



CENTRAL RAILWAY
CONSTRUCTION ORGANISATION
Engineering Department

START OF TENDER DOCUMENT

TENDER DOCUMENT / TECHNICAL BID

e-Tender Notice No. & Date	:	DyCECBSL-03-2026-27 dated 22.06.2026
Name of work	:	Construction work required for Yard Remodeling at Manmad, Nandgaon & Chalisgaon section including Earthwork/blanketing, Retaining Wall/drain, Minor/Major bridges and Track works including Ballast Supply in connection with Jalgaon-Manmad 4th line project of Central Railway. (Two packet System)
Tender Value	:	Rs. 86,80,07,027.3
Tender Document Cost	:	Not Applicable (As per Clause No.3 at Page 4 of GCC APRIL 2022)
Bid Security	:	Rs. 1,73,60,200.00 (As per Clause No.5 at Page 4 – 6 of GCC APRIL 2022)
Completion period	:	18 (Eighteen) months including monsoon
Sale of Tender forms	:	Tender documents will be available on IREPS website www.ireps.gov.in up to 11.00 hours of 14.07.2026.
Date & Time of submission	:	14.07.2026 up to 11.00 hours (online)
Date & Time of opening	:	14.07.2026 after 11.00 hours (online, Technical Bid only)
Office Address	:	Dy. Chief Engineer(C), Central Railway, Near Railway Ground, Bhusawal – 425201.
Note: Details of Tender Notice, Tender document and corrigendum issued from time to time along with eligibility criteria are available on the website www.ireps.gov.in. Necessary changes if required, would be posted on this website at least 15 days prior to opening of tender.		
This Tender document / Technical Bid contains 359 pages serially numbered from 1 to 359 The end of document is indicated by “END OF TENDER DOCUMENT (TECHNICAL BID)” marker		

e-Tender Notice No.: DyCECBSL-03-2026-27 dated 22.06.2026

Name of Work: Construction work required for Yard Remodeling at Manmad, Nandgaon & Chalisgaon section including Earthwork/blanketing, Retaining Wall/drain, Minor/Major bridges and Track works including Ballast Supply in connection with Jalgaon-Manmad 4th line project of Central Railway. (Two packet System)

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SPECIAL INSTRUCTIONS & GUIDELINES FOR SUBMITTING e-TENDERS

e-Tender Notice No. DyCECBSL-03-2026-27 dated 22.06.2026

Name of Work: Construction work required for Yard Remodeling at Manmad, Nandgaon & Chalisgaon section including Earthwork/blanketing, Retaining Wall/drain, Minor/Major bridges and Track works including Ballast Supply in connection with Jalgaon-Manmad 4th line project of Central Railway. (Two packet System)

Tenderer/s are advised to read the instructions given below & strictly ensure that all the compulsory & important documents as mentioned herein, are uploaded before submitting their tender.

1. Submission of tenders shall be **ONLY** through e-tendering on the website **www.ireps.gov.in**.

2. The tenderer shall clearly specify whether the tender is submitted on his own (Proprietary Firm) or on behalf of a Partnership Firm / Company / Joint Venture (JV) / 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.

If it is NOT mentioned in the submitted tender that tender is being submitted on behalf of 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.

The tenderer whether sole proprietor / a company or a partnership firm / registered society / registered trust / HUF / LLP etc. if they want to act through agent or individual partner(s), should submit along with the tender, a copy of power of attorney duly stamped and authenticated by a Notary Public or by Magistrate in favour of the specific person whether he/they be partner(s) of the firm or any other person, specifically authorizing him/them to sign the tender, submit the tender and further to deal with the Tender/ Contract up to the stage of signing the agreement except in case where such specific person is authorized for above purposes through a provision made in the partnership deed / Memorandum of Understanding / Article of Association / Board resolution, failing which tender shall be summarily rejected.

A separate power of attorney duly stamped and authenticated by a Notary Public or by Magistrate in favour of the specific person whether he/they be partner(s) of the firm or any other person, shall be submitted after award of work, specifically authorizing him/them to deal with all other contractual activities subsequent to signing of agreement, if required.

