) Act, 1974
- (19) The Noise Pollution (Regulation & Control) Rules, 2000
- (20) Notification on Control of Noise from Diesel Generator (DG) sets, 2002
- (21) Recycled Plastics Manufacture and Usage Rules 1999
- (22) Ground Water (Regulation, Development and Management) Rules 2007
- (23) Manufacture, Storage & Import of Hazardous Chemicals Rules, 1989
- (24) The Hazardous Wastes (Management, Handling and Trans-boundary Movement) Rules 2008 and its amendment
- (25) Chemical Accidents (Emergency Planning, Preparedness and Response) Rules 1996
- (26) Batteries (Management and Handling) Rules
- (27) Fly ash utilization notification, September 1999 as amended in August 2003
- (28) Payment of Wages Act, 1936;
- (29) Equal Remuneration Act, 1976;
- (30) Employees Provident Fund and Miscellaneous
- (31) Provisions Act, 1952;
- (32) Payment of Gratuity Act, 1972;
- (33) Employees State Insurance Act, 1948;
- (34) Payment Of Bonus Act, 1965;
- (35) Maternity Benefit Act, 1951;
- (36) Industrial Disputes Act, 1947;
- (37) Industrial Employment (Standing Orders) Act, 1946;
- (38) Trade Unions Act, 1926;
- (39) Building and Other Construction Workers (Regulation of Employment of Service) Act of 1996;
- (40) Inter State Migrant Workmen's (Regulation of Employment and Conditions of Service) Act ,1979;
- (41) Workmen Compensation Act. 1923;
- (42) Mines Act, 1952.

4.2.4 Notwithstanding the above Act/Rules, there is nothing in those to exempt the Contractor from the purview of any other Act or Rule in Republic of India for the safety of men and materials.

4.2.5 If the requirements stated in this document are in conflict or inconsistent with the requirements of applicable laws, the more stringent requirements shall apply.

4.3 Contractor's Statutory Obligations

4.3.1 The obligations and requirements for SHE under this Contract are entirely without prejudice to, and do not release the Contractor from his statutory obligations with respect to safety, environment and industrial health.

5 CONTRACTOR SHE POLICY AND PLAN

5.1.1 The Contractor shall prepare, submit, amend and improve his SHE Policy and SHE Plan and get it approved as detailed in Section 7, Chapter VI, Part-I.

5.1.2 The SHE Plan shall include the following but not be restricted to:

- i) A statement of the Contractor's SHE Policy as per Section 39 of BOCWR and bringing out the intent, organization and arrangements for making SHE Policy and Plan effective;
- ii) The name(s) and experience of person(s) within the Contractor's proposed management who shall be responsible for coordinating and monitoring the Contractor's SHE performance;
- iii) The number of SHE staff who shall be employed on the Works, their responsibilities, authority and line of communication with the proposed Contractor's agent;
- iv) A statement of the Contractor's policy and procedures for identifying and estimating hazards, and the measures for addressing the same;
- v) A list of SHE hazards anticipated for this Contract and sufficient information to demonstrate the Contractor's proposals for achieving effective and efficient health and safety procedures;
- vi) A statement on Contractor's approach / policy on sub-standard and unsafe engineering & construction practices and their control;
- vii) A SHE checklist indicating various aspects to be ensured before taking up different activities;
- viii) Arrangement of training of workers, supervisors and other staff along with a description of the SHE training courses and emergency drills which shall be provided by the Contractor, with an outline of the syllabus to be followed;
- ix) Details of the safety equipment which shall be provided by the Contractor, including personal protective equipment (PPE);
- x) A statement of the Contractor's policy and procedures for ensuring that Contractor's Equipment used on the project Site are maintained in a safe condition and are operated in a safe manner;
- xi) A statement of the Contractor's policy and procedures for ensuring that sub-contractors comply with the Contractor's safety plan;
- xii) A statement of the Contractor's disciplinary procedures with respect to SHE related matters;
- xiii) A statement of the Contractor's procedure for reporting and investigating accidents, dangerous occurrences or occupational illnesses;

- xiv) A statement of the Contractor's arrangements for appointment of a SHE Committee, especially in compliance with Clause 39 of BOCWR;
- xv) A statement of the Contractor's arrangements to provide for welfare facilities for his employees including implementation of Employer's Policy on HIV/AIDS Prevention and Control for Workers engaged by Contractors;
- xvi) A statement of the Contractor's arrangements to implement Employer's Policy on Labour Protection;
- xvii) Mockup Drills; and
- xviii) Contractor's Emergency Response Plan.

5.1.3 The Contractor shall, from time to time and as necessary, is required by the Engineer to produce supplements to the SHE Plan such that it is at all times a detailed, comprehensive and contemporaneous statement by the Contractor of his site safety, industrial health and environment obligations, responsibilities, policies and procedures relating to work on a site. Any and all submissions of supplements to the SHE Plan shall be made to the Engineer in accordance with the agreed procedures.

5.1.4 If at any time during the course of execution of the Work, the SHE Plan in the Engineer's opinion, is insufficient or requires revision or modification to ensure the security of the Works and the safety of all workmen/ visitors in the Work Area, the Engineer may instruct the Contractor to revise the SHE Plan and the Contractor shall within 21 days submit the revised plan(s) to the Engineer for review.

5.1.5 Any omissions, inconsistencies and errors in the SHE Plan or the Engineer's acceptance or rejection of the SHE Plan and/or supplements thereto shall be without prejudice to the Contractor's obligations with respect to site safety, industrial health and environment and shall not be an excuse for any failure by the Contractor to adopt proper and recognised safety practices throughout the execution of the Work and also shall not be a reason for extension of completion time of the project.

5.1.6 The Contractor shall adhere to the SHE Plan and shall ensure that all sub-contractors of all tiers require that contracting parties each have a copy of the relevant Site SHE Plan and comply with its provisions.

5.1.7 The details of contents to be covered in the SHE plan are given in Attachment 1.

5.1.8 The Contractor shall also submit a detailed SHE Plan, specific to each site, called hereinafter as the Site SHE Plan, for consent of the Engineer.

5.1.9 The Contractor shall provide all necessary access, assistance and facilities to enable the Engineer to carry out surveillance to verify that the Site SHE Plan is being properly and fully implemented.

6 ROLE OF DESIGN TEAM IN CONTRACTOR'S ORGANIZATION

6.1 Role of Design Team in Safety, Health and Environment

6.1.1 In this design-build Contract, the Contractor has a design Team in his project organization and

the Design Team's primary role includes to minimise the risk to health and safety of those who are going to construct, maintain, clean, repair, dismantle or demolish the structures and others like adjoining road users/general public, who might be affected by the work.

6.2 General Philosophy

6.2.1 When considering health and safety in the Design Team's work, they shall be expected to do what is reasonable at the time the design is prepared. It may be possible for hazards, which cannot be addressed at the feasibility stage to be looked at during detailed design. In deciding what is reasonably practicable, the risk to health and safety produced by a feature of the design has to be weighed against the cost of excluding the feature. The overall design process does not need to be dominated by a concern to avoid all risks during the construction phase and maintenance. However, a judgment has to be made by weighing up one consideration against another so the cost is counted not just in financial terms, but also those of fitness for purpose, aesthetics, buildability or environmental impact. By applying these principles, it may be possible to make decisions at the design stage, which will avoid or reduce risks during construction work. In many cases, the large number of design considerations will allow a number of equally valid design solutions. What is important is the approach to the solutions of design problems. This should involve a proper exercise of judgment, which takes account of health and safety issues.

6.3 Hierarchy of Risk Control

6.3.1 The Design Team shall need, so far as reasonably practicable, to avoid or reduce risks by applying a series of steps known as the hierarchy of risk control or principles of prevention and protection. The steps to be adopted shall include but not limited to the following:

- i) consider if the hazard can be prevented from arising so that the risk can be avoided (e.g. alter the design to avoid the risk);
- ii) if this cannot be achieved, the risk should be combated at source (e.g. ensure the design details of items to be lifted include attachment points for lifting);
- iii) failing this, priority should be given to measures to control the risk that will protect all people;
- iv) only as a last resort should measures to control risk by means of personal protection be assumed (e.g. use of safety harnesses).

6.4 Duty to Provide Health and Safety Risks in the Drawing itself

6.4.1 In case of situations where the Design Team has carried out the design work and concluded that there are risks, which were not reasonably practicable to avoid, detailed information shall be given about the health and safety risks, which remain. This information needs to be included with the design to alert others to the risks, which they cannot reasonably be expected to know. This is essential for the parties who have to use the design information.

6.4.2 If the Design Team's basic design assumptions affect health or safety, or health and safety risks are not obvious from the standard design document, the Design Team shall provide additional information. The information shall include a broad indication of the assumptions about the precautions for dealing with the risks. The information will need to be conveyed in a clear manner; it shall be included on drawings, in written specifications or outline method statements.

The level of detail to be recorded will be determined by the nature of the hazards involved and the associated level of risk.

6.5 Engineer's Consent

- 6.5.1 Every structure shall have its design calculations included in the method statements in addition to health and safety risks. The Engineer shall examine and communicate his consent as per the contract conditions.
- 6.5.2 Any non-standard structures which are very old, corroded, repaired for many times etc. for which no design calculations can be made accurately from any national standards, shall not be allowed to be used at sites even for short duration.

7 CONTRACTOR's SHE ORGANISATION

7.1 Education and Experience

- 7.1.1 The Contractor shall appoint adequate numbers of the required SHE personnel described in this document meeting the statutory requirement and establish the SHE organisation appropriate to the size and complexity of the project.
- 7.1.2 In order to effectively implement the requirements herein and to interact on safety and labour welfare matters with and the statutory authorities enforcing the safety and labour welfare legislations as well as the Engineer, the Contractor shall employ adequate numbers of full time qualified and experienced Labour Welfare Officer.

7.2 Conduct and Competency

- 7.2.1 The conduct and functioning of the contractor SHE personnel shall be monitored by the Engineer. Any default or deficiency shall attract penalty as per details given under penalty clause of this document.

7.3 Engineer's Consent

- 7.3.1 The name, address, educational qualification, work experience and health condition of each personnel deployed for SHE jobs shall be submitted to the Engineer in the format prescribed for the purpose for comments and obtaining his consent well before the start of the work. Only on receipt of consent by the Engineer, these personnel are authorised to work. In case any of the SHE personnel leaves the Contractor the same shall be intimated to the Engineer immediately. The Contractor shall also employ the new personnel as per the aforesaid procedure.

7.4 Responsibility of SHE Personnel

- 7.4.1 For all works carried out by the Contractor and his sub-contractors, the responsibility of ensuring the required SHE manpower lies with the main Contractor only. The minimum required manpower indicated by the Employer shall include the sub-contractors' workers also. It shall be the responsibility of the Contractor to provide required SHE manpower for all the works executed by all his sub-contractors. Necessary conditions shall be included in all sub-contract documents executed by the Contractor.

7.5 Employment Status of SHE Personnel

7.5.1 No contractor shall engage SHE manpower from any outsourcing agencies in which case the effectiveness would be lost. All SHE manpower shall be on the payroll of the main Contractor only and not on the payroll of any sub-contractor or outsourcing manpower agencies, etc. This condition does not apply to positions like traffic marshals who are engaged almost on a daily requirement basis.

7.6 Reporting of SHE Personnel

7.6.1 All SHE personnel in the Environmental Team shall report to the Chief Environmental Officer and all SHE personnel in the Health and Safety Team shall report to the Chief Accident Prevention Officer. These Chief Environmental and Chief Accident Prevention Officers shall report directly to the Contractor's Representative and the Engineer. The Engineer shall monitor adherence to this procedure at all times.

7.7 Inadequate SHE Personnel

7.7.1 In case the Contractor fails to provide the minimum required manpower, or fail to fill up vacancies created within 14 days, the same shall be provided by the Engineer at the Contractor's cost. Any administrative expenses involved to provide the same, like, paper advertisement or manpower consultant charges, etc., shall also be at the cost of the Contractor.

7.8 Prohibition of Performance of Other Duties

7.8.1 No SHE personnel shall be required or permitted to do any work which is unconnected to, inconsistent with or detrimental to the performance of the SHE duties which were stipulated in the SHE Plan and other detailed plans that defined SHE activities as have been submitted to and consented by the Engineer.

7.9 Facilities to be Provided to SHE Personnel

7.9.1 The contractor shall provide all SHE personnel with such facilities, equipment and information that are necessary to enable him to dispatch his duties effectively.

8 CONTRACTOR's SHE COMMITTEE

8.1 General

8.1.1 The Contractor shall form and maintain a committee referred to as the SHE Committee/Site SHE Committee being comprised of the Contractor's Personnel as defined and described in the clauses hereinafter.

8.2 Terms of Reference

8.2.1 The Terms of Reference for the SHE Committee shall be as follows;

- i) To establish company safety policies and practices
- ii) To monitor the adequacy of the Contractor's SHE plan and ensure its implementation
- iii) To review SHE training
- iv) To review the Contractor's monthly SHE reports.

- v) To identify probable causes of accident and unsafe practices in OHE works and to suggest remedial measures.
- vi) To stimulate interest of Employer and workers in safety by organizing safety week, safety competition, talks and film-shows on safety, preparing posters or taking similar other measures as and when required or as necessary.
- vii) To go round the construction site with a view to check unsafe practices and detect unsafe conditions and to recommend remedial measures for their rectifications including first-aid medical and welfare facilities.
- viii) Committee team members should perform a site inspection before every committee meetings and to monitor SHE inspection reports.
- ix) To bring to the notice of the Engineer the hazards associated with use, handling and maintenance of the equipment used during the course of OHE work.
- x) To suggest measures for improving welfare amenities in the construction site and other miscellaneous aspect of safety, health and welfare in OHE work.
- xi) To look into the health hazards associated with handling different types of explosives, chemicals and other construction materials and to suggest remedial measures including personal protective equipment.
- xii) To take punitive action against erring Contractor's agents / engineers at Site who do not heed to the advice on SHE aspects
- xiii) To review the last safety committee meeting minutes and to take action against persons/sub-contractors for non-compliance if any.

8.2.2 Within 14 days of the Commencement Date, the SHE Committee shall be constituted and notification regarding the same shall be communicated to the members and employees.

8.2.3 The SHE Committee meetings shall be conducted at least once in a month with the minimum members listed below:

Chairman	Contractor's Representative
Secretary	SHE Director
Members	<ul style="list-style-type: none"> i) Chief Environmental Officer ii) Chief Accident Prevention Officer iii) Labour Welfare Officer iv) Senior Managers/ Engineers heading different functions v) Sub – contractor's representative vi) Workers' representative
Employer's Representatives	<ul style="list-style-type: none"> i) The Engineer ii) DFCCIL SHE in charge and other representatives

8.2.4 The Site SHE Committee meetings shall be conducted at least once in a week with the minimum members listed below:

Chairman	Contractor's Representative at the site
Secretary	Senior Environmental Officer Senior Accident Prevention Officer
Employer's Representatives	Engineer's representative at the Site
Members	Sub- Contractor's representative Workers' representatives SHE staff

8.3 Other Contractors' Participation

8.3.1 In case of depot, station and other contiguous areas where more than one main contractors are working together, the Engineer shall instruct the other contractors to join for the monthly SHE committee meeting of the Contractor, so as to discuss and decide about the common provision of security, lighting, toilet, drinking water etc. and sharing the maintenance cost of the same etc.

8.3.2 The general principle for sharing the cost shall be based on the contract value of works executed at the contiguous area, the daily average number of workmen employed by each contractor in the contiguous area, or other pertinent criteria if applicable and mutually agreed upon. In case of any disagreement, the Engineer's decision shall be final & binding

8.4 Minimum Time between Two Monthly SHE Committee Meetings

8.4.1 A minimum period of 21 days shall be maintained between any two SHE monthly committee meetings.

8.5 Agenda

8.5.1 The Secretary shall circulate the agenda of the meeting at least three (3) working days in advance of the scheduled date of the meeting to all members.

8.5.2 The agenda should broadly cover the following:

- i) Confirmation of minutes
- ii) Chairman's review/overview of site SHE performance / condition
- iii) Previous month SHE statistics
- iv) Incident and Accident Investigation / dangerous occurrence / near miss report
- v) Site SHE inspection
- vi) Sub-contractors' SHE issues
- vii) Safety presentation by Members
- viii) Report from the Engineer
- ix) Matters arising
- x) Any other business

8.6 Minutes of the Meeting

8.6.1 The minutes of the meeting shall be prepared and sent to all members within 2 working days preferably by mail/fax followed by hardcopy. Safety Committee meeting minutes shall also be displayed in the notice board for wider publicity to all concerned.

8.7 Disciplinary Action

8.7.1 The chairman shall inform the members of any outstanding issues in the meeting and in case of repeated offence/non-compliance by some members or other co/sub-contractors and propose suitable disciplinary action including provisions of monetary penalty as per the relevant contract clauses, the Engineer shall ensure that the same is implemented.

9 ID CARD AND FIRST DAY AT WORK, SHE ORIENTATION TRAINING

9.1.1 The Contractor shall ensure that all personnel working at the site receive an induction SHE training explaining the nature of the work, the hazards that may be encountered during the site work and the particular hazards attached to their own function within the operation.

9.1.2 All Contractor's Personnel shall be issued a photo identity card of size 85mm x 55mm duly signed by the authorized representative of the Contractor before they are engaged for any work.

9.1.3 The Contractor shall also issue a personnel SHE handbook in a language known to the workers, which provides information on SHE and emergency procedures that all personnel involved in the Work are required to know and the need to follow. The Contractor shall ensure that this is distributed and its content introduced to all personnel working in the Work Area.

10 SHE TRAINING

10.1.1 The behaviour of people at all levels of the contractors is critical for SHE performance.

10.1.2 The Contractor shall organise quality SHE training to engage Managers, supervisors and other personnel in behavioural change and improve safety performance.

10.1.3 The Contractor shall analyse the training requirements for all the employees and initiate a training program to demonstrate that all persons employed, including subcontractors, are suitably qualified, competent and fit. This will include:

- i) Detailed Job descriptions for all personnel, to include their specific SHE responsibilities
- ii) Specification of qualifications, competency and training requirements for all personnel
- iii) Assessment and recording of training needs for all personnel, including subcontractors' employees in the workforce, vendor representatives and site visitors
- iv) A system for assessing new hirers e.g. previous training
- v) A means of confirming that the system is effective
- vi) A matrix and schedule of training requirements, covering general, task-specific and SHE-related training, showing the training frequency and interval between refresher courses
- vii) Timely, competent delivery of training courses.

- 10.1.4 The Contractor shall arrange behavioural-based training programmes for all the executives to identify, recognise and eliminate unsafe act and unsafe conditions.
- 10.1.5 The refresher-training programme to all employees shall be conducted once in six months.
- 10.1.6 On-job training by way of toolbox talk shall be conducted to all high-risk workmen everyday.
- 10.1.7 On-the spot practical skill development training on height safety including scaffold & formwork safety, crane safety, welding safety, electrical safety, work adjacent to tracks/ roads and traffic safety for marshals, shall also be conducted to all foremen/ workmen who were associated to the concerned jobs.
- 10.1.8 Daily Safety Oath shall be taken by every employee including workman.
- 10.1.9 All vehicle drivers including hydra operators shall be trained on defensive driving at Automobile Association of Western India or other organisation identified by the Employer. All vehicle drivers shall also undergo refresher training on defensive driving provided by the same institute once in 6 months.
- 10.1.10 In case of failure on the part of the Contractor to provide all the above-mentioned training programs to all employees in time, the same shall be provided by the Employer through accredited agencies if required by formulating a common scheme to all contractors. It is mandatory for the contractors to participate in the common scheme. Any administrative expenses and training fee towards the same shall be at the cost of the Contractor.
- 10.1.11 Mock up drills shall be carried out at a pre-defined intervals and the analyses report submitted to SHE Committee.

11 SHE INSPECTION

11.1 General

- 11.1.1 The Contractor shall evolve and administer a system of conducting SHE inspections and other risk management analysis on a periodical basis.
- 11.1.2 The purpose of SHE inspection is to identify any variation in construction activities and operations, machineries, plant and equipment and processes against the SHE Plan and its supplementary procedures and programs.
- 11.1.3 Following SHE inspections program shall be adopted.
- i) Planned General Inspection
 - ii) Routine Inspection
 - iii) Specific Inspection
 - iv) Other Inspection

11.2 Planned General Inspection

- 11.2.1 Planned General Inspections are performed at predetermined intervals and it usually involves the representation from both Contractor and the Employer/ Engineer.
- 11.2.2 Inspections that will be classified under this inspection program are:

- i) Monthly Contractor and subcontractor's site safety committee Inspection.
- ii) Weekly safety inspection by construction supervisors (Contractors and Sub-contractors).
- iii) Daily safety inspection by the SHE teams (Health and Safety Team and Environmental Team).

11.3 Routine Inspection

11.3.1 Routine Inspections are often referring to the inspection of Work Area, equipment and temporary structures performed by site and equipment operators and temporary structure erectors.

11.3.2 Inspections that will be classified under this inspection program are:

- i) Daily Inspection of plant and equipment by operator
- ii) Weekly Inspection of scaffold by scaffolding supervisor
- iii) Monthly Inspection of electrical hand tools by competent electrical supervisor
- iv) Quarterly Inspection of temporary electrical and mechanical systems by competent supervisor
- v) Half-yearly inspection of lifting machinery, lifting appliances, equipment and gears by Govt. approved competent person.

11.3.3 The list mentioned above is not exhaustive. Contractor may add additional categories. Contractors' site SHE Officers and Managers will ensure that a system of routine inspections are carried out periodically to all plants, equipment, powered tools and any other temporary structures that will pose a hazard to operators and workmen.

11.4 Specific Inspection

11.4.1 Specific Inspections are performed on activities without a predetermined date. Competent supervisors usually perform inspections for ensuring an activity whether it is executed in accordance to a general set of rules; method statement submitted or developed procedures.

11.4.2 The following are examples that will be commonly performed as required on the construction site:

- i) Inspection performed before a heavy lifting operation.
- ii) Inspection performed before and after the entry of person into a confined space.
- iii) Inspection performed before and after a welding and gas cutting operation.
- iv) Inspection of formwork before concreting by formwork erector.
- v) Inspection of temporary earth support systems before and after excavation

11.4.3 The list mentioned above is not exhaustive. The Contractor shall ensure that a competent supervisor inspects all high-risk processes and activities.

11.5 Other Inspection

11.5.1 Other inspections includes the following:

- i) Mandatory Inspections by Labour Department of Government
- ii) Employer's site SHE management team
- iii) Air and noise Quality Monitoring and Inspection

11.5.2 The Contractor shall prepare all required safety inspection checklist for all activity operations and equipment. Checklists will be prepared based on the Indian standards, rules and regulations and Employer's Requirements.

11.5.3 All inspection records and reports will be properly kept and filed for audit purpose. Inspection reports of Planned General Inspection and Routine Inspection shall be used for discussion at SHE Committee Meetings.

11.5.4 The Engineer reserves the right to order the immediate removal and replacement of any item of Contractor's Equipment or Temporary Works which, in his opinion, is unsatisfactory for its purpose or is in an unsafe condition.

12 SHE AUDIT

12.1 General

12.1.1 The purpose and scope of SHE audit is to assess potential risk, liabilities and the degree of compliance of the SHE Plan and its supplementary procedures and programs against applicable and current SHE legislation regulations and requirements of the Employer.

12.1.2 The Contractor's Representative holds the ultimate responsibility in ensuring implementation of SHE audit program during the construction work.

12.2 Monthly Audit Rating Score (MARS)

12.2.1 Monthly Audits will be conducted in accordance with DFCCIL guidelines. The Contractor's senior manager and SHE in-charge should also be invited to attend.

12.2.2 Monthly Audit Rating Score (MARS) will be performed once in a month. A team consisting of Contractor's Representative and the Engineer based on the pre-designed score-rating format will conduct it.

12.2.3 The MARS report will enable the Engineer to evaluate the general compliance by the Contractor with the Conditions of Contract and the Contractor's Site SHE Plan.

12.2.4 The MARS should be conducted at least 7 days prior to the scheduled date of Monthly SHE Committee meeting.

12.2.5 The numerical scoring has been weighed on a 1-10 scale. The audit team will use their observations noted in evaluating the points to be awarded against each of the elements of the audited section. Wherever some topics and sub-topics are not applicable the score rating need not be given. The overall audit ratings shall be achieved by:

$$\text{Overall Audit rating} = \frac{\text{Actual Score Achieved}}{\text{Maximum Possible Score}} \times 100$$

12.2.6 The criticality of the required actions for the respective sections of the Audit will be classified as :

Sl. No.	Score	Description	Action
1	< 60%	Immediate	Require Contractor to rectify within 24 hours
2	< 75%	Improvement Necessary	Contractor rectification within 7 days and confirmed in writing to the Engineer
3	< 90%	Improvement Desirable	Contractor rectification within one month and confirmed in writing to the Engineer

12.2.7 A copy of each Audit Report will be sent to the Engineer, the Employer and to all subcontractors, with whom it will then be discussed in detail at the Monthly SHE Committee Meeting in order to ensure that any corrective actions are agreed upon.

12.3 Monthly Electrical Safety Audit

12.3.1 A team comprising of the Contractor's Senior SHE (Electrical) Engineer and the Engineer shall conduct Electrical Safety Audit monthly covering the following and submit the report to the Engineer and the Employer. A monthly electrical audit format shall be designed by the Contractor with consent of the Engineer for this purpose.

- i) Electrical accidents investigation findings and remedy
- ii) Adequacy of power generation and power requirements
- iii) Power distribution and transmission system in place
- iv) Updated electrical single line diagram showing the current condition of power source and distribution including the IP44 DBs arrangement.
- v) Electrical protection devices - selection, installation and maintenance.
- vi) Earth or ground connection and earth pit maintenance details
- vii) Education and training of electrical personnel undertaken
- viii) Routine electrical inspection details
- ix) Safety Certificate in respect of Contractor's electrical systems and equipment
- x) Electrical maintenance system and register.
- xi) Name plate details of major electrical equipment
- xii) Classified zones in the site, if any.

12.4 External SHE Audit

12.4.1 External SHE audits are to be conducted by external agency appointed by the Employer that are

competent with ISO qualified auditors with prior approval of the Employer.

12.4.2 The audit team shall have a practical understanding of BOCW Act and Rules, statutory requirements on health/medical and welfare of workmen, construction hazards and its prevention and control, traffic management, electrical safety, rigging, safety of construction equipment and environment management.

12.4.3 Audit shall be conducted on quarterly basis as per the guidelines of ISO, ILO, and national standards. Audit report shall also be presented as per the above formats.

12.4.4 The contents and coverage of the external audit shall include the following items SHE management:

- i) Organization
- ii) Communication and Motivation
- iii) Time office
- iv) Inspection
- v) Emergency preparedness
- vi) Budget allocation
- vii) Education and Training
- viii) Work permit system

Technical:

- i) Building and Structure
- ii) Construction operational safety
- iii) Material safety
- iv) Hand tools and Power tools
- v) Electrical system
- vi) Safety Appliances
- vii) Fire prevention and control
- viii) Housekeeping
- ix) Maintenance and Machinery safety
- x) First-aid and Medical Facilities
- xi) Welfare measures
- xii) Environmental and Social Management

12.4.5 Contractor shall make the below listed documents available for the review by the Audit team.

- i) SHE policy
- ii) SHE manual

- iii) SHE Rules and Regulation
- iv) SHE organization chart
- v) Annual SHE objectives / programs
- vi) Accident / near miss statistics and analysis
- vii) SHE Training program / records for all personnel
- viii) Operating manuals and maintenance manual of all equipments
- ix) Safe worthiness certificates of all lifting appliances and gears
- x) Medical fitness record for all personnel
- xi) Risk identification, assessment and control details
- xii) Environmental and social management reports
- xiii) Emergency management records including mock drill

12.4.6 Audit Preparation

- i) Audit team members are required to gather information by observations through interviews and by checks of hardware and documentation.
- ii) Audit team shall prepare checklist to cover all parts based on SHE legislations rules and regulations and the DFCCIL Requirements.
- iii) Audit team members shall verify the facts and findings leading to the identified gaps and weakness.
- iv) Audit leader has overall responsibility for reaching a conclusion.

12.4.7 Audit report shall be prepared and directly sent to the Engineer and Employer within 7 days after conducting the audit with a copy to the Contractor.

12.4.8 The Audit Report shall have the following contents:

- i) Executive summary - based on the finalized checklists as written the findings to the Employer by the audit team members, the audit leader will compile a concise and accurate summary of observations and findings.
- ii) Introduction - this will contain basic information regarding the facilities or organization audited, the specific audit dates (inclusion of those for preparation and post-audit activities).
- iii) Principal positive findings - This will contain the summary of positive aspects as observed by the auditors. It will also contain highlights of those issue, which may warrant dissemination as best practice regarding methodology used or achievement.
- iv) Audit Findings - All audit findings as detailed in the audit checklists shall be grouped together as priority 1 and 2 as detailed below in a separate listing.
- v) Priority 1: Actions to rectify gaps or weakness should generally be implemented within two-weeks time, if risk potential is high or unacceptable.

vi) Priority 2: Actions should be generally implemented or rectified with a maximum of 3 – 4 weeks, if not rectified would create a likelihood of minor injury or business loss.

12.4.9 The auditor shall inspect the site after 14 days of conducting initial audit for checking the adequacy of implementation of items maintained under priority 1 by the Contractor and shall submit a conformity / non-conformity report to the Engineer and the Employer with a copy to the Contractor.

12.4.10 The auditor shall again inspect after 28 days of conducting initial audit for checking the adequacy of implementation of items mentioned under priority 2 by the contractor and shall submit a conformity / non-conformity report to the Engineer and Employer with a copy to the Contractor.

12.4.11 In case of non-conformity of items mentioned by auditor, the Engineer/ Employer shall take necessary steps including stoppage of work. If the Contractor fails to conduct the external SHE audit in time, the Employer at the cost of the Contractor shall have it done.

13 SHE COMMUNICATION

13.1.1 The Contractor shall make every effort to communicate the Safety, Occupational Health and Environment management measures through posters campaigns / billboards / banners / glow signs being displayed around the work site as part of the effort to raise safety awareness amongst to the work force. Posters should be in Hindi, English and a suitable prominent local language if it is other than Hindi. Posters / billboards / banners/ glow signs should be changed at least once in a month to maintain the impact.

13.1.2 The Contractor shall also observe important days and printing and displaying safety signage and posters.

13.1.3 The list indicated are the minimum indications of the Employer and the Contractor is encouraged to further the SHE communication activities by formulating suitable reward schemes for safety performers and any other activities, which deem fit for the purpose.

14 SHE SUBMITTALS TO THE ENGINEER / EMPLOYER

14.1 Reporting

14.1.1 The Contractor shall submit the following reports to the Engineer and the Employer periodically:

- i) Daily Reporting of Total No of Workmen as given in Clause 14.2
- ii) Monthly SHE Report as given in Clause 14.3
- iii) SHE Committee Meeting Minutes as given in Clause 8.6
- iv) SHE Inspection Reports
- v) SHE Audit Reports
 - a) Monthly Audit Rating Score (MARS) Reports

- b) External SHE Audit
 - c) Electrical Safety Audit
- vi) Environmental and Social Monitoring Report.

14.2 Daily Reporting of Total No of Workmen

- 14.2.1 The Contractor shall report to the Engineer the total nos. of workmen engaged by all including any subcontractor within 2 hours of starting of any shift in any day. This reporting shall be the primary duty of the CAPO and reporting shall be through tele-fax / email. The onus of checking the receipt of the same by the Engineer lies with the Contractor.

14.3 Monthly SHE Report

- 14.3.1 The Contractor shall prepare a monthly SHE report consisting of the following and submit 3 copies within 7th of the next month to the Engineer.
- i) Monthly man-hour details
 - ii) Monthly accident / incident details
 - iii) SHE Committee details
 - iv) Details of SHE training conducted in the month
 - v) SHE Inspection
 - vi) SHE internal audit details like electrical audit etc.
 - vii) SHE communication activities under taken in the month indicating the number of posters displayed and balance availability in stock
 - viii) Environmental and social monitoring details (Air quality / Noise)
 - ix) Any environmental and social issue reported
 - x) Toolbox talks details
 - xi) PPE details: Quantity purchased, issued to the workmen and stock available.
 - xii) Details on IP 44 panel boards, lighting poles, welding and cutting equipments, ladders, hoists, tools & tackles
 - xiii) Monthly Lux meter study results
 - xiv) Housekeeping
 - xv) Barricade maintenance details
 - xvi) Nos. of critical excavations
 - xvii) Health & Welfare activities
 - xviii) Safety walk conducted by Contractors' representative in the month
 - xix) SHE activities planned for the next month.

15 ACCIDENT REPORTING AND INVESTIGATION

15.1 Reporting to the Engineer and the Employer

- 15.1.1 All accidents and dangerous occurrences shall immediately be informed verbally to the Engineer and the Employer. This will enable the Engineer/ Employer to reach the scene of accident / dangerous occurrences to monitor/assist any rescue work and/or start conducting the investigation process so that the evidences are not lost.
- 15.1.2 Reports of all accidents (fatal/injury) and dangerous occurrences shall also be sent within 24 hours as per a pre-consented format (to be proposed by the Contractor and Engineer's consent obtained).
- 15.1.3 No accident / dangerous occurrences is exempted from reporting to the Engineer/ Employer.
- 15.1.4 Any wilful delay in verbal and written reporting to the Engineer/Employer shall be penalized as per relevant clause.

15.2 Reporting to Govt. Organisations

- 15.2.1 In addition to the above verbal and written reporting to the Engineer / Employer, as per Rule 210 of BOCWR, notice of any accident to a worker at the building or construction site that: a) causes loss of life; or b) disables a worker from working for a period of 48 hours or more immediately following the accident; shall forthwith be sent by telegram, telephone, fax, or similar other means including special messenger within four hours in case of fatal accidents and 72 hours in case of other accidents, to:
- i) the Regional Labour Commissioner (central), wherein the Contractor has registered the firm/work
 - ii) the Board with which the worker involved was registered as a beneficiary;
 - iii) Director General, Min. of Labour; and
 - iv) the next of kin or other relative of the worker involved in the accident.
- 15.2.2 Further, notice of accident shall be sent in respect of an accident which: a) causes loss of life; or b) disables the injured worker from work for more than 10 days to:
- i) the officer-in-charge of the nearest police station;
 - ii) the District Magistrate or, if the District Magistrate by order so desires, to the Sub-Divisional Magistrate.
- 15.2.3 In case of an accident causing minor injury, first-aid shall be administered and the injured worker shall be immediately transferred to a hospital or other place for medical treatment.
- 15.2.4 Where any accident causing disablement that subsequently results in death, notice in writing of such death, shall be sent to the authorities mentioned in Clause 15.2.1 and 15.2.2 above within 72 hours of such death.

15.3 Reporting of Dangerous Occurrences

- 15.3.1 The following classes of dangerous occurrences shall be reported to the Inspector having

jurisdiction, whether or not any disablement or death caused to the worker, namely:

- i) collapse or failure of lifting appliances, or hoist, or conveyors, or similar equipment for handling of building or construction material or breakage or failure of rope, chain or loose gears; or overturning of cranes used in construction work;
- ii) falling of objects from height;
- iii) collapse or subsidence of soil, tunnel, pipe lines, any wall, floor, gallery, roof or any other part of any structure, launching girder, platform, staging, scaffolding or means of access including formwork;
- iv) explosion of receiver or vessel used for storage of pressure greater than atmospheric pressure, of any gas or gases or any liquid or solid used as building material;
- v) fire and explosion causing damage to any place on construction site where building workers are employed;
- vi) spillage or leakage of any hazardous substance and damage to their container;
- vii) collapse, capsizing, toppling or collision of transport equipment;
- viii) leakage or release of harmful toxic gases at the construction site.

15.3.2 In case of failure of lifting appliance, loose gear, hoist or building and other construction work, machinery and transport equipment at a construction site, such appliances, gear, hoist, machinery or equipment and the site of such occurrence shall, as far as practicable, be kept undisturbed until inspected by the Authorities.

15.3.3 Every notice given for fatal accidents or dangerous occurrences shall be followed by a written report to the concerned Authorities under Section 39 of BOCWA and the Director General in the specified Form XIV of BOCWR.

15.4 Accident Investigation

15.4.1 Investigations should be conducted in an open and positive atmosphere that encourages the witnesses to talk freely. The primary objective is to ascertain the facts with a view to prevent future and possibly more serious occurrences.

15.4.2 Accidents and Dangerous Occurrences which result in death, serious injury or serious damage shall be investigated by the Contractor immediately to find out the cause of the accident/occurrence so that measures can be formulated to prevent any recurrence.

15.4.3 Near misses and minor accidents should also be investigated by the Contractor as soon as possible as they are signals that there are inadequacies in the safety management system.

15.4.4 It is important after any accident or dangerous occurrence that information relating to the incident is gathered in an organised way. The following steps shall be followed;

- i) take photographs and make sketches
- ii) examine involved equipment, workpiece or material and the environmental conditions
- iii) interview the injured, eye-witnesses and other involved parties
- iv) consult expert opinion where necessary

v) identify the specific contractor or sub-contractor involved.

15.4.5 Having gathered information, it is then necessary to make an analysis of incident

- i) establish the chain of events leading to the accident or incident
- ii) find out at what stage the accident took place
- iii) consider all possible causes and the interaction of different factors that led up to the accident, and identify the most probable cause. The cause of an accident should never be classified as carelessness. The specific act or omission that caused the accident must be identified.

15.4.6 The next stage is to proceed with the follow-up action

- i) report on the findings and conclusions
- ii) formulate preventive measures to avoid recurrence
- iii) publicise the findings and the remedial actions taken

15.5 Employers' Independent Incident Investigation

15.5.1 In case of fatal / dangerous occurrence, the Employer may also conduct independent investigation. Contractor and his staff shall extend necessary co-operation and testify about the accident.

15.5.2 The Contractor shall take every effort to preserve the scene of accident till the Employer completes the investigation.

15.5.3 All persons summoned by the Employer in connection to witness recording shall obey the instructions without delay. Any willful suppression of information by any person shall be removed from the site immediately.

16 EMERGENCY RESPONSE PLAN

16.1.1 The Contractor shall prepare an Emergency Response Plan for all work sites as a part of the Contractor's Project and Site SHE Plans. The plan shall integrate the Emergency Response Plan of the Contractor and all other subcontractors. The Emergency Response Plan shall detail the Contractor's procedures, including detailed communications arrangements, for dealing with all emergencies that could affect the Site. This include where applicable, injury, sickness, evacuation, fire, chemical spillage, severe weather and rescue.

16.1.2 The Contractor shall ensure that the Emergency Response Plan is prepared to deal with emergencies arising out of:

- i) Fire and explosion
- ii) Collapse of lifting appliances and transport equipment
- iii) Collapse of building, sheds or structure etc.
- iv) Gas leakage or spillage of dangerous goods or chemicals
- v) Bomb threatening, Criminal or Terrorist attack

vi) Falling from height / Drowning of workers

vii) Landslides getting workers buried, floods, Earthquake, storms and other natural calamities.

16.1.3 Arrangements shall be made for emergency medical treatment and evacuation of the victim in the event of an accident or dangerous incident occurring, the chain of command and the responsible persons of the Contractor with their telephone numbers and addresses for quick communication shall be adequately publicized and conspicuously displayed in the workplace.

16.1.4 Contractors shall require to tie-up with the hospitals and fire stations located in the neighbourhood for attending to the casualties promptly and emergency vehicle kept on standby duty during the working hours for the purpose.

16.1.5 Contractor shall conduct an onsite emergency mock drill once in every month for all his workers and his subcontractor's workers.

16.1.6 It shall be the responsibility of the Contractor to keep the Local Law & Order Authorities informed and seek urgent help, as the case may be, so as to mitigate the consequences of an emergency. Prompt communication to the Engineer and the Employer, telephonically initially and followed by a written report, shall be made by the Contractor.

17 EXPERTS / AGENCIES FOR SHE SERVICES

17.1.1 Contractors may utilise the services of experts/agencies empanelled under Rule 250 and Rule 297 of BOCWR for the purpose of training, internal audit and any other SHE services with prior approval of the Engineer / Employer.

Section 7.3: Labour Protection

18 GENERAL

18.1.1 The Contractor shall comply in full with the project Workplace Policy on Labour Protection as described in this tender as well as the specific requirements of the clauses hereunder.

19 ENGAGEMENT OF STAFF AND LABOUR

19.1.1 The Contractor shall engage appropriate staff and labour, local or otherwise to enable him to fulfil all his obligations under the contract in full. The Contractor shall be solely responsible for all matters relating to the engagement and welfare of all persons employed by him in relation to this project.

19.1.2 The Contractor shall give priority to the employment of local people in the construction workforce, especially those affected by land acquisition or resettlement and from disadvantaged households (those headed by women or disabled persons, and/or those living below the official poverty level).

19.1.3 The Contractor shall obtain complete bio-data, and maintain personal details of all employees, including but not limited to the name, age, gender, father's/husband's name, permanent home address, local address, phone number if any, designation, name and location of the work, and shall submit the same to the Engineer before commencement of the work.

19.1.4 The Contractor shall ensure that the employees deployed by him in the premises of the Employer are physically and mentally fit and do not have any criminal record.

20 RATES OF WAGES

20.1.1 The Contractor shall pay rates of wages that are in line with current industry standards and local conditions.

20.1.2 The Contractor shall ensure payment of at least the minimum wages as prescribed and applicable from time to time under the Minimum Wages Act, 1948, in the presence of an authorised representative of the Engineer / Employer; and shall maintain proper records of their timely disbursement. These records shall be preserved for a period of at least 3 years and made available even after the contract is over for any verification by the statutory authorities.

20.1.3 The Contractor shall inform his employees about the tax implications on their salary, wages, allowances, benefits and perquisites, under the laws of the country. The Contractor shall perform such duties as may be imposed on him by such laws, ensure deductions required by law and deposit all such deductions with the statutory authorities in the prescribed manner and within the stipulated period.

21 CONDITIONS OF LABOUR

- 21.1.1 The Contractor shall observe conditions of labour that are no less favourable than those established for the relevant trade or industry, and which at least comply with model standing orders provided under the Industrial Employment (Standing Orders) Act, 1946.
- 21.1.2 During the course of the work, the Contractor shall afford all employees all basic rights enumerated in the conventions of the International Labour Organisation, including freedom of association, right to freedom from forced labour, and right to freedom from discrimination on the basis of race, colour, sex, religion, political opinion and social origin.

22 PERSONS IN THE SERVICE OF THE EMPLOYER

- 22.1.1 The Contractor shall not recruit or attempt to recruit staff or labour from amongst the personnel of the Employer or the Engineer.

23 SOCIAL SECURITY

- 23.1.1 The Contractor shall extend all relevant social security benefits to his employees including but not necessarily limited to those specified in the following statutes:
- i) Employees Provident Fund and Miscellaneous Provisions Act, 1952;
 - ii) Payment of Gratuity Act, 1972;
 - iii) Employees State Insurance Act, 1948;
 - iv) Payment of Bonus Act, 1965;
 - v) Maternity Benefit Act, 1951.
- 23.1.2 The Contractor shall provide proof of coverage of his employees under the Employees Provident Fund and Miscellaneous Provisions Act 1952 and the Employees State Insurance Act 1948, via independent code numbers allotted to him by the Central Provident Fund Organisation and Employees State Insurance Corporation respectively, prior to his participation in the bidding process.
- 23.1.3 The Contractor shall provide a provident fund pass book to each employee and ensure payment to the Regional Provident Fund Commissioner of Provident Fund, Employees' Deposit-linked Insurance (EDLI), and pension dues as required by the Employees Provident Fund and Miscellaneous Provisions Act 1952.
- 23.1.4 The Contractor shall ensure payment of appropriate contributions under the Employees State Insurance Act 1948.
- 23.1.5 The Contractor shall provide proof of deductions as well as remittances of Provident Fund, EDLI, Pension, Employees State Insurance (ESI) contribution, administrative charges etc, wherever applicable by law and shall maintain proper records.
- 23.1.6 The Contractor shall furnish proper returns to the concerned statutory authorities.

- 23.1.7 The Contractor is solely responsible for any non-payment/delayed payment of wages or contributions under the Employees Provident Fund and Miscellaneous Provisions Act, Employees State Insurance Act etc.
- 23.1.8 The Contractor shall comply with all other relevant conditions of the applicable legislation.
- 23.1.9 If the Contractor fails to make payment of wages to his employees or remittance of contribution to the concerned authorities, the security deposit and/or other dues under the Contract can be utilized by the Employer to discharge the Contractor's liability.
- 23.1.10 The Contractor shall insure all his employees under Group Personal Accident Insurance scheme through a recognised and registered insurance company.

24 LABOUR LAWS

- 24.1.1 The Contractor shall comply with all relevant labour laws applicable to his personnel including but not necessarily limited to laws relating to employment, wages, health, safety, welfare, immigration and emigration and shall allow employees all their legal rights.
- 24.1.2 The Contractor shall ensure that all his employees and sub-contractors obey applicable laws and regulations, including those concerning safety at work.
- 24.1.3 The Contractor shall comply with all statutory requirements including but not necessarily limited to those contained in the following:
- i) Minimum Wages Act, 1948;
 - ii) Payment of Wages Act, 1936;
 - iii) Equal Remuneration Act, 1976;
 - iv) Employees Provident Fund and Miscellaneous Provisions Act, 1952;
 - v) Payment of Gratuity Act, 1972;
 - vi) Employees State Insurance Act, 1948;
 - vii) Payment Of Bonus Act, 1965;
 - viii) Maternity Benefit Act, 1951;
 - ix) Industrial Disputes Act, 1947;
 - x) Industrial Employment (Standing Orders) Act, 1946;
 - xi) Trade Unions Act, 1926;
 - xii) Child Labour (Prohibition and Regulation) Act, 1986;
 - xiii) Building and Other Construction Workers (Regulation of Employment of Service) Act 1996;
 - xiv) Building and Other Construction Workers Cess Act of 1996;

- xv) The Contract Labour (Regulation and Abolition) Act, 1970;
 - xvi) Inter State Migrant Workmen's (Regulation of Employment and Conditions of Service) Act ,1979;
 - xvii) Workmen Compensation Act. 1923;
 - xviii) Factories Act, 1948;
 - xix) Mines Act, 1952.
- 24.1.4 The Contractor shall comply with all other statutory requirements, rules, regulations and notifications in relation to employment of his staff and workers that may be issued from time to time by the concerned government authorities.

25 WORKING HOURS

- 25.1.1 No work shall be carried out beyond the statutory limit given under BOCWA 1996.
- 25.1.2 No work shall be carried out outside the normal working hours stated in contract unless:
- i) Otherwise stated in the contract;
 - ii) The Engineer gives his consent in writing;
 - iii) The work is unavoidable or necessary for the protection of life or property or for the safety of the works, in which case the Contractor shall immediately inform the Engineer.
- 25.1.3 Notwithstanding the above, no work shall be carried out in contravention of applicable laws barring any exceptions and exemptions provided under the particular law.

Section 7.4: Safety

26 HOUSEKEEPING

- 26.1.1 Housekeeping is the act of keeping the working environment cleared of all unnecessary waste, thereby providing a first-line of defence against accidents and injuries.
- 26.1.2 Contractor shall understand and accept that improper housekeeping is the primary hazard in any construction site and ensure that a high degree of housekeeping is always maintained. Indeed “Cleanliness is next to Godliness”.
- 26.1.3 Housekeeping is the responsibility of all site personnel, and line management commitment shall be demonstrated by the continued efforts of supervising staff towards this activity.
- 26.1.4 General Housekeeping shall be carried out by the Contractor and ensured at all times at Work Site, Construction Depot, Batching Plant, Labour Camp, Stores, Offices and toilets/urinals. Towards this the Contractor shall constitute a special group of housekeeping personnel. This group shall ensure daily cleaning at work sites and surrounding areas and maintain a register as per format consented by the Engineer.
- 26.1.5 Adequate time shall be assigned to ensure that good housekeeping is maintained. This shall be carried out by the team of housekeeping squad.
- 26.1.6 The Contractor shall be responsible to provide segregated containers for disposal of debris at required places and regular cleaning of the same.
- 26.1.7 In areas used by public, full height fence, barriers, barricades etc. shall be erected around the site in order to prevent the surrounding area from excavated soil, rubbish etc. which may cause inconvenience to and endanger the public. The barricade especially those exposed to public shall be aesthetically maintained by regular cleaning and painting as directed by the Engineer. These shall be maintained in one line and level.
- 26.1.8 The structure dimension of the barricade, material and composition, its colour scheme, DFCCIL logo and other details shall be developed by the Contractor in reference to documents and drawings provided in the Contract Package.
- 26.1.9 All stairways, passageways and gangways shall be maintained without any blockages or obstructions. All emergency exits passageways, exits fire doors, break-glass alarm points, firefighting equipment, first aid stations, and other emergency stations shall be kept clean, unobstructed and in good working order.
- 26.1.10 Lumber with protruding nails shall be either bent or removed and properly stacked. Un-packed wooden strips shall be safely stored and disposed.
- 26.1.11 All surplus earth and debris are removed/disposed off from the working areas to officially designated dumpsites. Trucks carrying sand, earth and any pulverized materials etc. in order to avoid dust or odour impact shall be covered while moving.

The tyres of the trucks leaving the site shall be cleaned with water, wherever the possibility of spillage on carriageways meant for regular road traffic exists.

- 26.1.12 No parking of trucks/trolleys, cranes and trailers etc. shall be allowed on roads, which may obstruct the traffic movement.
- 26.1.13 Roads shall be kept clear and materials like: pipes, steel, sand boulders, concrete, chips and brick etc., shall not be allowed on the roads which obstruct free movement of road traffic.
- 26.1.14 Water logging or bentonite spillage on roads shall not be allowed. If bentonite spillage is observed on road endangering the safety of road users, the Contractor shall immediately carry out the corrective measures on his own costs. Proper and safe stacking of material are of paramount importance at yards, stores and such locations where material would be unloaded for future use. The storage area shall be well laid out with easy access and material stored / stacked in an orderly and safe manner.
- 26.1.15 Flammable chemicals / compressed gas cylinders shall be safely stored.
- 26.1.16 Unused/surplus cables, steel items and steel scrap lying scattered at different places within the working areas shall be removed to identified locations(s).
- 26.1.17 All wooden scrap, empty wooden cable drums and other combustible packing materials, shall be removed from work place to identified location(s).
- 26.1.18 Empty cement bags and other packaging material shall be properly stacked and removed.
- 26.1.19 The Contractor shall ensure that all his sub-contractors maintain the site reasonably clean through provisions related to housekeeping.

27 WORK AT HEIGHT

27.1 Definitions

- 27.1.1 "access" and "egress" include ascent and descent.
- 27.1.2 "fragile surface" means a surface, which would be able to fail if any reasonably foreseeable loading were to be applied to it.
- 27.1.3 "line" includes rope, chain or webbing.
- 27.1.4 "personal fall protection" means -
- i) a fall prevention, work restraint, work positioning, fall arrest or rescue system, other than a system in which the only safeguards are collective safeguards; or
 - ii) rope access and positioning techniques;
- 27.1.5 "work at height" means -
- i) work in any place, including a place at or below ground level;
 - ii) obtaining access to or egress from such place while at work, except by a staircase in a permanent workplace,

where, if protective measures were not taken, a person could fall a distance liable to cause personal injury;

27.1.6 "work equipment" means any machinery, appliance, apparatus, tool or installation for use at work (whether exclusively or not) and includes:

- i) a guard-rail, toe-board, barrier or similar collective means of protection
- ii) a working platform
- iii) a net, airbag or other collective safe guard for arresting falls.
- iv) personal fall protection system
- v) ladders.

27.1.7 "working platform"

- i) means any platform used as a place of work or as a means of access to or egress from a place of work;
- ii) includes any scaffold, suspended scaffold, cradle, mobile platforms, trestle, gangway, gantry and stairway which is so used.

27.2 Organisation and Planning

27.2.1 The Contractor shall ensure that work at height is

- i) properly planned for any emergencies and rescue;
- ii) appropriately supervised; and
- iii) carried out in a manner, which is reasonably practicable safe.

27.2.2 The Contractor shall ensure that work at height is carried out only when the weather conditions do not jeopardise the health or safety of persons involved in the work.

27.3 Competence

27.3.1 The Contractor shall ensure that no person engages in any activity, including organization, planning and supervision, in relation to work at height or work equipment for use in such work unless he is competent to do so or, if being trained, is being supervised by a competent person.

27.4 Accident Prevention Measures

27.4.1 The Contractor shall formulate accident preventive measures taking into account of envisaged conditions, situations, and particular activities of the Works which may induce accidents. Then the Contractor shall plan and programme the measures to be implemented in all Work Areas in various construction stages. The Contractor is responsible for incorporating the accident prevention measures against the Work at Height into the SHE activities and efficiently carry out the measures in a practical manner.

27.5 Inspection of Work Equipment

27.5.1 The Contractor shall ensure that, where the safety of work equipment depends on how

it is installed or assembled, it is not used after installation or assembly in any position unless it has been inspected in that position.

27.5.2 The Contractor shall ensure that work equipment exposed to conditions causing deterioration which is liable to result in dangerous situations is inspected,

- i) at suitable intervals; and
- ii) each time that exceptional circumstances which are liable to jeopardise the safety of the work equipment have occurred,

to ensure that health and safety conditions are maintained and that any deterioration can be detected and remedied in good time.

27.5.3 Without prejudice to Clause 27.9.1, the Contractor shall ensure that a working platform,

- i) used for construction work; and
- ii) from which a person could fall 2 metres or more,

is not used in any position unless it has been inspected in that position or, in the case of a mobile working platform, inspected on the site, within the previous 7 days.

27.5.4 The Contractor shall ensure that the reports of all inspections are properly maintained and shown to the Engineer as and when required.

27.5.5 In this clause "inspection",

- i) means such visual or more rigorous inspection by a competent person as is appropriate for safety purposes;
- ii) includes any testing appropriate for those purposes,

27.6 Inspection of Places of Work at Height

27.6.1 The Contractor shall so far as is reasonably practicable ensure that the surface and every parapet, permanent rail or other such fall protection measure of every place of work at height are checked on each occasion before the place is used.

27.7 Duties of Persons at Work

27.7.1 Any workmen employed by the Contractor shall report to the supervisor about any defect relating to work at height which he knows is likely to endanger the safety of himself or another person.

27.7.2 Every workmen shall use any work equipment or safety device provided to him for work at height by the Contractor, in accordance with:

- i) any training in the use of the work equipment or device concerned which have been received by him; and
- ii) the instructions respecting that use which have been provided to him by the Contractor as per the requirements of the Employer.

27.8 Requirements for Existing Places of Work and Means of Access or Egress at

Height

- 27.8.1 Every existing place of work or means of access or egress at height shall:
- i) be stable and of sufficient strength and rigidity for the purpose for which it is intended to be or is being used;
 - ii) where applicable, rest on a stable, sufficiently strong surface;
 - iii) be of sufficient dimensions to permit the safe passage of persons and the safe use of any plant or materials required to be used and to provide a safe working area having regard to the work to be carried out there;
 - iv) possess suitable and sufficient means for preventing a fall;
 - v) possess a surface which has no gap,
 - a) through which a person could fall;
 - b) through which any material or object could fall and injure a person; or
 - c) giving rise to other risk of injury to any person, unless measures have been taken to protect persons against such risk.
 - vi) be so constructed and used, and maintained in such condition, as to prevent, so far as is reasonably practicable -
 - a) the risk of slipping or tripping; or
 - b) any person being caught between it and any adjacent structure.
 - vii) where it has moving parts, be prevented by appropriate devices from moving inadvertently during work at height.

27.9 Requirements for Guardrails, Toe-boards, Barriers and Similar Collective Means of Protection

27.9.1 Unless the context otherwise requires, any reference in this section to means of protection is to a guardrail, toe-board, barrier or similar collective means of protection.

27.9.2 Means of protection shall

- i) be of sufficient dimensions, of sufficient strength and rigidity for the purposes for which they are being used, and otherwise suitable;
- ii) be so placed, secured and used as to ensure, so far as is reasonably practicable, that they do not become accidentally displaced; and
- iii) be so placed as to prevent, so far as is practicable, the fall of any person, or of any material or object, from any place of work.

27.9.3 In relation to work at height involved in construction work

- i) the top guard-rail or other similar means of protection shall be at least 950 millimetres above the edge from which any person is liable to fall;
- ii) toe-boards shall be suitable and sufficient to prevent the fall of any person, or any material or object, from any place of work; and
- iii) any intermediate guardrail or similar means of protection shall be positioned so that any gap between it and other means of protection does not exceed 470 millimetres.

27.9.4 Any structure or part of a structure which supports means of protection or to which means of protection are attached shall be of sufficient strength and suitable for the purpose of such support or attachment.

27.10 Requirements for All Working Platforms

27.10.1 Every working platform requires a supporting structure for holding it.

27.10.2 Any surface upon which any supporting structure rests shall be stable, of sufficient strength and of suitable composition safely to support the supporting structure, the working platform and any loading intended to be placed on the working platform.

27.10.3 Stability of supporting structure: any supporting structure shall:

- i) be suitable and of sufficient strength and rigidity for the purpose for which it is being used;
- ii) in the case of a wheeled structure, be prevented by appropriate devices from moving inadvertently during work at height;
- iii) in other cases, be prevented from slipping by secure attachment to the bearing surface or to another structure, provision of an effective anti-slip device or by other means of equivalent effectiveness;
- iv) be stable while being erected, used and dismantled;
- v) when altered or modified, be so altered or modified as to ensure that it remains stable; and
- vi) Have suitable base plates and properly footed thereby.

27.10.4 Stability of working platforms: a working platform shall:

- i) be suitable and of sufficient strength and rigidity for the purpose or purposes for which it is intended to be used or is being used;
- ii) be so erected and used as to ensure that its components do not become accidentally displaced so as to endanger any person;
- iii) when altered or modified, be so altered or modified as to ensure that it remains stable; and
- iv) be dismantled in such a way as to prevent accidental displacement.

27.10.5 Safety on working platforms: a working platform shall:

- i) be of sufficient dimensions to permit the safe passage of persons and the safe use of any plant or materials required to be used and to provide a safe working area having regard to the work being carried out there;
 - ii) possess a suitable surface and, in particular, be so constructed that the surface of the working platform has no gap,
 - a) through which a person could fall;
 - b) through which any material or object could fall and injure a person; or
 - c) giving rise to other risk of injury to any person, unless measures have been taken to protect persons against such risk; and
 - iii) be so erected and used, and maintained in such condition, as to prevent, so far as is reasonably practicable,
 - a) the risk of slipping or tripping; or
 - b) any person being caught between the working platform and any adjacent structure.
- 27.10.6 Loading: a working platform and any supporting structure shall not be loaded so as to give rise to a risk of collapse or to any deformation, which could affect its safe use.
- 27.10.7 Additional requirements for scaffolding: strength and stability calculations for scaffolding shall be carried out unless:
- i) a note of the calculations, covering the structural arrangements contemplated, is available; or
 - ii) it is assembled in conformity with a generally recognised standard configuration.
- 27.10.8 Depending on the complexity of the scaffolding selected, a competent person shall draw up an assembly, use and dismantling plan. This may be in the form of a standard plan, supplemented by items relating to specific details of the scaffolding in question.
- 27.10.9 A copy of the plan, including any instructions it may contain, shall be kept available for the use of persons concerned in the assembly, use, dismantling or alteration of scaffolding until it has been dismantled.
- 27.10.10 The dimensions, form and layout of scaffolding decks shall be appropriate to the nature of the work to be performed and suitable for the loads to be carried and permit work and passage in safety.
- 27.10.11 While a scaffold is not available for use, including during its assembly, dismantling or alteration, it shall be marked with general warning signs in accordance with and be suitably delineated by physical means preventing access to the danger zone.
- 27.10.12 Scaffolding may be assembled, dismantled or significantly altered only under the supervision of a competent person and by persons who have received appropriate and specific training in the operations envisaged which addresses specific risks which the operations may entail and precautions to be taken, and more particularly in:

- i) understanding of the plan for the assembly, dismantling or alteration of the scaffolding concerned;
- ii) safety during the assembly, dismantling or alteration of the scaffolding concerned;
- iii) measures to prevent the risk of persons, materials or objects falling;
- iv) safety measures in the event of changing weather conditions which could adversely affect the safety of the scaffolding concerned;
- v) permissible loadings;
- vi) any other risks which the assembly, dismantling or alteration of the scaffolding may entail.

27.11 Requirements for Collective Safeguards for Arresting Falls

27.11.1 Collective safeguard are a safety net, airbag or other collective safeguard for arresting falls.

27.11.2 A safeguard shall be used only if:

- i) a risk assessment has demonstrated that the work activity can so far as is reasonably practicable be performed safely while using it and without affecting its effectiveness;
- ii) the use of other, safer work equipment is not reasonably practicable; and
- iii) a sufficient number of available persons have received adequate training specific to the safeguard, including rescue procedures.

27.11.3 A safeguard shall be suitable and of sufficient strength to arrest safely the fall of any person who is liable to fall.

27.11.4 A safeguard shall:

- i) in the case of a safeguard which is designed to be attached, be securely attached to all the required anchors, and the anchors and the means of attachment thereto shall be suitable and of sufficient strength and stability for the purpose of safely supporting the foreseeable loading in arresting any fall and during any subsequent rescue;
- ii) in the case of an airbag, landing mat or similar safeguard, be stable; and
- iii) in the case of a safeguard, which distorts in arresting a fall, afford sufficient clearance.

27.11.5 Suitable and sufficient steps shall be taken to ensure, so far as practicable, that in the event of a fall by any person the safeguard does not itself cause injury to that person.

27.12 Requirements for Personal Fall Protection Systems

27.12.1 A personal fall protection system shall be used only if:

- i) a risk assessment has demonstrated that:

- a) the work can so far as is reasonably practicable be performed safely while using that system; and
 - b) the use of other safer work equipment is not reasonably practicable; and
- ii) the user and a sufficient number of available persons have received adequate training specific to the operations envisaged, including rescue procedures.
- 27.12.2 A personal fall protection system shall:
- i) be suitable and of sufficient strength for the purposes for which it is being used having regard to the work being carried out and any foreseeable loading;
 - ii) where necessary, fit the user;
 - iii) be correctly fitted;
 - iv) be designed to minimise injury to the user and, where necessary, be adjusted to prevent the user falling or slipping from it, should a fall occur; and
 - v) be so designed, installed and used as to prevent unplanned or uncontrolled movement of the user.
- 27.12.3 A personal fall protection system designed for use with an anchor shall be securely attached to at least one anchor, and each anchor and the means of attachment thereto shall be suitable and of sufficient strength and stability for the purpose of supporting any foreseeable loading.
- 27.12.4 Suitable and sufficient steps shall be taken to prevent any person falling or slipping from a personal fall protection system.
- 27.13 Requirements for Ladders**
- 27.13.1 Every contractor shall ensure that a ladder is used for work at height only if a risk assessment has demonstrated that the use of more suitable work equipment is not justified because of the low risk and
- i) The short duration of use; or
 - ii) Existing features on site, which he cannot alter.
- 27.13.2 Only metal ladders shall be allowed. Bamboo ladders are prohibited.
- 27.13.3 Any surface upon which a ladder rests shall be stable, firm, of sufficient strength and of suitable composition safely to support the ladder so that its rungs or steps remain horizontal, and any loading intended to be placed on it.
- 27.13.4 A ladder shall be so positioned as to ensure its stability during use.
- 27.13.5 A suspended ladder shall be attached in a secure manner and so that, with the exception of a flexible ladder, it cannot be displaced and swinging is prevented.
- 27.13.6 A portable ladder shall be prevented from slipping during use by -
- i) securing the stiles at or near their upper or lower ends;
 - ii) an effective anti-slip or other effective stability device; or

iii) any other arrangement of equivalent effectiveness.

27.13.7 A ladder used for access shall be long enough to protrude sufficiently above the place of landing to which it provides access, unless other measures have been taken to ensure a firm handhold.

27.13.8 No interlocking or extension ladder shall be used unless its sections are prevented from moving relative to each other while in use.

27.13.9 A mobile ladder shall be prevented from moving before it is stepped on.

27.13.10 Where a ladder or run of ladders raises a vertical distance of 9 metres or more above its base, there shall, where reasonably practicable, be provided at suitable intervals sufficient safe landing areas or rest platforms.

27.13.11 Every ladder shall be used in such a way that:

- i) a secure handhold and secure support are always available to the user; and
- ii) the user can maintain a safe handhold when carrying a load unless, in the case of a step ladder, the maintenance of a handhold is not practicable when a load is carried, and a risk assessment has demonstrated that the use of a stepladder is justified because of:
 - a) the low risk; and
 - b) the short duration of use.

28 OVERHEAD PROTECTION

28.1.1 All contractors shall provide overhead protections as per Rule 41 of BOCWR.

28.1.2 Overhead protection should be erected along the periphery of every building which is under construction and the building height shall be 15m or above after construction.

28.1.3 Overhead protection shall be minimum 2m wide and the outer edge shall be 150mm higher than the inner edge and an angle not more than 20 degrees to its horizontal sloping into the building.

28.1.4 Overhead protection shall not be erected more than a height of 5m from the base of the building.

28.1.5 Areas of inadvertent hazard of falling of material shall be guarded or barricaded or roped-off thereby by the Contractor.

29 SLIPPING, TRIPPING, CUTTING, DROWNING AND FALLING HAZARDS

29.1 As per Rule 42 of BOCWR,

- i) All places should be free from dust, debris or similar materials.
- ii) Sharp projections or any protruding nails or similar objects shall be suitably guarded or shall even be avoided to make the place safe to work.

- iii) Contractor shall not allow workmen to work or use platforms, scaffolds/passageways or any walkways, which has water, or oil or similar substances spilt and has a slipping hazard, unless it is cleaned off or covered or sanded or saw dusted or make it safe with any suitable material.
- iv) When workers are exposed to areas where fall into water is possible, the Contractor shall provide suitable and adequate equipment for saving the workers from drowning and rescuing from such hazard. If the Engineer considers, the Contractor shall provide well-equipped boat or launch, manned with trained personnel at the work place.
- v) Open side or opening where worker, equipment, vehicle or lifting appliance may fall at a building or outside shall be guarded suitably except in places of free access by reasons of nature of work.
- vi) Suitable safety net shall be provided at places of material / man falling is possible in accordance with national standards.

30 LIFTING APPLIANCES AND GEAR

30.1 General

- 30.1.1 Lifting appliances means a crane, hoist machinery, derrick, winch, gin pole, sheer legs, jack, hoist drum, slewing machinery, slewing bearing fasteners, loffing machinery sheaves, pulley blocks, hooks or other equipment used for lifting materials, objects or building workers and lifting gears means ropes, chain slings, shackles, hooks, lifting lugs, wire ropes, lifting eyebolts and eyenuts and other accessories of a lifting appliance.
- 30.1.2 No machine shall be selected to do any lifting on a specific job until its size and characteristics are considered against:
 - i) the weights, dimensions and lift radii of the heaviest and largest loads
 - ii) the maximum lift height, the maximum lift radius and the weight of the loads that shall be handled at each
 - iii) the number and frequency of lifts to be made
 - iv) how long the crane will be required on site
 - v) the type of lifting to be done (for example, is precision placement of loads important)
 - vi) the type of carrier required (this depends on ground conditions and machine capacity In its operating quadrants: capacity is normally greatest over the rear, less over the side, and non-existent over the front)
 - vii) whether loads will have to be walked or carried
 - viii) whether loads will have to be suspended for lengthy periods

- ix) the site conditions, including the ground where the machine will be set up, access roads and ramps it must travel, space for erection and any obstacles that might impede access or operation.
- 30.1.3 The Contractor shall ensure that a valid certificate of fitness issued as per Cause 30.1.4 is available for all lifting appliances including synchronised mobile jacks, pre-stressing hydraulic jacks, jacks fitted with launching girders etc. and the Engineer's consent before inducting to the site. Only after obtaining the Engineer's consent, any lifting appliances and gear shall be used.
- 30.1.4 The laminated photocopies of fitness certificate issued by competent person, the Engineer's approval letter, the operators' photo, manufacturer's load chart and competency certificate shall always be either kept in the operator cabin or pasted on the visible surface of the lifting appliances.
- 30.1.5 All lifting appliances and loose gears shall be clearly marked for its safe working load and identification by stamping or other suitable means.
- 30.1.6 The Contractor shall also maintain a register containing a system of identification of all tools and tackles, its date of purchase, safe working load, competent person date of examination etc.
- 30.1.7 At least one trained banksman shall be in attendance at each lifting or hoisting installation.
- 30.1.8 All lifting hooks shall have a safety latch.

30.2 Test and Periodical Examination of Lifting Appliances and Gears

- 30.2.1 All lifting appliances including all parts and gears thereof, whether fixed or movable shall be thoroughly tested and examined by a competent person once at least in every six months or after it has undergone any alterations or repairs liable to affect its strength or stability. Within the validity, if the lifting appliances are shifted to a new site, re-examination by the same competent person for ensuring its safety shall also be done.
- 30.2.2 Contractors can utilise the services of any competent person as defined in BOCW Act, 1996 or Factories Act, 1948, or Dock Safety Act, 1987 and approved by corresponding act approving authority or any other equivalent agency with the permission of the Engineer.
- 30.2.3 All alarms and signals like automatic safe load indicators (SLI), boom angle indicators, boom extension indicators, over lift boom alarm, swing alarm, hydraulic safety valves, mechanical radius indicators, load moment indicators etc. shall be periodically examined and maintained always in working condition

30.3 Automatic Safe Load Indicators

- 30.3.1 As stipulated in Rule 57 of BOCWR, every lifting appliances and gears like cranes, hydras etc, if so constructed that the safe working load may be varied by raising or lowering of the jib or otherwise shall be attached with an automatic indicator of safe working loads approved by Bureau of Indian standards/ International certifying

bodies which gives a warning to the operator and arrests further movements of the lifting parts.

30.4 Qualification of Operator of Lifting Appliances and of Signaller etc.

30.4.1 The Contractor shall not employ any person to drive or operate a lifting machine like crane, hydra etc whether driven by mechanical power or otherwise or to give signals to work as a operator of a rigger or derricks unless he

- i) is above twenty-one years of age and possesses a valid heavy transport vehicle driving license as per Motor Vehicle Act and Rules.
- ii) is absolutely competent and reliable.
- iii) possesses the knowledge of the inherent risks involved in the operation of lifting appliances by undergoing a formal training at any institution of national importance acceptable to the Engineer.
- iv) is medically examined periodically as specified in schedule VII of BOCW Rules.

30.5 General Requirements of Appliances

30.5.1 Out-of level: one of the most severe effects of being out-of fit level is that side loads develop in the boom. Because of side loads all mobile cranes lose capacity rapidly as the degree of out-of-level increases and therefore

30.5.2 Boom

- i) The boom is one of the more critical elements of the crane and shall be in perfect condition at all time. No boom section with a bent lattice member shall be allowed
- ii) All welds shall be crack and corrosion free
- iii) No member of the boom shall be bent
- iv) All telescopic boom shall be free from cracks, rust, flaking or cracked paint, bulges, greases or varnishes.

30.5.3 The sweep area (work area) of the construction machinery shall be always free from obstructions.

30.5.4 All hydraulic piping and fittings shall be maintained leak proof.

30.5.5 The operator cab shall posses good and safe:

- i) structure, windows and windshield wipers
- ii) Drivers chair and foot rest
- iii) Control handles
- iv) Cab instrumentation
- v) Telecommunication

- vi) Cab out fitting
- vii) wind indicator with an adjustable set point shall be in a position representative for the wind on the crane. The indicator shall give continuous information regarding constant speeds and gusts.

30.6 Mandatory Rigging Requirements

- 30.6.1 Rigging shall be done under experienced and qualified rigger only.
- 30.6.2 The primary requirement in rigging shall be to assess the weight of load before attempting any lift.
- 30.6.3 All hooks shall be fitted with Master Rings having certificate of fitness from the competent person, so that the hooks are subjected to balanced vertical loading only.
- 30.6.4 Only four legged slings shall be allowed which includes master link (ring), intermediate master link (ring) if necessary, chain / wire rope sling, sling hook or other terminal fitting.
- 30.6.5 Hand spliced slings up to 32mm diameter shall not be used at site for any lifting purpose.
- 30.6.6 No load shall be slewed over public areas without stopping the pedestrians and road traffic first.
- 30.6.7 Requirements of outriggers:
 - i) All outriggers shall be fully extended and at all tyres are clear of the ground
 - ii) Heavy duty blocking having large bearing area shall be necessary to prevent sinking of floats
- 30.6.8 All loads shall have tag-lines attached in order to ensure that the load can be controlled at all times.
- 30.6.9 No close working to any live overhead power line is permitted without the operation of a strict Permit to Work.
- 30.6.10 Minimum lighting is to be ensured at all lifting operations.

31 Deleted

32 CONSTRUCTION MACHINERY

32.1 General

- 32.1.1 Construction machineries may include dumpers and dump trucks, lift trucks and telescopic handlers, transit mixers, batching & mixing plants, crushers, concrete pumps, piling rigs, vibro hammers, rail welding equipments, mobile elevating work platforms, cranes, tipper lorries, lorry loaders, skip wagons, 360° excavators, 180° backhoe loaders, crawler tractors, scrapers, graders, loading shovels, trenchers, side booms, pavers, planers, chippers, road rollers, locomotives, tankers and bowsers,

trailers, hydraulic and mechanical breakers etc.

32.2 Safe Worthiness Certificate

- 32.2.1 Each construction equipment shall be in sound mechanical working condition and certified by either competent person under Factories Act or carry manufacturers' warranty in case of brand new equipments or authorized persons / firms approved by Engineer before induction to any site.
- 32.2.2 Every such certificate shall have the date of purchase, main overhauling undertaken in the past, any accident to the equipment, visual examination details, critical components safety check, list of safety devises and its working condition, manufacturer's maintenance checklist, past projects wherein the equipments were used etc as its minimum content.

32.3 Reverse Horns

- 32.3.1 All Vehicles shall be fitted with audible reverse alarms and maintained in good working condition. Reversing shall be done only when there is adequate rear view visibility or under the directions of a banksman.

32.4 General Operating Procedures

- 32.4.1 Drivers entering site shall be instructed to follow the safe system of work adopted on site. These shall be verbal instructions or, preferably, written instructions showing the relevant site rules, the site layout, delivery areas, speed limits, etc.
- 32.4.2 No passengers shall be carried, unless specific seating has been provided in accordance with the manufacturers recommendations.
- 32.4.3 Working on gradients beyond any equipments capability shall not be allowed.
- 32.4.4 Prevention of dumper and dump truck accidents should be managed by providing for adequate lateral clearances, wheel stops at a sufficient distance from the edges of excavations, spoil heaps, pits, markers, etc.
- 32.4.5 The manufacturer's recommended bucket size shall not be exceeded in excavators.
- 32.4.6 If excavators operating on a gradient which cannot be avoided, it shall be ensured that the working cycle is slowed down, that the bucket is not extended too far in the downhill direction, and that travel is undertaken with extreme caution. A large excavator shall never be permitted to travel in a confined area, or around people, without a banksman to guide the driver, who should have the excavator attachment close in to the machine, with the bucket just clear of the ground. On wheeled excavators, it is essential that the tyres are in good condition and correctly inflated. If stabilizing devices are fitted, they should be employed when the machine is excavating.
- 32.4.7 When the front shovel of the 1800 backhoe loaders is being employed, the backhoe attachment shall be in its "travel" position, with the safety locking device in place.
- 32.4.8 When operating the backhoe in poor ground conditions, the stabilisers tend to sink into the surface of the ground, reducing stability. Therefore frequent checks shall be

made for the stability of the machine. The loading shovel should always be lowered to the ground to stabilise the machine when the backhoe is employed.

- 32.4.9 The netting operation of the skip wagons should be carried out prior to lifting the skip to reduce the risks of working on the rear platform.
- 32.4.10 If a tractor dozer is employed on clearing scrub or felling trees, it shall be provided with adequate driver protection.
- 32.4.11 When two or more scrapers are working on the same job, a minimum distance of at least 25m shall be kept between them.
- 32.4.12 In case of hydraulic breakers, hydraulic rams and hoses shall be in good working condition
- 32.4.13 While excavating care shall be taken against falling boulders, caving-in, etc., to avoid damage to men, equipment and materials. This precaution is all the more important while working close to existing railway tracks/ roads.
- 32.4.14 All wood working machines shall be fitted with suitable guards and devices such as top guard, riving knife, push stick, guards for drive belts and chains, and emergency stop switch easily accessible by the operator.

33 PENALTY

- 33.1.1 If any of the above clauses are not adhered, penalty shall be imposed as per relevant clause depending upon the gravity of the unsafe act and conditions.

34 MACHINE AND GENERAL AREA GUARDING

- 34.1.1 The Contractor shall ensure at the construction site all motors, cogwheels, chains and friction gearing, flywheels, shafting, dangerous and moving parts of machinery are securely fenced or legged. The fencing of dangerous part of machinery is not removed while such machinery is in motion or in use.

35 MANUAL LIFTING AND CARRYING OF EXCESSIVE WEIGHT

- 35.1.1 The Contractor shall ensure at his construction site of a building or other construction work that no building worker lifts by hand or carries overhead or over his back or shoulders any material, article, tool or appliances exceeding in weight as said below as per Rule 38 of BOCWR, unless aided by another building worker or device.

Person	Maximum weight in kg.
Adult man	55
Adult woman	30

- 35.1.2 No building worker aided by other building worker shall lift or carry weight higher

than or exceeding the sum of total of maximum limits set out for each building worker separately as mentioned in the table above.

36 SITE ELECTRICITY

36.1 Competency of Electrical Personnel

36.1.1 The Contractor shall employ qualified and competent electrical personnel as specified in General Instruction DFCCIL/SHE/GI/001 (will be issued by Engineer).

36.2 Assessment of Power

36.2.1 The Contractor shall assess the size and location of the electrical loads and the manner in which they vary with time during the currency of the Contract.

36.2.2 The Contractor shall elaborate as to how the total supply is to be obtained / generated. The details of the source of electricity, earthing requirement, substation / panel boards, distribution system shall be prepared and necessary approval from Engineer obtained before proceeding of the execution of the job.

36.2.3 The Contractor shall take consideration, the requirements of the sub / petty contractors' electric power supply and arrive at the capacity of main source of power supply.

36.2.4 As the sub / petty contractors' small capacity generators create more noise and safety hazard, no small capacity diesel generators shall be allowed for whatsoever the type of job to be executed under this Contract.

36.2.5 If any unsafe noise making small capacity diesel generators are found being used by sub / petty contractors, the Contractor shall only be responsible.

36.3 Work on Site

36.3.1 The Contractor shall also submit electrical single line diagram, schematic diagram and the details of the equipment for all temporary electrical installation and these diagrams together with the temporary electrical equipment shall be submitted to the Engineer for necessary approval.

36.4 Strength and Capability of Electrical Equipment

36.4.1 No electrical equipment shall be put into use where its strength and capability may be exceeded in such a way as may give rise to danger.

36.5 Adverse or Hazardous Environment

36.5.1 Electrical equipment which may reasonably foreseeably be exposed to:

- i) mechanical damage;
- ii) the effects of the weather, natural hazards, temperature or pressure;
- iii) the effects of wet, dirty, dusty or corrosive conditions; or
- iv) any flammable or explosive substance, including dusts, vapours or gases,

shall be of such construction or as necessary protected as to prevent, so far as is reasonably practicable, danger arising from such exposure.

36.6 Distribution System

36.6.1 The Contractor shall provide distribution system for control and distribution of electricity from a main AC supply of 50Hz for typical appliances:

- i) Fixed plant – 400V 3 phase
- ii) Movable plant fed via trailing cable over 3.75 kW – 400V 3 phase
- iii) Installation in site buildings – 230V single phase
- iv) Fixed flood lighting – 230V single phase
- v) Portable and hand tools – 115V single phase
- vi) Site lighting - 115V single phase
- vii) Portable hand lamps – 115V single phase

36.7 Electrical Protection Circuits

36.7.1 Precautions shall be taken, either by earthing or by other suitable means, to prevent danger arising when any conductor (other than a circuit conductor) which may reasonably foreseeable become charged as a result of either the use of a system, or a fault in a system, becomes so charged. A conductor shall be regarded as earthed when conductors of sufficient strength and current-carrying capability to discharge electrical energy to earth connect it to the general mass of earth.

36.7.2 If a circuit conductor is connected to earth or to any other reference point, nothing which might reasonably be expected to give rise to danger by breaking the electrical continuity or introducing high impedance shall be placed in that conductor unless suitable precautions are taken to prevent that danger.

36.7.3 Appropriate electrical protection shall be provided for all circuits, against over load, short circuit and earth fault current.

36.7.4 The Contractor shall provide sufficient ELCBs (maintain sensitivity 30 mA) / RCCBs for all the equipments (including Potable equipments), electrical switchboards, distribution panels etc. to prevent electrical shocks to the workers.

36.7.5 All protection devices shall be capable of interrupting the circuit without damage to any equipment and circuits in case of any fault may occur.

36.7.6 Rating of fuses and circuit breakers used for the protection of circuits should be coordinate with equipment power ratings.

36.7.7 Protection against lightning shall be ensured to all equipment kept in open at sites.

36.8 Cables

36.8.1 Cables shall be selected after full consideration of the condition to which they shall be exposed and the duties for which they are required. Supply cable up to 3.3 kV shall be in accordance with BS 6346.

- 36.8.2 For supplies to mobile or transportable equipment where operating of the equipment subjects the cable to flexing, the cable shall conform to any of these codes BS 6007 / BS 6500 / BS 7375.
- 36.8.3 Flexible cords with a conductor cross sectional area smaller than 1.5 mm² shall not be used and insulated flexible cable shall conform to BS 6500 and BS 7375.
- 36.8.4 Where low voltage cables are to be used, reference shall be made to BS 7375. The following standards shall also be referred to particularly for underground cables BS 6346 and BS 6708.
- 36.8.5 Cables buried directly in the ground shall be of a type incorporating armour or metal sheath or both. Such cables shall be marked by cable covers or a suitable marking tape and be buried at a sufficient depth to avoid their being damaged by any disturbance of the ground. Cable routes shall be marked on the plans kept in the site electrical register.
- 36.8.6 Cabling passing under the walk way and across way for transport and mobile equipment shall be laid in ducts at a minimum depth of 0.6 meters.
- 36.8.7 Cables that need to cross open areas, or where span of 3m or more are involved, a catenary wire on poles or other supports shall be provided for convenient means of suspension. Minimum height shall be 6 m above ground.
- 36.8.8 Cables carrying a voltage to earth in excess of 65V other than supply for welding process shall have metal armour or sheath, which has been effectively earthed and monitored by the Contractor. In case of flexible and trailing cables such earthed metal sheath and/or armour should be in addition to the earth core in the cable and shall not be used as the protective conductor.
- 36.8.9 Armoured cables having an over-sheath of polyvinyl chloride (PVC) or an oil resisting and flame retardant compound shall be used whenever there is a risk of mechanical damage occurring.

36.9 Plugs, Socket-outlets and Couplers

- 36.9.1 The Contractor shall ensure plugs, socket-outlets, and couplers available in the construction site as “splash proof” type. The minimum degree of Ingress Protection should be of IP44 in accordance with BS EN 60529.
- 36.9.2 Only plugs and fittings of the weatherproof type shall be used and they should be colour coded in accordance with the Internationally recognised standards for example as detailed as follows:
- i) 110 volts : Yellow
 - ii) 240 volts : Blue
 - iii) 415 volts : Red

36.10 Connections

- 36.10.1 Every joint and connection in a system shall be mechanically and electrically suitable for use to prevent danger. Proper cable connectors as per national/international

standards shall only be used to connect cables.

- 36.10.2 No loose connections or tapped joints shall be allowed anywhere in the work site, office area, stores and other areas.

36.11 Portable and Hand-held Equipments

- 36.11.1 The Contractor shall ensure the use of double insulated or all-insulated portable electrical hand equipment may be used without earthing (i.e. two core cables), but they shall still be used only on 110V because of the risk of damage to trailing leads.

36.12 Other Equipments

- 36.12.1 All equipment shall have the provision for major switch/cut-off switch in the equipment itself.
- 36.12.2 All non-current carrying metal parts of electrical equipment shall be earthed through insulated cable.
- 36.12.3 Isolate exposed high-voltage (over 415 Volts) equipment, such as transformer banks, open switches, and similar equipment with exposed energized parts and prevent unauthorised access.
- 36.12.4 Approved perimeter markings shall be used to isolate restricted areas from designated work areas and entryways and shall be erected before work begins and maintained for entire duration of work. Approved perimeter marking shall be installed with either red barrier tape printed with the words "DANGER—HIGH VOLTAGE" or a barrier of yellow or orange synthetic rope, approximately 1 to 1.5 meter above the floor or work surface.

36.13 Work On or Near Live Conductors

- 36.13.1 No person shall be engaged in any work activity on or so near any live conductor (other than one suitably covered with insulating material so as to prevent danger) that danger may arise unless:
- i) it is unreasonable in all the circumstances for it to be dead;
 - ii) it is reasonable in all the circumstances for him to be at work on or near it while it is live; and
 - iii) suitable precautions (including where necessary the provision of suitable protective equipment) are taken to prevent injury.

36.14 Inspection and Maintenance

- 36.14.1 All electrical equipment should be permanently numbered and a record kept of the date of issue, date of last inspection and recommended inspection period.
- 36.14.2 Fixed installations shall be inspected at least at three monthly intervals; routine maintenance being carried out in accordance with equipment manufactures recommendations.

37 LIGHTING

37.1 General

37.1.1 The Contractor shall provide sufficient site lighting, of the right type and at the right place for it to be properly effective. Lighting ought not to introduce the risk of electric shock. Therefore, 230V supplies should be used for those fittings, which are robustly installed, and well out of reach e.g. flood lighting or high-pressure discharge lamps.

37.2 Selection of Luminaries

37.2.1 The Contractor shall select the luminaries as per the area requirement indicated below:

Type of Lighting	Area of Requirement	Luminaries
Area Lighting	Workmen and vehicles to move about in safely.	i) Shovel type: non-symmetrical ii) Symmetrical or non- symmetrical tungsten halogen
Beam flood lighting	Concentrated light over an area from a relatively great distance.	i) Portable flood light (Conical beam) ii) Wide angle flood (fan shaped beam) iii) Medium or narrow angle flood (Conical beam)
Dispersive lighting	Lighting for indoor	i) Dispersive (Mercury florescent) ii) Cargo cluster iii) Florescent trough
Walkway lighting	Lighting for stairways, ladder ways, corridors, scaffold access routes, etc.	i) Well glass unit ii) Bulkhead unit (tungsten filament) iii) Bulk head unit (Florescent)
Local lighting	Lighting on sites and fittings are generally accessible to operatives	i) PAR (Parabolic Aluminised Reflector) lamp cluster ii) Festoons (with or without shades) iii) Adjustable florescent work lamp iv) Portable flood lamp (mounted on own cable drum)

37.2.2 The Contractor shall ensure that luminaries should always be placed so that no person is required to work in their own shadow and so that the local light for one person is not a source of glare for the others. Strongly made clamps should be available for attaching luminaries to poles and other convenient supports.

37.2.3 Luminaries should be robust, resistant to corrosion and rain proof especially at the point of the cable entry.

37.2.4 The correct type of lamp for each luminary should always be used and when lamps need to be replaced if shall be in accordance with the supply voltage.

37.2.5 Lamp holders not fitted with a lamp should be capped off.

38 HAND TOOLS AND POWER TOOLS**38.1 General**

- 38.1.1 The Contractor is wholly responsible for the safe condition of tools and equipment used by his employees and that of his sub-contractors.
- 38.1.2 Use of short / damaged hand tools shall be avoided and the Contractor shall ensure all his hand tools used at his worksite are safe to work with or stored and shall also train his employees (including his sub-contractors) for proper use thereby.
- 38.1.3 All hand tools and power tools shall be duly inspected before use for safe operation.
- 38.1.4 All hand tools and power tools shall have sufficient grip and the design specification on par with national/international standards on anthropometrics.

38.2 Hand Tools

- 38.2.1 Hand tools shall include but not limited to saws, chisels, axes and hatches, hammers, hand planes, screw drivers, crow bars, nail pullers etc.
- 38.2.2 The Contractor shall ensure that:
- i) For crosscutting of hardwood, saws with larger teeth points (no. of points per inch) shall be preferred to avoid the saw jumping out of the job.
 - ii) Mushroom headed chisels shall not be used in the worksite where the fragments of the head may cause injury.
 - iii) Unless hatchet has a striking face, it shall be used as a hammer.
 - iv) Only knives of retractable blades shall be used in the worksite.
 - v) No screwdrivers shall be used for scraping, chiselling or punching holes.
 - vi) A pilot hole shall always be driven before driving a screw.
 - vii) Wherever necessary, usage of proper PPEs shall be used by his employees.

38.3 Power Tools

- 38.3.1 Power tools include but not limited to drills, planes, routers, saws, jackhammers, grinders, sprayers, chipping hammers, air nozzles and drills etc.
- 38.3.2 The Contractor shall ensure that:
- i) Electric tools are properly grounded or / and double insulated.
 - ii) GFCIs/ RCCBs shall be used with all portable electric tool operated especially outdoors or in wet condition.
 - iii) Before making any adjustments or changing attachments, his workers shall disconnect the tool from the power source.

- iv) When operating in confined spaces or for prolonged periods, hearing protection shall be required. The same shall also apply to working with equipments, which gives out more noise as mentioned in Clause 5.3 of this contract document.
- v) Tool is held firmly and the material is properly secured before turning on the tool.
- vi) All drills shall have suitable attachments respective of the operations and powerful for ease of operation.
- vii) When any work / operation need to be performed repeatedly or continuously, tools specifically designed for that work shall be used. The same is applicable to detachable tool bit also.
- viii) Size of the drill shall be determined by the maximum opening of the chuck in case of drill bit.
- ix) Attachments such as speed reducing screwdrivers and buffers shall be provided to prevent fatigue and undue muscle strain to his workers.
- x) Stock should be clamped or otherwise secured firmly to prevent it from moving.
- xi) Workers shall never stand on the top of the ladder to drill holes in walls / ceilings, which can be hazardous, instead standing on the fourth or fifth rung shall be recommended.
- xii) Electric plane shall not be operated with loose clothing or long scarf or open jacket.
- xiii) Safety guards used on right angle head or vertical portable grinders shall cover a minimum of 1,800 of the wheel and the spindle / wheel specifications shall be checked.
- xiv) All power tools / hand tools shall have guards at their nip points.
- xv) Low profile safety chain shall be used in case of wood working machines and the saw shall run at high rpm when cutting and also correct chain tension shall be ensured to avoid “kickback”.
- xvi) Leather aprons and gloves shall be used as an additional personal protection auxiliary to withstand kickback.
- xvii) Push sticks shall be provided and properly used to hold the job down on the table while the heels moves the stock forward and thus preventing kickbacks.
- xviii) Air pressure is set at a suitable level for air actuated tool or equipment being used. Before changing or adjusting pneumatic tools, air pressure shall be turned off.
- xix) Only trained employees shall use explosive actuated tools and the tool shall also be unloaded when not in use.

- xx) Usage of such explosive actuated tools shall be avoided in case of places where explosive/flammable vapours or gases may be present.
- xxi) Explosive actuated tools and their explosives shall be stored separately and be taken out and loaded only before the time of immediate use.
- xxii) Misfired cartridges of explosive actuated tools shall be placed in a container of water and be removed safely from the project.
- xxiii) No worker shall point any power operated / hand tool to any other person especially during loading / unloading.

39 WELDING, GOUGING AND CUTTING

- 39.1.1 Gas cylinders in use shall be kept upright on a custom-built stand or trolley fitted with a bracket to accommodate the hoses and equipment or otherwise secured. The metal cap shall be kept in place to protect the valve when the cylinder is not connected for use.
- 39.1.2 Hose clamp or clip shall be used to connect hoses firmly in both sides of cylinders and torches.
- 39.1.3 All gas cylinders shall be fixed with pressure regulator and dial gauges
- 39.1.4 Non-return valve and Flashback arrester shall be fixed at both end of cylinder and torch.
- 39.1.5 Domestic LPG cylinders shall not be used for gas welding and cutting purpose.
- 39.1.6 DCP or CO₂ type Fire Extinguisher not less than 5 kg shall be fixed at or near to welding process zone in an easily accessible location. Fire extinguisher should confirm to IS 2190: 1992.
- 39.1.7 Use firewatchers if there is a possibility of ignition unobserved by the operator (e.g. on the other side of bulkheads).
- 39.1.8 Oxygen cylinders and flammable gas cylinders shall be stored separately, at least 6.6 meters (20 feet) apart or separated by a fire proof, 1.6 meters (5 feet) high partition. Flammable substances shall not be stored within 50 feet of cylinder storage areas.
- 39.1.9 Transformer used for electrical arc welding shall be fixed with ammeter and voltmeter and also fixed with separate main power switch.
- 39.1.10 Welding grounds and returns should be securely attached to the work by cable lugs, by clamps in the case of stranded conductors, or by bolts for strip conductors. The ground cable will not be attached to equipment or existing installations or apparatus.
- 39.1.11 Use a low voltage open circuit relay device if welding with alternating current in constricted or damp places.
- 39.1.12 Take precautions against the risk of increased fume hazards when welding with chrome containing fluxed consumables or high current metal inert gas (MIG) or tungsten inert gas (TIG) processes.

- 39.1.13 Avoid being in contact with water or wet floors when welding. Use duckboards or rubber protection.
- 39.1.14 All electrical installations shall meet the IS: 5571: 1997 and NFPA 70 for gas cylinder storage area and other hazardous areas.
- 39.1.15 The current for Electric arc welding shall not exceed 300 A on a hand welding operation.

40 DANGEROUS AND HARMFUL ENVIRONMENT

40.1 As per BOCWR Rule 40

- i) When internal combustion engines are to be used into a confined space or excavation or tunnel or any other workplace where neither natural or artificial ventilation system is inadequate to keep carbon monoxide below 50ppm, exposure of building workers shall be avoided unless suitable measures are taken and provided by the Contractor.
 - ii) No worker shall be allowed into any confined space or tank or trench or excavation wherein there is given off any dust, fumes / vapours or other impurities which is likely to be injurious or offensive, explosive or poisonous or noxious or gaseous material or other harmful articles unless steps are carried out by the Contractor and certified by the responsible person to be safe.
- 40.2 The Contractor shall ensure that all gases, fuels and other dangerous materials and goods are stored and handed in a safe manner and in accordance with the statutory regulations and as required by the Engineer. The Contractor shall be responsible for obtaining the requisite licenses and permission to store and handle such substances.

41 FIRE PREVENTION, PROTECTION AND FIGHTING SYSTEM

- 41.1.1 The Contractor shall ensure that every construction site is provided with fire protection and firefighting, extinguishing equipment and measures in accordance with statutory regulations and as required by the Engineer. The arrangements shall be sufficient to extinguish any probable fire at construction site. An adequate water supply shall be provided with ample pressure as per the national standards.
- 41.1.2 Recharging of fire extinguishers and their proper maintenance should be ensured and as a minimum should meet Indian National Standards.
- 41.1.3 All drivers of vehicles, foreman, supervisors and managers shall be trained on operating the fire extinguishers and firefighting equipment.
- 41.1.4 The Contractor shall also give consideration to the provision of adequate firefighting arrangements within the underground and tunnelling operations including the provision of Fire Service compatible hose connections and emergency lighting.
- 41.1.5 All lifting appliances' driver cabin should be provided with a suitable portable fire extinguisher.

- 41.1.6 Combustible scrap and other construction debris should be disposed off site on a regular basis. If scrap is to be burnt on site subject to consent of the Engineer, the burning site should be specified and located at a distance no less than 12 metres from any construction work or any other combustible material.
- 41.1.7 If, in the Engineer's opinion, the use of naked lights may cause a fire hazard, the Contractor shall take such additional precautions and provide such additional firefighting equipment as the Engineer considers necessary. The term "naked light" shall be deemed to include electric arcs and oxyacetylene or other flames used in welding or cutting metals.
- 41.1.8 Every fire, including those extinguished by the Contractor's Personnel, shall be reported to the Engineer.
- 41.1.9 A Fire Evacuation Plan shall be prepared and issued. Mock drills should be held on a regular basis to ensure the effectiveness of the arrangements and as a part of the plan, the telephone number of the local fire brigade should be prominently displayed near each telephone on site.

42 CORROSIVE SUBSTANCES

- 42.1.1 As per BOCWR Rule 44, corrosive substances including alkalis and acids shall be stored and used by a person dealing with such substances at a building / construction site in a manner that it does not endanger the building / construction worker and suitable PPE shall be provided by the Contractor to the workers during such handling and work. In case of spillage of such substances on the worker, the Contractor shall take immediate remedial measures.

43 DEMOLITION

- 43.1.1 The Contractor shall ensure that
- i) all demolition works be carried out in a controlled manner under the management of experienced and competent supervision.
 - ii) the concerned department of the Government or local authority be informed and permission obtained wherever required. Media shall also be informed regarding this concern.
 - iii) all glass or similar materials or articles in exterior openings are removed before commencing any demolition work and all water, steam, electric, gas and other similar supply lines are put-off and such lines so located or capped with substantial coverings so as to protect it from damage and to afford safety to the building workers and public.
 - iv) examine the walls of all structures adjacent to the structure to be demolished to determine thickness, method of support to such adjacent structures.
 - v) no demolishing work be performed if the adjacent structure seems to be unsafe unless and until remedial measures like sheet piling, shoring, bracing or

similar means be ensured for safety and stability for adjacent structure from collapsing.

- vi) debris / bricks and other materials or articles shall be removed by means of:
 - a) chutes
 - b) buckets or hoists
 - c) through openings through floors or
 - d) any other safe means as consented by the Engineer.
- vii) no person other than building workers or other persons essential to the operation of demolition work shall be permitted to enter a zone of demolition and the area be provided with substantial barricades.

44 EXCAVATION AND TUNNELLING

44.1 Excavation

44.1.1 The Contractor shall ensure

- i) where any construction / building worker engaged in excavation is exposed to hazard of falling or sliding material or article from any bank or side of such excavation which is more than 1.5 m above his footing, such worker shall be protected by adequate piling and bracing against such bank or side.
- ii) where banks of an excavation are undercut, adequate shoring is provided to support the material or article overhanging such bank.
- iii) excavated material is not stored at least 0.65 m from the edge of an open excavation or trench and banks of such excavation or trench are stripped of loose rocks and the banks of such excavation or trench are stripped of loose rocks and other materials which may slide, roll or fall upon a construction building worker working below such bank.
- iv) metal ladders and staircases or ramps are provided, as the case may be, for safe access to and egress from excavation where, the depth of such excavation exceeds 1.5 m and such ladders, staircases or ramps comply with the IS 3696 Part 1&2 and other relevant national standards.
- v) trench and excavation is protected against falling on a person by suitable measures if the depth of such trench or excavation exceeds 1.5m and such protection is an improved protection in accordance with the design and drawing of a professional engineer, where such depth exceeds 4.0m.

44.2 Deleted

44.3 Warning Signs and Notices

44.3.1 The Contractor shall ensure that:

- i) suitable warning signs or notices, required for the safety of building / construction workers carrying out the work of an excavation or tunnelling,

shall be displayed or erected at conspicuous places in Hindi and in a language understood by majority of such workers at such building such excavation or tunnelling work.

- ii) suitable signals or telephone system for the safety of construction workers and other personnel carrying out the work of an tunnelling, shall be provided or installed at suitable intervals on straight lengths and curves and shall conform to the requirements of IS Code 4756 – 1978 on ‘Safety Code for Tunnelling Work’.
- iii) Red and green lights of adequate size and brightness shall be provided at suitable intervals on straight lengths and curves, cross over points etc., to regulate the construction traffic.
- iv) such warning signs and notices with regard to compressed air and electrical equipment working shall include:
 - a) the danger involved in such compressed air work
 - b) the danger involved in working close to electrical equipment and cables
 - c) fire and explosion hazard
 - d) the emergency procedures for rescue from such danger or hazards or electric shock.

45 WORK PERMIT SYSTEM

45.1.1 The Contractor shall develop a work permit system, which is a formal written system used to control certain types of work that are potentially hazardous. A work permit is a document, which specifies the work to be done, and the precautions to be taken. Work Permits form an essential part of safe systems of work for many construction activities. They allow work to start only after safe procedures have been defined and they provide a clear record that all foreseeable hazards have been considered. Permits to Work are usually required in high-risk areas as identified by the Risk Assessments.

45.1.2 A permit is needed when construction work can only be carried out if normal safeguards are dropped or when new hazards are introduced by the work. Examples of high-risk activities include but are not limited to:

- i) Entry into confined spaces.
- ii) Work in close proximity to overhead power lines and telecommunication cables.
- iii) Hot work.
- iv) To dig-where underground services may be located.
- v) Work with heavy moving machinery.
- vi) Working on electrical equipment.

- vii) Work with radioactive isotopes.
 - viii) Heavy lifting operations and lifting operations close to live power line.
- 45.1.3 The permit-to-work system should be fully documented, laying down:
- i) How the system works;
 - ii) The jobs it is to be used for;
 - iii) The responsibilities and training of those involved; and
 - iv) How to check its operation.
- 45.1.4 The Permit-to-Work system shall be submitted to the Engineer for review before application.
- 45.1.5 A Work Permit authorisation form shall be completed with the maximum duration period not exceeding 12 hours.
- 45.1.6 A copy of each Permit To Work shall be displayed, during its validity, in a conspicuous location in close proximity to the actual works location to which it applies.

46 TRAFFIC MANAGEMENT

46.1 General

- 46.1.1 The basic objective of the following guiding principles is to lay down procedures to be adopted by the Contractor to ensure the safe and efficient movement of traffic and also to ensure the safety of workmen in the all Work Areas.
- 46.1.2 The guiding principles to be adopted for safety in construction zone are to:
- i) Warn the road user clearly and sufficiently in advance.
 - ii) Provide safe and clearly marked lanes and diversions for guiding road users.
 - iii) Provide safe and clearly marked buffer and work zones.
 - iv) Provide adequate traffic marshals to regulate the movement of traffic.
 - v) Provide adequate measures that control driver behaviour through construction zones.

46.2 Legal Permission

- 46.2.1 In all cases, the Contractor shall employ proper precautions. Wherever operations undertaken are likely to interfere with public traffic, specific Traffic Management Plans shall be drawn up and implemented by the Contractor in consultation with the approval of local police authorities and/or the concerned metropolitan/civil authorities as the case may be.
- 46.2.2 Such traffic management plans shall include provision for traffic diversion and selection of alternative routes for transport of equipment. If necessary, the Contractor

shall carry out road widening before commencement of works to accommodate the extra load.

- 46.2.3 The primary traffic control devices used in work zones shall include signs, delineators, barricades, cones, pylons, pavement markings and flashing lights.
- 46.2.4 The road construction and maintenance signs which fall into the same three major categories as do other traffic signs, that are Regulatory Signs, Warning Signs and Direction (or guidelines) Signs shall only be used. The IRC: 67 (Code of Practice for Road Signs) provide a list of traffic signs. The size, colours and placement of sign shall confirm to IRC: 67.

46.3 Regulatory Signs

- 46.3.1 Regulatory signs impose legal restriction on all traffic. It is essential, therefore, that they are used only after consulting the local police and traffic authorities.

46.4 Warning Signs

- 46.4.1 Warning signs in the traffic control zone shall be utilised to warn the drivers of specific hazards that may be encountered.
- 46.4.2 The Contractor shall place detour signage at strategic locations and install appropriate warning signs. In order to minimize disruption of access to residences and business, the Contractor shall maintain at least one entrance to a property where multiple entrances exist.
- 46.4.3 A warning sign shall be installed on all secondary road which merge with the primary road where the construction work is in progress at sufficient distance before it merges with the primary road so as to alert the road users regarding the 'Work in Progress'. The Contractor shall develop the design and obtain the Engineer's consent.
- 46.4.4 Materials hanging over / protruded from the chassis / body of any vehicle especially during material handling shall be indicated by red indicator (red light/flag) to indicate the caution to the road users.

46.5 Delineators

- 46.5.1 The delineators are the elements of a total system of traffic control and have two distinct purposes:
- i) To delineate and guide the driver to and along a safe path
 - ii) As a taper to move traffic from one lane to another.
- 46.5.2 These channelising devices such as cones, traffic cylinders, tapes and drums shall be placed in or adjacent to the roadway to control the flow of traffic. These should normally be retro-reflectors complying to IRC: 79 - Recommended Practice for Road Delineators.
- 46.5.3 Traffic cones and cylinders: traffic cones of 500mm, 750mm and 1,000mm high and 300mm to 500mm in diameter or in square shape at base and are often made of plastic or rubber and normally have retro-reflectorised red and white band shall be used wherever required.

- 46.5.4 Drums: drums about 800mm to 1000mm high and 300mm in diameter can be used either as channelising or warning devices. These are highly visible, give the appearance of being formidable objects and therefore command the respect of drivers.
- 46.5.5 Barricades: full height fence, barriers, barricades etc. shall be erected around the site in order to prevent the working area from the risk of accidents due to speedy vehicular movement. Same the way barricades protect the road users from the danger due to construction equipment and other temporary structures.
- 46.5.6 The structure dimension of the barricade, material and composition, its colour scheme, DFCCIL logo and other details shall be in accordance with the Employer's Requirements for Temporary Works.
- 46.5.7 All barricades shall be erected as per the approved design, numbered, painted and maintained in good condition and also Barricade in-charge maintains a barricade register in site.
- 46.5.8 All barricades shall be conspicuously seen in the dark/night time by the road users so that no vehicle hits the barricade. Conspicuity shall be ensured by affixing retro reflective stripes of required size and shape at appropriate angle at the bottom and middle portion of the barricade at a minimum gap of 1000mm. In addition minimum one red light or red light blinker should be placed at the top of each barricade.
- 46.5.9 Vehicle and Operator Licenses: the Contractor shall ensure that all his construction vehicles plying on public roads (like dump trucks, trailers, etc.) have proper license to ply on public roads from the State Transport Authority. Drivers holding proper valid license as per the requirements of Motor Vehicles Act shall drive these vehicles.
- 46.5.10 No obstruction to traffic: the Contractor shall not undertake loading and unloading at carriageways obstructing the free flow of vehicular traffic and encroachment of existing roads by the Contractor applying the excuse of work execution.
- 46.5.11 Tow away vehicle: the Contractor shall make arrangements keeping tow away van / manpower to tow away any breakdown vehicle in the traffic flow without loosing any time at his cost.
- 46.5.12 Cleaning of roads: the Contractor shall ensure the cleanliness of roads and footpaths by deploying proper manpower for the same. The Contractor shall have to ensure proper brooming, cleaning washing of roads and footpaths on all the time throughout the entire stretch till the currency of the contract including disposal of sweepings.

47 WORK ADJACENT TO RAILWAYS

47.1 Protection of Live Railways

- 47.1.1 The Contractor shall design to install the temporary fencing / barricades for protection of the existing Indian Railway (IR) lines where the construction activities of all Works adjacent to the line are taking place. The fencing / barricades shall be installed as indicated in the Employer's Drawings and the fencing may be movable and reusable whereas it is stable enough not to lean and infringe the structure gauge of the IR lines.

The fencing pole / barricades shall be colored to enhance visual precautionary effects. The Contractor shall submit the design of the temporary fencing / barricades to the Engineer for consent.

- 47.1.2 Whenever work is to be conducted in close proximity to the live railways, the following measures shall need to be addressed:
- i) The rules provided in the Railway's manual shall be followed.
 - ii) No persons are allowed to encroach onto the railway unless specific authority has been given by the owner.
 - iii) Adequate protection in accordance with the railway owner's requirements shall be followed (Provision of Block Inspectors, Flagmen and Lookouts).
 - iv) All persons shall wear high visibility clothing at all times.
 - v) Any induction training requirements of the railways shall be strictly observed.
 - vi) Special care shall be taken to ensure safety of the travelling public, safety of existing railway and other structures located nearby, etc.

47.2 Securement of Train Operation

- 47.2.1 Where the work to be executed is in proximity of the running railway track, the Contractor shall be required to observe all precautions and carryout all works that may be necessary to ensure the safety of the running track/trains etc. without imposition of any speed restriction thereon as may be directed by the Engineer. The Contractor shall ensure that the materials are not stacked close to the railway track, which may endanger the safety of trains and workmen.

48 BATCHING PLANT / CASTING YARD

- 48.1.1 The batching plant / casting yard shall be effectively planned for smooth flow of unloading and stacking the aggregates reinforcements and cement, batching plant, transport of concrete, casting and curing of the segment, stacking the segment and loading the segments to the trucks. As far as possible the conflicts should be avoided.
- 48.1.2 The batching plant/casting yard shall be barricaded and made as a compulsory PPE zone.
- 48.1.3 If in case of material unloading area is not maintainable as PPE zone, the same shall be segregated properly and made as a non-PPE zone with appropriate barrications.
- 48.1.4 Electrical system shall also be suitably planned so that location of diesel generator, if any, location of DBs, routing of cables and positioning of area lighting poles/masts does not infringe on any other utility and pose danger.
- 48.1.5 Drainage shall be effectively provided and waste water shall be disposed after proper treatment.
- 48.1.6 Time office, canteen, drinking water, toilet and rest place shall be suitably located for the easy access to workers. All the facilities shall be properly cleaned and maintained

during the entire period of operation.

- 48.1.7 Manual handling of cement shall be avoided to a larger extent. Whenever it is absolutely necessary, the workmen shall be given full body protection, hand protection and respiratory protection as a basic measure of ensuring better health.
- 48.1.8 The PPEs provided to cement handling workmen shall conform to international standards.
- 48.1.9 Access roads and internal site roads shall be well laid and maintained properly at all time.

49 Deleted

50 PERSONAL PROTECTIVE EQUIPMENTS (PPEs)

- 50.1.1 The Contractor shall provide required PPEs to workmen to protect against safety and / or health hazards. Primarily PPEs are required for the following protection:
- i) Head Protection (Safety helmets)
 - ii) Foot Protection (Safety footwear, Gumboot, etc.)
 - iii) Body Protection (High visibility clothing (waistcoat/jacket), Apron, etc.)
 - iv) Personal fall protection (Full body harness, Rope-grip fall arrester, etc.)
 - v) Eye Protection (Goggles, Welders glasses, etc.)
 - vi) Hand Protection (Gloves, Finger coats, etc.)
 - vii) Respiratory Protection. (Nose mask, SCBAs, etc.)
 - viii) Hearing Protection (Ear plugs, Ear muffs, etc.)
- 50.1.2 The PPEs and safety appliances provided by the Contractor shall be of the standard as prescribed by Bureau of Indian Standards (BIS). If materials conforming to BIS standards are not available, the Contractor as approved by the Engineer shall procure PPE and safety appliances.
- 50.1.3 The Contractor shall provide the PPEs which the Contractor deems necessary including, but not be limited to, safety helmets, safety shoes to all the Contractor's Employees including workmen (including those of its sub-contractors). When and Where the Contractor thinks that he needs to provide the Contractor's Employees including workmen (including those of its sub-contractors) with high visibility clothing as per the following requirement:
- i) Hi-visibility jacket covering upper body and meeting the following requirements as per BS EN 471:1994.
 - ii) Background in fluorescent orange-red in colour.

- iii) Jackets with full-length sleeves with two bands of retro reflective material, which shall be placed at the same height on the garment as those of the torso. The upper band shall encircle the upper part of the sleeves between the elbow and the shoulder; the bottom of the lower band shall not be less than 5cm from the bottom of the sleeve.
- iv) Two vertical green strips of 5cm wide on front side, covering the torso at least 500 cm².
- v) Two diagonal strips of 5 cm wide on back in an 'X' pattern covering at least 570cm².
- vi) Horizontal strips not less than 5cm wide running around the bottom of the vertical strip in front and 'X' pattern at back.
- vii) The bottom strip shall be at a distance of 5cm from the bottom of the vest.
- viii) Strips shall be retro reflective and fluorescent.

50.1.4 Color coding for helmets

Safety Helmet Color Code (Every Helmet should have the LOGO* affixed /painted)	Person to use
White	DFCCIL staff
Grey	All Designers, Architect, Consultants, etc.
Violet	Main Contractors (Engineers / Supervisors)
Blue	All Sub-contractors (Engineers / Supervisors)
Red	Electricians (Both Contractor and Sub-contractor)
Green	Safety Professionals (Both Contractor and Sub-contractor)
Orange	Security Guards / Traffic marshals
Yellow	All workmen
White (with "VISITOR" sticker)	Visitors

Note: LOGO*

- i) Logo shall have its outer dimension 2"X2" and shall be conspicuous
- ii) Logo shall be either painted or affixed
- iii) No words shall come either on Top / Bottom of Logo

Logo of the corresponding main contracting company for their employees and sub-contracting company for their employees shall only be used.

50.1.5 In addition to the above any other PPEs required for any specific jobs like, welding and cutting, working at height, tunnelling etc shall also be provided to all workmen and also ensure that all workmen use the PPEs properly while on the job.

50.1.6 The Contactor shall not pay any cash amount in lieu of PPEs to the workers/sub-contractors and expect them to buy and use during work.

- 50.1.7 The Contactor shall at all time maintain a minimum of 10% spare PPEs and safety appliances and properly record and show to the Engineer during the inspections.
- 50.1.8 It is always the duty of the Contactor to provide required PPEs for all visitors. Towards this required quantity of PPEs shall be kept always at the security post.
- 50.1.9 The Contractor shall ensure that safety equipment and protective clothing is available and used on the site at all material times and those measures for the effective enforcement of proper utilisation and necessary replacement of such equipment and clothing shall be incorporated into the Site SHE Plan.

51 VISITORS TO SITE

- 51.1.1 No visitor is allowed to enter the site without the permission of the Engineer. All authorised visitors should report at the site office. Contractor shall provide visitor's helmet (White helmet with visitor sticker) and other PPEs like safety shoe, reflective jacket, respiratory protection etc. as per requirement of the site.
- 51.1.2 All visitors shall be accompanied at all times by a responsible member of the site personnel.
- 51.1.3 The Contactor shall be fully responsible for all visitors' safety and health within the site.

Section 7.5: Occupational Health and Welfare

52 PHYSICAL FITNESS OF WORKMEN

- 52.1.1 The Contractor shall ensure that his employees/workmen subject themselves to such medical examination as required under the law or under the contract provision and keep a record of the same.
- 52.1.2 The Contractor shall not permit any employee/workmen to enter the work area under the influence of alcohol or any drugs.

53 MEDICAL FACILITIES

53.1 Medical Examination

- 53.1.1 The Contractor shall arrange a medical examination of all his employees including his sub-contractor employees employed as drivers, operators of lifting appliances and transport equipment before employing, after illness or injury, if it appears that the illness or injury might have affected his fitness and, thereafter, once in every two years up to the age of 40 and once in a year, thereafter.
- 53.1.2 The Contractor shall maintain the confidential records of medical examination or the physician authorized by the Engineer.
- 53.1.3 No building or other construction worker is charged for the medical examination and the cost of such examination is borne by the Contractor employing such worker.
- 53.1.4 The medical examination shall include a full medical and occupational health history, with a clinical examination with particular reference to:
- i) General Physique;
 - ii) Vision: - Total visual performance using standard orthorator like Titmus Vision Tester should be estimated and suitability for placement ascertained in accordance with the prescribed job standards.
 - iii) Hearing: - Persons with normal must be able to hear a forced whisper at twenty-four feet. Persons using hearing aids must be able to hear a warning shout under noisy working conditions.
 - iv) Breathing: - Peak flow rate using standard peak flow meter and the average peak flow rate determined out of these readings of the test performed. The results recorded at pre-placement medical examination could be used as a standard for the same individual at the same altitude for reference during subsequent examination.
 - v) Upper Limbs: - Adequate arm function and grip.
 - vi) Spine: - Adequately flexible for the job concerned.
 - vii) Lower Limbs: - Adequate leg and foot concerned.

- viii) General: - Mental alertness and stability with good eye, hand and foot coordination.
- ix) Any other tests which the examining doctor considers necessary.

53.1.5 If the Contractor fails to get the medical examination conducted as mentioned above, the Engineer will have the right to get the same conducted through an agency with intimation to the Contractor and deduct the cost and overhead charges from his dues.

53.2 Occupational Health Centre (First Aid Station)

53.2.1 The Contractor shall provide at a construction site an occupational health centre (OHC) as a first aid station, and maintain it in good order in terms of Rule 225 (b) of BOCWR. At least one The OHC shall be provided to serve a length of about 30 km along the alignment and shall have:

- i) Minimum floor area of 15 square metres, adequately illuminated and ventilated;
- ii) Two air-conditioned rooms with smooth walls and intern service;
- iii) Adequate and necessary equipments for day-to-day requirement and to manage any medical emergency.

53.2.2 The Contractor shall appoint one construction medical officer as in charge of the OHC where the total number of employees is up to one thousand and one additional construction medical officer for every additional one thousand employees or part thereof. The qualifications (Schedule XI of BOCWR) of such construction medical officer shall be:

- i) MBBS degree from a medical institute recognised by the Medical Council of India and;
- ii) Diploma in industrial health or equivalent post-graduate certificate of training in industrial health;

53.2.3 A medical officer having more than three (3) years of experience in policy, execution, advice and safety and health of workers employed in mines, ports and docks, factories, building and other construction work, may be considered without the qualification mentioned at (ii) above.

53.2.4 The Contractor shall appoint appropriate full-time staff including one nurse, one dresser-cum-compounder, one sweeper-cum-ward boy with each construction medical officer.

53.2.5 The Contractor shall communicate the complete particulars including name, qualification and experience of the construction medical officer, to the inspector having jurisdiction under BOCWR.

53.3 Ambulance Room, Ambulance Van and Stretchers

53.3.1 At Construction sites where five hundred (500) or fewer workers are employed, the Contractor shall provide an ambulance room in terms of Rule 226 of BOCWR. Alternatively the Contractor shall make an arrangement with a nearby hospital for

providing suitable ambulance rooms. Such ambulance rooms shall have a qualified nurse in charge and its services are available to all workers during working hours.

- 53.3.2 In a Construction site where five hundred (500) or more workers are employed, the Contractor shall provide an ambulance room with a suitably qualified Construction Medical Officer in charge, provided with an effective communication system.
- 53.3.3 An ambulance room shall be equipped at least with the articles listed in Schedule IV, BOCWR (ref: Rule 226).
- 53.3.4 The Contractor shall provide an ambulance van at all construction sites or make an arrangement with a nearby hospital for providing such an ambulance van for prompt transportation of workers who meet with serious accident or who are sick. It is the Contractor's responsibility to ensure that all such ambulances are maintained in good repair and equipped with standard facilities specified in Schedule V of BOCWR.
- 53.3.5 The Contractor shall provide a sufficient number of stretchers at each construction site for use in an emergency.

53.4 First-aid Boxes and Emergency Care

- 53.4.1 The Contractor shall ensure at a construction site one first-aid box for 100 workers provided and maintained for providing first-aid to the building workers and other construction workers. Every first-aid box shall be distinctly marked "First-aid" and equipped with the articles specified in Schedule III of BOCWR.
- 53.4.2 At all construction sites, the Contractor shall provide essential life-saving aids and appliances under the supervision of a construction medical officer, where he may be required to handle: Such lifesaving aids shall be provided to any worker who meets with an accident, before and during his transportation to a hospital and until he is attended by a doctor in such hospital.
- 53.4.3 The Contractor shall also provide other equipments or facilities that may be required for emergency care or treatment of a worker arising from local conditions and specific construction processes.

53.5 HIV/ AIDS Prevention and Control

- 53.5.1 The Contractor shall adopt the Employer's "Workplace Policy on HIV / AIDS Prevention and Control for Workers Engaged by Contractors" and implement it.
- 53.5.2 The Contractor shall prepare and submit a manual for HIV/AIDS prevention and control for his workers in terms of the aforesaid Employer's Policy within 112 days of the date of notification of the Contract.

53.6 Prevention of Mosquito Breeding

- 53.6.1 Measures shall be taken to prevent mosquito breeding at site. The measures to be taken shall include:
- i) Empty cans, oil drums, packing and other receptacles, which may retain water shall be deposited at a central collection point and shall be removed from the site regularly.

- ii) Still waters shall be treated at least once every week with oil in order to prevent mosquito breeding.
 - iii) Contractor's equipment and other items on the site, which may retain water, shall be stored, covered or treated in such a manner that water could not be retained.
 - iv) Water storage tanks shall be provided.
- 53.6.2 Posters in local language, Hindi and English, which draw attention to the dangers of permitting mosquito breeding, shall be displayed prominently on the site.
- 53.6.3 The Contractor at periodic interval shall arrange to prevent mosquito breeding by fumigation / spraying of insecticides. Most effective insecticides shall include SOLFAC WP 10 or Baytex, The Ideal Larvicide etc.

53.7 Alcohol, Smoking and Drugs

- 53.7.1 The Contractor shall ensure at all times that no employee is working under the influence of alcohol / drugs which are punishable under Govt. regulations.
- 53.7.2 Smoking at public worksites by any employee is also prohibited as per Govt. regulations. The Contractor shall comply with the legal provisions in this regard, such as, Prohibition of Smoking in Public places Rules, 2008. He shall be solely responsible for any penalty or punitive action by the government authorities on account of violations of the provisions contained in these rules by him or his representatives or his employees or his sub-contractors. Requisite notice boards, posters, etc., shall be put by him, as per the Rules.

54 OCCUPATIONAL NOISE

54.1 General

- 54.1.1 The Contractor shall comply with the codes, regulations and standards with regard to noise pollution and control as notified and amended by Central Government and State Governments from time to time including but not necessarily limited to:
- i) Rule 34 and Schedule VI of the Building and Other Construction Workers (Regulation of Employment of Service) Central Rules of 1998;
 - ii) Noise Pollution (Regulation and Control) Rules, 2000;
 - iii) Environment (Protection) Act, 1986;
 - iv) Environment (Protection) Amendment Rules, 2000;
 - v) Central Motor Vehicles Rules, 1989;
 - vi) Notification on Control of Noise from DG Sets, 2002.
- 54.1.2 The Contractor shall comply at all times with any specific requirements of these and any other relevant statutes, including prescribed noise limits and standards as follows:

- i) Permissible Exposure Levels of Impulse or Impact Noise for Work Zone Area [as per Model Rules of Factories Act, 1948]
 - ii) Permissible Exposure in Case of Continuous Noise for Work Zone Area [as per Model Rules of Factories Act, 1948].
- 54.1.3 The Contractor shall consider noise level reduction in his design, planning and execution of the Works and provide demonstrable evidence of the same on Engineer's request. The Contractor shall, at his own expense, take all appropriate measures to ensure that work carried out by the Contractor and by his sub-contractors, whether on or off the Site, will not cause any unnecessary or excessive noise.
- 54.1.4 Without prejudice to the generality of the foregoing, noise level reduction measures shall include the following:
- i) The Contractor shall ensure that all powered mechanical equipment used in the Works shall be effectively sound reduced using the most modern techniques available including but not limited to silencers and mufflers.
 - ii) The Contractor shall construct acoustic screens or enclosures around any parts of the Works from which excessive noise may be generated.

54.2 Control Measures

- 54.2.1 Protection against the effects of occupational noise exposure shall be provided when the sound levels exceed the threshold values.
- 54.2.2 The Contractor shall take adequate measures to protect the workers against the harmful effects of excessive noise at all work sites including the continuous sound level exceeding those specified in Schedule VI "Permissible Exposure in Cases of Continuous Noise" of BOCWR (see table below).

Duration per day, Hours	Sound level (slow Response)
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
½	110
¼ or less	115

- 54.2.3 If such controls fail to reduce sound levels below the levels of the table, personal

protective equipment shall be provided and used to reduce sound levels below the levels of the table.

- 54.2.4 As a minimum, the Contractor shall provide ear protection to workers who are continuously exposed to high sound levels. Effectiveness of ear protectors shall be checked at a regular interval. Audiometry of the workers exposed to high noise level shall be conducted from time to time.
- 54.2.5 When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. Exposure to different levels for various periods of time shall be considered and computed accordingly. The basis of the calculations and the formula adopted shall have the prior consent of the Engineer.

55 VENTILATION AND ILLUMINATION

55.1 Ventilation

- 55.1.1 The Contactor shall ensure at a construction site of a building or other construction work that all working areas in a free tunnel are provided with ventilation system as approved by the DG and the fresh air supply in such tunnel is not less than 6m³/min for each building worker employed underground in such tunnel or underground workings and the free air flow movement inside such working area is not less than 9m³/min.
- 55.1.2 The oxygen level shall not be less than 19.5% in the working environment.

55.2 Illumination

- 55.2.1 The Contactor shall take every effort to illuminate the work site as per the Employer's Requirement illustrated in Section-3, Chapter-VI, Part-I of this tender document.
- 55.2.2 The Contactor shall conduct a monthly illumination monitoring by a lux meter for all the locations and the report shall be sent to the Engineer within 7th of the next month and the same shall be reviewed during the monthly SHE Committee meeting.

56 RADIATION

- 56.1.1 The use of radioactive substances and radiating apparatus shall comply with the Government regulatory requirements and all subsidiary legislations.
- 56.1.2 Operations involving risk of exposure to ionising radiation shall only be carried out after having been reviewed without objection by the Engineer and shall be carried out in accordance with a method statement.
- 56.1.3 Each area containing irradiated apparatus shall have warning notices and barriers, as required by the regulations, conspicuously posted at or near the area.
- 56.1.4 Radioactive substances shall be stored, used or disposed off, strictly in accordance with the Government Enactments.
- 56.1.5 The Contactor shall ensure that all site personnel and members of the public are not exposed to radiation.

57 WELFARE MEASURES FOR WORKERS**57.1 Latrine and Urinal Accommodation**

- 57.1.1 Latrine and urinals shall be provided as per Section 33 of BOCWA and maintained as per Rule 243 of BOCWR and shall also comply with the requirements of public health authorities.
- 57.1.2 When women are employed, separate latrine and urinals accommodation shall be provided.

57.2 Moving Sites

- 57.2.1 In case of works like track laying, the zone of work is constantly moving at elevated level or at underground level. In such cases mobile toilets with proper facility to drain the sullage shall be provided at reasonably accessible distance.
- 57.2.2 In case the Contactor fail to provide required number of urinals and latrines or fail to maintain it as per the requirements of Public Health laws, the Engineer shall have the right to provide/maintain through renowned external agencies at the cost of the Contactor.

57.3 Canteen

- 57.3.1 In every workplace wherein not less than 250 workers are employed, the Contractor shall provide an adequate canteen conforming to Section 37 of BOCWA, Rule 244 of BOCWR and as stipulated in Rule 247 of BOCWR. The charges for food stuff shall be based on 'no profit no loss' basis. The price list of all items shall be conspicuously displayed in such canteen.

57.4 Drinking Water

- 57.4.1 As per Section 32 of BOCWA the Contractor shall make in every worksite, effective arrangements to provide sufficient supply of wholesome drinking water. Quality of the drinking water shall conform to the requirements of national standards on Public Health laws.
- 57.4.2 While locating these drinking water facilities due care shall be taken so that these are easily accessible within a distance of 200m from the place of work for all workers at all location of work sites. All such points shall be legible marked "Drinking Water" in a language understood by a majority of the workmen employed.

57.5 Creches

- 57.5.1 In every workplace where in more than 50 female workers are ordinarily employed, there shall be provided and maintained a suitable room for use of children under age of 6 yrs, conforming to the provisions of Section 35 of BOCWA.

57.6 Labour Accommodation Camps

- 57.6.1 Where workers are based some distance from their normal place of residence, the

Contractor shall provide them with suitable and safe accommodation free of charge and shall take all necessary precautions to protect their health and welfare. The accommodation shall conform to the requirements of Section 34 of BOCWA, and include but not be limited to the further measures specified hereunder.

- 57.6.2 All accommodation camps shall be provided at all times with a sufficient supply of clean drinking water (of potable quality according to national legal standards), in suitable and easily accessible locations.
- i) The quality of drinking water shall be tested once a fortnight as prescribed in IS 1050:1991 and immediate remedial action shall be taken if quality falls below the standard. Test results shall be provided to the Engineer at least monthly.
 - ii) Storage tanks for potable water shall be located at least 1 m above ground level, and any boreholes or wells shall be 30 m or more from any toilet, drain or other potential source of pollution.
 - iii) Any wells shall be securely covered and provided with a trap door for inspection purposes, which is water and dust-proof and kept locked at all times, except when pump inspections and maintenance are performed.
 - iv) All wells shall be provided with suitable pumps, which shall be inspected and cleaned periodically according to manufacturers' specifications, and repaired or replaced immediately that any malfunction is detected.
- 57.6.3 The Contractor shall provide all accommodation camps with clean and properly equipped and staffed kitchen and canteen facilities to supply meals for workers.
- 57.6.4 The Contractor shall provide sufficient toilet and bathroom facilities for the numbers of workers accommodated in each camp. Separate accommodation and toilet/bathroom facilities shall be provided for men and women and all facilities shall be kept in full working order at all times, and cleaned and re-equipped daily.
- 57.6.5 The Contractor shall provide a laundry facility for the workers at the Labour Camps.

Section 7.6: Environmental and Social Management

58 LEGISLATION

58.1.1 The Contractor shall comply at all times with all relevant national and state legislation regarding environmental and social protection, pollution prevention and control, waste management and other relevant environmental and social matters, including but not necessarily limited to the following:

- The Environment (Protection) Act 1986 and Environment (Protection) Amendment Rules 2002 (amended 2003, 2004, 2005, 2006, 2007 and 2008);
- The Indian Wildlife (Protection) Act, 1972;
- The Forest (Conservation) Act, 1980 & rules there under;
- The Tree Preservation and Felling Acts of respective States;
- The Coastal Regulation Zone (CRZ) Notification, 2011;
- The Noise Pollution (Regulation and Control) Rules 2000;
- The Air (Prevention and Control of Pollution) Act 1981 (amended 1987);
- The Water (Prevention and Control of Pollution) Act 1974 (amended 1988);
- The Ground Water (Regulation, Development and Management) Rules 2007;
- The Municipal Solid Waste (Management and Handling) Rules 2000;
- The Construction, Demolition and De-silting Waste (Management and Handling) Rules 2006;
- The Manufacture, Storage and Import of Hazardous Chemicals (Amendment) Rules 2000;
- The Bio-medical Waste (Management and Handling) Rules 1998;
- The Batteries (Management and Handling) Rules 2001;

58.1.2 Some guidance on the applicability and demands of these statutes is given where relevant below. This is not intended to be definitive and it is the Contractor's responsibility to obtain detailed guidance from the appropriate government competent authorities regarding the specific requirements of all applicable legislation.

58.1.3 It is also the Contractor's responsibility to obtain all official approvals, consents or other authorizations as may be necessary in order to comply with the relevant statutes, and to pay all related fees and other costs. The Contractor shall obtain all such authorizations in a timely manner and submit to the Engineer for checking well before commencement of any related construction activity.

58.1.4 The Contractor shall comply with all legislative requirements and any additional conditions imposed by the competent authorities via consent conditions or any other mechanism, throughout the entire construction period.

59 SITE PREPARATION**59.1 Preservation of Trees**

- 59.1.1 The Contractor shall not cut any tree within or outside the work site without the explicit written approval of the Engineer and the local Forest Department.
- 59.1.2 The Contractor shall design all the Temporary and Permanent Works in such a way as to retain trees to the extent possible, without impeding operational requirements and safety.
- 59.1.3 Before construction begins, the Contractor shall physically mark the agreed boundaries of all areas in which vegetation is to be removed, and protect any areas in which trees or vegetation are to be retained, by robust, readily visible fencing, with signs prohibiting entry of vehicles or personnel.

59.2 Vegetation Removal

- 59.2.1 The Contractor shall remove vegetation from within the ROW only after he receives written authorization from the Engineer.
- 59.2.2 The Contractor shall prohibit workers from cutting trees or deliberately damaging any vegetation outside the ROW, including in the vicinity of accommodation camps; and shall ensure that all such camps are provided with adequate power and cooking fuel at all times.
- 59.2.3 The Contractor shall keep appropriate records of the agreed ROW boundaries and other measures and shall regularly monitor to ensure that no vegetation is damaged outside.

59.3 Topsoil Removal and Storage

- 59.3.1 The Contractor shall prepare a detailed Stockpile Area Management Plan (SAMP) which shall be submitted to the Engineer for review before construction begins. It shall include stockpile locations and prevention of runoff/dust control of fine particles.
- 59.3.2 Stockpiles shall be located in purpose-built storage areas, preferably within the ROW, which are more than 500 m from any inhabitation or waterway, in areas that are not subject to flooding.
- 59.3.3 Stockpile slopes shall not exceed 1:2 and height shall not exceed 2 m; and surfaces shall be covered with securely-fixed tarpaulins or via an alternative method subject to approval by the Engineer.
- 59.3.4 The Contractor shall prohibit the entry of vehicles and storage of objects in stockpile areas to prevent soil compaction, and shall keep multiple-handling of stored soil to a minimum.
- 59.3.5 The Contractor shall utilize removed topsoil in this project as much as possible: in top dressing embankments and fill slopes; reinstating borrow pits and other disturbed areas after use; and for other purposes.

59.4 Sites of Temporary Works

- 59.4.1 To prevent unnecessary damage of land, the Contractor shall locate sites for all temporary works and storage areas except the borrow pits, the quarries, and the stock pile areas within the approved ROW wherever possible.
- 59.4.2 If there is no alternative to locating certain temporary worksites outside the ROW, the Contractor shall ensure that all such sites are located at least 500 m from the nearest inhabited area, on land that owners are willing to sell or lease. The Contractor shall be solely responsible for negotiating the sale or rental of such land from the legal owner(s).
- 59.4.3 The Contractor shall reinstate the land after use to the entire satisfaction of the legal owner(s) and the Engineer.

59.5 Flood Prevention

- 59.5.1 The Contractor shall prepare a detailed Site Drainage and Flood Prevention Plan (SDFPP) to maintain natural drainage and avoid causing flooding of construction sites or surrounding areas and shall submit these to the Engineer for approval before construction start. The SDFPP shall include but not be limited to the measures specified in Clause 16 (59.5.2 & 59.5.3) below.
- 59.5.2 The Contractor shall not dispose of any material into rivers, streams, natural culverts or drains.
- 59.5.3 The Contractor shall incorporate suitable drainage structures into all construction sites, sufficient to prevent flooding of the site and adjacent areas during monsoon rainfall, and shall provide the Engineer with written proposals and drawings of proposed drainage and flood prevention measures for approval before construction begins.

60 ACCOMMODATION CAMP MANAGEMENT

- 60.1.1 The Contractor shall prepare a detailed Accommodation Camp Management Plan (ACMP) which shall be submitted to the Engineer for review before construction begins. It shall include particularly prevention of runoff/dust control of fine particles.
- 60.1.2 In the pre-construction period the Contractor shall identify potential locations for worker accommodation camps at which the social and environmental impacts of building and operating the camps are expected to be minimal. All such locations shall be at least 500 m from the nearest inhabited area within the project ROW, or if outside the ROW shall be on land that the owners are willing to lease or sell.
- 60.1.3 Final camp locations shall be selected on the basis of the Engineer's review, after which it shall be the Contractor's sole responsibility to obtain all necessary approvals/authorisations from national, state and local authorities for the establishment and operation of all camps. Copies of all necessary approvals shall be provided to the Engineer in advance of any work on the proposed sites.
- 60.1.4 If chosen camp site(s) are outside the ROW, it is the Contractor's sole responsibility

to arrange to rent or purchase the land from the legal owner(s).

- 60.1.5 Camp design, construction and operation shall comply in full with any and all conditions imposed by national, state or local authorities and by the Engineer, and with all appropriate legislation. The Contractor shall regularly provide the Engineer (and competent authorities if required by the consent conditions) with appropriate evidence to demonstrate that compliance is being maintained.
- 60.1.6 The Contractor shall consult the appropriate competent authorities regarding the treatment and disposal of wastewater from each camp, shall obtain the necessary authorisation and design and construct the treatment and disposal system accordingly.
- 60.1.7 Wastewater disposal shall comply at all times with effluent discharge standards and any other conditions that may be imposed by the competent authority and the Contractor shall regularly provide the Engineer (and competent authority if required by consent conditions) with data demonstrating that consent conditions are being met.
- 60.1.8 At all camps the Contractor shall provide separate garbage bins for biodegradable and non-biodegradable material, and litter bins in the accommodation blocks; and shall ensure that each site is tidied daily and that garbage is taken away/disposed of at least thrice a week.

61 Deleted

62 CONSTRUCTION WATER AND RAIN WATER HARVESTING

- 62.1.1 The Contractor shall prepare a detailed Construction Water and Rain Water Harvesting Plan which shall be submitted to the Engineer for review before construction begins.
- 62.1.2 The Contractor shall bear sole responsibility for organizing the supply and storage of water needed for the construction process and shall make all necessary arrangements with the relevant government authorities and comply in full with any charges or other conditions specified by them.
- 62.1.3 In advance of any water use the Contractor shall inform the Engineer of proposed water sources and arrangements made, and shall provide the Engineer with copies of all official approvals.
- 62.1.4 The Contractor shall ensure that usage volumes or rates of extraction agreed by the competent authorities are not exceeded.
- 62.1.5 The Contractor shall prepare and submit to the Engineer plans to minimise the wastage of water and prevent runoff into surface and underground water sources; and shall implement the water conservation and pollution prevention plans on approval by the Engineer. In certain cases, it may be advantageous to convert borrow pit area into community ponds to augment the groundwater condition, with the consent of the land owner(s) and local Panchayat.
- 62.1.6 Necessary permissions shall be obtained from the competent authority before

abstraction of surface water or groundwater. Groundwater abstraction for construction purposes shall not be done in the area listed by Central Ground Water Authority as notified for control and regulation of ground water.

62.1.7 The Contractor shall not abstract water from existing ponds, without the consent of the local people/Panchayat.

62.1.8 Where feasible as part of the construction works, the Contractor shall develop plans and implement rainwater harvesting schemes as per Central Ground Water Board (CGWB) guidelines. The Contractor shall be responsible for obtaining approval from the competent authority for any such proposals.

63 POLLUTION PREVENTION AND CONTROL

63.1 General

63.1.1 The Contractor shall prepare a detailed Pollution Prevention and Control Plan (PPCP), which shall be submitted to the Engineer for review before construction begins. It shall describe pollution control measures relating to air, water, noise and vibration. *Inter alia* this shall describe how compliance with the above legislation will be achieved, how liquid and solid emissions/wastes will be controlled. It shall also describe how clean-up any pollution occur including operational procedure and monitoring methods.

63.2 POLLUTION FROM VEHICLES, MACHINERY AND EQUIPMENT

63.2.1 In addition to the requirements of any consent conditions imposed by the competent authorities, the Contractor shall take the measures listed below to reduce the pollution and noise by vehicles, machinery and other equipment.

63.2.2 All vehicles, machinery or other equipment used in the construction process shall be three years or less from the date of manufacture at the commencement date of the Services.

63.2.3 All vehicles, machinery or other equipment used in the construction process shall be three years or less from the date of manufacture at the commencement date of the Services.

63.2.4 All vehicles, machinery or other equipment shall conform to the requirements of The Central Motor and Vehicle Act 1988 and other relevant national and state legislation and the appropriate norms of the Bureau of Indian Standards (BIS), and shall be fitted with the most up-to-date appropriate equipment for the reduction of noise, and atmospheric and other emissions.

63.2.5 All vehicles, machinery and other equipment shall be maintained, serviced and repaired where necessary, according to manufacturers' specifications and recommended schedules; the Contractor shall keep a schedule and records of all such activities and provide these to the Engineer for inspection on request.

63.2.6 The Contractor shall conduct and document regular inspections by appropriately qualified experts to identify and remediate any mechanical defects and wear and tear

before the performance of the vehicles, machinery or other equipment affects their fitness for purpose or environmental performance.

- 63.2.7 The Contractor shall also conduct and document regular inspections of all vehicles, machinery or other equipment to be used in bridge or culvert construction or any other work near waterways, to confirm that: all plant is clean, fit for purpose and there is no leakage of oil or grease; and that plant left on site is safely and appropriately stored in facilities with suitable spill prevention provision.

64 WATER QUALITY

64.1 General

- 64.1.1 The Contractor shall comply in full with all relevant requirements of national legislation governing water quality, including but not necessarily limited to The Environment (Protection) Act 1986 and Environment (Protection) Amendment Rules 2002 (amended 2003, 2004, 2005, 2006, 2007 and 2008), and the Water (Prevention and Control of Pollution) Act 1974 (amended 1988).
- 64.1.2 The Contractor shall comply at all times with any specific requirements of these and any other relevant statutes, including prescribed water quality limits and standards as per the following IS codes/CPCB norms/EP rules, and any other relevant legislation, code or guidelines:
- Drinking Water Quality Standards (as per IS: 10500)
 - Water Quality Criteria and Standards for Freshwater Classification (CPCB, 1979)
 - Tolerance Limits for Inland Surface Waters (as per IS:2296)
 - General Standards for Discharge of Effluents [as per Environment (Protection) Rules, 1986]
- 64.1.3 The Contractor is solely responsible for obtaining all consents and approvals from government competent authorities as required by national laws on water quality, and shall provide the Engineer with copies of all necessary approvals before construction begins.
- 64.1.4 The Contractor shall comply in full with any conditions imposed by the competent authorities when granting consent, and shall regularly provide the Engineer (and competent authorities if required by the consent conditions) with appropriate evidence to demonstrate that compliance is being maintained.
- 64.1.5 Notwithstanding the above, the Contractor is expected to maintain the highest standards of environmental performance throughout all his work and to take all necessary precautions to avoid causing any significant pollution of any natural water, both surface and underground. Precautions shall include but not be limited to those specified in Clause (64.2 to 64.5) below.

64.2 Siltation Control

- 64.2.1 The Contractor shall not obtain any construction materials from the beds of rivers, streams, lakes or other water bodies, except with prior approval of the competent authority. He shall bear related all costs and abide by the stipulated conditions, if any.
- 64.2.2 The Contractor shall install silt runoff prevention measures as consented by the Engineer at the base of embankments constructed near surface water bodies; and shall maintain such measures in place until embankment slopes are fully stabilised by grassing or other means as approved.
- 64.2.3 Stockpiled soil, sand and any other fine-grained construction materials shall be covered with secure tarpaulins or via an alternative method subject to the approval by the Engineer, and stored in fully waterproof enclosures, located more than 100 m from any surface water.
- 64.2.4 Where construction work is conducted in a natural waterway the Contractor shall prepare and submit to the Engineer for approval before such work begins, detailed plans to minimise and contain sediment disturbance.
- 64.2.5 During the construction period, the Contractor shall arrange for removal/cleaning of deposited silt from drainage channels and outlet points within the project influence area before the monsoon season. Rejuvenation of the drainage system by removing encroachments/congestions shall also be ensured.

64.3 Erosion Control

- 64.3.1 To minimise slope erosion and runoff of silt-laden rainfall, the Contractor shall conduct all cut and fill operations outside the monsoon season; and shall protect all cut slopes as per the design requirements as soon as the final profile has been reached.
- 64.3.2 While slopes are being cut or constructed, if areas are to be left uncovered for more than 5 days before further profiling, soil surfaces shall be suitably protected temporarily as consented by the Engineer, to reduce erosion.
- 64.3.3 The Contractor shall provide adequate temporary or permanent drainage alongside all slope areas before excavation/cutting begins, and shall provide adequate settlement lagoons/chambers to collect runoff and allow sediment to settle out before water is discharged to a natural waterway.
- 64.3.4 Soil erosion shall be visually checked by the Contractor periodically on slopes and high embankment areas. In case soil erosion is found, suitable measures shall be taken to control soil erosion.
- 64.3.5 The Contractor shall be responsible to ensure that all the slopes are fully stabilised and protected as per the design requirements before being taken over by the Employer

64.4 Wastewater Disposal

- 64.4.1 Notwithstanding the requirements of any consent conditions applied by the statutory authority, all site drainage and waste water shall be adequately treated including installation of a Sewage Treatment Plant, if required, before disposal to the natural environment; and no liquid or other material shall be allowed to drain away untreated.

- 64.4.2 Site drainage shall be retained in lagoons or chambers for a sufficient time to allow settlement of a significant proportion of the suspended sediment before water is decanted to a natural water body.
- 64.4.3 Wastewater from toilets, washrooms and other sanitary facilities shall be treated to national legal standards and discharged as prescribed by consent conditions applied by the statutory authority.
- 64.4.4 Any oil and grease contents of waste water shall be trapped and recovered before discharge to drain or water body.
- 64.4.5 Sufficient toilet and washroom facilities shall be provided at all construction sites for the numbers of workers and staff on site at all times, and all such facilities shall be fully cleaned and re-equipped at least daily.

64.5 Accidental Spillage

- 64.5.1 The Contractor shall comply in full with the requirements of all relevant legislation pertaining to the storage, handling and disposal of hazardous chemicals used in the construction process, including, but not necessarily limited to the Manufacture, Storage and Import of Hazardous Chemicals (Amendment) Rules 2000, and the “Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules 2008” and its amendment.
- 64.5.2 The Contractor is solely responsible for obtaining any consents and approvals that may be necessary under these and any other relevant statutes, for complying with any consent conditions set by the competent authority, and for providing the Engineer (and competent authority if necessary) with regular monitoring data demonstrating that those conditions are being met.
- 64.5.3 The Contractor shall adopt all necessary measures during the monsoon season to avoid soil erosion and sedimentation, accidental spillage, accident risks to workers and damage to already constructed works, near the water bodies considering their nature, extent and site-specific conditions.
- 64.5.4 The Contractor shall locate all parking areas, vehicle/machinery or equipment maintenance yards, and storage areas for fuel, oil or any other potentially toxic materials within the ROW of construction areas, and more than 100 m from any water body.
- 64.5.5 All parking areas and vehicle/plant maintenance yards shall be floored with waterproof hard-standing, and drainage from all such areas shall be collected and treated as required to meet legal discharge standards and any other consent conditions.
- 64.5.6 Fuel, oil and any other hazardous liquids shall be stored only in concrete-floored and bunded areas; and the volume of the bunded areas must be sufficient to retain all the stored liquid in the event of leakage.
- 64.5.7 Refuelling shall only be conducted in areas that are dedicated for this purpose and provided with floors of waterproof concrete, from which all drainage is collected and passed through an oil/water separator before discharge.

- 64.5.8 Accurate records shall be kept documenting all fuelling and maintenance, plus any spill events and action taken.
- 64.5.9 Appropriate spill containment and clean-up equipment shall be provided at all fuel storage, refueling and vehicle maintenance areas; and operators shall be appropriately trained in their normal activities as well as pollution control and remediation.
- 64.5.10 Waste oil from vehicle maintenance shall be collected in sealed containers and stored safely in sealed damage-proof containers prior to collection and disposal.
- 64.5.11 All waste oil shall be disposed of as per the Central Pollution Control Board (CPCB) and/or State Pollution Control Board (SPCB) guidelines as applicable.

65 AIR QUALITY

65.1 General

- 65.1.1 The Contractor shall comply in full with all relevant requirements of national legislation governing air quality, including but not necessarily limited to The Environment (Protection) Act 1986 and Environment (Protection) Amendment Rules 2002 (amended 2003, 2004, 2005, 2006, 2007 and 2008), and the Air (Prevention and Control of Pollution) Act 1981 (amended 1987).
- 65.1.2 The Contractor shall comply at all times with any specific requirements of these and any other relevant statutes, including prescribed air quality limits and standards as follows:
- National Ambient Air Quality Standards (NAAQS) amended till date; and
 - General emission standards as per the Environment (Protection) Rules, 1986.
- 65.1.3 The Contractor is solely responsible for obtaining all consents and approvals from government competent authorities as required by national laws on air quality, and shall provide the Engineer with copies of all necessary approvals before construction begins.
- 65.1.4 The Contractor shall comply in full with any conditions imposed by the competent authorities when granting consent, and shall regularly provide the Engineer (and competent authorities if required by the consent conditions) with appropriate evidence to demonstrate that compliance is being maintained.
- 65.1.5 Notwithstanding the above, the Contractor is expected to maintain the highest standards of environmental performance throughout all his work and to take all necessary precautions to avoid causing any significant air pollution. Precautions shall include but not be limited to those specified in Clause 65.2 below.

65.2 Dust Control

- 65.2.1 The Contractor shall water all unpaved roads in all construction sites at least thrice daily in dry weather to reduce dust; and shall apply the same watering regime to areas of exposed soil during dry and windy weather.
- 65.2.2 All fine-grained loose material (soil, sand, etc), debris shall be covered with secure

taraulins when stored on site and when carried on- or off-site on trucks.

- 65.2.3 Vehicle speeds on all construction sites shall be limited to a maximum of 20 kmph at all times.
- 65.2.4 Wheel washing facilities shall be provided and used by all vehicles at all site exits prior to travelling on public roads.
- 65.2.5 Crushers and any other machinery likely to produce significant dust shall be located at least 1 km from the nearest inhabitation, downwind of the predominant wind direction. Permission/NOC shall be obtained from the State Pollution Control Board for installing and operating all crusher units. The Contractor shall provide the Engineer with copies of relevant certification to show that all such machinery is fitted with appropriate dust reduction/extraction equipment.

66 NOISE

66.1 General

- 66.1.1 The Contractor shall comply in full with all relevant requirements of national legislation governing noise, including but not necessarily limited to The Environment (Protection) Act 1986 and Environment (Protection) Amendment Rules 2002 (amended 2003, 2004, 2005, 2006, 2007 and 2008), and the Noise Pollution (Regulation and Control) Rules 2000.
- 66.1.2 The Contractor shall comply at all times with any specific requirements of these and any other relevant statutes, including prescribed noise limits and standards as per Ambient Noise Level Limits (in Leq dB(A)) specified in Environment Protection Rules, 1986, Schedule III.
- 66.1.3 The Contractor is solely responsible for obtaining all consents and approvals from government competent authorities as required by national laws on noise pollution, and shall provide the Engineer with copies of all necessary approvals before construction begins.
- 66.1.4 The Contractor shall comply in full with any conditions imposed by the competent authorities when granting consent, and shall regularly provide the Engineer (and competent authorities if required by the consent conditions) with appropriate evidence to demonstrate that compliance is being maintained.
- 66.1.5 Notwithstanding the above, the Contractor is expected to maintain the highest standards of environmental performance throughout all his work and to take all necessary precautions to avoid causing any significant noise pollution or nuisance. Precautions shall include but not be limited to those specified in Clause 66.2.1 and 66.2.4 below.

66.2 Control Requirements

- 66.2.1 The Contractor shall ensure that noise generated by work carried out by the Contractor and his sub-contractors during daytime and night time shall not exceed the stipulated maximum permissible noise limits, whether continuously or intermittently.

In the event of a breach of this requirement, the Contractor shall immediately re-deploy or adjust the relevant equipment or take other appropriate measures to reduce the noise levels and thereafter maintain them at levels which do not exceed the said limits. Such measures may include without limitation the temporary or permanent cessation of use of certain items of equipment.

- 66.2.2 The Contractor shall submit to the Engineer a Noise Monitoring and Control Plan (NMCP) to supplement PPCP. It shall include full and comprehensive details of all powered mechanical equipment, which he proposes to use during daytime and night time, and of his proposed working methods and noise level reduction measures. The NMCP shall include detailed noise calculations levels to demonstrate the anticipated noise generation by the Contractor. The NMCP shall be reviewed on a regular basis and updated as necessary to assure that current construction activities are addressed.
- 66.2.3 The Contractor shall cease any activity likely to produce significant noise (such as concrete mixing, excavation, operation of heavy vehicles, etc.) at all locations that are less than 150 m from inhabited areas, between the hours of 10.00 pm and 6.00 am, and on Sundays and public holidays. Work sites near sensitive locations like schools and hospitals shall be surrounded by the temporary noise barriers.
- 66.2.4 Construction materials should be operated and transported in such a manner as not to create unnecessary noise as outlined below:
- i) Perform Work within the procedures outlined herein and comply with applicable codes, regulations, and standards established by the Central and State Governments and their agencies.
 - ii) Keep noise to the lowest reasonably practicable level. Appropriate measures will be taken to ensure that construction works will not cause any unnecessary or excessive noise, which may disturb the occupants of any nearby dwellings, schools, hospitals, or premises with similar sensitivity to noise. Use equipment with effective noise-suppression devices and employ other noise control measures as to protect the public.
 - iii) Schedule and conduct operations in a manner that will minimize, to the greatest extent feasible, the disturbance to the public in areas adjacent to the construction activities and to occupants of buildings in the vicinity of the construction activities.
 - iv) As far as possible, stationary noise making equipment shall be located along un-inhabited areas.

67 VIBRATION

- 67.1.1 In locations where the alignment is close to sensitive structures, historical / heritage structures, the Contractor shall control vibration at such locations. The control measures of vibration level at such sites shall be submitted to the Engineer for his approval. The scheme shall include:

- i) Monitoring requirements for vibrations at regular intervals throughout the construction period.
- ii) Pre-construction structural integrity inspections of sensitive structures in project activity.
- iii) Information dissemination about the construction methods, probable effects, quality control measures and precautions to be used.
- iv) The vibration level limits at work sites adjacent to the alignment shall conform to the permitted values of Peak Particle Velocity (PPV) as given in the table below.

Sl. No.	Condition of Structure	Max. PPV in mm/sec
1.	Most structures in “good condition”	25
2.	Most structures in “fair condition”	12
3.	Most structures in “poor condition”	5
4.	Water supply structures	5
5.	Heritage structures/bridge structures	5

68 SOLID WASTE MANAGEMENT

- 68.1.1 The Contractor shall comply in full with the requirements of all relevant legislation pertaining to the management and disposal of solid waste, including, but not necessarily limited to the Environment (Protection) Act 1986 and Environment (Protection) Amendment Rules 2002 (amended 2003, 2004, 2005, 2006, 2007 and 2008), and the Municipal Solid Wastes (Management and Handling) Rules 2000 and local legislation governing construction and demolition wastes.
- 68.1.2 The Contractor is solely responsible for obtaining any consents and approvals that may be necessary under these and any other relevant statutes, for complying with any consent conditions set by the competent authority, and for providing the Engineer (and competent authority if necessary) with regular data demonstrating that those conditions are being met.
- 68.1.3 The Contractor shall prepare a detailed Solid Waste Management Plan (SWMP), which shall be submitted to the Engineer for review before construction begins.
- 68.1.4 When preparing the SWMP the Contractor shall contact the relevant authorities at state and local level and make arrangements to deposit waste materials from construction sites at existing sanitary landfills wherever possible, or if such facilities are not available within a reasonable distance from any locations, at alternative licensed waste disposal sites.
- 68.1.5 The SWMP shall describe how compliance with the above legislation will be achieved; and how all solid waste will be collected and stored at Work Areas, removed and transported for disposal, and where and how it will be deposited.

Measures to keep sites in a tidy and sanitary condition will also be described, along with measures to minimise waste and re-use and recycle used materials.

- 68.1.6 No potentially polluting material is to be deposited at unlicensed sites.
- 68.1.7 With the approval of the Engineer, surplus inert material (excavated spoil, building rubble, etc.) that cannot be used as infill or for other purposes on the project may be deposited at unlicensed sites with the consent of the owner, if it can be retained indefinitely without causing pollution or other environmental hazard or damage, and if it does not create an unsightly appearance. Public perception and consent from the village Panchayats about the location of debris disposal site has to be obtained before finalizing the location.

69 HAZARDOUS WASTE MANAGEMENT

- 69.1.1 The Contractor shall comply in full with the requirements of all relevant legislation pertaining to the storage, handling and disposal of hazardous chemicals and wastes used in the construction process, including, but not necessarily limited to the 'Manufacture, Storage and Import of Hazardous Chemicals (Amendment) Rules 2000', and the 'Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules 2008' and its amendment.
- 69.1.2 The Contractor is solely responsible for obtaining any consents and approvals that may be necessary under these and any other relevant statutes, for complying with any consent conditions set by the competent authority, and for providing the Engineer (and competent authority, if necessary) with regular monitoring data demonstrating that those conditions are being met.
- 69.1.3 All waste oil shall be disposed of as per the Central Pollution Control Board (CPCB) and/or State Pollution Control Board (SPCB) guidelines as applicable.
- 69.1.4 Special arrangements for hazardous waste shall be described, including the manner in which such waste will be deposited to prevent escape of any material over the long term.
- 69.1.5 The asbestos waste from demolition debris, if any, shall be separated and disposed of as per the Hazardous Wastes Rules.

70 USE OF FLY ASH

- 70.1.1 The Contractor may be required to use fly ash or fly ash based products to the maximum extent possible in certain structures and works to fulfil the provisions of Fly Ash Notification of the Ministry of Environment and Forests.
- 70.1.2 The Contractor shall maintain a detailed record of sources and usage of fly ash or fly ash based products and makes such record available to the Engineer on request or to the competent authority for legal compliance.

71 ENERGY CONSERVATION

- 71.1.1 The Contractor shall use and deploy energy efficient and energy rating equipment, machineries, appliances and lighting fixtures at work site to comply with energy conservation norms, codes and guidelines of Bureau of Energy Efficiency (BEE) or any other state legislation.
- 71.1.2 The Contractor shall design site offices with maximum daylight and minimum heat gain to aid in conserving energy.

72 ARCHAEOLOGY

- 72.1.1 When the working near scheduled ancient monuments or sites, the Contractor shall obtain NOC from the Archaeological Survey of India for any activities within the Prohibited Area (100 m from the Protected Limit) and Regulated Area (200m from the Protected Limit) according to ancient monuments and Archaeological Sites and Remains Act, 1958.
- 72.1.2 The Contractor shall commission archaeological expert(s) to conduct a detailed assessment of all Work Areas to estimate the risk of encountering previously undiscovered historical remains during excavation and prepare a Physical Cultural Resources Management Plan (PCRMP). The PCRMP shall set out procedures to be adopted to minimise the risk of causing accidental damage during excavation work and other ground disturbance and to ensure that any material discovered is recognised and dealt with appropriately.
- 72.1.3 *Inter alia* the PCRMP shall include a “chance finds” procedure that involves: a qualified field archaeologist, familiar with international best practice, observing excavation work in any especially sensitive areas; stopping work immediately to allow further investigation if any finds are suspected; and calling in the State or Central archaeological authority in the event of a significant find and taking any action they require to ensure its removal or protection *in situ*.

73 CONTRACTOR’S DEMOBILIZATION

- 73.1.1 The Contractor shall prepare Site Rehabilitation Plans (SRPs) for all temporarily occupied sites (including but not limited to construction sites, storage yards, accommodation camps, borrow areas, etc) and shall submit these to the Engineer for approval well before each site is vacated. Each plan shall include but not be limited to the measures specified in Clause 73.1.2 to 73.1.6 below.
- 73.1.2 All garbage, debris and hazardous materials shall be removed and deposited as directed by competent authorities, at approved disposal locations.
- 73.1.3 All equipment, plant and other materials shall be removed from all sites, all trenches shall be filled, and any waste disposal pits shall be filled and sealed.
- 73.1.4 Infrastructure such as buildings, water supply, etc may be left *in situ* if desired by the landowner, otherwise all structures shall be demolished and the debris removed for disposal, and all wells and sewage treatment and disposal systems shall be sealed and left in a sanitary condition.

- 73.1.5 Final landscaping shall be as agreed with the landowner, and may include such reasonable measures as slope grading, grass seeding, tree planting, etc.
- 73.1.6 The Contactor shall report completion of site restoration to the Engineer, who shall approve site closure if all actions have been completed according to the Restoration Plan to the satisfaction of the landowner(s).

74 AUDIT AND INSPECTION, REPORTING

74.1 Audit and Inspection

- 74.1.1 The Contractor shall audit the activities described in his ESMP base on ESMoP at weekly, bi-weekly and/or monthly intervals or as otherwise required by the Engineer and shall keep appropriate records of this activity.
- 74.1.2 The Engineer will inspect the Contractor's environmental and social performance in the course of his normal supervision activities, and the Contractor will cooperate by providing access to sites, equipment, staff, records, etc. as may be requested by the Engineer either in writing or verbally.
- 74.1.3 At least two weeks' notice will be given to the Contractor by the Engineer of any formal audit of the Contractor's environmental and social performance, and the notice will indicate the areas and activities to be audited and any special requirements, including records to be provided. The Contractor's Senior Environment Officer and other appropriate staff shall accompany the Engineer's staff throughout such an audit as may be requested by the Engineer.

74.2 Reporting

- 74.2.1 The Contractor shall submit a written report to the Engineer at the end of each week and a more detailed report to the Engineer at the end of each month, describing:
- Progress in providing the mitigation measures specified below and described in the ESMP (refer Attachment 2);
 - The results of each monitoring activity specified in the ESMoP (refer Attachment 3, with an explanation of conclusions drawn from the results;
 - Any other observations regarding environmental or social matters;
 - Any recommendations or requests for authorisation of proposed changes in implementation of the ESMP or ESMoP, with an explanation/ justification.
- 74.2.2 The contractor shall also meet with the Engineer and his Environmental officers for ad-hoc formal and informal discussions as may be requested by the Engineer; and shall report verbally to the Engineer immediately there is any significant non-compliance with consent conditions or prescribed standards, or any significant deviation from the implementation of mitigation as described in the ESMP.

Section 7.7: Penalty and Award

75 CHARGES TO BE RECOVERED FROM CONTRACTOR FOR UNSAFE ACT OR CONDITION

- 75.1.1 DFCCIL aims to build an image of one of the best safety conscious organization. Any reportable accident (fatality/injury) results in loss of life and/or property damage but also damages the reputation of the organization. Most of the accidents are avoidable and caused preliminary due to contractors negligence. Hence DFCCIL shall recover the cost of damages from the contractors for every reportable incident (fatality /injury).
- 75.1.2 In addition every DFCCIL work site is exposed to public scrutiny as the work is executed just on the ROW. Any unsafe act/unsafe condition observed by public further damages DFCCIL reputation. Because of the non-voluntary compliance of contractors to the condition of contract on SHE and project SHE manual. DFCCIL has introduced an enforcement system design to influence the contractor's decision making and risk management process in favor of compliance rather than non-conformance.
- 75.1.3 The following table indicates the SHE violations (unsafe act/unsafe condition) that will warrant charges to be recovered from contractors. Penalties shall be applied to the contractor following repetitive failure to comply with the SHE manual or employer's direct instructions. Where awarded by the employer penalties shall be deducted from the contractor's running bill.

Sl. No	Topic	Unsafe Act/Unsafe Condition	Deductible Amount
1.	SHE Policy & Plan	i. SHE Policy a. non-compliance of Clause 2.2 b. Inadequate coverage, not signed c. Not displayed at prominent locations	Rs.5,000 per single violation, compounded to a maximum of Rs.25000 at any single instance.
		ii. SHE Plan a. Not as per Employers' content and coverage b. Delay in submission c. Not updated as per employer's instruction as per Clause 2.2 d. Copies not provided to all required supervisors/ engineers	Rs.100,000 per single violation, compounded to a maximum of Rs.200,000 at any single instance.