***Note:** A Power of Attorney executed and issued overseas, the document will also have to be legalized by the Indian Embassy and notarized in the jurisdiction where the Power of Attorney is being issued. However, the Power of Attorney provided by Bidders from countries that have signed the Hague Legislation Convention 1961 are not required to be legalized by the Indian Embassy if it carries a conforming Apostille certificate.*

(Ref: Clause 14(i), 14(iii) & 15 of TENDER FORM (Second Sheet) at Page 17 & 19 and Correction Slip No.3 of GCC APRIL 2022).

3. The tender must be accompanied by a Bid Security as mentioned in Para 5 of Part-1, Instruction to Tenderers (ITT) at Page 4-6 of GCC APRIL 2022, Para 6 (a), 17.5 & 18.6 of

TENDER FORM (Second Sheet) along with Annexure-VIA at Page 11, 21, 26 & 37-39 of GCC APRIL 2022, failing which the tender shall be summarily rejected.

4. Following documents mentioned at (a) to (h) below, should be furnished along with tender and should be submitted online at the time of tender bidding. **Tenders not accompanied by these documents will be summarily rejected.** No post tender communication, in any form will be made or entertained, after opening of tenders, in this regard. Railways may however call for the originals of the credentials for verification or any clarifications/confirmations on the contents of the documents submitted:

(a) **TENDER FORM (First Sheet) (Ref: Page 9 & 10 of GCC APRIL 2022).**

(b) **Work(s) completion certificate(s) as per the requirement of Technical eligibility criteria (Ref: Clause 10.1 & and for tenderer participating as JV firm Clause 17.15.1 of TENDER FORM (Second Sheet) at Page 12-14 & 24 of GCC APRIL 2022 & Clause 1(3) of SPECIAL CONDITIONS OF CONTRACT (PART-I) (SCC) at Page 138-139 of this document).**

(c) **Documents as per the requirement of financial eligibility criteria (Ref: Clause 10.2 and for tenderer participating as JV firm Clause 17.15.2 of TENDER FORM (Second Sheet) along with Annexure-VIB at Page 14, 24-25 & 40 of GCC APRIL 2022).**

(d) **Documents for evaluating the Bid Capacity, for tenders having advertised value more than Rs.10.00 crore (Ref: Clause 10.3 and for tenderer participating as JV firm Clause 17.15.3 of TENDER FORM (Second Sheet) along with Annexure-VI at Page 14, 25 & 35-36 of GCC APRIL 2022).**

(e) **Certificate, stating that the tenderer/s are not liable to be disqualified and all their statements / documents submitted along with bid are true and factual, as per Annexure-V and Annexure-V (A) of this document (Ref: Para 6.1 of Part-1, Instruction to Tenderers (ITT) at Page 7 & 33-34 of GCC APRIL 2022 and Correction Slip No.2 of GCC APRIL 2022).**

(f) **In case the tenderer is other than Joint Venture (JV) firm, tenderer has to submit all the documents as mentioned below (Ref: Clause 14 (ii) (a) to (c), (e) to (g), (iv) and 18.10 of TENDER FORM (Second Sheet) at Page 17-18 & 26-27 of GCC APRIL 2022):**

Type of Firm	Documents to be submitted
(a) Sole Proprietorship Firm:	All documents in terms of Para 10 of the Tender Form (Second Sheet) at Page 12-16 of GCC APRIL 2022.
(b) HUF:	<p>(i) 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.</p> <p>(ii) All other documents in terms of Para 10 of the Tender Form (Second Sheet) at Page 12-16 of GCC APRIL 2022.</p>
(c) Partnership Firm:	<p>(i) A notarized copy of the Partnership Deed or a copy of the Partnership deed registered with the Registrar.</p> <p>(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.</p> <p>(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</p>