Sl. No	Topic	Unsafe Act/Unsafe Condition	Deductible Amount
2.	SHE Organization	<ul style="list-style-type: none"> i. Not complying to the minimum manpower requirements as specified by Engineer. ii. Not filling up the vacancies created due to SHE personnel leaving the contractor within 14 days. iii. SHE organization not provided with required Audio-visual and other equipments as specified by Engineer. iv. Employing through outsourcing agencies and SHE personal are not in the payroll of the main contractor v. Disobedience/improper conduct of any SHE personnel. vi. Chief SHE Manager not reporting directly to CPM of contractor. 	<ul style="list-style-type: none"> i. Rs.100,000 per month for first month and Rs.200,000 for subsequent months ii. Rs.50,000 per month for first month and Rs.100,000 for subsequent months <p>For items iii, iv, v and vi Rs.50,000 for first violation and Rs.100,000 for subsequent violations</p>
3.	SHE committees	<ul style="list-style-type: none"> i. Failed to formulate or conduct SHE committee meeting for any month ii. Contractor and Sub-contractor representatives not attending SHE Committee meetings. iii. Failed to conduct Site inspection before conducting SHE committee meeting iv. Failed to send SHE Committee Meeting minutes or Agenda to Employer in time. v. Non-adherence of Clause 8.4.1 vi. Non-adherence of Clause 8.6 	<ul style="list-style-type: none"> i. Rs.100,000 for the first violation and Rs.500,000 for the subsequent violations ii. Rs.5,000 to the contractor of the member who had not attended the meeting for first violation and Rs.25,000 for subsequent violations. <p>For item iii, iv, v, and vi Rs.25,000 for first violation and Rs.50,000 for subsequent violations</p>

Sl. No	Topic	Unsafe Act/Unsafe Condition	Deductible Amount
4.	ID card	i. non-adherence of Clause 9.1, 9.2 and 9.3	Rs.100,000 for first violation and Rs.200,000 for subsequent violations.
5.	SHE Training	i. non complying to the requirements as mentioned in conditions of contract on SHE and project SHE manual with regard to: <ul style="list-style-type: none"> a. Induction training not given b. Supervisor/engineer/manager training not conducted as per Clause 10.1.6 c. Refresher training as per clause 10.1.7 and 10.1.11 not conducted d. Tool-box talk not conducted as per Clause 10.1.8 e. Skill development training not conducted as Clause 10.1.9 f. Daily Safety Oath not conducted as per Clause 10.1.10 g. Top management behavior based SHE training conducted 	For item a to g Rs.50,000 for first violation on and Rs.100,000 for subsequent violations
6.	SHE inspection	i. Not complying to the requirements as mentioned in conditions of contract on SHE and project SHE manual as per Clause 11. ii. Noncompliance of Clause 11.5.3	Rs.50,000 for first violation and Rs.100,000 for subsequent violations

Sl. No	Topic	Unsafe Act/Unsafe Condition	Deductible Amount
7.	SHE audit	<p>Internal Audit: MARS</p> <p>i. Not conducted as per SHE Plan</p> <p>ii. Report not sent to Employer</p> <p>iii. Action not taken for any month</p> <p>External Audit</p> <p>iv. Not conducted as per SHE Plan</p> <p>v. Report not sent to Employer</p> <p>vi. Action not taken for any month</p>	<p>For item i. to iii. Rs.50,000 for first violation and Rs.100,000 for subsequent violations.</p> <p>For item iv to vi Rs.100,000 for first violation and Rs.200,000 for subsequent violations.</p>
8.	SHE Communication	<p>i. Important days to be observed for SHE awareness as furnished by employer not observed</p> <p>ii. Posters as furnished by Employer not printed and displayed</p>	<p>i. Rs. 10,000 for first violation and Rs.50,000 for subsequent violations</p> <p>ii. 200,000 per contract.</p>
9.	SHE Submittals	<p>i. Non compliance of Clause 14.1.</p> <p>ii. Non compliance of Clause 14.2.</p> <p>iii. Non compliance of Clause 14.3.</p>	<p>For item i. Rs.50,000 for first violation and Rs.100,000 for subsequent violations</p> <p>For item ii and iii Rs.100,000 for first violation and Rs.200,000 for subsequent violations</p>
10.	Injury and Incidence reporting	<p>i. Fatal accidents</p> <p>ii. Injury accident</p> <p>iii. Abnormal delay in reporting accidents of willful suppression of information about any accidents/dangerous occurrence as per Clause 15.1.4</p> <p>iv. Delay in informing about any accidents/dangerous incidents.</p> <p>v. Non-compliance of Clause 15.4</p>	<p>i. Rs.500,000 for first fatality and Rs.100,000 for every subsequent fatality.</p> <p>ii. Rs.100,000 for first grievously injured person and Rs.200,000 for every subsequent grievously injured person (grievous injury as defined by Workmen Compensation Act)</p> <p>iii. Rs.100,000 for first violation and Rs.200,000 for subsequent violations for items iv and v Rs.50,000 for first violation and Rs.100,000 for subsequent</p>

Sl. No	Topic	Unsafe Act/Unsafe Condition	Deductible Amount
			violations
11.	Emergency preparedness plan	Non-compliance of Clause 16.1.1 to 16.1.6	Rs.100,000 for non-compliance of any of the clauses
12.	Housekeeping	<ul style="list-style-type: none"> i. housekeeping maintenance register not properly maintained up to date ii. Surrounding areas of drinking water tanks/taps not hygienically cleaned/maintained iii. Office, stores, toilet/urinals not properly cleaned and maintained. iv. Required dustbins at appropriate places not provided / not cleaned. v. Stairways, gangways, passageways blocked. vi. Lumber with protruding nails left as such vii. Openings unprotected viii. Excavated earth not removed within a reasonable time. ix. Truck carrying excavated earth not covered/tyres not cleaned. x. Vehicles/equipments parked/ placed on roads obstructing free flow of traffic. xi. Unused surplus cables/steel drums lying scattered xii. Scraps lying scattered xiii. Wooden scraps, empty wooden cable Water stagnation leading to mosquito breeding 	<p>Rs.10,000 per single violation</p> <p>Compounded to a maximum of Rs.100,000 at any single instance</p>

Sl. No	Topic	Unsafe Act/Unsafe Condition	Deductible Amount
13.	Working at height/ Ladders and Scaffolds	<ul style="list-style-type: none"> i. Not using or anchoring Safety Belt ii. Not using Safety Net iii. Absence of life line or anchorage point to anchor safety belt iv. Non-compliance of Clause 27.10 v. Using Bamboo ladders. vi. Painting of ladders vii. Improper usage (less than 1m extension above landing point, not maintaining 1:4 ratio) viii. Aluminum ladders without base rubber bush. ix. Usage of broken/weak ladders. x. Usage of re-bar welded ladders. xi. Improper guardrail, toe board, barriers and other means of collective protection xii. Improper working platform xiii. Working at unprotected fragile surface xiv. Working at unprotected edges. 	<p>Rs.10,000 per single violation</p> <p>Compounded to a maximum of Rs.100,000 at any single instance</p>
14.	Lifting appliances and gear	<ul style="list-style-type: none"> i. Non availability of fitness certificate as per clause 30.1.3 ii. Documents not displayed on the machine or not available with the operator as per Clause 30.1.4 iii. Maximum Safe Working Load not written on the machine as per Clause 30.1.5 iv. Non compliance of Clause 30.16 	<p>Rs.50,000 per single violation</p> <p>Compounded to a maximum of Rs.500,000 at any single instance</p>

Sl. No	Topic	Unsafe Act/Unsafe Condition	Deductible Amount
		v. Non compliance of Clause 30.2 vi. Automatic safe load indicator not provided or not in working condition as per Clause 30.3 vii. Age of the operator less than 21 years or without any licence and non-compliance of other item as per Clause 30.4 viii. Non-compliance of Clause 30.5 ix. Non-compliance of any of the items mentioned regarding rigging requirements as per Clause 30.6 x. Failure to submit method statement in case of all critical lifting. xi. Person riding on crane. xii. Creating more noise and smoke xiii. Absence of portable fire extinguisher in driver cabin xiv. Fail to guard hoist platform xv. No fencing of hoist rope movement area xvi. Hoist platform not in the horizontal position	
15.	Launching operation	Non-adherence of any of the provisions mentioned in Clause 31.1.2	Rs.50,000 for first violation and Rs.100,000 for subsequent violations.
16.	Site Electrical safety	i. Non-compliance of Clause 36.1 ii. Non-compliance of Clause 36.2.4, 36.2.5 iii. Non-compliance of Clause 36.3.1	Rs.10,000 per single violation Compounded to a maximum of Rs.100,000 at any single instance

Sl. No	Topic	Unsafe Act/Unsafe Condition	Deductible Amount
		<ul style="list-style-type: none"> iv. Non-compliance of Clause 36.7, 36.8 and 36.9.1 v. Non-compliance of Clause 36.10 and 36.13 vii. Exposed electric lines (fermentative damage) and circuits in the workplace viii. Inserting of bare wires into the socket ix. Improper grounding for the electrical appliances x. Electrical cables running on the ground xi. Non-compliance Clause 37 	
17.	Hand tools and Power tools	Non-compliance of Clause 38	Rs.10,000 per single violation Compounded to a maximum of Rs.100,000 at any single instance
18.	Gas cutting	<ul style="list-style-type: none"> i. Wrong colour coding of cylinder. ii. Cylinders not stored in upright position. iii. Flash back arrester, non-return valve and regulator not present or not in working conditions. iv. Fail to put cylinders in a cylinder trolley. v. Damaged hose. vi. Using domestic LPG cylinders. vii. Fail to store cylinder 6.6m away from fire prone materials. viii. Fail to use hose clamps ix. Fire extinguisher not placed in the vicinity during operation. 	Rs.10,000 per single violation compounded to a maximum of Rs.100,000 at any single instance.
19.	Welding	<ul style="list-style-type: none"> i. Voltmeter and ammeter 	Rs.10,000 per single violation

Sl. No	Topic	Unsafe Act/Unsafe Condition	Deductible Amount
		<ul style="list-style-type: none"> not working ii. Improper grounding and return path. iii. Damaged welding cable iv. Bare openings in the cable. v. Non-availability of separate switch in the transformer vi. Non-availability of main switch control to switch off power to the welding unit. vii. Usage of reinforcement rod as return conductor viii. Damaged holder ix. Fire extinguisher not placed in the vicinity during operation. 	Compounded to a maximum of Rs.50,000 at any single instance.
20.	Fire precaution	<ul style="list-style-type: none"> i Smoking and open flames in fire prone area ii. Using more than 24V portable electrical appliances in the fire prone area iii. Not proper ventilation in cylinder storage area. iv. Absence of fire extinguishers v. Fire extinguishers not refilled once in a year. vi. Fire extinguisher placed in a not easily accessible location. 	<p>Rs.5,000 per single violation</p> <p>Compounded to a maximum of Rs.25,000 at any single instance.</p>
21	Excavation and confined space	<ul style="list-style-type: none"> i. Non-compliance of Clause 44.1 ii. Non-compliance of Clause 44.2 	<p>For any item from i and ii Rs.10,000 per single violation</p> <p>Compounded to a maximum of Rs.50,000 at any single instance. Rs.10000 per first violation and Rs.50,000 for subsequent violations.</p>

Sl. No	Topic	Unsafe Act/Unsafe Condition	Deductible Amount
22.	Work permit system	i. Non-compliance of Clause 45.1	For item i and ii Rs.50,000 per first violation and Rs.100,000 for subsequent violations
23.	Traffic	i. Non-compliance of Clause 46.2.1 ii. Non-compliance of Clause 46.4.3 iii. Non-compliance of Clause 46.5.2 iv. Non-compliance of Clause 46.5.5 v. Non-compliance of Clause 46.5.11 vi. Non-compliance of Clause 46.5.12	Rs.100,000 per first violation and Rs.200,000 for subsequent violations
		a. Barricades i. Not Cleaned ii. Not in alignment iii. Not numbered iv. Not painted v. Red lights/reflectors not working vi. Damages not repaired vii. Not secured properly viii. Barricade inspector not employed ix. Protruding parts/portions not repaired x. Barricades maintaining register not properly maintained up to date	Rs.25,000 per single violation Compounded to a maximum of Rs.100,000 at any single instance
		b. Contractor Vehicles i. Over loading of vehicles ii. Unfit drivers or operators iii. Unlicensed vehicles iv. Absence of traffic marshals v. Absence of reversing alarm vi. Absence of fog light (at winter) vii. Power/hand brakes not in	Rs.25,000 per single violation Compounded to a maximum of Rs.100,000 at any single instance

Sl. No	Topic	Unsafe Act/Unsafe Condition	Deductible Amount
		working condition. c. Splashing of Bentonite on roads/non-cleaning of tyres of dumpers and transit mixers i. Mishandling of bentonite like splashing of bentonite outside specified width of barricading ii. Non-cleaning of tyres of dumpers and transit mixers before leaving the site and thereby creating a traffic safety hazard to road users.	For item i. and ii. a. Rs.100,000 on first observation. b. Rs.200,000 on second observation. c. Rs.300,000 on third and subsequent observations.
24.	Batching plant/Casting yard	Non-adherence of any of the provision mentioned in Clause 48	Rs.10,000 for single violation Compounded to a maximum of Rs.100,000 at any single instant.
25.	PPE	i. Not having ii. Not wearing (or) using and kept it elsewhere iii. Using damaged one iv. Using wrong type v. Using wrong colour helmet or helmet vi. Using for other operation (e.g. Using safety helmet for storing materials or carrying water from one place to other) vii. Not conforming to BIS standard viii. Non-compliance of Clause 50.16, 50.17 and 50.18	From item i. to vi. Rs.200 per single violation For item vii. Rs.10,000 for first violation and Rs.50,000 for subsequent violations For item viii. Rs.50,000 for first violation and Rs.100,000 for subsequent violations.
26.	Occupational Health	i. Fail to conduct medical examination to workers. ii. Absence of ambulance van & room iii. Workers not having ID card iv. Inadequate number of toilets	Rs.10,000 per single violation Compounded to a maximum of Rs.100,000 at any single instance.

Sl. No	Topic	Unsafe Act/Unsafe Condition	Deductible Amount
		v. toilets not cleaned properly vi. Absence of water facilities for toilets and washing places vii. Toilet placed more than 500m from the work site. viii. Absence of drinking water ix. Absence of first-aid person in work site. x. Absence or inadequacy of first- aid box. xi. Misuse of first-aid box. xii. First-aid box not satisfy the minimum xiii. Smoking inside the construction site xiv. Drink and drive or work. xv. Excessive noise and vibration xvi. Canteen not provided xvii. Food stuff not served on no loss no profit basis. xviii. Creche not provided. xix. Accommodation not provided as per BOCWA xx. Fumigation / insecticides not sprayed to prevent Mosquito breeding xxi. Non-compliance of Clause 55.1 and 45.2	
27.	Labour Welfare measures	i. Non-adherence of Labour welfare provisions of BOCWA ii. Fail to register establishment and display the registration certificate at workplace iii. Absence of workers register and records iv. Absence of muster roll and wages register	Rs.10,000 per single violation Compounded to a maximum of Rs.50,000 at any single instance

Sl. No	Topic	Unsafe Act/Unsafe Condition	Deductible Amount
		v. Fail to display an abstract of BOCWA and BOCWR	
28.	Environmental Management	i. Tire wash facility not provided ii. Spillage from vehicles not arrest iii. Air monitoring not practiced iv. Noise monitoring not practiced v. The values of air monitoring and noise monitoring not within acceptable limits vi. Dust control measures at sites not practiced vii. Improper disposal of debris/residues	Rs. 10,000 per single violation Compounded to a maximum of Rs.50,000 at any single instance
29.	Working near exiting railway track	i. To start work without erecting barricading as per requirement. ii. To start work in station area without permit to work or without approved plan. iii. To launch girder for RFO/ROB without approved plan and work permit. iv. Infringement of moving dimension by any vehicle / construction equipment with running train causing disruption of traffic, injury to passenger / fatal incidence.	Rs. 500,000 for first violation and Rs.1,000,000 for subsequent violation.

75.1.4 Without limiting to the unsafe acts and or conditions mentioned above in Clause 75.1.3 the Employer shall have the right to deduct charges for any other unsafe act and or condition depending upon the gravity of the situation on a case-to-case basis. The charges shall be in comparison with that of the similar offence indicated in Clause 75.1.3.

76 STOPPAGE OF WORK

- 76.1.1 The employer shall have the right to stop the work at his sole discretion, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and/or property, and / or equipments. In such cases, the contractor shall be informed in writing about the nature of hazards and possible injury/accident.
- 76.1.2 The contractor shall not proceed with the work until he has complied with each direction to the satisfaction of Employer
- 76.1.3 The Contractor shall not be entitled for any damages/compensation for stoppage of work, due to safety reasons and the period of such stoppage of work shall not be taken as an extension of time for completion of the facilities and will not be the ground for waiver of levy of liquidated damages.

77 AWARDS

- 77.1.1 The following categories will be considered for awards as per the scheme in practice of the Contractor.
- i. For every safe million-man hour working without any reportable incidents.
 - ii. Zero fatality contracts.
 - iii. 100% adherence to voluntary reporting of all accidents throughout the currency of contract.
 - iv. Safest project team of the year.
 - v. Best SHE team of the year.
 - vi. Safest Contractor of the year.

Attachments to SHE Requirements of Specifications**ATTACHMENT 1**
CONTENTS OF SHE PLAN

SITE SHE PLAN	
Contract No.	
Contractor Name	
Project Name	

1	Project Highlights i. Title of the content ii. Contractor Number iii. Brief scope of work iv. Location map/ key plan v. Period of the project
2	SHE Policy
3	Site Organization Chart Chart indicating reporting of SHE personnel
4	Roles & Responsibility Individual responsibility of the i. Contractor's Representative ii. SHE Director iii. Chief Environmental Officer iv. Chief Accident Prevention Officer v. Construction Manager vi. Construction Supervisors vii. SHE Committee Members viii. SHE In charge ix. Site Engineers x. First Line Supervisors xi. Sub-contractors
5	SHE Committee i. Details - Chairman, Members, Secretary and Engineer ii. Procedures for effective conduct of meeting
6	SHE Training
7	Sub-contractor Evaluation, Selection and Control
8	SHE Inspection

9	SHE Audit
10	Accident Investigation and Reporting Procedures
11	Occupational Health Measures
12	Labour Welfare Measures
13	Risk Assessment and Mitigation Procedures
14	Safe Work Procedures <ul style="list-style-type: none"> i. Work at Height ii. Structural Steel Erection iii. Launching of segments iv. Embankments and Cuttings v. Switch-over works vi. Bridges, ROBs, RUBs, Railway Flyovers vii. Works in close vicinity of railway tracks/ roads viii. Floor, Wall Openings and Stairways ix. Welding, Cutting and Bracing x. Lifting appliances xi. Work Permit Systems xii. Electrical Equipments xiii. Mechanical Equipments xiv. Excavation xv. Fire Prevention xvi. Hazardous Chemicals and Solvents xvii. Ionising Radiation xviii. Lighting xix. Abrasive Blasting
15	Work Permit System
16	List of standard job specific PPEs to be used in the site
17	Maintenance of Regime for construction Equipment and Machinery
18	Traffic Management
19	Housekeeping
20	Environmental and Social Management
21	Emergency Management
22	Visitors and Security arrangement

Note: The Environmental and Social Management Plan (ESMP), the Environmental and Social Monitoring Plan (ESMoP), the Safety and Health Plan (SHP) and the Safety and Health Monitoring Plan (SHMoP) which supplement the SHE Plan shall be incorporated in the relevant sections.

ATTACHMENT 2**CONTRACTOR'S ENVIRONMENTAL AND
SOCIAL MANAGEMENT PLAN****1. General**

- 1.1 The Contractor shall prepare an Environmental and Social Management Plan (ESMP) setting out in detail how he proposes to manage and minimise the environmental and social impacts of his activities based on general, site-specific and mandatory requirements throughout the construction period.
- 1.2 The Contractor's ESMP shall be based on environmental and social considerations submitted with the Bid and shall have the content shown in the next section [Contents of ESMP].
- 1.3 The Contractor shall submit his ESMP for review by the Engineer within 42 days after the Commencement Date of the Services, and shall amend the ESMP to address any comments made by the Engineer and submit a Final ESMP within 28 days of receipt of comments.
- 1.4 The Final ESMP shall be binding on the Contractor for the duration of the Services.

2. Contents of ESMP**2.1 Contractor's Environmental Policy**

- 2.1.1 The first section of the ESMP shall contain a statement of the Contractor's intent with respect to the environment and the management of environmental and social impacts, which sets the framework for, and guides, all other aspects of the plan.

2.2 Management Responsibility

- 2.2.1 This section of the ESMP shall name the most senior manager in the contracting company or at their project site as having overall responsibility for environmental management, with an explanation of how that responsibility is delegated down to each level of management. It shall also name the Chief Environmental Officer (CENO) who is responsible for day-to-day environmental management, supervision and monitoring at all work-sites, and has company authority to stop construction works if environmental non-compliance is observed.
- 2.2.2 At each active construction site there must be at least one named person with delegated responsibility for environmental management on each shift. This person will be referred to as the Senior Environment Officer (SEO), and on larger sites he may be assisted by Environment Officer (EO), who will work under his direction conducting routine monitoring, data collection, etc.
- 2.2.3 Environmental affairs include social issues, and the ESMP must also identify a Community Liaison Officer (CLO) who will deal with community relations and liaise on behalf of the Contractor with people who may be affected by the construction process. The CLO shall integrate all of his activities with those of other social specialists responsible for supporting the Resettlement and Rehabilitation Plan (RRP) for the project for the Employer; and shall operate within the framework of the Entitlement Matrix and Grievance Redress Procedure established by the RRP.

2.3 Management Contact

2.3.1 The office and home telephone or radio contacts (including mobile / cell phone contact) shall be listed for all named persons having environmental management responsibility.

2.4 Mitigation and Management Measures

2.4.1 The Contractor shall deal in turn with each of the mitigation measures identified as his responsibility in the Environmental and Social Impact Assessment (ESIA) for the Project, Environmental Management Plan (EMP) to be updated under the Engineering Consultancy Service for the Project, and mandatory provisions specified in the clearance and approval letters and explain in detail how he proposes to provide the mitigation as specified in the SHE Requirements of Specifications.

2.4.2 This should not simply repeat the contents from the SHE Requirements of Specifications but shall explain in detail: a) the action or series of actions the Contractor will take to comply with each clause or sub-clause; b) responsibility for each action; c) the programme for each action; d) how the Contractor proposes to monitor the provision and effects of each action; and e) parameters or performance indicators to be monitored.

2.5 General Environmental Management

2.5.1 The Contractor shall identify and describe the more general actions he proposes to take to manage and mitigate the environmental and social impacts of his day-to-day operations. These shall be presented and explained in the same way as the specified mitigation measures, as in 2.4.2 (a-e) above.

2.5.2 Actions shall include, but not be limited to, those specified in 2.5.3 – 2.5.5 below (any items that are adequately covered in Section 2.4 need not be repeated).

2.5.3 Construction Site Management

General environmental mitigation and management measures at construction sites shall include at least the following:

- Dedicated concrete-floored areas for vehicle maintenance and washing, from which all drainage passes through an oil/water separator and sediment trap;
- Storage of all liquid fuel, lubricants and other toxic liquids in concrete-floored and bunded areas, the volume of which is at least equivalent to that of all stored liquids;
- Watering of site roads and other exposed soil during the dry season to suppress dust, with water tankers permanently available for this purpose;
- Collection of drainage at all sites and passage into settlement tanks/sediment traps before discharge;
- Treatment of all sewage and any other liquid discharges to national effluent standards and/or consent conditions before discharge;
- All point-source atmospheric emissions (e.g. from crushers, batching plants, engines, generators, etc) shall comply with national standards or international standards if a national standard is not available;
- All motor-driven generators, compressors, pumps, etc. to be properly silenced to suppress noise to national standards or international standards if a national standard is not available;

- Site lighting and use of machinery near inhabited areas to be limited to normal daytime working hours;
- Disposal of solid waste by arrangement with local municipalities;
- No use or disposal of nationally or internationally proscribed toxic and hazardous substances;
- Issuance of a Code of Practice to all workers, specifying required behaviour, including but not limited to :
 - No hunting, fishing, timber collection or lighting of fires;
 - No discarding of litter or other waste;
 - Proper usage of toilets and washrooms;
 - Other behaviour to comply with defined local cultural and religious sensitivities;
 - No unauthorized entry onto private property;
 - Immediate dismissal for any transgression.

2.5.4 Management of Land

Preparation, use and after-care of land shall include at least the following:

- Conservation of topsoil during vegetation removal, and disposal of cut vegetation by composting to the extent possible, and provision of wood/timber to local communities free of charge;
- Disposal of any remaining vegetation at managed sites, without burning;
- Removal of topsoil before excavation; and storage for future use, with measures to prevent erosion or dust production from stockpiles;
- Prior recording of the location of all walls, fences and other structures on temporarily acquired land, so that they may be replaced at the end of construction;
- Reinstatement of all temporarily acquired land after use to its pre-construction condition or as otherwise reasonably required by the owner;
- Detailed planning of cut and fill volumes to maximise the re-use of material in the project and minimise the disposal of spoil, with excess spoil being deposited at planned disposal sites only;
- Adoption of a precautionary approach towards the risk of uncovering archaeological material, by: a) avoiding any work within the boundaries of scheduled monuments and sites. Work outside the extended boundary as per rules. If required to work within the boundary, necessary permission from authority shall be in place; b) obtaining an expert assessment of the risk of finding material at non-scheduled sites; c) having excavation in high-risk sites observed by qualified archaeologists; d) training workers and digger operatives to recognize archaeological material; and e) halting work if any finds are suspected.

2.5.5 Community Liaison and Facilities

The Contractor shall establish regular contact with communities local to all construction sites for the purposes of exchanging information and developing mutual understanding. Such contacts shall include:

- Consulting all communities in the vicinity of construction sites prior to commencement of any work (via the CLO and other staff as necessary), to inform them of the work proposed, construction programme, and measures to maintain safety and minimize disruption and disturbance; all such contacts shall be coordinated with the Employer's ongoing programme of community liaison;
- Identification via the consultation process of any important community features, which the Contractor shall make arrangements to conserve or remove/relocate with community agreement, at his own expense;
- Protecting features to be retained (cemeteries, buildings, etc) by secure fences, fluorescent tapes, and appropriate signs;
- Clear marking of excavated areas near settlements with posts, fluorescent tapes and warning signs;
- Providing suitable temporary bridges or diversions wherever existing roads, tracks or footpaths are intersected by construction works;
- Providing temporary potable water supplies if access to the existing water supply is interrupted at any time; and
- Barricading of excavated sites near settlement.

2.6 Training

2.6.1 The Contractor shall describe the training programme and content he will provide for workers and staff in order to:

- Raise awareness on: the role and importance of environmental matters both globally and locally; the potential negative impacts of construction work in general and the ways in which impacts can be mitigated; sensitivity of certain critical areas of the alignment (such as reserved forest land, national parks, coastal areas, etc.) and the expected construction impacts and long-term environmental and social benefits of the DFC project;
- Disseminate the philosophy and approach of the ESMP to environmental protection throughout the workforce, and explain the roles of all parties in implementing the mitigation and environmental safeguard measures;
- Inform all employees of the mitigation and environmental protection measures they are required to comply with when conducting their work, and the penalties for non-compliance.

2.6.2 Training to raise the awareness and capacity of sub-contractors and their employees shall also be incorporated where necessary.

2.7 Appendices

2.7.1 The ESMP shall contain components of the mitigation and management measures specified above and in Clause 16 [SHE Requirements] of Specifications. The contents of the plan shall include, but not be limited to, the items listed below.

2.7.2 The Contractor shall prepare the following plans to supplement the ESMP.

- Stockpile Area Management Plan (SAMP)
- Site Drainage and Flood Prevention Plan (SDFPP)

- Accommodation Camp Management Plan (ACMP)
- Construction Water and Rain Water Harvesting Plan (CWRWHP)
- Pollution Prevention and Control Plan (PPCP)
- Noise Monitoring and Control Plan (NMCP)
- Solid Waste Management Plan (SWMP)
- Hazardous Waste Management Plan (HWMP)
- Energy Conservation Plan (ECP)
- Physical Cultural Resources Management Plan (PCRMP)
- Site Rehabilitation Plan (SRP)

3. ESMP Implementation

- 3.1 The Contractor's ESMP shall be implemented within the framework of a company Environmental Management System (EMS), which is certified to ISO 14001-2004, or is scheduled to be so certified within the timescale of this project.
- 3.2 Each organization sub-contracted by the Contractor shall prepare their own daughter ESMP, which follow the format specified in "2 Contents of ESMP" above. This applies to all sub-contractors and major suppliers, whether or not they are working on-site. The Contractor shall provide guidelines on ESM to its other vendors viz. transport contractors, waste management contractors, quarry companies, material merchants, fuel suppliers etc. describing how they will manage and minimise the environmental and social impacts of their activities related to this project. The sub-contractor's ESMP should be integrated into the Contractor's ESMP.
- 3.3 The ESMP shall be brought to the attention of all employees engaged in construction or supporting activities, and they shall be given training in those aspects of the ESMP that relate to their work, and an insight into the potential adverse impacts of their work and how they are to be mitigated.

ATTACHMENT 3**CONTRACTOR'S ENVIRONMENTAL
AND SOCIAL MONITORING PLAN****1. General**

1.1 The Contractor shall prepare an Environmental and Social Monitoring Plan (ESMoP) setting out the details of the monitoring to conduct in order to:

- a. Ensure that each environmental mitigation and management measure (general, site-specific and mandatory) that is his responsibility is provided as specified in section 2.4 of his ESMP;
- b. Ensure that each additional general environmental mitigation and management measure is implemented as proposed in section 2.4 of his ESMP;
- c. Ensure he complies with the requirements of all relevant national and state legislation and any consent/clearance/approval conditions applied by government competent authorities;
- d. Determine whether each mitigation and management measure is protecting the environment as intended; and
- e. Detect any additional environmental impacts that may occur, for which additional mitigation may be needed.

1.2 The Contractor shall submit his ESMoP for review by the Engineer within 42 days after the Commencement Date of the Services, and shall amend the ESMoP to address any comments made by the Engineer and submit a Final ESMoP within 28 days of receipt of comments.

1.3 The Final ESMoP shall be binding on the Contractor for the duration of the Services.

2. Content of ESMoP

2.1 Monitoring described in the ESMoP shall cover all areas that could be affected by the construction work, including all construction sites and their surroundings, plus off-site areas and locations operated by sub-contractors, such as quarries, transportation routes, waste disposal sites.

2.2 Monitoring shall be conducted at specified regular intervals throughout the entire construction period.

2.3 The Contractor shall be solely responsible for conducting the monitoring described in his ESMoP and for ensuring that data collected are scientifically robust and credible.

2.4 The ESMoP shall describe each monitoring procedure in detail, including (as relevant):

- Purpose;
- Equipment and specifications;
- Calibration procedure;
- Monitoring locations, parameters, frequency and duration;
- Monitoring methodology;
- Data presentation and analysis.

- 2.5 The monitoring shall include, but not necessarily be limited to, the items listed below.
- 2.6 The most frequent monitoring activity shall involve inspection and observation on a daily basis to determine compliance with the mitigation and management measures described in section 2.4 of the Contractor's ESMP.
- 2.7 Daily inspection and observation shall also be conducted to determine compliance with the mitigation and management measures specified in section 2.5 of the Contractor's ESMP, relating to construction site management (including accommodation camp management, solid and toxic waste management), management of land (including transport management), and community liaison and facilities.
- 2.8 The Contractor shall also conduct regular formal monitoring of environmental quality parameters (including air quality, noise, vibration, water quality, ground water level, plantation, and any other) as proposed by the ESIA for the Project and EMoP to be updated under the E/S for the Project to determine the impacts of the ongoing construction work and to record compliance with legally prescribed standards.
- 2.9 Additional inspection or monitoring shall be conducted as may be specified by government competent authorities in consent conditions or other approvals obtained by the Contractor.
- 2.10 Additional "spot" monitoring shall be conducted whenever non-compliance is observed, or if a complaint is received from a member of the public, organisation or a government body.

3. ESMoP Implementation

- 3.1 Monitoring activities shall be conducted by the Contractor's employees, or specialist sub-contractors employed by him; and all persons involved in the monitoring procedures shall be suitably qualified and experienced. Engineer's representative may also join if he so desires.
- 3.2 Monitoring at each construction site shall planned and supervised by the Contractor's Senior Environment Officer at that site, and overall implementation of the ESMoP across all sites shall be planned and coordinated by the Contractor's CEO.
- 3.3 The results of the monitoring shall be regularly reported to the Engineer and Employer.

ATTACHMENT 4**CONTRACTOR'S SAFETY AND HEALTH PLAN****1. General**

- 1.1 The Contractor shall prepare a Safety and Health Plan (SHP), which provides measures to protect the safety and health of employees at all times when engaged in the construction process and the general public when exposed to construction activities either on- or off-site.
- 1.2 The Contractor's SHP shall be based on safety and health considerations submitted with the Bid and shall have the content shown in the next section [Contents of SHP].
- 1.3 The Contractor shall submit his SHP for review by the Engineer within 42 days after the Commencement Date of the Services, and shall amend the SHP to address any comments made by the Engineer and submit a Final SHP within 28 days of receipt of comments.
- 1.4 The Final SHP shall be binding on the Contractor for the duration of the Services.

2. Content of SHP

- 2.1 The Contractor's SHP shall cover the following aspects
 - (a) Statement of Contractor's Safety and Health Policy
 - (b) Senior management responsibility for safety and health
 - (c) Appointment, duties and responsibilities of site safety and health staff
 - (d) Policy for identifying hazards and risks
 - (e) Safety and health training
 - (f) Safety and health equipment
 - (g) Safety and health of the Contractor's construction and office equipment
 - (h) Safety and health of the workmen and staff at site
 - (i) Safety and health procedures for sub-contractors
 - (j) Disciplinary procedures
 - (k) Accident, disease and injury reporting
 - (l) First aid and emergencies
 - (m) Safety and health promotion and awareness
 - (n) Site security
 - (o) Labour safety and health.
- 2.2 The Contractor's SHP shall also incorporate the requirements of safety while having interface with the running tracks of Indian Railways and complying with
 - (a) Indian Railway's rules and regulations for track, signalling and operations possessions;
 - (b) operating a system of permit to work for all works which may affect the operations of the existing railway; and
 - (c) requirements of safety aspects for working near the running tracks of Indian Railways as

specified herein below.

- 2.3 The Engineer reserves the right to order (in writing) the immediate removal and replacement of any of the Contractor's equipment or temporary works which in his opinion is unsatisfactory or not required for the Work for its purpose and / or is in unsafe condition, while the Contractor shall be fully responsible for safety of the Works and shall treat safety measures as a priority in all his activities throughout the execution of the Works. The following requirements shall be also incorporated in the SHP, but not limited to:
- 2.3.1 The Contractor shall have full regard for the safety and health of all his personnel, sub-contractor's personnel, the public and all the personnel directly or indirectly associated with the Works on or in the vicinity of the Site and the Work Areas (including without limitation to the persons to whom access to the Site has been allowed by the Contractor), to comply with all relevant safety and health regulations, including provision of safety and health gear, and insofar as the Contractor is in occupation or otherwise is using areas of the Site and the Work Areas, to keep the Site and the Work Areas (so far as the same are not completed and occupied by the Employer) in an orderly state appropriate to the avoidance of injury to all persons and shall keep the Engineer/ Employer indemnified against all the injuries to such persons.
- 2.3.2 The Contractor shall provide and maintain all lights, guards, fences and warning signs and watchmen when and where necessary or required by the Engineer or by laws or by any relevant authority for the protection of the Works and for the safety and convenience of the public and all persons on or in the vicinity of the Site and the Work Areas.
- 2.3.3 The Contractor is required to take note of all the necessary provisions in SHE Requirements of Specifications and the Contract Price shall be deemed to be inclusive of all the necessary costs to meet the requirements as prescribed therein. In case the Contractor fails to meet the above requirements, the Employer may provide the necessary arrangements and recover its costs from any bills due to the Contractor.

3 Training

- 3.1 The Contractor shall describe the training programme and content he will provide for workers and staff in order to:
- Raise awareness of: the role and importance of safety and health matters; the potential negative impacts of construction work in general and the ways in which impacts can be prevented; and the expected construction impacts and long-term environmental and social benefits of the DFC project;
 - Disseminate the philosophy and approach of the SHP throughout the workforce, and explain the roles of all parties in implementing the SHP;
 - Inform all employees of the safety and health activities they are required to comply with when conducting their work, and the penalties for non-compliance.
- 3.2 Training to raise the awareness and capacity of sub-contractors and their employees shall also be incorporated where necessary.

4 Appendix

- 4.1 The SHP shall contain components of the mitigation measures specified above and in SHE Requirements of Specifications. The contents of the plan shall include, but not be limited to, the

items listed below.

4.2 The Contractor shall prepare the following plans to supplement the SHP

- Emergency Response Plan
- Fire Evacuation Plan.

ATTACHMENT 5**SAFETY REQUIREMENTS FOR WORKING
NEAR RUNNING TRACKS OF INDIAN RAILWAYS****1. Operational Safety**

1.1 Where the Schedule of Dimensions of Indian Railways (IR) for the running tracks are likely to be infringed by the Contractor, the following safety measures shall be ensured.

1.1.1 Measures Prior to Start of the Work

- (i) Contractor to provide necessary training to their supervisors and staff and shall ensure that they know about the safety norms to be followed for working in the premises of IR and in the vicinity of running tracks and electrified territories.
- (ii) Inform the Engineer / Employer about:
 - (a) Name and address of the Contractor's supplier / sub-contractor assigned to execute the work
 - (b) Name of the vehicle drivers / equipment operators identified for the work
 - (c) Location, duration and timings during which the SOD of IR is to be infringed
- (iii) Provide the Engineer / Employer with:
 - (a) copy of detailed planning of work including protection of IR track and safety measures proposed (duly approved by the Engineer)
 - (b) copy of the competency certificate of the Contractor's Supervisor incharge of the work (to be issued by the Engineer).
- (iv) Demarcate the working area at site in consultation with the Engineer / Employer.
- (v) Barricade / temporary fencing along the stretch of the concentration of the work area along the IR track, as consented by the Engineer.
- (vi) Provide adequate watch and ward, flagmen, lighting etc. including signage boards.

1.1.2 Measures during Execution of Work

- (i) It shall be ensured that no workmen and staff is working on line / trackside unless proper 'Permit to Work' is issued for those lines by the Indian Railways and Engineer.
- (ii) It shall be ensured that the moving dimensions of IR shall not be infringed. In case of track crossing, the work is required, the same shall not be carried out without permission from the Engineer and IR. Safety of all the existing fixed structures near the vicinity of the Site shall also be ensured.
- (iii) No vehicles shall be plied within 6m of centre of the IR track without the specific approval from Engineer / Employer. Individual vehicle / construction equipment shall not be left un-attended. No vehicle shall ply from sun-set to sunrise and during the period when the visibility is impaired, except in case of emergency and with the consent of the

Engineer.

- (iv) Where the construction vehicles are required to ply along the existing running tracks of IR, the Contractor shall deploy the adequate patrolmen to prevent tendency of the vehicle drivers to come close to the tracks and infringe.
- (v) All the drivers of the road vehicles / machines plying near the running tracks of IR shall be provided with a red flag / red lamp so that in the event of any obstruction, they can stop the incoming train.
- (vi) It shall be ensured that the line of demarcation shall not be infringed by the road vehicles / construction equipment.
- (vii) It shall be ensured that only eligible and competent staff shall be employed for the work and they must wear identity card while working near running tracks of IR.
- (viii) For working during night, sufficient illumination shall be provided for the entire work area for safety of the workmen and public.
- (ix) Temporary Engineering signals as required shall be provided.
- (x) Existing engineering indicator boards shall be lit as per Permanent Way Manual (PWM) of Indian Railways.
- (xi) Lookout man with red and green flags / hand signals and whistle shall be deployed wherever required.
- (xii) No part of the stacked material should infringe the moving dimensions of IR. Material shall be stacked to such a height that it does not lead to infringement of SOD in case of accidental toll off.
- (xiii) Any temporary arrangement shall not infringe with the moving dimensions of IR.
- (xiv) Where the work is planned to be done within 3.5m from the centre of the IR tracks, it shall require traffic block and all the necessary safety precautions shall be ensured as per the requirements of Para No. 806 and 807 of PWM of Indian Railways.
- (xv) First aid kit shall be readily available at the site.
- (xvi) In case any cable / utility is found while working, the Contractor shall inform the Engineer immediately. In case a large number of cables / utilities are found during excavation, the work shall be carried out in the presence of representative from the concerned owning agency of the utility / cable.
- (xvii) It shall be ensured that the existing emergency sockets of IR are not damaged.

1.1.3 Additional Measures Required during Traffic Block

- (i) Any work when infringing the moving dimensions of IR shall be started only after traffic block has been imposed and IR track is protected.
- (ii) All the work intended to be completed during traffic block shall be completed within the duration of the traffic block and the duration of the traffic block shall not be exceeded.
- (iii) Traffic block shall be considered as cleared only when all the temporary arrangements /

machinery are cleared of the moving dimensions and the IR track is left with proper track geometry so that IR trains can run safely.

1.1.4 Safety Measures while Working in OHE Area

- (i) While working near the OHE area, the safety guidelines as specified in para 20301, 20327, 20334, 20335, 20529, 20612, 20614, 20714, 20825, 20833, 21206 and 21207 of Volume II, Part 1 of AC Traction Manual of Indian Railways shall be followed.
- (ii) No electric work close to the live OHE shall be carried out without power block and specific approval from Engineer / Employer.
- (iii) A minimum distance of 2m shall be maintained between live OHE wire and any body part of the workmen or tools or metallic support etc.
- (iv) No electric connection shall be tapped from OHE.

2. Excavation Affecting Existing Tracks

2.1 While doing excavation near the vicinity of the existing tracks including for bridges and other structures, special care has to be taken to ensure that formation of the existing Railway line is not excavated, for that matter any activity involved in construction / execution of the project shall not endanger the safety of existing running line of Indian Railways. If excavation or any other activity involving working and or modification and or alteration of the existing permanent way then, before execution of such work, the Contractor shall prepare a drawing clearly indicating such alternation / modification of the existing permanent way, and the protection measure intended to be taken by the Contractor to ensure safety of the existing running line. The effectiveness of design of such protection measures is the sole responsibility of the Contractor and the Contractor shall indemnify the Engineer / Employer towards the losses incurred due to failure of such protection measure. These protection measures duly indicating the extent of alternation / modification to the existing formation shall be incorporated in the design and drawing submitted during preliminary design submission as per the Contract. Such work shall not be undertaken unless and until these drawings are consented by the Engineer.

2.2 The Contractor shall indemnify the Engineer / Employer against any damage to the existing tracks / structures / utilities etc. caused by the actions of the Contractor or his sub-contractors, and shall make good the same, as directed by the concerned authorities, at his own cost and shall also pay any penalty(ies) / demurrages if levied by the concerned authorities.

3. Safety Requirements for Electrical Works

- (i) The Indian Electricity Rules 1956, as amended up to date, shall be followed. The detailed instructions on safety procedures given in I.S.S. and Indian Electricity Rules, respective State Electricity Authorities' regulation with up to date amendment shall be applicable.
- (ii) The LT/HT distribution diagrams of sub stations shall be prominently displayed. The substation premises, main switch rooms and D.B. enclosure shall be kept clean whenever works are carried either inside or outside.

- (iii) No inflammable materials shall be stored in places other than the rooms specially constructed for this purpose in accordance with the provisions of Indian Explosives Act.
- (iv) Rubber insulating mats of suitable size and thickness should be provided in front of the main switch boards of sub-station or any other control equipments of medium voltage and above.
- (v) Protective and safety equipment such as rubber gauntlets or gloves, earthing rods, linemen's belt, portable artificial respiration apparatus, safety goggles etc., shall be provided as per the requirement of the Work.
- (vi) Necessary number of caution boards such as "Man working on line, Don't switch on" shall be readily available in the vicinity of electrical installation.
- (vii) Standard first aid boxes containing materials as prescribed by the St. John's Ambulance Brigade or Indian Red Cross shall be made available.
- (viii) Charts displaying methods of giving artificial respiration to a recipient of electrical shock (one in English and another one in the regional language) shall be prominently displayed at appropriate places.
- (ix) No work shall be undertaken on live installations, or on installation, which could be energized unless one another person is present to immediately isolate the electric supply in case of any accident and to render first aid, if necessary.
- (x) No work on live L.T. bus bar or pedestal switch board in the sub stations should be handled by a person below the rank of a Licensed Wireman and such a work should preferably be done in the presence of a qualified engineer.
- (xi) When working on or near live installations, suitable insulated tool should be used, and special care should be taken to see that those tools accidentally do not drop on live terminals causing shock or dead short.
- (xii) The electrical switch controls in distribution boards shall be clearly marked to indicate the areas being controlled by them.
- (xiii) Before starting any work on the existing installation, it shall be ensured that the electric supply to that portion is cut off. Precautions, like displaying "Men at Work" caution boards on the controlling switches, removing fuse carrier from these switches shall be taken against accidental operation. Caution boards shall be kept with the person working on the installation.
- (xiv) All electrical panels & switchgear shall conform to relevant IEC standard.
- (xv) All external enclosures shall have degree of protection not less than IP-54.
- (xvi) All equipment/system shall conform to relevant IEC standard on Electromagnetic Compatibility (EMC).
- (xvii) Cable routes of all the newly laid cables by the Contractor shall be identified with electronic or concrete markers.

ATTACHMENT 6**SAFETY, WELFARE AND OCCUPATIONAL HEALTH REQUIREMENTS****Safety, Welfare and Occupational Health Requirements as per BOCW Act 1996 and BOCW Rules 1998**

(This list has been prepared in chronological order with primary importance to Section of Act and secondary importance to Rules)

S - Refers relevant Sections in BOCWA

R - Refers relevant Rules in BOCWR

C - Refers relevant Chapter No. in BOCWR

Sl. No.	Items / Requirements	Relevant Sections / Rules in BOCWA and BOCWR
1.	Registration of establishment	S – 7, R – 23 to 27
2.	Display of registration certification at workplace	R – 26 (5)
3.	Hours of work	S – 28 R – 234 to 237
4.	Register of overtime	S – 28; S – 29 R – 241(1) Form XXII
5.	Weekly rest and payment at rest	R – 235
6.	Night shift	R – 236
7.	Maintenance of workers registers and records	S – 30 R – 238
8.	Notice of commencement and completion	S – 46 R – 239
9.	Register of persons employed as building workers	R – 240
10.	Muster roll and wages register	R – 241(1) (a); Form XVI and XVII
11.	Payment of wages	R – 248
12.	Display of notice of wages regarding	R – 249
13.	Register of damage or loss	R – 241(1)(a); Form XIX, XX, XXI
14.	Issue of wages book	R – 241(2)(a); Form XXIII
15.	Service certificate for each worker	R – 241(2)(b); Form XXIV

Sl. No.	Items / Requirements	Relevant Sections / Rules in BOCWA and BOCWR
16.	Display an abstract of BOCWA and BOCWR	R – 241(5)
17.	Annual return	R – 242; Form XXV
18.	Drinking water	S – 32
19.	Latrines and Urinals	S – 33 R - 243
20.	Accommodation	S – 34
21.	Creches	S – 35
22.	First-aid boxes	S – 36 R – 231 and Schedule III
23.	Canteens	S – 37; R – 244
24.	Food stuff and other items served in the canteens	R – 245
25.	Supply of tea and snacks in work place	R – 246
26.	Food charges on no loss no profit basis	R - 247
27.	Safety committee	S – 38 R – 208
28.	Safety officer	S – 38 R – 209 and Schedule VII
29.	Reporting of accidents and dangerous occurrences	S – 39 R – 210
30.	Procedure for inquiry in to the causes of accidents	R – 211
31.	Responsibility of employer	S – 44; R – 5
32.	Responsibility of Architects, Project engineer and Designers	R – 6
33.	Responsibility of workmen	R – 8
34.	Responsibility for payment of wages and compensation	S – 45
35.	Penalties and Procedures	S – 47; S – 55
36.	Excessive noise, vibration etc	R – 34
37.	Fire Protection	R – 35
38.	Emergency action plan	R – 36
39.	Fencing of motors	R – 37
40.	Lifting of carrying of excessive weight	R – 38

Sl. No.	Items / Requirements	Relevant Sections / Rules in BOCWA and BOCWR
41.	Health, Safety and Environmental Policy	R – 39
42.	Dangerous and Harmful Environment	R – 40
43.	Overhead protection	R – 41
44.	Slipping, Tripping, Cutting, Drowning AND Falling Hazards	R – 42
45.	Dust, Gases, Fumes, etc.	R – 43
46.	Corrosive substance	R – 49
47.	Eye Protection	R – 45
48.	Head Protection and other protection apparel	R – 46; R – 54
49.	Electrical Hazards	R – 47
50.	Vehicular traffic	R – 48
51.	Stability of structure	R – 49
52.	Illumination	R – 50; R – 124
53.	Stacking of materials	R – 51
54.	Disposal of debris	R – 52
55.	Numbering and marking of floors	R – 53
56.	Lifting appliances and gears	C – VII; R – 55 to 81
57.	Runways and Ramps	C – VIII; R – 82 to 85
58.	Working on or adjacent to water	C – IX; R – 86 & 87
59.	Transport and earthmoving equipments	C – X; R – 88 to 95
60.	Concrete work	C – XI; R – 96 to 107
61.	Demolition	C – XII; R – 108 to 118
62.	Excavation and Tunnelling works	C – XIII; R – 119 to 168
63.	Ventilation	R – 153
64.	Construction, repair and maintenance of step roof	C – XIV; R – 169 to 171
65.	Ladders and Step ladders	C – XV; R – 172 to 174
66.	Catch platform and hoardings, chutes, safety belts and nets	C – XVI; R – 175 to 180
67.	Structural frame and formworks	C – XVII; R – 181 to 185
68.	Stacking and unstacking	C – XVIII; R – 186 & 187
69.	Scaffold	C – XIX; R – 188 to 205

Sl. No.	Items / Requirements	Relevant Sections / Rules in BOCWA and BOCWR
70.	Cofferdams and Caissons	C – XX; R – 206 to 211
71.	Explosives	C – XXI; R – 212 & 213
72.	Piling	C – XXII; R – 214 to 222
73.	Medical Examination for building and other construction worker, Crane operator an Transport vehicle drivers	R – 81; R – 223(a)(iii) and Schedule XII
74.	Medical examination for occupational health hazards	R – 233(a)(iv)
75.	Charging of workers for Medical Examination	R – 223(b)
76.	Occupational health centres and medical officers	R – 225 and Schedule X & XI
77.	Ambulance van & room	R – 226 & 227 and Schedule IV & V
78.	Stretchers	R – 228
79.	Occupational health service for building workers	R – 229
80.	Medical examination for occupational health hazards	R – 223(a)(iv)
81.	Emergency care services & emergency treatment	R – 232
82.	Panel of experts and agencies	Central Rule 250
83.	Power of inspectors	Central Rule 251

ATTACHMENT 7**WORK PLACE POLICY ON LABOUR PROTECTION****CHAPTER - I****Perspectives****1.0 Preamble**

DFCCIL believes that all its employees including the employees of contractors, subcontractors or consultants must live with social and economic dignity and freedom, regardless of nationality, gender, race, economic status or religion.

Further, DFCCIL is committed to the principles of:

- a) No child or forced labour in its operations.
- b) Discrimination free workplace.
- c) Gender Equity.
- d) Supportive work environment.

DFCCIL intends to evolve a workplace policy on labour protection for the employees and workers of contractors, subcontractors and consultants upholding the rights of citizens enshrined in The Constitution of India, principles laid down in the Directive Principles of State Policy and the statutory provisions contained under applicable laws relating to employment and service conditions of labour, their welfare, occupational health and safety.

2.0 Aim

The policy aims to:

- a) Provide a statutory framework on employment and service conditions of labour, their welfare, occupational health and safety;
- b) Design suitable control systems of compliance, enforcement and incentives for better compliance;
- c) Provide administrative and technical support services;
- d) Provide a system of incentives to contractors and their employees to achieve higher health and safety standards;
- e) Provide for a system of non-financial incentives for improvement in safety and health;
- f) Provide for a system of penalties if provisions on safety, health and employee welfare are not adhered to.

3.0 Objectives

The basic objectives of this Workplace Policy on Labour Protection are:

- a) To promote a just, free and humane workplace ambience;
- b) To ensure safe and healthy working conditions;
- c) To eliminate the incidence of work related injuries, diseases, fatalities, disaster and loss of national resources;

- d) To ensure a high level of occupational health and safety and conditions of labour through proactive approaches including a system of penalties and awards;
- e) To enhance the well-being of the employees and their family members.

4.0 Scope

This policy applies to all contractors, subcontractors, consultants and their employees (including candidates applying to them for work) in the work sites, office locations, accommodation camps, all other workplaces and contracts of employment, and all aspects of work, formal and informal and the self-employed worker engaged with the contractor for providing goods or services at any work location and their spouse and children or other family members, residing in contractor provided accommodation with the worker.

5.0 Framework

This policy and guidelines of action plan is based on the framework as given below:

5.1 Laws and Regulations:

The Contractor shall fully comply with the applicable labour laws as amended from time to time and the rules framed there-under as given in [SHE Requirements] of Specifications.

5.2 Policy and Manual for Safety and Health:

The Contractor shall promote safe and healthy working practices and adhere to the norms given in [SHE Requirements] of Specifications.

5.3 Contractor's Policy and plan for Safety and Health:

The Contractor shall submit policy and plan for health and safety which shall include the stipulations made in [SHE Requirements] of Specifications.

5.4 Design and Method Statement:

The Contractor shall prepare the method statements for construction based on the design that shall include measures and methods for dealing with the risks in construction within the period stipulated in the Bid Documents.

5.5 Safety and Health on Site:

The Contractor shall develop the regulations for SHE committee to be established in terms of the requirements given in [SHE Requirements] of Specifications.

The Contractor shall also develop the regulation for the site inspection and monitoring compliance of safety and health norms.

5.6 Prevention and Control of HIV/AIDS:

The Contractor shall prepare a manual for HIV/AIDS prevention and control for his workers in terms of the Employer's policy and submit the same for Employer's approval within the period stipulated in the [SHE Requirements] of Specifications.

6.0 Coverage

6.1 The coverage of this policy shall be as under:

- a) Conditions of employment;
- b) Salary and Wages;

- c) Social Security;
- d) Occupational Health and Welfare;
- e) Compliance with Labour Laws;
- f) Implementation and monitoring.

7.0 Awareness

7.1 The Contractor shall create awareness about this policy by:

- a) Wide circulation among his key officials, subcontractors and consultants;
- b) Display in notice boards at conspicuous places;
- c) Increasing awareness on safety, health and environment at the workplace through appropriate means;
- d) Providing forums for consultations with employees representatives on matters relating to occupational safety, health and welfare and wherever necessary with the community on matters of societal concerns with the objective of increasing productivity;
- e) Encouraging joint labour-management efforts to preserve, protect and promote national assets and to eliminate injuries and diseases arising out of employment;
- f) Providing medical criteria wherever necessary to ensure as far as is reasonably practicable that no employee will suffer diminished health, functional capacity, or life expectancy as a result of his work place activities and that in the event of such occupational diseases having been contracted, the affected employee is suitably compensated;
- g) Taking necessary steps to provide safe and healthy working conditions and ensure that workers and their representatives are consulted, trained, informed and involved in all measures related to their safety and health at work.

8.0 Occupational Safety and Health Skills Development

8.1 The Contractor shall:

- a) Arrange training programmes to increase the number and competence of personnel engaged in the field of occupational safety and health and environment at workplace;
- b) Provide information and advice, in an appropriate manner, to employees with a view to eliminating hazards or reducing them as far as is reasonably practicable;
- c) Establish occupational health services aimed at protection and promotion of health of employee and improvement of working conditions and by providing employee access to these services;
- d) Integrate health and safety into vocational, professional and labour related training programmes including management development programmes;
- e) Adopt Occupational Safety and Health training curricula in workplace programmes.

9.0 Miscellaneous

9.1 The Contractor shall comply with the applicable labour laws and the rules framed there under by Central or State Governments as amended and/or modified from time to time.

- 9.2 Consequences and or penalties arising out of violation of the applicable laws shall be the sole responsibility of contractors.
- 9.3 The policy shall also be periodically reviewed by the Employer with reference to the evolving legislation, scope and programme of the work, ambient conditions, etc. and the Contractor shall incorporate the requisite modifications in execution of the work without any extra charges.

10.0 Conclusion

There is a need to develop close involvement of social partners to meet the challenges ahead in the assessment and control of workplace risks by mobilising local resources and extending protection to such working population and vulnerable groups where social protection is not adequate.

DFCCIL stands committed to strengthen the labour protection mechanism through broad-based consultation, develop special programmes for hazardous operations, set up training mechanisms, create awareness, arrange for the mobilisation of available resources and expertise.

This policy envisages total commitment and demonstration by all concerned stake holders through dedicated and concerted efforts consistent with the requirements of labour protection at workplace and thereby improving the quality of work and working life.

The policy shall be periodically reviewed by the Employer with reference to the evolving legislation, scope and programme of the work, ambient conditions, etc. and the Contractor shall incorporate the requisite modifications in execution of the work without any extra charges.

ATTACHMENT 8

Precautions While Working in Close Proximity of Existing Indian Railway Track

General: Any construction activity involving the existing embankment/formation/ running track of the Indian Railways shall be carried out only with the prior specific authorization of the Engineer.

Plying of Vehicles in Close Proximity of tracks

The contractor shall not allow any road vehicle belonging to him or his suppliers etc. to ply in railway land next to the running line. If for execution of certain works viz concreting work, earth work for New railway line and supply of ballast for new or existing rail line, etc, road vehicles are necessary to be used in railway land next to the railway line, the contractor shall apply to the Engineer for permission giving the type & no. of individual vehicles, names & license particulars of the drivers, location, duration & timings for such work / movement. The Railways/Railways/ Engineer or his authorized representative will personally counsel, examine & certify, the road vehicle drivers, contractor's flag men & supervisor and will give written permission giving names of road vehicle drivers, contractor's flag men and supervisor to be deployed on the work, location, period and timing of the work. This permission will be subject to the following obligatory conditions:

Road vehicles can ply along the track after suitable cordoning of track with minimum distance of 6 meters from the centre of the nearest track. For working of machinery close to the running tracks or plying of road vehicles during night hours, the contractor shall apply to the Engineer in writing for permission, duly indicating the site details in a neat sketch and safety measures proposed to be taken. Subject to the approval of concerned Railway authorities, the Engineer or his authorized representative will communicate permission to the contractor / contractor's representative. The contractor and his men shall strictly adhere to the instructions given along with such permissions.

Nominated vehicles and drivers shall be utilized for work in the presence of at least one flag man and one supervisor certified for such work. In order to monitor the activities during night hours, additional staff may have to be posted based on the need of the individual site.

The Contractor's machinery, equipment and vehicles shall normally operate 6 m clear of track. Any movement / work at less than 6m and upto a minimum of 3.5m clear of track centre, shall be carried out only in the presence of a person (including any railway employee) authorized by the Engineer. No part of the road vehicle shall be allowed at less than 3.5m from track centre. Cost of such railway employee shall be borne by the Railways.

The Contractor's machinery and equipment like Cranes, Flash Butt Welders, Ballasting machinery, Compactors, Track Laying Systems etc., are required to operate close to the existing line carrying traffic. Contractor is fully responsible for operating these machinery without endangering the safety of the running line and traffic.

Works being executed outside running lines are further divided into following 3 sub-groups depending upon their distance from the IR track:-

works being done within 3.5 meters from centre of track.

works being done between 3.5 meters and 6 meters from centre of track

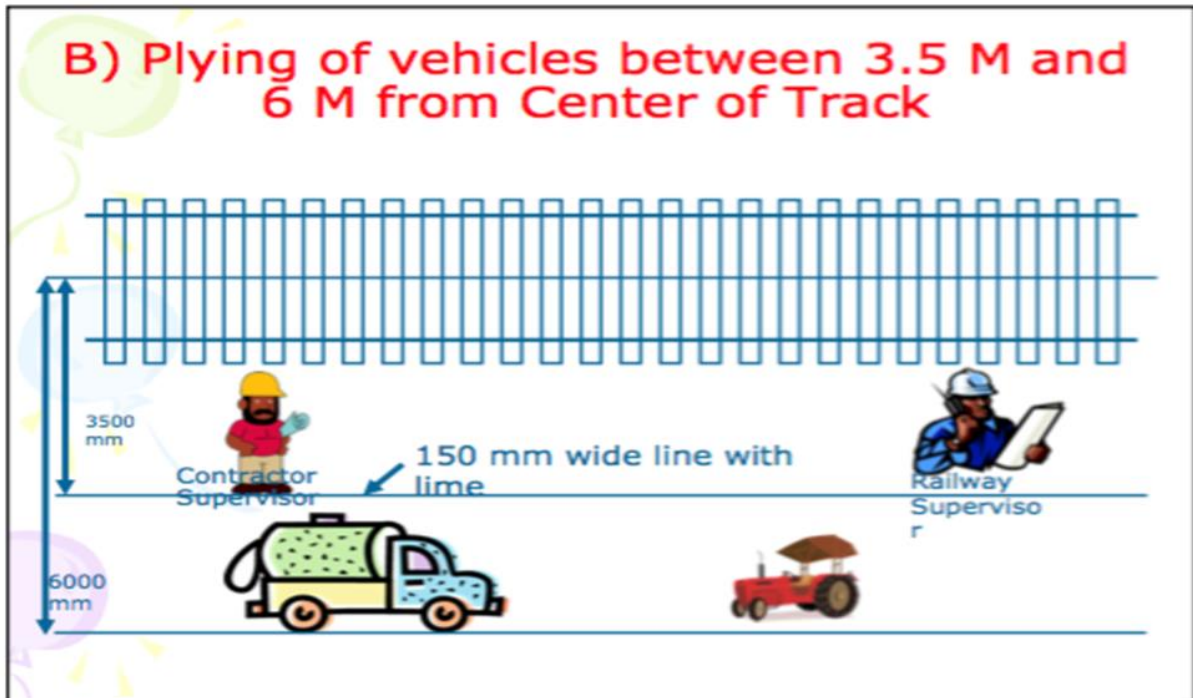
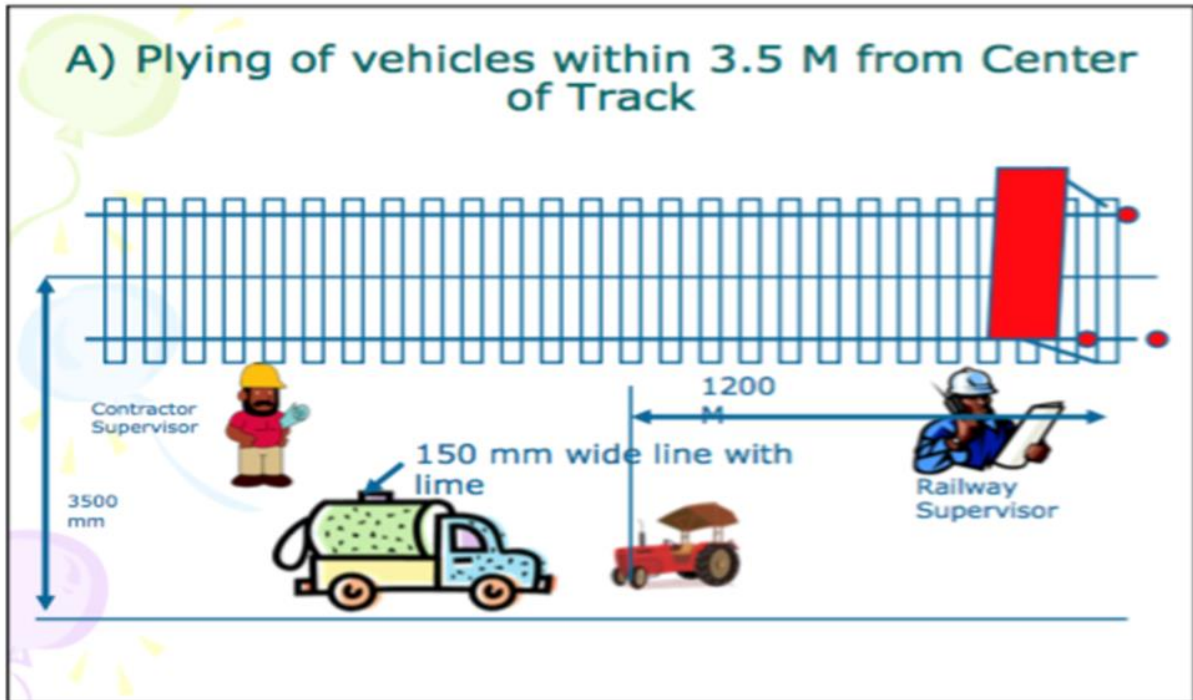
works being done beyond 6 meters from centre of track

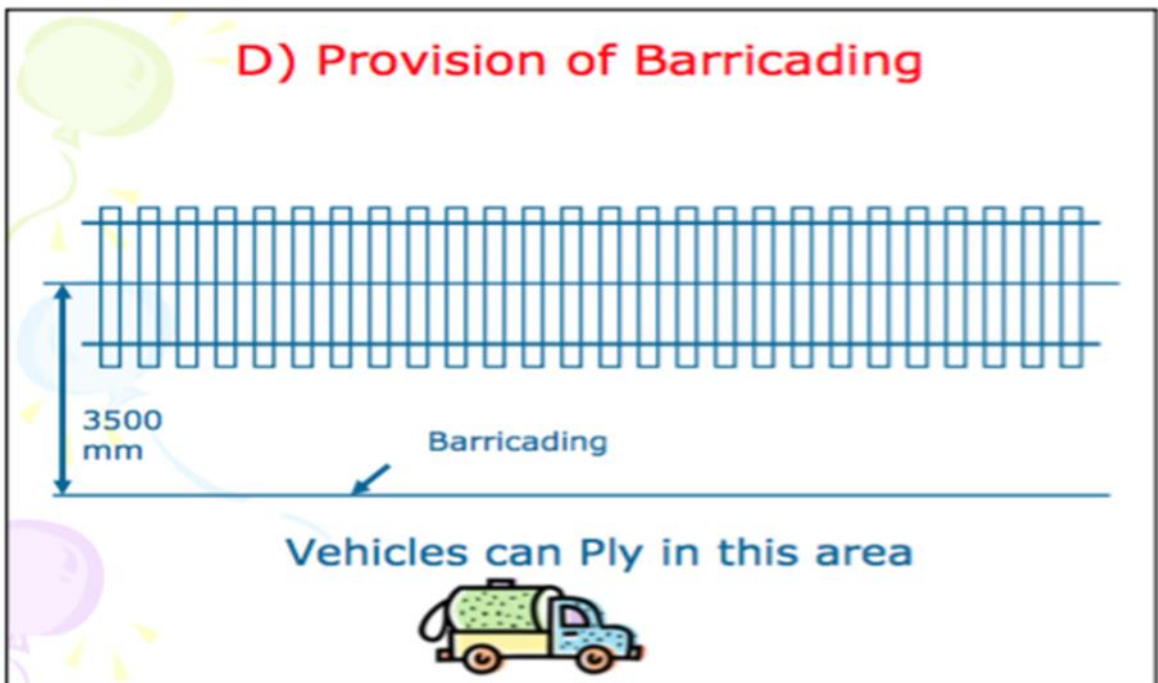
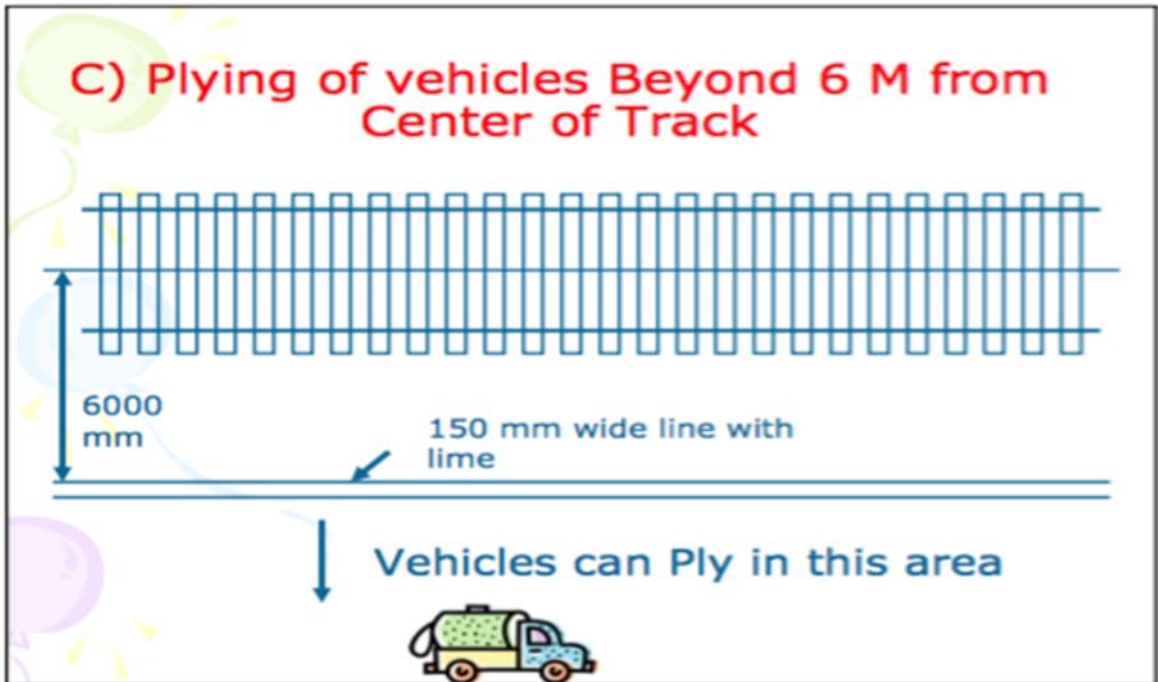
If a work site is located far away from the existing track but the vehicles in connection with the work are required to ply within the distance from centre of track as mentioned above, it will be construed that the work is being executed under above classification.

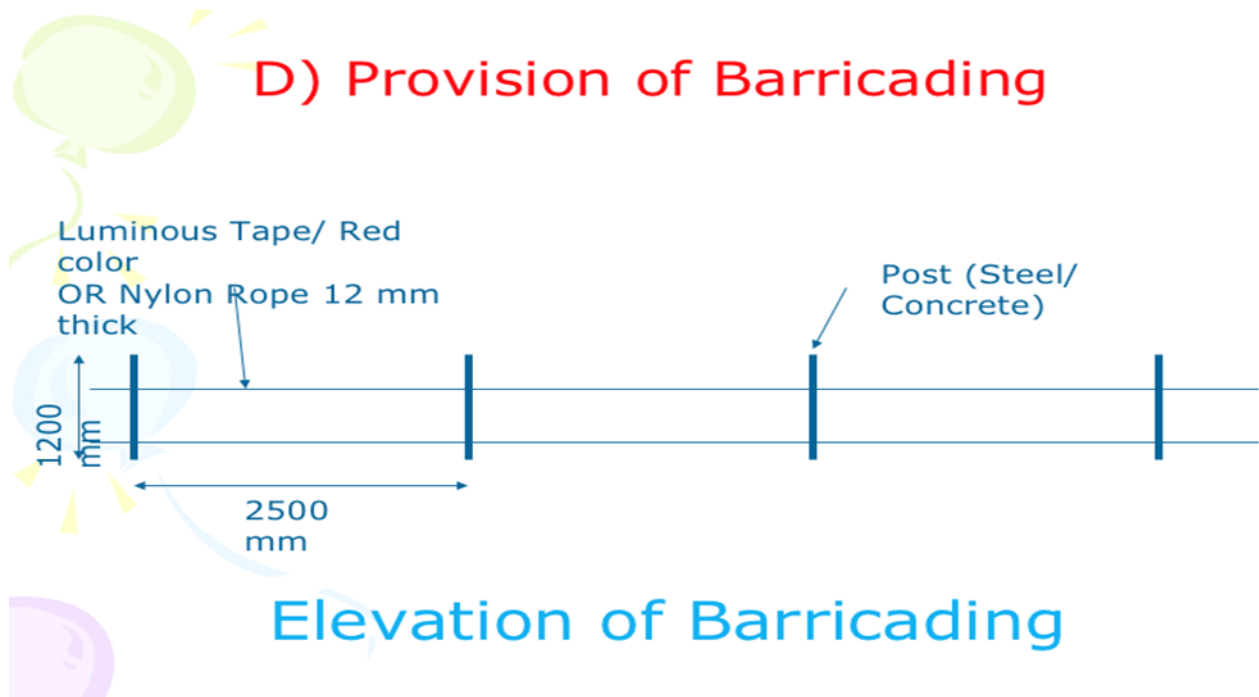
Works being done within 3.5 meters from centre of track. All works planned within 3.5 meters from centre of running line or which involve working of machineries and vehicles within this zone, are to be done essentially under block protection and necessary safety precautions for protection of track as per para 806 and 807 of IRPWM be taken. This includes even occasional plying of vehicles/ machineries for short durations.

Works being done between 3.5 meters and 6 meters from centre of track. Following precautions be taken when works are required to be done between 3.5 meters to 6 meters from track centre or machines/vehicles are required to work/ply within this zone.

Before start of work demarcation should be done parallel to running track at a distance of 3.5 meters from centre of track in advance, as per sketch B, by 150 mm wide white line of lime. Any work or movement of machinery infringing this line will need block protection. Barricading should be put up at such locations, as per sketch C, to ensure that even by carelessness or oversight, vehicles do not infringe fixed dimensions. Barricading design shall be approved by the Engineer.







In case vehicles have to ply or machineries have to work within this zone, railway's and contractor's supervisors be positioned as shown in sketch D except for the following:

- Instead of a Railway supervisor it would be a responsible and trained staff of the Contractor.
- Additional trained staff of the Contractor, shall be posted where turning of vehicles is required during working e.g. earth work, bridge work, ballasting etc. Location for reversing vehicles should be nominated and it should be selected in such away that there is no danger to running trains at such a location. Such trained staff of the Contractor should be available with hand flags so that vehicles do not come closer to track by 3.5 meters. Wherever vehicles have to take turn, it should be done in such a way that the driver is invariably facing the running track at all times.
- Look out men should be posted along the track at a distance of 800 meters from location of work with red flag and to whistle in face of road vehicles and approaching trains. Look out men shall also be suitably trained staff of Contractor.
- In addition to look out men, caution order needs to be issued to trains and speed restrictions imposed wherever considered necessary through Railways.
- Arrangements should be made to protect the track in case of emergency at work site.
- All temporary arrangements required during execution should be done in a manner that moving dimension is not fringed.

- Individual vehicle/machinery shall not be left unattended at site of work. If it is unavoidable and essential to stable it near running track, it shall be properly secured and manned even during non-working hours with all arrangements to protect the track from infringement.
- Any materials unloaded or shifted along the track should be kept clear of moving dimensions and stacked at a specified distance from running track.
- Movement of vehicle/working of machineries should be prohibited at night. However, in case of emergency when night working is unavoidable, adequate lighting shall be provided with all protection measures as mentioned above in full force. All night working near IR track shall require Engineer's prior approval.
- The work site should be suitably demarcated to keep public and passengers away. Necessary signages, boards, such as "work in progress" etc should be provided at appropriate location to warn public/passengers.
- Contractor's drivers/operators handling vehicles/machineries shall be issued a fitness certificate by the safety officer of the Contractor after educating them about safety norms and after taking assurance in writing for working within vicinity of railway's track.
- While working on cuttings with machineries or when there is movement of vehicles above cutting, if there is possibility of any of the following circumstances, work has to be done under block protection:
 - Any possibility exists for machinery/vehicle after toppling/due to loss of control come over track or infringe it.
 - Chance of machineries/vehicles to come within 3.5 meters from track centre though working beyond it.

1.2 Safety Fencing:

- 1.2.1 Before commencing any work close to the running track, the Contractor shall provide safety fencing and obtain the specific permission of Engineer to commence the work in that stretch.
- 1.2.2 The fencing shall be for a height of 2.4 meters with wooden/Casuarina balli posts of length 3 m at 3 m centre to centre spacing as per relevant BOQ item.
- 1.2.3 The Contractor shall maintain the safety fencing in good working condition through out the period till the work in a given stretch is completed. He can remove the fencing after getting the approval of Engineer. The fencing material will be the property of the Contractor. Serviceable materials obtained from the released fencing can be re-used for providing fencing in subsequent stretches.
- 1.2.4 The Contractor will be paid for providing safety fencing along the track as per the relevant item in the BOQ.

1.3 The contractor's special attention is drawn to Para 819 of Indian Railways Permanent Way Manual-2020, reproduced below which should invariably be complied with.

“Safe Working of Contractors – A large number of men and machinery are deployed by the contractors for track renewals, gauge conversions, doublings, bridge rebuilding etc. It is therefore essential that adequate safety measures are taken for safety of the trains as well as the work force. The following measures should invariably be adopted:

- (1) The contractor shall not start any work without the presence of railway supervisor or his representative and contractor's supervisor at site.
- (2) Wherever the road vehicles and/or machinery are required to work in the close vicinity of railway line, the work shall be so carried out that there is no infringement to the Railway's Schedule of Dimensions. For this purpose, the area where road vehicles and/or machinery are required to ply, shall be demarcated, and acknowledged by the contractor. Special care shall be taken for turning/reversal of road vehicles/machinery without infringing the running track. Barricading shall be provided wherever justified and feasible as per site conditions.
- (3) The look out and whistle caution orders shall be issued to the trains and speed restrictions imposed where considered necessary. Suitable flagmen/detonators shall be provided where necessary for protection of trains.
- (4) The supervisor/workmen should be counselled about safety measures. A competency certificate to the contractor's supervisor as per proforma annexed shall be issued by ADEN which will be valid only for the work for which it has been issued. (Annexure -8/5).
- (5) The ballast/rails/sleepers/other P.Way Materials after unloading along track should be kept clear off moving dimensions and stacked as per the specified heights and distance from the running track.
- (6) Supplementary site-specific instructions, wherever considered necessary, shall be issued by the Engineer in-charge.
- (7) The Engineer in-charge shall approve the methodology proposed to be adopted by the contractor, with a view to ensure safety of trains, passengers and workers and he shall also ensure that the methods and arrangements are actually available at site before start of the work and the contractor's supervisors and the workers have clearly understood the safety aspects and requirements to be adopted/ followed while executing the work.

There shall be an Assurance register kept at each site, which will have to be signed by both, i.e. Railway Supervisor or his representative as well as the contractor's supervisor as a token of their having understood the safety precautions to be observed at site”.

1.4 The work of formation in banks and cuttings throughout the length of doubling is adjacent to track under running traffic. Many of the bridges on the proposed double line are to be constructed either as extensions or just adjacent to the existing bridges under running traffic. The work of Installation of Track throughout the length of doubling is adjacent to track under running traffic. The work of Installation of Track and Signals in the Station yards including alterations to the existing Track and Signals has to be done adjacent to or in replacement of the existing Track and Signals which are under running traffic. The contractor shall ensure that the safety of the running lines and running traffic is not endangered, because of his work.

1.5 Any traffic/traction blocks, temporary speed restrictions and caution orders required in this connection shall also be got sanctioned from the Railway authorities well in advance, through the Engineer. The Railways may sanction the same for specific sites within the overall recovery time available in the Railway's time table. The contractor shall have to schedule his programme according to the convenience of the Railways. No claim from the contractor for any delay/inconvenience/loss on this account shall be entertained by the Railways.

1.6 The contractor shall provide at site at his own cost, all protection measures including exhibition and lighting of all Temporary Engineering Signals as per Railway rules, instructions and norms. All lights provided by the contractor shall be screened so as not to interfere with any signal light on the Railways or with any traffic or signal lights of any local or other authority.

2 SAFETY MEASURES

2.1 GENERAL

- 2.1.1 The Contractor shall be fully responsible for the safety of the Works, his personnel, sub contractors' personnel, the public and all persons directly or indirectly associated with the Works or on or in the vicinity of the Site.
- 2.1.2 The Contractor shall treat safety measures as a priority in all his activities throughout the execution of the Works.
- 2.1.3 The project site safety requirements have been provided in Part 2 "Works Requirement, Section VII, .
- 2.1.4 The contractor shall not start any work without the presence of railway supervisor at site.
- 2.1.5 The Contractor shall comply with these requirements provided that the standards set out in the project Site Safety requirements and Contractor's Site Safety plan shall be regarded as the minimum to be achieved and shall not relieve the Contractor of any of his statutory duties or his responsibilities under the Contract.
- 2.1.6 The provisions of the Contract regarding safety shall apply to and be binding upon the Contractor for any part of the Works and the persons employed by sub-contractors of any tier.
- 2.1.7 The Contractor shall ensure that the requirements of the Contract in respect of safety are included in all sub-contracts placed by him.
- 2.1.8 The Engineer reserves the right to order the immediate removal and replacement of any item of Contractor's equipment or Temporary Works which, in his opinion, is unsatisfactory for its purpose or is in an unsafe condition.
- 2.2 The works included in this contract are to be carried out close to the running tracks and public utilities, therefore, safety of running trains and the public is paramount. Therefore, all activities undertaken by the Contractor / his Sub-contractors shall ensure safety at all times. The contractor shall comply with the instructions issued by the Railway / Engineer /DFCCIL from time to time to ensure safe running of trains while carrying out works. The rates quoted by the Contractor shall be deemed to include all expenditure incurred in compliance with the same.

- 2.3 Before starting any excavation work adjacent to existing track, the contractor shall ensure that necessary permissions have been obtained and required precautions have been taken for doing such work in terms Indian railway Joint Procedure Order reproduced below:

**GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)**

No.2003/Tele/RCIL/1 Pt.IX

New Delhi dated 24.06.2013

General Managers,
All Indian Railways.

Telecom Circular No. 17/ 2013

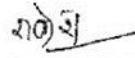
**Sub: Procedure for undertaking digging work in the vicinity of Signaling,
Electrical and Telecommunication Cable.**

JPO No. 1/Sig/2004 dated 16.12.2004 issued by Board on the subject matter was reviewed in consultation with Signal, Electrical, Civil Engineering and Works Directorates of Board.

2. The same has now been finalized and a copy of the Revised Joint Procedure Order duly signed by ED/TD, EDCE/P, ED/SD, ED/W and EDEE/M is attached for compliance.

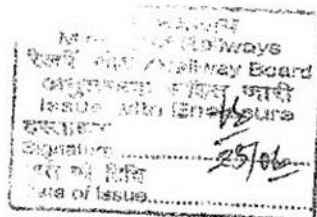
3. Please acknowledge receipt.

DA: 1 in 5 pages.


(Rakesh Ranjan)
Director(Telecom.)

Copy to:-

- i) ED/TD, EDCE/P, ED/SD, ED/W and EDEE/M
- ii) CSTEs, All Indian Railways
- iii) CSTEs/Construction, All Indian Railways
- iv) ED/Tele, RDSO, Lucknow
- v) MD/RCIL, 143, Institutional Area, Sector 44,
Gurgaon – 122003.Haryana.




Annexure to Telecommunication Circular No. 17/2013**JOINT PROCEDURE ORDER FOR UNDERTAKING DIGGING WORK
IN THE VICINITY OF UNDERGROUND SIGNALING, ELECTRICAL &
TELECOMMUNICATION CABLES.**

3


- A. A number of Engineering works in connection with gauge conversion/doubling/third line are in progress on various Railways, which require extensive digging work near the running track, in close vicinity of the working S&T cables carrying vital safety circuits as well as electrical cables feeding the power supply to cabins, ASM room, RRI Cabin, Intermediate Block Huts (IBH) etc. Similarly, S&T organisation under open line or construction units under CAO/C, are executing various Signaling and Telecom works requiring digging of earth for laying of cables or casting of foundations for the erection of signal posts etc. RailTel is also executing the work of laying of quad cable and OFC on various Railways as a part of sanctioned works for exclusive use of Railways for carrying voice and data i.e. administrative and control communication, PRS, FOIS etc. or shared by RailTel Corporation of India Ltd. On certain sections digging is also required for laying of electrical cable and casting of foundation for the erection of OHE masts by Electrical Deptt. Generally, these works are executed by contractors employed by these organisations.
- B. However, while carrying out these works in the vicinity of working signaling, telecommunication and electrical cables, at times, cable cuts take place due to JCB machines working along the track or during the digging work being done by contractors carrying out the Civil Engineering works. Similarly, such cable cuts are also resulting due to works undertaken by S&T or Electrical departments. Such cable faults results in the failure of vital signaling and telecommunication circuits & electrical installations.
- C. Henceforth, the following joint procedure shall be followed by Engineering, Electrical and S&T (and RailTel organisation, wherever such works are being done by them) officers of the respective divisions and by the construction organisation, while carrying out any digging work near to existing signaling & telecommunication and electrical cables, so that the instances of cable cut due to execution of works, can be controlled and minimized.
1. S&T department (and RailTel, where they have laid the cables) and Electrical department shall provide a detailed cable route plan showing exact location of cable at an interval of 200 m or wherever there is change in alignment so that the same is located easily by the Engineering official/contractor. In addition, S&T department and Electrical department shall also provide cable markers along the alignment of the cable. These cable route plans shall be made available to the Sr.DEN/DEN or Dy.CE/C, as the case may be, by Sr. DSTE/DSTE or Sr.DEE/DEE of the divisions or Dy. CSTE/C or Dy. CEE/C within 15 days in

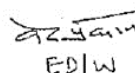


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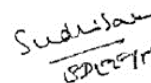


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duplicate. Sr. DEN/DEN or Dy.CE/C will send copies to their field unit i.e. AEN/SE/P. Way & Works.

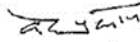
2. Before taking up any digging activity on a particular work by any agency, Sr. DSTE/DSTE or Sr.DEE/DEE of the section shall be approached in writing by the concerned Engg. or S&T or Electrical officer for permitting to undertake the work. Sr.DSTE/DSTE or Sr.DEE/DEE, after ensuring that the concerned executing agencies including the contractor have fully understood the S&T and Electrical cable route plan, shall permit the work in writing within 7 days of the request by concerned department.
3. After getting the permission from S&T or Electrical department as the case may be, the relevant portion of the cable route plan shall be attached to the letter through which permission is issued to the contractor by concerned Engg. official for commencement of work and ensuring that the contractors have fully understood the cable route plan and precautions to be taken to prevent damage to the underground cables. The contractor shall be asked to study the cable plan and follow it meticulously to ensure that the safety of the cable is not endangered. Such a provision, including any penalty for default, should form part of agreement also. It is advisable that a suitable post of SE/Sig or SE/Tele or SE/Electrical(TRD or G) shall be created chargeable to the estimates of doubling/gauge conversion, who can help Engg. agencies in the execution of the work. However basic responsibility will be of the department executing the work and the contractor. Creation of posts is not mandatory.
4. The SE/P.Way or SE/Works shall pass on the information to the concerned SE/Sig. or SE/Tele or SE/Electrical(TRD or G) about the works being taken up by the contractors in their sections at least 3 days in advance of the day of the work. In addition Engineering control shall also be informed by SE/P.Way or SE/Works, who in turn shall pass on the information to the test room/network operation center of RailTel/TPC/Electrical control.
5. On receiving the above information, SE/Sig or SE/Tele or SE/Electrical(TRD or G) shall visit the site on or before the date of taking up the work and issue permission to the contractor to commence the work after checking that adequate precautions have been taken to avoid the damage to the cables. The permission shall be granted within 3 days of submission of such requests.
6. The name of the contractor, his contact telephone number, the nature of the work shall be notified in the Engineering control as soon as the concerned Engineering officials issue the letter authorizing commencement of work to the contractor. Test room shall be given copies. Test room shall collect any further details from the Engineering control and shall pass it on to S&T/RailTel & Electrical officials regularly. In case the supervisors of concerned departments do not turn up on the day as advised in terms of para 4 and 5 above, the works of contractor should not be stopped on this account.

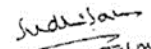

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7. In case of works being taken up by the State Government, National Highway Authority etc., the details of the permission given i.e. the nature of work, kilometer etc. be given to the Engineering control including the contact person's number so that the work can be done in a planned manner. The permission letter shall indicate the contact numbers of Test room/Network Operating Centre of RailTel/TPC/Elect. Control.
8. Where the nature of the work taken up by the Engineering department is such that the OFC or other S&T cables or Electrical cables is to be shifted and relocated, notice of minimum one week shall be given so that the Division/RailTel/Construction can plan the works properly for shifting. Such shifting works shall in addition, for security and integrity of the cables, be supervised by S&T supervisors/RailTel supervisors/Electrical supervisors.
9. The concerned SE/P.Way/SE/Works/SE/Sig/SE/Tele/ SE/Electrical(TRD or G) or RailTel supervisors supervising the work of the contractor shall ensure that the existing emergency sockets are not damaged in view of their importance in providing communication during accident/emergency.
10. In case of minor nature of works where shifting of cable is not required, in order to prevent damage to the cable, the Engineering contractor shall take out the S&T or optical fibre cable or Electrical cable carefully from the trench and place it properly alongside at a safe location before starting the earthwork under the supervision of SE/Sig. or SE/Tele or SE/Electrical(TRD or G). The cable shall be reburied soon after completion of excavation with proper care including placement of the brick over the cable under the supervision of S&T or Electrical supervisors. However, the work will be charged to the concerned engineering works. The responsibility for ensuring availability of SE (Signal), SE (Electrical) as per para 4 and 5 above lies with the respective department. The contractor will go ahead with the shifting of cables as per the program decided and he will not be held responsible for any cable cut.
11. In all the sections where major project are to be taken up/going on RailTel/S&T department shall deploy their official to take preventive/corrective action at site of work. As regards Electrical Department, the official may be deputed on need basis.
12. No new OFC or quad cable shall be laid close to the existing track. It shall be laid close to the Railway boundary on one side of the Railway track to the extent possible to avoid any interference with the future works (doubling etc.). It shall be ensured in the new works of cable laying that the cable route is properly identified with electronic or concrete markers. Wherever multiple cables are laid in a trench, RFID markers may be provided for easy identification of the cable. Henceforth, wherever cable laying is planned, before undertaking the cable laying work, the cable route plan of the same shall be prepared by the Dy.CSTE/C or Dy.CEE/C

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and shall be got approved from the concerned Sr. DSTE/DSTE or Sr. DEE/DEE and also from the concerned Dy. CE/C for new lines and from the concerned Sr.DEN for all other projects including doubling GC etc., to avoid possible damage in future. Such approval shall be granted within 15 days of the submission of the request.

13. The works of excavating the trench and laying of the cable should proceed in quick succession, leaving a minimum time between the two activities.
14. In case damage is caused to OFC/Quad cable during execution of the work, the contractor is liable to pay a penalty for damaging the cable. Penalty shall not be levied in case of the following:-
- (i) Detailed cable route plan as per clause C-1 not provided by concerned department or cable is not protected as per laid down procedures.
- (ii) The alignment of the cable does not tally with the information provided to the contractor.
- (iii) The cable depth is found to be less than 800 mm from normal ground level.
- (iv) No representative of S&T department/RailTel was available at site guarding the cables on the fixed pre determined date and time.
15. Penalty to be imposed for damages to cable shall be as under:-

Cable damaged	Penalty per location
Only Quad cable or Signaling cable	₹ 1.0 Lakh
Only OFC	₹ 1.25 Lakh
Both OFC & Quad	₹ 1.5 Lakh
Electrical Cable	₹ 1.0 Lakh


Necessary debit in this regard shall be raised on the department undertaking the work who shall in turn levy the penalty on the defaulting contractor. S&T department shall raise the debits in case of damage to OFC or Quad or Signaling cable and Electrical department shall raise the debits in case of damage to Electrical cable.

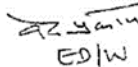
16. Railways will not lodge FIR with RPF in cases of works being executed by authorized contractors of Railways who have been duly permitted to execute the works in accordance with this JPO. Joint note by the supervisors of the concerned department shall be prepared and the responsibility of the cable cut should be decided without involving RPF. The joint note deciding the fact whether the contractor should be penalized shall be completed in a day's time from the occurrence of cable cut.

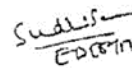
In all other cases, when the cable is cut by an agency that was not permitted to execute any work, FIR should be lodged with RPF.


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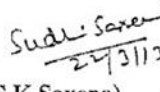
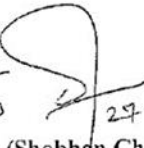
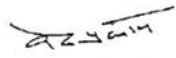
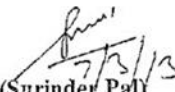

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17. While giving permission for taking up the works, concerned departments may note that earthwork by engineering contractors will normally be done by machines except in a few isolated locations where the quantity of earth work is very less.
18. Railways shall make necessary correction in their future contract so that this JPO can also be enforced contractually.
19. In case of damage to OFC, RailTel should be paid 5/6th of the penalty recovered. RailTel shall raise demands on the S&T department in this regard.
20. All types of signaling & OHE bonds i.e. rail bond, cross bond and structure bond shall be restored by the contractor with a view to keep the rail voltage low to ensure safety of personnel.
-
21. Above joint circular shall be applicable for construction as well as open line organisation of Engineering, S&T & Electrical.
22. S&T cable and electrical cable route plan should be prepared by the concerned S&T and Electrical officers respectively and got approved as stipulated in para C-12 before undertaking the work. The completion cable route plan should be finalized block section by block section as soon as the work is completed.
23. All cable laying works shall be executed as per laid down technical specifications, such as protection measures/protective cover, compaction of refilled material etc.

				
(Rajeev Sharma) Exec. Dir. Signal Devel.	(S K Saxena) Exec. Dir. Elect. Enery (M)	(Shobhan Chaudhuri) Exec. Dir. Telecom (Dev)	(V P Dudeja) Exec. Dir. Works	(Surinder Pal) Exec. Dir. Civil Engg.(P)

3 Safety of Public

- 3.1 The Contractor shall be responsible to take all precautions to ensure the safety of the Public whether on Public or Railway property and shall post such look out men as may in the opinion of the Engineer be required to comply with regulations pertaining to the work.
- 3.2 The Contractor shall provide effective barricading using G.I. corrugated sheets around foundation pits, trenches, erection sites, demolition sites etc., to prevent accidents and injuries to the public. He shall erect barricading duly leaving safe passage for the movement of the public as per the directions of Engineer.
- 3.3 Payment will be made for providing such barricading in the relevant item of schedule.

3.4 Reporting of Accidents

The Contractor shall report to the Engineer details of any accidents as soon as possible after its occurrence. In the case of any fatality or serious accident, the Contractor shall, in addition, notify the Engineer and the Railways immediately by the quickest available means.

4 Life-saving Appliances and First-aid Equipment:

The Contractor shall provide and maintain upon the Works sufficient, proper and efficient life-saving appliances and first-aid equipment to the approval of the Engineer and in accordance with the requirements of ILO Convention No. 62. The appliances and equipment shall be available for use at all time.

4.1 FIRST AID BASE

- 4.1.1 First aid bases shall be located at each of the Contractor's principal Works Area.
- 4.1.2 The base shall consist of a treatment room fitted with two treatment couches, a hand wash basin, sterilizing equipment and lockable cupboards to contain sufficient medical supplies for the Contractor's personnel, the DFCCIL's personnel, the Engineer's personnel and the interfacing contractor working in the area and any visitors to the Site.
- 4.1.3 In addition, two stretchers shall be stored, available for instant use.
- 4.1.4 The first aid base shall contain a recovery room that shall be furnished with six chairs and a centre table.
- 4.1.5 The first aid base shall be air-conditioned.

4.2 STAFFING

- 4.2.1 A qualified doctor shall be available on call during all times when work is being undertaken on Site.
- 4.2.2 In each Site office and location at least one employee of the Contractor shall be trained in first aid and shall be available during all working hours for the purpose of attending to emergencies.

4.2.3 The Contractor may have a tie-up with the local health centres where they are unable to implement any of the above services.

4.3 EQUIPMENT

4.3.1 A fully equipped ambulance and driver shall be available on call during all working hours.

4.3.2 The ambulance shall be equipped with emergency life support equipment suitable for application in construction Site accidents.

4.3.3 Portable first aid boxes will be maintained fully equipped at each of local Site offices and work locations where twenty (20) or more persons work at a time.

5 Security Measures

5.1 The Contractor shall be responsible for the security of the Site for the full time the Site is in its possession, except for the specific case of the Railway Envelope after handover to the Railways.

5.2 The Contractor shall always maintain all Site boundary fences in good condition, and shall so arrange site boundary fences at all access drainage points of work areas that its use of such access points etc., is not restricted by the system or method of achieving the required security measures.

5.3 Notices shall be displayed at intervals around the Site to warn the public of the dangers of entering the Site.

5.4 During the progress of the Works the Contractor shall maintain such additional security patrols over the areas of the Works as may be necessary to protect its own and its sub-contractor's work and equipment and shall co-ordinate and plan the security of both the work under this Contract and the work of others having access to and across the Site and the Works.

5.5 The Contractor shall liaise with the sub-contractors and the contractors responsible for the adjacent and other interfacing contracts and ensure that co-ordinated security procedures are operated, in particular in respect of vehicles permitted to pass through the Site and/or the adjacent sites in the latter periods of the Contract.

5.6 Contractor's as well as Sub Contractor's employees and representatives shall wear identification Badges (cards), uniforms, helmets, gum boots and other safety / protection gadgets / accessories provided by the Contractor. Badges shall identify the Contractor and show the employee's name and number and shall be worn at all times while at site.

5.7 All vehicles used by the contractor shall be clearly marked with the Contractor's name or identification mark.

5.8 The contractor shall be responsible for security of works for the duration of the contract and shall provide and maintain continuously adequate security personnel to fulfil these obligations. The requirements of security measures shall include, but not be limited to, maintenance of Law and Order at site, provision of all lighting, guard, flagmen, and all other measures necessary for

protection of works within the colonies, camps and elsewhere at site, all materials delivered to the site and all persons employed in connection with the works continuously throughout working and non-working periods including nights, Sundays and holidays, for the duration of the contract. However, at work sites in close proximity of traffic corridors where public and traffic are likely to come close to the work area, suitable barricading as proposed by contractor and approved by Engineer shall be provided.

5.9 No separate payment will be made for providing security measures and will be deemed to be included in the rates quoted by the contractor.

5.10 It is presumed that Tenderers have gone through the Rail Vikas Nigam Ltd.'s above mentioned letters including any subsequent instructions on this issue if any, before quoting the rates.

6 Safety precautions: General

Safe working of contractors: A large number of men and machinery are deployed by the contractors for track renewals, gauge conversions, doublings bridge rebuilding etc. it is therefore essential that adequate safety measures are taken for safety of the trains as well as the work force. The following measures should invariably be adopted.

i) The contractor shall not start any work without the presence of railway supervisor at site.

ii) Where ever the road vehicles and/or machinery are required to work in the close vicinity of railway line, the work shall be so carried out that there is no infringement to the railway's schedule of dimensions. For this purpose the area where road vehicles and/or machinery are required to ply, shall be demarcated and acknowledged by the Contractor. Special care shall be taken for turning/reversal of road vehicles/machinery without infringing the running track. Barricading shall be provided wherever justified and feasible as per site conditions

iii) The look out and whistle caution orders shall be issued to the trains and speed restrictions imposed where considered necessary. Suitable flagmen/detonators shall be provided where necessary for protection of trains.

iv) The supervisor/workmen should be counselled about safety measures. A competent certificate to the contractor's supervisor as per proforma annexed shall be issued by Engineer which will be valid only for the work for which it has been issued.

v) The unloaded ballast/rails/sleepers/other P. Way materials after unloading along track should be kept clear off moving dimensions and stacked as per the specified heights and distance from the running track.

vi) Supplementary site specific instructions, wherever considered necessary, shall be issued by the Engineer-in-charge.

7 Precautions in Electrified Section

- 7.1 Protection of work sites and obtaining work blocks for repair and maintenance works undertaken by Engg./Signalling/Electrical (Traction) etc.
- 7.2 To work in the electrified areas, the staff, supervisors and officers at work sites should familiarize themselves with relevant provisions of ACTM for guidance and necessary action as given below :-
- (i) Signalling & Telecommunication staff.
- Signalling & Telecommunication staff working on sections equipped with 25 kv A.C. Traction, should follow instructions given in para 10429 to 10433 of the Manual of A.C. Traction, Volume I.
- (ii) Engineering Staff.
- Whenever working in the vicinity of the tracks equipped with 25 kV AC traction, instructions given in para 10420 to 10428 Manual of A.C. Traction Volume I, and those given in the supplement to Part 'J' of Chapter II of the Indian Railways Permanent Way Manual, must be followed by the Engineering Staff.
- (iii) Bridge Staff.
- No work of painting/scraping of any structure including bridges shall be undertaken within 2 metre from live overhead equipment without obtaining permit to work from an authorised person in accordance with SR 17.09 (2)
- (iv) Electrical (General Services) Staff.
- Electrical (General Services) staff working on high tension/low tension lines in the vicinity of tracks equipped with 25 kV A.C. traction should take precautions given in para 10400 of the manual of A.C. Traction. Volume I.
- (v) Electrical (Tractions Distribution) Staff.
- (a) OHE staff when using ladders for lifting or supporting overhead wires which may disturb OHE temporarily and is likely to endanger safety of staff/passengers, must get look out caution orders (driver to whistle continuously) and ensure that danger signals have been shown. In case of work being carried out within station limits, written permission of the Station Master should also be obtained as per SR 17.03 (8) (2).
- (b) In all OHE works where there is a possibility of infringement to moving dimension such as replacement of Catenary or Contact wires, replacement or POH of Cantilevers, replacement of cut-in insulators etc. the work must be carried out by taking full Traffic Block along with the Power Block.
- 7.3 All Departments.

- (a) In addition to the above, it may be ensured by staff, supervisors & officers of all departments, that no work in the vicinity of 2 mtrs. of live OHE/PSI should be carried out without obtaining "Permit to work" (Ref.: Para 20334 of ACTM Vol.IIPt.I).
- (b) While undertaking cable laying work at stations, precautions must be taken by all concerned to avoid damage to the existing Electrical and Signal & Telecommunication cables in the stations/yards, as follows:-
 - (i) Before starting the excavation in yards/stations/officer residential complex, a joint survey must be conducted by the supervisor of Civil, Electrical, Signal& Telecommunication & Construction Departments. After deciding the route a plan should be prepared which should be jointly signed by the supervisors of all departments and countersigned by the concerned PMC Engineer.
 - (ii) Before the commencement of the excavation, the route must be marked on the ground.
 - (iii) Where there are large no. of cables/difficult locations, the excavation work shall not be undertaken without a responsible nominee of the department owning the cables being present at site.
 - (iv) Supervisor of department undertaking cable laying work/excavation should be available at site to ensure that the excavation site is free from other cables and ensure that no cables are damaged during excavation.
 - (v) Track crossing should be done under the supervision of a responsible Engg. Official.
 - (vi) While working, if an existing cable gets damaged, it should be immediately brought to the notice of the supervisor & officers of the concerned department who should immediately take remedial measure to rectify the damage.

Section-8: Execution Programme

Section-8.1: PROJECT PROGRAMME REQUIREMENT

1. General

1.1 The Programme has the following three primal purposes in three respective phases of the contract procedure. Those purposes on respective phases are clarified as follows:

1) Bid Programme

The proposed program by the Bidder during the bidding process shall be used for evaluating the Bids and used to develop the contractual agreement between the Employer and the Contractor.

2) Contractual Construction Programme

The Contractor shall submit a detailed time programme to the Engineer for his consent within 28 days after the Commencement Date. While preparing this, the Contractor shall duly consider his various obligations including but not limited to the train operations on the existing Indian Railway tracks, shared Site areas with the Other Contractors, Co-ordination Events and Dates etc. This programme shall be supplemented and developed at the time of the Inception Report. However, supplementing the same shall not relieve the Contractor of his obligation to adhere to the Time for Completion and Co-ordination Dates as specified in the Contract. Upon consent by the Engineer to this programme, it shall be referred to as the Contractual Construction Programme, and become an integral part of the Contract; and

3) Works Programme and Supporting Reports

Base on the Contractual Construction Programme, the Contractor shall submit subdivided and detailed programmed in respect of all the Work Segments as advised by Engineer, along with status reports of the Works to the Engineer for checking and monitoring the Works. Each programme produced and submitted to the Engineer shall be a detailed time window of the Contractual Construction Programme.

2. Methodology

2.1 Unless otherwise instructed by the Engineer, the Programme shall be in the form of a Critical Path Method (CPM) Network showing critical path along with the Narrative Statements. The programme shall also be submitted in the form of a Time Bar-chart showing a Critical Path and S-curve (cumulative progress in percentage). The Time Bar-chart Schedule shall list all main activities and connected sub-activities

2.2 The CPM Network shall be prepared in accordance with commonly accepted practices and shall show graphically the chain of activities/sub-activities and their sequential relationship with each

other from the Commencement Date to the day of issue of Taking-Over Certificate. It shall include all activities with their durations along with earliest and latest event times, free and total floats, dates of submission of the Contractor's drawings, process for procurement of the Borrow Pits and the Quarries, soil material tests and field trials of embankment, tests of concrete materials and trial mixing of concrete, each date of inspection by the Engineer for the Works Segment or part of the Works; and shall meet the provisions of the Contract in all respects. It shall be noted that the Contractor does not have an exclusive right to use free and total floats without consent of the Engineer.

- 2.3 In preparing the CPM Network and the Time Bar-chart Schedule showing a Critical Path and S-curve, the Contractor shall make due allowances for delays, holidays, local working conditions, maintenance of equipment, trial runs, and similar items. Under no circumstances shall the CPM Network or the Time Bar-chart Schedule show a completion date beyond the of issue of Taking-Over Certificate.

3. Coordination Event and Coordination Date

The Contractor shall execute the Works necessary for the Other Contractors within a specific time window delimited by the Coordination Date so as not to hinder the Other Contractor from executing their works smoothly for the sake of overall implementation of the Works. All the programmes shall meet the Coordination Dates, each of which corresponds with each Coordination Event defined in this document.

4. Bid Programme

4.1 Contract Stages:

The Contractor shall divide the Work in to various stages. Completion of these stages shall be linked with the designated Co-ordination Events and Dates, as indicated in the Conditions of the Contract and of the Employer's Requirements. For the purpose, the Contractor shall elaborate a comprehensive schedule for achieving of the same and shall include, but not limited to, the following;

- (a) stage Identification
- (b) the Co-ordination Events and Date
- (c) the Interfacing Parties
- (d) related bodies and / or organisations and its Certification and / or approval
- (e) works to be performed and / or actions to be taken before the Co-ordination Date
- (f) intended achievements

- 4.2 The Bid Programmes shall meet the Coordination Dates, each of which corresponds with each Coordination Event defined and clearly indicate sequence in which the Bidder proposes to

execute the Works. The Programme shall recognize realistic review and approval durations for both the Engineer and any external agency which may impose authority on the Works.

- 4.3 The Programme shall be totally comprehensive and detailed as much as possible covering all major activities in the Design Phase and the Construction Phase. Activities of the Works shall be supported by and correlated to information detailed by the technical proposal concurrently submitted by the Bidder.
- 4.4 The critical path shall be clearly identified and recognized in the programme and fully described in the accompanying programme narrative. Each activity description shall succinctly convey the nature and scope of the work in each stage.

5. Contractual Construction Programme

- 5.1 The Bid programme submitted during the bidding process shall be further developed and submitted to the Engineer within 28 days after the commencement date. Upon consent by the Engineer, it shall be referred to as the Contractual Construction Programme which shall serve as the base against which the Contract Progress shall be monitored. The Contractual Construction Programme shall supersede all other programme submitted earlier and shall be deemed to be the programme on which the Contractor has based his accepted Contract Amount and in accordance with which he shall execute the works within the specified time for Completion.
- 5.2 The Contractual Construction Programme shall be the highest priority programme. Other programmes in respect of structure *I* priority, a particular time window taken from the Contractual Construction Programme and detailed in terms of their purposes.
- 5.3 If, at any time, actual progress is too slow to complete in the Time for Completion, and/or progress has fallen (or will fall) behind the current Contractual Construction Programme, then the Engineer shall instruct the Contractor to submit a revised Contractual Construction Programme and supporting report describing the revised methods and resources which the Contractor proposes to adopt in order to expedite progress and to complete the Work within the Specified Time for Completion.
- 5.4 Any changes to the Contractual Construction Programme shall be subject to the consent of the Engineer and shall not relieve the Contractor of his responsibility to complete the Work within the Time for Completion as per the Contract.

6. Works Programme

6.1 General

The Contractual Construction Programme shall be divided into sub-programmes of the Work Segments, of manageable sizes addressing in more specific detail and/or in more specific issues

and they are collectively referred to as Works Programme. The Works Programme is categorized including but not limited to the following:

- (a) Survey Programme for validation of the Data provided by the Employer and additional survey as considered necessary by the Contractor;
- (b) Geotechnical Investigation Programme;
- (c) Design Submission Programme;
- (d) Construction Programme;
- (e) Coordinated Construction Programme;
- (f) Temporary Facilities and Utility Services Programme; and
- (g) Procurement Programme;

The Works Programmes shall be further substantiated by supplementary programmes upon request by the Engineer such as three months Rolling Programmes addressing in more detail for an imminently forthcoming time window (weeks or months.) First three months rolling programme shall be submitted as part of the Inception Report. Further supplementary programmes shall be added as required to adequately plan and monitor specific Work Segments or sets of activities.

6.2 Programme Requirements

The Contractor's Works Programme and all other programme in the Contract as applicable shall comply with the following requirements unless otherwise instructed by the Engineer:

- (1) all programmes e.g. design and/or construction work, including all subcontractors' work, under this Contract shall be prepared, scheduled, executed and reported using the latest version of CPM scheduling software of Primavera Project Planner. Other equivalent software such as Sure Track, Microsoft Project etc. shall also be used subject to the consent of the Engineer and provided that the system is compatible and capable of direct file interchange with software programme being used by Employer. Such interchangeability shall have to be demonstrated in the Contractor's Proposal as well as before start of the work to the entire satisfaction of the Engineer / Employer. In such a case, the Contractor shall supply to the Engineer and Employer with the Original licensed copy of the said software including manuals and training and subsequent versions thereof at no extra cost to the Employer.
- (2) All programmes shall be accompanied by a Programme Analysis Report as described thereafter;
- (3) the Contractor is responsible for determining the sequence of activities, the time estimates for the detailed design and construction activities and the means, methods, techniques and procedures to be employed. Time schedules identified herein shall represent the

Contractor's best judgment of how it will execute the Work in compliance with the Contract requirements. The Contractor shall ensure that the time schedule is current and accurate and is properly and timely monitored, updated and revised to accommodate with current project conditions and in compliance with the requirements in the Contract.

- (4) a standard Gregorian calendar shall be used for planning and execution of the Works. All programme submissions shall include details of the Contractor's allowance for public holidays and non-work periods. If a Coordination Date falls on a Public Holiday or non-work day, it shall be effective the next working day;
- (5) CPM programmes shall reflect status using remaining duration and percent complete;
- (6) all programmes shall be fully resource loaded as appropriate or required by the Engineer covering all stages and aspects of the Contract and shall include, but no be limited to:
 - (a) major manpower for both design and installation;
 - (b) number of itemized Contractor's equipment;
 - (c) drawings and other design deliverables;
 - (d) principle quantities of components or parts;
 - (e) principle quantities of bulk materials inclusive of fill/cut volume, blanket material, piles, steel, concrete, re-bar, sleepers, rails, ballast, cabling, piping, ducting, etc. and
 - (f) sub-contractor's deliverables
- (7) Each activity shall be coded to indicate, as a minimum, the work group or entity responsible for the activity, the area, facility or location when the Other Contractors or other entities are involved and
- (8) All the activities including Coordination Dates shall be coded so as to be separately identifiable. The Contractor shall be required to assign additional activity codes as required by the Engineer.

Respective Works Programme shall be identified and detailed in the categories as specified herein below.

7. Survey Programme for Validation of Data and Additional

The Contractor shall prepare a Survey Programme for validation of data provided by the Employer and additional survey in regard to geo-technical requirements, survey of structures, circuits in vicinity including that on the adjoining IR installations, measurement of earth resistances with respect to EMI emanating out of 2 x 25 kV AC Traction System and their mitigation measures required. This will be required to develop his intended Technical Design in a reasonable time within the agreed Contractual Construction Programme. The Programme shall also indicate duration of "Access to the Site" for every stretch and area all along the Alignment. The Survey Report shall also contain a submission of all the data and results of the survey including the Site Location Maps, the earth resistivities and type of soil for foundations of equipment and structures

9. Deleted

10. Construction Programmes

- 10.1 The Construction Programme shall in general consist of the Construction Programmes for the works of Traction and Auxiliary Power Supply, OHE and SCADA, being parts of all the Work Segments.
- 10.2 The Construction Programmes shall be identified by the distinctive names and / or numbers. Covering separately.
- 10.3 Overhead equipment: for wiring of tracks: Foundations, Mast Erection, Bracket erection, Wiring, stringing of feeders, earth wires, catenary and contact wires: their adjustments, earthing and bonding. The programmes for all the major activities in respect of each segmented stretch of the alignment shall be submitted to the Engineer for consent.
- 10.4 Traction Substations, SPs, SSPs and AT stations: Preparation of land, foundations, buildings roads leveling drainage fencing, building construction, structure erection, bus-bar and conductors, equipment erection, Transformers transport and installation, tests and any other allied activity vital to completion of the work etc.
- 10.5 SCADA works for remote control and monitoring of the traction system from a centralized operations control centre.

10.2 Coordinated Construction Programme

1. The coordination with Other Contractors and other entities shall be the sole responsibility of the Contractor. The contractor shall submit the coordinated construction programme not less than 3 months before the start of the respective construction activities for check and monitor by the Engineer.
2. The coordinated construction programme shall include detailed activities describing all aspects of the access dates on completion of works of Other Contractors and other entities to meet all coordination dates given in the Contract and clearly linked to the other Works Programme of Other Contractors. The coordinated construction programme shall indicate the physical areas to which the Contractor requires access, with access date, duration required and the required degree of completion of the Works prior to the access dates by the Other Contractors.
3. It is the Contractor's responsibility to ensure timely co-ordination with the Other Contractors to review, revise and finalize his Work Programme so as not to affect the progress of Works/ and or the works of the Other Contractors.
4. The Contractor shall note that the following conditions apply to the works of the Other Contractors:
 - (a) the Other Contractors shall not have exclusive access to any part of the Site except by the specific consent of the Engineer;
 - (b) the Contractor shall take note that concurrent time allocations for certain areas may be given to more than one contractor. The Contractor shall coordinate the Work in such areas

with the works of Other Contractors / Interfacing Parties and report to the Engineer for his review / consent;

(c) the absence of a programme date or installation period for the other contractor and / or other relevant entities in a specific area shall not prejudice the right of the Engineer to establish a reasonable programme date or installation period for that area; and

(d) the Contractor and the Other Contractors shall comply with the coordination dates and other successive activities specified in the coordinated construction programme.

10.3 Temporary Facility Programme

The Contractor shall prepare programmes of all the major temporary facilities to be constructed and operated by the Contractor such as the Borrow Pits and the Quarries, aggregate crusher/mixing and, concrete batcher plants and any other temporary facilities with relevant Temporary Services.

The programme shall include but not limited to, arranging the land, if required by the Contractor, including the land in the ROW for the Temporary Works (if requested by the Contractor to the Engineer / Employer). The Programme shall also include payments to the land owners, royalty charges etc., with relevant approval process, construction, procurement of machinery and equipment, mobilization of core personnel and labour and daily production and transportation of materials, as well as demobilization and reinstatement.

11. Procurement Programme for Manufactured Items

11.1 Within 42 days after the Commencement Date, the Contractor shall submit the initial Procurement Programme for manufactured items to the Engineer for consent. Afterwards the Contractor shall update the Programme not less than three (3) months prior to the first shipment of each item as an item-wise Procurement Programme to the Engineer for consent. The initial submission shall fully outline the succeeding Programme as instructed by the Engineer.

The Procurement Programme shall show the interdependencies of engineering disciplines between the Contractor and its sub-contractors and/or suppliers which provide the Contractor with major machinery, equipment and materials produced and/or assembled in their factories or any off-site manufacturing process, and shipped to the corresponding site by them.

11.2 Production and Shipment

The Contractor shall carefully incorporate the activities which are subject to long lead time and/or component parts or items manufactured from countries outside India (if any) into the Procurement Programme.

The Procurement Programme shall detail including but not limited to the following information for each major and significant component and shall include:

- a) Name and description detailing supplier/sub-supplier;

- b) drawing information (where appropriate), title, drawing status, submission dates, shop drawings/ fabrication drawing preparation, etc.;
- c) the manufacturing process, manufacturing of test pieces, testing programme (type tests and factory acceptance tests), trial production, Engineer's inspection, monthly production of components and monthly supply of components;
- d) the assembly process, erection and assembly sequences (particularly for the first pieces) prior to shipment, test assemblies, monthly assembly requirement, Engineer's inspection, testing of assemblies; and
- e) transportation process, quality release from factory, factory storage, transportation.

From these base data above, the Contractor shall prepare an exception report detailing all components that are in delay. This report shall be annotated with the reason for the delay and indicate what action the Contractor is taking to recover the lost time.

11.3 Tests for Procurement and Commissioning Programme

Procurement Programme shall also include testing programme. The testing programme shall include, but not limited to, the factory testing programme.

(1) Tests Performed in Factory

The factory testing programme shall be fully detailed in the Procurement Programme, with activities individually identifying all tests for which a certificate shall be issued, and shall include activities for preparation, submittal and consideration of the test procedures. It shall also demonstrate the logical dependencies and correlations between the other individual tests of the Works.

The factory testing programme shall include details of inspection, testing and witnessing of the Contractor's and subcontractor's procurement and manufacturing activities.

(1) Tests Performed on Site

The Contractor shall include the On-site testing programme as part of the Procurement Programme that shall fulfil all the On-site testing on the items which are produced and/or assembled in the manufacturer's and/or Sub-contractor's factory or any off-site manufacturing process, and shipped to the corresponding site by them.

The testing programme shall be fully detailed, with activities individually identifying all tests for which a certificate shall be issued, and shall include activities for preparation, submittal and consideration of the test procedures.

The Engineer shall carry out the tests as prescribed in the respective codes before accepting any manufactured item for use in the Permanent Works and for the Temporary Works to the extent required for safety considerations.

12. Review and Monitoring of Programme

12.1 Programme Review

- 1) The Contractor shall submit all programmes as required in the Contract to the Engineer for consent.
- 2) The Engineer shall, within 21 days of receipt of the initial submission of any programme for consent, either give a notice of no objection or provide specific details as to why a notice of no objection is not given. If the Contractor is advised that the programme is not given a notice of no objection, the Contractor shall amend the programme taking into account the Engineer's comments and/or requirements and resubmit the programme within 14 days.
- 3) In the case of further re-submittals, the resubmission shall be made within 14 days after the notice.

12.2 Works Programme Revisions

- 1) The Contractor shall immediately notify the Engineer in writing of the need for any change in the Works Programme, whether due to a change of intention or circumstances or for any other reason. Where such a proposed change affects the timely completion of the respective Works or any Stretch or Stage; the Contractor shall within 14 days of the date of notifying the Engineer submit for the Engineer's consideration his proposed revised Works Programme and accompanying Programme Analysis Report. The proposed revised Works Programme shall show the sequence of operations of any and all work related to the change and the impact of changed work or changed conditions on the Works and Other Contractors and their works.
- 2) If at any time the Engineer considers the actual or anticipated progress of the work reflects a significant deviation from the Works Programme, he shall request the Contractor to submit a revised Works Programme. Upon receipt of such a request the Contractor shall submit within 14 days a revised Works Programme, together with an accompanying Programme Analysis Report and narrative statement, if any, including the reasons/repercussions of such deviations and the likely delays arising out of such deviations. The Contractor's resubmission of the programme shall demonstrate the means including deployment of additional resources etc. by which the Contractor shall eliminate the deviations and make good the delays occurred or likely to occur due to the same.
- 3) Unless and until an amended version has the consent of the Engineer, the existing programme shall remain as the Works Programme for all purposes of the Contract.

- 4) Consent by the Engineer to a Works Programme shall not relieve the Contractor of any of his duties or responsibilities under the Contract, nor in the event that a Works Programme indicates that a Co-ordination Date or any intermediate targeted date has not or will not be met, and nor constitute any form of acknowledgement that the Contractor is or may be entitled to an extension of time in relation to such Coordination Date intermediate target date. In any circumstances the Contractual Construction Programme shall always prevail over other programmes and each of the other programmes shall be a detailed time window of the Contractual Construction Programme.
- 5) Notwithstanding the above, the Engineer may at any time during the course of the Contract require the Contractor to reproduce the computer-generated schedule report described above to reflect actual activity dates and generate schedules based upon "what if" statements.

12.3 Progress Monitoring

The Contractor shall monitor the progress and his Sub-Contractors' performance and against programmes to ensure its compliance with its obligations under the Contract. Monitoring of the Works shall include direct, daily monitoring of the progress of the Works and the preparation of written reports to be submitted to the Engineer. The reports shall include all necessary supporting data to apprise the Engineer of the status of the completion of the Works. The Contractor shall prepare the Monthly Progress Reports covering all aspects of the execution of the Works.

12.4 Programme Analysis Report

The Contractor shall submit a Programme Analysis Report that shall, in narrative format, describe the basis and assumptions used to develop every programme. The Programme Analysis Report shall be prepared in a format having been considered without objection by the Engineer and contain as a minimum the following:

- a) cycle times and work sequences;
- b) the deployment of Contractor's Equipment and labor;
- c) the production rates used in determining duration;
- d) the shifts assumed in determining duration;
- e) the breakdown of labor requirements by trades;
- f) the schedules of quantities used in developing the programme, to the extent that such information is not provided elsewhere;
- g) interfaces with the Engineer and Other Contractors / Interfacing Parties and other constraints; and

12.5 Physical Progress (Earned Value) Report

- 1) The Contractor shall prepare and submit monthly, a Physical Progress Report based on earned value techniques. The contractor's proposal for the Physical Progress Report and basis for measuring progress shall be prepared in accordance with the requirements listed below and shall be submitted to the Engineer within 42 days after the Commencement Date.
- 2) Selection of work activities
 - a) Earned value progress reporting requires that the Contractor's work activities be broken down into discrete measurable units that are time phased (0% to 100% complete) in accordance with the Contractor's programme and maximum limit. These discrete measurable units shall be based on the physical deliverables and the pro-rata value of the items / milestones in order to summarize the activities into a planned percent complete curve. The format for presenting the earned value progress measurement information in a Physical Progress Report is to be considered by the Engineer.
 - b) Coordination work activities with Other Contractors and other relevant entities for reporting progress shall be prepared by the Contractor and submitted to the Engineer for review / consent.
 - c) To the maximum extent possible, activities shall be chosen which can be measured quantitatively rather than subjectively as the work progresses. In the event it is necessary to use activities that can only be measured subjectively, intermediate activities or milestones shall be identified on the programme in which the Contractor shall establish a predetermined intermediate percent complete for the activity at attainment of each intermediate milestone. Such milestones shall be no more than one month apart.

(3) Activity weighting

In order to summaries the key individual activities into an overall planned or actual percent complete, activities shall be weighted. Various methods for determining the appropriate weighting can be used. The Contractor may propose an existing methodology comparable to the intent of the earned value concept. The Engineer shall assess and, if appropriate, consider the method proposed by the Contractor. The sum of the weighting for all activities shall equal one hundred percent (100%).

(4) Revisions to Physical Progress Report

Once the weightings have been established, the planned progress curve shall be calculated and forms the basis of monitoring the progress of the Work. It shall not be changed unless there is a variation that significantly impacts on the programme. If, after consideration, it is decided by the Engineer to incorporate a major variation, the planned and physical progress curves shall be revised incorporating the impact of approved variation. The curves shall be recalculated and

shall be submitted to the Engineer for consideration prior to its use in the Monthly Progress Reports. Other time phased planned activities shall remain unchanged during this process in order to maintain the integrity of the precedent programmes and most of all Contractual Construction Programme in any event.

(5) Measurement of activity progress

- a. The actual percentage of the Works completed shall be calculated on a monthly basis as required to support the preparation of the Physical Progress Report. The Contractor shall ensure that sufficient reliable quantitative backup documentation exists to support these calculations for each activity within the Physical Progress Report.
- b. Periodic detailed considerations may be made by the Engineer to assess the Contractor's calculations.

12.6 Progress Meetings and Programme Updates

- (1) The Employer shall chair progress meetings every month with the Contractor. These meetings shall be held at dates and times to be advised by the Engineer. Progress meetings shall not be later than 10 days after the issue of the Contractor's Monthly Progress Report.
- (2) The Engineer shall convene at his discretion, at any time upon reasonable notice to the Contractor, any meeting, either on or off the Site, to discuss and address any aspect of the Works or the Contract. The Contractor shall attend any such meetings convened by the Engineer.
- (3) On a monthly basis, the Contractor shall arrange for its Project Manager, Superintendent, and Scheduler to meet at the Site with the Engineer to review Contractor's Monthly Programme Update. A turnaround document as per the agreed computer software generated by the Contractor shall be marked-up to show the agreed upon progress, signed by the Contractor, and a signed copy issued to the Engineer. The Monthly Programme Update shall show up-to-date and accurate progress of the Work, and shall forecast the completion date for activities in progress based on the Contractual Construction Programme. The Monthly Programme Update shall be prepared by the Contractor in co-ordination with all its principal subcontractors and suppliers and the Other Contractors if necessary.
- (4) The Monthly Programme Update shall include actual activity data for progress to date, but in the Monthly Programme Update, the Contractor shall not change the schedule logic, the activity relationships/dependencies, or planned activity durations and shall not add or delete activities. If the Contractor believes that any of these items should be changed, then a proposed revised Works Programme shall be submitted by the Contractor to the Engineer. Although activities shall not be added or deleted in the Monthly Programme Update, activities that have been recommended and consented by the Engineer shall be included in the next Monthly Programme Update.

- (5) The Contractor will be notified by the Engineer, in writing, as to acceptance, reasons for rejection, or any revisions required to the Programme. Changes to the Programme agreed upon by the Contractor and the Engineer and consented by the Employer shall be incorporated by the Contractor into the Programme within seven (7) calendar days after such agreement. Changes on which the Contractor and the Engineer cannot agree shall be documented and shall be subject to the final decision of the Employer and which shall be binding.
- (6) Contractor shall adjust the data date ("as of date") to be the same as the end date for the invoicing period.
- (7) The Monthly Programme Update shall show actual activity commencement and completion dates, the actual remaining duration in workdays and physical percent complete for those activities commenced and not complete. For the stored materials, the update shall show the amount of material stored, representing the total cost of the materials delivered and properly stored. The Monthly Programme Update shall also show a graphic comparison of the current status and the Work Programme for each activity in the network.
- (8) Each Monthly Programme Update shall continue to show all work activities including those already completed. These completed activities shall accurately reflect "as built" information by indicating when activities were actually started and completed.
- (9) Monthly Programme Updates shall also contain the following information for each activity:
 - (a) Activity identification number, description and estimated original duration in workdays;
 - (b) Calculated early and late finish dates;
 - (c) Actual start and actual finish dates, and remaining duration, in calendar, for those activities started and not completed;
 - (d) Days ahead and/or behind schedule of the milestones representing the identified contracted milestones and especially to the Co-ordination Dates. Specified Contract Milestones and Contract Completion dates;
 - (e) Physical percent complete for each activity;
 - (f) A float analysis of the longest path through the Programme detailing potential delays and areas for acceleration. Actual start and finish dates shall be indicated for each activity as appropriate. Completed activities shall be omitted from remaining float and late start sorts.
- (10) The deliberation of all meetings shall be recorded in the jointly signed Meeting.

(11) Other Programme Meetings

- a) The Engineer shall convene routine and/or ad-hoc review meetings.
- b) Requirement of the meetings shall be provided by the Engineer

12.7 Revised Programme

- (1) If at any time the Engineer believes that the current Works Programme or Monthly Programme Update no longer represents the actual or planned execution and progress of the Work, the Engineer shall require of the Contractor, and (weather or not being required) the Contractor shall submit a revision to the current Works Programme within seven (7) days after the Engineer's instructions if it is required by him or in the Contractor's opinion.
 - (a) The programme revision, shall be carried out by the Contractor by modifications made to activities and I or activities duration, modification in logic connections between activities with supporting report describing additional resource loading (e.g. labour, equipment, material etc.) and I or the revised construction method I sequence to the current Works Programme or other sub-programme at the risk and cost of the Contractor.
- (2) Any proposed revisions to the Works Programme and other sub-programmes shall be submitted to the Engineer for consent with the supporting reports as stated above. This submittal shall include, at a minimum, a written narrative with a full description and reasons for each Work activity revised, a full programme printout of Contractual Construction Programme, and an electronic copy of the revised Works Programme (and I or the sub-programme). For revisions affecting the sequence of Work, the Contractor shall provide a programme diagram "fragnet" which compares the original sequence to the revised sequence of the Work. This diagram shall maintain all the Co-ordination Dates and comply with the Contractual Construction Programme.

12.8 Recovery Programme

- (1) Should the updated Works Programme, the sub-programmes or Monthly Programme Update, at any time during Contractor's performance, show that the Contractor is ten (10) or more calendar days behind schedule for the forthcoming Co-ordination Date and any other identified events on the Contractual Construction Programme, the Contractor shall prepare a Recovery Programme separate from the updated Monthly Programme Update at no additional cost to the Employer (unless the Employer is responsible for the event or occurrence which has caused the programme slippage) explaining and displaying how the Contractor shall reschedule its Work in order to regain compliance with the Contractual Construction Programme.
- (2) If a Recovery Programme is required as detailed above, the Contractor shall prepare and submit to the Engineer the Recovery Programme, incorporating the best available information from the Subcontractors, Other Contractors and the Interfacing parties, which shall permit the forecasted completion dates to return to the designated Coordination Dates and other identified events on

the Contractual Construction Programme. The Contractor shall prepare a Recovery Programme to the same level of detail as the originally accepted Works Programme I sub-programme I Monthly Programme.

- (3) The Contractor shall discuss and finalize the Recovery Programme, as prepared by him, with the Engineer and finalized for his acceptance within 7 working days of its initial submission by the Contractor. The Recovery Programme, once accepted by the Engineer, shall be implemented as the Revised Works Programme I sub-programme I Monthly Programme as the case may be for the remaining Works in the scope.

Section-8.2: MONTHLY PROGRESS REPORT

1. General

The Contractor shall submit to the Engineer, a Monthly Progress Report (MPR). This Report shall be submitted on the last working day of each calendar month and shall account for all work actually performed from 26th day of the last month and up to and including the twenty-fifth (25th) day of the month of the submission and referred to as the 'Report Month'. It shall be submitted in a format to which the Engineer shall have given his consent, describing, but not limited to, the topics listed below.

2. Design Status

Status of design progress shall be reported including:

- 1) A report detailing the design progress made for 'Technical Design', 'Construction Design, and 'As Built Records', as the case may be and outstanding issues to be resolved with solutions during the reporting period; and
- 2) The progressive and detailed version of the Design Submission Programme or its subprograms indicating actual achievement dates and forecast dates for outstanding items.

3. Physical Progress

It shall describe the status of work performed, significant accomplishments, including critical items and problem areas, corrective actions taken or planned and other pertinent activities, in respect of all the items / sub-items of the milestones / cost centre in each Work Segment and shall, in particular, address interface issues, problems and resolutions, representation of progress measured in percentage terms compared with percentage planned as derived from the Works Programme.

The Physical Progress shall be reported including:

- (1) A listed description of all Civil, Building and Track Works performed during the month with quantified progress and the updated Works Programmes as advised by Engineer showing both scheduled and actual progress of each sub-item of the work corresponding to each milestone / cost centre pertaining to each Work Segment;
- (2) The percentage of each main work activity completed as well as the projected percentage thereof to be completed to the end of the Report Month;
- (3) The total overall percentage of the works completed as well as the projected percentage thereof to be completed in respect of each cost center, each Work Segment and the project

as a whole to the end of the Report Month, and with appropriate comments to explain any differences and how to regain any lost time or set-backs which may have occurred;

- (4) A list of quantities of each major items of the work (including temporary works) performed during the month vis a vis total quantity to be executed and illustration showing the exact location of the work done.
- (5) A list of major Works (including Temporary Works) schedules to be started within the next two (2) months and estimated quantities thereof. If the expected starting and/or completion dates are different from those shown on the updated programme, an explanation is to be given as advised by Engineer.

4. Coordination

Status and outstanding issues of coordination and interfacing activities with the Other Contractors and other entities described in Part-I Section-5 [Interface Management] to the Employer's Requirements. Items to be reported shall include:

- (1) a summary of the coordination and interfacing activities during the Report Month and details of outstanding actions; and
- (2) a schedule of all submissions and consents/approvals outstanding as well as those obtained.

5. Procurement

Status of procurement of major items such as plants, equipment and manufactured materials, and material for the earthwork shall be reported including:

- (1) a summary of all significant procurement activities during the Report Month, including action taken to overcome problems;
- (2) a list of major items with description detailing their manufacturer, date of letter of credit, status of manufacturing and its origin, transportation and date of arrival at site (scheduled / actual), reasons for delay, if any and quantities procured immediately and made available for the Works;
- (3) Delays in procurement, if any, including reasons thereof and mitigation measures.

6. Programme Update

6.1 Programme Update for the entire project shall include but not limited to the following items:

- (1) The Monthly Programme Update which shall be prepared by recording actual activity completion dates and percentage of activities completed up to the twenty-fifth (25th) of the month together with estimates of remaining duration and expected activity completion based on current progress. The Programme Update shall include
 - (a) to account for the actual progress
 - (b) updated Works Programme to reflect modifications in the design and construction Programme
 - (c) status of every Work in progress, its graphic representation (completed and remaining) in respect of the identified Works in the Report Month as well as for all the major Works and relevant activities; and
 - (d) Progress 'S' curve indicating Base Line 'S' Curve for the accepted programme and physical Progress 'S' curve.

- (2) The Programme Update shall be accompanied by an Activity Report and a Narrative Statement which shall explain the basis of the contractor's submittal regarding:
 - (a) Work Programme – explaining determination of activity duration and describing the Contractor's approach for meeting Co-ordination Dates as specified in the Contract.
 - (b) updated Works Programme – stating in the narrative, the works actually completed and reflecting along the Critical Path in terms of days ahead or behind allowable dates. Specific requirements of narrative are:
 - (i) Identification of causes of actual and potential delays (if any) in respect of milestones, Coordination Dates and Contract Completion dates
 - (ii) Provide explanation of the Works affected due to delays and proposed corrective action / mitigation measures to achieve the milestones, Coordination Dates and Contract Completion dates and mitigation the potential delays.
 - (iii) Identification of any deviation from previous month's Critical Path.
 - (iv) Clear identification of every activity with number and description for activities in progress and activities scheduled to be completed.
 - (v) Provision of time required to cater for the Design Changes and Variation order, if any.
 - (c) Programme Status presenting:
 - (i) Works Programme status up to and including the current Report Month with cumulative progress to date and a forecast of remaining work.
 - (ii) Programme bar-chart size A3 and a time-related logic network diagram on an A1 size, including activity listings.
 - (d) Activity Variance Analysis analyzing activities planned to start prior to or during the Report Month but not started at the end of the period as well as activities started and/or completed in advance of the Works Programme.

7. Three Month Rolling Programme

- 7.1 The Three-Months Rolling Programme shall be an expansion of the Works Programme, covering sequential periods of three months.
- 7.2 The Three-Month Rolling Programme shall provide more detail of the Contractor's plan, organisations and execution of the work within these periods.
- 7.3 In particular, the Contractor shall expand each activity planned to occur during the next three (3) month period, if necessary to a daily level of detail. The Three-Month Rolling Programme shall be developed as a Critical Path Method (CPM) network, and shall be presented in bar chart and time-scaled network diagram format. Bar charts shall be presented on an A3 size and time-scaled networks diagrams on an A1 size reproducible media. Tasks in the programme shall be derivatives of and directly related to tasks in the consented Works Programme.
- 7.4 The Contractor shall describe the discrete work elements and work element interrelationships necessary to complete all works and any separable parts thereof including work assigned to sub-contractors / suppliers.
- 7.6 Each activity in the Three-Month Rolling Programme shall be coded, or described so as clearly to indicate the corresponding activity in the Works Programme.
- 7.7 The Three-Month Rolling Programme shall be issued on a monthly basis.

8. Three Month Rolling Programme Revisions and Updates

- 8.1 The Three-Month Rolling Programme shall be extended forward each month as described above. Each submission of Three-Month Rolling Programme shall be accompanied by a Programme Analysis Report, describing actual progress to date, and the forecast for activities occurring over the next three-month period.
- 8.2 If the Three-Month Rolling Programme is at variance with the work programme, the Programme analysis report shall be accompanied by a supporting Narrative Statement describing the Contractor's plan for the execution of the activities to be undertaken over the three month period, including programme assumptions and methods to be employed in achieving timely completion.
- 8.3 The Contractor shall revise the Three-Month Rolling Programme or propose revisions of the Works Programme, or both, from time to time as may be appropriate to ensure consistency between them.

9. Performance on Quality Management System

The MPR shall also include the Contractor's monitoring report on performance of the Contractor's quality management system and shall include the following as a minimum:

- a) The submission status and review status of the quality system documents;
- b) An up-to-date audit schedule and status
- c) An up-to-date nonconformity register providing the status of all nonconformity identified by the Engineer or the Contractor within the reporting period and those nonconformities not yet satisfactorily closed;
- d) An narrative appraisal of the performance of the quality management system, including any nonconformities, shortcomings or problem areas identified and the corrective and preventative action taken or proposed; and
- e) All the pending issues / references with the Engineer, Employer and the Contractor and the action proposed.

10. Financial Status

The MPR shall also include the following aspects of the financial status:

- (1) A narrative review of all significant financial matters, and actions proposed or taken in respect to any outstanding matters.
- (2) A spread sheet summarizing each major activity as defined in Section 8.1 [Project Programme Requirements], the budget, costs incurred during the period, costs to date, costs to go.
- (3) A spread sheet indicating the status of all payments due and made.
- (4) 'S' curve for the cash flow planned as per the Contract and as actual till the date of MPR including describing the variance.
- (5) A report of the status of any outstanding claims.
- (6) The report shall in particular provide interim updated accounts of continuing claims.
- (7) Any other information as required by the Engineer

11. Other Items

At minimum the following items shall be covered:

- (1) a list of local labour (in man-date by trade classification) employed during the month and the statement about labour relations including shifts and hours of works executed and an explanation of any actual or potential problems;
- (2) a list of expatriate personnel (in man-month by position) employed during the month;
- (3) a table showing actual working hours of each item of construction equipment, a list of stand-by equipment and a list of unserviceable (inoperable) equipment describing action being taken to get it back in operation;
- (4) a quantity list of the Contractor's Construction Material Consumed or used during the month and accumulated quantities thereof;
- (5) photographs showing work progress,
- (6) a summary of quality control tests (routine tests and check tests) performed on the materials and the products for the Permanent Works during the month including results (in values) of performance on each test and contrasted fluctuations of the properties with the specified range of their acceptability. The results of Quality Audits shall be summarized in the Contractor's monthly reports.
- (7) a general description of the weather, listing rainfall in mm, maximum and minimum temperatures, and river water levels, for each day through the month;
- (8) a statement concerning the effectiveness of the safety/security activities including a list of each accident involving the hospitalization and/or death of any person and list of any major thefts. Also, a list of any accidents in which equipment was damaged to the extent it become inoperable, and any fire which occurred;
- (9) a list of the amount and date of each payment received and amount of any monthly invoice which has been submitted but not yet paid;
- (10) a list of claims (if any) submitted during the month, including claim amounts and extension(s) of time;
- (11) a table of updated cash flow estimate;
- (12) a list of letters, drawings, and documents received from or submitted to the Engineer and/or Employer during the month;
- (13) Resources Mobilization: Status in respect of key persons and major construction material indicating the resources already available at Site and the proposed mobilization schedule for the next three months and

(14) construction equipment report including:

- a) a list of all the construction equipment located at the Site vis-a-vis required during the month to achieve targeted progress (segment wise);
- b) daily working and operation records of each item of equipment;
- c) inspection, repair and maintenance records;
- d) quantities of fuel, lubricant, oil and tires consumed;
- e) overhauling records;
- f) accident reports; and
- g) a list of unserviceable equipment and action being taken to put back in operation.
- h) Schedule of mobilization of the construction equipment required at Site for the next three months.

(15) Status of all the Temporary Works including temporary facilities and utility services for Contractor's use

(16) Status of temporary facilities and utility services for the use of Engineer / Employer

(17) Assistance required from the Employer

Section-8.3: Quality Management Programme

1. General

- 1.1 The Contractor shall maintain and implement a quality management system that shall remain in effect during the execution of the Works. The Contractor's quality management system shall be tailored specifically to the Contract and the Works in accordance with ISO 9001 - Quality Management System, the latest edition of the International Standard ISO 9001, and shall submit his quality management system titled as the Project Quality Assurance Plan for Engineer's review as specified herein.
- 1.2 The Project Quality Assurance Plan documentation shall include, but shall not be limited to the following:
- a) Project Quality Assurance Plan (as Contractor's integrated quality assurance documentation);
 - b) Design Quality Assurance Plan;
 - c) Site Quality Assurance Plan (as including Inspection and Test Plan);
 - d) Manufacturing Quality Assurance Plans (as including Inspection and Test Plan); and
 - e) On-site Inspection Plan for Resources Procurement;
- 1.3 The Contractor shall plan, perform and record all quality control activities to ensure that all Works are performed in accordance with the requirements under the Contract and are detailed in the quality plans which are required herein. Such activities shall include, without limitation, the inspections and/or test expressly or implicitly required by the Contract.
- 1.4 Quality audits shall be carried out by the Engineer and surveillance audit shall be carried out by Employer to verify the Contractor's implementation and compliance with the quality management system as specified herein.

2. Submission of Quality Documentation

- 2.1 Quality system documents to be submitted shall embrace all activities of the Contractor and his Sub-Contractors of any tier, including his suppliers and any design consultants for the execution of the Works.
- 2.2 Within 42 days after the Commencement Date, the Contractor shall submit the following documents for review by the Engineer;
- a) Contractor's Quality Assurance Philosophy
 - b) Project Quality Assurance Plan; and
 - c) Design Quality Assurance Plan and any associated work instruction and/or standard forms which the Contractor proposes to be used for the Contract.
- 2.3 The Contractor shall submit the separate Site Quality Assurance Plan and Manufacturing Quality Assurance Plans for managing, controlling and recording the on-site construction and

manufacturing process including off-site process for individual key items of the Works. The Manufacturing Quality Assurance Plan shall be submitted for review by the Engineer for his consent.

- 2.4 The Contractor shall submit the separate On-site Inspection Plan for Procurement for managing, monitoring and recording the on-site receipt of general construction resources including all construction materials, labour forces, and works and services delivered to the construction site. The On-site Inspection Plan for Resources Procurement shall be submitted for consent by the Engineer.
- 2.5 The Contractor shall, and/or as requested by the Engineer, continuously review and update the quality system documents to meet the requirements and development of the Works throughout the duration of the Contract. For any amendment to the quality system documents, the Contractor shall prepare and submit the proposed amendment for consent of the Engineer.
- 2.6 The Plan shall clearly define the Contractor's policy, Quality Assurance Organization, Management responsibility, the requirements for Quality Assurance personnel, their qualifications, skills and training, the Contractor's Quality Audit schedule
- 2.7 Records of certifications shall be maintained and monitored by the Quality Assurance personnel. These records shall be made available to the Engineer / Employer for inspection and review as and when required.
- 2.8 The Quality Assurance operations shall be subject to the Engineer's / Employer's verification at any time.
- 2.9 The verification shall include: surveillance of the operations to determine that practices, methods and procedures of the plan are being properly applied; inspection to measure quality of items to be offered for acceptance; and audits to ensure compliance with the Contract documents.
- 2.10 The Contractor's Quality Audit schedule shall be submitted to the Engineer for consent every three months or more frequently as required.
- 2.11 The Contractor shall provide all necessary access, assistance and facilities to enable the Engineer / Employer to carry out on-site and off-site Quality Audit / surveillance audit to verify that the Contractor's quality assurance system which has been consented by the Engineer, is being implemented fully and properly.

3. Controlled Copy of Quality System Documentation

The Contractor shall promptly supply the Engineer with six (6) controlled copies of his quality system documents duly consented by the Engineer. The Contractor shall maintain such controlled documents throughout the duration of the Contract. In addition, the Engineer may

request further copies of the quality system documents and these documents shall reach to the Engineer office within fourteen (14) days of notification.

4. Project Quality Assurance Plan

4.1 The Project Quality Assurance Plan shall establish the Contractor's management structure which functions efficiently to execute the Works in compliance with the Employer's Requirements under the Contract and shall, without limitation, define as follows:

- 1) A dedicated Quality Assurance Team
- 2) Appointment of a Chief Design Engineer and a Quality Assurance Engineer as described hereinafter;
- 3) A set of organization chart which depict in line with the Contractor's intent of the quality plans. Each organization chart shall identify the Contractor's managerial staff with reference to any member of the partnership, consortium or joint venture, and the main Sub-contractors and indicate the reporting structure and the interface relationship between all parties involved;
- 4) Each organization chart which shall be subdivided with regard to Works segments, site locations, and phases and stages of the project to ensure complete implementation of the quality management system in every part to the Work.
- 5) The Allocation of responsibilities and authorities given to managerial and technical staff with particular reference to the design and site supervision of the Works; and
- 6) Hierarchy of the quality management system documentation for managing and controlling the whole system.

4.2 The Contractor shall submit the Curriculum Vitae (CV) of each member of his Quality Assurance Team and other personnel relevant to his quality management system. Assignment of such personnel shall be subject to prior consent of the Engineer,

4.3 The Project Quality Assurance Plan shall without limitation include Quality Assurance procedures for design, construction, manufacturing, supply, installation, testing and commissioning and shall contain control processes for each stage in the Work such as design verification and validation, management of change control, non-conformance procedures, control on sub-standard practices, inspection, testing, auditing and so on

4.4 The Project Quality Assurance Plan shall also include a full list of quality management procedures, method statements, inspection and test plans, standards and protocol and/or standard forms, which shall form the frame work of the Project Quality Assurance Plan. It shall define specific procedures to perform the quality management activities and to record the evidence of

the activities performed and/or the results achieved. It shall detail the system and the procedure by which the Contractor shall ensure that

- The Quality Assurance Plan is fully observed at all times and
- Any non-compliant and sub-standard material, practice and I or work are brought back to compliance

4.5 It shall cover the requirements of the International Standard ISO 9001 in compliance with the Contract as precedence requirements, and shall, without limitation, include the basic management disciplines as follows:

- (1) Review, approval and updating management of the quality system documents to ensure their continuing suitability and effectiveness;
- (2) Design control management to all Permanent Works and/or Temporary Works, including design works carried out by Sub-Contractors and sub-consultants. The procedures shall clearly define the review and verification procedures of the designs submittals and the design packages described under the Contract.
- (3) Drawing management in the Contractor's main office and site office(s), including procedures of production, approval, updating, maintaining, storage and distribution;
- (4) Document management, including procedures of registration, updating, indexing, filing, maintenance, storage and distribution and monitoring and recording of the submission and re-submission to the Engineer;
- (5) Monitoring, recording and control of the quality system of his Sub-Contractors with respect to their quality of works with relevant time schedule; and
- (6) Quality control of the Works including Quality audits to be held on the Contractor and Sub-Contractors, suppliers and design consultants of any tiers.

6. Site Quality Plan

6.1 On-site Quality Management Provisions

The Contractor shall prepare a Site Quality Plan separately for the construction and installation of Works. The Site Quality Plan shall include the comprehensive on-site quality management in compliance with the Employer's Requirements under the Contract and shall, without limitation, define as follows:

- 1) Organization of the Contractor's staff directly responsible for the day-to-day management of the construction and installation activities to execute the Works on the site;
- 2) Allocation of responsibilities and authorities given to identified personnel or Subcontractors for particular construction and installation of the Works;

- 3) Hierarchy of relevant documentation (including drawings) of quality management system for managing and controlling construction and installation of the Works, including construction and installation works of Subcontractors of any tiers to avoid conflicts in the execution of the Works; and
- 4) A list of sequences to be applied to manage, control and record the construction and installation of the Works.

6.2 On-site inspection and test provisions

- (1) The Contractor shall note that he shall also prepare on site inspection and test plans to manage, control and record any test and inspection activities. The Inspection and Test Plans shall be established for particular activities which require inspection and/or test to meet the quality level required in the Employer's Requirements and as included in any form in the Contractor's design and the Works Specification. It shall cover the requirements of International Standards ISO 9001 and in compliance with the Contract.
- (2) The Contractor shall prepare and maintain a full list of the all Inspection and Test Plans needed under the Contract with submission status and review status, and shall submit to the Engineer for his consent.
- (3) Each Inspection and Test Plan for the particular activity shall define, without limitation
 - a) Scope of activities covered by the plan;
 - b) A sequence of the Work related to the activities in the scope
 - c) Personnel responsible for undertaking the inspections and/or tests and the personnel responsible for certifying the inspections and tests;
 - d) Inspections and/or test methods, their frequency, and/or reference materials to the relevant standard of the inspections and/or the tests;
 - e) Compliance criteria of the inspections and/or tests with clear descriptions of the quality hold point and the quality control point;
 - f) Documents to be used for reporting the results of the inspections and/or tests with sample documents incorporated into the Plan; and
 - g) Methods of record keeping and document storage as to the locations to be maintained I stored and procedures for those to be acknowledged/ filed.

7. Manufacturing Management and Quality Assurance Plans

7.1 Manufacturing Quality Management Provisions

The Manufacturing Quality Plans shall define the Contractor's management structure and quality management system for the manufacturing process of the key items of the Works, and for the items as requested by the Engineer. Separate Manufacturing Quality Assurance Plans shall be prepared for each manufactured item and submit them to the Engineer for consent.

Each Manufacturing Quality Assurance Plans for manufacturing process management shall be established in compliance with the Employer's Requirements under the Contract and shall, without limitation, define as follows:

- (1) Scope of activities and items covered by the plan;
- (2) Organization of the Contractor and/or the Subcontractor responsible for the day-to-day management of the manufacturing process of the items;
- (3) Allocation of responsibility and authority given to identified personnel for the day-to-day management of the manufacturing process with particular reference to the supervision, inspection and testing of the process and manufactured items;
- (4) Specific methods including handling and management of the manufacturing process and manufactured items, including but not limited to the following:
 - a) Particulars of the materials to be used in the manufacturing process;
 - b) Monitoring and management of manufacturing process in compliance with the consented drawings and specifications;
 - c) Identification or referencing procedures for traceability of the manufactured items;
 - d) Identification of the inspection and test status of the materials and the final manufactured item;
 - e) Disposition of nonconforming materials and the manufactured item;
 - f) Handling, storage, packaging, preservation and delivery of the manufactured item;
and
 - g) Procedure of monitoring and recording of the ordering and delivery of the item.

7.2 Manufacturing inspection and test provisions

- (1) The manufacturing inspection and test plans to be prepared by the Contractor shall cover all the requirements as described in Sub-para 6.2 above.
- (2) In addition to the inspection by the Contractor and the Engineer, the Employer may, at its own cost, depute its representative or nominate any other independent inspection agency for supervising, monitoring and inspection of raw materials and manufacturing process at the factory. To facilitate such an inspection, the detailed production/manufacturing plan shall be provided by the Contractor to the participants of the inspection as well as to the Engineer / Employer at least six weeks in advance of the commencement of the manufacturing process along with the description of mandatory specifications and tests proposed during the manufacturing process and the tests intended to be conducted on the finished product along with codal permitted tolerances.

8. On-site Inspection Plan for Resources Procurement

- 8.1.1 The Contractor shall establish On-site Inspection Plan for Resources Procurement for managing, monitoring and recording the on-site receipt of general construction resources including all construction materials, labour forces, and works and services delivered to the Site and the Temporary Facilities (e.g. Concrete batching & mixing plant and aggregate storage and so on) in the Work Areas.
- 8.1.2 On site Inspection Plan for resources procurement to be prepared by the Contractor shall cover all the requirements as described in sub-para 6.2 above.

9. Deleted

10. Tests

1. Tests to be carried out for quality assurance purposes shall be as specified in the Specifications (Volume III of the Bid Documents) and as per the Quality Assurance Plan / Inspections and Test Procedures duly approved by the Engineer.
2. The Contractor may employ other tests to further ensure the quality of the Works. In such a case, the Contractor is responsible for obtaining prior approval from the Engineer by submitting the test plans with regard to the application of the tests as part of the Project Quality Assurance Plan or its sub-plans.

11. Quality Audits

- 11.1 The Contractor shall carry out quality audits on the Works at quarterly intervals, or at such other intervals as the Engineer may require, to ensure the continuing suitability and effectiveness of the quality management system. Reports of each such audit shall be submitted promptly to the Engineer for review.

- 11.2 The Contractor shall submit for review by the Engineer details of the authority, qualifications and experience of personnel assigned to quality audit activities before carrying out quality audits.
- 11.3 The Engineer shall require quality audits on the Contractor and his Subcontractors of any tier to be carried out by his representative or the Employer's staff. In such case, the Contractor shall afford to such auditors all necessary facilities and access to the activities and records to permit this function to be performed.
- 11.4 Upon receipt of corrective action request (CAR) or similar document issued by the Engineer as a result of quality audits, the Contractor shall promptly investigate the matter and submit the proposed corrective and preventive actions within 14 days to the Engineer for review. The Contractor shall take timely corrective and preventive actions to rectify the matter and to prevent re-occurrence. Evidence to demonstrate effective implementation of corrective and preventive actions shall be submitted by the Contractor to the Engineer for review.

12. Notification of Nonconformities

- 12.1 If, prior to an issue of the Taking-Over Certificate for the Works or the relevant Section, the Contractor has used or proposes to use or repair any item of the Works which does not conform to the requirements of the Contract, the Contractor shall immediately submit for review by the Engineer of such proposal and supplying full particulars of the nonconformity and, if appropriate, of the proposed means of repair.
- 12.2 If the Engineer issues nonconformity report or similar documents to notify the Contractor of any item of the works which does not conform to the requirement of the Contract, the Contractor shall promptly investigate the matter and, within 14 days of notification by the Engineer, submit to the Engineer for review the remedial measures and necessary actions to be taken to rectify the items and to prevent re- occurrence.
- 12.3 The Contractor shall maintain and update a nonconformity register to indicate the status of all nonconformities which are identified by the Engineer/ and or the Contractor. The Contractor shall submit the register for review upon request by the Engineer.

13. Monthly Progress Report on Quality Management System

- 13.1 The Contractor shall continuously monitor the performance of the quality management system and shall include the same in each Monthly Progress Report as required in Annexure-2 [Monthly Progress Report] to the Employer's Requirements.
- 13.2 The Contractor shall provide and maintain at all stages of the Works a quality control register or registers to identify the status of inspections, sampling and testing of the work and all certificates. Such register shall be updated by the Contractor to show all activities in previous

months and shall reach the Engineer's office before 7th working day of each month. Each register shall:

- a. List the certificates received for each batch of goods and materials incorporated in the Works and compare this against the certification required by the Contractor and the Contractor's quality plans;
- b. List the inspection and testing activities undertaken by the Contractor on each element or segment of the Works and compare these activities against the amount of inspection and testing required by the Contract and the Contractor's quality plans;
- c. Show the results of each report of inspection and/or test and any required analysis of these results and compare these results against the pass/fail criteria; and
- d. Summaries any actions proposed by the Contractor to overcome any nonconformity.

The Engineer shall submit the same to the Employer along with his observations *I* comments before 15th working day of each month.

14. Quality Records

The Contractor shall ensure that all the quality records as objective evidence of the implementation of the quality management system are properly indexed, filed, maintained, updated and stored.

Part-I**CHAPTER – VII****ENGINEER's AUTHORITY****1. Role and Responsibilities of the Parties to the Contract**

- i) Normally the DFCCIL contracts will have a Project Management Consultant who will also be the Engineer. The roles of the Employer, Contractor and Engineer have been brought out below. In case the Employer's representative is designated as the Engineer, the responsibilities of the Engineer will be appended to that of the Employer except for the duties assigned to the PMC as per the contract with PMC.
- ii) **Employer** is responsible for defining the scope of the work, the Terms of Reference, setting the employer's requirements, specifications and standards to which the work shall be constructed and completed, providing possession of site to the Contractor, laying down adequately provisions of Applicable Law, Clearly spelling out Safety, Health and Environmental requirements, and making payments, approving any variations or design changes, coordination with other government agencies and getting clearances from them wherever mentioned in the Contract. In addition to these the Employer's representatives will also be responsible for ensuring quality of construction.
- iii) **Contractor** is responsible for construction methods, provision of competent and experienced personnel, supply and organization of labour, job safety, traffic management, construction related quality assurance and quality programmes, compliance with all applicable laws relevant to the work, ensuring a robust Safety, Health and Environment plan and overall completion of the Contract Works. He will keep proper records including those for quality, inspection, rejection or rectification of work.
- iv) **Engineer** is the party mentioned in the Contract for Project Management. The Engineer, as such, is the consultancy firm engaged by the Employer or any official of DFCC designated as such. The Consultant is, however, required to appoint a person to act as the Engineer and delegate to him the responsibilities to work and act on its behalf and carry out most of the functions related to the project. The consultancy firm may have internal regulatory and control arrangements with the said person and give him required directions. The Engineer is responsible for administering the Contract, inspection of plant, materials and workmanship, making measurements of quantities as work proceeds and making engineering decisions where ambiguities or unforeseen circumstances occur. He will act impartially, give proper and timely advice to the Employer/Contractor to enable corrections during execution, and give reasons for his recommendations and decisions when called by the Employer. He will keep proper records including those for quality, inspection, rejection or acceptance of work, and make available such records as may be called for by the Employer.

2. Role of Employer

- a) **Land Acquisition and Other Clearances:** The process of land acquisition shall be started by the Employer, through the Chief General Manager, well ahead and completed entirely, or at least substantially, by the time contract is awarded.

The CGM shall also pursue with the following departments for requisite clearances so that the progress of work is not impeded and incidence of delay claims by the contractor is avoided.

- i) Forest Department, for removal of trees, compensatory forestation and approval under Forest Conservation Act;
- ii) Telecommunication Department, for re-locating telephone lines;
- iii) Public Health Engineering Department and or Local Authorities such as Corporations/Municipalities, for re-locating the water supply and sewer pipe lines
- iv) PGCIL & State Electricity Boards, for shifting or removing of Electrical Power Line crossings / structures;
- v) Optical Fiber Cable Service (OFC) providers, for safety of cables;
- vi) Ministry of Petroleum or the Oil Companies, for adjustment in the sites of petrol pumps and gas lines;
- vii) Zonal Railways and Road Authorities, for conversion of level crossings into ROB/RUB, and laying of project needed railway sidings; for inter connection with DFCCIL, for shifting / modification of utilities pertaining to Railways.
- viii) Competent Authority / District Administration, for Rehabilitation and Resettlement (R&R) of persons affected by the project and Land Acquisition;
- ix) Police Department, for traffic control;
- x) State Mining and Mineral Department, for mining of earth and stone;
- xi) Archaeology Department, for clearance in respect of interfering protected monuments;
- xii) Industries Department, for blasting permission, if any;
- xiii) Ministry of Environment, for environmental clearance; and
- xiv) Community Leaders, for shifting of religious shrines.

- b) **Supervision and Quality Assurance:** CGM and his team will be responsible for supervision and managing the contract of PMC and ensuring an overall Quality Assurance. Quality Assurance will be in accordance to the procedure detailed out in Chapter VI, Part-I.

3. Scope of Consultancy Services: The scope of services of the PMC is as follows:

- a) **Project Management Support:** The PMC shall support DFCCIL /MOR in the Project Management and Coordination of the project and shall
- Prepare and implement coordination procedures
 - Prepare and implement project control procedures
 - Prepare and implement document control procedures
- b) **Contract Management:** The PMC shall support DFCCIL /MOR in the Project Management of the project and shall
- Support preparation of correspondence to Contractors
 - Manage Claim Control
 - Manage Change Control

c) **Programme Management:** To manage Project Programme, the PMC shall

- Establish Master Programme
- Review Contractors Programmes and Associated Progress
- Prepare consolidated programme / progress report

d) **Project Budget and Cost Management**

To manage the Project costs, the PMC shall

- Develop Project Budget and Cost Plan
- Estimate overall project cost relating to the master implementation schedule
- Assess the financial position and project long term financial statements
- Certify all contract payments required to be made by DFCCIL/MOR and satisfy DFCCIL/MOR in monitoring the same

e) **Monitor Safety, Health and Environment (SHE):** PMC shall establish requirements for SHE and overview the Contractors activities.

f) **Monitoring and Supervision of Implementation of updated Environmental Management Plan:**

PMC shall review Environmental Management Plan (EMP) and ensure its implementation through monitoring and supervision of Contractor's activities.

g) **Quality Assurance and Quality Control (QA/QC):** PMC shall

- Implement a quality assurance system for the project.
- Review/endorse Contractor QA/QC and overview the Contractors activities.
- Review and approve quality assurance program submitted by individual Contractors and shall formulate and implement an integrated quality assurance program for the project.

h) **Stakeholder Coordination**

During implementation of the project, continuous coordination will be required with Government authorities and various local authorities for resolution of issues related to the project. DFCCIL/MOR will be the main coordinating agency, and PMC shall assist DFCCIL/MOR wherever required, to provide technical support, by way of data, drawings, sketches and other technical aspects of the issues.

i) Review and issue of Engineer's Non-Objection Certificate to Detailed Design Drawings prepared by the Contractors

PMC shall review the General Arrangement Drawings (GADs) prepared by the Contractors and issue Non-Objection Certificate to the GADs after conducting necessary modification and finalization by Contractors and after obtaining approval of DFCCIL/MOR.

PMC shall review the Detailed Design Drawings prepared by the Contractors and issue Non-Objection Certificate to the Detailed Design Drawings after conducting necessary modification and finalization by Contractors.

j) Review and issue of Engineer's Non-Objection Certificate to Construction Drawings prepared by the Contractors.

PMC shall review the Construction drawings prepared by the Contractors, and issue Non-Objection Certificate to the drawings after conducting necessary modification and finalization by Contractors.

k) Overall Construction Supervision for Infrastructure

PMC shall monitor all contract works in progress and identify any schedule or coordination conflicts, recommend measures to settle or mitigate problems and implement the recommended measures with the approval of DFCCIL/MOR.

During construction stage of the Project the PMC shall carry out overall construction supervision. The PMC shall consist of Core Management Team (CMT) and Zonal Management Team (ZMT). The role of CMT and ZMT will be to accomplish the following Tasks.

4. Tasks of CMT

- i) To coordinate with DFCCIL headquarter and MoR for overall implementation of the Project.
- ii) To monitor overall project cost relating to master implementation program and assess the financial position and project long term financial statement.
- iii) To monitor overall construction schedule and evaluate progress of overall construction work and recommend the countermeasure for recovering the progress, when it is necessary, to DFCCIL/MOR.
- iv) To examine and approve proposals on additional environmental mitigation measures and monitoring activities prepared by ZMTs.
- v) To recommend acceptance or rejection of any part or parts of the completed works to DFCCIL/MOR.

- vi) To evaluate claims from the Contractors for extension of time, extra work payment etc., and submit recommendation to DFCCIL/MOR.
- vii) To review and recommend for approval of DFCCIL/MOR all GADs and to review and issue Non-Objection Certificate to all detail design and drawings for the part of the Project which will be constructed.
- viii) To negotiate with Contractors and recommend to DFCCIL/MOR on contract variations, if any.
- ix) To evaluate and recommend to DFCCIL/MOR for approval of any changes in the plans or any effects on the changes of the contract amount and time schedule of the project.
- x) To prepare integrated periodical reports and submit to DFCCIL/MOR.
- xi) To integrate as-built drawings prepared by the Contractors and submit to DFCCIL/MOR.

5. Tasks of Zonal Management Teams (ZMTs)

- i) To conduct routine field construction supervision works.
- ii) To coordinate with respective, headquarter and divisions of Zonal Railways and DFCCIL Regional /Site Offices for implementation of the Project under jurisdiction
- iii) To carry out regular site inspection for monitoring field construction works.
- iv) To confirm stake out furnished by the Contractors for DFC alignment in the field.
- v) To obtain and test, as necessary and as required, material, works and equipment to maintain quality control.
- vi) To examine all field performance test for equipment of train operation, electrification system and submit the report to the CMT with copy of DFCCIL/MOR.
- vii) To inspect testing and monitoring of all material and facilities/devices to ensure that they comply with the specifications and give immediate report to the Contractor, as required, with copy of DFCCIL/MOR.
- viii) To carry out inspections for machinery and equipment for maintenance of DFC infrastructure.
- ix) To recommend to CMT as acceptance or rejection of any part or parts of the completed works.
- x) To verify measurement of quantities of works executed and checking of payment certificate to Contractors.
 - xi) To review and issue Non-Objection Certificate to all construction drawings and shop drawings prepared and submitted by the Contractors.
 - xii) To check remain quantities and forecast final amount of the contract periodically.
 - xiii) To train personnel of DFCCIL/MOR to enhance their capacity in terms of environmental management.
 - xiv) To supervise implementation of updated Environmental Management Plan and Monitoring Plan undertake by the Contractors and report to CMT and DFCCIL/MOR.
 - xv) To carry out initial review of claims from the Contractors and submit to DFCCIL/MOR through CMT.
 - xvi) To prepare, if required, proposal on any changes in the plans or any effects on the changes of the Contract amount and time schedule of the project and submit it to CMT.
 - xvii) To participate in the final construction inspection and prepare check lists for defect items.
 - xviii) To prepare periodical progress reports and submit to CMT.

To compile and review as-built drawings prepared by the Contractors and submit to CMT/Engineer.

6. Variation

- i) The variation will be governed by the provisions of the extant contracts. However, if there is no specific provision of variation in the contracts then the Engineer is authorized to issue a variation within the limits set below:
 - a) For individual items, the Engineer shall normally be authorized to issue variation order upto 25% of the value of individual items or 0.5 % of contract value whichever is less.
 - b) The Engineer shall obtain technical approval from Employer before issuing orders to execute new items of work (non BOQ) items.
- ii) Overall, the 'Engineer' is authorized to issue cumulative variations up to a limit of 1% of the original contract value (less negative variations/savings). The overall limit shall apply collectively on all BOQ items as well as non-BOQ items and shall include all the variations issued till that point of time including those approved otherwise than by the Engineer. The overall limit shall be exclusive of escalation.
- iii) Any variation beyond above limits (individual items and overall variations) shall be approved by the Employer.
- iv) These provisions shall be superseded by the process and limits of variations enumerated in the contract.

7. Emergency

- i) Notwithstanding the obligation, as set out above, to obtain approval, if, in the opinion of the Engineer, for reasons to be recorded in writing, an emergency occurs affecting the safety of life or of the works or of adjoining property, he may, without relieving the Contractor of any of his duties and responsibilities under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forthwith comply, despite the absence of approval of the Employer, with any such instruction of the Engineer. The Engineer shall determine an addition to the Contract Price, in respect of such instruction, in accordance with conditions of the contract and shall notify the Contractor accordingly, with a copy to the Employer.
- ii) The Engineer shall notify the CGM, concerned GM and Director within an hour of such a situation on phone and shall send them a copy of such instructions by email.
- iii) Chief Project Manager should send his report and detailed comments quickly whenever such approvals are sought by the Engineer and ensure that all initial formalities are complied with. General Manager/Director should ensure that the requisite approvals are processed and communicated promptly.

8. Setting up of Milestones

'Deadlines' or 'Contractual Milestones' should be set up and tabulated to facilitate monitoring of the progress of work.

9. Delegation by the Engineer

- i) The Engineer or the Engineer's representative may appoint a number of assistants to assist them after duly notifying their names, duties and scope of authority to the contractor.
- ii) Each Assistant to whom duties have been assigned or authority has been delegated shall be authorized to issue instructions to the Contractor to the extent defined by the delegation. Any approval, check, certificate, consent, examination, inspection, instruction, notice, proposal, request, Test or similar act by assistance shall have the same effect as though the act had been act of the Engineer. However, any failure to disapprove any work, plant or Materials shall not constitute Approval, and shall not therefore prejudice the right of the Engineer to reject the work, plant, machinery, equipment, design, workmanship and materials.
- iii) If the Contractor questions any determination or instruction of an assistant, the contractor may refer the matter to the Engineer who shall promptly confirm, reverse or vary the determination or instruction.

10. Instructions of the Engineer

- i) The Contractor shall comply with the instructions given by the Engineer, Engineer's Representative or the delegated assistant, on any matter related to the Contract. Wherever practicable, the instructions shall be given in writing. If the Engineer or a delegated assistant gives an oral instruction and receives a written communication of the instruction, from (or on behalf of) the Contractor, within two working days after giving the instruction, and does not reply by issuing a written rejection and/or instruction within two working days after receiving the confirmation, then the confirmation shall constitute the written instruction of the Engineer or delegated assistant (as the case may be).
- ii) The Contractor shall give reasonable notice to the Engineer of any instruction which he considers necessary for execution of the Works to enable the Engineer to issue the instruction so that the progress of Works is not delayed. The Engineer shall, however, not be bound to issue any instruction which, in his opinion, is unnecessary.
- iii) No act or omission by the Engineer or the assistants to the Engineer in the Performance of any of the Engineer's duties or exercise of any of the Engineer's powers under the Contract shall, in any way, operate to relieve the Contractor of any of the duties, responsibilities, obligations or liabilities imposed by any of the provisions of the Contract.

PART – I**CHAPTER – VIII**
PRICES AND PAYMENTS

- 1.8.1 Quoted rates for supply and erection shall be inclusive of all taxes.
- 1.8.2 Contractor shall submit invoicing procedure for approval to Engineer within a month of the issue of LOA and format for bill submission shall be agreed between the Engineer and the Contractor.
- 1.8.3 The Contractor shall submit its claim for interim payment for various items of work on the basis of actual progress of work executed duly supported with documents as prescribed in the approved invoicing procedure.
- 1.8.4 The Employer shall make Interim Payments to the Contractor as certified by the Engineer on the basis of the progress achieved for the items of works/ stages of the works estimated for each item of work in accordance with the provisions of Schedules of prices
- 1.8.5 The Employer may carry out necessary test checks either directly or through an independent agency, of the Works done by the Contractor for which the payment has been accepted and certified by the Engineer. The payment shall depend upon the outcome of such test checks.
- 1.8.6 Adjustment for changes in the cost i.e., Price Variation shall be made in accordance with clause 46A, Part I, Chapter IV.
- 1.8.7 The Price Schedules shall be filled in with indelible ink or be type written. The person authorized to sign on behalf of the Contractor (Authorized Signatory) shall sign in full with the date at the bottom of all pages of all Schedules.
- 1.8.8 The contract envisages the provision of deduction of money for satisfactory fulfillment of obligations under the defect notification period in case Contractor opt for the same in lieu of submission of Security Deposit in other forms as per Clause 16.1 (Part-I, Chapter IV). Accordingly, deductions towards Retention Money at the rate of 10 % of the bill till entire amount of Security Deposit is deducted.
- 1.8.9 Responsibility of preferring the bill and entering the details shall vest with the Contractor. It is his responsibility to ensure that under no circumstances the payment claimed is more than the amount equivalent of Work done. If it is discovered or otherwise during the check by the Engineer or the Employer, then a warning will be issued. If the instance is repeated then an amount equivalent to 6% of the excess claim shall be forfeited besides denying the extra claim.