Tenderer/s

For Dy.CE(C)BSL

Type of Firm	Documents to be submitted
	<p>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 Standard General Conditions of Contract.</p> <p>NOTE: THIS DOCUMENT SHOULD BE SIGNED BY ALL THE PARTNERS OF THE FIRM.</p> <p>(iv) All other documents in terms of Para 10 of the Tender Form (Second Sheet) at Page 12-16 of GCC APRIL 2022.</p>
(e) Company registered under Companies Act-2013:	<p>(i) The copies of MOA (Memorandum of Association) / AOA (Articles of Association) of the company</p> <p>(ii) A copy of Certificate of Incorporation.</p> <p>(iii) A copy of Authorization/Power of Attorney issued by the Company (backed by the resolution of Board of Directors) in favour of the individual to sign the tender on behalf of the company and create liability against the company.</p> <p>(iv) All other documents in terms of Para 10 of the Tender Form (Second Sheet) at Page 12-16 of GCC APRIL 2022.</p>
LLP (Limited Liability Partnership) registered under LLP Act-2008:	<p>(i) A copy of LLP Agreement</p> <p>(ii) A copy of Certificate of Incorporation</p> <p>(iii) A copy of Power of Attorney/Authorization issued by the LLP in favour of the individual to sign the tender on behalf of the LLP and create liability against the LLP.</p> <p>(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 Standard General Conditions of Contract.</p> <p>NOTE: THIS DOCUMENT SHOULD BE SIGNED BY ALL THE PARTNERS OF THE FIRM.</p> <p>(v) All other documents in terms of Para 10 of the Tender Form (Second Sheet) at Page 12-16 of GCC APRIL 2022.</p>
Registered Society & Registered Trust:	<p>(i) A copy of Certificate of Registration.</p> <p>(ii) A copy of Memorandum of Association of Society / Trust Deed.</p> <p>(iii) A copy of Power of Attorney in favour of the individual to sign the tender documents and create liability against the Society/Trust.</p> <p>(iv) A copy of Rules & Regulations of the Society.</p> <p>(v) All other documents in terms of Para 10 of the Tender Form (Second Sheet) at Page 12-16 of GCC APRIL 2022.</p>

After opening of the tender, any document pertaining to the constitution of Sole Proprietorship Firm / Partnership Firm / Registered Company/ Registered Trust / Registered Society / HUF / LLP etc. shall be neither asked nor considered, if submitted. Further, no suo moto cognizance of any document available in public domain (i.e., on internet etc.) or in Railway's record/office files etc. will be taken for consideration of the tender, if no such mention is available in tender offer submitted

(g) In case the tenderer is a **Joint Venture (JV) firm**, tenderer has to submit all the documents as mentioned below:

(i) 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. (**Ref: Clause 17.6 of TENDER FORM (Second Sheet) at Page 21 of GCC APRIL 2022 & Appendix-VIII of the Tender Document**).

(ii) **Documents of JV Members:**

(**Ref: Clause 17.14 of TENDER FORM (Second Sheet) at Page 22-24 of GCC APRIL 2022**).

In case one or more of the members of the JV is / are:

Type of Firm	Documents to be submitted
Partnership Firm:	<p>(i) A notarized copy of the Partnership Deed or a copy of the Partnership deed registered with the Registrar.</p> <p>(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,</p> <p>(iii) A notarized or registered copy of Power of Attorney in favour of the individual to sign the MOU/JV Agreement on behalf of the partnership firm and create liability against the firm.</p> <p>(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 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 Standard General Conditions of Contract.</p> <p>NOTE: THIS DOCUMENT SHOULD BE SIGNED BY ALL THE PARTNERS OF THE FIRM.</p>
Proprietary Firm or HUF:	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.
Companies	<p>(i) A copy of resolutions of the Directors of the Company, permitting the company to enter into a JV agreement;</p> <p>(ii) The copies of MOA (Memorandum of Association) / AOA (Articles of Association) of the company;</p> <p>(iii) A copy of Certificate of Incorporation; and</p> <p>(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.</p>
LLP firm/s	<p>(i) A copy of LLP Agreement</p> <p>(ii) A copy of Certificate of Incorporation of LLP</p> <p>(iii) A copy of resolution passed by partners of LLP firm, permitting the Firm to enter into a JV agreement</p> <p>(iv) A copy of Authorization /copy of Power of Attorney</p>

Type of Firm	Documents to be submitted
	<p>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.</p> <p>(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 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 Standard General Conditions of Contract.</p> <p>NOTE: THIS DOCUMENT SHOULD BE SIGNED BY ALL THE PARTNERS OF THE FIRM.</p>
Society/s or Trust/s	<p>(i) A copy of Certificate of Registration</p> <p>(ii) A copy of Memorandum of Association of Society/Trust Deed</p> <p>(iii) A copy of Rules & Regulations of the Society</p> <p>(iv) A copy of Power of Attorney, in favour of the individual to sign the tender documents and create liability against the Society/Trust.</p>

(iii) All other documents in terms of **Para 10 of the Tender Form (Second Sheet) at Page 12-16 of GCC APRIL 2022.**

(h) Copy of **Ballast Test Report.**

5. Compliance of **Employment / Partnership etc. of Retired Railway Employees** as per **Clause 16 of TENDER FORM (Second Sheet) at Page 19-20 of GCC APRIL 2022**, failing which contract is liable to be dealt in accordance with provision of **Clause 62 of Standard General Condition of Contract at Page 92-95 of GCC APRIL 2022 (Note: Information / Certification should be given as per ‘Appendix-IV’ of the Tender / Technical Bid Document).**

6. Tenderers shall note that the submission of other following supporting documents, ***is important and they shall ensure the same at the time of online bidding of tender.*** However, Railways may seek clarifications / details / documents in this regard:

(a) Copy of **Vendor Mandate Form** as per **Appendix-VII** of the Tender Document. All Payments to the agency [Including the refund of the Earnest Money (EMD) of the unsuccessful bidder] will be remitted through NEFT. The Tenderer is required to declare Bank details and A/C No. etc. in Vendor Mandate Form.

(b) Copy of the **complete details of the firm** as per **Appendix-I** of the Tender / Technical Bid Document, to which all correspondences shall be made by the Railway.

(c) Copy of **Goods and Services Tax (GST) Registration Certificate containing GST Registration Number.**

(d) Copy of certificate by tenderer for **site visit & familiarization** as per **Appendix-VI** of the Tender / Technical Bid Document.

(e) Copy of the **list of the Personnel / Organisation of the tenderer on hand and proposed to be engaged for this tender** as per **Appendix-IV** of the Tender / Technical Bid Document.

(f) Copy of **list of the plants & machinery of tenderer available on hand and proposed to be inducted & hired for this tender** as per **Appendix-V** of the Tender / Technical Bid Document.

7. The Railway 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 Railway, make available all such information, evidence and documents as may be necessary for such verification. Any such verification or

8. lack of such verification, by the railway shall not relieve the bidder of its obligations or liabilities hereunder nor will it affect any rights of the railway thereunder.

INTRODUCTION OF ELECTRONIC REVERSE AUCTION (e-RA) FOR WORKS CONTRACTS (Rs.50.00 crores & above)

(Authority Railway Board's letter No.2017/Trans/01/Policy/Pt S dated 28.03.2018)

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The following procedure shall be followed for tenders invited through 'ELECTRONIC REVERSE AUCTION (e-RA) FOR WORKS CONTRACTS' System.

1. Tenders invited shall be by selecting the 'ELECTRONIC REVERSE AUCTION (e-RA)' option on the IREPS website.
2. (a) **Initial e-RA period:** This shall be the initial time interval for e-RA. e-RA shall be open for this duration.
- (b) **Auto extension period:** In case any offer is received in the time period equal to auto extension period before close of initial e-RA shall be extended for time equal to auto extension period from time to time of last bid. There shall be no upper limit on number of auto extensions. When no offer is received in the last auto extension period, e-RA shall close.
- (c) Minimum decrement in percentage of value of the last successful bid. —
3. Date and time for start of e-RA shall be communicated to qualified tenderers after evaluation of the Technical Bids.
4. After submission of Initial Price Bid, tenderers will not be allowed to revise the taxes and other levies.
5. During auction period, identities of the participating tenderers will be kept hidden.
6. Minimum admissible bid value will be last bid value minus minimum decrement as specified, before starting of reverse auction. Starting point for reverse auction shall be the lowest Price Bid of the tenderer eligible for award of contract. During Reverse Auction process, bidders shall not be allowed to bid a rate higher than the lowest Initial Price Offer.
7. After close of the e-RA, tabulation of last (minimum) bids received from all the tenderers will be generated and made visible to the participating tenderers.
8. Railway users can also view the bidding history in chronological order.
9. Bidders will not be allowed to withdraw their last offer.
10. L 1 will be defined as the lowest bid obtained after the closure of e-RA session.