The Contractor shall prepare his monthly bill and submit the same by the 7th of every month in the format agreed with the Engineer, in six copies (hard) and soft copy. This shall be accompanied by supplementary details in two hard copies and a soft copy. All hard copies shall bear the original signatures of the Contractor and submitted to the Engineer.

If these are found in order then Engineer shall forward the same with copy of supplementary details to the Employer, with Interim Payment Certificate, for payment by the Employer, otherwise return back all documents to the Contractor for rectification and resubmission.

While submitting the bills all supplementary details like, sketches, drawings, approvals, calculations etc. shall accompany the bill so that payment can be substantiated by the Engineer as well as the Employer.

Even if no stage of work is completed during the month or Contractor does not choose to prefer a bill a 'NIL' bill shall be submitted by him.

1.8.10 Contractor will be eligible for payments on supply of material at its depot and after acceptance by the Engineer and handing over to Employer as under:

- a. On receipt of material, 80% of the value of the item supplied.
- b. On erection of material, 15% of the value of the item supplied.
- c. Balance 5% after successful commissioning and issue of taking over certificate by the Engineer.
- d. For claiming payments for supply of materials, Contractor shall submit following documents:
 - (i) Notice for No Objection for Factory Acceptance Test report
 - (ii) Supplier's Delivery Challan
 - (iii) Request for Inspection (RFI) for acceptance of material received in Contractor's depot in good condition
 - (iv) Material taking over Certificate issued by the Employer
 - (v) Valid Insurance policy and Indemnity Bond as per clause 1.5.12 and 1.5.15 (Part-I, Chapter-V)

1.8.11 On erection of material Contractor will be eligible for 95% of erection charges on erection of material and remaining 5% of erection rates on successful commissioning and issue of taking over certificate by the Engineer. For claiming payments for erection of materials, Contractor shall submit RFI for acceptance of erection of material with check sheet duly filled in.

1.8.12 The contractors supply items will be re-issued to the contractor at Employer's depot for erection purpose on submission of B. G. for an amount equal to 10% of value of supplied material claimed against each on account bill payment. Material will be issued in stages in such a way that at no point of time, the cost of material in contractors custody is more than the value of B.G. available with DFCCIL. The Bank Guarantee shall be in the prescribed form issued by any state Bank of India or from any Schedule Bank/Nationalized Bank duly conforming to the requirements and valid for one year beyond the date of completion of work. In the event of

extension to the time of completion, the contractor shall extend validity of the Bank Guarantee. In case the contractor is unable to furnish the Bank Guarantee, equivalent cash would be held by the Employer from the payments due to the contractor. If the amount of B.G. found to be inadequate to cover the cost of material required to be issued to the contractor to achieve the required progress of work to meet the completion period, contractor will be required to furnish additional B.G. In case, if contractor is not in a position to furnish additional B. G., equivalent cash would be withheld by the Employer from payments due to the contractor. Additional B.G. or cash withheld will be returned / refunded soon after same is not required i.e. additional material issued to improve the progress work is erected. After completion of work, surplus material if any and not required by Employer will be returned to contractor. B.G. will be returned if no material is outstanding after material reconciliation is done and all “On account Payments” are adjusted through progress payments.

B. G. will have to be furnished by the contractor at least 15 days in advance of the date of the issue of material as decided by the Employer’s representative”.

- 1.8.13 For item no 1 & 2 of Schedule of Prices, break up of payments will be as per details given in the Explanatory Notes.
- 1.8.14 Non schedule item: New item if any required during execution for successful completion of the Contract, Contractor will execute such work at price as may be decided mutually.
- 1.8.15 Variation of Quantities of schedule items will be dealt as per Clause No 42(4), Part-I, Chapter IV.
- 1.8.16 While passing of the bill, all statutory deductions like TDS, Cess on GST, etc. will be applicable.

PART – II
TECHNICAL SPECIFICATIONS

PART - II**Chapter-1****TECHNICAL SPECIFICATIONS FOR OVERHEAD EQUIPMENTS****I.2.1 Scope of Work:**

This specification covers complete design, supply, installation, testing and commissioning of traction overhead equipment (OHE) for 25 kV AT Feeding System of traction for the tracks on the Western Dedicated Freight Corridor of Mumbai/South Unit, (Double Line Section from JNPT – Vaitarna) including main lines, yards, connecting tracks to Indian Railways and depot access lines to provide traction power to rail vehicles.

The principal components of the scope of work shall include but not be limited to the following:

- a) The Contractor shall provide 25kV AT Feeding System, auto- tensioned overhead equipment on the sections.
- b) The nominal height of contact wire shall be about 7.54 m above rail level for the passage of double stack containers mounted on flat wagons.
- c) Complete 25 kV ac flexible polygonal Overhead Equipment (OHE) including parallel reinforcing conductors along the track, foundations, steel structures, protective conductors, 25 kV feeder and cross track feeders, earth and associated insulators and hardware, jumpers and isolators (other than those located in TSS, SSP and SP).
- d) +25kV and -25kV cable/Overhead cross-track feeders and flexible cable feeder connections from track-side bus to the tracks.

I.2.2 Scope of OHE Wiring:

Up and Down Main tracks as below:

	From	To
Station	JNPT Holding Station	Vaitarna
DFC CH	-1.2	102

- b) All yard lines in stations namely JNPT Holding Station, Nilje Junction Station & Kharbao Crossing Station.
- c) All OHE works are to be done as per approved design.

d) Connecting tracks for inter connection between Kharbao station of Indian Railways and New Kharbao station of DFCCIL (up and down lines) and single connecting line for connection between Talaja station (IR) and New Nilje station of DFCCIL.

I.2.3 Even though LOP's have been approved, the Contractor shall be responsible for successful completion of work for introduction of electric traction. Therefore, Contractor is required to do verification of all drawings and carry out modification where felt necessary. During execution of work, no excuse on deficiency or incorrectness or shortfall will be entertained.

I.2.4 The Contractor shall be responsible for coordinating and cooperating with the Other Contractors so that the design and installation of all components of the railway are compatible as a whole. The extent of provision of overhead equipment for the tracks shall be determined in coordination with the Other Contractors and with the Engineer for ensuring that the design incorporates suitable fixings by Other Contractors.

Contractor is required to interface with CTP-11 Contractor for laying of HDPE pipes by CTP-11 Contractor for laying of cable crossing for AT supply for S&T installations and laying and interconnection of 75x8 flats from buried rails with running track opposite TSS/SP/SSPs. Similarly, interface with STP-17 Contractor is required for provision of AT supply at Stations, ALH and Telecom huts.

I.2.5 The Contractor shall also coordinate with CTP-11 and STP-17 Contractors for laying of Buried earth conductors on bridges and on slopes of formation in the near vicinity of Telecom cables etc.

I.2.6 Bridge masts are to be erected on baseplate with nuts and bolt provided on bridge piers and retaining walls wherever necessary as per approved LOP. Necessary coordination is required to be done with CTP-11 Contractor.

I.2.7 Factors Governing Design of OHE:

A) **Track Structure:** Highlights of the Track Work Specifications as finalized for Civil and Track works Contract CTP-11 are furnished below:

Following technical parameters in respect of track structure corresponding to 25 tonne axle load will be adopted. In future the track structure shall be upgraded to 32.2 tonne axle load by increasing the track level by 275 mm, provision for which shall be made while designing the OHE.

Table: Track Structure

Points & Crossings		
a)	Main line and auxiliary main tracks and running Loops	60 kg Rail, 1 in 12 curved thick web switches with CMS crossings on fan shaped PSC sleepers layout
b)	Minor loops and non-running lines /Sidings	60 kg Rail, 1 in 8 1/2 curved thick web switches with CMS crossings on fan shaped PSC sleepers layout
Ballast Cushion below the bottom of the sleeper at the rail seat		
a)	Main line.	350 mm.
b)	Loop line & sidings	250 mm
Sleepers		
a)	Sleeper	PSC Mono-block, 60 Kg with 1 in 20 cant for the rail seat (The rail seat of PSC sleeper will be able to cater to 68 Kg/m and 60 Kg/m rail sections by providing suitable liners.)
Formation Width		
a)	Embankment	a) For double track : 14.1 meter b) For single track : 8.1 meter
b)	Cutting excluding side drains	a) For double track : 13.5 meter b) For single track : 7.5 meter

The relevant part of the design criteria to be followed by CTP-11 Contractors for the track construction is attached for information only for the Contractor to suitably design the Overhead Equipment structures for the tracks of the route, if required to alternation of LOPs and other drawings of OHE works.

B) Earth Work: The main features of the geometric parameters of the earth work are furnished in the table below.

Table: Geometric Parameter of Earthwork

S. No.	Parameter	Value
1.	Formation Width (a) Embankment (b) Cutting	i) For double track: 14.1 m ii) For single track: 8.1 m i) For double track: 13.5 m ii) For single track: 7.5 m
2.	Slope gradient for embankment	2H: 1V
3.	Slope gradient for cut	1H: 1V
4.	Thickness of blanket	600mm
5.	Thickness of prepared sub-grade	1,000mm (if the existing soil conditions satisfy the conditions of the prepared sub-grade for the embankment height up to 1.6 meter, the same shall be treated as sub-grade)
6.	Width of berm	1,500mm (Minimum)
7.	Width of cess	900mm (Minimum)
8.	Cross slope at top of blanket	1: 30 or 3.0% with tolerance of 0.5%
9.	Cross slope at top of prepared sub-grade	1: 30 or 3.0% with tolerance of 0.5%
10.	Cross slope at top of embankment fill	1: 30 or 3.0% with tolerance of 0.5%
11.	Cross slope at berm	1: 30 or 3.0% with tolerance of 0.5%

I.2.8 Track Gauge & Track Centers:

- (a) The track gauge is 1676 mm in multiple track Zones. The normal distance between track centers is generally more than 6000 mm.
- (b) **Speed:** The overhead electrification is to be/shall be designed with clearances as provided in the Standard Schedule of Dimension for Dedicated Freight Corridor Jan. 2013 for maximum speed of 120 kmph and shall permit raising of the tracks by 275 mm to allow ultimately axle loads to be increased to 32.5 tonnes in future.
- (c) **Curves:** The minimum radius shall comply with the requirements as follows:
 Minimum radius for the Main Line: 700 meters (2.5 degree curve)
 Minimum radius for other than Main Lines 438 meters (4 degree curve)

Where degree of the curve is the angle subtended at the center by a chord of 30.5m (refer Para 401 of Indian Railway Permanent Way Manual).

- (d) **Cant:** The curve speed and cant relationship shall be based on the following equations:

$$\text{Actual Cant } Ca = GV^2/127R$$

Where Ca: Actual cant [mm]

G: Dynamic Gauge in mm i.e. 1750 [mm]

V: Equilibrium Speed in km/hr i.e. 85 [km/hr]

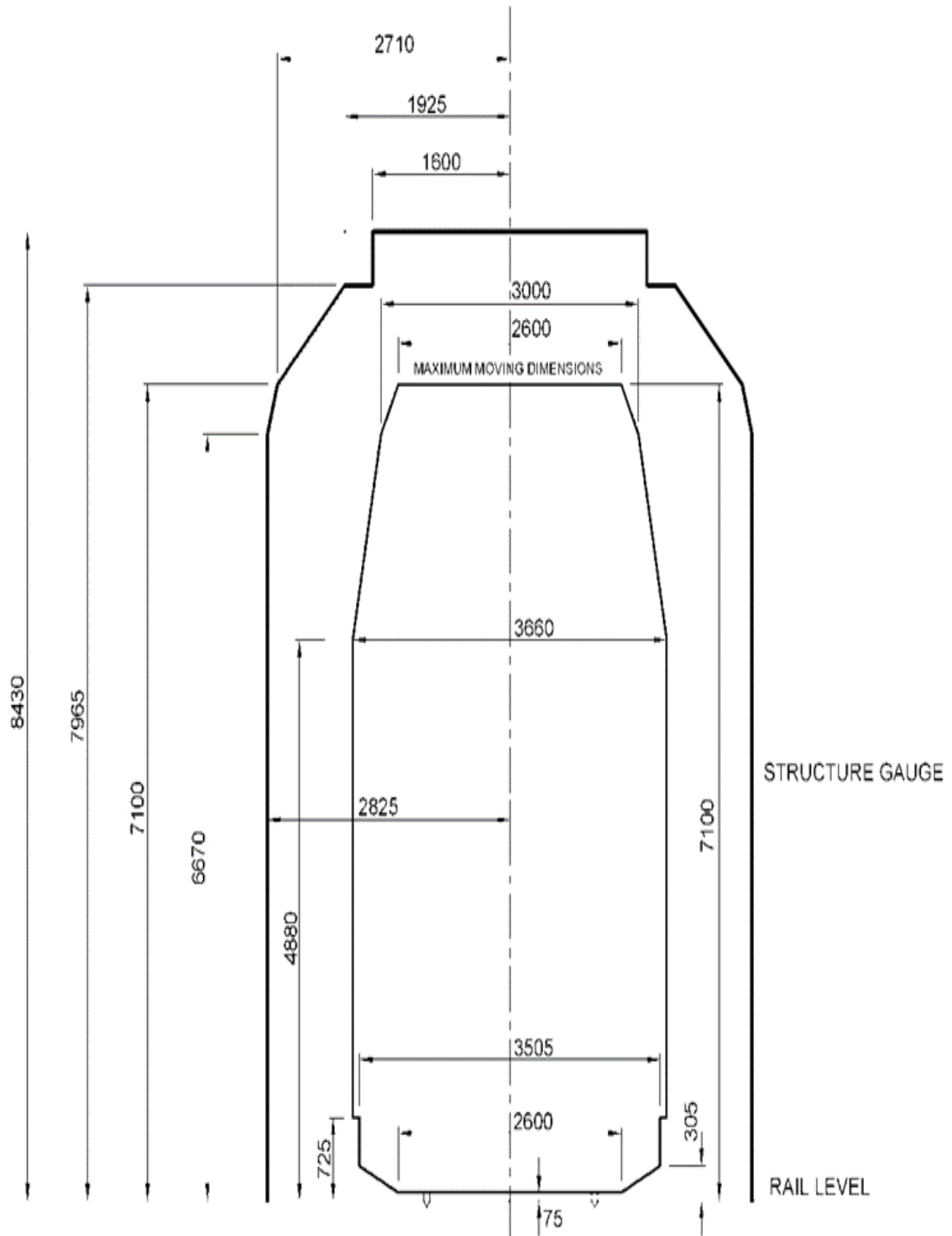
R: Radius of the curve [m]

The standard speed for actual cant is defined by considering the maximum permissible speed (100 km /hr.), speed restriction, gradient and train operation plan. The equilibrium speed of actual cant setting for general section is 85 km/hr. The cant computed is rounded off nearest 5mm. The allowable applied cant shall not be over 140mm and the cant deficiency shall be limited to 75mm.

Cant transition shall be straight ramp. Cant excess shall be limited to 75mm. For OHE design proposed to be used for Construction drawings the actual cant provided, shall be obtained from the relevant Civil Contractor (CT-P11).

- (e) **Low Joints:** For low or loosely packed joints a difference of 10 mm in the opposite rail is taken as the basis for estimating the displacement of the Pantograph with respect to its normal position.
- (f) **Formation:** Generally, sections with more than one track have common formation. In certain lengths, however, the formation for different track may be separate.
- (g) **Displacement:** The general design of overhead equipment shall permit a displacement of ± 100 mm of tracks without difficulty and any adjustment of the overhead equipment on this account shall be of such a nature as could be done conveniently without changing any component of the overhead equipment.
- (h) **Maximum Moving Dimensions (MMD) and Structure Gauges:** Double stack containers on flat wagons are proposed to be run on the route. The MMD and Structure Gauges Drawings are shown below as per the details given in DFCC-SOD-2013. The Contractor shall ensure that the proposed size and location of Works including Contractor's works are outside the Structure Gauge.

Figure: Maximum Moving Dimension and Structure Gauges



(i) **Headroom clearances:** With regard to headroom clearance, the following exceptions are added to the requirements above. Minimum height above rail level for a distance of 1,600 mm on either side of the centre of the track shall be as under:

1) When lower track line is DFC tracks.

(i) Light overhead structure such as foot over bridges 8,430 mm

(ii) Heavy overhead structure such as road over bridge or flyover 8,050mm

(iii) Heavy overhead structure at turnout etc. 8,430 mm

2) When DFC tracks are crossing over IR Lines, the vertical clearances to be observed (as per IR Schedule of Dimensions) shall be:

(i) Light overhead structure such as FOB 6250 mm

(ii) Heavy overhead structure such as Flyover or ROBs 5870 mm

In case IR track is nominated for Double Stack Container (DSC), vertical clearance shall be provided as per the requirement specified above.

(j) **Height of Rolling Stock:** Maximum height of the rolling stock with Double Stacked Container, above Rail level 7.10m. This height of the Rolling Stock above rail level shall result in contact wire height above rail level as follows:

Normal at the support : 7.54 m

Minimum (anywhere in the span) : 7.47m

Minimum under overline structure 7.41 m

(k) **Maximum Span of OHE:** Maximum Span to be adopted on this route: 54 m. All spans shall be in multiples of 4.5 m.

I.2.9 Over-line structures with restricted Overhead Clearance:

The list of over-line structures such as Road Over-Bridges and Rail Flyovers with restricted Overhead Clearance has been furnished in Employer's Requirement, Part-I Chapter-VI. The overhead equipment profile through these structures shall be designed to pass through them with adequate electrical and mechanical clearance under both new and worn-out contact wire conditions, without any speed restrictions on this account as per DFCC-SOD-2013 along with all addendums.

- I.2.10** A list of major and important bridges is in Employer's Requirement, Part-I Chapter-VI. Structures to support traction overhead equipment may be required to be provided on the bridge piers.
- I.2.11** On long bridges and long viaduct, OHE anchors and supports may also be required on bridge/structures itself. On through girder bridges, the overhead conductors and pantograph swept path shall have to be provided with adequate electrical and mechanical clearances. These will need special designs.
- I.2.12** The design and erection of OHE structures on these bridges and earthing & bonding of all structures shall be carried out in close co-ordination with the other (Civil and track work) contractor.
- I.2.13** The overhead equipment which shall be of simple sagged polygonal type shall be designed for a maximum line speed of 120 km/h, and a normal operating speed of 100 km/h.
- I.2.14** The following design features of OHE as on Indian Railways may be adopted:
- a) Normal Encumbrance:(Axial Distance between Contact wire and the Catenary wire in a vertical plane) :1.4m
 - b) Standard spans in multiples of 4.5 m from a minimum of 27 m
 - c) Stagger of Contact Wire:
 - On straight :200 mm
 - On curved track: 300 mm
 - d) The maximum distance between anti-creeps to the anchor structure is 750m on Indian Railways. The Contractor may propose longer lengths upto 1000 m in view of the need to provide taller masts to support contact wire at height of 7.54 m based on his design calculations for acceptance by the Engineer. This should be submitted with detailed calculations for movement of cantilevers from their normal position to extreme temperature conditions. Further, LOPs shall be provided by DFCCIL and these points shall be noted by Contractor if it requires any changes in approved LOPs.
- I.2.15 Structural Design of the Overhead Equipment Support:** The structural design of overhead equipment adopted by the Contractor shall follow the method of RDSO as applicable to the special parameters of DFC (WC) requiring increased height of contact system to permit passage of double stack containers of flat wagons as well as the sizes and number of conductors required for the 25 kV AT Feeding System of traction. It is to be noted that the designs shall continue to be safe for the ultimate raised height of the contact wire plus 275 mm for future needs, when the axle load permitted on the route is increased to 32.5 tonnes.
- I.2.16 Sectioning of Overhead Equipment:**

- A) Introduction:** Stations are generally 30km to 40km apart with crossing stations for giving precedence to trains and junction stations providing exchange with IR route. With reduced manning for operation, the switching of OHE for main lines and yard sections will be through remote control from the Operations Control Centre.
- B) Sectioning of OHE shall be done through remote controlled switching, so as to maximize the amount of operational track in the event of:**
- a) An overhead equipment failure
 - b) An isolation required for routine maintenance
 - c) Isolation required for emergency work.

The approved sectioning and General Power Supply diagram/drawing (5/OH/TD/1135 and 5/TP/TD/0322) for the JNPT-Vaitarna section of Western Dedicated Freight Line is shown in the Part-II, Chapter-3 of Designs & drawings to be used in this work of S.N. 84 & 85.

- C) Sub-sectioning Posts (SSP):** To enable speedy issue of maintenance and emergency power blocks, outer most crossovers between up and down main tracks have an SSP located at each entrance of Junction and Crossing stations.

The SSP sectionalization has been arranged such that movement to various lines and yard line is maintained, isolating the smallest portion of tracks for maintenance or breakdowns. Portions of station yard can be made dead whilst the rest of the mainline and yard is energized and vice versa.

At Junction stations, there is also an isolation point at the boundary between the Western Dedicated Freight Corridor infrastructure and Indian Railways infrastructure through a neutral section. The IR sections are fed by conventional 25 kV system, while DFC is on 25 kV AT Feeding System and these two need to be isolated. The isolation shall also allow the 25 kV ac traction supply from Indian Railways to feed the Junction station exchange yard lines when the Western Dedicated Freight Corridor main lines are un-energized . The neutral section between DFCCIL and Indian Railway OHE including the connection to IR shall be installed by the Contractor.

- D) Section Posts (SP) and Traction Substations (TSS):** At SP and TSS locations, there is sectionalization to allow one section to be isolated from the next section. The section isolations has been arranged such that safe isolation can be made for maintenance purposes, whilst the adjacent section remains alive.

- E) Auto-transformer Stations:** Auto Transformers have been provided at every 15 km in TSS, SSP and SP. To isolate faulty Auto Transformers, provision circuit breakers is available.
- F) Approve Sectioning and General Power Supply Diagrams:** Deleted
- G) Insulated overlaps** to be provided for isolation facilities as per approved drawings.
- H) Yard Supply:** The sectioning diagram/s also indicate the tracks in station yard and siding whose equipment is electrically independent from those of other tracks. The overhead equipment in yards and sidings may be fed through isolator switch or interrupter in accordance with arrangement indicated in the sectioning diagram/s.
- I) Section Insulators:** Section insulators shall be provided as indicated in the approved sectioning diagrams, or crossover between main tracks and to isolated sections of overhead equipment in yards and sidings.
- J) LOPs:** The approved LOPs of the JNPT - Vaitarana section to be electrified will be given to the successful tenderer along with GPSD (General Power Supply Diagram).
- K) Sectioning Diagram:** The approved sectioning diagram/s of the sections to be electrified will be given to the successful tenderer.

I.2.17 Pantographs: Motive Power Pantograph Characteristic and the Pantograph details used in DFCC rolling stock are as follows:

- | | |
|---|-------------------------|
| a) Overall width (Including Horns) | 1800mm |
| b) Number of collector strips | 2 |
| c) Collector material | Metalized carbon strips |
| d) Working width of the head | 1040 mm |
| e) Static contact force | 7 ± 0.4 kg on OHE |
| f) Working range (above rail level) (m) | 4.58 to 7.55 |

I.2.18 Overhead Equipment:

- (a) **Brief Description:** Essentially the traction overhead equipment shall consist of a standard catenary wire from which a grooved contact wire is suitably suspended by means of droppers. In order to cater for a speed of 120 Km/h, the contact wire is given a pre-sag of about 50 mm for 54-meter span and reduced suitably for other spans or as per latest guideline.

- (b) **Catenary:** The Catenary Conductor for main line shall be Hard Drawn Stranded Magnesium Copper (Cu-Mg) 125 mm² (37/2.10) size. The catenary wire is conforming to RDSO Spec. No. TI/SPC/OHE/Cat (Mg-Cu)/0120 or DIN 48201 - T1 & T2, EN 50119, DIN 43138 and capable of withstanding a minimum temperature of 100°C.
- (c) **Contact wire:** The contact wire for main line shall be conformed to EN 50149 and withstand minimum 100°C temperature continuously without affecting mechanical properties as per EN 50119. The Contact wire is 150 Sq. mm Cu-Sn 0.2 high conductivity wire.
- (d) **Aerial Earth Conductor:** It shall be of ACSR steel reinforced aluminum strands and fixed termination shall be erected parallel to the OHE system and be simultaneously utilized as a common aerial earth conductor (AEC) providing earth for traction structures and as a continuous path for return and fault currents.
- (e) **Buried Earth Conductors:** Buried Earth Conductors shall be laid on both sides of the tracks by the Contractor. The Contractor shall connect BEC, AEC and running rails of both the tracks at regular intervals as per earthing bonding management plan to keep the rail touch and step potentials under acceptable limits both for normal and fault conditions.
- (f) **Feeder Wire:** Feeder wire shall be stranded all aluminium conductor, Type AAAC, size 288 sq.mm.
- (g) **DFCCIL Approved Sizes of Conductors and its Material Composition for use in JNPT - Vaitarna Section:**

Name of Conductor	Minimum Size	Material	Remarks
Catenary Main Line	125 sq. mm	Cu-Mg	Approved Specification No. KFH-JTM-20170214 dated 18.10.2018.
Contact wire Main Line	150 sq. mm	Copper Tin alloy	Approved Specification No. 8K-2017019 dated 15.12.2017.
25 kV Feeder	288 sq. mm	AAAC	Approved Specification No. WDFC/EMP-16/AAAC/SPEC/01 dated 09.09.2019.
Aerial Earth Conductor	93.3 sq.mm	ACSR	Approved Specification No. WDFC/EMP-16/ACSR/SPEC/01 dated 19.03.2019.
Buried Earth Conductor	17.5 mm Dia (i.e., 19 No. of Strand X 3.50 mm)	GS (Galvanized Steel)	Approved Specification No. WDFC/EMP-16/BEC/SPEC/02 dated 20.09.2018.

- (h) **Conductors for the Yard Lines:** The size of contact and catenary wires for yard lines shall be 107 mm² HDGC copper and 65 mm² Cu-Cd catenary to RDSO's specifications TI/SPC/OHE/CW/0971 and TI/SPC/OHE/CAT/Cu-Cd/0971 respectively.
- (i) The clearance between feeders and the catenary system should remain adequate under adverse wind and temperature ambient conditions.
- (j) **Flexible Droppers:** Each "Current carrying" bronze dropper shall consist of suitable size (minimum 10 mm²) bronze strands and two dropper clamps, one of which is connected to the contact wire, and the other to the catenary wire. Flexible dropper shall conform to DIN 43138. The maximum resistance at the joint between the bronze dropper wire and the clamp, and at the contact point between the clamp and the catenary and contact wire, shall be less than the resistance of the conductor of the same length. The maximum temperature rise at the joint and at the contact surface shall not be higher than that of the conductor. The tensile breaking load of the complete joint shall not be less than 90% of the failure tension of the dropper wire. Contractor shall refer to the DFCCIL approved dropper specifications which is provided to the successful bidder.
- Dropper charts to be used for standard spans of regulated OHE. Droppers for non-standard spans, spans with section insulators and special locations shall be calculated by the Contractor in accordance with the method indicated by the Employer/Engineer and submitted to the Employer/Engineer for approval.
- (k) **Encumbrance:** As a general rule, the nominal "encumbrance", i.e., the center distance between the catenary and contact wire at the support shall be 1.40 m. Deviation from this figure will be permitted in special cases (e.g. spans near bridges, structures with more than one cantilever etc.)
- (l) **Jumpers:** Copper flexible jumper wires fabricated from soft annealed high conductivity copper with stranded conductors shall be connected to the OHE conductors as per approved drawings. The jumper shall conform to DIN 43138.
- (m) **Cantilever Assemblies:** The overhead equipment of main tracks in case of multiple track sections shall be electrically and mechanically independent of one another by provision of independent cantilever masts to the maximum extent possible.

(A) Modular Cantilever Assembly:

- (1) The Cantilever Assembly is described in Specification of OHE items (Part II, Chapter-7)

- (2) The contractor shall adopt the Modular Cantilever System (MCS) on the Main line in the polluted zone of JNPT-Vaitarna section. The components of Cantilever Assembly shall be of corrosion resistant material such as Al alloy / Stainless Steel / Cu alloy. It shall be ensured that the components of the same Cantilever are interchangeable to have ease of construction, maintenance and better inventory control. The design shall conform to EN 50119. Cantilevers made of fibre shall not be used. The approved drawings/specification may be provided by DFCCIL for successful bidders.
- (3) The number of components and their sizes shall be as few as possible.
- (4) The Contractor shall ensure that the ranges of cantilever frame components are suitable for the loadings and applications shown in the Drawings and these Specifications.
- (5) The proposed cantilever frames will sustain the normal and worst case loading conditions with a factor of safety not less than 2.5.
- (6) The contact wire registration profile shall accommodate the permissible extremes of uplifted and swayed pantograph movement in addition to the effects of track tolerances and include allowance for mechanical and electrical clearances and to be in accordance with the stipulations of DFC-SSOD-2013 (Latest Amendments).
- (7) Fittings connected to the in-running contact wire shall utilize the wire groove and shall be shaped to maximize clearances to the pantograph head when uplifted by the extreme operating running conditions and shall take account of pantograph and contact wire wear and to be in accordance with the EN/IEC standards.
- (8) Assemblies shall allow for the adjustment of contact wire stagger and the equivalent catenary adjustment by 75 mm either side of the designed position without changing components.

(B) IR Modified Cantilever Assembly:-

- (1) The Cantilever Assembly is described in Specification of OHE items (Part II, Chapter-7)
- (2) The contractor shall adopt the IR Modified Cantilever System (IR Modified) on the Main line except the polluted zone of JNPT-Vaitarna section. Cantilevers made of fiber shall not be used. The approved drawings/specification may be provided by DFCCIL for successful bidders.

(n) **Cantilever assemblies, ATD, jumpers, droppers, & other fittings in the yard shall be as per Indian Railways' design.**

(o) **Summary of Cantilever Assemblies shall be used as per following criterion.**

1	Modular Type	Main Line in polluted zone
2	IR Modified type	Main Line in non-polluted zone
3	IR Cantilever type	Loop lines and connecting lines and other yard lines

I.2.19 Clamps and other Tension Fittings for the Conductors:

- A) The performance of fittings designed to terminate or splice stranded or individual wires is critical to the efficient operation and maintenance of the OHE.
- B) The fittings shall be tested in tension, in a special rig to simulate the load characteristics experienced in service and Contractor shall demonstrate its suitability by FEM Analysis.
- C) The tensile failing load of the fitting shall exceed the failing load of the wire or stranded wire with which it shall be assembled and used.
- D) When the fitting is tested and assembled to the allocated wire or stranded wire the assembly shall achieve 85% or greater than the specified tensile failing load of the wire or stranded wire.
- E) Applicable factors of safety shall be derived from the European standard EN 50119 or IEC 60913.
- F) Unless otherwise specified by the DFCCIL, all bolts, studs, nuts, washers and pins used for the current carrying conductors shall be of stainless steel or high tensile copper alloy. However, for all other applications, galvanized steel may be used with particular reference to the prevention of corrosion.

I.2.20 Electrical Connections:

- A) The connections shall be robust, to withstand both static and dynamic loads, wind, along track movement. (Temperature variation in conductors and operational vibrations).

- B) Design of fittings and connections shall ensure no localized temperature rise at the connection to prevent any damage or deformation or adversely affect the mechanical capacity of the conductors or their electrical performance.
- C) Where dissimilar connecting materials are used appropriate measures shall be employed to mitigate the risk of bimetallic corrosion.
- D) Protective bimetallic tapes and shells shall be installed at clamps and terminals used with aluminum and copper conductors and cables.
- E) Nominal working pressure shall be kept up to compensate for the permanent temperature deformations and generation of local overheats.
- F) The tapes and shells shall envelope 10mm outside of clamps on both sides.

I.2.21 General requirement:

All wires including feeders, earth wires shall all be preferably located on the inside (side closest to the railway track) of the OHE mast for convenience of wiring from the wiring train, and to minimize EMI effects.

I.2.22 Type of regulating equipment:

Regulated type of overhead equipment, the tension of both the catenary and the contact wires shall be maintained at a constant value at all temperature by means of automatic tensioning devices to take up the variation in the length of overhead equipment due to temperature variation. An anti-creep shall be provided at a point approximately midway between two tensioning devices and not more than 750 meter from any one of them. The general arrangement of an anti-creep is shown in approved LOPs. The arrangement shall generally consist of the galvanized steel wire anchored on the masts adjacent to the anti-creep central mast in accordance with the relevant drawing/LOP. Alternatively, the arrangement may consist of catenary on either side of the boom of a portal with the contact wire running through and providing a jumper connection as per general arrangement shown in typical drawing listed in Annexure.

I.2.23 Tensions:

- (a) The tension in the catenary shall be 1200 kgf and in the contact wire also shall be 1200 kgf in each conductor.

- (b) **Auto Tensioning Devices:** The tension in the contact and catenary conductors of the flexible overhead equipment shall be regulated at all temperatures by auto-tensioning devices of proven design (i.e., 3 Pulley & 5 Pulley ATD). The auto tensioning device shall be as per IEC-60913 or EN 50119. The anchoring of contact & catenary wire on separate mast or same mast through regulating equipment.
- (c) The DFCCIL shall provide the approved drawings of 3 Pulley & 5 Pulley ATD to bidder for use of bidder for completing the OHE work in JNPT - Vaitarna Section.

I.2.24 Cable for 25 kV Feeder Wire:

- (A) XLPE insulated single core armored Copper Conductor Cable for laying inside tunnel etc., in lieu of 25kV feeder wire etc., shall be used as per approved drawings.
- (B) The cable shall be as per RDSO's specification no TI/SPC/PSI/CABLE/0090(02/2009) and meeting following parameters:

Voltage		Short Circuit Capacity- 3 Sec	Minimum Current Carrying Capacity	Duty	Size of Copper Conductor	Brief Discussion
Normal (KV)	Max (KV)					
25 AC	52.5	12 KA	2000-A	Traction Power	1cx240 sqmm	FRLS Standard Armored

- (C) The outer sheath of the cables shall be protected against ultra violet radiation.
- (D) **Conduits and Cables:** Cables shall be placed in protective metallic conduits up to 1.5m above the ground, these being encased in concrete up to the plinth level of structure.

I.2.25 Clearances:

- (a) **General:** The distance between live parts and parts at earth potential (or part likely to be earthed) shall be as large as possible. The minimum clearances to be adopted are given below:

E&M Clearances

Item	Dimension
25kV Live metal to earth	
- Static	250
- Dynamic (passing)	200

Item	Dimension
25kV Live Metal to Vehicles	
- Static	290
- Dynamic (passing)	220
Phase Difference (47.6kV)	
- Static	540
- Dynamic (passing)	300
Between conductors of different electrical sections	
Gap at Insulated Overlap	500
Gap at Uninsulated Overlap	200

In all cases the values given in Standard Schedule of Dimensions of DFCCIL, 1676mm Gauge (2013 revised) shall be observed along with any other supplementary rules that may be issued by the Railway Board and advised to the Contractor.

The minimum clearances between live conductors (including the pantograph) and any grounded fixed structure shall be in accordance with DFC-SOD-2013 along with all addendums.

Mechanical clearance from the pantograph to any fixed structure, excluding the registration assembly, steady arm or registration pipe of the cantilever, shall be not less than 200 mm. except at locations where a locomotive is expected to halt as a matter of normal operation. Clearance to steady arms and registration assemblies or tubes used for registration purpose, shall be not less than 35mm under worst case operating conditions including dynamic displacement of the vehicle, the pantograph as well as track and maintenance tolerances.

The Aerial Earth Conductor (AEC) level at the lowest point shall not fall below the contact wire level at the maximum temperature.

- (b) **Over-bridges and Tunnels:** The clearances which are to be made available at over bridges, signal, gantries and other over line structures shall be based on the above rules.
- (c) **Platform Sheds and Other Structures:** In the course of checking the overhead equipment pegging plans, the Contractor shall prepare a list of platform sheds and other structures in the vicinity of track to be wired. The clearances to these structures shall be in accordance with those shown in the relevant drawings listed in Annexure. If these clearances are not available, the Contractor shall advise the Purchaser in time to enable the latter to take up necessary modification/corrective action.

I.2.26 Height of Contact Wire:

- (a) Maximum height of the rolling stock with Double Stacked Container, above Rail level 7.10m. This height of the Rolling Stock above rail level shall result in contact wire height above rail level as follows:

Normal at the support	: 7.54 m
Minimum (anywhere in the span)	: 7.47m
Minimum under Overline structure	: 7.41 m

- (b) Gradient of Contact wire: Any change in the height of the contact wire shall be made gradually and the maximum slope shall not normally exceed 3 mm per meter on main line and 10 mm per meter on sidings. The end spans of any section with a gradient of contact wire shall have a slope not greater than half the main slope.

I.2.27 Stagger: To ensure uniform wear of contact strips of pantographs, the contact wire shall normally be staggered in a manner which will be indicated by the Purchaser.

I.2.28 Termination:

- (a) **General:** Traction overhead lines shall be terminated using components specified. The termination may be carried forward by one or two spans if anchoring facilities so required.
- (b) Terminating wires shall be electrically connected to the conductors with which they are likely to approach closely or come into contact under normal conditions.
- (c) **Supplementary insulation:** If a terminating wire passes a live conductor to which it should not be connected, i.e., in a different elementary section, the portion of the terminating wire close to the live conductor shall be separated by means of insulators. The insulators shall be located in such a manner as to clear the swept zone of the pantograph under the worst conditions and as far away as is possible from live conductors.

I.2.29 Type of structures:

- (a) **Structure/Uprights and their Foundations:** Overhead equipment structures for the main line tracks shall be mechanically and electrically independent and shall not be located between Up and Down tracks except where specifically approved by the Engineer. The structure uprights shall generally be embedded in concrete. In station yards, generally through portals spanning over 4 tracks, shall be erected. In junction stations, portals spanning larger number of tracks may also be required. For this purpose, adequate track centers shall be provided by the other (Civil and Track Work contractor). Designs for steel structures shall comply with IS 800- Indian Standard Code of Practice for use of structural steel in general building construction. Pre-

stressed concrete structures shall not be adopted. Types of Structures are indicated in Part-II Chapter 7.

Foundations: For methods of designs of structures and foundations, Indian Railways Design Manual for Electric traction shall be followed. The Concrete for the foundations shall be of minimum M20 with proportion as given in IS456. For grouting, muffing, and embedment of structures the nominal mix of the concrete shall be M20. Volume of batching shall be adopted as per clause 9.2.2 of IS 456. Cylindrical foundations mechanically augured to be adopted as per drawing/document given at Part-II Chapter 7.

Foundations for all structures shall be designed in an economical manner by following the methods of design indicated by the Employer. Precast foundation shall not be used.

The Contractor shall examine the details of geotechnical survey supplied by the Engineer followed by that verified and/or carried out by the Other Contractor for civil engineering and track-work and also validate it through his own geo technical survey wherever found necessary. This data should form the basis for his design for foundations. **The Contractor shall undertake sufficient geo-technical investigation to demonstrate that the foundation designs are adequate.**

- (b) **Portals:** In case where the tracks in a multiple tracks section do not permit location of independent masts and where automatic tensioning of overhead equipment is required, rigid portals may be used. Also, in the vicinity of points and crossings, portals may be used, provided it is not possible to have prescribed setting distance with independent cantilever masts. These structures shall be equipped with standard bracket assemblies for supporting individual equipment of different tracks. The use of such structures is to be avoided as far as possible and for this purpose the Purchaser will arrange to slew the tracks, if practicable. A single portal shall normally not cover more than five tracks. Portal structures will also be employed at anti creep central locations and such portals will have necessary guy arrangement.

I.2.30 Location and Setting distance of Structures:

- (a) Location of structures shall be selected after ensuring that there are no infringements and they do not obstruct roadways, pathways, run of cables, drains, or the sighting of DFC or IR signals etc.
- (b) Setting distance of structures (distance from center line of track to face of mast) shall normally be 3.0 m plus curve allowance as required. Setting distance of portal upright, multiple OHE structure, anchor structures shall normally be 3.5 m. Where such distances are not possible,

maximum possible clearance, but not less than that required by the Schedule of Dimensions for Western Dedicated Corridor for fixed structure shall be adopted. This is subject to review by the Engineer. The setback of location of traction mast shall be such that visibility of signals is not obstructed and shall be as indicated in the ACTM.

- (c) To ensure provision of safe current collection under adverse conditions, the reverse deflection of masts on top at the time of erection shall be adequate so that it becomes vertical on application of permanent loads and to ensure that under the maximum wind loads, contact wire remains within permissible limits. Torsional deflection under permanent loads shall not exceed 0.1 radian.

The value of setting distance of masts/structures shall be painted on each mast/structure. The figures shall be 25mm in size in white on a red background. In addition, the track level shall also be marked on the mast/structure by a horizontal red painted stroke.

- (d) **Extra clearance on Curves:** The minimum setting of structures on curves shall be increased by adding to the above minimum figures of extra clearances on account of the kinematic profile of the locomotive and wagons and super elevation, the figures for curve allowance being taken from Clause 1.2.8 (c) of this chapter.

- **Structures with Counter Weights:** Structures carrying counter-weight assemblies, the term “setting” shall refer to the minimum distance of the mast including the counter-weight from the track center. The minimum and maximum travel of counter weight shall be marked on the mast.
- **Numbering of Structures Carrying Overhead Equipment:** Structures shall be numbered in accordance with the standard numbering given in the finalized overhead equipment layout plans. Enameled number plates at eye level from a locomotive driving cab (approx. 3m above rail level) shall be provided on each mast or structure. Details to be submitted for review by Engineer.

I.2.31 Field/Foundation work shall only be commenced when the Contractor has received a letter of no objection to the proposed mast and foundation designs and construction methodology from the Engineer.

I.2.32 Tolerance in erection:

1	Span lengths shall not vary more than	+/- 200 mm
2	Cumulative error in all spans in one km shall not exceed	+/- 1000 mm

3	Height of contact wire	+/- 20 mm
4	Dropper length	+/- 5 mm
5	Dropper location	+/- 100 mm

I.2.33 For OHE masts to be erected on long bridges and viaducts, the Civil Contractor (CTP-11 and other DFCCIL Contractors) shall provide fixing arrangements for the masts with base plates. The Contractor shall interface with Civil Contractor so that masts with base plate are ordered and fabricated at the supplier's works and duly galvanized after welding and drilling holes in the base plate.

I.2.34 Signages shall be provided on steel structures/stand-alone boards. All Signages shall be retro-reflective type in OHE (not PSI). The locations of signs shall be as under but not limited to:

- (i) Number plates on masts / portals on up and down route.
- (ii) Critical locations like before the stop signals and before the permanent speed restrictions.
- (iii) Up and Down gradients
- (iv) All other warning boards as per ACTM like DJ Open, DJ Close, 500 m board, 250 m board coasting board, danger board, brake testing board, overhead crossing boards etc.
- (v) Sigma strip in fog prone area.
- (vi) Other unusual locations.
- (vii) Drop Arm in Yard.

Guideline furnished for numbering in clause 3.31 of ACTM Vol. II 2010, shall be followed. This shall be finally approved by the Engineer.

I.2.35 Outdoor Steel parts: All the steel structures and small part steel for carrying overhead equipment shall be fully galvanized.

- (A) The zinc coating for steel structures and parts shall be as per RDSO Specification No. ETI/OHE/13 (4/84) i.e. minimum coating of zinc shall be 610 gm/m², except for marine and chemically polluted areas identified as a result of pollution mapping by the contractor and approved by the Engineer, where the coating shall be 1000 gm/m².
- (B) In case of need to use nonstandard SPS at special locations to be fixed to the steel structure, these shall be with clamps to avoid drilling of galvanized mast sections.
- (C) **Anti- Climbing Guards**

- a) Anti-climbing guards shall be provided for all structures supporting Auxiliary Transformers.
- b) Screens and anti-climbing guards shall be provided on OHE supports at locations where any person can either touch or gain access to live overhead conductors.
- c) Where deemed necessary the equipment and critical points shall be clearly identified with warning and danger signs positioned at appropriate intervals, distance and heights.
- d) All safety critical items shall be secured by bolts, clamps, etc., and shall be fitted with shake proof, self-locking washers or secured with split pins behind the nuts.
- e) The device shall be clamped to the structure that it protects, and no drilling of the structure shall be acceptable.
- f) The guards shall be positioned to allow unimpeded access to maintenance staff during the normal course of their duties.

I.2.36 Interface Coordination by the Contractor:

- (A) **Design Coordination and Interface:** The Contractor shall be responsible for design coordination for EMI and safety works related to rendering the whole installation safe from EMI interference and from unsafe touch potential from induction effects of AC traction currents with all the Contractors viz: CTP-11, CTP-15A, STP-17 and through the Engineer with adjacent Indian Railway system of both electrified and non-electrified section.
- (B) The Contractor shall be responsible for coordinating the final OHE design and installation at different stages of design and construction in coordination with CTP-11, CTP-15A and STP-17 Contractors.
- (C) The Contractor shall interface with STP-17 Signaling Contractor and also co-ordinate for positioning of masts in respect of signal sighting and locating automatic signals near TSS and SP such that long twin trains with pantographs 750 m apart can negotiate the neutral sections located opposite the traction supply installations.
- (D) The Contractor shall also interface with Indian Railways through the Engineer as follows:-
 - For the design, construction, testing and commissioning of the overhead line interface between Indian Railways and the Western Dedicated Freight Corridor at Junction Stations.

- To ensure that the design and construction of the OHE does not affect the signal sighting on Indian Railways.
- To ensure that the construction of the OHE does not interfere with train operation on Indian Railways nor damage any Indian Railway assets.
- To ensure that the design and construction does not impede the operation and maintenance for Indian Railways in any way.

(E) The Contractor shall also interface with the civil and track work contractors for CT-P11, and CTP-15A to ensure that they provide the statutory signage and height gauges on the roads and Highways crossing the tracks (Level crossings and the road over-bridges) to ensure that Railway and Statutory warning signs are installed warning of the hazards caused by the 25kV AT Feeding traction system provided on the rail system. The Contractor shall further coordinate for laying of buried earth conductors on both sides of the track.

(F) The Contractor shall also interface with bridge contractor CT-P15A in order to ensure adequate electrical clearances for OHE and suitable earthing and bonding of the integral bridge structure to ensure safe touch and step potential of rails and bridge structures under all conditions of operation, fault and lightning stroke.

(G) In addition to what has been stated above, interface requirements to be met by the Contractor, have been clearly defined in Chapter-VI, **Section-5 of Employer's Requirement**.

I.2.37 Overlaps: Overlaps shall be provided at suitable intervals such that neither the tension length exceeds 1,500 m nor the fixed anchor to balance weight anchor exceeds 750 meter.

- (a) **General:** The two contact wires at the overlapping zone shall be parallel to each other in a place parallel to the track and run separated from each other
- (b) **Insulated:** In the case of insulated overlaps the separation between the two contact and the two catenary wires shall be 0.5m
- (c) **Points and Crossings:** Arrangements of overhead equipment of different type e.g. regulated, unregulated or tramway at points and crossings shall be in accordance with the standard drawings.

I.2.38 Light Weight Section Insulators (LWSI):

- (a) **Brief description:** The section insulators shall provide effective electrical isolation of two elementary electrical sections of overhead equipment and permit smooth passage of the pantograph in either direction at all speeds up to 120 Km/h. The section insulators shall be of light weight section insulator type.

I.2.39 Isolators: Manually operated isolator single or double pole type with or without earth contact assembly may be required to bridge certain section insulator or insulated overlap. In certain large Yards, isolators controlling different lines may be grouped together on a gantry.

I.2.40 Over Bridges/Bridges and Tunnels & Cutting:

- (a) **Over Bridge:** The complete overhead equipment (i.e., both the catenary and the contact wires) shall normally pass under overline structures. Additional intermediate suspension points shall be provided, if necessary, to ensure the specified minimum height of contact wire being maintained. In special case the catenary may be anchored on either side of the over line structure and the contact wire carried underneath.
- (b) **Tunnels and Cuttings:** The arrangements proposed for the equipment in tunnels and cuttings shall take into account the special features of each location and shall be in accordance with general design specified.
- (c) **Safety Screen:** On over bridges metallic protective screens shall be provided in order to prevent any person from coming into contact with the live overhead equipment. Such screens shall be properly earthed.
- (d) **Height Gauge at Level Crossing:** Height gauge is to be provided at all level crossing in accordance with the standard arrangement drawings.

I.2.41 Bonding and Earthing: Bonding and earthing shall be done in accordance with the approved DFCCIL earthing and bonding documents. Work shall be taken up according to the approved earthing and bonding management plan.

PART-II

Chapter- 2

EQUIPMENT, COMPONENTS AND MATERIAL

- 2.3.1 General:** This chapter deals with the details and specifications of the equipments, components and materials to be used for traction overhead equipment, switching stations, booster transformer stations and LT supply transformer stations. In general, based on the specifications issued by various bodies, such as IEC, EN, BIS, British Standards etc, specifications have been issued by the CORE.
- 2.3.2 Compliance of standard Specification:** Tenderers offer equipment in accordance with the appropriate International/National standard specifications of the country of manufacture. But such offers will be treated as deviations and should be quoted clearly English rendering of the text and illustrations of the national standard specifications and explanatory notes on the specific deviation from IEC, British or Indian Standards in question, shall also be submitted in Form. In case of doubt, the Purchaser shall decide the clause and specification applicable and the contents of the specification and standard mentioned above shall guide such decisions.
- 2.3.3 Quality Assurance:** The provision of Part I for quality assurance will apply, including facilities to be provided by the manufacturer.
- 2.3.4 Inspection and Test:** These comprise inspection and tests conducted at the manufacturer's factory for ensuring quality of manufactured items as part of the Quality Assurance Programme.
- 2.3.4.1 All works connected with this contract shall be done in accordance with the standard established methods of inspections and shall comply with relevant Indian Electricity Rules, IS code, RDSO /CORE/DFCCIL Specification and Standards.
- 2.3.4.2 The inspection of all the equipments, materials, fittings and components will be carried out by Engineer at the manufacturer's premises. No materials shall be dispatched from the manufacturer's premises until these are inspected and report approved.
- 2.3.4.3 All erection work will be subject to inspection by the Engineer to ensure that the work is done in accordance with the specification and approved drawing. The decision of the authorized representative of Engineer shall be final in respect of acceptability or otherwise of any material, fitting, component/ equipment/ execution of the work.

2.3.4.4 The works which shall be rejected by the inspecting officer of the Engineer, the contractor shall replace such rejected equipments/assemblies of the work forthwith but in any event not later than a period of one week from the date of rejection. The contractor shall bear all the cost of such replacement including freight etc but without being entitled to any extra time on this account.

2.3.5 Test Certificates: Three copies of the test certificates of successful prototype tests carried out at the manufacturer's Factory on all equipments shall be furnished to the Purchaser within a month after completion of the prototype test. Three copies of test certificates the routine test carried out of each equipment shall also be furnished, after the equipment is passed by the Purchaser's representative.

2.3.6 INSPECTION:

2.3.6.1 The works shall be accepted after inspection by the Engineer particularly for the following aspects.

- i) Setting out of Electrical equipment.
- ii) Approval of quality of works.
- iii) Erection, testing & commissioning as per the approved drawings and relevant standard/specification.
- iv) Safety works to conform to Indian Electricity Rules. These aspects shall be checked during periodical inspections. Any defects, deficiencies noticed in the works will be recorded in the site order book so that the contractor acts upon it without loss of time.

2.3.6.2 The cost of travel, lodging/boarding of the Engineer for the inspection of works/materials will be borne by DFCCIL subject to any other provisions contained hereunder or elsewhere in contract. Three weeks' notice must be given by the contractor to the Engineer to take up the inspection.

2.3.6.3 The contractor shall provide, without any extra cost to DFCCIL, details of all materials, equipments, machine, plant, tools and labour etc of every kind of which the Engineer's inspecting officer may consider necessary for any test and examination to be made at site or elsewhere.

2.3.6.4 All the equipments and material shall be of best quality and will be tested/inspected by the Engineer or Engineer's representative at site of work and approved before they are installed/used in the works covered in the contract. If the contractor uses any equipment/materials without the prior approval of Engineer these are liable to be rejected.

2.3.6.5 The decision of the Inspecting Officer with regard to the acceptance or rejection of the equipment/work will be final and binding on the contractor

2.3.7 Bulk manufacture: Bulk manufacture may be undertaken only after specifications/drawings approved of the Engineer or his representative has been obtained indicating that proto type tests are satisfactory. Where proto type test has already been approved, the manufacturer may proceed after exemption from proto type tests is received from the Engineer in writing.

2.3.8 Interchangeability: All equipments, components and fittings shall be interchangeable and supplies shall be in accordance with the purchaser's design unless otherwise specifically approved by him. Components such as fuses, indication lamps etc should be replaceable with substitutes available indigenously as far as possible. Important components and fittings and their drawings have been listed in Schedule.

2.3.9 Technical specification: Following specifications (latest revision) will govern the supply and testing of important materials, components and equipments:

- (i) Structural Steel: IS 2062-1992 IS 800-1984 IS 808-1989
- (ii) Tensile Testing: IS 1608 - 1972 for steel products etc. IS 2004 - 1991
- (iii) Welding: IS 816 - 1969
- (iv) Tin Bronze Castings: IS 306 - 1983
- (v) Aluminum Bronze Castings: IS 3091 - 1965
- (vi) Malleable Iron Castings: IS 2108 - 1977
- (vii) Grey Iron Castings: IS 210 - 1978
- (viii) Aluminum Castings: IS 617 - 1975
- (ix) Copper Strip for Formed Fittings: IS 1897-1983
- (x) Contact Wire 150 and 107 sq.mm.: As per specification given in Chapter-7, Part-II Annealed stranded copper Conductor for: ETI/OHE/3(2/94) with A&C jumper wire slip No.1 issued on 4(95)
- (xi) Copper Bus-bar: RE/30/OHE/5(11/60)
- (xii) Steel Tubes: ETI/OHE/11(5/89)

- (xiii) Hot dip zinc galvanization of steel masts: ETI/OHE/13(4/84) with A&C (Rolled and fabricated) tubes and Fittings slip No.3 of (4/90)
- (xiv) Stainless steel wire rope: TI/SPC/OHE/WR/1060(06/06) with A&C slip 2 of (5/07)
- (xv) Solid core Porcelain Insulator: TI/SPC/OHE/INS/0071(04/07) with A & C Slip No- 01 & 02 (10/16)
- (xvi) Silicone Composite Insulators: TI/SPC/OHE/INSCOM/1072, Rev-02
- (xvii) 25 kV Single and Double pole Isolators: TI/SPC/PSI/ISOLTR/0210 with A & C slip 1
- (xviii) Bolts, Nuts and Washers: TI/SPC/OHE/FASTNERS/0120 with A&C slip No.5 of (03/13)
- (xix) Aluminum Alloy section and tube for 25 kV for traction overhead equipment: ETI/OHE/21(9/74)
- (xx) Standard Drawings and Traction: ETI/OHE/53(6/88) with A&C slip No.5 of Overhead Equipment (11/06)
- (xxi) Light Weight Section Insulator: For Conventional IR OHE- Drawings no. EJG3430/102-21 and for Heavier OHE of WDFC Drawing no. Drawings no. EJG3430/202-31, Specification No. TI/SPC/LW/TSI/0060
- (xxii) PTFE Type Short Neutral Section: PI/SPC/OHE/SNS/0000
- (xxiii) Enameled Steel Plates: ETI/OHE/33(8/85)
- (xxiv) Retro-Reflective Structure Number Plates: ETI/OHE/33A (12/97) with A & C Slip no. 8 (11/12)
- (xxv) Fittings for 25 kV, 50 HZ, AC: ETI/SPC/OHE/FITTINGS/0130 (10/13) with OHE A&C slip No.1 (10/13)
- (xxvi) Catenary Wire 125 and 65 sq.mm.: As per specification given in Chapter-7, Part-II
- (xxvii) Bimetallic (Al -Cu) Strip: ETI/OHE/55(4/90)
- (xxviii) Specification for 3-pulley type regulating: TI/SPC/OHE/3PHTATD/0150 Rev. 1 equipment (3:1 ratio) with A & C Slip No. 1

- (xxix) Specification for 5-pulley type regulating: TI/SPC/OHE/5P/ATD/0130 equipment (5:1 ratio) with A & C Slip No. 1 & 2
- (xxx) Technical Specifications for Fittings: ETI/SPC/OHE/FITTINGS/0130(10/13) for 25 KV AC OHE
- (xxxix) Specification for discharge/earthing pole: ETI/OHE/51(9/87) Assembly for 25 kV ac Traction
- (xxxixii) Specification for continuous cast copper: ETI/OHE/65(8/87) with A & C wire rods Slip No. 1 to 4 (09/16)
- (xxxixiii) Code of bonding and earthing for 25kV: ETI/OHE/71(11/90) (03/93) AC 50 Hz single phase traction system
- (xxxixiv) Specification for 4 axle car for winding: ETI/OHE/72(11/91) and/or unwinding of contact wire and catenary wire
- (xxxixv) Gearless hand operated pulling and Lifting: TI/SPC/OHE/TOOLPL/1990 machines (TIRFOR) (11/99)
- (xxxixvi) Ratchet lever Hoist (Pull - lifts): TI/SPC/OHE/TOOLPL/1990 (11/99)
- (xxxixvii) Insulated Cadmium copper catenary: TI/SPC/OHE/INSCAT/0000 with 19/2.1mm. diameter for provision under A & C Slip No. 1 & 2 Over line structures in the 25 KV AC Electric traction.

2.3.10 (a) Nomenclature and Marking: All components and fittings supplied by the contractors shall bear the respective identification number and a mark to identify the source of supply except in the case of galvanized tubes, bolts and nuts and/or any other fittings as may be agreed to by the purchaser.

(b) In case of insulators, galvanized steel tubes, stainless steel wire rope and conductors, name of manufacturer shall be specified in "As Erected" drawings for identification.

2.3.11 Steel Work and Protection against Rust:

- (a) **Galvanizing:** All ferrous materials and fittings shall be hot dip galvanized according to the Specification ETI/OHE/13(4/84) with A & C slip No.1 of 5/86), 2 & 3 of (4/90).
- (b) **Painting:** Some components or parts may, with the approval of the purchaser, be protected only by paint and parts as protected shall be given two coats of composite Aluminum primer and two coats of aluminum paints. The second coat of aluminum paint shall be applied after erection.
- (c) **Rectification at Site:** In case of modifications, which would damage the protective coat,

repairs to such damage would be allowed only in exceptional circumstances. The part damaged shall be protected in accordance with the method indicated in specification ETI/OHE/13/(4/84) with A&C slip 1 of 5/86 or any other method approved by the Purchaser. The contractor shall, in all such cases obtain prior permission from the purchaser before carrying out repairs.

2.3.12 Bracket for Unregulated Tramway type Equipment:

Unregulated equipment shall normally span two tracks and the contact wire carried on V- Type clamps suspended from a span wire. The span wire shall be provided with a turn buckle at only one end.

2.3.13 Droppers:

- (a) **General Designs:** The droppers should be current carrying flexible of 10 sq.mm. made of standard conductor of copper bronze Cu-Bronze with two dropper clamps for connecting to contact wire and catenary wire and should confirm to DIN 43138.

2.3.14 (a) Insulators: All solid core insulators shall conform to TI/SPC/OHE/INS/0070 (04/07) with A & C Slip no-01 & 02 (10/16) or TI/SPC/OHE/INSCOM/1071, Rev-01 (12/16) as the case may be.

and composite insulator shall confirm to TI/SPC/OHE/INSCOM/1071, Rev.01 (12/16)

(b) **Interchangeability:** For free inter changeability only the following types of insulators shall be used. While the shapes of the insulators may vary slightly from those shown in the drawings, the essential dimensions of the galvanized malleable cast iron caps as given in standard drawings shall be adopted.

- (i) **Stay- arm Insulators (composite: CD 1600 mm):** These insulators will be used in conjunction with the tubular stay arm of all bracket assemblies.
- (ii) **Bracket Insulators (composite: CD 1600 mm):** These will be used at the base of each bracket assembly in conjunction with bracket tubes.
- (iii) **9 -Ton Insulators (composite: CD 1600 mm):** These will be used at all places for cut in and terminal insulation including these in return conductors but excluding those in earth wire.
- (iv) **Solid Core Post Insulators:** These will be used at all places for supporting isolator mechanism, bus bars, jumpers etc of 25 KV.

2.3.15 Ending Fittings and Splices:

- (a) **General Designs:** Terminating or ending fittings and splices on copper conductors shall be of the cone type clamping on both the inner and outer strands of conductors except for contact

wire ending clamps which may be wedge type. The arrangements shall be easy to install and also be such as would apply the clamping pressure gradually without shock (See ETI/OHE/49(9/95) with A&C slip No.1 of 3(97). For Aluminum Alloy/pure aluminum conductor, the end fittings shall be either cone type, strain clamp type or any other type as approved by the Purchaser.

- (b) **Loading:** All the parts shall be capable of withstanding, without damage, a load greater than the ultimate strength of the wires to which they are fitted. In the case of threads, no damage shall occur when they are subjected to a load equal to two third of the ultimate strength of the wire.
- (c) **Restricted use of Splices:** The use of splices shall generally be avoided and their use shall be restricted to the minimum necessary. Over main tracks, there shall be no splice in the contact wire on first erection. Elsewhere, not more than one splice be used in any tension length (i.e. anchor to anchor) for which prior approval shall be taken from the Purchaser. Additional splices may, however, be provided to enable retention of conductors which are found defective during and/or after erection. Splices may also be permitted for repair of damage due to theft or railway accidents.
- (d) **Strength of Assembled Fittings:** The strength of fittings assembled with appropriate conductors or wires shall not be less than that of the conductors or wire itself.

2.3.16 Electrical Connections for OHE:

- (a) **General Designs:** All electrical connections between conductors shall be made by parallel clamps. The general arrangements of connections are shown in the standard drawings, listed in Annexure.
- (b) **Jumper:** The Drawing of OHE Jumper connection arrangement as approved by DFCCIL to be followed. The Drawing no. Copper jumpers is 5/OH/TD/1179:
- (i) Large Jumper of annealed copper in accordance with specification ETI/OHE/3 (2/94) A and C Slip No.1 of April-1995.
- (ii) Small jumper of annealed copper in accordance with the specification IS 434 Pt-I. Aluminum jumpers, wherever used, shall be of all aluminum stranded conductor 19/7/4 mm bare 3/4 H generally conforming to IS:8130:1984.
- (iii) 160 sq. mm flexible copper jumper wire made of annealed stranded 100% pure copper conductor as per RDSO's spec No. ETI/OHE/3 (2/94) with A & C Slip No.1 or latest, all components and fittings required for providing a flexible copper jumper 160 sq. mm.
- (c) **Bus Bars:** Bus bar or rigid jumpers in copper where used shall be of 18mm dia of copper rod in accordance with RE/30/OHE/5(11/60). Aluminum bus bars wherever used shall be of 36/30.4mm or 36/28mm tubing. Aluminum tubular bus bars shall be made of alloy to IS:5082-

1981. The tolerance on diameter and thickness shall be as per class-I IS:2673-1979.

- (d) **Feeders:** Feeders shall be of AAAC Conductor 37/3.15 mm 288 sq. mm as per IS 398 Part-IV
- (e) **Aerial Earth Wire:** AEW/AEC shall be as per the approved specification no. WDFC/EMP-16/ACSR/SPEC/01.

2.3.17 Regulating Equipment:

- (a) Stainless steel wire rope in accordance to TI/SPC/OHE/WR/1060 (06/06) with A & C slip no. 1 & 2 (05/07) shall be used in these equipments and these shall be sufficiently flexible for the purpose.
- (b) **Counter Weight:** Counter weights and arrangements used shall be as per the standards drawing listed in Annexure.
- (c) **Reduction Ratio:** Reduction ratio in the arrangement used shall be three in three pulley type and five in five pulley type.

2.3.18 Head-span Construction: Deleted

2.3.19 Isolators: 25 KV Isolator switches shall comply with specification as indicated in Para 2.3.9.

2.3.20 Bus Bars:

- (a) No splicing will normally be allowed in the tubular bus bars unless the length of the bus bar exceeds 6m.
- (b) **General:** The bus bar shall be clean, smooth, mechanically sound and free from surface and other defects. Provision shall be made where necessary to allow for expansion and contraction of bus bars caused by temperature variation. The open ends of bus bars shall be covered by suitable tubes cap, wherever the tubular bus bars are required to be bent, the radius of the bend shall be not less than 200mm.
- (c) **Joint:** The joints in bus bars shall be mechanically technically and electrically sound so that the temperature rise under normal working conditions does not exceed 400°C for an ambient temperature of 650°C.
- (d) All aluminum joints shall be thoroughly cleaned and smeared with suitable corrosion inhibiting joint compound before and after assembling the joint. Similar procedure shall be followed for connecting the equipment terminals to the aluminum bus bars with bimetallic connectors.

PART-II**Chapter- 3****LIST OF DESIGN & DRAWINGS TO BE USED IN THIS WORK**

Sr No.	Drawing No.	Description
1	5/OH/TD/1001	TYPICAL ARRANGEMENT OF OHE ON MAST FOR OPEN LINE SECTION
2	5/OH/TD/1002	TYPICAL ARRANGEMENT OF OHE ON PORTAL AT FOUR TRACK SECTION
3	5/OH/TD/1008	TWO TRACK CANTILEVER GENERAL ARRANGEMENT
4	5/OH/TD/1009	SCHEMATIC ARRANGEMENT OF UNINSULATED OVERLAP
5	5/OH/TD/1010	SCHEMATIC ARRANGEMENT OF INSULATED OVERLAP
6	5/OH/TD/1011	GENERAL ARRANGEMENT OF REGULATED OHE AT TURNOUT (OVERLAP TYPE)
7	5/OH/TD/1012	GENERAL ARRANGEMENT OF REGULATED OHE AT CROSS OVER (OVERLAP TYPE)
8	5/OH/TD/1013	IMPLANTATION (SETTING DISTANCE) OF OHE STRUCTURE
9	5/OH/TD/1014	SETTING DISTANCE AND EMPLOYMENT OF ANCHOR FOUNDATION BLOCKS
10	5/OH/TD/1015	MUFF FOR OHE STRUCTURES
11	5/OH/TD/1017	TYPICAL PLAN AND ELEVATION OF OHE TENSION LENGTH (HEAVIER OHE)
12	5/OH/TD/1018	TYPICAL PLAN OF FEEDER AND AERIAL EARTH WIRES AND SECTIONING OF FEEDER WIRE (HEAVIER OHE)
13	5/OH/TD/1019	TYPICAL PLAN AND ELEVATION OF ANTICREEP ARRANGEMENT (HEAVIER OHE)
14	5/OH/TD/1020	GENERAL ARRANGEMENT OF GUY ROD ASSEMBLY AND ANCHOR FOUNDATION BLOCKS (HEAVIER OHE)
15	5/OH/TD/1021	GENERAL DISTRIBUTION OF DROPPER (HEAVIER OHE)
16	5/OH/TD/1026	TYPICAL DRAWING FOR FIXING OF OHE MAST ON BRIDGE PIER
17	5/OH/TD/1028	CHARACTERISTICS OF CONDUCTORS
18	5/OH/TD/1029	GENERAL ARRANGEMENT OF DWARF MAST ANCHOR
19	5/OH/TD/1030	EQUIVALENT FOUNDATION SELECTION CHART FOR MAST
20	5/OH/TD/1034	GENERAL ARRANGEMENT OF WN, WO & WR TYPE PORTALS
21	5/OH/TD/1035	SETTING DISTANCE OF OHE STRUCTURES IN THE VICINITY OF SIGNALS
22	5/OH/TD/1053	SCHEMATIC ARRANGEMENT OF UNINSULATED OVERLAP (MODULAR CANTILEVER SYSTEM)

23	5/OH/TD/1054	SCHEMATIC ARRANGEMENT OF INSULATED OVERLAP (MODULAR CANTILEVER SYSTEM)
24	5/OH/TD/1064	OUTRIGGER ARRANGEMENT ON PORTAL BOOM
25	5/OH/TD/1070	ANTI SLIPPING ARRANGEMENT OF CATENARY SUPPORT / DOUBLE SUSPENSION CLAMP AT ACC LOCATION
26	5/OH/TD/1085	TYPICAL SUPPLIMENTARY FEEDER TO OHE (CATENARY & CONTACT) JUMPER ARRANGEMENT
27	5/OH/TD/1086	TYPICAL SUPPLIMENTARY FEEDER TO NEGATIVE FEEDER JUMPER ARRANGEMENT
28	5/OH/TD/1087	GENERAL ARRANGEMENT DRAWING OF OHE JUMPER CONNECTION
29	5/OH/TD/1112	TYPICAL ANCHOR ARRAGNEMENT ON BRIDGE PIERS.
30	5/OH/TD/1113	STANDARD TERMINATIONS FOR OHE WIRES
31	5/OH/TD/1115	SUSPENSION OF 25KV FEEDER WIRE
32	5/OH/TD/1116	FEEDER SUSPENSION ON OHE STRUCTURES (SPS)
33	5/OH/TD/1127	TYPICAL DETAILS OF CYLINDRICAL FOUNDATION FOR OHE MAST
34	5/OH/TD/1129	GENERAL ARRANGEMENT OF OHE AT TURNOUT (OVERLAP TYPE)
35	5/OH/TD/1130	GENRAL ARRANGEMENT OF OHE AT CROSSOVER (OVERLAP TYPE)
36	5/OH/TD/1136	TYPICAL GENERAL ARRANGEMENT FOR OHE INSIDE RFO 1
37	5/OH/TD/1139	TYPICAL HDPE PIPE LAYING ARRANGEMENT FOR CABLE CROSSINGS UNDER TRACKS
38	5/OH/TD/1140	DETAILS OF OHE FOUNDATION IN ROCK STRATA
39	5/OH/TD/1141	BOOM COMBINATION CHART
40	5/OH/TD/1143	TYPICAL DETAILS OF CYLINDRICAL FOUNDATION FOR DWARF MAST
41	5/OH/TD/1144	TYPICAL DETAILS OF CYLINDRICAL FOUNDATION FOR TTC
42	5/OH/TD/1173	SUSPENSION OF 25KV FEEDER & 25KV ANTICREEP WIRES
43	5/OH/TD/1174	EARTH WIRE ATTACHMENT ON OHE STRUCTURES
44	5/OH/TD/1176	CUT-IN-INSULATOR ASSEMBLIES
45	5/OH/TD/1191	ANCHOR ARRANGEMENT ON MASTS, TTC AND PORTALS
46	5/OH/TD/1192	FEEDER SUSPENSION ON OHE STRUCTURES (SPS)
47	5/OH/TD/1194	GUY ROD ASSEMBLY
48	5/OH/TD/1195	SUSPENSION ARRANGEMENT OF DROPARM FROM BOOM OF PORTALS AND TTC
49	5/OH/TD/1196	ANTICREEP SUSPENSION ARRANGEMENT FROM TTC & PORTAL BOOMS (SPS)
50	5/OH/TD/1197	MOUNTING OF 25KV ISOLATOR ON OHE STRUCTURES
51	5/OH/TD/1198	MOUNTING OF NUMBER PLATE ON OHE STRUCTURES

52	5/OH/TD/1199	MOUNTING OF NUMBER PLATE (RETRO REFLECTIVE TYPE) ON OHE STRUCTURES
53	5/OH/TD/1211	MOUNTING ARRANGEMENT OF AUXILIARY TRANSFORMER ON SEPARATE MAST
54	5/OH/TD/1217	TYPICAL ARRANGEMENT OF OHE INSIDE TUNNEL
55	5/OH/TD/1219	TYPICAL ARRANGEMENT OF OHE AND AUXILIARY TRANSFORMER SUPPORTED ON MAST
56	5/OH/TD/1220	CROSS ARM CHANNEL FOR LV SUPPLY TRANSFORMER SUPPORT
57	5/OH/TD/1221	ANTI-CLIMBING DEVICE FOR B-200(S), B-225(S), AND B-250(S) MASTS
58	5/OH/TD/1222	CANTILEVER SUPPORT ANGLE FOR AUXILIARY TRANSFORMER MOUNTING ON B-200(S), B-225(S), B-250(S) MASTS
59	5/OH/TD/1223	CROSS ARM CHANNEL FOR PEDESTAL INSULATOR SUPPORT
60	5/OH/TD/1224	CROSS ARM CHANNEL FOR DROP ARM FUSE (ISMC 75)
61	5/OH/TD/1234	ARRANGEMENT OF SINGLE CANTILEVER INSIDE BOX TYPE ROB
62	5/OH/TD/1235,1236	TYPICAL DETAILS OF CYLINDRICAL FOUNDATION DESIGN FOR OHE PORTAL WITH 1.5M DIAMETER AT JNPT YARD
63	5/OH/TD/1238	DETAILS OF BASE PLATE AND BOLTING ARRANGEMENT FOR TTC-B STRUCTURE
64	5/OH/TD/1239	TYPICAL ANTI-CREEP TERMINATION ON SUPRESTRUCTURE OF THROUGH GIRDER BRIDGE
65	5/OH/TD/1240	STRUCTURAL AND FOUNDATION DETAILS OF MAST TO SUPPORT OHE FEEDING ARRANGEMENT
66	5/OH/TD/1241	DESIGN OF CONVENTIONAL FOUNDATION FOR WN, WO(A) & WR TYPE PORTAL AT JNPT
67	5/OH/TD/1245	TYPICAL CABLE (UG) LAYING ARRANGEMENT FOR FEEDER TERMINATION
68	5/OH/TD/1247	SLACK FEEDER WIRE ARRANGEMENT ON FOB WITH NO TENSION
69	5/OH/TD/1248	DETAILS OF OHE MAST FOUNDATION ON ROCK STRATA WITH ROCK LEVEL VARIES FROM 1.2M TO 2M BELOW FORMATION TOP
70	5/OH/TD/1249	PROVISION FOR DROP ARM SUSPENSION INSIDE TUNNEL
71	5/OH/TD/1250	GAD OF PROVISION FOR OHE ARRANGEMENT INSIDE THE ROB
72	5/OH/TD/1251	DETAILS OF STRUCTURE AND FOUNDATION FOR MOUNTING OF 100 KVA, 25 KV / 230 KV LT SUPPLY TRANSFORMER FOR OHE
73	5/OH/TD/1252	SCHEMATIC ARRANGEMENT OF TRAMWAY TYPE OHE (REGULATED)

74	5/OH/TD/1254	POST INSULATOR ARRANGEMENT FOR FEEDER/SLACK FEEDER
75	5/OH/TD/1267	BACKING ANGLE FOR FEEDER SUPPORT
76	5/OH/TD/1275	TYPICAL OUTRIGGER ARRANGEMENT ON PORTALS TO FEED AUXILLIARY TRANSFORMER FROM MAIN LINE
77	5/OH/TD/1277	REINFORCEMENT ARRANGEMENT FOR CATENARY WIRE UNDER FOB, ROB & RFO STRUCTURES TO AVOID CUTTING OF CATENARY WIRE STRANDS
78	5/OH/TD/1278	GENERAL ARRANGEMENT OF MOUNTING OF RETRO-REFLECTIVE NUMBER PLATE ON OHE DROP ARMS
79	5/OH/TD/1601	DESIGN OF BASE PLATE AND BOLTING ARRANGEMENT FOR OHE ANCHORS AT ERS LOCATIONS
80	5/OH/TD/1605	MUFF FOR OHE STRUCTURES (PORTALS AND TTC)
81	5/OH/TD/1607	GAD OF MOUNTING ARRANGEMENT OF 25 KVA / 50 KVA LT SUPPLY TRANSFORMER ON SEPARATE MAST
82	5/OH/TD/1235	TYPICAL DETAILS OF CYLINDRICAL FOUNDATION DIA 1.5M
83	5/OH/TD/1236	TYPICAL DETAILS OF CYLINDRICAL FOUNDATION DIA 1.8M
84	5/OH/TD/1135	SECTIONING DIAGRAM FOR CTP-11 SECTION
85	5/TP/TD/0322	GENERAL POWER SUPPLY DIAGRAM FOR CTP-11 SECTION

PART-II
Chapter- 4

LIST OF APPROVED METHOD STATEMENTS

List of Method Statements for execution of important activities is as under:

Sr. No.	DESCRIPTION	Document No.	Rev.
1	Method Statement for Foundation, Mast Erection and Grouting.	DOC/EMP16/QAQC/GEN/023	2
2	Method statement for Installation of Buried Earth Conductor (BEC)	DOC/EMP16/QAQC/GEN/033	2
3	Method Statement for OHE Foundation, Mast Erection and Grouting for Central Railway Proposed Holding yard at JNPT	DOC/EMP16/QAQC/GEN/040	0
4	Method Statement for Erection of Small part of Steel (SPS), Cantilever assembly and guy rod	DOC/EMP16/QAQC/GEN/052	2
5	Method Statement for Stringing of Aerial Earth Conductor and Feeder Wire	DOC/EMP16/QAQC/GEN/054	1
6	Method Statement for Testing and Commissioning of LT Transformer at LC/Auto Location Huts/Stations & PI Locations	DOC/EMP16/QAQC/GEN/056	1
7	Procedure for drilling of Holes on Rails	DOC/EMP16/QAQC/GEN/057	0
8	Method Statement for Stringing of OHE, Dropper Works & Installation of Counter Weight Assembly	DOC/EMP16/QAQC/GEN/058	1
9	Method statement for removal of hard rock before blanketing/subgrade for OHE FDN.	DOC/EMP16/QAQC/GEN/060	1
10	Method statement for anti-theft charging	DOC/EMP16/QAQC/GEN/065	0
11	Method statement for OHE Testing & Commissioning	DOC/EMP16/QAQC/GEN/066	0
12	Method statement for stringing of OHE, (Anti- creep catenary & contact wire Dropping Works & Installation of Counter Weight Assembly	DOC/EMP16/QAQC/GEN/067	0
13	Method statement for adjustment of Cantilever (Brackets) for the OHE work.	DOC/EMP16/QAQC/GEN/068	0
14	Method statement for Adjustment of auto tensioning devices (ATD)and checklist for	DOC/EMP16/QAQC/GEN/069	0

	verification, overlap, Tower Wagon, Turnout, SED		
15	Method statement for Installation for LT Supply station (Auxiliary transformers auto change over switch and associates cable laying.	DOC/EMP16/QAQC/GEN/070	0
16	Method statement of OHE foundation excavation by pilling rig machine in ZMT-1 section	DOC/EMP16/QAQC/GEN/074	0
17	Method Statement for Measurement of Output Voltage of Auxiliary Transformer at ALH, TH & Station Locations.	DOC/EMP16/QAQC/GEN/092	0
18	Project wide Earthing and Bonding Management Plan	DOC-EMP-16_DGN-RP-021	2

PART II**Chapter-5****INSPECTION AND TESTING****2.5.1 General**

- (a) The Contractor shall provide and perform all forms of testing procedures applicable to the Works relating to plant & equipment and manufactured items and various components and the interfacing of the Works relating to plant & equipment and manufactured items with the Other Contractors and shall conduct all necessary factory, site and acceptance tests.
- (b) Prior to commissioning activity, the Contractor shall provide adequate training to Employer's staff to enable them to participate in the commissioning activity and later to operate and maintain the installation.
- (c) The commissioning activity shall include a period of the Integrated System testing followed by a period of Trial Running attended by the Commissioner of Railway Safety (CRS) or other Authorized Official and for staff training in familiarization of the installation and its proving.
- (d) Within 6 months from the date of Commencement of the Work, the Contractor shall submit a comprehensive Testing and Commissioning Programme, which shall be part of Comprehensive Testing Programme defining the personnel, procedure and format of testing
- (e) All testing procedures shall be submitted at least three-four weeks (28 days) prior to conducting any Test. The testing procedures shall show unambiguously the extent of testing covered by each submission, the method of testing, the acceptance criteria, the relevant drawing (or modification) status and the location.
- (f) The testing procedures shall be submitted by the Contractor and amended, if required subsequently by the Contractor during the duration of the contract to reflect changes in design of works, interface systems or the identification of additional testing requirements, if needed.
- (g) The Engineer shall have the facilities for monitoring all tests and have access to all testing records.
- (h) Sufficient time shall be allowed within the Testing Programme for necessary alterations to equipment and sub-systems to be undertaken, together with re-testing prior to final commissioning.
- (i) The Contractor is reminded that at some point of time, the electric Traction System shall be energized and the additional precautions for the safety and co-ordination of the activities prior to and after 'power-on' shall be anticipated in his co-ordination with Other Contractors and installation, testing and commissioning program of all the contractors and all associated with the Traction Power Energization Programme.
- (j) All costs associated with the testing shall be borne by the Contractor. Contractor will deploy its own specialized personnel or independent accredited testing agency. The Contractor shall

also bear any expenses incurred due to resetting / retesting caused by defects or failure of equipment to meet the requirements of the Contract in the first instance. The Contractor shall bear all costs of Employer/ Employer's authorized representative's visit including passage / stay etc., in case of retesting.

- (k) In the event of any tests being performed in the countries other than India, the Contractor shall give at least eight weeks (56 days) notice to the Engineer for witnessing the tests. The Contractor shall not be required to bear the cost of any Engineer's visit in India/Abroad.
- (l) Unless agreed in writing by the Engineer, the personnel engaged on testing shall be independent of those directly engaged in the design or installation of the same equipment.
- (m) All testing equipment shall carry an appropriate and valid calibration label. They shall be periodically checked for calibration accuracy.
- (n) All reports of the tests shall be signed by the Contractor's Representative

2.5.2 Inspection and Testing Philosophy

- (a) The inspection of various items shall be carried out by the agencies in the manner as approved by the Engineer.
- (b) All field tests shall be witnessed by authorized representative of the Engineer / Employer & recorded. An appropriate format for Test Schedules and Procedures including the details of testing equipment shall be submitted to the Engineer for approval. All tools & instruments for carrying out the tests shall be arranged by the Contractor to the satisfaction of the Engineer. Test results will be witnessed and signed by the Contractor and the Engineer.
- (c) Prior to shipment of equipment, the Engineer reserves the right to inspect the equipment at the manufacturers' works and the Contractor shall provide and secure every reasonable access and facility at the manufacturers' works for such inspection by the Engineer.
- (d) Test Certificates and Reports: The Contractor shall submit manufacturer's type and routine test certificates and reports for each equipment and devices. Complete test results are to be submitted in clearly identified and organized booklets, indicating item of equipment, make, model, type, date of tests, type of tests, descriptions and procedures. Test reports shall also include the Quality Assurance Certification, the standards to which the equipment comply, and the standards to which the equipment was tested.

2.5.3 Sequence of Tests

The sequence of tests shall comprise as appropriate the following:

- (a) type tests (if required);
- (b) factory acceptance tests (FAT) or works test;
- (c) installation tests;
- (d) partial acceptance tests (PAT)
- (e) functional tests;
- (f) integration tests;

- (g) dynamic tests;
- (h) system / sub-system acceptance tests (SAT);
- (i) tests on completion (integrated System tests); and
- (j) tests after completion (Trial Running).

2.5.4 Type Tests

- (a) Should the Contract include any equipment not previously type tested or Type tested more than three years ago, or not proven in service on Indian Railways for at least for 3 years, or are of modified design, the Contractor shall undertake Type testing of the unit to the satisfaction of the Engineer. Prior to its production and supply.
- (b) Type testing and its approval shall be used to confirm that the proposed equipment or component complies with the design criteria specified and meets the requirements of the Contract, before taking up its manufacture and supply.
- (c) Type Test may not be required in those cases where the contractor can produce certified evidence that the required type tests have been performed successfully on identical equipment of the same design and identical or higher capacity and produced in the factory where the equipment to be supplied under the contract is to be manufactured, provided the type test(s) have been carried out and witnessed by reputed test agency within three years from the date of opening of the tender. The final decision regarding applicability and acceptance of the type test certificate produced shall rest with the Engineer.
- (d) Short circuit test on Traction Transformers and Auto Transformers
- (e) Type test shall be witnessed by an independent accredited testing agency any other individual as required by the Engineer.