Note: e-RA not applicable in this tender

SECTION

“A”

TENDER INFORMATION;

Indian Railways
Standard

General Conditions of Contract
GCC April 2022
&

SPECIAL CONDITIONS OF
CONTRACT (PART-I) (SCC)

CENTRAL RAILWAY

TENDER DETAILS

e-Tender Notice No. : DyCECBSL-03-2026-27 dated 22.06.2026

Name of Work : Construction work required for Yard Remodeling at Manmad, Nandgaon & Chalisgaon section including Earthwork/blanketing, Retaining Wall/drain, Minor/Major bridges and Track works including Ballast Supply in connection with Jalgaon-Manmad 4th line project of Central Railway. (Two packet System)

Tender Value : Rs. **86,80,07,027.30**

Tender Document Cost : **Not Applicable**

Bid Security : Rs. **1,73,60,200.00** {(As per Clause No.5 at Page 4 – 6 of GCC APRIL 2022)}.

Completion period : 18 (Eighteen) Months including monsoon.

Due on : **14.07.2026** up to 11.00 hours (Online)

Date of opening : **14.07.2026** after 11.00 hours (Online / Technical Bid only)

Issued to : M/s _____

CENTRAL RAILWAY**CONTRACT DETAILS**

e-Tender Notice No. : **DyCECBSL-03-2026-27 dated 22.06.2026**

Contract Agreement No. :

Name of work : Construction work required for Yard Remodeling at Manmad, Nandgaon & Chalisgaon section including Earthwork/blanketing, Retaining Wall/drain, Minor/Major bridges and Track works including Ballast Supply in connection with Jalgaon-Manmad 4th line project of Central Railway. (Two packet System)

Value of work :

Date of Acceptance :

Completion period : **18 (Eighteen) Months including monsoon.**

Date of Completion :

Name of Contractor : **M/s**

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ACCEPTANCE OF TENDER

e-Tender Notice No.: DyCECBSL-03-2026-27 dated 22.06.2026

Name of Work: Construction work required for Yard Remodeling at Manmad, Nandgaon & Chalisgaon section including Earthwork/blanketing, Retaining Wall/drain, Minor/Major bridges and Track works including Ballast Supply in connection with Jalgaon-Manmad 4th line project of Central Railway. (Two packet System)

CE(C)Central, Central Railway, CSMT, Mumbai for and on behalf of the PRESIDENT OF INDIA has accepted the instant Tender and agrees to pay the rates as entered in the schedule of quantities and rates & 'Offer Sheet' at Page Nos. _____ of Price Bid document.

Dy.CE (Const.)/BSL
CENTRAL RAILWAY
For and on behalf of the
PRESIDENT OF INDIA

Date

Witnesses:

(1) _____

(2) _____

Indian Railways Standard General Conditions of Contract

GCC April 2022

Engineering Department

This document has been corrected up to Correction Slip 11 of GCC 2022 issued
by Railway Board.

GCC April 2022

Indian Railways

STANDARD GENERAL CONDITIONS OF CONTRACT

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PART - I

REGULATIONS FOR TENDERS AND CONTRACTS

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PART I

Instructions to Tenderers (ITT)

1.0 Applicability: These conditions of contract shall be applicable for all the tenders and contracts of railways for execution of works as defined in GFR 2017.