2.5.5 Factory Acceptance Test (FAT)

- (a) Works Tests shall include but not be limited to:
 - Physical inspection;
 - Dimensional test
 - Calibration;
 - Output check;
 - Operational performance;
 - Full Load test;
 - Flash-over test;
 - Insulation test;
 - Soak test; and
 - Any other test required as per relevant standards or codes.
- (b) A Factory Test Plan shall be submitted for the Engineer's review within six (6) months from the Date for Commencement of the Works.
- (c) All materials, components, sub-assemblies, unit assemblies (including software, cables and wiring) shall be subject to testing and certification. Notification of these Tests shall be submitted to the Engineer four weeks (28 days) in advance of carrying out any Test. The FAT shall demonstrate that each equipment/sub-system meet its functional specification.

- (d) No equipment or software shall be delivered to the Site until the Contractor has demonstrated to the satisfaction of the Engineer that the equipment or software conforms to the specification by carrying out the FAT.
- (e) Where processor-based equipment is to be used, the Works Tests shall include also verification of software used in this application.

2.5.6 Samples for Testing

- (a) Samples that have been tested may be incorporated in the Works provided that:
 - the sample complies with the specified requirements;
 - the sample is not damaged;
 - the sample is not required to be retained under any other provision of the Contract; and
 - Consent of the Engineer has been obtained
- (b) Additional samples shall be provided for testing if in the opinion of the Engineer:
 - material previously tested no longer complies with the specified requirements; or
 - material has been handled or stored in such a manner that it may not comply with the specified requirements.
- (c) Unless agreed otherwise, all Tests shall be carried out by the Contractor in the presence of the Engineer.
- (d) Attendance on Tests, including that by Engineer / Employer, and the Contractor, shall be as laid down in the Quality Assurance procedures.

2.5.7 Installation Tests

- (a) Prerequisites for Installation: Prior to installation, the Contractor shall ensure that components / equipment delivered to Site has not been damaged in transit and ensure for their dimensional accuracy.
- (b) Inspection:
 - The inspection shall verify that equipment has been installed to the procedures and design that have been reviewed without objection by the Engineer and that equipment is correctly located and labeled.
 - The inspection shall verify that any false feed, temporary wiring and redundant items have been removed and that equipment is correctly protected against interference, damage and deterioration.
 - The Contractor shall maintain inspection records to demonstrate that each item of equipment has been inspected and found to be satisfactory, and attach to this record a detailed list of any discrepancies found and remedial work carried out.
 - As defects are rectified, these shall be recorded on the appropriate inspection record.
- (c) Site Installation Tests
 - The Contractor shall carry out installation tests for each sub-system following Installation but before Functional Testing to demonstrate that the installation has been carried out correctly and equipment is properly housed and fixed.

- During and on completion of installation, the Contractor shall undertake testing of all cables, wiring and equipment, instrumentation and protection devices including relays, in a progressive sequence and in accordance with the overall-testing program.
- These tests shall culminate in Functional Tests to verify the correct operation of all apparatus and, where appropriate, correct response to the respective control commands or monitored function.
- An inspection and visual verification of ratings and connections of equipment, instrument transformers and auxiliary circuits, installation tests shall be carried out.
- Stagger and Height: The stagger and height of contact wire over the entire section of completed overhead equipment and the clearance available shall be measured and the measurement shall be checked against approved drawings. These measurements shall be carried out at low speed with a vehicle or device to be arranged by the Purchaser, the movement of which will follow the track levels as closely as possible. Tolerances that will be permitted on the dimensions indicated in the approved drawings.
- Electrical Independence: The electrical independence of individual elementary sections in relation to one another shall also be tested with a merger.
- Switches: All isolators shall be tested for smooth and trouble-free operation.
- Tension Device: All automatic tensioning devices installed shall be tested for sensitive functioning and adjustment
- After installation of equipment, visual inspection and operational tests on un-energized equipment shall be carried out to check the following:
 - Cleanliness;
 - Workmanship;
 - Confirmation of items conforming to ratings specified;
 - Water and dust proofing;
 - Leveling, mounting and positioning;
 - Joints and connections tightness;
 - Cables – dressing, bending radii, jointing and finish at terminals;
 - Clearances and dimensions in conformity with drawings;
 - Earthing and bonding;
 - Functioning of circuit breakers, isolating switches and their interlocks;
 - Protection devices;
 - Phase sequence verification;
 - Conformance to as built records.
- Earth resistance measurements – individually and of the subsystem and system as required.
- Continuity Test and Contact Resistance: Continuity of all circuits shall be verified. Contact resistance of all high current joints and bolted contacts, especially the joints of 25 kV conductors and the running rails for return current shall be measured. Earth system joints shall also be measured.

- (d) Test Protocol for all site tests: For all tests on components and individual equipment, a site test protocol shall be proposed by the Contractor and approved by the Engineer based on which the requisite tests shall be carried out to prove the suitability of the component.
- (e) Partial Acceptance Tests (PAT)
- Installation work shall be completed and inspection records submitted to the Engineer for review before the commencement of each PAT.
 - The PAT Plan shall be submitted for the Engineer's review at least twelve weeks (84 days) before the commencement of each PAT.
 - These tests form part of on-site and System Acceptance Tests as part testing of the equipment and system.
 - i) Functional Tests and Interlock Tests
 - ii) All control and protection functions and electrical/mechanical interlocks shall be tested.
- (f) Functional Tests
- The functional tests of the PAT shall be carried out on installed equipment before system / sub-system acceptance tests (SAT) to demonstrate that the Section of the Works operates correctly in accordance with the Specifications.
 - The functional tests shall sequence through all required operations to prove that the system / sub-system performs in accordance with the Specification and that the local configuration data (for example, control tables) is correct.
 - Where necessary, input conditions shall be simulated.
 - The functional tests shall be specified and carried out by Contractor's personnel independent of design and installation.
- (g) Integration Tests
- Partial Acceptance Test (PAT) shall include integration tests to integrate the various sub-systems of the system and demonstrate correct operation of all internal and external interfaces.
 - Following satisfactory completion of these Tests, the Contractor shall prepare the installation for formal demonstration in the presence of the Engineer.
- (h) System Acceptance Tests (SAT)
- The Contractor shall prepare and organize a comprehensive programme of Tests to demonstrate to the Engineer that all systems, sub-systems and apparatus defined under the Contract, when installed, connected and configured as a complete system meet the specified performance requirements in all respects.
 - Prerequisites and requirements for SAT to be satisfied before the commencement of the system acceptance tests (SAT) shall be as follows:
 - All documentation for the system safety report shall be submitted to the Engineer for review;

- All PAT shall be completed and test records submitted to the Engineer for review;
- (i) The system acceptance tests for the Traction Electrification System shall include, but not be limited to, verification activities which demonstrate that the required criteria have been met for normal and credible emergency feed modes in respect of:
- The control of the electrification system;
 - Electrical sectioning;
 - System voltages and currents;
 - Accessible and touch voltages; and
- Integrated Tests with Employers Train Operator
 - Short Circuit Tests on OHE: Short Circuit Tests on 25kV overhead lines shall be carried out to prove correct operation of protection equipment and to ensure that the dynamic strength requirements of overhead equipment are met. Short Circuit Tests shall be carried out on every overhead equipment line feeder.
 - Traction Power Energization of a track shall be carried out progressively in stages. For the Energization of section in stages, sectional turn-on of 25 kV ac power may require putting up of temporary works e.g. cable diversion, additional earthing provision, etc. to ensure the safety of workers working in the adjacent non-energized area. Such work inclusive of sectional testing of traction power shall be deemed to be included in the Contract.
 - The OHE commissioning shall include as a minimum:
 - Visual inspection: This shall include check for accuracy of construction for ensuring that all the structures, equipment, insulators, jumpers and conductors have been erected as provided in approved Drawings and they are not damaged and remain in healthy state.
 - Dimensional Checks: This shall include dimensional checks to ensure the execution of permanent Works are within the limits of tolerance permitted so as to permit the current collection by locomotives to be satisfactory.
 - Final Physical Check: This shall validate as a minimum that all earths are removed, wires are present and in good condition, nothing is foul of the OHE and all insulators are undamaged and present and auto-tensioning devices are installed and are functional.
 - Clearance for Test Charging.
 - Section proving: This test shall be undertaken in each electrical section, to ensure that each electrical section can be successfully isolated from neighboring electrical sections and that the correct OHE alive indications are shown in the TSS control rooms and on the SCADA system.
 - Test Charging
 - Antitheft Charging

(j) Tests Prior to Commissioning of a section

- Short circuit test: Each electrical section shall be subject to minimum of two electrical short circuits, one at the remote end under normal feeding and one short circuit at using the extended feeding arrangements. This test shall confirm the mechanical integrity of the OHE and validate that the substation protection systems function correctly.
- For energization of OHE, interfacing is required with all TSS, SP, SSP etc., until all parties have issued a letter of no objection. Once all third-party letters of no objection have been received then the Contractor shall apply to the “Employer” to seek a letter of no objection to proceed with Energization of the electrical section.
- The Contractor shall interface with the Other Contractors to ensure that no downstream cables or other electrical equipment is energized before it has been tested and before other involved Contractor’s facilities are ready and secured.
- The Contractor’s responsibility for surveillance and security of the system shall remain in force for each part of the system until such a time that the Employer takes over the System.

(k) All the tests shall be conducted by the Contractor in the presence of the Engineer.

2.5.8 Records of Tests: Records of Tests carried out shall be kept by the Contractor and a report and all Test results shall be submitted to the Engineer no later than 14 days after completion of the Test, in addition to any other requirements, the report shall contain the following details:

- (a) material or part of the Works tested;
- (b) location of the part of the Works;
- (c) place of testing;
- (d) date and time of tests;
- (e) technical personnel supervising or carrying out the tests;
- (f) equipment used and method of testing with reference to the Specifications
- (g) readings and measurements taken during the tests;
- (h) test results, including any calculations and graphs;
- (i) specified acceptance criteria along with remarks whether the criteria have been met;
- (j) other details stated in the Contract or as required by the Engineer.

2.5.9 Integrated System Tests

- (a) Tests on Completion shall include Integrated Testing including the Work of Other Contractors. The Contractor shall, following satisfactory completion of tests on his works, equipment, sub-systems or system, perform, at the direction of the Engineer, programme of tests to verify and confirm the compatibility and complete performance of his works, equipment, sub-systems or system with the works, equipment, sub-systems or system provided by others.

- (b) The Contractor shall submit to the Engineer requirements and procedures, in respect of the Contractor's scope of work, for Integrated System Tests in conjunction with the Other Contractors to demonstrate that the complete system provided under the Contract is fully operational and meets the specified performance criteria.
- (c) Integrated Testing and Commissioning refers to those tests undertaken in order to demonstrate that the various components of the railway systems operate satisfactorily between one another and meet all specified requirements for design, operability, safety, and integration with other works and systems.
- (d) These tests shall be entirely within the requirements of one or more of the Project Contracts or they shall involve a multiplicity of Contract procedure. The final Integrated Testing and Commissioning shall be carried out after the SCADA system and OCC have become operational.
- (e) Those systems that can be tested without depending on the running of trains, such as SCADA system, etc. will have their integration tests scheduled to commence as early as possible. It is preferable that any interface problems associated with these "train less" system tests be identified and resolved prior to the commencement of test running.
- (f) Completion of Test Results: The results of the Integrated Testing and Commissioning shall be compiled and evaluated by the Engineer and the Contractor.
- (g) Retesting: If the Works, or a part thereof, or a Section, or a plant & equipment and manufactured items fail to pass the Integrated Testing and Commissioning, the Engineer shall require such failed Tests, to be repeated under the same terms and conditions. If such failure and retesting result from a default of the Contractor and cause the Employer to incur additional costs, the same shall be recoverable from the Contractor by the Employer, and may be deducted by the Employer from any monies due, or to become due, to the Contractor.
- (h) Failure to pass Test: If the Works, or a part thereof, or a Section, or a plant & equipment and manufactured item fail to pass Integrated Testing and Commissioning and the Contractor in consequence proposes to make any adjustment or modification to the Works or a part thereof, or a section, or the plant & equipment and manufactured item, the Engineer may, with the approval of the Employer, instruct the Contractor to carry out such adjustment or modification, at his own cost and to satisfy the requirements of Integrated Testing and Commissioning within such time as the Employer / Engineer may deem to be reasonable.
- (i) Statutory Requirements: The Contractor along with others shall carry out all statutory tests and trials, under the supervision of the Engineer, necessary for obtaining sanction of the competent authority, if required, for opening the Railway System.

2.5.10 Performance Verification

- (a) The Contractor shall carry out all Performance Tests to verify that the performance of the System meets the Employer's Requirements after the substantial completion of the works
- (b) For the Performance Tests which shall be carried out by the Contractor in conjunction with Other Contractors or relevant parties (e.g. Indian Railways).

- (c) Should the performance of the System deviate from the Particular Specification, the Contractor shall make every effort to rectify the deviation in the shortest possible time, and to the satisfaction of the Employer's Representative.

2.5.11 Trial Running and Commissioning

- (a) Following satisfactory completion of the acceptance Tests and the Integrated System Test the Employer will commence an extended period of trial running to prove all technical systems, to the satisfaction of the Engineer and Commissioner for Railway Safety or any other Authorized Official, and to allow all technical systems to settle and to train staff become conversant in working procedures.
- (b) The Contractor shall allow for attendance in respect of the Contractor's scope of work over the whole of this period, which may be expected to include maintenance and repair activities and also further opportunity for technical staff training

2.5.12 Overall Performance: The overall performance of the overhead equipment should be such as would permit collection of current by electric rolling stock with full load at speeds, up to and including the maximum specified for the design of overhead equipment, smoothly, without mechanical shocks or prejudicial sparks and without undue heating in the case of other equipment's.

2.5.13 Current Collection Testing

- a. Current Collection testing shall be done in accordance with RDSO specification (TI/SPC/OHE/OLIVIR/0051(01/2015) its latest version for Overhead-Line-Inspection-with Video-Recording-System. It focuses on detecting and analyzing electrical sparking which can lead to wear and tear of the contact wire. Recording and mapping (GPS data) of spark locations with OHE structures by utilizing the system.
- b. The criteria for measurement shall be loss of contact with measurable arcs lasting longer than 10ms (maximum 25ms) shall not occur more than once in 100m.
- c. All deficiencies observed during testing shall be attended by the Contractor.
- d. Contractor will make its own arrangement for testing setup required to carry out the testing and after completion, it will submit test report in accordance with the RSDO specification and hand over entire set to the Employer for further use.
- e. It focuses on detecting and analyzing electrical sparking (which can lead to wear and tear) in the contact line.
- f. The OLIVIR-G system detects sparks and records their locations.
- g. It stores captured images and provides software for analysis and report generation.
- h. The GPS mapping data for OHE features is utilized by the system.

PART II

Chapter-6

WIRING PROCEDURE

Wiring Procedure: This section deals with the wiring procedure which may be adopted for erection of normal overhead equipment.

The following procedure for erection of overhead equipment has been formulated with a view to ensure that:

- (i) Bracket assemblies (brackets) and regulating equipment are correctly installed in their final position.
- (ii) The conductors are correctly tensioned, and
- (iii) The need for final adjustments of overhead equipment immediately before energization and commissioning, is virtually eliminated.

A. Anti-Creep, Catenary & Contact Wires, Dropper Works and Installation of Counter Weight Assembly

1. Resources, Equipment & Manpower Requirement

1.1 Manpower:

- A. Section in charge (Responsible for other works in the section)– 1 No
- B. Site engineer / supervisor – 1 No
- C. Quality engineer / supervisor – 1 No
- D. Safety engineer / supervisor – 1 No
- E. P & M engineer / supervisor – 1 No (as and when required)
- F. Skilled workers – as per site requirement
- G. Unskilled workers – as per site requirement

Above manpower requirement is indicative. This may change as per the need of the hour at the time of actual execution of work.

1.2. Material:

1.2.1. For Anti –creep wire installation:

Materials enlisted in this section are generalized for utilization of all the process involved in the erection of anti-creep installation:

- A. Anti-creep wire (of length as per site measurement) – as per requirement
- B. Insulator (9 –tonne) – As per approved drawing
- C. Counter weight assembly (as per approved drawing) – as per requirement
- D. Various fittings (as per approved drawing) (certain fittings listed below)– as per requirement
 - D.1. Single clevis
 - D.2. 9 – tonne adjuster
 - D.3. End fittings for anti-creep wire
 - D.4. Suspension clamp for anti-creep wire
- E. Fasteners (of various sizes) (as per approved drawing) – as per requirement

1.2.2. For Stringing of OHE (Contact & Catenary):

Materials enlisted in this section are generalized for utilization of all the process involved in stringing of OHE (Catenary and contact):

- A. Catenary and contact – of tension length as per approved drawing
- B. Regulating equipment (either five pulley or three pulley) (as per approved drawing) – 2 nos per tension length
- C. Insulator (9 –tonne) – As per approved drawing
- D. Various fittings (as per approved drawing) (certain fittings listed below)– as per requirement
 - D.1. 9 – tonne adjuster
 - D.2. Equalizing plate
 - D.3. End fittings for catenary and contact wire
 - D.4. Suspension clamp for catenary wire
- E. Fasteners (of various sizes) (as per approved drawing) – as per requirement
- F. Assembled Dropper wire with clips (of various sizes as per dropper schedule) – as per requirement

1.2.3. For counter – weight erection:

Materials enlisted in this section are generalized for utilization of all the process involved in the erection of counter weight assembly:

- A. Insulator (9 –tonne) – As per approved drawing
- B. Counter weight assembly (as per approved drawing) – as per requirement

- C. Stain less steel wire rope – as per requirement
- D. Various fittings (as per approved drawing) (certain fittings listed below)– as per requirement
 - D.1. 9 – tonne adjuster
 - D.2. Counter weight eye rod
- E. Fasteners (of various sizes) (as per approved drawing) – as per requirement

1.2.4. For Droppering:

Materials enlisted in this section are generalized for utilization of all the process involved in Droppering work:

- A. Fasteners (of various sizes) (as per approved drawing) – as per requirement
- B. Assembled Dropper wire with clips (of various sizes as per dropper schedule) – as per requirement

1.3. Equipment / Tools & Plant:**1.3.1. For Anti –creep wire installation:**

- a. Rope (20mm) – 6 set
- b. Hack saw frame with blade/ wire cutter– 2 nos.
- c. Measuring tape-5m/15m
- d. Spanner set (both double end and ring) (of various sizes) – as required
- e. Pulley (Single sleeve and double sleeve) –as required

1.3.2. For Stringing of OHE (Contact & Catenary):

- a. Wiring train – 1 No.
- b. UTV / Drive unit - 1 No.
- c. Working platform – 1No.
- d. Hook – chook (Turfor) [of capacity 1.5 Ton & 3 Ton] – 2 nos. each
- e. Come along clamp (for contact and catenary) – 3 set each
- f. Roller -100 Nos.
- g. Rope (20mm) – 6 set
- h. S – hook – 100 Nos.
- i. Special Discharge Rod – 2 set (required only working nearby electrified line)
- j. Dynamometer for measuring tension equipment (of 5 M.T capacity) – 1 no.
- k. 3 Ton capacity D shackle- 6 nos.
- l. 16 mm dia Slings (1.5, 3 & 6 meters long)-6 nos.
- m. 2 lb hammer – 2 nos.

- n. Hack saw frame with blade/ wire cutter– 2 nos.
- o. Measuring tape-5m/15m
- p. Spanner set (both double end and ring) (of various sizes) – as required
- q. Tommy rod – 2 nos.
- r. Pulley (Single sleeve and double sleeve) –as required

1.3.3. For counter – weight erection:

- a. Hook – chook (Turfor) [of capacity 1.5 Ton & 3 Ton] – 2 nos. each
- b. Roller -100 Nos.
- c. Rope (20mm) – 6 set
- d. Dynamometer for measuring tension equipment (of 5 M.T capacity) – 1 no.
- e. 3 Ton capacity D shackle- 6 nos.
- f. 16 mm dia Slings (1.5, 3 & 6 meters long)-6 nos.
- g. 2 lb hammer – 2 nos.
- h. Hack saw frame with blade/ wire cutter– 2 nos.
- i. Measuring tape-5m/15m
- j. Spanner set (both double end and ring)(of various sizes) – as required
- k. Pulley (Single sleeve and double sleeve) –as required

1.3.4. For Droppering:

- a. Working platform – 1No.
- b. Measuring tape-5m/15m
- c. Spanner set (both double end and ring)(of various sizes) – as required

2. Procedure for erection of anti-creep:

- 1.1 Measure the span length of the anti-creep location and cut the anti- creep wire in line with measurement.
- 1.2 Erection of guy rod & anchor SPS and erection of guy rod shall be carried out in line with method statement for SPS & bracket erection - Document No. DOC/EMP-4/QAQC/MS/282.
- 1.3 After ensuring the erection of required SPS and guy rod, fix the end fitting with the anti – creep wire.
- 1.4 Fix the required fittings (like single clevis and adjuster) to support anti-creep and 9 – tone insulator on the pre-erected mast anchor fitting. After fixing fittings and insulator, fix the end fitting of anti- creep wire with insulator.
- 1.5 Otherwise, fix the all required fittings and insulator on the anti-creep wire itself before fixing the same on the pre-erected mast anchor fittings.
- 1.6 Lift the anti-creep wire using rope and pulley assembly and fix the same at mast anchor fittings.
- 1.7 At anti – creep center location, fix the double suspension clamp on the cantilever / bracket.

- 1.8 Lift the wire using rope and pulley assembly and fix the same through pre-fixed double suspension clamp.
- 1.9 Fix the anti-creep wire at other end in the same manner.

3. Procedure for stringing of OHE (catenary and contact):

3.1 General requirement for stringing of OHE (Catenary & Contact):

- 3.1.1. Coordinate with the other contractors (civil & track and systems) for maneuvering of RRV on the track for removal of hindrances on the track for work section.
- 3.1.2. Working permit and permit to maneuver wiring kit and working platform on the track shall be ensured prior to maneuvering of the equipment.
- 3.1.3. Load the drum of required tension length with tolerances (as required) in accordance with approved LOP on the wiring kit.
- 3.1.4. Conformity checking shall be carried out to ensure all required materials (Regulating equipment, fittings, fasteners, ending clamping and others) and tools & tackles (as per clause 6 of this document) loaded.
- 3.1.5. The entire tension length under stringing shall be verified for completion of guy rods at termination locations and cantilever / bracket assemblies at all locations and anti-creep.

3.2 Loading and unloading of drums:

- 3.2.1. Drum shall be lifted gradually from the stocked position or from ground using crane.
- 3.2.2. Conductor drum shall be loaded into spindle arrangement of the carrier.
- 3.2.3. Drum should be locked in its position rigidly on spindle using the locking arrangement provided on the carrier.
- 3.2.4. While unloading, the drum shall be gradually removed from the spindle and stocked at designated position / moving carrier.
- 3.2.5. While loading and unloading drum shall not be allowed to swing, the movement of drum should be controlled through guide rope.

3.3 Procedure for stringing of OHE (Catenary & Contact):

3.3.1. Loading of conductors at wiring train:

- 3.3.1.1. Loading and placing of the drum at wiring train shall be carried out any of the option mentioned in the OEM's recommendation as shown in the pic-1.

- 3.3.1.2. After loading of the conductor drums (catenary and contact), the conductor shall be routed through the tensioning unit in line with OEM's recommendations.
- 3.3.1.3. From the tensioning unit the conductors shall be guided through the guide mast with required gap between two conductors.
- 3.3.1.4. During all these stages, adequate care should be ensured to avoid damages to the conductors.

3.3.2. Erection of termination assembly:

- 3.3.2.1. Termination of the conductors (catenary and contact) shall be carried out as shown in the drawing.
- 3.3.2.2. Termination of the conductors shall be started with auto tensioning device followed by other fittings and insulators (pre-assembled).
- 3.3.2.3. By using the suitable fasteners, the termination assembly shall be fixed properly.

3.3.3. Stringing of OHE conductors:

- 3.3.3.1. Prior to the commencement of stringing of conductors, end fittings / clamps for both catenary and contact wire shall be provided.
 - a. Conductor shall be sleeve of the end fitting and tightened using suitable spanner.
 - b. End fitting shall start self- grip with conductor when the tension acts on it.
 - c. While fixing the end fittings / clamp, it should be ensured that strands of conductor remain undisturbed and must not split.
- 3.3.3.2. After providing end fitting / clamp on the conductor properly, fix the conductors at pre-erected termination assembly.
- 3.3.3.3. Wiring kit (comprising drive unit and wagon with drums & guide mast) shall maneuvered in such way conductors uncoiled in opposite direction. Conductor length of minimum 3 to 4 spans shall be uncoiled before fixing conductors at cantilever fixed at first location.
- 3.3.3.4. It should be ensured that no tension is applied at conductors till fixing them at cantilever at first / initial location of the tension length.
- 3.3.3.5. Maneuver the working platform to the first location of the tension length and fix the roller of size suitable to accommodate the catenary wire at catenary suspension position.
- 3.3.3.6. Carefully lift the catenary wire and place the same at the roller.

- 3.3.3.7. Provide S – hook from catenary to support contact wire.
- 3.3.3.8. After completion of placing catenary and supporting contact, required tension shall be applied on the conductors (i.e. 1200 kgf on each conductor).
- 3.3.3.9. Fixing of the catenary and contact at other locations in the tension length shall be completed in the same manner.
- 3.3.3.10. Contact wire shall be supported by catenary using S- hook between span at regular intervals.

3.3.4. Termination of the conductor at the end of the tension length:

- 3.3.4.1. At the end of the tension length, erect the termination assembly kit (including ATD, insulator and other required fittings) as mentioned in clause 7.3.2 of this method statement.
- 3.3.4.2. Fix the come along clamp of the suitable size on both conductors.
- 3.3.4.3. Connect the come along clamp with hook – chook (turfor) and apply load gradually till reaching the required load.
- 3.3.4.4. Measure the length of the conductor required and mark the same on the conductors.
- 3.3.4.5. After transferring the load to the hook – chook (turfor) and marking the length of the conductor's release / remove the tension applied in the tensioner of the wiring train.
- 3.3.4.6. Cut the remaining length of the conductor and recoil the same.
- 3.3.4.7. Provide end fittings on the conductors as per clause no 7.3.3.1(a) & (b) of this method statement.
- 3.3.4.8. Fix the conductors at termination arrangement.
- 3.3.4.9. After properly fixing the conductor at the termination arrangement, gradually remove the load on the hook – chook.

4. Procedure for erection of counter-weight assembly:

- 4.1 Assemble the counter weights as per requirement by duly providing counter weight eye rod as shown in the drawing.
- 4.2 Fix the 9 – ton adjuster and stainless-steel wire rope as shown in the assembly drawing.
- 4.3 Lift the assembled counter weight with help of hook – chook (tirfor) of adequate lifting capacity.
- 4.4 Fix the SS wire rope on the pre-erected regulating equipment and ensure the sequential routing of the SS wire rope on the regulating equipment as per assembly drawing.
- 4.5 Arrest the movement of the counter weight assembly by using binding rope.

5. procedure for Droppering:**5.1. Dropper fabrication:**

- 5.1.1. Dropper fabrication shall be carried out in accordance with dropper schedule.
- 5.1.2. Fabrication of dropper shall be carried out by cutting dropper wire to the required length and crimping the dropper clips with the dropper wire.
- 5.1.3. During fabrication of dropper, it shall be ensured that projection of the dropper wire shall be maintained as shown in the approved drawing.
- 5.1.4. After fabrication of dropper, labelling shall be done by duly mentioning span length and type of dropper in accordance with approved dropper schedule and LOP.

5.2. Dropper installation / fixing:

- 5.2.1. Verification of the received dropper from the stores in accordance with dropper schedule and approved drawing.
- 5.2.2. Mark the dropper distance on the rail in accordance with span and dropper schedule.
- 5.2.3. Maneuver the working platform to the first cantilever / bracket of the span.
- 5.2.4. Fix the steady arm and anti-wind clamp (in accordance with approved drawing) on the cantilever.
- 5.2.5. Move the working platform to marked point of dropper fixing and fix the dropper on catenary and contact wires using suitable fasteners.
- 5.2.6. Complete the fixing of the dropper for entire span in same manner.

6. Quality assurance and quality control:**6.1. For erection of anti-creep wire:**

- 6.1.1. Length of the anti-creep wire shall be adequate enough as per approved drawing.
- 6.1.2. During cutting, wire should not damage and strands of the wire should not get separated.
- 6.1.3. During erection, termination of the wire at both ends and suspension of wire at anti-creep center shall be verified for correctness.
- 6.1.4. Sag on the wire shall be verified and maintained adequately.

6.2. For OHE stringing:**6.2.1. Prior to commencement of stringing of OHE:**

- i. Conductors & their related accessories/fittings to be installed shall be verified for the physical damage during transit or handling.
- ii. In case of any non-rectifiable damage, that material shall not be used.

6.2.2. During stringing of OHE:

- i. Wherever needed, the termination accessories/fittings shall to be assembled with various parts / components preferably at ground level.
- ii. End fittings/accessories shall be rigidly fixed at their respective positions.

6.2.3. After completion of stringing of OHE:

- i. Conductor position and orientation shall be verified as per approved drawing.
- ii. Rigid fixing of end fittings/accessories shall be ensured.
- iii. Interconnection between all the components shall be verified in line with approved drawing.

6.3. For Erection of counter weight:

- 6.3.1. Counter weight assembly should be made as per approved drawing.
- 6.3.2. All the fittings and stainless-steel wire rope shall be connected as per approved drawing.
- 6.3.3. Routing of SS wire rope on the regulating equipment shall be sequential as shown in the drawing.
- 6.3.4. Strands of the SS wire rope should not get damage during routing / installation.

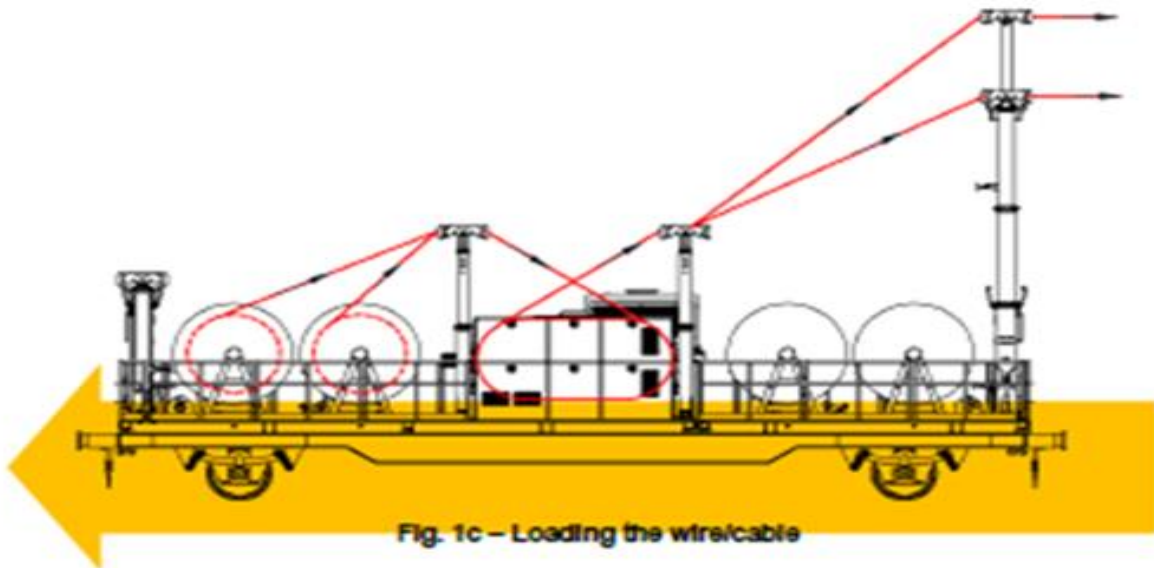


Fig. 1c – Loading the wire/cable

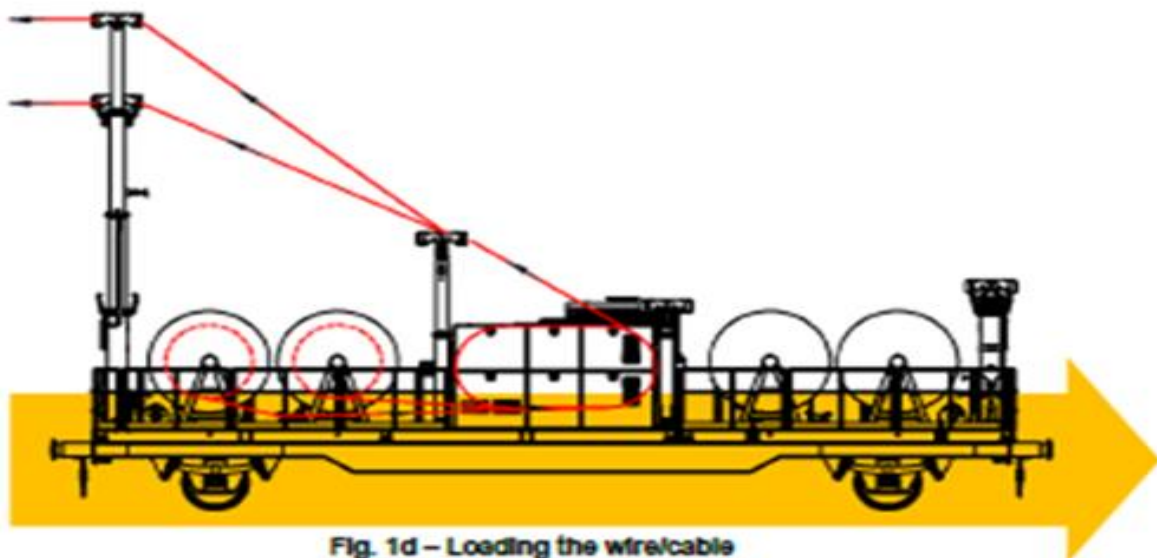
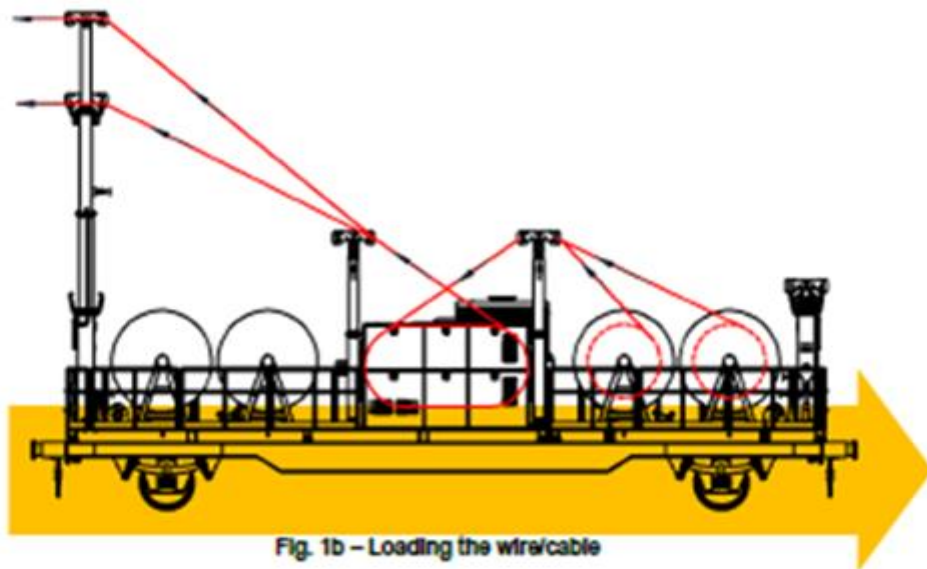
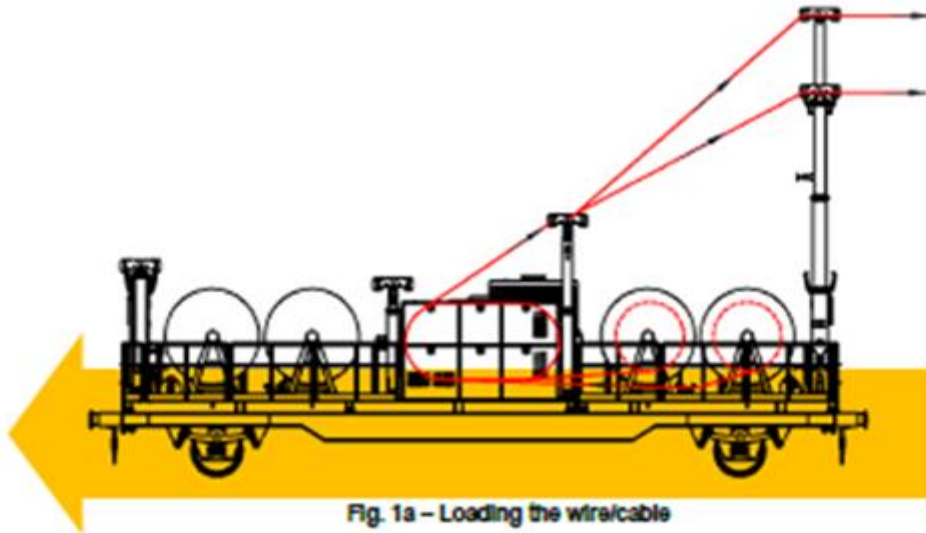
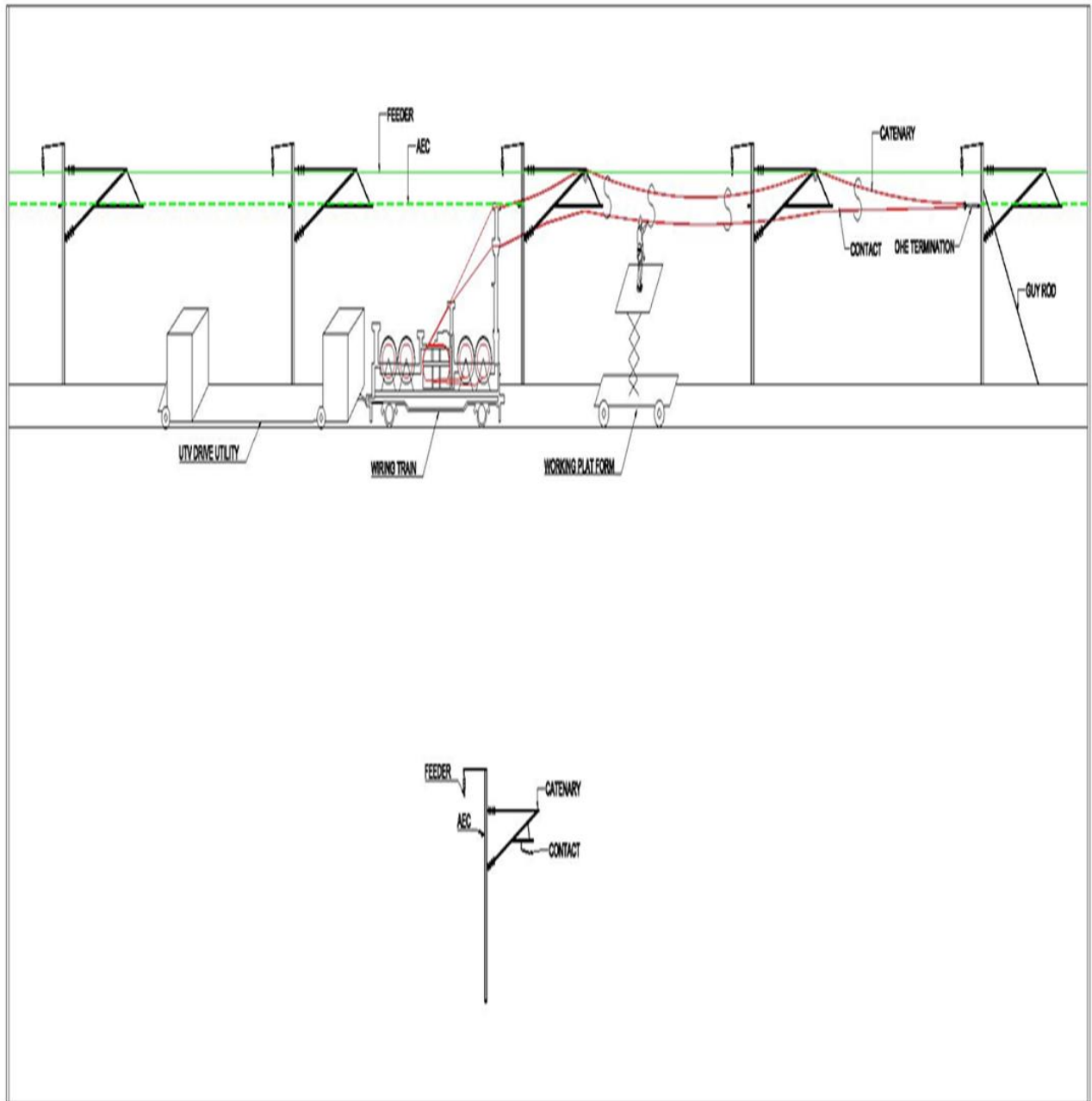


Fig. 1d – Loading the wire/cable

LOADING THE CONDUCTOR





6.4 For installation of dropper:

- 6.4.1 Correctness of the droppers for the particular span shall be verified prior to commencement of the installation.
- 6.4.2 Marking of the distances shall be as per approved dropper schedule in accordance with span length.
- 6.4.3 Steady arm shall be installed / erected on the cantilever prior to installation of the droppers.

B. Aerial Earth Conductor (AEC) & Feeder Wires**1. Resources, Equipment & Manpower Requirement:****1.1. Manpower (for each activity):**

- A. Construction manager (Common position responsible for other works also) – 1 No
- B. Site engineer / supervisor -1 No
- C. Quality engineer / supervisor – 1 No
- D. Safety engineer / supervisor – 1 No
- E. P & M engineer / supervisor – 1 No
- F. Skilled workers – as per site requirement – 4 Nos
- G. Un skilled workers – as per site requirement – 9-12 Nos

Above manpower requirement is indicative. This may change as per the needs of the hour at the time of actual execution of work.

1.2. Material:

- A. Small Part Steel (SPS) (as per approved drawing) - as per requirement
- B. GI Fasteners (as mentioned in the approved drawing) – as per requirement
- C. Guy Rod Assembly – as per requirement
- D. Mast Anchor Fitting and Guy Rod Fitting – as per requirement
- E. End Clamps – as per requirement
- F. AEC Mast Clamps– as per requirement
- G. 9 Ton Suspension / Termination insulator – as per requirement
- H. Feeder Suspension Clamps – as per requirement
- I. Al Tape and ferrules – as per requirement
- J. AEC and Feeder Conductor Drums – as per requirement

Note: Quantity of other required material mentioned as “as per requirement” shall be calculated from approved GFC drawing.

1.3. Equipment and tools & tackles:

The following tools and tackles will be used for AEC / feeder wire stringing work:

- A. RRV (Rail cum road vehicle) – 2 Nos.
- B. Rail based man lift (scissor lift) - 2 nos.
- C. Conductor Drum Rail Trolley—2 Nos.
- D. Hook – chook [of capacity 1.5 Ton & 3 Ton] – 2 nos. each
- E. Come along clamp (for AEC & Feeder each) – 3 set each
- F. Roller -100 Nos.
- G. Rope (20mm) – 6 set
- H. Aluminum ladder- 4 Nos. with 13.4 mtrs folding type heavy duty.
- I. Special Discharge Rod – 2 set (required only working nearby electrified line)
- J. Binding Wire – 2 bundle
- K. Dynamometer for measuring tension equipment (of 5 M.T capacity) – 1 no.
- L. 3 Ton capacity D shackle- 6 nos.
- M. 16 mm dia Slings (1.5, 3 & 6 meters long)-6 nos.
- N. 2 lb hammer – 2 nos.
- O. Hack saw frame with blade/ wire cutter– 2 nos.
- P. Measuring tape-5m/15m
- Q. Spanner set (both double end and ring)(of various sizes) – as required
- R. Tommy rod – 2 nos.
- S. Pulley (Single sleeve and double sleeve) –as required
- T. Drum with spindle arrangement with jack set (5-ton capacity for each trolley) – 2 nos.

Above list of equipment is indicative. This may change as per the site requirement during actual execution of work or new innovative plant & machinery may be used in-order to obtain faster project execution in a better and efficient way.

2.1. General requirement for stringing of AEC and Feeder wire:

- 2.1.1. Check the working condition of the RRV and conductor drum trolley arrangement before proceeding to work section.
- 2.1.2. Coordinate with the other contractors (civil & track and systems) for maneuvering of RRV on the track for removal of hindrances on the track for work section.
- 2.1.3. Working permit and permit to maneuver RRV on the track shall be ensured prior to maneuvering of the equipment.
- 2.1.4. Prior to proceeding for stringing of AEC, installation of required mast anchor & guyrod fitting and guy rod at both sides of the termination locations shall be ensured. In case earth clamp erected prior to stringing, the same also to be confirmed.

- 2.1.5. Load the drum of required tension with tolerances (as required) in accordance with approved LOP on the RRV or trolley.
- 2.1.6. Details of conductor drum like drum number, conductor length shall be noted.
- 2.1.7. Conformity checking shall be carried out to ensure all required materials (fittings, fasteners, ending clamping and others) and tools & tackles loaded.

2.2. Loading and unloading of drums (for both AEC & Feeder wire):

Irrespective of carrier (trolley with jack- set, RRV or wiring train) following procedure shall be adopted during load and unloading of the conductor drums.

- 2.2.1 Drum shall be lifted gradually from the stocked position or from ground using crane.
- 2.2.2 Conductor drum shall be loaded into spindle arrangement of the carrier (trolley with jack-set, RRV or wiring train).
- 2.2.3 Drum should be locked in its position rigidly on spindle using the locking arrangement provided on the carrier.
- 2.2.4. While unloading, the drum shall be gradually removed from the spindle and stocked at designated position.
- 2.2.5. While loading and unloading drum shall not be allowed to swing, the movement of drum should be controlled through guide rope.

3. Work procedure for Aerial Earth conductor (AEC):

3.1. Erection of anchor SPS for AEC:

- 3.1.1. At termination location of Aerial Earth Conductor (AEC), anchor SPS and guy rod SPS along with guy rod shall be erect in accordance with details provided in the approved drawing.
- 3.1.2. Erection of anchor and guy rod SPS shall be carried out either using rope and pulley assembly or using rail – road-based man lift.
- 3.1.3. In case of SPS erection using rope and pulley assembly following procedures shall be adopted:
 - 3.1.3.1. Shift the suitable type of SPS in accordance with type of mast at termination location prior to erection along with all required fasteners.
 - 3.1.3.2. Assemble the ladder on the mast and fix the pulley at an appropriate position to lift the SPS.
 - 3.1.3.3. Mark the position of anchor and guy rod SPS as per approved drawing from rail level on the mast.
 - 3.1.3.4. Gradually lift the SPS using rope to the marked position through pulley.

3.1.3.5. Fix the SPS and tighten the fasteners with required torque.

3.1.4. In case of SPS erection using rail – road-based man lift (scissor lift) , following procedures shall be adopted:

3.1.4.1. Maneuver the vehicle to the location where SPS need to be erected along with required SPS for that location on the man lift bucket.

3.1.4.2. Mark the position of anchor and guy rod SPS as per approved drawing from rail level on the mast.

3.1.4.3. Fix the SPS at marked location and ensure the proper tightening the fasteners with required torque.

3.2. Erection of Guy rod at AEC termination locations:

3.2.1. Straighten the guy rod properly with no indications of bend (not necessary at dwarf mast locations).

3.2.2. Fix the guy rod on the pre-erected SPS and tighten the fasteners, at other end of the guyrod fix the anchor “V” bolt and stirrup assembly and complete the connection of guyrod through this assembly tighten the same with 24 mm bolt.

3.2.3. Guy rod on the other side shall erected in the same manner/ method.

3.2.4. In case of short guy rod (Dwarf mast locations), fixing of guy rod at mast side shall be carried out through designated SPS (dwarf mast attachment) and anchor bolt assembly.

3.3. Stringing of Aerial Earth Conductor (AEC):

3.3.1. Requirements prior to commencement of stringing:

3.3.1.1. Completion of installation Small parts of steel (SPS) at termination locations shall be confirmed.

3.3.1.2. Completion of installation of guyrod at termination location shall be confirmed.

3.3.1.3. Tension length of conductor drum shall be confirmed.

3.3.1.4. Ensure the line block (if required) is granted in prescribed format from DFCC/Railways representative.

3.3.2. Stringing of AEC from country side:

Stringing of Aerial Earth Conductor (AEC) shall be carried out using any of the following methods. The method of stringing shall be on the bases of availability of work front, site conditions and availability of machineries:

1. Stringing of AEC using jack set and ladder (manually)
2. Stringing of AEC using Rail cum road vehicle (RRV)

3.3.2.1. Stringing of AEC using jack set and ladder (manually):

- a. Place the jack set firmly on the ground on one side of the termination. Place the conductor drum on the jack set with support of rigid pipe in the jack set. Ensure that drum on rotating condition.
- b. Uncoil the conductor from the drum manually gradually and drag the conductor manually towards the other (one/starting) end of the termination.
- c. After reaching the termination end, lift the conductor using rope and pulley assembly till the termination point marked on the mast.
- d. Complete the termination of the conductor as per approved drawing.
- e. Lift the conductor at every mast using the rope and pulley arrangement and fix the conductor on the mast using binding wire, rope or roller fixed on the mast.
- f. Complete the stringing of the conductor for entire tension length using the same procedure.
- g. At the (other) termination end, mark the required length of the conductor and cut the remaining from the drum.
- h. Termination of the AEC shall be carried out as per procedure explained in clause 8.3.4 of this document.
- i. Ensure the verticality of the mast after releasing the hook – chook (tirfor).
- j. Remove the binding wire, rope or roller and fix the earth clamp and transfer the conductor to the earth clamp.

3.3.2.2. Stringing of AEC using rail cum road vehicle (RRV):

- a. After completion of termination of conductor at one end of the tension length, uniformly move the RRV with conductor drum towards other end of the tension length.
- b. Conductor uncoiled from the drum shall be lift to the position of fixing of AEC through either crane or high mast fitted in the RRV.
- c. Termination of the AEC shall be carried out as per procedure explained in clause 8.3.4 of this document.
- d. After completion of termination, ensure verticality of the mast.

- e. Remove the binding wire, rope or roller and fix the earth clamp and transfer the conductor to the earth clamp.

3.3.3. Stringing of AEC from track side:

Stringing of Aerial Earth Conductor (AEC) shall be carried out using any of the following methods. The method of stringing shall be on the bases of availability of work front, site conditions and availability of machineries:

- a) Stringing of AEC using push trolley and ladder trolley (manually)
- b) Stringing of AEC using RRV and working platform
- c) Stringing of AEC using wiring train and working platform

3.3.3.2. Stringing of AEC using push trolley and ladder trolley (manually)

- a. After obtaining required permit to move on the track, maneuver the push trolley with jack set in which drum loaded and ladder trolley on the track on the working track (either up or down).
- b. Commence the stringing of AEC by terminating one end at pre-erected anchor fittings. Termination arrangement shall be as approved drawing (LOP).
- c. Uncoil the conductor from drum and lay the conductor over the pre-laid wooden rollers (in a span of 25 meters) to avoid damaging of conductor.
- d. Maneuver the push trolley and ladder trolley in a uniform speed while uncoiling the conductor gradually from the drum.
- e. Place the aluminum ladder near the mast where AEC to be installed along with pulley and rope arrangement.
- f. Lift the laid conductor using pulley and rope assembly through the ladder and transfer the conductor to the other side of the mast (from track side to country side) manually.
- g. Support the AEC at country side using any one among binding wire or rope or roller fixed on the mast.
- h. Continue the stringing of AEC in the similar process till reaching other end of the termination.
- i. Termination of the AEC shall be carried out as per procedure explained in clause 8.3.4 of this document.
- j. After completion of termination, ensure verticality of the mast.
- k. In case stringing carried out on the rollers, change the rollers and erect earth conductor clamp.

- l. After completion close down the work advice the workmen to keep all tools and material in the safe place and also get down from Deck/heavy ladders.
- m. Ensure the strands of conductor not damaged during the stringing.
- n. After the completion of stringing record, the balance length of conductor and seal the end of the conductor.

3.3.3.3. Stringing of AEC using RRV and working platform:

- a. After obtaining required permit to move on the track, maneuver the RRV with conductor drum and rail- road based working platform on the working track (either up or down).
- b. Commence the stringing of AEC by terminating one end at pre-erected anchor fittings. Termination arrangement shall be as approved drawing (LOP).
- c. Uncoil the conductor from drum and shall be lifted to require height using either crane fixed at the RRV or high mast fixed at the RRV, the conductor shall be controlled through rope – pulley assembly fitted at the rail based working platform following the RRV.
- d. Transfer the conductor through the other side of the mast (from track side to country side) manually using rope – pulley assembly.
- e. Support the AEC at country side using any one among binding wire or rope or roller fixed on the mast.
- f. Maneuver the RRV or ladder trolley in a uniform speed while uncoiling the conductor gradually from the drum.
- g. Continue the stringing of AEC in the similar process till reaching other end of the termination.
- h. Termination of the AEC shall be carried out as per procedure explained in clause 8.3.4 of this document.
- i. After completion of termination, ensure verticality of the mast.
- j. After completion close down the work advice the workmen to keep all tools and material in the safe place and also get down from Deck/heavy ladders.
- k. Ensure the strands of conductor not damaged during the stringing.
- l. After the completion of stringing record, the balance length of conductor and seal the end of the conductor.

3.3.3.4. Stringing of AEC using wiring train and working platform

- a. The procedure for the stringing AEC using wiring train shall remain same of procedure explained in stringing AEC using RRV (clause 8.3.2.2 of this method statement).
- b. The conductor shall be uncoiled from the drum loaded on the wiring train through the flexible / adjustable mast fitted on the wiring train.

3.3.4. Termination of AEC wire:

- 3.3.4.1. Fix the “come along clamp” on the conductor and gradually apply load on the conductor using hook chook (tirfor) till achieving required load.
- 3.3.4.2. Apply the load steadily with Tirfor, until the dynamometer reaches the desired tension as required from tension chart (Annexure – A)
- 3.3.4.3. After achieving the required load and proper tension on the conductor, mark the termination point on the conductor and cut the remaining / excess conductor.
- 3.3.4.4. Fix the AEC ending clamp on the conductor and fix its rigidity. Terminate the conductor by fixing conductor with ending clamp on the pre-erected anchor SPS.
- 3.3.4.5. After properly terminating the conductor, gradually release the load on the hook-chook and remove the same once entire load is removed.

4. Stringing of feeder wire:

4.1. Erection of SPS for Feeder for feeder suspension and termination:

- 4.1.1. SPS for feeder suspension arrangement shall be erect at all locations (either cross arm with suspension arrangement or super mast with cross arm and suspension).
- 4.1.2. At termination location of Feeder wire, anchor SPS and guy rod SPS along with guy rod shall be erect in accordance with details provided in the approved drawing.
- 4.1.3. Erection of all feeder related SPS shall be carried out either using rope and pulley assembly or using rail – road-based man lift.
- 4.1.4. In case of SPS erection using rope and pulley assembly following procedures shall be adopted:
 - 4.1.4.1. Shift the suitable type of SPS in accordance with type of mast at termination location prior to erection along with all required fasteners.
 - 4.1.4.2. Assemble the ladder on the mast and fix the pulley at an appropriate position to lift the SPS.

4.1.4.3. Mark the position of anchor and guy rod SPS as per approved drawing from rail level on the mast.

4.1.4.4. Gradually lift the SPS using rope to the marked position through pulley.

4.1.4.5. Fix the SPS and tighten the fasteners with required torque.

4.1.5. In case of SPS erection using rail – road-based man lift, following procedures shall be adopted:

4.1.5.1. Maneuver the vehicle to the location where SPS need to be erected along with required SPS for that location on the man lift bucket.

4.1.5.2. Mark the position of anchor and guy rod SPS as per approved drawing from rail level on the mast.

4.1.5.3. Fix the SPS at marked location and ensure the proper tightening the fasteners with required torque.

4.2. Erection of Guy rod of at feeder termination locations:

4.2.1. Straighten the guy rod properly with no indications of bend (not necessary at dwarf mast locations).

4.2.2. Fix the guy rod on the pre-erected SPS and tighten the fasteners, at other end of the guy rod fix the anchor “V” bolt and stirrup assembly and complete the connection of guy rod through this assembly tighten the same with 24 mm bolt.

4.2.3. Guy rod on the other side shall erected in the same manner/ method.

4.2.4. In case of short guy rod (Dwarf mast locations), fixing of guy rod at mast side shall be carried out through designated SPS (dwarf mast attachment) and anchor bolt assembly.

4.3. Stringing of Feeder wire:

4.3.1. Requirements prior to commencement of stringing:

4.3.1.1. Completion of installation of suspension arrangement (SPS) with suspension insulator and anchor & guy rod SPS at termination locations shall be confirmed.

4.3.1.2. Completion of installation of guy rod at termination location shall be confirmed.

4.3.1.3. Tension length of conductor drum shall be confirmed.

4.3.1.4. Ensure the line block (if required) is granted in prescribed format from DFCC/Railways representative.

1.1.1. Stringing of Feeder wire from country side:

Stringing of Feeder wire shall be carried out using any of the following methods. The method of stringing shall be on the bases of availability of work front, site conditions and availability of machineries. However, this method of stringing may not be feasible for the tension lengths in which feeder wire crosses to track side from country side or vice versa.

1. Stringing of feeder using jack set and ladder (manually)
2. Stringing of feeder using Rail cum road vehicle (RRV)

1.1.1.1. Stringing of Feeder wire using jack set and ladder (manually):

- a. Place the jack set firmly on the ground on one side of the termination. Place the conductor drum on the jack set with support of rigid pipe in the jack set. Ensure that drum on rotating condition.
- b. Uncoil the conductor from the drum manually gradually and drag the conductor manually towards the other (one) end of the termination.
- c. After reaching the termination end, lift the conductor using rope and pulley assembly till the termination point marked on the mast.
- d. Complete the termination of the conductor as per approved drawing.
- e. Lift the conductor at every mast using the rope and pulley arrangement and fix the conductor on the mast using binding wire, rope or roller fixed on the mast.
- f. Complete the stringing of the conductor for entire tension length using the same procedure.
- g. Termination of the AEC shall be carried out as per procedure explained in clause 9.3.4 of this document.
- h. Ensure the verticality of the mast after releasing the hook – chook (tirfor).
- i. Remove the binding wire, rope or roller and fix the suspension clamp and transfer the conductor to the Suspension clamp.

1.1.1.2. Stringing of Feeder wire using rail cum road based vehicle (RRV):

- a. After completion of termination of conductor at one end of the tension length, uniformly move the RRV with conductor drum towards other end of the tension length.
- b. Conductor uncoiled from the drum shall be lift to the position of fixing of Feeder wire through either crane or high mast fitted in the RRV.
- c. Fix the conductor on the mast using binding wire, rope or roller fixed on the mast.

- d. Termination of the AEC shall be carried out as per procedure explained in clause 9.3.4 of this document.
- e. Ensure the verticality of the mast after releasing the hook – chook (tirfor).
- f. Remove the binding wire, rope or roller and fix the suspension clamp and transfer the conductor to the suspension clamp.

1.1.2. Stringing of Feeder wire from track side:

Stringing of Feeder wire shall be carried out using any of the following methods. The method of stringing shall be on the bases of availability of work front, site conditions and availability of machineries:

- a) Stringing of Feeder wire using push trolley and ladder trolley (manually)
- b) Stringing of Feeder wire using RRV and working platform
- c) Stringing of Feeder wire using wiring train and working platform

1.1.2.2. Stringing of Feeder wire using push trolley and ladder trolley (manually)

- a. After obtaining required permit to move on the track, maneuver the push trolley with jack set in which drum loaded and ladder trolley on the track on the working track (either up or down).
- b. Commence the stringing of Feeder wire by terminating one end at pre-erected anchor fittings. Termination arrangement shall be as approved drawing (LOP).
- c. Uncoil the conductor from drum and lay the conductor over the pre-laid wooden rollers (in a span of 25 meters) to avoid damaging of conductor.
- d. Maneuver the push trolley and ladder trolley in a uniform speed while uncoiling the conductor gradually from the drum.
- e. Place the aluminum ladder near the mast where Feeder wire to be installed along with pulley and rope arrangement.
- f. Lift the laid conductor using pulley and rope assembly through the ladder and transfer the conductor to the other side of the mast (from track side to country side) manually.
- g. Support the Feeder wire at country side using any one among binding wire or rope or roller fixed on the mast.
- h. Continue the stringing of Feeder wire in the similar process till reaching other end of the termination.
- i. Termination of the AEC shall be carried out as per procedure explained in clause 9.3.4 of this document.

- j. Ensure the verticality of the mast after releasing the hook – chook (tirfor).
- k. In case stringing carried out on the rollers, change the rollers and erect suspension clamp.
- l. Wherever the feeder wire crosses to track side from country side, suspension height of the feeder will be varied. In these conditions, the height of the ladder trolley shall be increased to support the stringing of the feeder wire at increased height.
- m. After completion close down the work advise the workmen to keep all tools and material in the safe place and also get down from Deck/heavy ladders.
- n. Ensure the strands of conductor not damaged during the stringing.
- o. After the completion of stringing record the balance length of conductor and seal the end of the conductor.

1.1.2.3. Stringing of Feeder wire using RRV and working platform:

- a. After obtaining required permit to move on the track, maneuver the RRV with conductor drum and rail- road based working platform on the working track (either up or down).
- b. Commence the stringing of Feeder wire by terminating one end at pre-erected anchor fittings. Termination arrangement shall be as approved drawing (LOP).
- c. Uncoil the conductor from drum and shall be lifted to required height using crane fixed at the RRV , the conductor shall be controlled through rope – pulley assembly fitted at the rail based working platform following the RRV.
- d. Transfer the conductor through the other side of the mast (from track side to country side) manually using rope – pulley assembly.
- e. Support the Feeder wire at country side using any one among binding wire or rope or roller fixed on the mast.
- f. Maneuver the RRV or ladder trolley in a uniform speed while uncoiling the conductor gradually from the drum.
- g. Continue the stringing of Feeder wire in the similar process till reaching other end of the termination.
- h. Termination of the AEC shall be carried out as per procedure explained in clause 9.3.4 of this document.
- i. Ensure the verticality of the mast after releasing the hook – chook (tirfor).
- j. In case stringing carried out on the rollers, change the rollers and erect earth conductor clamp.

- k. Wherever the feeder wire crosses to track side from country side, suspension height of the feeder will be varied. In these conditions, the height of the working platform shall be increased to support the stringing of the feeder wire at increased height.
- l. Stringing of feeder at these locations shall be carried out manually using rope and pulley assembly.
- m. After completion close the work and advice the workmen to keep all tools and material in the safe place and get down from Deck/heavy ladders.
- n. Ensure the strands of conductor not damaged during the stringing.
- o. After the completion of stringing record, the balance length of conductor and seal the end of the conductor.

1.1.2.4. Stringing of Feeder wire using wiring train and working platform

- a) The procedure for the stringing Feeder wire using wiring train shall remain same of procedure explained in stringing Feeder wire using RRV (clause 8.3.2.2 of this method statement).
- b) The conductor shall be uncoiled from the drum loaded on the wiring train through the flexible / adjustable mast fitted on the wiring train.

1.1.3. Termination of feeder wire:

- 1.1.3.1. Fix the “come along clamp” on the conductor and gradually apply load on the conductor using hook chook (tirfor) till achieving require load.
- 1.1.3.2. After achieving the required load and proper tension on the conductor, mark the termination point of the conductor and cut the excess conductor from the marked point.
- 1.1.3.3. Ensure the proper seating of keeper and Tightness of the strain clamp with proper direction of rivets and then support the wire on termination.
- 1.1.3.4. Fix the conductor ending clamp and terminate the conductor on pre-erected anchor fittings at mast.
- 1.1.3.5. After completing termination of the conductor, gradually decrease the load on the hook-chook and remove the same.

PART-II

Chapter-7

SPECIFICATION OF OHE ITEMS

2.7.1 Scope- Specification covered in this chapter is for imported/ major items to be used in this work. These specifications are indicative, details if required by the Contractor will be provided by DFCCIL. *Any specification of material not covered in this chapter will be provided by DFCCIL.*

Description of Item			
Conductors			
	Minimum Size	Material	Remarks
Catenary	125 sq. mm (Imported)	Cu-Mg	Approved Specification No. KFH-JTM-20170214 dated 18.10.2018 Of i)M/S Fujikura ,Japan ii)M/S Lamifil n.v. Belgium as per RDSO Spec. No TI/SPC/OHE/Cat(Mg-Cu)/0120 +Lamifil
	65 sq.mm	Cu-Cd	RDSO Spec TI/SPC/OHE/CAT/Cu-Cd/0971
Contact wire	150 sq. mm (Imported)	Copper Tin alloy	Approved Specification No. 8K-2017019 dated 15.12.2017 of M/S Sumitomo Electric Industries,Japan.
	107 sq.mm	Hard Drawn Copper Grooved	RDSO Spec TI/SPC/OHE/CW/0971
25 kV Feeder	288 sq. mm	AAAC	Approved Specification No. WDFC/EMP-16/AAAC/SPEC/01 dated 09.09.2019.
Aerial Earth Conductor	93.3 sq.mm	ACSR	Approved Specification No. WDFC/EMP-16/ACSR/SPEC/01 dated 19.03.2019.

Buried Earth Conductor	17.5 mm Dia (i.e., 19 No. of Strand X 3.50 mm)	GS (Galvanized Steel)	Approved Specification No. WDFC/EMP-16/BEC/SPEC/02 dated 20.09.2018.
Foundation for OHE Mast	900 mm Dia (B200/B225/B250/B300)		Approved Drawing No. 5-OH-TD-1127_REV_D dated 01.04.2019
	1200 mm Dia (N/O/R Type) for Portal/TTC		Approved Drawing No. DOC_EMP-16_DGN_DC_070_REV_2 dated 07.01.2020
	1500 mm dia 1800 mm dia		5/OH/TD/1235 5/OH/TD/1236
12m mast fabrication		Steel	Approved Drg.No 5/OH/TD/1101,Rev.C
Portal Fabrication	N/O/R	Steel	Approved Drg. No. 5/OH/CD/0101, 5/OH/CD/0102, 5/OH/CD/0103,
TTC Fabrication	-	Steel	Approved Drg.No 5/OH/TD/1110,Rev.C
TTC Fabrication with based plate`	-	Steel	Approved Drg.No 5/OH/TD/1255,Rev.D
Bridge Mast Fabrication	-	Steel	Approved Drg.No 5/OH/TD/1027,Rev.D
<i>Bracket Assembly –</i>	IR Conventional type		Approved ITP document no. DOC/EMP-16/DGN/RP/120 dated 12.02.2019
	IR Modified type		Approved RDSO Specification No. TI/SPC/OHE/Fitting /0130 (10/13) dated 09.07.2020
	Modular type (Imported)		Approved design documents : DOC-EMP-16-DGN-RP-121, DOC-EMP-16-DGN-RP-121, DOC-EMP-16-DGN-RP-122, DOC-EMP-16-DGN-RP-123, DOC-EMP-16-DGN-RP-132, DOC-EMP-16-DGN-RP-133,

			Approved ITP drawings : DOC-EMP-16-DGN-RP-128, DOC-EMP-16-DGN-RP-129 M/S RIBE Germany
<i>Fittings</i>	End Clamps - 150sq.mm Contact Wire		GA-8 of Aaruti Spain ETI/OHE/P/1790 (Rev.B) of M/s. Hindustan Malleables & Forgings Ltd.
	End Clamps - 125sq.mm Catenary Wire		GA-8 of Aaruti Spain 1131(S), 1102(S), 1143(S) of M/s. Kumar Fastners.
	End Clamps - 288sq.mm Feeder Wire (Imported)		GA-3 of M/S Aaruti Spain
	End Fittings – 93.3sq.mm Aerial Earth Wire		Drawing no. 7050 of M/s. Mosdorfer ,Nasik
	Suspension Fittings – 288sq.mm Feeder Wire (Imported)		Drawing No. GS-3 of M/S Arruti Spain
	Suspension Fittings – 93.3sq.mm Aerial Earth Wire		Mosdorfer drawing no. 7040
Current Carrying Droppers	10 sq.mm flexible dropper conforming to DIN 43138 (Imported)	Cu-Bronze	Approved Document/Drawing no. Contact wire clamp – 531115, Dropper clamp for messenger wire- B662030, Notched connector- F01918-06, Thimbles – B615001, Dropper arrangement compression type – B662030-20, Notch type cable lug – F01918-05 of M/S RIBE Germany for fittings and M/S Lamifil Belgium for Cu-Mg0.4 BZII Dropper wire
PTFE Neutral section			Approved RDSO Document no. TI/SPC/OHE/SNS/0000 rev-1
LWSI	150sqmm contact wire & 125sqmm catenary wire (Imported)		Approved Document/Drawing no. EJG3430/202-31 of M/S Galland France.

	107sqmm contact wire & 65sqmm catenary wire (Imported)		Approved Document/Drawing no. EJG3430/102-21 of M/S Galland France. TI/SPC/OHE/LWTSI/0060 Rev. 1 A&C slip no. 1
ATD –5 Pulley	Five Pulley Auto Tensioning Device		TI/SPC/OHE/5PATD/0130 with A&C slip no 1&2
ATD –3 Pulley	Three Pulley Auto Tensioning Device		TI/SPC/OHE/3PHTATD/0150 with A&C slip no. 1
Cable	Cable for 25 KV Feeder		RDSO's specification no TI/SPC/PSI/Cable/0090(02/2009).

PART - II**Chapter 8****LIST OF STANDARD DRAWINGS**

This Annexure contains reference to drawing number, charts, schedule specifications and may be referred for item other than imported major items given in Chapter 7 & 3.

All references to drawings, charts, schedules, or specifications given in this annexure shall be taken to be the version available as on date of issue of LOA of such drawings, charts and schedule of specifications as issued by the Purchaser.

Sl No.	Brief Description	Drawing		Mod No.
		Series	Number	
1.	Extra allowance for setting of structures on curves (1676 mm Broad gauge)	ETI/OHE/G	00111 Sh-1 B	B
2.	Standard setting of structures in the vicinity of signals (broad gauge)	-do-	00112 C	C
3.	Typical design of bearing foundation	-do-	00131 -	-
4.	Deleted-			
5.	Typical design of cantilever mast	RE/33/G	00141 Sh.3 -	-
6.	Standard drilling schedule of OHE masts 9.5 m long RSJ and BFB respectively	ETI/OHE/G	00144 Sh.3 C	C
7.	Span and stagger chart for (conventional OHE, Cad-Cu Catenary & Cu Contact Wire) wind pressure 75,112.5 & 150 kgf /sq. meter	ETI/OHE/G	00202 -	-
8.	Employment schedule for Cantilever mast regulated OHE cat.65/Cu and Cont 107/Cu, WP 112.5 kgf/Sq m without Ex & without RC	ETI/OHE/G	00153 Sh.1 E	E
9.	Employment schedule for Cantilever mast regulated OHE cat.65/Cu and Cont 107/Cu, WP 112.5 kgf/sq m without Ex & without RC	ETI/OHE/G	00153 Sh.2 E	E
10.	Employment schedule for Cantilever mast regulated OHE cat.65/Cu and Cont 107/Cu, WP 112.5 kgf/sq m without Ex & with RC.	ETI/OHE/G	00153 Sh.3 E	E
11.	Employment schedule for Cantilever mast regulated OHE cat.65/Cu and Cont 107/Cu, WP 112.5 kgf/sq m without Ex & without RC.	ETI/OHE/G	00153 Sh.4 D	D

12.	Employment schedule for Cantilever mast regulated OHE cat.65/Cu and Cont 107/Cu, WP 112.5 kgf/sq m at 35 XC & 28 kgf/Sq m at 4xC without (E x & RC)	ETI/OHE/G	00154 D	D
13.	Employment schedule of bracket tubes regulated pressure Conventional OHE (Cd Cu catenary & Cu contact wire 1000 kgf tension Each).	ETI/OHE/G	00158 Sh.1 (for wind - pressure75 kgf/sq m)	-
		-do-	Sh.2(for wind pressure 112.5 Kgf/sq m)	
		-do-	Sh.3(for wind pressure 150 kgf/sq.m.)	
14.	Dropper schedule for – un-insulated Overlap spans.	-do-	00169	A
15.	Dropper schedule for – insulated Overlap spans.	-do-	00170	A
16.	Dropper schedule for conventional regulated OHE. With Zero pressure (1400/1400).	-do-	00177	A
17.	Adjustment chart of Regulating equipment 3-pulley Type 3:1 ratio.	-do-	00195	A
18.	Schematic arrangement of regulated OHE	-do-	02101	A
19.	Schematic arrangement of un-insulated overlap(3&4 span overlaps)	-do-	02121 Sh.4	A
20.	Schematic arrangement of insulated overlap.	ETI/OHE/G	02131 Sh.3	A
21.	Termination arrangement of OHE with 3 pulley type regulating equipment (3:1 ratio).	ETI/OHE/G	04212	B
22.	General distribution of droppers.	ETI/OHE/G	00161	-
23.	Outline of Pantograph (Broad gauge and meter gauge)	RE/33/G	00181	A
24.	General formation of single track Embankments and cutting (Broad gauge)	RE/33/G Sh.1	01101	A
25.	General formation of double track in Embankments and cutting (Broad gauge)	-do-	01102 Sh.1	A
26.	General formation of multiple tracks (1675mm. Gauge).	-do-	01103 Sh.1	A
27.	Standard anchor arrangement	-do-	01401	E
28.	Anchor arrangement with dwarf mast.	ETI/OHE/G	01402	B
29.	Schedule of anchor block for BG track	-do-	01403 Sh.1	D

30.	Double guy rod arrangement with anchor block for BG track..	-do-	01403 Sh.2	C
31.	Schedule of anchor block for BG track (Black cotton soil).	-do-	01403 Sh.3	B
32.	Standard guide tube arrangement on a mast and structures.	ETI/OHE/G	01505	-
33.	Trapezoidal counter weight arrangement on OHE structures.	-do-	01502	-
34.	Arrangement of 3 KV & 25 KV Pedestal insulator supports on OHE masts and portals.	-do-	01601	-
35.	Standard arrangement for mounting of number plate on OHE structure.	ETI/OHE/G	01701	A
36.	Schematic arrangement of regulated overhead equipment.	-do-	02101	A
37.	Typical arrangements of OHE on cantilever masts for double track section.	-do-	02102	-
38.	Typical arrangement for fixing of bracket assembly on 9.5 m mast and structure to suit raising of tracks(in future)	-do-	02102 Sh.3	-
39.	Mast on platforms (1676mm. Gauge)	ETI/OHE/G	02104 Sh.2	A
40.	Details of bracket arrangement on tangent and Curved tracks	-do-	02106 Sh.1	A
41.	Details of bracket arrangement for OHE (High speed).	-do-	02106 Sh.3	C
42.	Single bracket assembly on structures and dropped arms.	RE/33/G	02107	D
43.	Box type cantilever arrangement.	ETI/OHE/G	02108	A
44.	Arrangement at anti-creep.	-do-	02111	A
45.	Standard cantilever arrangement for boom anchor anti-creep location.	-do-	02113	-
46.	Schematic arrangement of un-insulated over Lap (type-I) 3 & 4 span overlaps.	RE/33/G	02121 Sh.1	F
47.	Schematic arrangement of insulated overlap.	ETI/OHE/G	02131 Sh.1	
48.	General arrangement of regulated OHE at turnout (overlap & crossed type).	-do-	02141	C
49.	General arrangement of regulated OHE at cross over (overlap & crossed type).	-do-	02151	
50.	Arrangement of neutral section	-do-	02161 Sh.1 of 2.	C
51.	Arrangement of neutral section assembly (PTFE Type) at SWS	-do-	02162	-
52.	Arrangement of short neutral section.	-do-	02161 Sh.2 of	-

			2	
53.	Schematic arrangement of unregulated overhead equipment.	-do-	03101	-
54.	Standard termination of OHE (Regulated & un-regulated)	ETI/OHE/G	03121	D
55.	General arrangement of unregulated OHE at turnout (overlap and crossed type).	-do-	03151	-
56.	General arrangement of unregulated OHE crossovers and diamond crossings (overlap and crossed type).	-do-	03152 Sh.1	-
57.	General arrangement of unregulated OHE crossovers and diamond crossings.	-do-	03152 Sh.2	-
58.	General arrangement of head span.	-do-	03301	-
59.	General arrangement of pull off.	-do-	03201	A
60.	In span jumper connection between cat nary & contact wire.	-do-	05101	-
61.	Continuity jumper connection at un-insulated overlap.	-do-	05102	C
62.	Arrangement of anti-theft jumper.	-do-	05107	A
63.	Connection at turnouts.	-do-	05103	B
64.	Potential equalizer connection at insulated overlap and neutral section.	-do-	05104	-
65.	Connections at diamond crossing.	-do-	05106	A
66.	General arrangement of connections to OHE by copper cross feeder (150)	-do-	05121 Sh.1	C
67.	General arrangement of connections at switching station on double track section by copper cross feeder (150)	ETI/OHE/G	05122 Sh.1	C
68.	General arrangement of connections at switching station on multiple track section by copper cross feeder (150)	ETI/OHE/G	05123 Sh.1	C
69.	Suspension of 25kv feeder (spider) on OHE masts.	-do-	05143	B
70.	Termination of feeder, return conductor and return feeder (copper & aluminum).	RE/33/G	05145-1	
71.	Arrangement of suspension of double spider 25 KV feeder and return feeder between sub- station and feeding station.	-do-	05152	C
72.	Assembly of section insulators.		051181	C
73.	General arrangement of earth wire on OHE mast.	ETI/OHE/G	05201	A
74.	General arrangement of earth wire on OHE mast.	ETI/OHE/G	05201-1	-
75.	Arrangement of transverse bonds	ETI/OHE/G	05251	A
76.	Connection of return conductor to track.	-do-	05306	F
77.	Suspension arrangement of aluminum return conductor (spider) on traction structures.	-do-	05306	B

78.	Suspension of return conductor (spider) from boom of structures (with clevis type disc insulators).	-do-	05312	A
79.	Connections between OHE and aluminum return conductor at booster stations.	ETI/OHE/G	05413	B
80.	Mounting of 25kv isolators on OHE structures (General arrangement).	-do-	05513 Sh.1	A
81.	Details of small part steel work for supporting 25kv isolator on new T.C.C. boom.	-do-	05513 Sh.2	A
82.	Connection from isolator to OHE	-do-	05516	A
83.	Characteristics of conductors/bus bar for 25kv AC traction	-do-	05600	A
84.	Arrangement of mounting 25 KV/240,10 KVA LT supply transformer.	ETI/OHE/G	05522	-
85.	Employment schedule for cantilever mast regulated OHE Caty.65 Cu.Cont.107/CU (WP 75 kgf/sq. m.)	ETI/C	0702(OHE only)(Sh.1)	A
		ETI/C	(OHE+EW) (S h.2)	A
86.	Employment schedule for Tramway type regulated OHE (WP 75 kgf/sq. m.) without EW& without RC.	ETI/C	0704	A
87.	Employment schedule for 8"x8"35 lbs BFB (9.5 M. long) (WP 112.5 kgf/sq. m. Cat.65/CU & Cont.107/Cu. cantilever mast regulated OHE Caty.65 Cu.Cont.107/CU.	ETI/C	0702(OHE only)(Sh.1)	A
88.	Employment Schedule for OHE mast overlap central location with 3.0 m implantation. Cat. 65/Cu & Cont. 107/Cu. WP 75 kgf/sq. m.	-do-	0709	A
89.	Employment Schedule for OHE mast overlap central location with 3.0 m implantation. Cat. 65/Cu & Cont. 107/Cu. WP 112.5 kgf/sq. m.	-do-	0710	A
90.	Employment Schedule for OHE mast (9.5m) overlap central location with 3.0 m implantation. Cat. 65/Cu & Cont. 107/Cu. WP 75 kgf/sq.m.	-do-	0711	A
91.	Employment Schedule for OHE mast overlap central location with 3.0 m implantation. Cat. 65/Cu & Cont. 107/Cu. WP 112.5 kgf/sq. m.	-do-	0712	A
92.	Employment Schedule for (9.5m) long 200x200x49.9 kgf.OHE mast overlap inter location with 3.0 m implantation. Cat. 65/Cu & Cont. 107/Cu. WP 75 kgf/sq. m.	-do-	0713	A

93.	Employment Schedule for 9.5 m. long 200x200x49.9 kg mast Cat. 65/Cu & Cont. 107/Cu. WP 112.5 kgf/sq. m.	-do-	0714	A
94.	Employment Schedule for OHE mast (9.5 m) overlap Anchor location with 3.0 m implantation. Cat. 65/Cu & Cont. 107/Cu. WP 75 kgf/sq. m.	-do-	0715	A
95.	Employment Schedule for OHE mast overlap anchor location with 3.0 m implantation. Cat. 65/Cu & Cont. 107/Cu. WP 112.5 kgf/sq. m.	-do-	0716	A
96.	Employment schedule 0721 for regulated OHE mast (9.5 m) wind pressure 75 kgf/sq. m. for composite OHE (1000&1000)kgf. tension.	ETI/C	0721 (OH E only)(Sh.1)	
		-do-	(OHE+EW)(Sh2)	
		-do-	(OHE+RC) (Sh.3)	
		-do-	(OHE+EW+RC)(Sh. 4)	
97.	Employment Schedule for regulated OHE mast (9.5m) wind pressure 75 kgf/sq. m. for composite OHE with extra setting distance Overlap Anchor location.	-do-	0722	-
98.	Employment Schedule for regulated OHE mast (9.5m) wind pressure 75 kgf/sq. m. for composite OHE with extra setting distance Overlap center location.	-do-	0723	-
99.	Employment Schedule for regulated OHE mast (9.5m) wind pressure 75 kgf/sq. m. for composite OHE with extra setting distance Anchor location.	-do-	0724	-
100.	Employment Schedule for pre-stressed concrete mast (PC-42) 9.5 m long, for conventional OHE, Normal Location (WP 150,112.5 and 75 kgf/sq. m.) regulated OHE mast (9.5m) wind pressure 75 kgf/sq. m.	-do-	0725	-
101.	Standard portal (N,O,P,R,G & Double BFB type)	ETI/C	0064	
102.	Volume chart and equivalent chart of foundation.	-do-	0058 Sh.1	E
103.	-do- new pure gravity	-do-	0058 Sh.2A	C
104.	-do- Dry black cotton soil (NBC type)A	-do-	0058 Sh.3A	-
105.	-do- new pure gravity(500m,exposed)	-do-	0058 Sh.4	A
106.	-do- Dry black cotton soil (NBC type)2.5m depth.	-do-	0058 Sh.5	A
107.	-do- (for a direct load of 4000 Kg).	-do-	0058 Sh.6	A
108.	Special BFB portal for 5 tracks(general C arrangement)	ETI/C	0026 Sh.1	C
109.	Protective screen at foot over bridge and road over bridge.	-do-	008	F

110.	Chart for portal foundation	-do-	005/68	
111.	Muff for OHE structures	-do-	007/68	D
112.	Structure muff for sand core foundations.	-do-	0012/69	D
113.	9.5 m standard traction mast (fabricated 'K' series)	-do-	0018-2	D
114.	Remote control cubicle at switching station, foundation, RCC slab Building plan & steel door.	-do-	0067	B
115.	9.5 m standard traction mast (fabricated with bottom plates 'B' series)	ETI/C	0071	E
116.	Details of OHE foundation in soft rock (bearing capacity 45,000 Kgf/sq. m.	-do-	0059	A
117.	Details of foundation for fencing upright	-do-	0032	A
118.	Employment schedule for switching and booster station main masts	ETI/C	0185	B
119.	Drilling schedule for S-1 mast	ETI/C	0030	F
120.	-do- S-2 mast	-do-	0031	D
121.	-do- S-3 mast (length 11.4m).	-do-	0180	C
122.	Drilling schedule for 8"x6"x35 lbs RSJ mast 8.0 m long for booster transformer station Type S-4	-do-	0036	E
123.	Drilling schedule for S-5 mast (11.4m long)	-do-	0042	E
124.	-do- S-6 mast (length 12.4m)	-do-	0181	C
125.	-do- S-7 -do-	-do-	0182	C
126.	-do- S-8 -do-	-do-	0182	C
127.	-do- S-9 mast (length 9.4m)	-do-	0184	C
128.	General arrangement & details of fencing panels & gate for switching station.	-do-	0186 Sh.1	E
129.	Details of fencing upright and anti-climbing device for switching station	-do-	0186 Sh.2	E
130.	S-100 fabricated mast for mounting LT supply transformer and drop out fuse switch at switching station.	-do-	0043	B
131.	S-101 details of mast for supporting isolator inside switching station.	ETI/C	0044	A
132.	Details of anchor beam or SP, SSP, & FP.	-do-	0033	D
133.	Details of small part steel for switching station.	ETI/C	0034 Sh.1	K
134.	Details of bracing for switching & B.T. masts.	ETI/C	0034 Sh.2	B
135.	Details of small parts steel of out rigger for switching stations and booster transformer stations.		0037	C
136.	Details of small parts for booster transformer stations.	ETI/C	0040	E
137.	Details of pre-cast cable trench for switching station.	-do-	0038	E

138.	Standard 'R' type portal rod laced general arrangement.	-do-	0011/69 Sh.1	C
139.	Standard 'G' type portal special upright and end piece.	-do-	0056	C
140.	Short bored pile foundation for traction mast(permissible BM & volume)	-do-	0062	C
141.	Chart for portal foundations in dry black cotton soil safe bearing capacity 16500 Kg/sq.mm.	-do-	0063	B
142.	Dwarf mast foundation on wet & dry black cotton soil.	RE/ALD/OH E/SK/C	02	-
143.	Typical design of new pure gravity foundation.	ETI/SK/C	131	-
144.	Typical design of side gravity foundation	-do-	142	-
145.	Rock Anchor for BG Track.	ETI/SK/C	208	-
146.	Bracket fitting for PSC Masts capacity- 4.200 kg. m.	ETI/SK/C	214 Sh.1	E
147.	SPS details of earth wire clamp of PSC mast.	ETI/SK/C	214 Sh.1 of 2	-
148.	Special arrangement of OHE under over line structure.	ETI/OHE/SK	529	D
149.	Ear thing and bonding of PSC mast	ETI/OHE/SK	537 Sh.2 of 2	D
150.	Typical Ear thing arrangement in SPUN D PSC Mast with 18mm. dia rod.	-do-	537 Sh.2	B
151.	Arrangement of antitheft jumper at overlap.	ETI/OHE/SK	566	-
152.	Cat nary dropper assembly	ETI/OHE/P	1190	B
153.	Parallel clamp (20/20)	ETI/OHE/P	1550	E
154.	Standard guide tube assembly.	ETI/OHE/P	5060-2	C
155.	Standard anti-wind clamp.	-do-	2550-1/2	L
156.	Multiple cantilever cross arm assembly.	RE/33/P	3120	H
157.	Anchor fitting assembly on rolled sections.	ETI/OHE/P	3230	C
158.	Anchor fitting assembly on 'K' series, TCC masts and 'P' type portal upright.	-do-	3240	D
159.	Anchor assembly on 'N' and 'O' type portal upright.	-do-	3250	D
160.	Structure bonds	-do-	7000	E
161.	Ear thing station	-do-	7020	B
162.	Longitudinal rail bond	-do-	7030	F
163.	Short super mast assembly.	ETI/C/P	8010	G
164.	Long super mast assembly	-do-	8020	C
165.	Bracket attachment assembly on portal upright (N,O,R,P,G & BFB Type).	-do-	8030	B
166.	Super mast assembly on portals.	-do-	8050	C
167.	Medium super mast assembly.	ETI/OHE/P	8060	C
168.	Compensating plate.	-do-	5191-1/2	D

169.	Suspension clamp.	RE/33/P	1160	J
170.	Double suspension clamp.	-do-	1170	K
171.	Double suspension lock plate.	-do-	1172	C
172.	Cat nary splice (65)	ETI/OHE/P	1090	-
173.	Typical location & schematic connection diagram for a three interrupter switching station.	ETI/PSI	003	E
174.	Typical general arrangement of a three interrupter switching station.	-do-	004	E
175.	Typical location plan & general arrangement for sectioning & paralleling station.	-do	005	E
176.	Typical location plan & arrangement for A feeding station	-do	006	E
177.	Typical general arrangement at a Booster transformer station (with 4 cross feeder) type- III.	-do	013	B
178.	Typical general arrangement of 280 KVA Booster transformer station (with 4 cross feeder type-III.	-do-	018	A
179.	Typical general arrangement at a booster transformer station. (Without cross feeder type-I.	-do-	011	C
180.	Typical number plate for auxiliary transformer. ETI/PSI/P	ETI/PSI/P	7525	-
181.	Typical fencing and anti-climbing arrangement at switching station.	ETI/PSI	104	E
182.	Typical ear thing layout of sub-sectioning and paralleling station.	-do-	201	B
183.	Typical ear thing layout of a sectioning and paralleling station.	-do-	202	B
184.	Typical ear thing layout of a feeding station.	-do-	203	B
185.	Ear thing details for interrupter LT supply transformer 25 KV lightning arrestors PT Type-I (S-100 masts, S-101 mast, fencing upright and n masts).	-do-	204	A
186.	Typical ear thing layout at a booster transformer stations (without cross feeder) for Type-I & II.	-do-	211-1	A
187.	Typical cable run layout of a sub-sectioning & paralleling station.	-do-	301	C
188.	Typical cable run layout of a sectioning and paralleling station.	-do-	302	C
189.	Typical cable run layout of a feeding station.	-do-	303	B
190.	Typical ear thing layout at a booster transformer station (with 4 cross feeder for Type-III,IV and V.	ETI/PSI	212	B
191.	Typical drawing for a terminal board.	-do-	501	C
192.	36mm. Aluminum Bus terminal	ETI/PSI/P	6480	C
193.	-do- Splices.	-do-	6490	B
194.	-do- Tee connector.	-do-	6500	C

195.	36mm. Aluminum terminal.	-do-	6510	D
196.	36/15 Tap connector.	-do-	6520	B
197.	36mm. Aluminum flexible bus splice.	-do-	6550	B
198.	36mm. Alu. Bus splice cum tee connector.	-do-	6560	B
199.	Typical number plate for interrupter and double pole isolator.	-do-	7520	B
200.	Typical number plate for potential transformer type.	-do-	7521	B
201.	Typical number plate for booster transformer.	-do-	7522	B
202.	Standard plan Remote Control cubicle at switching station.	RECivil/BS-11/95		
203.	Typical details of pressed steel door window and ventilator.	RE/Civil/S-115/95	R1	-
204.	Bolted base connection for portals located drain	ETI/ C	0010 C	C
205.	Details of base plate for mast on drains in station yards.	-do-	6002/68	A

LIST OF STANDARD DRAWINGS FOR COMPOSITE OHE (REGULATED):

1.	Employment schedule for OHE masts unregulated OHE without RC & EW (WP=150 kgf/m ² at 10 deg.C).	ETI/OHE/G	00150	D
2.	Employment schedule of bracket tube regulated conventional OHE (Cd-Cu catenary and Cu-contact wire (1000 kgs tension each)) for wind pressure 150 kgf/m ² at 10 deg C.	ETI/OHE/G	00158 Sh.3	-
3.	Employment schedule of bracket tubes unregulated conventional OHE (Cd-Cu catenary and Cu-contact wire)	ETI/OHE/G	00159 Sheet-3	-
4.	Schematic arrangement of un-insulated overlap (Al. Alloy) catenary and copper contact wire.	ETI/OHE/G	02121 Sh.3	-
5.	Schematic arrangement of insulated overlap for (Al. Alloy) catenary & Cu Contact wire.	ETI/OHE/G	02131 Sh.2	-
6.	General arrangement of regulated composite OHE at turnouts (overlap and crossed type)	ETI/OHE/G	02141 Sh.2	-
7.	Standard termination of Regulated composite OHE.	-do-	03121 Sh.2	B
8.	In span jumper connection between Alu. Alloy cat nary & copper contact wire.	-do-	05101 Sh.2	B

9.	Continuity jumper connection at un-insulated overlap(Al. Alloy cat nary and copper contact wire).	-do-	05102 Sh.2	-
10.	Connections at turnouts for composite OHE.	-do-	05103 Sh.2	-
11.	Potential equalizer connection at insulated overlap& neutral section (Al. Alloy cat nary & copper contact wire).	-do-	05104 Sh.2	-
12.	Connection at diamond crossing for composite OHE.	-do-	05106 Sh.2	C
13.	General arrangement of connection to composite OHE by cross feeder (SPIDER)	-do-	05124 Sh.2	C
14.	General arrangement of connection at switching station on double track section for composite OHE.	-do-	05125 Sh.2	C
15.	General arrangement of connection at switching station on multiple track sec.(with composite OHE and spider cross feeder).	-do-	05126 Sh.2	C
16.	Assembly of section insulator (with Al. Alloy cat nary and copper contact wire).	-do-	05181 Sh.2	
17.	Std. Arrangement of supporting cantilevers on Boom of portals and TTC (to avoid Bird's nesting).	ETI/C	0076	C
18.	Employment schedule for OHE mast (9.5 M) wind pressure 112.5 kg/f sq. m. for composite OHE (1000+ 1000) Kgf Tension.			
19.	OHE only.	ETI/C/0717	Sh.1	-
20.	-do- OHE + EW		Sh.2	-
21.	-do- OHE + RC	ETI/C/0717	Sh.3	-
22.	-do- OHE+EW+RC		Sh.4	-
23.	Employment schedule for OHE Mast (9.5 M) wind pressure 112.5 kgf/sq.m. with 3.0 m implantation composite OHE (1000+1000) KGF Tension.			
24.	-do- Overlap anchor location.	ETI/C/0718		-
25.	-do- Overlap Central location	ETI/C/0719		-
26.	-do- Overlap inter location	ETI/C/0720		-
27.	Employment schedule for OHE mast (9.5m) for wind pressure 150 kgf/m2 copper OHE	ETI/C	0726 Sheet-1	-
28.	Employment schedule for OHE mast (9.5m) for wind pressure 150 kgf/m2 copper OHE & EW.	ETI/C	0726 Sheet-2	-

29.	Employment schedule for OHE mast (9.5m) for wind pressure 150 kgf/m ² copper OHE & RC.	ETI/C	0726 Sheet-3	-
30.	Employment schedule for OHE mast (9.5m) for wind pressure 150 kgf/m ² copper OHE, RC & EW.	ETI/C	0726 Sheet-4	-
31.	Employment schedule for OHE mast (9.5m) for wind pressure 150 kgf/m ² copper OHE with higher implantation overlap anchor location.	-do-	0727	-
32.	Employment schedule for OHE mast (9.5m) for wind pressure 150 kgf/m ² copper OHE with higher implantation overlap central location.	-do-	0728	-
33.	Employment schedule for OHE mast (9.5m) for wind pressure 150 kgf/m ² copper OHE with higher implantation overlap inter location.	-do-	0729	-
34.	Employment schedule for Tramway type regulated OHE WP 150 kgf/m ² without RC & EW.	-do-	0706	A
35.	Aluminum Alloy cat nary suspension clamp (MCI)	ETI/OHE/S K	176	D
36.	Double suspension lock body (Galvanized MCI)	-do-	205	B
37.	Parallel grove clamp (14/9).	-do-	123	D
38.	Parallel grove clamp (18/14)	-do-	231	D
39.	Cat nary dropper clip assembly with bimetallic washer.	-do-	333	D
40.	Envelope type end fitting assembly for all Al. Alloy standard Cat. Wire (size 19/2.79mm).	-do-	436	B
41.	Crimp type repair sleeve for AAA standard cat nary wire.	-do-	285	C
42.	Catnary splice (cone type) AL. Alloy cat nary.	-do-	134	D
43.	Aluminum cat nary suspension clamp assembly (MCI)	-do-	468	A
44.	Double suspension clamp assembly (MCI for Al. Alloy. Cat nary).	-do-	469	A
45.	Span and stagger chart for composite OHE	-do-	375	A

46.	Double suspension clamp body for Al. Alloy. Category.	-do-	1171-1	A
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LIST OF STANDARD SPECIFICATIONS:

S.N	TITLE OF SPECIFICATION	SPECIFICATION NO.
1	2	3
1.	Annealed standard copper conductor for jumper wire.	ETI/OHE/3(2/94) with A&C slip No.1 of 4/95.
2.	Copper bus bar	RE/30/OHE/5(11/60)
3.	Structural steel tubes.	ETI/OHE/11(5/89)
4.	Hot dip zinc galvanization of steel mast (Rolled and Fabricated) tube and fittings used on 25 kV AC OHE.	ETI/OHE/13(4/84) with A&C slip No.1 of 5/86, 2 of 4/90 and 3 of 4/90.
5.	Stainless steel wire rope.	TI/SPC/OHE/WR/1060(06/06) with A&C slip No. 2 of 05/07
6.	Solid core porcelain insulators for 25 kV, 50 Hz Single phase overhead traction lines.	TI/SPC/OHE/INS/0070(04/07) with A & C Slip No. 1 & 2 (10/16)
7.	25 KV single and double pole isolators.	ETI/OHE/16(1/94) with A & C slip No. 1 & 2 (03/04)
8.	Steel Fasteners and Stainless Steel Fasteners for 25 kV AC Traction Steel Overhead Equipment	TI/SPC/OHE/FASTENERS/0120 with A & C slip No. 5 (03/13)
9.	Aluminum alloy section and tubes.	ETI/OHE/21(9/74).
10.	Principles for OHE Layout Plans and Sectioning Diagrams for 25 kV AC Traction	ETI/OHE/53 (6/88) with A & C slip no. 5 (11/06)
11.	Section insulators assembly.	TI/SPC/OHE/LWTSI/0060 (Rev. 1) with A & C slip no. 1 (07/16)
12.	Enameled steel plates	ETI/OHE/33(08/85).
13.	Retro-reflective Structure Number Plates	ETI/OHE/33A(12/97) with A & C Slip No. 1 to 8 (11/12)
14.	Galvanized steel wire Rope	ETI/OHE/36(12/73) with A&C slip No.1 of (5/98).
15.	Regulating equipment (a) 5 pulley type (5:1)	TI/SPC/OHE/5PATD/0130
	(b) 3 pulley type (3:1)	TI/SPC/OHE/ATD/0060 Rev. 1 with A&C slip No. 1 (09/16)

16.	Fittings for 25 kV, 50 HZ, AC Overhead Traction equipment.	ETI/SPC/OHE/FITTINGS/0130 with A&C slip No.1 (10/13)
17.	Cadmium copper conductors for overhead Rly Traction	ETI/OHE/50(6/97) with A&C slip No. 1 to 5 (09/16)
18.	All Alu. Alloy, Stranded catenary wire 9/2.79 mm.	ETI/OHE/54 (2/85) with A&C slip No.2 (10/92)
19.	Bimetallic (AL/Cu) strip for 25 KV traction OHE.	ETI/OHE/55(4/90)
20.	Short neutral section assembly (phase Break).	TISPC/OHESNS/0000 (Rev. 1) with A&C slip No. 1 (01/16).
21.	Code for bonding and earthing for 25 kV, single phase, 50 Hz, AC Traction system.	ETI/OHE/71(11/90) with A&C slip No.2 (3/93)

NOTE:

- 1) Above specifications can be purchased from RDSO/office of CAO/CORE/ALD on payment of their cost.
- 2) For structural steel (standard quantity) please refer IS: 2062 – 1992.
- 3) Any amendment in specification and drawings subsequent to LOA, if required to be carried out shall need approval of DFCCIL duly considering the financial implication of the same either in upward or downward direction.

PART - II**Chapter 9****LIST OF EQUIPMENT, PLANT & MACHINERY**

Contractor shall submit list of Plant & Machinery owned and to be hired.

An indicative list of Plant & Machinery for execution of the above work is as below:

Item	Machineries	Required For	Source (Owned/Hired)	MOU (Yes/No)
1	Rail Auger	>Foundation perforations		*
2	RRV	>Foundation perforations		*
3	Wiring Train with driving unit	Wiring (Contact/Catenary)		*
4	RRV (Rail cum road vehicle), Rail based man lift (scissor lift) & Conductor Drum Rail Trolley	Wiring (Feeder/AEC)		*
5	Tractor Augur	>Foundation perforations		
6	Concrete Pump	>Foundation concreting		
7	Transit Mixer	>Foundation concreting		
8	RRV Transit Mixer	>Foundation concreting		
9	Tractor	>Foundation concreting		
10	Concrete Conveyor	>Foundation concreting		
11	Pick & Carry Crane	Mast/Portal/Boom		
12	Rail Crane	Mast/Portal/Boom		
13	Trailer	>Used for Material shifting		
14	Truck	>Used for Material Shifting		
15	Camper (Pick up Van)	Used for Material Shifting		
16	Conveyor Belt	for Concreting		

***Note:**

This excerpt provides instructions for filling out **Form No. 31** by the tenderer regarding the availability of specific machinery necessary for executing the work. Key points include:

1. The tenderer must indicate in Form No. XX whether they own or plan to hire the machinery listed.
2. For machinery at Sr. No. 1, 2, 3 and 4, if the tenderer plans to hire them, a Memorandum of Understanding (MOU) with the hiring agency must be submitted.
3. The availability of these particular machines is crucial for the successful completion of the work.
4. For evaluation purposes, the tenderer must provide:
 - a. Details of ownership of the machines, or
 - b. An MOU with the vendor, including response time for making the machinery available at the worksite.

This ensures that the tenderer is either prepared with the necessary equipment or has firm plans in place to secure it.

If the tenderer does not submit the specified information—either details of ownership of the machinery listed at Sr. No. 1, 2, 3 and 4 or an MOU for hiring from owner—the offer submitted by the tenderer shall not be considered. This requirement is crucial for ensuring the availability of key machinery for the successful execution of the project.

PART - II**Chapter 10****EXPLANATORY NOTES OF SCHEDULE PRICES**

Explanatory notes for various items of work in OHE works are mentioned below. This shall be read in conjunction with latest standards/Guidelines /Rules/Instructions/ Codes/ Technical specification issued by DFCCIL/RDSO/ Railway Board/ CORE/Zonal Railway/RVNL/Other statutory body like BIS, Electricity act 2003, CEA rules/regulations/safety measures, CERC rules, National Grid Code, IEC, EN/IEEE etc.

Brief description on scope of work included in this tender document:

2.10.1 There are mainly three Packages for execution of various works in JNPT-Vaitarna Section.

Sr No	Name of the Package	Status of Works
1	CTP-11 Package for Civil and Track works	<ol style="list-style-type: none"> 1. About 50% formation work in various stretches is completed 2. Track work is under progress where ever formation is ready 3. Work in most of the major bridges is under progress 4. Work is under progress at four tunnels
2.	EMP-16 for OHE, PSI and SCADA Works	<ol style="list-style-type: none"> 1. Design and drawing works are completed. 2. There are 10 PSI locations where work is under progress and EIG sanction for one PSI location obtained. 3. OHE foundations 600 Nos. and Mast erection 300 Nos. is completed till date. 4. OHE works of CTP-11section has been descoped. 5. List of equipment/material available in depot is given in this document as free supply items for OHE works.
3	STP-17	Signalling & Telecom Works

2.10.2 Brief description of important activities requires interface activities with interfacing Contractor is given below:

1.	Arrangement of OHE components inside tunnels
2	Arrangement of OHE Masts on bridges and retaining walls and viaducts etc.
3	Arrangement for HDPE pipes under the track for crossing of Auxiliary transformer cables for AT supply to S&T installations in station premises or ALH or Telecom hut, crossing of 75x8 mm flat for inter-connection of buried rail with running rail etc.
4	Drilling of holes on running rails for interconnection of buried rail with tracks opposite PSI installations.
5	Getting access of site to carry out own work as well as to give access to others for execution of their works
6	Laying of BEC works in coordination with other contractors etc.
7	Earthing and bonding arrangements on bridges, viaduct, RFO, tunnel, retaining walls and any other structures for safe working.
8	arrangement of cantilever erection in steel bridges
9	Interface for commissioning of SCADA and Auto Fault Locator.
10	Power supply arrangement for S&T installation.
11	Any other for activity which requires interface with other agencies for successful execution of OHE works including PSI, SCADA & AFL etc.

Above points are only indicative for highlighting the importance of interface activities. Contents given in EMP-16 Package Contract Agreement on Interface-Management will be the guiding principle in this regard.

2.10.3 Tenderer(s) are advised to get familiarized with site condition before participation in this tender and Pre-Bid Conference will be held for seeking any clarification and Tender(s)'s suggestions if any.

2.10.4 Cylindrical foundations utilizing mechanical augers (or Tripod-Hammer) and ready-mix concrete as per approved method statements are to be made.

2.10.5 TSS/SP/SSP works are being done by other Contractors and the Contractor will be required to execute the work of gantries as per approved drawing for erection of cross

feeders for connection of OHE/Negative feeder with TSS/SP/SSP through drop jumpers. Payment for gantries will be made under item No. 3.

2.10.6 Tenderer(s) are advised to get familiarize with the differences in Indian Railway conventional overhead equipment's and special features of designs adopted in EMP-16 Package.

2.10.7 Employer/DFCCIL is in possession of approved drawings and same will be shared with successful Tenderer:

- a. General Power Supply Diagram (GPSD) and Sectioning Diagram
- b. LOP/CSD/SED
- c. Method Statements for all major activities
- d. Set of DFCCIL approved Drawings.
- e. List of suppliers approved by the Employer/DFCCIL for items other than RDSO/CORE approved list.
- f. Some of the above drawings are also made part of this document and remaining details can be shared on demand with tenderer(s) also

2.10.8 DFCCIL approved drawings are available to cater for new features adopted in the scope of work of this document. Approved drawings stated in this document implies work shall be executed as per DFCCIL or latest RDSO/CORE approved drawings. In case of a conflict between DFCCIL and RDSO/CORE approved drawings, DFCCIL approved drawings shall be followed.

2.10.9 Cross acceptance criteria will be applicable on following:

Vendor for Materials/Equipment which are not available in RDSO/CORE/DFCCIL approved vendor list, the Cross-acceptance criteria shall be as under:

- Three years satisfactory performance on AC Traction System prior to date of tender opening.
- The manufacturer should have supplied equipment of minimum 70% rating of equipment offered. Certificate from the user Railway to be submitted in this regard.
- The manufacturer/s should have supplied at least 20% quantity to be used in this contract last seven years or they can supply, maximum five times the quantities supplied in last seven years.
- Proto type test certificate for such items carried out in similar environmental conditions, during the last three (3) years to be submitted.
- Manufacturer shall have to support maintenance and repair in India and supply spares till the design life of the material.

2.10.10 Explanatory notes to describe item wise scope of each item of the Schedule of Prices is given below. Tenderer(s) are advised to take note of the description given for each item before submission of their offer.

Item No1: Design and drawing: The price shall cover following items.

- a. Verification of LOP/CSD/SED as per site condition and submission of corrected drawing where ever necessary as per site condition for approval to the Engineer.
- b. SEDs provided are tentative in nature and same is to resubmitted by the Contractor as per site condition showing stagger, BEC connection, AEC etc. for approval to the Engineer.
- c. Submission of drawings for approval, showing detailed clearance study of OHE under all over-line-structures such as foot over bridges, road over bridges, tunnels, steel bridges etc., for maintaining the specified height of contact wire and requisite clearances.
- d. Compliance of all safety and statutory requirements and other standards stipulated in ACTM and various RDSO/DFCCIL approved drawings shall be the prerequisite requirement before commissioning of OHE installation by the Contractor.
- e. Supply of six number of copies of all drawings during execution. This item also includes as erected drawing (In original six copies) after final execution of work (soft and hard copies).
- f. Any item/drawing, if required for completion of the work and for which RDSO/DFCCIL approved drawings are not available shall be submitted to Engineer for approval.
- g. Before commencement of any payment, Contractor is required to submit requirement of all major components such as steel-structures, Conductors (Contact & Catenary Wire), Insulators, Number-of-brackets, Guy-Rod-Assembly, isolators, Feeder wire, AEC, BEC etc., for successful completion of work.
- h. Break up of Design-Payments will be as under on per RKM basis:
 - i. 25% on verification of the details provided in this tender document and pinpointing of requirement of further information if any.
 - ii. 25% on approval of SEDs
 - iii. 10% on approval of clearance study of OHE under overline structures.
 - iv. 40% on submission of requisite numbers of As-Erected-Drawings

Item no. 02

Excavation and Casting of Cylindrical foundations with ready-mix-concrete in all types of soils are to be done as per approved Drawing and Method Statement. Excavation and casting of Foundations in hard rock shall be done as per separate approved drawing and method statement. For normal soil, excavation for cylindrical foundations shall be done using mechanical auger and for marshy land, alternate method for excavation for cylindrical foundations may be required such as tripod-hammer method.

Schedule of Payment will be released as under on the basis of per Cubic meters:

80%	On casting of Main Foundations
10%	On Grouting of Mast/Upright etc.
10%	On Muffing, Coping and Stenciling of location number on both side of the structure.

Item no.03

Supply & erection of rolled or fabricated and galvanized Traction Mast, TTC, Portals, AT Mast, Dwarf Mast, Cross Feeder Gantry, Drop-Arms, Chair Arrangement etc.

Contractor shall supply of Hot-dipped-Galvanized-Structures as per approved drawings and successful completion of Factory Acceptance Test (FAT) as per approved Inspection and Testing Plan (ITP) before dispatch from approved vendors only.

Portal/TTC components shall be supplied with requisite components such as required quantity of splicing angles and knee bracings etc.

The prices for erection shall cover the cost of erection, alignment and setting before grouting of individual traction masts/upright/towers/TTC etc., but excluding cost of concrete. This price shall also cover the cost of assembly of Portal Components and cost of all fasteners required as per approved drawings. Erection of bridge mast on bridges and retaining walls shall be done on base plate along with nut-bolts provided by CTP-11 contractor.

Contractor shall follow the relevant Method statement provided in this Tender-Documents for erection work.

The price for this item shall also include the cost of stenciling of location number on both sides of masts / portal uprights in the manner as directed by the purchaser. The price shall also include the straightening of masts / portal uprights bent during transit and cutting of masts /

portal uprights to suit the site conditions. It is clarified that the term transit also covers transit from manufacturer / supplier premises to DFCCIL depot / Contractor 's depot or subsequent handling.

Item no. 4

Supply of Fabricated and Galvanized SPS other items covered in Item No 3.1 and 3.2.

Contractor shall supply of Hot-dipped-Galvanized-SPS as per approved drawings and successful completion of Factory Acceptance Test (FAT) as per approved Inspection and Testing Plan (ITP) before dispatch from approved vendors only.

The Price shall cover supply of Hot-Dipped-Galvanized-Small-Part-Steel (SPS) other than mast/portal etc., for those items which are required for erection of Negative Fedder Wire, erection of isolators, Auxiliary Transformers etc., and not specifically defined under other items. Price shall also include supply and fixing of special drop arms inside tunnels.

Notes for Item 3 and 4

- i. Raw material shall be procured only from RDSO/ CORE approved supplier and shall be after successful completion of Factory Acceptance Test (FAT) as per approved Inspection and Testing Plan (ITP) before dispatch.
- ii. 1000 GSM hot dipped galvanized structures shall be supplied.
- iii. For the purpose of payment, Contractor will be required to submit item wise weights schedule for approval based on approved drawing for approval of the Employer/Engineer. Standard weight schedule shall be followed for calculation of weight of all type of Masts & portals etc. For special types if any, the payable weight per meter length will be indicated by the purchaser at the time of approval of designs.
- iv. Schedule of Payment will be released as under:

80%	On Supply of Material
15%	On erection of Mast/Upright/Boom etc.
5%	On Completion of bracket erection and bonding with BEC and between rails/tracks.

Item no. 5 Supply of Insulators: Price shall include only for supply and testing of following insulators from RDSO/ CORE approved vendors

- 5.1 Composite Type 9-Ton Insulator with long creepage (CD-1600 mm)
- 5.2 Set of Composite Type Bracket and Stay Insulator with long creepage (CD-1600 mm)
- 5.3 Post Insulator

The price shall not cover the cost for erection as this has been made part of erection cost of other items. Contractor will be required to follow OEM's guide lines for their safe storage in the Contractor depot and during transit.

Item no. 06 Supply & erection of Single Bracket assembly excluding insulators and SPS/Fasteners: Three type of brackets will be used as under:

6.1 Supply and erection of Modular Brackets: Price shall include supply of complete bracket assembly as per approved specification and FAT as per ITP. Price shall cover erection of all bracket component as per relevant drawing and Method-Statement including cost of all SPS/Fasteners required for erection of bracket.

6.2 Supply and erection of IR Modified Brackets: Price shall include supply of complete bracket assembly as per approved specification and FAT as per ITP. Price shall cover erection of all bracket component as per relevant drawing and Method-Statement including cost of all SPS/Fasteners required for erection of bracket.

6.3 Supply and Erection of IR Conventional Brackets: Price shall include supply of complete bracket assembly as per approved specification and FAT as per ITP. Price shall cover erection of all bracket component as per relevant drawing and Method-Statement including cost of all SPS/Fasteners required for erection of bracket.

Item no. 7 Supply & Erection of Guy Rod Assembly

The Price shall cover supply & erection of complete galvanized guy rod assembly including Mast anchor fitting and fasteners required as per approved drawing and method statement. Length of guy rod shall be as per requirement at site for termination OHE/Anti-Creep/Feeder Wire etc. on Mast or Portal upright etc. Cost of anchor loop embedded in anchor foundation shall be considered as part of item No 2.

Item no. 8 Supply and Erection of 288 Sq. mm AAAC Feeder Wire:

Price shall include supply of feeder wire conductors as per approved specification and FAT as per ITP and erection price shall include execution of work as per relevant Method statement

and erection price shall include cost of fittings such as clamp for suspension of feeder wire on structure with 9-Ton insulator, ending clamp and other fittings for termination of feeder wire on structure. Erection price shall also include for jumpering arrangement between two adjacent tension lengths. Price shall also include special arrangement if any required under FOB, ROB, RCC-BOX etc. for safe clearance. Price shall also include special arrangement if any required under ROB, FOB, RCC Box, Tunnel etc., for safe clearance.

Cost of 9-Ton insulator, pedestal insulator and SPS required for execution of this item will be paid in item 5a, 5d and 4. All fasteners etc. required are part of this item.

Item no. 9 Supply and Erection of Arial Earth wire (AEC) 93.3 ACSR Conductor:

Price shall include supply of conductors as per approved specification and FAT as per ITP. Erection work is to done as per relevant Method statement and erection price shall include cost of fittings such as clamp for fixing of AEC on structure, ending clamp and other fittings for termination of AEC wire on structure. Erection price shall also include for jumpering arrangement between two adjacent tension lengths. Price shall also include special arrangement if any required under FOB, ROB, RCC-BOX, Tunnels etc.

All of fasteners etc., required are part of this item. SPS required if any for this item, will be paid in item 4. Supply of all fasteners etc. required are part of this item.

Item no. 10 Supply and Erection of Buried Earth wire (BEC) 19/3.5 mm galvanized steel wire (17.5 mm dia):

Price shall include supply of conductors as per approved specification and FAT as per ITP. Erection work is to done as per relevant Method statement and erection price shall include cost of fittings such as clamp for joining of two buried earth conductors. Erection cost shall also include to facilitate its connection to various OHE structures, S&T installations and civil structures in accordance with earthing-bonding-management-plan at appropriate stage of the work. Contractor is required to adopt appropriate sequence of its own work and interface with other interfacing Contractors.

All components required for fixing of BEC on bridges, tunnels, viaduct, FOB, ROB, steel girder bridges, RCC-BOX etc. are part of this item. But, SPS required if any will be paid in item 4.

Item no. 11 Supply and Erection of Earthing and bonding

Contractor is required to provide effective bonding and earthing to ensure safety and contain ill effects of electromagnetic and electrostatic induction. Bonding and earthing to be done in accordance to Earthing-Bonding-Management-Plan. Drilling of holes on tracks is permitted only opposite TSS/SP/SSPs for interconnection of buried rails available inside TSS/SP/SSP

premises and running track opposite this installation using 75*8 mm flats. At other locations, rail clamp as per approved drawing is required to be used for fixing of bond with rail.

Contractor is required to provide effective Earthing and Bonding as under:

- 11.1 Connection of mast/OHE structure, LC-Gate fencing, retaining or protection wall, Minor Bridge, Bridge Mast, Steel girder etc., with BEC Erection cost shall cover T connector, Terminal pad, and suitable fasteners required for fixing. Price for supply and erection of Jumper (BEC) will be paid in item 8.
- 11.2 50*6mm Structure bond between Mast/upright and nearest rail as per approved drawings using rail clamp and suitable fasteners. Price shall include cost of 50*6 flat, fabrication of bond, fasteners and rail clamp.
- 11.3 Same as item 11.2 but rail clamp on both ends.
- 11.4 Supply and erection of protective screen on ROB/FOBs: The price shall cover on per track basis on both sides of ROB/FOB, the cost of all material required for fabrication of protective screen including angle, Tee, expanded metal (Jali), GI sheet, paints etc. The price shall also include the labour cost for fabrication, erection and painting at locations in entire section. The fabrication and erection work shall be done as per latest approved drawing. Price shall also include required caution/danger boards/signages etc., to meet statutory requirement.
- 11.5 Supply and erection of GI 75*8 Flat: Work involves laying of GI flat in the ground, above the ground connection between tracks and buried rails installed inside TSS/SP/SSP by another Contractor and on the bridges for connection between earth terminal provided by another Contractor on bridge pier cap and deck slab. Work shall be executed as per approved method statements and approved drawing. Price shall include supply of GI flat, fabrication work, fixing of bonds of desired shape and sizes, required fasteners. Erection cost shall also include execution of work as mentioned above. Price for supply of GI flat shall not be included in this item, as it will be paid in item 4.
- 11.6 Provision of earthing for AT mast, FOB, ROB, steel girder bridges, RFO etc., with the help of 50*6 GI Flat connection to earth electrode, erection cost shall include fabrication of bond, required fasteners, clamps required for fixing/routing of the bond as per the instructions of the Employer/Engineer at site. Price shall not include for supply of 50*6 GI Flat and earth electrode which will be paid in item 4 and 12.

Item no. 12

Supply & Erection of Single earth electrode with earth Pit complete.

The price shall cover supply and erection of an earth electrode in all types of soil except hard soil/soft rock as per approved drawings. The price shall cover supply and erection of an earthing station with protective concrete box and lugs suitable for directly connecting two 50 mm x 6 mm GI Flat of required length as per site condition. Earth pit will be provided for earthing of AT's, FOB, ROB, steel girder bridges, RFO etc. Length of the flat will vary as per site condition, supply and erection cost of the same will be paid as described in item no. 11.6. The price shall cover the cost of measurement of earth value and painting the earth resistance value on the box.

Item no. 13:

- 13.1 Supply & Erection of OHE with complete fitting including termination clamps and excluding Cost of Contact Wire, Catenary Wire as per approved drawings and Method Statements. The price shall cover erection of all components and wires and conductors including contact wire (150 sqmm), catenary (125 sq mm), droppers etc. The price shall cover supply of all components of droppers, and splices (wherever permitted), all fasteners etc. Splices will be permitted for joining with connecting lines with IR lines such as Kharbao, Taloje and at Vaitarna for connection with CTP-12 section. The price shall include provision of Retro reflective number plates one number each on traction masts/upright and on drop arms also. The prices shall not cover the cost of small parts steel work for fixing of retro reflective number plate (like as Clamps & plates) which will be paid under item no. 4. The price shall also cover cost of fasteners for fixing of Retro reflective number plates. The price shall also include the cost of painting the setting distance and rail level on masts/structures, stenciling of symbol for direction of emergency telephone socket etc. Price shall also cover for supply of all components required for provision of 10 sq.mm current carrying flexible droppers for heavier OHE (125 Cat) and conventional 5 mm dropper for lighter OHE (65 Cat and 107 Contact) as per approved drawings. Price shall not include cost of conductors' (catenary (125) and contact (107) wires) as these items will be paid in item 19 and 20.
- 13.2 Anti-Creep: Price shall cover cost of erection of anti-creep using 125 or 65 Sqmm catenary (will be paid under item no 19), 9-Tone insulators (will be paid under item no 5.1). Price shall also cover for cost of supply of all standard fitting with fasteners required for termination as per approved drawings. SPS with fasteners will be paid in item 4.
- 13.3 Termination of OHE: The price shall cover supply and erection of all materials necessary for the termination of two conductor (catenary and contact) on a traction mast or structure, including appropriate mast anchoring, clevis assembly, two adjusters, ending clamps for catenary and contact wires, anchor double strap assembly, equalizing/ compensating plate and fittings including 9-Ton insulator,

- assembly and terminating wire, if any. Price shall not include cost of 9-Tone insulator, SPS and ATD required for this item as this is covered in item no 5.1, 4 and 14.
- 13.4 Same as item no 13.1 but the price shall cover erection of all components for lighter OHE consisting of contact wire (107 sqmm), catenary (65 sq mm), droppers etc. Price shall cover for supply of all components required for conventional 5 mm dropper for lighter OHE (65 Cat and 107 Contact) as per approved drawings. Price shall not include cost of conductors' (catenary (65) and contact (107) wires) as these items will be paid in item 19 and 20. All other details are same as described in item 13.1.

Special Notes for Item No 13:

Method statements approved for Stringing of Conductors i.e., Catenary, Contact, Aerial Earth Conductor, Negative feeder wires and Buried Earth Conductor adopted in CTP-12 and CTP-13 sections are given in this document. Method Statements primarily deal with following activities/resources to be deployed by the Contractor:

- i. Requirement of various Machinery and tools,
- ii. Requirement of manpower with adequate skillset
- iii. Preparation required before commencement,
- iv. Safety precautions to be observed
- v. Procedure for stringing of conductors and further associated works
- vi. Quality control measure to be taken

However, Contractor is free to adopt his own procedure to suit site conditions. In case, Contractor proposes to have its own procedure, Contractor shall submit the same along with the offer highlighting the deployment of machinery required at its own cost covering items at Sr. No. 1 to 6 above. Method shall focus particularly on the most important aspect i.e., contact wire drawn shall be free of twist and kink while stringing. No wiring train shall be provided by the Employer for stringing of Catenary Wire, Contact Wire, Feeder Wire, AEC and BEC.

Tower wagon will be made available on hiring on demand.

Item no. 14: Auto-Tensioning device

- 14.1 Supply and erection of 3 Pulley Auto-Tensioning device complete with SS wire rope and counterweight Assembly. The price shall cover supply and erection of 3 Pulley ATD including 5-ton adjuster, double strap assembly and normal/anti-theft guide tube assembly, counterweight assembly etc. as per approved drawings. Price shall also include X-Y adjustment and required marking on the mast/structures etc.

- 14.2 Supply and erection of 5 Pulley Auto-Tensioning device complete with SS wire rope and counterweight Assembly. The price shall cover supply and erection of 5 Pulley ATD including 5-ton adjuster, double strap assembly and normal/anti-theft guide tube assembly, counterweight assembly etc. as per approved drawings. Price shall also include X-Y adjustment and required marking on the mast/structures etc.

Item no. 15**Supply & Erection of Cross-Feeder and Connections at TSS/SP/SSPs locations**

The price shall cover cost of supply and erection of various type of jumpers with PG clamps required as per approved drawings.

- 15.1 Cross feeders at TSS/SP/SSP locations: The price shall include supply and erection of 2*37/2.25 mm hard drawn bare copper conductor (HDBC) of size as per approved drawings and method statement. Erection price shall also include all components required for termination as per approved drawing at both ends. Cost of insulators and SPS required if any for completion will be paid under item 5a and 4 and 5 respectively. Payment will be made in Sets.
- 15.2 Loop-Jumper: Connection between cross feeders and TSS/SP/SSP gantry will be done using 1*288 sqmm feeder wire used for negative feeder as jumpers with the help of suitable PG clamps with bi-metallic strip if required. Price shall include supply and erection of PG clamps, fittings with fasteners. Price shall also include for erection insulators. But price shall not include cost of SPS, insulators and 288 sqmm feeder wire and same will paid in items 4, 5 and 8 respectively. Payment will be made in numbers, one number of 288 sq mm jumper with connection on both ends with two PG clamps, insulator (if any), will be counted as one number.
- 15.3 Slack-Feeder: Intermediate cross gantry if available feeding arrangement between TSS/SP/SSP gantry and cross feeder gantry will be done using 1*288 sqmm feeder wire as Slack feeder. Price shall include supply and erection of ending clamps, insulator and fittings with fasteners required for erection of slack feeder and erection of insulators. Price shall not include for supply of 288 sqmm wire to be used for slack feeder, insulators and SPS, which will be paid in items 8, 5, and 4 respectively. Payment will be made in set, one slack feeder (288) and other associated works for associated with termination of slack feeder will be termed as one set.
- 15.4 Drop Jumpers 2*160 sq mm: Copper conductor for connections between cross feeders and catenary and contact wire or 288 sq mm., negative feeder shall be

- provided. Drop jumper shall also be provided for connection between cross feeders and along-the-track feeder. Drop jumper shall also be provided for connection between along-the-track feeder and OHE at IOL. Drop jumper shall also be provided for connection between along-the-track feeder and negative feeder. Price shall include for supply and erection of jumper wire, suitable PG clamps (required numbers) and bimetallic strip where ever required as per approved drawing. It will be paid in numbers for a set (2*160 sq mm jumper and required number of PG clamps for connections on both ends). Same jumper will also be used as isolator jumper and will be counted as one set for one isolator. For earthing heel connection, it will be counted as half set.
- 15.5 False Catenary: It will be erected under all over line structures. Price shall include cost of supply and erection of ending clamp for catenary wire (125 or 65) and contact wire (150 or 107) and PG clamps for continuity jumpers. same catenary wire will be continuity jumper to ensure proper electrical connection between catenary and false catenary wires on either side. Price shall not include cost of false catenary contact wire which will be paid in item no 20. Unit of payment will be in numbers.
- 15.6 Provision of cut in insulators at insulated overlap or for separation of elementary section: Price shall include cost of supply and erection of termination clamps for catenary or contact wires and fasteners and insertion of 9-Tone insulator in OHE or Large-Span-Wire or Anti-Creep wire. Price shall not include for adjustment to get proper profile of OHE and require clearance under item 13 and Cost of 9-Ton insulator which will be paid in item 5.1. Insertion of one 9-Ton insulator will be counted as one number.
- 15.7 G jumper of 120 sqmm copper as continuity jumper at uninsulated overlap, turn out locations (at loop line/cross-over). Price shall include for the cost and erection of jumper of adequate length and required PG clamps.
- 15.8 50 sqmm copper jumper as anti-theft jumpers or potential equalizing jumpers at out-of-run OHE and anti-creep wire as per approved drawing. Price shall include for the cost and erection of jumper and required PG clamps for each jumper.
- 15.9 G jumper of 105 sqmm copper as continuity jumper at uninsulated overlap, turn out locations (at loop line/cross-over). Price shall include for the cost and erection of jumper of adequate length and required PG clamps.

Item no. 16

Supply & Erection of various type of boards

The price shall cover supply of danger/Caution Board, unwired turn out board, Engine Stop Board, Sigma Board, Gradient Board, Neutral section Board and other Boards including fixing material. Erection price shall cover fixing of boards at requisite places including require SPS

and fasteners. Unit of measurements will be numbers. Similarly, Supply and erection of various types of public caution boards as stipulated in ACTM for stations, various office/workshop etc., where public is expected to visit at locations are also part of this item. Uniform and common rate is to be quoted for various boards and unit of payment will be on per board basis.

Item no. 17**Supply & Erection of Light Weight Section Insulator Assembly as per DFCCIL requirement.**

The price shall cover supply and erection of light weight section insulator assembly as per RDSO/DFCCIL specification for main line and loop line. Price shall also include special droppers for supporting the equipment and all terminal fittings for conductors and the section insulator assembly. The price shall cover erection and adjustment of all components including light weight section insulator assembly, insulating rod on the catenary and droppers.

Item no. 18**Supply and Erection of PTFE Short Neutral section Assembly.**

The price shall cover supply and erection of PTFE type short neutral sections assembly as per latest RDSO/DFCCIL specification. The price shall also cover supply and erection of, all fittings for contact and catenary wire as necessary including supply of required dropper wire.

Item no. 19 Supply of Catenary wire of 125/65 sq. mm

The price shall cover the cost of supply of stranded copper catenary wire of 125/65 sq.mm as per approved specification and FAT as per ITP for overhead equipment. The cost of erection of catenary wire shall be payable separately in item 13.1 or 13.4.

Item no. 20**Supply of Contact Wire of 150/107 sq. mm**

The price shall cover the cost of supply of hard drawn grooved continuous cast copper contact wire 150/107 sq. mm for overhead equipment as per approved specification and FAT as per ITP. The cost of erection of contact wire shall be payable separately in item 13.1 or 13.4.

Common notes for item 19 and 20:

The Tender Document specifies that certain quantities of Catenary and Contact wires (of both types) are being provided as free supply. The contractor is responsible for procuring only the remaining quantities as mentioned in the price schedule. The contractor must assess the total requirement considering the Catenary and Contact wire drums supplied as free supply. After this assessment, the contractor needs to submit a proposal for the additional procurement needed to cover the shortfall. The contractor is required to submit this assessment and procurement proposal within one month of receiving the Letter of Acceptance (LOA). This process is intended to expedite the procurement of any additional quantities of conductors that the contractor needs to procure.

Item no. 21**Supply and Erection of complete set of 10/25/50/100 KVA 25 kV/240 V Auxiliary Transformer**

The price shall include supply of 25 kV/240V, 50Hz, single phase, oil filled transformers of required KVA with complete accessories required for successful commissioning to meet the operational requirement as per latest RDSO/DFCCIL specifications and guidelines from approved vendor. Erection Cost shall include testing & commissioning of 10/25/50/100 KVA 25 kV/240 V Auxiliary Transformer complete with accessories like jumpers/fittings, 9Tonne insulators, etc.

The erection price shall cover cost of oil filtration, pre-commissioning testing required for successful commissioning of an auxiliary transformer after obtaining EIG sanction. However, cost shall not include supply of 9-Ton insulator and provision of earth electrode covered under item number 5 and 15 respectively. Entire work shall be done as per approved method statement.

Item no. 22

Supply and erection of Automatic Change over Panel (ACO) suitable for 10/25/50/100 KVA Auxiliary Transformers. Price shall include for supply of ACP panels from approved source and as per approved specification. Erection price include fixing of at appropriate place inside control room and earthing of panel with earth-bus available inside control room and all pre-commissioning testing recommended by the OEM.

- 22.1 Automatic Change over Panel (ACO) suitable for 10 KVA AT
- 22.2 Automatic Change over Panel (ACO) suitable for 25 KVA AT
- 22.3 Automatic Change over Panel (ACO) suitable for 50 KVA AT
- 22.4 Automatic Change over Panel (ACO) suitable for 100 KVA AT

23.0 Supply & erection of anti-climbing for Auxiliary Transformer:

Price shall cover on lump sum basis the supply and erection of anticlimbing devices consisting of galvanized steel fixture mounted on the masts below transformer. The price shall be for each mast provided with the devices.

24.0 Supply without Insulator & erection of 25 kV D.O. fuse switch:

Price shall cover supply and erection of 25kV Drop Out fuse switch complete with all mounting accessories and terminal connectors as required but without the cost of supply of 25kv solid core insulator. The price shall include erection of small part steel work.

Item no. 25 Supply without Insulator & erection of Cable for interconnection between Auxiliary Transformers (AT) and ACO Panel.

- 25.1 2Cx70 sqmm
- 25.2 2Cx120 sqmm
- 25.3 2Cx185 sqmm
- 25.4 2Cx240 sqmm

Contractor will submit route layout drawings with selection of cable required depending on rating of cable and distance of cable length required to contain voltage drop within acceptable limits. Cable shall be supplied of approved make and meeting the requirement of GTP.

The price shall include supply of above cable and laying as per approved drawing including cable marker with provision of suitable terminal box on the AT mast and proper routing of cable as approved by Employer/DFCCIL inside the control room to facilitate termination of incoming cable from ATs in ACO panel.

Item no. 26 Supply and Erection of isolators:

The prices shall cover supply and erection of Isolator switches of approved make, complete with arcing horns, operating rods, operating rod guides, mounting base including cost of 25 KV Solid Core Post and Operating rod insulator. The price shall also cover supply and erection of a number plate of approved design for each isolator, supply and erection of small parts steel work complete with bolts and nuts for support of isolators and for support of operating rods on gantries/ masts, and insulator to support jumper and jumper connectors.

- 26.1 Single pole isolator
- 26.2 Double pole isolator

26.3 Extra of earthing heal: The price shall be payable as extra for erection of an earth contact assembly in any isolator. The price shall cover the cost of supply and erection of 3x25 mm copper connections between the earth contact assembly and the structures.

Item No 27: Supply and erection of 25 KV feeder copper cable of size 1 core 240 sqmm inside tunnel, RCC Box, Panel station etc.

Item No 28: Supply and erection of termination kit for 25 KV feeder copper cable of size 1 core 240 sqmm, as per approved specification

Item No 29: Integrated Testing and Commissioning AC Traction in JNPT-Vaitarna Section: Price shall cover Testing and Commissioning of entire OHE installations, interfacing with PSI, SCADA and Auto-Fault-Locator Contractors for integrated Testing for Commissioning of Electric Traction in JNPT-Vaitarna Section. GPS mapping of all traction assets like mast, portals, SP, SSP, TSS, overline structures, overlaps, cross-overs etc., to be submitted in hard & soft copy. Price shall also cover the Cost of supply of GPS based Current Collection equipment as per latest RDSO specification Current and conducting the current collection test, report submission highlighting the GPS coordinates of locations where spark/arch noticed and rectification of adverse findings of the test.

Common Notes for Item 1 to 29

Contractor shall take cognizance of the list of material being supplied as free supply and their quantity while quoting rates for above schedule items.

- a. Work is to be carried out as per the approved method statement and after completion of an activity, the Contractor will offer for inspection through a Request for Inspection (RFI) and inspection will be done as per the checklist given in the method statement for the completed work and RFI will be concluded with the checklist duly filled in with all parameters by the Engineer/Employer and the Contractor Engineer.
- b. For any item or activity, if there is no checklist/method statement, the Contractor will submit the same for approval of the Employer before commencement of the work to avoid delay in certification of work done.
- c. All the works shall be carried out in compliance with the latest RDSO instructions for compliance for new works. DFCCIL instructions will prevail over RDSO instructions if found different.
- d. Non-Standard work, if any, will not be acceptable and the underlying factor of above explanatory notes is that standard arrangement as per approved drawing

using standard fittings, components and standard fasteners will be the only acceptance criteria.

- e. Contractor is free to propose revision of any method statements citing the pros and cons in the overall interest of the work. The contents of special notes given for item no 13 are applicable for other items also.
- f. No equipment/machinery such as wiring train, augur, Colmer, RRV etc. shall be provided by DFCCIL. However, tower wagon shall be provided on hiring for final pantograph checking of OHE.

Schedule of Prices:

Item no	Description	Unit	Scope Qty.		Unit Rates		Total Value for Supply & Erection		
			Supply	Erection	Supply	Erection	Supply	Erection	Total
1	Submission and approval of Design and Drawings and supply of as erected drawings.	TKM	0	240	0	14906.3	0	3577512	3577512
2.1	Casting of OHE Foundations in all types of soils other than hard rocks using mechanical augers	CUM	0	10000	0	9552.23	0	95522300	95522300
2.2	Casting of OHE Foundations in hard rocks.	CUM	0	1000	0	10442.26	0	10442260	10442260
2.3	Casting of OHE Foundations using tripod for excavation in marshy land where mechanical auger working is not feasible	CUM	0	1500	0	14242.2	0	21363300	21363300
3.1	Supply and Erection of Fabricated and galvanized B Series Mast, bridge mast (i.e., B-200(S), B-225(S), B-250(S) & B-300(S)) with 1000 GSM hot dipped galvanization	MT	2000	3600	113335.51	2485.66	226671020	8948376	235619396
3.2	Supply and Erection of Fabricated and galvanized Portals (N, O, TTB & R Type) with 1000 GSM hot dipped galvanization	MT	1000	1200	133544.39	8499.67	133544390	10199604	143743994
4	Supply and Erection of Fabricated and galvanized SPS, including Drop Arm & OHE SPS) other than Mast	MT	450	0	163274.06	0	73473327	0	73473327

	with 1000 GSM hot dipped galvanization								
5.1	Supply of 09-ton Insulators (CD-1600)	Nos.	7500		5216.11	0	39120825	0	39120825
5.2	Supply of Bracket Insulators (CD-1600) and Stay Insulators (CD-1600)	Set	5308		10432.21	0	55374171	0	55374171
5.3	Supply of Post Insulators (CD-1600)	Set	800		8976.43	0	7181144	0	7181144
6.1	Supply and Erection of Single Bracket assembly (Modular type)	Each	1150	2688	42546.97	1028.14	48929016	2763640	51692656
6.2	Supply and Erection of Single Bracket assembly (IR Modified type)	Each	2368	2808	16816.21	1028.14	39820785	2887017	42707802
6.3	Supply and Erection of Single Bracket assembly (IR-Conventional)	Each	912	912	13761.03	1028.3	12550059	937810	13487869
7	Supply and Erection of Guy Rod Assembly	Nos.	2000	2000	9794.03	1133.77	19588060	2267540	21855600
8	Supply and Erection of 288 Sq. mm AAAC Feeder wire (19*4 mm) with all fittings as required	TKM	205	205	340005.93	16284	69701216	3338220	73039436
9	Supply and Erection of 93.3 sq.mm AEC wire with all fittings as required	TKM	85	205	123321.08	16284	10482292	3338220	13820512
10	Supply and Erection of BEC wire with all fittings as required	TKM	35	215	242102.37	20355	8473583	4376325	12849908
11	Bonding and Earthing of various structures								

11.1	Connection of mast/OHE structure, LC-Gate fencing, retaining or protection wall, Minor Bridge, Bridge Mast, Steel girder etc., with BEC. Price shall cover supply and erection cost of T connector, Terminal pad, lug, and suitable fasteners required for fixing of jumper wire. But Price shall not cover the cost jumper (BEC) wire which will be paid in item 8.	Nos.	5500	5500	865.09	314	4757995	1727000	6484995
11.2	Supply and erection of 50*6mm Structure bond between Mast/upright and nearest rail as per approved drawings using rail clamp and suitable fasteners.	Nos.	1700	1700	1615.19	368.96	2745823	627232	3373055
11.3	Same as item 11.2 but Structure bond with Rail clamp on both side	Nos.	3200	3200	1964.77	423.92	6287264	1356544	7643808
11.4	Supply and erection of protective screen on ROBs/FOBs	Set	70	70	0	33051.87	0	2313631	2313631
11.5	GI 75*8 Flat	meter	0	4000	0	106.55	0	426200	426200
11.6	GI 50*6 Flat	meter	0	4000	0	78.51	0	314040	314040
12	Supply & Erection of Single earth electrode with earth Pit complete.	Nos.	170	170	6613.34	1653.34	1124268	281068	1405336
13.1	Supply & Erection of OHE with complete fitting, droppers, termination clamps, continuity G-Jumpers, anti-	TKM	0	212	0	323255.5	0	68530168	68530168

	theft jumpers for out of run OHE and Anti-Creep etc., as per approved method statement and drawings, but excluding Cost of Contact and Catenary Wires.								
13.2	Anti Creep	Nos.	220	220	8908.04	4201.97	1959769	924433	2884202
13.3	OHE Termination	Nos.	500	500	10031.34	1124.18	5015670	562090	5577760
13.4	Same as item 13.1 but suitable for lines in yard except main lines	TKM	0	28	0	195828.2	0	5483188	5483188
14.1	Supply of 3 Pulley ATD with Counter Weight Assembly	Nos.	80	80	77149	4228.26	6171920	338261	6510181
14.2	Supply of 5 Pulley ATD with Counter Weight Assembly	Nos.	550	550	77149	4228.26	42431950	2325543	44757493
15	Cross Feeding Arrangement at TSS/SP/SSP, jumpers etc.,	Nos.			0	0	0	0	0
15.1	Cross Feeders 2*37/2.25 mm	Set	92	92	112392.93	1584.78	10340150	145800	10485949
15.2	Loop Jumper	Set	114	114	4093.25	1484.56	466631	169240	635870
15.3	Slack-Feeder	Set.	22	22	9236.67	2068.45	203207	45506	248713
15.4	Drop Jumpers 2*160 sq mm copper	Set.	115	115	20493.12	1533.41	2356709	176342	2533051
15.5	False Catenary	Nos.	65	65	5584.37	1925.27	362984	125143	488127
15.6	Cut in insulators	Nos.	80	80	2195.11	902.93	175609	72234	247843
15.7	G jumper 120 sqmm	Nos.	700	700	9311.85	766.71	6518295	536697	7054992
15.8	50 sqmm copper jumper	Nos.	3500	3500	955.13	766.71	3342955	2683485	6026440
15.9	G jumper 105 sqmm	Nos.	100	100	8147.87	766.71	814787	76671	891458
16	Supply & Erection of various type of retro reflective boards on OHE structures and public caution boards	Nos.	150	150	1271.18	60.21	190677	9032	199709
17	Supply and Erection of Light Weight Section Insulator	Nos.	51	58	315883.55	14393.83	16110061	834842	16944903

	Assembly as DFCCIL requirement								
18	Supply & Erection of PTFE Short Neutral section Assembly	Nos.	16	16	855749.99	7062.78	13692000	113004	13805004
19.1	Supply of Catenary wire of 125 sq. mm as per DFCCIL requirement.	MT	64.32	0	1065082.81	0	68506126	0	68506126
19.2	Supply of Catenary wire of 65 sq. mm as per DFCCIL requirement.	MT	1	0	1065082.81	0	1065083	0	1065083
20.1	Supply of Contact Wire of 150 sq. mm as per DFCCIL requirement	MT	84.16	0	1188235.69	0	100001916	0	100001916
20.2	Supply of Contact Wire of 107 sq. mm as per DFCCIL requirement	MT	34	0	1188235.69	0	40400013	0	40400013
21.1	Supply and Erection 10 KVA 25 kV/240 V Auxiliary Transformer	Nos.	18	18	87504.3	14587.24	1575077	262570	1837648
21.2	Supply and Erection of 25 KVA 25 kV/240 V Auxiliary Transformer	Nos.	6	32	298671.51	14587.24	1792029	466792	2258821
21.3	Supply and Erection of 50 KVA 25 kV/240 V Auxiliary Transformer	Nos.	1	7	388109.29	14587.24	388109	102111	490220
22.1	Supply and Erection of Automatic Change over (ACO) Suitable for 10 KVA Auxiliary Transformers	Nos.	9	9	62082.66	6444.88	558744	58004	616748
22.2	Supply and Erection of ACO Panel Suitable for 25 KVA Auxiliary Transformers	Nos.	17	17	176362.59	8818.71	2998164	149918	3148082

22.3	Supply and Erection of ACO Panel Suitable for 50 KVA Auxiliary Transformers	Nos.	2	2	436218.72	21810.88	872437	43622	916059
23	Supply & erection of anti-climbing for Auxiliary Transformer	Nos.	56	56	1522.08	354.75	85236	19866	105102
24	Supply without Insulator & erection of 25 kV D.O. fuse switch.	Nos.	56	56	15742.22	762.54	881564	42702	924267
25	Supply and Erection and laying of Cables for commissioning of ACO panel suitable for 10/25/50/100 KVA Auxiliary Transformers				0	0	0	0	
25.1	2Cx70 sqmm	meter	2800	2800	212.3	21.23	594440	59444	653884
25.2	2Cx120 sqmm	meter	1000	1000	305.46	30.55	305460	30550	336010
25.3	2Cx185 sqmm	meter	2000	2000	470.93	47.09	941860	94180	1036040
26.1	Supply and Erection of Single Pole Isolators	Nos.	15	15	58815.37	4229.87	882231	63448	945679
26.2	Supply and Erection of Double Pole Isolators	Nos.	6	6	95912.85	4671.7	575477	28030	603507
26.3	Extra for Earthing Arrangement for item 26.1 or 26.2	Nos.	6	6	19573.72	487.31	117442	2924	120366
27	Supply and erection of 25 KV feeder Cu cable of size 1cx240 sqmm	meter	8187	8187	4881.57	1220.39	39965414	9991333	49956747
28	Supply and erection of Termination kit 25 KV feeder Cu cable of size 1cx240 sqmm	Nos.	56	56	29455.39	7363.85	1649502	412376	2061877
29	Integrated Testing & Commissioning of OHE, PSI & SCADA, current collection and GPS mapping etc.	Nos.		1	0	14663104	0	14663104	14663104
Total Approximate Cost							113.41	28.67	142.08
Total Cost for CTP-11 Section (JNPT-Vaitarna) in Crs							Rs. 1,42,07,85,426.36/-		

PART - II

Chapter 11

PRIORITY OF DOCUMENTS

The several documents forming the contract are to be taken as mutually explanatory as one another. If any inconsistency or discrepancy is found in the documents the Client/Employer shall issue any necessary Clarification or instruction. For the purpose of interpretation, the priority of documents shall be in accordance with the following sequence.

1. The Contract agreement
2. The Letter of Acceptance
3. The Preamble & General Instructions to Tenderers
4. Special Conditions of Contract
5. General Conditions of Contract
6. Technical Specifications
7. Employer's Requirement
8. Drawings
9. Schedules of Prices
10. Any other documents forming part of Contract

PART - II**Chapter 12****MILESTONES AND TIME SCHEDULES****4.1.1 Time Schedule:****4.1.1.1 Time of start and completion:**

The time allowed for execution of the works is 12 months **(Twelve months) for (Execution of balance Works for 2x25 kV High Rise OHE in JNPT-Vaitarna Section of DFCCIL in CGM/Mumbai South Unit (102 Km))** from the date of issue of Letter of Acceptance (LOA) from DFCCIL.

The contractor shall be expected to mobilize to the site of works and commence execution of the works within **28 (days)** from issue of Letter of Acceptance by DFCCIL. The contractor shall be expected to complete the whole work ordered on the contractor within the stipulated completion date from the date of issue of Acceptance Letter by DFCCIL.

If the contractor commits defaults in commencing execution of the works as afore stated, DFCCIL shall without prejudice to any other right to remedy, be at liberty to take action for termination of contract as per GCC.

4.1.1.2 Progress of works:

Within a period of 28 days from the issue of Letter of Acceptance, the contract shall submit a schedule for completion / program for execution of all works withing the completion period stipulated in the LOA. All schedules and schedule submittals under this Contract shall be computerized by the Contractor utilizing the latest version of ORACLE PRIMAVERA P6 PROFESSIONAL PROJECT MANAGEMENT SOFTWARE, hereinafter referred to as ORACLE PRIMAVERA P6. The contractor shall submit the programme of work in the form on PrimaveraP6 duly identifying the resource requirement ie, resource loaded for all the activities in consistence with milestone target mentioned in Clause 4.1.2 of this Chapter. The chart shall be prepared in direct relation to the time stated as 12 months for the completion of the works as the milestone targets specified in Clause 4.1.2 below of these special conditions. It shall indicate the forecast of the dates of commencement and completion of various activities of the work and may be amended as necessary by agreements between the Engineer/Employer and the contractor

within the limitation of 12 months as overall completion period. The program shall also indicate the dates by which the inputs required from Employer is expected and same shall be communicated to Employer for timely arrangement. The issues to be addressed and inputs required from the Employer shall be flagged and intimated to Employer well ahead of time, preferably 7 days before these are required as per program.

4.1.1.3 Monthly Progress Update:

The Contractor shall ensure that the schedule is current and accurate and is properly and timely monitored, updated and revised as project conditions may require and as required by the Contract documents. There shall be monthly update of Schedule which shall show up-to date and accurate progress of the Works, and shall forecast the completion date for activities in progress based on the contract baseline schedule. The monthly schedule update shall be prepared by the Contractor and report shall be submitted to Employer on Monthly basis by the 5th of each month indicating progress made against each activity, resources deployed, recovery plan, if any, assistance requirement from Employer, if any.

4.1.2 Achievement of milestone progress:

In order to ensure progress during the execution of the work the contractor will be expected to achieve the following milestone targets ahead of dates mentioned against each. Failure to achieve accomplished milestone targets within allocated time frame, save for reason accepted as laid by the Engineer shall create and constitute the ground for failure on the part of contractor for maintaining progress of the work as per agreed programme (as per Milestone). Failure to achieve any Milestone may attract suitable penalty as deemed fit by Engineer.

S.No.	Milestone Targets	Time Allocated within which to achieve completion in total 365 days (12 months)	
1	Submission of Detailed Schedule of Completion Programme of execution	D+28 days	MS-1
	Familiarization with interface activities with other Contractors to ensure seamless integration and alignment with established methodologies.		
2	Physical commencement of work and mobilization of resources	(D+120 days)	MS-2
3	Completion of Foundation and Steel erection works equivalent to 40 RKM		
4	Completion of laying of BEC conductor and associated bonding work equivalent to 35 RKM	(D+180 days)	MS-3
5	Completion of Foundation and Steel erection works equivalent to 70 RKM		
6	Completion of laying of BEC conductor and associated bonding work equivalent to 70 RKM		
7	Completion of all OHE works ready for commissioning equivalent to 35 RKM	(D+270 days)	MS-4
8	Completion of Foundation and Steel erection works equivalent to 90 RKM		
9	Completion of laying of BEC conductor and associated bonding work equivalent to 75 RKM		
10	Completion of all OHE works ready for commissioning equivalent to 75 RKM	(D+365 days)	MS-5
11	Commissioning of Entire Section along with Commissioning of AFL in co-ordination with M/S Tsuda Japan and SCADA in association with M/S Synergy with OCC Ahmedabad		
12	System Integrated Testing and Commissioning and taking over by the Employer		

- D is the date of issue of the letter of acceptance by DFCCIL to the Contactor.
- These milestones shall be further broken down and planned in details on Primavera.

PART-III

TENDER FORMS (INCLUDING SCHEDULE OF PRICES)

TENDER FORMS

FORM No.	SUBJECT
Form No. 1	Offer Letter
Form No. 2	Tenderer's Credentials
Form No. 2A	Technical Eligibility Criteria Details
Form No. 2B	Financial Eligibility Criteria Details
Form No. 2C	Bid Capacity
Form No. 2D	Applicant's Party Information Form
Form No. 3	Summary of Prices
Form No. 4	Schedule of Prices and Total Prices
Form No. 5	Contract Agreement
Form No. 6	Performance Guarantee Bond
Form No. 7	Standing indemnity bond for on account payment.
Form No. 8	ECS / NEFT / RTGS
Form No. 9	Draft MOU for Joint Venture Participation
FormNo.10	Draft Agreement for JV
FormNo.11	Pro-forma of Participation from each partner of JV
FormNo.12	Power of Attorney for authorized signatory of JV Partners
FormNo.13	Power of Attorney to lead partner of JV
Form No. 14	Proforma for Time Extension
Form No. 15	Certificate of Fitness
Form No. 16	Proforma of 7 days Notice
Form No. 17	Proforma of 48 Hours Notice
Form No. 17A	Proforma of 48 Hrs Notice for Part of the Work
Form No. 18	Proforma of Termination Notice
Form No. 18A	Proforma of Termination Notice for Part of the Work
Form No. 19	Format of Bank Guarantee for Mobilization
Form No. 20	Format of Integrity pact
Form No. 21	Summary of Insurances
Form No. 22	Format for Affidavit
Form No. 23	Format for Safe Custody stores Items
Form No. 24	Format for Bank Guarantee for BID SECURITY
Form No. 25	Proforma for 14 Days Notice for Offloading of Part of Contract work
Form No. 26	Proforma for Notice for Part of Contract work Offloaded
Form No.27	Certification by Arbitrators appointed under Clause 63 & 64 of General Conditions of Contract
Form No. 28	Format for Bank Guarantee for Security Deposit
Form No. 29	Agreement towards Waiver under Section 12(5) and Section 31A (5) of Arbitration and Conciliation
Form No. 30	Final Supplementary Agreement
Form No. 31	List of Equipment, Plant & Machinery.

FORM No. 1

OFFER LETTER

Tender No.....
Name of work.....

To,
The Chief General Manager,
DFCCIL,

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Amendments;
(b) We offer to execute the Works in conformity with the Bidding Documents;
(c) Our bid shall be valid for a period of 120 days from the date of opening of Technical Bid in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
(d) We have not been blacklisted/banned in accordance with para.1.3.13 (ii)(v)(a) of Preamble & General Instructions to tenderers.
(e) We are neither Bankrupt/Insolvent nor in the process of winding-up nor there is a case pending before any Court on deadline of submission of the Bid in accordance with para. 1.3.13 (ii) (v) (b) of Preamble & General Instructions to tenderers.
(f) If our bid is accepted, we commit to obtain a Performance Guarantee in accordance with the Bidding Documents;
(g) If our bid is accepted, we commit to deploy key equipment and key personnel consistent with the requirements of the work.
(h) We understand that this bid, together with your written acceptance thereof included in your notification of award/Letter of Acceptance (LOA), shall constitute a binding contract between us, until a formal contract is prepared and executed; and
(i) All information, statements and description in this bid are in all respect true, correct and complete to the best of our knowledge and belief and we have not made any tampering or changes in the bidding documents on which the bid is being submitted and if any tampering or changes/incorrect information are detected at any stage, we understand the bid will invite summarily rejection and forfeiture of Bid Security deposit, the contract will be liable to be terminated along with forfeiture of performance security, even if LOA has been issued.
(j) We understand that you are not bound to accept the lowest bid or any other bid that you may receive.

Name

In the capacity of

Seal & Signature of Tenderer(s)

For DFCCIL/CGM/South

Signed

Duly authorized to sign the Bid for and on behalf of

Date

FORM No. 2

TENDERER'S CREDENTIALS

S. No.	Description
1	For technical experience/competence, give details of completed or substantially completed similar works during the last Seven years, ending last day of month previous to the one in which tender is invited in the proforma given in Form-2AI
2	For financial capacity and organizational resources, give details of contractual turnover for the last three financial years (i.e current Financial year and three previous financial years) as per audited balance sheet certified by Chartered Accountant in the proforma given in Form-2B
3	Give constitution of your firm. Attach certified copies of legal documents in support thereof. Form-2D

FORM No. 2AI

TECHNICAL ELIGIBILITY CRITERIA DETAILS

Details of the similar works completed (as per Para1.3.13 (i) (A) (I) of
'Preamble & General Instructions to Tenderers')

S. No.	Description	Details to be filled by Tenderer	
1	Contract Identification/ Contract Agreement No.		
2	LOA/LOI No. and Award date		
3	Date of Completion		
4	Role in Contract (This criterion must be fulfilled by the JV or Lead Member of JV ONLY)	Prime Contractor <input type="checkbox"/>	Member in JV <input type="checkbox"/>
5	If member in a JV, specify share of each JV member		
6	Total Contract Value of this contract		
7	Total payment received against this contract before Tender Opening Date		
8	Similar work completed for		
9	Value of Completed similar work under this Contract as defined in requirement of Para 1.3.13(i) (A) (I) and Note of Eligibility Criteria		
10	If member in a JV, specify qualifying amount against Item-9	<i>[insert percentage]</i>	<i>[insert amount]</i>
11	Employer's Name: Address: Telephone/fax number E-mail:		
12	Description of the similarity of Work in accordance with Criteria 1.3.13(i)(A)(I)		

The bidder shall upload Certified completion certificates issued by the client duly signed and scanned/ digitally signed as per Eligibility Criteria of the tender documents along with this form.

Signature of the
Tenderer with Seal

Note: Use separate sheet for each similar work submitted in support of this criterion.

FORM No. 2AII

Deleted

Seal & Signature of Tenderer(s)

For DFCCIL/CGM/South

FORM No. 2B

Reference -Para 1.3.13 (i)(B) of 'Preamble & General Instructions to Tenderers'

FINANCIAL ELIGIBILITY CRITERIA DETAILS

Each Bidder or each member of JV must fill in this form separately.

Name of Bidder/ JV Partner

Annual Contractual Turnover Data for the Previous 3/4 Years (Contractual Payment only)			
Year	Amount Currency	Exchange Rate	Indian National Rupees Equivalent
Average Annual Contractual Turnover for last 3 years			

1. The average annual contractual turnover shall be calculated as an average of "total contractual payments" in the previous three financial years. However, in case balance sheet of the previous year is yet to be prepared/ audited, the audited balance sheet of the fourth previous year shall be considered for calculating average annual contractual turnover.
2. The information supplied shall be substantiated by data in the audited balance sheets and profit and loss accounts for the relevant years in respect of the bidder or all members constituting the bidder.
3. Contents of this form should be certified by a Chartered Accountant duly supported by Audited Balance Sheet duly certified by the Chartered Accountant.

SEAL AND SIGNATURE OF THE BIDDER

Certified that all figures and facts submitted in this form have been furnished after full consideration of all observations/notes in Auditor's reports.....

(Signature of Chartered
Accountant)

Name of CA:.....

Registration No: _.....

(Seal)

FORM 2C

Reference -Para 1.3.13 (i)(C) of 'Preamble & General Instructions to Tenderers'

BID CAPACITY- DETAILS OF EXISTING COMMITMENT AND BALANCE WORK

Each Bidder or each member of JV must fill in this form separately.

Name of Tenderer/JV partner:

S.N.	Name of work	LOA no./ CA no.	Employer's Name/ Address/ Contact Details	Date of Award	Stipulated date of Completion	Expected Date of Completion	Value of work completed up to date of NIT	Balance value of work to be completed in 'N'	Remarks

A (Maximum value of construction works executed and payment received in any one of the previous three financial years or the current financial year (up to date of inviting tender), taking into account the completed as well as works in progress) = **Rs.....**

N (Number of years prescribed for completion of work for which bids has been invited) = **.....Years**

B (Existing commitments and balance amount of ongoing works with the tenderer as per the above format for statement of all works in progress and also the works which are awarded to tenderer but yet not started up to the date of inviting of tender) = **Rs.**

Calculated Bid Capacity of the Tenderer / JV Partner [AxNx2- 0.33xNxN] = Rs.....

Certified that all figures and facts submitted in this form have been furnished after full consideration of all observations/notes in Auditor's reports.....

(Signature of Chartered Accountant)

Name of CA:.....

Registration No: _.....

(Seal)

TENDERER'S CREDENTIALS (BID CAPACITY)
DFCCIL

For tenders having advertised value more than Rs 20 crore wherein eligibility criteria includes bid capacity also, the tenderer will be qualified only if its available bid capacity is equal to or more than the total value of the present tender. The available bid capacity shall be calculated as under:

Available Bid Capacity = $[A \times N \times 2] - 0.33 \times N \times B$ Where,

A = Maximum value of construction works executed and payment received in any one of the previous three financial years or the current financial year (up to date of inviting tender), taking into account the completed as well as works in progress.

N= Number of years prescribed for completion of work for which bids has been invited.

B = Existing commitments and balance amount of ongoing works with the tenderer as per the Format in Form 2C-II for statement of all works in progress and also the works which are awarded to tenderer but yet not started up to the date of inviting of tender.

Note:

- (a) The Tenderer(s) shall furnish the details of -
- (i) Maximum value of construction works executed and payment received in any one of the previous three financial years or the current financial year (up to date of inviting tender) for calculating A, and
 - (ii) Existing commitments and balance amount of ongoing works with tenderer as per the Format in Form 2C-II for statement of all works in progress and also the works which are awarded to tenderer but yet not started up to the date of inviting of tender for calculating B. In case of no works in hand, a 'NIL' statement should be furnished.

The submitted details for (i) and (ii) above should be duly verified by Chartered Accountant.

- (b) In case if a bidder is JV, the tenderer(s) must furnish the details of
- (i) Maximum value of construction works executed and payment received in any one of the previous three financial years or the current financial year (up to date of inviting tender) by each member of JV for calculating A, and
 - (ii) Existing commitments and balance amount of ongoing works with each member of JV either in individual capacity or as a member of other JV as per the Format in Form 2C-II for statement of all works in progress and also the works which are awarded to each member of JV either in individual capacity or as a member of other JV but yet not started up to the date of inviting of tender for calculating B. In case of no works in hand, a 'NIL' statement should be furnished.

The submitted details for (i) and (ii) above should be duly verified by Chartered Accountant.

- (c) Value of a completed work/work in progress/work awarded but yet not started for a Member in an earlier JV shall be reckoned only to the extent of the concerned member's share in that JV for the purpose of satisfying his/her compliance to the above-mentioned bid capacity in the tender under consideration.
- (d) The arithmetic sum of individual "bid capacity" of all the members shall be taken as JV's "bid capacity".
- (e) In case, the tenderer/s failed to submit the above statement along with offer, their/his offer shall be considered as incomplete and will be rejected **summarily**.
- (f) The available bid capacity of tenderer shall be assessed based on the details submitted by the tenderer. In case,

the available bid capacity is lesser than estimated cost of work put to tender, his offer shall not be considered even if he has been found eligible in other eligibility criteria/tender requirement.

FORM 2C-II

PROFORMA OF BID CAPACITY: VALUE OF EXISTING COMMITMENTS**(Railway Board's letter No.2020/CE-I/CT/3E/GCC/Policy Dated 30.12.2020.)**

(Mandatory and applicable for tenders valuing more than Rs 20 Cr to calculate Bid Capacity of tenderer- For value of "B"-Value of existing commitments)

Bidders and each partner of the JV should provide information on their current commitments on all contract that have been awarded, or Letter of Acceptance has been received **up to the date of uploading of tender offer on the website www.ireps.gov.in by the tenderer** or for contracts approaching completion, but for which an unqualified full completion certificate is yet to be issued. **Contract Commitments (for calculating "B" as per the Bid Capacity formula).**

SN	Description of work	Contact No. & date	Name & Address of Employer/ Tel./ Fax/ email	Value of Contract in Rs.	Date of Award of Contract	Date of Completion of Contract
1	2	3	4	5	6	7
1						
2						

Table continued...

Stipulated Period of Completion in Years = (7-6)/365	Date of Opening of this tender (Present Tender)	Balance period for Completion of the Work (In years) = (7-9)/365	Value of Balance Work as on date of Closing of Tender (Total for calculation of 'B' value of work)	Proportionate Amount of contract to be executed in "N" Years** (For calculation of 'B' Value) Refer Note below.
8	9	10	11	12

Total of all works under Column ‘12’ =

‘B’ Value (Total of Column ‘12’) =

“Certified that current commitments on all the contracts that have been awarded or for which a letter of intent or acceptance has been received or for the works in progress or the works approaching completion, value of outstanding work has been indicated in the above table correctly”.

Certified by Chartered Accountant

Signed by Tenderer/s

Name:

Name:

Signature with Seal:

Signature with Seal

Note (1) for Column ‘12’:

1. In case the balance period for completion of the work (assessed at “**Column 10**”) is less than the period of completion of the present tender, full value of balance work as contained in “**Column 11**” shall be taken in “**Column 12**”.
2. In case the balance period for completion of the work (assessed at “**Column 10**”) is more than the period of completion of the present tender, the proportionate amount to be filled in “**Column 12**” shall be calculated as:

$$\frac{\text{Value of balance work as on date of closing (Value in “Column 11”)} \times N}{\text{Balance period for completion value of (Value in “Column 10”)}} \times N$$

3. N = Number of Years prescribed for completion of works for tender under consideration.

Other Notes: -

- (i) This statement should be submitted with tender/bid/uploaded duly certified/issued by Chartered Accountant and duly signed by the tenderer failing which, the document will considered as incomplete and offer will be **SUMMARILY REJECTED**.
- (ii) In case of no work in hand, a ‘NIL’ statement should be furnished duly certified/issued by Chartered Accountant and signed by the tenderer.
- (iii) in case of JV firm, the details of works with each member of JV is required to be submitted duly issued by Chartered Accountant and signed by each member of JV.
- (iv) In case, the tenderer failed to submit the above statement along with tender/bid, his offer shall be considered as incomplete and will be rejected summarily.
- (v) ‘N’ for **Column 12**: Number of years prescribed for completion of work for which bid has been invited.
- (vi) ‘B’ Value of existing commitments and balance amount of ongoing works with the tenderer as on date one month prior to the tender closing date to be completed in next ‘N’ years

- (vii) Value of completed Work/ Work in Progress/Work Awarded but yet not started for a Member in an earlier JV shall be reckoned only to the extent of the concerned member 's share in the JV for the purpose of satisfying his/her compliance to the above-mentioned technical eligibility criteria in the tender under consideration.
- (viii) The arithmetic sum of individual "Bid's Capacity" of all the members shall be taken as in JV's "Bid Capacity".
- (ix) In case, the tenderer/s failed to submit the above statement along with offer, their/his offer shall be considered as incomplete and will be **rejected summarily**.
- (x) **The available Bid Capacity of tenderer shall be assessed based on the details submitted with tender/bid by the tenderer/bidder. In case, the available Bid Capacity is lesser than estimated cost of work put to tender, his offer shall not be considered even if he has been found eligible in other eligibility criteria/ tender requirement.**

FORM 2C-III

PROFORMA OF BID CAPACITY: CONSTRUCTION TURNOVER

(Mandatory and applicable for tenders valuing more than Rs 20 Cr to calculate Bid Capacity of tenderer- For value of "A"- **Construction Turnover**)

(ON THE LETTER HEAD OF CHARTERED ACCOUNTANT)

To

CGM/MUMBAI SOUTH

DFCCIL

Sub: -Construction works executed and payment received

It is to certify that construction works executed and payment received through construction works of M/s (Name of firm)during the previous three financial years and the current financial year (up to date of inviting tender), as extracted from, Balance sheet/ certificate issued by the employer/ client, Form 16 , Form 26AS etc. are as under :-

Sr. No.	Financial year	Work executed And Payment received through Only construction works	Maximum value of construction works executed and payment received in any one of the previous three financial years or the current financial year up to date of inviting tender
1.	Current year (Say A-0)		A
2.	A-1		
3.	A-2		
4.	A-3		

Yours sincerely,

Date: ...

(Name & Sign. Of Authorized Signatory)

Seal of firm Registration No /E-Mail/ Fax

Note :

(a) In case of JV firm details of construction works executed by each member of JV is required to be submitted

(b) In case, the tenderer/s failed to submit the above statement (for tenders valuing more than 20 Cr) along with offer, their/his offer shall be considered as incomplete and will be rejected summarily.

FORM 2C-IV**PROFORMA OF BID CAPACITY CALCULATION BASED ON Form 2C-II & 2C-III
(AxNx2-B)**

Tenderer should Fill up details of “A”(As per Form 2C-III) , “B”(As per Form 2C-II) and “N”(As per NIT) and establish the Bid requirement.

A	
Maximum value of construction works executed and payment received in any one of the previous three financial years or the current financial year (up to date of inviting tender), taking into account the completed as well as works in progress.	<i>Fill up Amount “A” certified by Chartered Accountant in Annexure XII</i>
N	
Number of years prescribed for completion of work for which bids has been invited.	<i>Fill up Completion Period As per NIT.</i>
B	
(Value of existing commitments and balance amount of ongoing works with the tenderer as on date one month prior to the tender closing date to be completed in next ‘N’ years.)	<i>Fill up Amount “B” certified by Chartered Accountant in Annexure-XI.</i>
Available Bid Capacity = [A x N x 2] – 0.33xNx B	<i>Fill up calculated amount as per formula {AxNx2}-0.33xNx B</i>

**Bid Capacity eligibility criteria will be qualified only if the available bid capacity of tenderer is equal to or more than the total bid value of the present tender.*

SEAL AND SIGNATURE OF THE TENDERER

Dated:

Note: The contents in Italics are only for guidance purpose where the Amount is to filled up.
Details as appropriate are to be filled in suitably by tenderer.

APPLICANT'S PARTY INFORMATION FORM

Applicant name:

[insert full name]

Applicant's Party name:

[insert full name of Applicant's Party]

Applicant's Party country of registration:

[indicate country of registration]

Applicant Party's year of constitution:

[indicate year of constitution]

Applicant Party's legal address in country of constitution:

[insert street/ number/ town or city/ country]

Applicant Party's authorized representative information

Name: *[insert full name]*

Address: *[insert street/ number/ town or city/ country]*

Telephone/Fax numbers: *[insert telephone/fax numbers, including country and city codes]*

E-mail address: *[indicate e-mail address]*

1. Attached are copies of original documents of

Articles of Incorporation (or equivalent documents of constitution or association), and/or registration documents of the legal entity named above.

In case of a Government-owned enterprise or institution, documents establishing legal and financial autonomy, operation in accordance with commercial law, and absence of dependent status.

2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

Signature of the Tenderer with Seal

FORM No. 3

SUMMARY OF PRICES

(Summary of Prices has been separately attached in Financial Packet "B")

FORM No. 4

SCHEDULE OF PRICES & TOTAL PRICES

(Schedule of Prices & Total Prices have been separately attached in Financial Packet "B").

FORM No. 5

SAMPLE AGREEMENT

CONTRACT AGREEMENT

(To be executed on requisite value of stamp papers) AGREEMENT

This agreement is made on this Day of 202_ BY AND

BETWEEN Dedicated Freight Corridor Corporation of India Limited (DFCCIL), a company incorporated under the companies Act, 1956 and having its office at Supreme Court Metro Station Building, Pragati Maidan, New Delhi 110001 (hereinafter referred to as "EMPLOYER" which expression shall, where the context admits, include its successors and assigns) OF THE ONE PART

AND

M/s having its office at.....(hereinafter referred to as " the Contractor" which expression shall, where the context admits, include their legal heirs, executors, administrators, successors and assigns in business) OF THE OTHER PART.

WHEREAS: -

1. The Employer is desirous that certain works should be executed by the Contractor viz. Tender No.(hereinafter called "the works", and has accepted a Bid by the Contractor for the execution and completion of such works and the remedying of any defects therein.

NOW THIS AGREEMENT WITNESSETH as follows: -

1. In this Agreement, words and expressions shall have the same meaning as are respectively assigned to them in the Conditions of Contract hereinafter referred to.

2. The following documents shall be deemed to form and be read and construed as part of this Agreement:

- (a) The Contract agreement
- (b) The Letter of Acceptance
- (c) The Preamble & General Instructions to Tenderers
- (d) The Schedules of Prices (Bill of Quantities)
- (e) Special Conditions of Contract (SCC)
- (f) General Conditions of Contract (GCC)

- (g) Employer's Requirement
- (h) Technical Specifications
- (i) Drawings
- (j) Any other documents forming part of Contract

3. In consideration of the payment to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy any defects therein in conformity in all respect with the provision of the contract.
4. The Employer hereby covenant to pay the Contractor in consideration of the execution and completion of the works and the remedying of defects therein the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.
5. Both the parties shall hereby submit to the jurisdiction of the courts situated at New Delhi for the purpose of actions and proceedings arising out of the contract and the courts at Delhi shall have the sole and exclusive jurisdiction to hear and decide such actions and proceedings.
6. In case any one or more of the provisions contained in this Agreement shall for any reason be held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provisions of this Agreement, but this Agreement shall be construed as if such invalid or illegal or unenforceable provision had never been contained herein.

IN WITNESS

Where of the parties hereto have caused this Agreement executed the day and year first before written.

(Name, Designation and address of the
and Authorized signatory)
signatory)

(Name, Designation
address of the authorized
signatory)

Signed for and on behalf of the Contractor in the
Presence of:

Employer in the presence of:

Witness:

Witness:

1.

1.

2.

2.

Name and address of the witnesses to be indicated.

FORM No. 6

SAMPLE

Name of the Bank

Managing Director/ DFCCIL Bank Guarantee Bond No.
Acting through (Designation Dated and address of contract signing authority)

PERFORMANCE GUARANTEE BOND

In consideration of the Managing Director/ DFCCIL acting through CGM/ GM Co-ord., Dedicated Freight Corridor Corporation of India Limited, hereinafter called “DFCCIL”) having agreed under the terms and conditions of agreement/Contract Acceptance letter No. dated made between

(Designation & address of contract signing Authority) and (hereinafter called “the said contractor(s)”) for the work (hereinafter called “the said agreement”) having agreed for submission of an irrevocable Bank Guarantee Bond for Rs. (Rs. only) as a performance security Guarantee Bond from the contractor(s) for compliance of his obligations in accordance with the terms & conditions in the said agreement.

1. We (indicate the name of the Bank) hereinafter referred to as the Bank, under take to pay the Government an amount not exceeding Rs. (Rs. only) on demand by the government
2. We (indicate the name of the bank, further agree that (and promise) to pay the amounts due and payable under this guarantee without any demur merely on a demand from the Government through the Deputy Chief Project Manager/ FINANCE, Dedicated Freight Corridor Corporation of India Limited or CGM/ GM Co-ord, DFCCIL stating that the amount claimed is due by way of loss or damage caused to or would be caused or suffered by the Government by reason of any breach by the said contractor of any of the terms or conditions contained in the said agreement or by reason of the contractor failure to perform the said agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. (Rs. only).
3. (a) We (indicate the name of Bank) further undertake to pay to the Government any money so demanded notwithstanding any dispute or dispute raised by the contractor (s) in any suit or proceeding pending before any court or Tribunal relating to liability under this present being absolute and unequivocal.

(b) The payment so made by us under this bond shall be valid discharge of our liability for payment there under and the contractor(s) shall have no claim against us for making such payment.

4. We, (indicate the name of bank) to further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the Government under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged by CGM/ GM Co-ord DFCCIL (Designation & Address of contract signing authority) on behalf of the Government, certify that the terms and conditions of the said agreement have been fully and properly carried out by the said contractor (s) and accordingly discharges this guarantee.

5. (a) Notwithstanding anything to the contrary contained herein the liability of the bank under this guarantee will remain in force and effect until such time as this guarantee is discharged in writing by the Government or until (date of validity/extended validity) whichever is earlier and no claim shall be valid under this guarantee unless notice in writing thereof is given by the Government within validity / extended period of validity of guarantee from the date aforesaid.

(b) Provided always that we (indicate the name of the Bank) unconditionally undertakes to renew this guarantee to extend the period of guarantee form year to year before the expiry of the period or the extended period of the guarantee, as the case may be on being called upon to do so by the Government. If the guarantee is not renewed or the period extended on demand, we (indicate the name of the Bank) shall pay the Government the full amount guarantee on demand and without demur.

6. We (indicate the name of Bank) further agree with the Government that the Government shall have the fullest liberty without our consent and without effecting in any manner out of obligations hereunder to vary any of the terms and conditions of the said contract from time to time or to postpone for any time or from time to time any to the powers exercisable by the Government against the said contractor (s) and to forbear or enforce any of the terms and conditions of the said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said contractor (s) or for any bearance act or omission on the part of the Government or any indulgence by the Government to the said contractor (s) or by any such matter or thing whatsoever which under the law relating to sureties for the said reservation would relive us from the liability.

7. This guarantee will not be discharged by any change in the constitution of the Bank or the Contractor (s).

8. We (indicate the name of the Bank) lastly undertake not to revoke this guarantee except with the previous consent of the Government in writing.

9. This guarantee shall be valid upto (Date of completion plus 60 days beyond that). Unless extend on demand by Government. Notwithstanding anything to the contrary contained herein before, our liability under this guarantee is restricted to Rs. (only) unless a demand under this guarantee is made on us in writing on or before we, shall be discharged from our liabilities under this guarantee thereafter.

Dated the day of the for (indicate the name of Bank)

Witness:

Signature of Bank Authorize official (Name):

Designation:

Full Address.

FORM No. 7

**SAMPLE
STANDING INDEMNITY BOND FOR "ON ACCOUNT" PAYMENTS**

(On paper of requisite stamp value)

We, M/s _____ hereby undertake that we hold at our stores/Depot/s at _____ for and on behalf of the Managing Director/ DFCCIL acting in the premises through the CGM/ GM Co-ord DFCCIL or his successor (hereinafter referred to as "The Employer") all materials for which "On Account" payments have been made to us against the Contract for (_____) on the section _____ DFCCIL also referred to as Group/s _____ vide letter of Acceptance of Tender dated _____ and material handed over to us by the employer for the purpose of execution of the said contract, until such time the materials are duly erected or otherwise handed over to him.

We shall be entirely responsible for the safe custody and protection of the said materials against all risk till they are duly delivered as erected equipment to the employer or as he may direct otherwise and shall indemnify the employer against any loss/damage or deterioration whatsoever in respect of the said material while in our possession and against disposal of surplus materials. The said materials shall at all times be open to inspection by any officer authorized by the CGM/ GM Co-ord in charge of Dedicated Freight Corridor Corporation of India Limited (Whose address will be intimated in due course).

Should any loss, damage or deterioration of materials occur or surplus material disposed off and refund becomes due, the Employer shall be entitled to recover from us the 85% of supply portion of Part IV, Chapter-II (Form - 4) to the Contract (as applicable) and also compensation for such loss or damage if any long with the amount to be refunded without prejudice to any other remedies available to him by deduction from any sum due or any sum which at any time here after becomes due to us under the said or any other Contract.

Dated this day _____ day of 2024

for and on behalf of

M/s _____ (Contractor)

Signature of witness

Name of witness in Block letter. Address.

FORM No. 8

ECS / NEFT / RTGS MANDATE FORM

Date:- To,

Deputy Chief Project Manager /Finance,

Mumbai/South

Sub: ECS / NEFT / RTGS payments

We refer to the ECS / NEFT / RTGS set up by DFCCIL for remittance of our payments using RBI's NEFT / RTGS scheme, our payments may be made through the above scheme to our under noted account.

Name of Bank	
Name of City	
Bank Code No	
Name of Bank Branch	
Branch Code No	
Address of Bank Branch	
Telephone Number of Bank Branch	
Fax No of Bank Branch	
Name of customer / Tenderer as per account	
Account Number of Tenderer appearing on cheque book	
Type of Account (S. B. / Current / Cash credit)	
IFSC code for NEFT	
IFSC code for RTGS	
9-Digit-code number of the bank and branch appearing on the MICR cheque issued by the bank.	
Details of Cancelled Cheque leaf	
Telephone no of tenderer	
Cell Phone Number of the tenderer to whom details with regard to the status of bill submitted to Accounts Office i.e Co6 & Co7 & Cheque Purchase Orders particulars can be intimated through SMS	
Tenderer's E - mail ID	

Confirmed by Bank signature of tenderer With stamp and address Enclose a copy of crossed cheque.

FORM No. 9

**DRAFT MEMORANDUM OF UNDERSTANDING (MOU)
For JOINT VENTURE PARTICIPATION
BETWEEN**

M/s having its registered office at (hereinafter referred to as) acting as the Lead Partner of the first part,

and

M/shaving its registered office at (hereinafter referred to as `..... ') in the capacity of a Joint Partner of the other part.

and

M/shaving its registered office at(hereinafter referred to as `..... ') in the capacity of a Joint Partner of the other part.

The expressions of and.....shall wherever the context admits, mean and include their respective legal representatives, successors-in-interest and assigns and shall collectively be referred to as “the Parties” and individually as “ the Party”

WHEREAS:

Dedicated Freight Corridor Corporation of India Limited (DFCCIL) [hereinafter referred to as “Client”]has invited bids for ... “[Insert name of work]... ..”

NOW, THEREFORE, THE PARTIES AGREE AS FOLLOWS:

1. The following documents shall be deemed to form and be read and construed as an integral part of this MOU.
 - (i) Notice for Bid, and
 - (ii) Bidding document
 - (iii) Any Amendment [Addendum/Corrigendum] issued by Dedicated Freight Corridor Corporation of India Limited
 - (iv) The bid submitted on our behalf jointly by the Lead Partner.
2. The `Parties' have studied the documents and have agreed to participate in submitting a `bid' jointly.
3. M/s.....shall be the lead member of the JV for all intents and purpose and shall represent the Joint Venture in its dealing with the Client. For the purpose of submission of bid proposals, the

parties agree to nominate as the leader duly authorized to sign and submit all documents and subsequent clarifications, if any, to the Client. However M/s.....shall not submit any such proposals, clarifications or commitments before securing the written clearance of the other partner which shall be expeditiously given by M/s.....to M/s.....

4. The 'Parties' have resolved that the distribution of responsibilities and their proportionate share in the Joint Venture is as under:

a. Lead Partner;

(i)

(ii)

(iii)

b. Joint Venture Partner

(i)

(ii)

(iii)

[Similar details to be given for each partner]

5. JOINT AND SEVERAL RESPONSIBILITY

The Parties undertake that they shall be jointly and severally liable to the Client in the discharge of all the obligations and liabilities as per the contract with the Client and for the performance of contract awarded to their JV.

6. ASSIGNMENT AND THIRD PARTIES

The parties shall co-operate throughout the entire period of this MOU on the basis of exclusivity and neither of the Parties shall make arrangement or enter into agreement either directly or indirectly with any other party or group of parties on matters relating to the Project except with prior written consent of the other party.

7. EXECUTIVE AUTHORITY

The said Joint Venture through its authorized representative shall receive instructions, payments from the Client. The management structure for the project shall be prepared by mutual consultations to enable completion of project to quality requirements within permitted cost and time.

8. BID SECURITY

Till the award of the work, JV firm/Lead Partner of JV firm shall furnish Bid Security to the Client on behalf of the joint venture which shall be legally binding on all the members of the Joint Venture.

9. BID SUBMISSION

Each Party shall bear its own cost and expenses for preparation and submission of the bid and all costs until conclusion of a contract with the Client for the Project. Common expenses shall be shared by all the parties in the ratio of their actual participation.

10. INDEMNITY

Each party hereto agrees to indemnify the other party against its respective parts in case of breach/default of the respective party of the contract works of any liabilities sustained by the Joint Venture.

11. For the execution of the respective portions of works, the parties shall make their own arrangements to bring the required finance, plants and equipment, materials, manpowered the sources.

12. DOCUMENTS & CONFIDENTIALITY

Each Party shall maintain in confidence and not use for any purpose related to the Project all commercial and technical information received or generated in the course of preparation and submission of the bid.

13. ARBITRATION

Any dispute, controversy or claim arising out of or relating to this agreement shall be settled in the first instance amicably between the parties. If an amicable settlement cannot be reached as above, it will be settled by arbitration in accordance with the Indian Arbitration and Conciliation Act 1996 or any amendments thereof. The venue of the arbitration shall be Delhi.

14. VALIDITY

This Agreement shall remain in force till the occurrence of the earliest to occur of the following, unless by mutual consent, the Parties agree in writing to extend the validity for a further period.

- a. The bid submitted by the Joint Venture is declared unsuccessful, or
- b. Cancellation/ shelving of the Project by the client for any reasons prior to award ofwork
- c. Execution of detailed JV agreement by the parties, setting out detailed terms afterward of work by the Client.

15. This MOU is drawn in number of copies with equal legal strength and status. One copy is held by M/s and the other by M/s.....&M/s and a copy submitted with the proposal.

16. This MOU shall be construed under the laws of India.

17. NOTICES

Notices shall be given in writing by fax confirmed by registered mail or commercial courierto the following fax numbers and addresses:

Lead Partner

Other Partner(s)

.....

.....

(Name & Address)

(Name & Address)

IN WITNESS WHEREOF THE PARTIES, have executed this MOU the day,

month andyear first before written.

M/s.....

.....

(Seal)

Witness

1(Name & Address)

2(Name & Address)

Notes: (1) In case of existing joint venture, the certified copy of JV Agreement may be finished

FORM No. 10

DRAFT FORMAT OF JOINT VENTURE AGREEMENT

To be executed on non-judicial stamp paper of appropriate value in accordance with relevant Stamp Act and to be registered with appropriate authority under Registration Act.

The JV agreement shall be structured generally as per contents list given below:

A. CONDITIONS AND TERMS OF JV AGREEMENT

1. Definitions and Interpretation
2. Joint Venture – Include Equity of members, transferability of shareholding of equity of a partner leaving during the subsistence of the contract.
3. Proposal Submission
4. Performance – To indicate scope of responsibility of each member
5. Language and Law
6. Exclusively
7. Executive Authority
8. Documents
9. Personnel
10. Assignment and Third Parties
11. Severability
12. Member in Default
13. Duration of the Agreement
1. Liability and sharing of risks
1. Insurance
2. Sharing of Promotion and Project Costs, Profits, Losses and Remuneration
3. Financial Administration and Accounting
4. Guarantees and Bonds
5. Arbitration
6. Notices
7. Sole Agreement and Variation

B. SCHEDULES

1. Project and Agreement Particulars
2. Financial Administration Services
3. Allocation of the obligations
4. Financial Policy and Remuneration

FORM No. 11

PROFORMA LETTER OF PARTICIPATION FROM EACH PARTNER OF JOINT VENTURE (JV)

(To be executed on non-judicial stamp paper of appropriate value in accordance with relevant Stamp Act and to be registered with appropriate authority under Registration Act.)

No....

Dated

From:

.....

To,

CGM

Mumbai/South

Dedicated Freight Corridor Corporation of India Limited

Address -----

Sir,

Re: ..."[Insert name of work]"

Ref: Your notice for 'Notice Inviting Tender' (NIT) No.dated.....

- 1. We wish to confirm that our company/firm has formed a Joint Venture with (i).....& ii)..... for the purposes associated with IFB referred to above.

*(Members who are not the lead partner of the JV should add the following paragraph)**

- 2. 'The JV is led by... .. whom we hereby authorize to act on our behalf for the purposes of submission of Bid for..... and authorize to in cur liabilities and receive instructions for and on behalf of any and all the partners or constituents of the Joint Venture.'

OR

*(Member(s) being the lead member of the group should add the following paragraph)**

- 2. 'In this group we act as leader and, for the purposes of applying for Bid, represent the Joint Venture:
- 3. In the event of our JV being awarded the contract, we agree to be jointly with i).....& ii).....(names of other members of our JV) and severally liable to the Dedicated Freight Corridor Corporation of India Limited, its successors and assigns for all obligations, duties and responsibilities arising from or imposed by the contract subsequently

entered into between Dedicated Freight Corridor Corporation of India Limited and our JV.

- 4. *I/We, further agree that entire execution of the contract shall be carried out exclusively through the lead partner.**

Yours faithfully,

(Signature)

(Name of Signatory).....

(Capacity of Signatory).....

Company Seal

* Delete as applicable

Note: In case of existing joint venture, the certified copy of JV Agreement maybe furnished.

FORM No. 12

**FORMAT FOR POWER OF ATTORNEY FOR AUTHORISED SIGNATORY OF
JOINT VENTURE (JV) PARTNERS
POWER OF ATTORNEY***

(To be executed on non-judicial stamp paper of the appropriate value in accordance with relevant stamp Act. The stamp paper to be in the name of the company who is issuing the power of Attorney)

Know all men by these presents, we ... do hereby constitute, appoint and authorize Mr/Ms.....who is presently employed with us and holding the position ofas our attorney, to do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental to our bid for the work of ... [Name of Work] including signing and submission of all documents and providing information / responses to Dedicated Freight Corridor Corporation of India Limited, representing us in all matters, dealing with Dedicated Freight Corridor Corporation of India Limited in all matters in connection with our bid for the said project.

We here by agree to ratify all acts, deed sand things lawfully done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall and shall always be deemed to have been done by us.

Dated this the.....day of.....

(Signature of authorised Signatory)

Signature of Lead Partner Signature of JV Partner(s)

.....
(Signature and Name in Block letters of Signatory) Seal of Company

Witness

Witness1: Name:

Witness2: Name:

*Notes:

Address: Occupation:

Address: Occupation:

i) To be executed by all the partners jointly, in case of a Joint Venture.

FORMAT FOR POWER OF ATTORNEY TO LEAD PARTNER OF JOINT VENTURE (JV)

(To be executed on non-judicial stamp paper of the appropriate value in accordance with relevant stamp Act. The stamp paper to be in the name of the company who is issuing the power of Attorney)

POWER OF ATTORNEY*

Whereas Dedicated Freight Corridor Corporation of India Limited has invited Bids for the work of[Name of Work]

Whereas, the members of the Joint Venture comprising of M/s....., M/s....., M/s....., and M/s..... are interested in submission of bid for the work of...[Insert name of work] in accordance with the terms and conditions contained in the bidding documents.

Whereas, it is necessary for the members of the Joint Venture to designate one of them as the Lead Partner, with all necessary power and authority to do, for and on behalf of the Joint Venture, all acts, deeds and things as may be necessary in connection with the Joint Venture's bid for the project, as may be necessary in connection the Joint Venture's bid for the project.

NOW THIS POWER OF ATTORNEY WITNESSETH THAT:

We, M/s....., hereby designate M/s. , being one of the partners of the Joint Venture, as the lead partner of the Joint Venture, to do on behalf of the Joint Venture, all or any of the acts, deeds or things necessary or incidental to the Joint Venture's bid for the contract, including submission of bid, participating in conferences, responding to queries, submission of information/document sand generally to represent the Joint Venture in all its dealings with the Railways/DFCCIL or any other Government Agency or any person, in connection with the Bid/contract for the said work until culmination of the process of bidding till the contract agreement if successful, is entered into with the Dedicated Freight Corridor Corporation of India Limited and thereafter till the expiry of the contract agreement.

*To be executed by all the members of the JV except the lead member.

The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executants (s) and when it is so required the same should be under common seal affixed in accordance with the required procedure.

We hereby agree to ratify all acts, deeds and things lawfully one by lead member, our said attorney, pursuant to this power of attorney and that all acts deeds and things done by our aforesaid attorney shall and shall always be deemed to have been done by us/Joint Venture.

Dated this the..... Day of 2024

.....
(Signature)

.....
(Name in Block letters of
Executants) Seal of Company

Witness 1	
Name:	
Address:	
Occupation:	
Witness 2	
Name:	
Address:	
Occupation:	

FORM No. 14

Registered Acknowledgement Due

PROFORMA FOR TIME EXTENSION

No. Dated :

- Sub : (i) (name of work).
(ii) Acceptance letter no.
(iii) Understanding/Agreement no.

Ref: (Quote specific application of Contractor for extension to the date received)

Dear Sir,

1. The stipulated date for completion of the work mentioned above is.....From the progress made so far and the present rate of progress, it is unlikely that the work will be completed by the above date (or 'However, the work was not completed on this date').
2. Expecting that you may be able to complete the work, if some more time is given, the competent authority, although not bound to do so, hereby extends the time for completion from.....to.
3. Please note that an amount equal to the liquidated damages for delay in the completion of the work after the expiry of (give here the stipulated date for completion with/without any penalty fixed earlier)will be recovered from you as mentioned in Clause, 17-B of the General Conditions of Contract for the extended period, notwithstanding the grant of this extension. You may proceed with the work accordingly.
4. The above extension of the completion date will also be subject to the further condition that no increase in rates on any account will be payable to you.
5. Please intimate within a week of the receipt of this letter your acceptance of the extension of the conditions stated above.
6. Please note that in the event of your declining to accept the extension on the above said conditions or in the event of your failure after accepting or acting upto this extension to complete the work by

(here mention the extended date), further action will be taken in terms of Clause 62 of the General Conditions of Contract.

Yours faithfully,

For and on behalf of the Employer

Name of the Official:-

Stamp/Seal of the Employer

FORM No. 15

As per Clause 60.(2) of GCC

CERTIFICATE OF FITNESS

1. (a) Serial Number
(b) Date
2. Name of person examined
I certify that I have personally examined (name)
3. Father's Name: son/daughter of , residing at
4. Sex
5. Residence:
6. Date of birth, if available, and/or certified age
7. Physical fitness
8. Identification marks

Who is desirous of being employed in a factory or on a work requiring manual labour and that his / her age as nearly as can be ascertained from my examination, is

years and that he/she is fit for employment in a factory or on a work requiring manual labour as an adult/child.

9. Reasons for:

- (a) refusal to grant certificate, or
- (b) revoking the Certificate

Signature or Left Hand Thumb Impression of the
person Examined

Signature of Certifying Surgeon

Note :In case of physical disability, the exact details of the cause of the physical disability should be clearly stated

FORM No. 16
Reference Clause 62.(1) of GCC
Registered Acknowledgement Due

**PROFORMA OF 7 DAYS NOTICE FOR WORKS AS A WHOLE/
IN PARTS(DETAILS OF PART OF WORK TO BE MENTIONED)**
DFCCIL
(Without Prejudice)

To

M/s _____

Dear Sir,

Contract Agreement No. _____ In connection with

1. In spite of repeated instructions to you by the subordinate offices as well as by this office in various letters of even no. _____, dated _____; you have failed to start work/show adequate progress and/or submit detailed programme for completing the work.
2. Your attention is invited to this office/CGM's office letter no. _____, dated _____ in reference to your representation, dated _____.
3. As you have failed to abide by the instructions issued to commence the work/to show adequate progress of work you are hereby given 7 days' notice in accordance with Clause 62 of General Conditions of Contract to commence works / to make good the progress, failing which further action as provided in Clause 62 of the General Conditions of Contract viz. to terminate your Contract and complete the balance work without your participation will be taken.

Kindly acknowledge receipt.

Yours faithfully

For and on behalf of the
Employer Name of the
Official:-
Stamp/Seal of the Employer

FORM No. 17
Reference Clause 62.(1) of GCC
Registered Acknowledgement Due

PROFORMA OF 48 HRS NOTICE FOR WHOLE WORK
DFCCIL
(Without Prejudice)

To

M/s _____

Dear Sir,

Contract Agreement No. _____ In connection with _____

1. Seven days' notice under Clause 62 of General Conditions of Contract was given to you under this office letter of even no., dated _____; but you have taken no action to commence the work/show adequate progress of the work.
2. You are hereby given 48 hours' notice in terms of Clause 62 of General Conditions of Contract to commence works / to make good the progress of works, failing which and on expiry of this period your above contract will stand rescinded and the work under this contract will be carried out independently without your participation and your Security Deposit shall be forfeited and Performance Guarantee shall also be encashed and consequences which may please be noted.

Kindly acknowledge receipt.

Yours faithfully

For and on behalf of the
Employer Name of the
Official:-
Stamp/Seal of the Employer

FORM No. 17(A)
Reference Clause 62.(1) of GCC
Registered Acknowledgement Due

PROFORMA OF 48 HRS NOTICE FOR PART OF THE WORK

_____ DFCCIL
(Without Prejudice)

To

M/s _____

Dear Sir,

Contract Agreement No. _____ In connection with _____

1. Seven days' notice under Clause 62 of General Conditions of Contract was given to you under this office letter of even no., dated _____; but you have taken no action to commence the work/show adequate progress of the part of work.....(details of part to be mentioned).
2. You are hereby given 48 hours' notice in terms of Clause 62 of General Conditions of Contract to commence works / to make good the progress of works, failing which and on expiry of this period your above part of work(details of part to be mentioned) in contract will be rescinded and the work under this contract will be carried out independently without your participation.
3. Your full Performance Guarantee for the Contract shall be forfeited and you shall not be issued any completion certificate for the contract. However, no additional Performance Guarantee shall be required for balance work being execute through the part terminated contract.
4. The contract value of part terminated contract shall stand reduced to

Kindly acknowledge receipt.

Yours faithfully

For and on behalf of the
EmployerName of the
Official:-
Stamp/Seal of the Employer

FORM No. 18
Reference Clause 62.(1) of GCC
Registered Acknowledgement Due

PROFORMA OF TERMINATION NOTICE
_____DFCCIL
(Without Prejudice)

No. _____ Dated _____

To
M/s _____

Dear Sir,

Contract Agreement No. _____ In connection with

Forty eight hours (48 hrs.) notice was given to you under this office letter of even no.,
dated _____; but you have taken no action to commence the work/show adequate progress
of the work.

Since the period of 48 hours' notice has already expired, the above contract stands rescinded in terms of
Clause 62 of General Conditions of Contract and the balance work under this contract will be carried out
independently without your participation. Your participation as well as participation of every
member/partner in any manner as an individual or a partnership firm/JV is hereby debarred from
participation in the tender for executing the balance work and your Security Deposit shall be forfeited
and Performance Guarantee shall also be encashed.

Kindly acknowledge receipt.

Yours faithfully

For and on behalf of the
EmployerName of the
Official:-
Stamp/Seal of the Employer

FORM No. 18 (A)
Reference Clause 62.(1) of GCC
Registered Acknowledgement Due

**PROFORMA OF TERMINATION NOTICE FOR PART OF THE WORK
(DETAILS OF PART OF WORK TO BE
MENTIONED)**

_____DFCCIL
(Without Prejudice)

No. _____ Dated _____

To
M/s _____

Dear Sir,

Contract Agreement No. _____ In connection with

1. Forty eight hours (48 hrs.) notice was given to you under this office letter of even no.,..... dated _____; but you have taken no action to commence the work/show adequate progress of the part of work.....(details of part of work to be mentioned)
2. Your above part of work in contract.....(details of part of work to be mentioned)stands rescinded interms of Clause 62 of General Conditions of Contract and the same will be carried out independently without your participation. Your participation as well as participation of every member/partner in any manner as an individual or a partnership firm/JV is hereby debarred from participation in the tender for executing the balance work.
3. Your full Performance Guarantee for the Contract shall be forfeited and you shall not be issued any completion certificate for the contract. However, no additional Performance Guarantee shall be required for balance work being execute through the part terminated contract.
4. The contract value of part terminated contract shall stand reduced to

Kindly acknowledge receipt.

Yours faithfully

For and on behalf of the
EmployerName of the
Official:-
Stamp/Seal of the Employer

FORM No. 19

**SAMPLE
FORMAT OF BANK GUARANTEE FOR MOBILISATION ADVANCE**

(Clause 1.5.20, Part - I, Chapter - V)

Bank guarantee made on this Between
..... (hereinafter
r
called “**the Bank**”) of the One Part and Dedicated Freight Corridor Corporation of India Limited.
(hereinafter called “**the Employer**”) of the other Part.

WHEREAS Dedicated Freight Corridor Corporation of India Limited has awarded the
Contract no..... for “.....” (hereinafter called “**the Contractor**”),
having its registered office at

AND WHEREAS vide Clause 1.5.20 of Part - I, Chapter V , Special Conditions of
Contract, Mobilization Advance up to__%
(_____percent) of the original contract value of Rs.....is
payable to the contractor against Bank Guarantees, the contractor hereby applies for Mobilization
Advance of__%
(___percent) amounting to Rs...../- (Rupees.....) of
the Contract Price,

Now, we the undersigned, Bank of, being fully authorized to sign and to incur
obligations for and on behalf of and in the name of Bank ofhereby declare that the said
Bank will guarantee the Employer the full amount of Rs.-/
(Rupees.....) as stated above.

We, Bank of, do hereby unconditionally, irrevocably and without demur
guarantee and undertake to pay the Employer immediately on demand any or all money payable
by the contractor to the extent of Rs.-/(Rupees.....) without any
demur, reservation, context, recourse or protest and/or without any reference to the contractor.
Any such demand made by the Employer on the Bank shall be conclusive and binding
notwithstanding any difference between the Employer and the contractor on any dispute
pending before any court, Tribunal, Arbitrator or any other authority. We agree that the
guarantee herein contained shall be irrevocable and shall continue to be enforceable till the
Employer discharges this guarantee.

This guarantee is valid till

At any time during the period in which this guarantee still valid of the contractor fails to fulfill its
obligation under the Contract, it is understood that the Bank will extend this guarantee under the

same condition forthe required time on demand by the Employer at the cost of the contractor.

The Guarantee hereinbefore contained shall not be affected by any change in the constitution of the Bank or of the contractor.

The neglect or forbearance of the Employer in enforcement of payment of any money, the payment whereof is intended to be hereby secured or the giving of time by the Employer for the payment hereof shall in no way relieve the Bank of their liability under this Deed.

The expressions “the Employer”, “the Bank” and “the contractor” hereinbefore used shall include theirrespective successors and assigns.

Notwithstanding anything contained herein:

Our liability under this Bank Guarantee shall not exceed Rs...../- (Rupees)

This bank Guarantee shall be valid up to.....

We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only and onlyif you serve upon us a written claim or demand on or before.....(date of expiry of Guarantee).

In witness whereof we of the Bank have signed and sealed this Guarantee on the day of..... being herewith duly authorized.

For and on behalf of the Bank of.....

Signature of Authorized Bank Official

Name
Designation
Stamp/Seal of the bank
Signed, sealed and delivered for
and onBehalf of the bank by the
above named

..... in the
presence ofWitness 1
Signature
Name
Address
Witness 2

Signature

Name

Address

Form no. 20

PRE CONTRACT INTEGRITY PACT

General

This pre-bid pre-contract Agreement (hereinafter called the Integrity Pact) is made on-----
----day of the month of----- 20xx, between, on one hand, the DFCCIL acting through Shri ----
----- Designation of the officer, (hereinafter called the CLIENT, which expression shall mean
and include, unless the context otherwise requires, his successors in office and assigns) of the First Part and
M/s----- represented by Shri ----- Chief Executive Officer (hereinafter called the
"BIDDER/SELLER" which expression shall mean and include, unless the context otherwise requires, his
successors and permitted assigns) of the Second part.

WHEREAS the CLIENT proposes to procure (Name of the Stores/Equipment/Item, Name of the
Consultancy Service, Name of Works Contract, Name of Services) and the [A] is willing to Offer/has
offered for stores or works.

WHEREAS the [A] is a private company/ public company/ Government undertaking/ partnership/ registered
export agency, constituted in accordance with the relevant law in the matter and the CLIENT is a PSU
performing its functions.

NOW, THEREFOR,

To avoid all forms of corruption by following a system that is fair, transparent and free from any
influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered
into with a view to:-

Enabling the CLIENT to obtain the desired said (Name of the Stores/Equipment/Item, Name of the
Consultancy Service, Name of Works Contract, Name of Services) at a competitive price in conformity
with the defined specifications by avoiding the high cost and the distortionary impact of corruption on
public procurement, and

Enabling BIDDERS to abstain from bribing or indulging in any corrupt practice in order to secure [B] by
providing assurance to them that their competitors will also abstain from bribing and other corrupt practices
and the CLIENT will commit to prevent corruption, in any form, by its Officials by following transparent
procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows: Commitments of the
CLIENT

1. The CLIENT undertakes that no official of the CLIENT, connected directly or indirectly with the [B],
will demand, take a promise for or accept, directly or through intermediaries, any bribe,

consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the [A] either for themselves or for any person, organization or third party related to the [B], in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the [B].

1.1 The CLIENT will, during the pre-contract stage, treat all BIDDERS alike, and will provide to all BIDDERS the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular [A] in comparison to other BIDDERS.

1.2 All the officials of the CLIENT will report to the appropriate Government office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.

2. In case any such preceding misconduct on the part of such official(s) is reported by the [A] to the CLIENT with full, and verifiable facts and the same is prima facie found to be correct by the CLIENT, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the CLIENT and such a person shall be debarred from further dealings related to the [B] process. In such a case while an enquiry is being conducted by the CLIENT the proceedings under the [B] would not be stalled.

Commitments of BIDDERS

3. The [A] commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage) in order to secure the [B] contract or in furtherance to secure it and in particular commit itself to the following:-

3.1 The [A] will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission fees, brokerage or inducement to any official of the CLIENT, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the [B] in exchange for any advantage in the bidding, evaluation, contracting and implementation of the [B].

3.2 The [A] further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour, any Material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the CLIENT or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the [B] or any other [B] with the Government for showing or forbearing to show favour or disfavor to any person in relation to the [B] or any other [B] with the Government.

3.3 *[A] shall disclose the name and address of agents and representatives and Indian [A] shall disclose their foreign

principals or associates.

3.4 *[A] shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.

3.5 The [A] further confirms and declares to the CLIENT that the [A] is the original manufacturer/integrator/authorized government sponsored export entity of the defense stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the CLIENT or any of its functionaries, whether officially or unofficially to the award of the [B] to the [A] nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.

3.6 The [A] either while presenting the bid or during pre-contract negotiations or before signing the [B] shall disclose any payments he has made, is committed to or intends to make to officials of the CLIENT or their family members, agents, brokers or any other intermediaries in connection with the [B] and the details of services agreed upon for such payments.

3.7 The [A] will not collude with other parties interested in the [B] to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the [B].

3.8 The [A] will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.

3.9 The [A] shall not use improperly, for purposes of competition or personal gain, or pass on to others, any information provided by the CLIENT as part of the business relationship, regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The [A] also undertakes to exercise due and adequate care lest any such information is divulged.

3.10 The [A] commits to refrain from giving any complaint directly or through any other manner without Supporting it with full and verifiable facts.

3.11 The [A] shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.

3.12 If the, [A] or any employee of the [A] or any person acting on behalf of the [A], either directly or Indirectly, is a relative of any of the officers of the CLIENT, or alternatively, if any relative of an officer of the CLIENT has financial. Interest/stake in the Bidder's firm, the same shall be disclosed by the [A] at the time of filling of tender.

The term 'relative' for this purpose would be as defined in section 6 of the companies act 1956.

3.13 The [A] shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the CLIENT.

3.14 The [A] shall not approach the courts while representing the matter to IEM and he/she will await their decision in this matter.

4. Previous Transaction

4.1 The [A] declares that no previous transgression occurred in the last three years immediately before signing of this integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any public sector enterprise in India or any Government department in India that could justify BIDDER's from the tender process.

4.2 The [A] agrees that if it makes incorrect statement on this subject, [A] can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

5. Securities/Guarantees

5.1 The Bid Security (also called Earnest Money)/Security Deposit (also called Retention Money)/Performance Guarantee shall be as per the provisions of Bid document.

6. Sanctions for Violations

6.1 Any breach of the aforesaid provisions by the [A] or any one employed by it or acting on its behalf (whether with or without the knowledge of the [A] shall entitle the CLIENT to take all or any one of the following actions, wherever required :-

- (i) To immediately call off the pre-contract negotiations without assigning any reason or giving any compensation to the [A]. However, the proceedings with the other BIDDER(s) would continue.
- (ii) The Bid Security deposit (in pre-contract stage) and/or security Deposit/performance Bond (after the [B] is signed) shall stand forfeited fully and the CLIENT shall not be required to assign any reason therefore.
- (iii) To immediately cancel the [B], if already signed, without giving any compensation to the [A].
- (iv) To recover all sums already paid by the CLIENT, and in case of an Indian [A] with interest thereon at 2% higher than the prevailing prime lending rate of state bank of India, while in case of a [A] from the country other than India with interest thereon at 2% higher than the LIBOR. If any outstanding payment is due to [A] from the CLIENT in connection with any other [B], such outstanding payment could also be utilized to recover the aforesaid sum and interest.
- (v) To encash the advance bank guarantee and performance bond, if furnished by the [A], in order

to recover the payments, already made by CLIENT, along with interest.

- (vi) To cancel all or any other contracts with the [A]. The [A] shall be liable to pay compensation for any loss or damage to the Client resulting from such cancellation/rescission and the client shall be entitled to deduct the amount so payable from the money(s) due to the [A].
- (vii) To debar the [A] from participating in future bidding processes of the Government of India for a minimum period of five years, which may be further extended at the discretion of the CLIENT.
- (viii) To recover all sums paid in violation of this pact by [A] to any middleman or agent or broker with a view a view to securing [B] the contract.
- (ix) In cases where irrevocable letters of credit have been received in respect of any [B] signed by the client with the [A], the shall not be opened.
- (x) Forfeiture of Performance Bond in case of a decision by the client to forfeit the same without assigning any reason for imposing sanction for violation of this pact.

6.2 The client will entitled to take all or any of the actions mentioned at para 6.1(i) to (x) of this pact also on the commission by the [A] or any one employed by it or acting on its behalf (whether with or without the knowledge of the [A], of an offence as defined in chapter IX of the Indian penal code, 1860 or prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.

6.3 The decision of the CLIENT to the effect that a breach of the provisions of this pact has been committed by the [A] shall be final and conclusive on the [A]. However, the [A] can approach the Independent Monitor(s) appointed for the purposes of this Pact.

7. Fall Clause

7.1 The [A] undertakes that it has not supplied/is not supplying similar product/systems or subsystems at a price lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India or PSU and if it is found at any stage that similar product/system or sub systems way supplied by [A] to any other Ministry/Department of the Government of India or a PSU at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the [A] to the CLIENT, if the [B] has already been concluded.

8. Independent Monitors

8.1 The CLIENT has appointed Independent Monitors (hereinafter referred to as Monitors) for this pact in consultant with the central vigilance commission (Names and addresses of the Monitors to be given)

8.2 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this pact.

8.3 The monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.

8.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.

8.5 As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the CLIENT

8.6 The BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the CLIENT including that provided by the BIDOER. The [A] will also grant the Monitor, upon his request and demonstration of a valid Interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the [A] with confidentiality.

8.7 The client will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

8.8 The monitor will submit a written report to the MD/DFCCIL within 8 to 10 weeks from the date of reference or intimation to him by the CLIENT/BIDDER and, should the occasion arise, submit proposal for correcting problematic situations.

9. Facilitation of Investigation

In case of any allegation of violation of any provisions of this Pact or payment of commission, the CLIENT or its agencies shall be entitled to examine all the documents including the Books

of Accounts of the [A] and the [A] shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

10. Law and Place of Jurisdiction

This pact is subject to Indian law. The place of performance and jurisdiction is the seat of the CLIENT.

11. Other Legal Actions

The actions stipulated in this integrity pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

12. Validity

12.1 The validity of this integrity pact shall be from date of its signing and extend upto 5 years or the complete execution of the [B] to the satisfaction of both the CLIENT and the [A] including warranty period, whichever is later. In case [A] is unsuccessful, this integrity pact

shall expire after six months from the date of the signing of the [B].

12.2 Should one or several provisions of this pact turn out to be invalid; the remainder of this pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

The parties hereby sign this integrity pact at on

CLIENT

BIDDER

Name of the officer

CHIEF EXECUTIVE OFFICER

Designation

Deptt./Ministry/PSU

witness

2. 2.

Note:

[A]- To be replaced by BIDDER/Seller/Consultant/Consultancy firm/Service provider as the case may be

[B]- To be replaced by contract/supply contract/consultancy contract/works contract as the case may be.

FORM No. 21

SUMMARY OF INSURANCES
(Clause 1.5.12, Part - I, Chapter - V)

Insurance to be taken by the Contractor

In accordance with the provision of SCC Sub-Clause 1.5.12, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurance set for the below in the sums and with the deductibles and other conditions specified. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, such approval not to be unreasonably withheld.

A. Insurance against Injuries to Person and Damage to property-

Covering any loss, damage, death or bodily injuries which may occur to any physical property or to any person / animal covering loss and damage to Employer property and Employer's personal.

Amount (In Rs)	Deductible limits (in Rs.)	Parties insured (names)	From	To
Rs. 100 Lakh per occurrence with no limit on the number occurrences	-	Contractor and Employer	Commencement date	Issue of Performance certificate

B. Insurance of Works and Contractor's equipments-

The contractor shall insure to cover loss or damage to works, plants, materials and contractor's documents occurring prior to completion of the work until the date of issue of the Taking-Over Certificate for the Works.

Amount (In Rs)	Deductible limits (in Rs.)	Parties insured (names)	From	To
Full replacement value, including delivery to Site plus 15% of replacement cost	-	Contractor and Employer	Commencement date	Issue of Taking-Over Certificate for the Works

C. Insurance for Contractor's Personnel

The Contractor shall effect and maintain insurance against liability for claims, damages, losses and expenses (including legal fees and expenses) arising from injury, sickness, disease or death of any person employed by the Contractor or any other of the Contractor's Personnel. The Employer and the Engineer shall also be indemnified under the policy of insurance, except that this insurance may exclude losses and claims to the extent that they arise from any act or neglect of the Employer or of the Employer's Personnel.

D. Automobile Liability Insurance

Covering use of all vehicles used by the contractor or its sub contractors (whether or not owned by them) in connection with the design, construction testing and commissioning of the facilities under the contract in accordance with statutory requirements.

E. Professional Indemnity Insurance

To cover professional negligence in the design of the works.

Amount (In Rs)	Deductible limits (in Rs.)	Parties insured (names)	From	To
Rs. 50 Lakh	-	Contractor and Employer	Commencement date	Issue of Performance certificate plus 3 years

F. Workers' Compensation

In accordance with the statutory requirement applicable in India.

G. Insurance to be taken by the Employer (DFCCIL)- Nil

FORM No. 22

FORMAT FOR AFFIDAVIT TO BE UPLOADED BY TENDERER ALONGWITH THE TENDER DOCUMENT
(Clause 1.3.13.(iii)(2), Part - I, Chapter - III)

(To be executed in presence of Public notary on non-judicial stamp paper of the value of Rs. 100/- The stamp paper has to be in the name of the tenderer)**

I..... (Name and designation) ** appointed as the attorney/authorized signatory of the tenderer

M/s.....(hereinafter called the tendered) for the purpose of the Tender documents for the work of as per the tender No..... of(DFCCIL/Railway)**, do hereby solemnly affirm and state on the behalf of the tenderer including its constituents as under:

1. I/we the tenderer (s) am/are signing this document after carefully reading the contents.
2. I/We the tenderer(s) also accept all the conditions of the tender and have signed all the pages in confirmation thereof.
3. I/we hereby declare that I/we have downloaded the tender documents from Indian Railway website www.ireps.gov.in
- . I/we have verified the content of the document from the website and there is no addition, no deletion or no alteration to the content of the tender document. In case of any discrepancy noticed at any stage i.e. evaluation of tenders, execution of work or final payment of the contract, the master copy available with the DFCCIL Administration shall be final and binding upon me/us.
4. I/we declare and certify that I/we have not made any misleading or false representation in the forms, statements and attachments in proof of the qualification requirements.
5. I/We also understand that my/our offer will be evaluated based on the documents/credentials submitted along with the offer and same shall be binding upon me/us.
6. I/We declare that the information and documents submitted along with the tender by me/us are correct and I/we are fully responsible for the correctness of the information and documents, submitted by us.
7. I/we understand that if the certificates regarding eligibility criteria submitted by us are found to be forged/false or incorrect at any time during process for evaluation of tenders, it shall lead to forfeiture of the tender BID SECURITY besides banning of business for Five years on entire DFCCIL. Further, I/we (insert name of the tenderer)** and all my/our constituents understand that my/our offer shall be summarily rejected.
8. I/we also understand that if the certificates submitted by us found to be false/forged or incorrect at any time after the award of the contract, it will lead to termination of the contract, alongwith forfeiture of BID SECURITY/Security Deposit (SD) and Performance guarantee besides any other provided in the contract including banning of business for Five Years on entire DFCCIL.

9. I/we certify that I/we the tenderer(s) is/are not blacklisted or debarred by Railways or any other Ministry /Department of Govt. of India from participation in tender on the date of submission of bids, either in individual capacity or as a HUF/ member of the partnership firm/LLP/Society/Trust.

10. I/We have read the clause regarding restriction on procurement from a bidder of a country which shares a land border with India and certify that I am/We are not from such a country or, if from such a country, have been registered with the competent Authority. I/We hereby certify that I/we fulfil all the requirements, in this regard and am/are eligible to be considered (evidence of valid registration by the competent authority is enclosed)

SEAL AND SIGNATURE OF THE TENDERER

Place:

Dated:

***The contents in Italics are only for guidance purpose. Details as appropriate, are to be filled in suitably by tenderer.*

Attestation before Magistrate/Notary Public

FORM – 23

**BANK GUARANTEE FOR SAFE CUSTODY STORES DFCCIL SUPPLY ITEMS / DFCCIL SUPPLY ITEMS / RE-
ISSUE OF CONTRACTOR SUPPLY ITEMS FROM DFCCIL STORES.**

(ON STAMP PAPERS OF Rs.200/-)

The agreement made this _____ day of _____ 202_ between M/s _____
(hereinafter called the Guarantor of the one part) and the Managing Director, Dedicated Freight Corridor
Corporation of India Ltd. acting through Chief General Manager / General Manager Co-ordination (hereinafter
called the DFCCIL of other part) and M/S. ----- for the work of-----

(hereinafter called “the said Agreement”).

We, ----- (hereinafter referred to as the “Bank”) at the
request of M/S. ----- (Contractor(s)) do hereby undertake to pay to the
Government an amount not exceeding Rs.-----only [Rupees - -----
Only], against any loss or damage caused to or suffered or would be caused to or suffered by the Government
by reason of any breach by the said Contractor(s) of any of the terms or conditions contained in the said
contract agreement towards ” SAFE CUSTODY STORES DFCCIL SUPPLY ITEMS / DFCCIL SUPPLY ITEMS / RE-ISSUE
OF CONTRACTOR SUPPLY ITEMS FROM DFCCIL STORES “ We, -----
----- do hereby undertake to pay the amounts due and payable under this guarantee without any demur,
merely on a demand from the Government stating that the amount claimed is due by way of loss or damage
caused to or would be caused to or suffered by the Government by reason of breach by the said Contractor (s)
of any of the terms or conditions, contained in the said Agreement or by reason of the Contractor(s) failure to
perform the said Agreement. Any such demand made on the bank shall be conclusive as regards the amount
due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be
restricted to an amount not exceeding Rs.----- Only (Rupees ----- Only).

We, ----- undertake to pay to the Government any money so
demanded not withstanding any dispute or disputes raised by the Contractor(s)/Supplier(s) in any suit or
proceeding pending before any court or Tribunal relating thereto our liability under this present being absolute
and unequivocal. The payment so made by us, the ----- under this
bond shall be a valid discharge of our liability for payment there under and the Contractor(s)/Supplier(s) shall
have no claim against us for making such payment.

We, ----- further agree that the guarantee herein contained
shall remain in full force and effect during the period that would be taken for the performance of the said
Agreement and that it shall continue to be enforceable till all dues of the Government under or by virtue of
the said Agreement have been fully paid and its claims satisfied or discharged or till The Chief General Manager
/ General Manager Co-ordination, Ministry of Railways, Government Of India certifies that the terms and
conditions of the said Agreement have been fully and properly carried out by the said Contractor(s) and
accordingly discharges this Bank Guarantee towards ” SAFE CUSTODY STORES DFCCIL SUPPLY ITEMS / DFCCIL
SUPPLY ITEMS / RE-ISSUE OF CONTRACTOR SUPPLY ITEMS FROM DFCCIL STORES “ unless a demand or claim
under this guarantee is made on us in writing on or before the ----- Day of ----- 2023[---.2023] we shall

be discharged from all liability under this guarantee thereafter.

We, ----- further agree that the Government shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time of performance by the said Contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said Contractor(s) and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason or any such variation, or extension being granted to the said Contractor(s) or for any forbearance, act or commission on the part of the Government or any indulgence by the Government to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to securities would, but for this provision, have effect of so relieving us.

We, ----- lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Government in writing. Notwithstanding anything contained herein,

A] Our liability under this Bank Guarantee Bond shall not exceed Rs.----- Only (Rupees --- ----- Only).

B] This Bank Guarantee Bond shall be valid up-to ----- DAY OF ----- 20__ [--.--.20__].

C] We are liable to pay the Guaranteed amount or any part thereof under this Bank Guarantee Bond only and only if you serve upon us a written claim or demand on or before ----- DAY OF ----- 20__ [--.--.20__].

Date : the day of ----- 20__

Place :

SEAL OF BANK

FORM No. 24

Bid Security

Bank Guarantee Bond from any scheduled commercial bank of India
(On non-judicial stamp paper, which should be in the name of the Executing Bank).

.....**Bank's Name, and Address of Issuing Branch or Office**.....

Beneficiary: Dedicated Freight Corridor Corporation of India Limited.

Date:.....

Bank Guarantee Bond No.:

Date:-----

..... **(Designation & address of Contract Signing Authority)**,
Dedicated Freight Corridor Corporation of India Limited (herein called "**the Employer**") having
invited the bid for ----- through Notice inviting
tender (NIT) No.. -----, We have been informed
that **[Insert name of the Bidder]**----- (**hereinafter called "the
Bidder"**)
intends to submit its bid (hereinafter called "**the Bid**").

WHEREAS, the Bidder is required to furnish Bid Security for the sum of **[Insert required Value
of Bid Security]**, in the form of Bank Guarantee, according to conditions of Bid.

AND

WHEREAS,**[Insert Name of the Bank]**, with its Branch**[Insert
Address]** having its Headquarters office at..... **[Insert Address]**, hereinafter called the
Bank, acting through**[Insert Name and Designation of the authorised persons of the
Bank]**, have, at the request of the Bidder, agreed to give guarantee for Bid Security as hereinafter
contained, in favour of the Employer:

1. KNOW ALL MEN that by these present that I/We the undersigned **[Insert name(s) of
authorized representatives of the Bank]**, being fully authorized to sign and incur
obligations for and on behalf of the Bank, confirm that the Bank, hereby, unconditionally
and irrevocably guarantee to pay to the Employer full amount in the sum of **[Insert
required Value of Bid Security]** as above stated.
2. The Bank undertakes to immediately pay on presentation of demand by the Employer any
amount up to and including aforementioned full amount without any demur, reservation or
recourse. Anysuch demand made by the Employer on the Bank shall be final, conclusive and
binding, absolute and unequivocal on the Bank notwithstanding any disputes raised/
pending before any Court, Tribunal, Arbitration or any Authority or any threatened litigation
by the Bidder or Bank.

3. The Bank shall pay the amount as demanded immediately on presentation of the demand by Employer without any reference to the Bidder and without the Employer being required to show grounds or give reasons for its demand of the amount so demanded.
4. The guarantee hereinbefore shall not be affected by any change in the constitution of the Bank or in the constitution of the Bidder.
5. The Bank agrees that no change, addition, modifications to the terms of the Bid document or to any documents, which have been or may be made between the Employer and the Bidder, will in any way absolve the Bank from the liability under this guarantee; and the Bank, hereby, waives any requirement for notice of any such change, addition or modification made by Employer at anytime.
6. This guarantee will remain valid and effective from.....***[insert date of issue]*** till***[insert date, which should be minimum (90 days beyond the expiry of validity of Bid)]***. Any demand in respect of this Guarantee should reach the Bank within the validity period of Bid Security/Maintenance period plus 60 days.
7. The Bank Guarantee is unconditional and irrevocable.
8. The expressions Bank and Employer herein before used shall include their respective successors and assigns.
9. The Bank hereby undertakes not to revoke the guarantee during its currency, except with the previous consent in writing of the Employer. This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No.758.
10. The Bank hereby confirms that it is on the SFMS (Structured Financial Messaging System) and shall invariably send the advice of this Bank Guarantee to the following bank details
-

IFSC CODE	
IFSC TYPE	
BANK NAME	
BRANCH NAME	
CITY NAME	
ADDRESS	
DISTRICT	
STATE	
BG ENABLED	

11. The Guarantee shall be valid in addition to and without prejudice to any other security Guarantee(s) of

Bidder in favour of the Employer. The Bank, under this Guarantee, shall be deemed as Principal Debtor of the Employer.

Date

Place..... Bank's Seal and authorized signature(s)

[Name in Block letters]

[Designation with Code No.]

[P/Attorney] No.

Witness:

1 Signature, Name & Address & Seal

2 Signature, Name& address & Seal Bank's Seal

[P/Attorney]No.

Note: All italicized text is for guidance on how to prepare this bank guarantee and shall be deleted from the final document.

FORM No. 25

(Reference Clause 40.(3) of GCC)
Registered Acknowledgement Due

PROFORMA OF 14 DAYS NOTICE FOR OFFLOADING OF PART OF CONTRACT WORK

Dedicated Freight Corridor Corporation of India Ltd.
(Without Prejudice)

To

M/s
.....

Dear Sir,

Contract Agreement No.

In connection with

In spite of repeated instructions to you by the subordinate offices as well as by this office through various letters of even no....., dated.....; you have failed to show adequate progress of work so as to complete the contract within the original / extended date of completion of contract and part(s) of contract work are yet to be started/ still lagging behind the agreed program of work, listed as under:

(Details of part(s) of work which is delayed and can be executed independently, to be mentioned).

2. Your attention is invited to this office/Chief Engineer’s office letter no., dated.....in reference to your representation, dated.....

3. As you have failed to abide by the instructions issued to commence the work /to show adequate progress of work, you are hereby given 14 days’ notice in accordance with Clause 40.(3) of the General Conditions of Contract to deploy adequate resources i.e. *(the details of resource requirement, to be mentioned)* and commence / to make good the progress for part(s) of works detailed above, failing which action as provided in Clause 40.(3) of the General Conditions of Contract shall be commenced after expiry of 14 days’ notice period viz. to offload few/ all part(s) of work mentioned above to any of the existing or new contractor without your participation and at your Risk & Cost, not exceeding the value of Performance Guarantee of this contract, which may please be noted.

Kindly acknowledge receipt.

Yours faithfully

For and behalf of the Employer
Name of the Official:-
Stamp/ Seal of the Employer

FORM No. 26

(Reference Clause 40.(3) of GCC)
Registered Acknowledgement Due

NOTICE FOR PART OF CONTRACT WORK OFFLOADED

Dedicated Freight Corridor Corporation of India Ltd.
(Without Prejudice)

To

M/s
.....

Dear Sir,

Contract Agreement No.
In connection with

1. Fourteen days’ notice under Clause 40.(3) of the General Conditions of Contract was given to you under this office letter of even no., dated ; but you have taken no/inadequate action to deploy adequate resources to commence the part(s) of work/show adequate progress of the part(s) of work, mentioned therein.

As you have failed to abide by the instructions issued to commence the part(s) of work/show adequate progress of the part(s) of work even at the lapse of 14 days’ notice period under Clause 40.(3) of the General Conditions of Contract, few part(s) of the work under the contract have been offloaded and being executed by other mode(s) at the cost detailed below:

Or,

1. Please refer your request letter no..... dated, wherein it was requested under clause 40.(3) of the General Conditions of Contract to offload part(s) of works at your risk & cost. The details of part(s) of the work under the contract which have been offloaded and being executed by other mode(s) at the cost detailed below:

(List of Part(s) of work offloaded, Details of mode of execution of such offloaded work along with approximate cost thereof to be mentioned)

2. The final measurement of work(s) already executed for above part(s) of work recorded as per clause 45 (1) or/and 45 (2) of the General Conditions of Contract is enclosed herewith.

3. The Bill(s) of Quantities for Part(s) of work offloaded is enclosed herewith.

4. The additional cost in execution of offloaded work through mode(s) mentioned in para (1) above is determined as Rs....., over& above the cost of execution under this contract (including the PVC amount payable as per contract, as on the date of issue of this notice). This additional cost shall be recovered from your next on account bill(s) or any other dues payable to you under contract.

5. The Contract value gets reduced to Rs.....:

6. You are requested to continue with the balance work in the contract subsequent to offloading of above part(s) of work.

Kindly acknowledge receipt.

Yours faithfully

For and behalf of the Employer

Name of the Official:-

Stamp/ Seal of the Employer

FORM No. 27

**Certification by Arbitrators appointed under Clause 63 & 64
of General Conditions of Contract**

1. Name:
2. Contact Details:
3. Prior experience (Including Experience with Arbitrations):
4. Total Number of Arbitration/DAB/Conciliation Cases presently involved as Arbitrator/DAB Member/Conciliator:
5. Total Number of Arbitration/DAB/Conciliation Cases in which acting as Contractor's (one of the Party to the present dispute) nominee Arbitrator/DAB Member/Conciliator:
6. I have no any past or present relationship in relation to the subject matter in dispute, whether financial, business, professional or other kind.

Or

I have past or present relationship in relation to the subject matter in dispute, whether financial, business, professional or other kind. The list of such interests is as under:

7. I have no any past or present relationship with or interest in any of the parties whether financial, business, professional or other kind, which is likely to give rise to justifiable doubts as to my independence or impartiality in terms of The Arbitration and Conciliation Act-1996.

Or

I have past or present relationship with or interest in any of the parties whether financial, business, professional or other kind, which is likely to give rise to justifiable doubts as to my independence or impartiality in terms of The Arbitration and Conciliation Act-1996. The details of such relationship or interests are as under:

8. There are no concurrent Circumstances which are likely to affect my ability to devote sufficient time to the arbitration and in particular to finish the entire arbitration within twelve months.

Or

There are Circumstances which are likely to affect my ability to devote sufficient time to the arbitration and in particular to finish the entire arbitration within twelve months. The list of such circumstances is as under:

FORM No. 28

Security Deposit

Bank Guarantee Bond from any scheduled commercial bank of India

(On non-judicial stamp paper, which should be in the name of the Executing Bank)......**Bank's Name, and Address of Issuing Branch or Office**.....**Beneficiary:** Dedicated Freight Corridor Corporation of India Limited.

Date:.....

Bank Guarantee Bond No.:**Date:-----**

..... **(Designation & address of Contract Signing Authority)**,
 Dedicated Freight Corridor Corporation of India Limited (herein called "**the Employer**") having
 invited the bid for ----- through Notice inviting
 tender (NIT) No.. -----, We have been informed
 that **[Insert name of the Bidder]**----- (**hereinafter called "the
 Bidder"**)
 intends to submit its bid (hereinafter called "**the Bid**").

WHEREAS, the Bidder is required to furnish Security Deposit for the sum of **[Insert required
 Value of Security Deposit]**, in the form of Bank Guarantee, according to conditions of Bid.

AND

WHEREAS,**[Insert Name of the Bank]**, with its Branch**[Insert
 Address]** having its Headquarters office at..... **[Insert Address]**, hereinafter called the
Bank, acting through**[Insert Name and Designation of the authorised persons of the
 Bank]**, have, at the request of the Bidder, agreed to give guarantee for Bid Security (Bid Security)
 / Security Deposit as hereinafter contained, in favour of the Employer:

1. KNOW ALL MEN that by these present that I/We the undersigned **[Insert name(s) of
 authorized representatives of the Bank]**, being fully authorized to sign and incur
 obligations for and on behalf of the Bank, confirm that the Bank, hereby, unconditionally
 and irrevocably guarantee to pay to the Employer full amount in the sum of **[Insert
 required Value of Security Deposit]** as above stated.
2. The Bank undertakes to immediately pay on presentation of demand by the Employer any
 amount up to and including aforementioned full amount without any demur, reservation or
 recourse. Anysuch demand made by the Employer on the Bank shall be final, conclusive and
 binding, absolute and unequivocal on the Bank notwithstanding any disputes raised/
 pending before any Court, Tribunal, Arbitration or any Authority or any threatened litigation
 by the Bidder or Bank.
3. The Bank shall pay the amount as demanded immediately on presentation of the demand
 by Employer without any reference to the Bidder and without the Employer being
 required to show grounds or give reasons for its demand of the amount so demanded.

4. The guarantee hereinbefore shall not be affected by any change in the constitution of the Bank or in the constitution of the Bidder.
5. The Bank agrees that no change, addition, modifications to the terms of the Bid document or to any documents, which have been or may be made between the Employer and the Bidder, will in any way absolve the Bank from the liability under this guarantee; and the Bank, hereby, waives any requirement for notice of any such change, addition or modification made by Employer at anytime.
6. This guarantee will remain valid and effective from.....***[insert date of issue]*** till***[insert date, which should be minimum 60 days beyond the Maintenance period]***. Any demand in respect of this Guarantee should reach the Bank within the validity period of Bid Security/Maintenance period plus 60 days.
7. The Bank Guarantee is unconditional and irrevocable.
8. The expressions Bank and Employer herein before used shall include their respective successors and assigns.
9. The Bank hereby undertakes not to revoke the guarantee during its currency, except with the previous consent in writing of the Employer. This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No.758.
10. The Bank hereby confirms that it is on the SFMS (Structured Financial Messaging System) and shall invariably send the advice of this Bank Guarantee to the following bank details -

IFSC CODE	
IFSC TYPE	
BANK NAME	
BRANCH NAME	
CITY NAME	
ADDRESS	
DISTRICT	
STATE	
BG ENABLED	

11. The Guarantee shall be valid in addition to and without prejudice to any other security Guarantee(s) of Bidder in favour of the Employer. The Bank, under this Guarantee, shall be deemed as Principal Debtor of the Employer.

Date

Place.....

Bank's Seal and authorized signature(s)

[Name in Block letters]

*[Designation with Code
No.].....*

[P/Attorney] No.

Witness:

1 Signature, Name & Address & Seal

2 Signature, Name& address & Seal

Bank's Seal

[P/Attorney]No.

Note: All italicized text is for guidance on how to prepare this bank guarantee and shall be deleted from the final document.

Form No. 29

Reference Para 64.(1)(iii) & 64.4

Agreement towards Waiver under Section 12(5) and Section 31A (5) of Arbitration and Conciliation (Amendment) Act

I/we..... (Name of agency/Contractor) with reference to agreement no..... raise disputes as to the construction and operation of this contract, or the respective rights and liabilities, withholding of certificate and demand arbitration in respect of following claims :

Brief of claim:

(i) Claim 1- Detailed at Annexure- `

(ii) Claim 2 –

(iii) Claim 3 –

I/we..... (post of Engineer) with reference to agreement no..... hereby raise disputes as to the construction and operation of this contract, or the respective rights and liabilities, withholding of certificate and demand arbitration in respect of following claims:

I/we.....do/do not agree to waive off applicability of section 12(5) of Arbitration and Conciliation (Amendment) Act.

Signature of Claimant_____ Signature of Respondent

Agreement under Section 31(5)

I/we..... (Name of claimant) with reference to agreement no..... hereby waive off the applicability of sub section 31-A (2) to 31-A (4) of the Arbitration and Conciliation (Amendment) Act. We further agree that the cost of arbitration will be shared by the parties as per Clause 64(4) of the Standard General Conditions of Contract.

Signature of Claimant_____ Signature of Respondent_____

*Strike out whichever not applicable.

Form No. 30
Reference Para 48.(3)

FINAL SUPPLEMENTARY AGREEMENT

1. Articles of agreement made this day _____ in the year _____ between the President of India, acting through the _____ Railway Administration having his office at _____ herein after called the Railway of the one part and _____ of the second part.

2. Whereas the party hereto of the second part executed an agreement with the party hereto of the first part being agreement Number _____ dated ____ for the performance _____ herein after called the 'Principal Agreement'.

3. And whereas it was agreed by and between the parties hereto that the works would be completed by the party hereto of the second part on _____ date last extended and whereas the party hereto of the second part has executed the work to the entire satisfaction of the party hereto of the first part.

4. And whereas the party hereto of the first part already made payment to the party hereto of the second part diverse sums from time to time aggregating to ₹ _____ including the Final Bill bearing voucher No. _____ dated _____ of value _____ duly adjusted as per price variation clause, if applicable (the receipt of which is hereby acknowledged by the party hereto of the second part in full and final settlement of all his /its claims under the principal agreement. And whereas the party hereto of the second part have received sum of ₹ _____ through the Final Bill bearing voucher No. _____ dated _____ duly adjusted as per price variation clause (PVC), if applicable (the receipt of which is hereby acknowledged by the party thereto of the second part) from the party hereto of the first part in full and final settlement of all his/its disputed claims under principal agreement. Now, it is hereby agreed by and between the parties in the consideration of sums already paid by the party hereto of the first part to the party hereto of the second part against all outstanding dues and claims for all works done under the aforesaid principal agreement excluding the Security Deposit, the party hereto of the second part have no further dues of claims against the party hereto of the first part under the said Principal Agreement. It is further agreed by and between the parties that the party hereto of the second part has accepted the said sums mentioned above in full and final satisfaction of all its dues and claims under the said Principal Agreement. (Applicable in case Final Supplementary Agreement is signed after release of Final Payment)

Or

And whereas the party hereto of the first part already made payment to the party hereto of the second part diverse sums from time to time aggregating to ₹ _____ through various On Account Bills (the receipt of which is hereby acknowledged by the party hereto of the second part). And whereas the party hereto of the second part have received sum of ₹ _____ through various On Account Bills (the receipt of which is hereby acknowledged by the party thereto of the second part) from the party hereto of the first part and party hereto of the second part have accepted final measurements recorded on Page No..... to Page No.... of Measurement Book

No.....and corresponding Final Bill duly adjusted as per price variation clause (PVC), if applicable, for full and final settlement of all his/its disputed claims under principal agreement

Now, it is hereby agreed by and between the parties in the consideration of sums already paid through various On Account Bills and sums to be paid through Final Bill duly adjusted as per price variation clause (PVC), if applicable, based on accepted final measurements including the Security Deposit by the party hereto of the first part to the party hereto of the second part against all outstanding dues and claims for all works done under the aforesaid principal agreement, the party hereto of the second part have no further dues of claims against the party hereto of the first part under the said Principal Agreement. (Applicable in case Final Supplementary Agreement is signed before release of Final Payment)

5. It is further agreed and understood by and between the parties that the arbitration clause contained in the said principal agreement shall cease to have any effect and/or shall be deemed to be non-existent for all purposes.

Signature of the Contractor/s

for and on behalf of the President of India

Witnesses _____

ADDRESS: _____

FORM No. 31

LIST OF EQUIPMENT, PLANT & MACHINERY

Contractor shall submit list of Plant & Machinery owned and to be hired.

An indicative list of Plant & Machinery for execution of the above work is as below:

Item	Machineries	Required For	Source (Owned/Hired)	MOU (Yes/No)
1	Rail Auger	>Foundation perforations		*
2	RRV	>Foundation perforations		*
3	Wiring Train with driving unit	Wiring (Contact/Catenary)		*
4	RRV (Rail cum road vehicle), Rail based man lift (scissor lift) & Conductor Drum Rail Trolley	Wiring (Feeder/AEC)		*
5	Tractor Auger	>Foundation perforations		
6	Concrete Pump	>Foundation concreting		
7	Transit Mixer	>Foundation concreting		
8	RRV Transit Mixer	>Foundation concreting		
9	Tractor	>Foundation concreting		
10	Concrete Conveyor	>Foundation concreting		
11	Pick & Carry Crane	Mast/Portal/Boom		
12	Rail Crane	Mast/Portal/Boom		
13	Trailer	>Used for Material shifting		
14	Truck	>Used for Material Shifting		
15	Camper (Pick up Van)	Used for Material Shifting		
16	Conveyor Belt	for Concreting		

***Note:**

This excerpt provides instructions for filling out Form No. 31 by the tenderer regarding the availability of specific machinery necessary for executing the work. Key points include:

5. The tenderer must indicate in Form No. 31 whether they own or plan to hire the machinery listed.
6. For machinery at Sr. No. 1, 2, 3 and 4, if the tenderer plans to hire them, a Memorandum of Understanding (MOU) with the hiring agency must be submitted.
7. The availability of these particular machines is crucial for the successful completion of the work.
8. For evaluation purposes, the tenderer must provide:
 - c. Details of ownership of the machines, or
 - d. An MOU with the owner, including response time for making the machinery available at the worksite.

This ensures that the tenderer is either prepared with the necessary equipment or has firm plans in place to secure it.

If the tenderer does not submit the specified information—either details of ownership of the machinery listed at Sr. No. 1, 2, 3 and 4 or an MOU for hiring from owner—the offer submitted by the tenderer shall not be considered. This requirement is crucial for ensuring the availability of key machinery for the successful execution of the project.

Schedule of Prices

Schedule of Prices:

Item no	Description	Unit	Scope Qty.		Unit Rates		Total Value for Supply & Erection		
			Supply	Erection	Supply	Erection	Supply	Erection	Total
1	Submission and approval of Design and Drawings and supply of as erected drawings.	TKM		240	0	14906.3	0	3577512	3577512
2.1	Casting of OHE Foundations in all types of soils other than hard rocks using mechanical augers	CUM	0	10000	0	9552.23	0	95522300	95522300
2.2	Casting of OHE Foundations in hard rocks.	CUM	0	1000	0	10442.26	0	10442260	10442260
2.3	Casting of OHE Foundations using tripod for excavation in marshy land where mechanical auger working is not feasible	CUM	0	1500	0	14242.2	0	21363300	21363300
3.1	Supply and Erection of Fabricated and galvanized B Series Mast, bridge mast (i.e., B-200(S), B-225(S), B-250(S) & B-300(S)) with 1000 GSM hot dipped galvanization	MT	2000	3600	113335.51	2485.66	226671020	8948376	235619396
3.2	Supply and Erection of Fabricated and galvanized Portals (N, O, TTB & R Type) with 1000 GSM	MT	1000	1200	133544.39	8499.67	133544390	10199604	143743994

	hot dipped galvanization								
4	Supply and Erection of Fabricated and galvanized SPS, including Drop Arm & OHE SPS) other than Mast with 1000 GSM hot dipped galvanization	MT	450	0	163274.06	0	73473327	0	73473327
5.1	Supply of 09-ton Insulators (CD-1600)	Nos.	7500	0	5216.11	0	39120825	0	39120825
5.2	Supply of Bracket Insulators (CD-1600) and Stay Insulators (CD-1600)	Set	5308	0	10432.21	0	55374170.68	0	55374170.68
5.3	Supply of Post Insulators (CD-1600)	Set	800	0	8976.43	0	7181144	0	7181144
6.1	Supply and Erection of Single Bracket assembly (Modular type)	Each	1150	2688	42546.97	1028.14	48929015.50	2763640.32	51692655.82
6.2	Supply and Erection of Single Bracket assembly (IR Modified type)	Each	2368	2808	16816.21	1028.14	39820785.28	2887017.12	42707802.40
6.3	Supply and Erection of Single Bracket assembly (IR-Conventional)	Each	912	912	13761.03	1028.3	12550059.36	937809.60	13487868.96
7	Supply and Erection of Guy Rod Assembly	Nos.	2000	2000	9794.03	1133.77	19588060	2267540	21855600
8	Supply and Erection of 288 Sq. mm AAAC Feeder wire (19*4 mm) with all fittings as required	TKM	205	205	340005.93	16284	69701215.65	3338220	73039435.65

9	Supply and Erection of 93.3 sq.mm AEC wire with all fittings as required	TKM	85	205	123321.08	16284	10482291.80	3338220	13820511.80
10	Supply and Erection of BEC wire with all fittings as required	TKM	35	215	242102.37	20355	8473582.95	4376325	12849907.95
11	Bonding and Earthing of various structures								
11.1	Connection of mast/OHE structure, LC-Gate fencing, retaining or protection wall, Minor Bridge, Bridge Mast, Steel girder etc., with BEC. Price shall cover supply and erection cost of T connector, Terminal pad, lug, and suitable fasteners required for fixing of jumper wire. But Price shall not cover the cost jumper (BEC) wire which will be paid in item 8.	Nos.	5500	5500	865.09	314	4757995	1727000	6484995
11.2	Supply and erection of 50*6mm Structure bond between Mast/upright and nearest rail as per approved drawings using	Nos.	1700	1700	1615.19	368.96	2745823	627232	3373055

	rail clamp and suitable fasteners.								
11.3	Same as item 11.2 but Structure bond with Rail clamp on both side	Nos.	3200	3200	1964.77	423.92	6287264	1356544	7643808
11.4	Supply and erection of protective screen on ROBS/FOBs	Set	0	70	0	33051.87	0	2313630.90	2313630.90
11.5	GI 75*8 Flat	meter	0	4000	0	106.55	0	426200	426200
11.6	GI 50*6 Flat	meter	0	4000	0	78.51	0	314040	314040
12	Supply & Erection of Single earth electrode with earth Pit complete.	Nos.	170	170	6613.34	1653.34	1124267.80	281067.80	1405335.60
13.1	Supply & Erection of OHE with complete fitting, droppers, termination clamps, continuity G-Jumpers, anti-theft jumpers for out of run OHE and Anti-Creep etc., as per approved method statement and drawings, but excluding Cost of Contact and Catenary Wires.	TKM	0	212	0	323255.5	0	68530168.12	68530168
13.2	Anti Creep	Nos.	220	220	8908.04	4201.97	1959768.80	924433.40	2884202.20
13.3	OHE Termination	Nos.	500	500	10031.34	1124.18	5015670	562090	5577760
13.4	Same as item 13.1 but suitable for	TKM	0	28	0	195828.15	0	5483188.20	5483188.20

	lines in yard except main lines								
14.1	Supply of 3 Pulley ATD with Counter Weight Assembly	Nos.	80	80	77149	4228.26	6171920	338260.80	6510180.80
14.2	Supply of 5 Pulley ATD with Counter Weight Assembly	Nos.	550	550	77149	4228.26	42431950	2325543	44757493
15	Cross Feeding Arrangement at TSS/SP/SSP, jumpers etc.,	Nos.							
15.1	Cross Feeders 2*37/2.25 mm	Set	92	92	112392.93	1584.78	10340149.56	145799.76	10485949.32
15.2	Loop Jumper	Set	114	114	4093.25	1484.56	466630.50	169239.84	635870.34
15.3	Slack-Feeder	Set.	22	22	9236.67	2068.45	203206.74	45505.90	248712.64
15.4	Drop Jumpers 2*160 sq mm copper	Set.	115	115	20493.12	1533.41	2356708.80	176342.15	2533050.95
15.5	False Catenary	Nos.	65	65	5584.37	1925.27	362984.05	125142.55	488126.60
15.6	Cut in insulators	Nos.	80	80	2195.11	902.93	175608.80	72234.40	247843.20
15.7	G jumper 120 sqmm	Nos.	700	700	9311.85	766.71	6518295	536697	7054992
15.8	50 sqmm copper jumper	Nos.	3500	3500	955.13	766.71	3342955	2683485	6026440
15.9	G jumper 105 sqmm	Nos.	100	100	8147.87	766.71	814787	76671	891458
16	Supply & Erection of various type of retro reflective boards on OHE structures and public caution boards	Nos.	150	150	1271.18	60.21	190677	9031.50	199708.50
17	Supply and Erection of Light Weight Section Insulator Assembly as DFCCIL requirement	Nos.	51	58	315883.55	14393.83	16110061.05	834842.14	16944903.19

18	Supply & Erection of PTFE Short Neutral section Assembly	Nos.	16	16	855749.99	7062.78	13691999.84	113004.48	13805004.32
19.1	Supply of Catenary wire of 125 sq. mm as per DFCCIL requirement.	MT	64.32	0	1065082.81	0	68506126.34	0	68506126.34
19.2	Supply of Catenary wire of 65 sq. mm as per DFCCIL requirement.	MT	1	0	1065082.81	0	1065082.81	0	1065082.81
20.1	Supply of Contact Wire of 150 sq. mm as per DFCCIL requirement	MT	84.16	0	1188235.69	0	100001915.67	0	100001915.67
20.2	Supply of Contact Wire of 107 sq. mm as per DFCCIL requirement	MT	34	0	1188235.69	0	40400013.46	0	40400013.46
21.1	Supply and Erection 10 KVA 25 kV/240 V Auxiliary Transformer	Nos.	18	18	87504.3	14587.24	1575077.40	262570.32	1837647.72
21.2	Supply and Erection of 25 KVA 25 kV/240 V Auxiliary Transformer	Nos.	6	32	298671.51	14587.24	1792029.06	466791.68	2258820.74
21.3	Supply and Erection of 50 KVA 25 kV/240 V Auxiliary Transformer	Nos.	1	7	388109.29	14587.24	388109.29	102110.68	490219.97
22.1	Supply and Erection of Automatic Change over (ACO) Suitable for 10 KVA Auxiliary Transformers	Nos.	9	9	62082.66	6444.88	558743.94	58003.92	616747.86

22.2	Supply and Erection of ACO Panel Suitable for 25 KVA Auxiliary Transformers	Nos.	17	17	176362.59	8818.71	2998164.03	149918.07	3148082.10
22.3	Supply and Erection of ACO Panel Suitable for 50 KVA Auxiliary Transformers	Nos.	2	2	436218.72	21810.88	872437.44	43621.76	916059.20
23	Supply & erection of anti-climbing for Auxiliary Transformer	Nos.	56	56	1522.08	354.75	85236.48	19866	105102.48
24	Supply without Insulator & erection of 25 kV D.O. fuse switch.	Nos.	56	56	15742.22	762.54	881564.32	42702.24	924266.56
25	Supply and Erection and laying of Cables for commissioning of ACO panel suitable for 10/25/50/100 KVA Auxiliary Transformers								
25.1	2Cx70 sqmm	meter	2800	2800	212.3	21.23	594440	59444	653884
25.2	2Cx120 sqmm	meter	1000	1000	305.46	30.55	305460	30550	336010
25.3	2Cx185 sqmm	meter	2000	2000	470.93	47.09	941860	94180	1036040
26.1	Supply and Erection of Single Pole Isolators	Nos.	15	15	58815.37	4229.87	882230.55	63448.05	945678.60
26.2	Supply and Erection of Double Pole Isolators	Nos.	6	6	95912.85	4671.7	575477.10	28030.20	603507.30
26.3	Extra for Earthing Arrangement for item 26.1 or 26.2	Nos.	6	6	19573.72	487.31	117442.32	2923.86	120366.18
27	Supply and erection of 25 KV feeder Cu	meter	8187	8187	4881.57	1220.39	39965413.59	9991332.93	49956746.52

	cable of size 1cx240 sqmm								
28	Supply and erection of Termination kit 25 KV feeder Cu cable of size 1cx240 sqmm	Nos.	56	56	29455.39	7363.85	1649501.84	412375.60	2061877.44
29	Integrated Testing & Commissioning of OHE, PSI & SCADA, current collection and GPS mapping etc.	Nos.	0	1	0	14663104.27	0	14663104.27	14663104.27
Total Approximate Cost							113.41	28.67	142.08
Total Cost for CTP-11 Section (JNPT-Vaitarna) in Crs							Rs. 1,42,07,85,426.36/-		

PART- IV
CHECKLIST FOR TENDERERS

Appendix-1**CHECKLIST FOR TENDERERS**

1) Uploading of Tender Form – 1 (Offer Letter)	Form 1
2) Uploading of Tender's Credential	Form 2
3) Uploading of Tender Form for Power of Attorney	Form 12 and 13
4) Uploading of Tender Form in support of Technical Eligibility	Form 2AI
5) Deleted	Deleted
6) Uploading of Tender Form in support of Financial Eligibility	Form 2B
7) Bid Security Bank Guarantee Bond Format from any scheduled commercial bank of India.	Form 24
10) Uploading of Bid Capacity Supporting Documents (when tender value is more than Rs.20 Crore) (i) Proforma of Bid Capacity-Value of Existing Commitments, (ii) Proforma Of Bid Capacity (Construction Turnover) & (iii) Proforma Of Bid Capacity Calculation	Form 2C, 2C-I, 2C-II, 2C-III & 2C-IV
11) Uploading of Documents for Eligibility in case of constitution of firm by the Sole Proprietor Firm/ Partnership firm/ JV/ Society/ Companies / HUF etc. as prescribed in Para 1.3.6. (if applicable).	
12) Uploading of MOU for Joint Venture Agreement	Form 9
13) Uploading of Certificate as per Annexure-V of IRSGCC-2020.	Form 22
14) Uploading of Plant and Machinery details	Form 31
15) Any other documents related to tendered work	

Note: In addition to above, any other documents required as per Tender Document (all documents uploaded with tender notice) shall also be submitted/uploaded by the tenderer/bidder.

PART V
Drawings, LOPs and Method Statements

Drawings, LOPs and Method Statements

The drawings, LOPs and Method Statement of the items of tender are attached on IREPS site