1.01 Order of Precedence of Documents: In a tender/contract, in case of any difference, contradiction, discrepancy, with regard to conditions of tender/contract, specifications, drawings, bill of quantities etc., forming part of the tender/contract, the following shall be the order of precedence:

- i. Letter of Award / Acceptance (LOA)
- ii. Bill(s) of Quantities
- iii. Special Conditions of Contract
- iv. Technical Specifications as given in tender documents
- v. Drawings
- vi. Indian Railways Standard General Conditions of Contract updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents.
- vii. Indian Railways Unified Standard Specification (IRUSS-2019) updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents, if applicable in the contract.
- viii. CPWD Specifications 2019 Vol.I & II updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents, if applicable in the contract.
- ix. Indian Railways Unified Standard Specifications (Works and Material) 2010 updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents, if applicable in the contract.
- x. IR Specifications/Guidelines updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents.
- xi. Relevant B.I.S. Codes updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents.

1.1 Interpretation: These Regulations for Tenders and Contracts shall be read in conjunction with the Standard General Conditions of Contract which are referred to herein and shall be subject to modifications additions or suppression by Special Conditions of Contract and/or Special Specifications, if any, annexed to the Tender Forms.

1.2 Definition: In these Regulations for Tenders and Contracts the following terms shall have the meanings assigned hereunder except where the context otherwise requires:

- (a) "Railway" shall mean the President of the Republic of India or the administrative officers of the Railway or Successor Railway authorized to deal with any matter, which these presents are concerned on his behalf.
- (b) "General Manager" shall mean the Officer-in-Charge of the general superintendence and control of the Zonal Railway/Production Unit and shall also include Addl. General Manager, General Manager (Construction) and shall mean and include their successors of the Successor Railway.
- (c) "Chief Engineer" shall mean the Officer-in-Charge of the Engineering Department of Railway and shall also include Chief Engineer (Construction), Chief Electrical Engineer,

Tenderer/s

For Dy.CE(C)BSL

Chief Electrical Engineer (Construction), Chief Signal & Telecom Engineer, Chief Signal & Telecom Engineer (Construction), Chief Mechanical Engineer and shall mean and include their successors of the Successor Railway.

- (d) “Divisional Railway Manager” shall mean the Officer-in-Charge of a Division of Zonal Railway and shall mean and include Divisional Railway Manager of the Successor Railway.
- (e) “Engineer” shall mean the Divisional Engineer or Executive Engineer, Divisional Signal & Telecom Engineer, Divisional Electrical Engineer, Divisional Mechanical Engineer in executive charge of the works and shall include the superior officers, both Open Line and Construction Organisations, of Engineering, Signal & Telecom, Mechanical and Electrical Departments, i.e. the Senior Divisional Engineer/Deputy Chief Engineer, Senior Divisional Signal & Telecom Engineer / Dy. Chief Signal & Telecom Engineer, Senior Divisional Electrical Engineer / Deputy Chief Electrical Engineer, Senior Divisional Mechanical Engineer and shall mean & include the Engineers of the Successor Railway.
- (f) “Tenderer” shall mean the person / firm / co-operative or company whether incorporated or not who tenders for the works with a view to execute the works on contract with the Railway and shall include their representatives, successors and permitted assigns.
- (g) “Limited Tenders” shall mean tenders invited from all or some contractors on the approved or select list of contractors with the Railway.
- (h) “Open Tenders” shall mean the tenders invited in open and public manner and with adequate notice.
- (i) “Works” shall mean the works contemplated in the drawings and schedules set forth in the tender forms and required to be executed according to the specifications.
- (j) “Specifications” shall mean the Specifications for Materials and Works of the Railway as specified under the authority of the Ministry of Railways or Chief Engineer or as amplified, added to or superseded by special specifications if any, appended to the Tender Forms.
- (k) Standard Schedule of Rates (SSOR) shall mean the schedule of Rates adopted by the Railway, which includes-
 - 1. “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;
 - 2. “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.
- (l) “Drawings” shall mean the maps, drawings, plans and tracings, or prints thereof annexed to the Tender Forms.
- (m) “Contractor’s authorized Engineer” shall mean a graduate engineer or equivalent, having more than 3 years’ experience in the relevant field of construction work involved in the contract, duly approved by the Engineer.
- (n) 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.
- (o) “Bill of Quantities” shall mean Schedule of Item(s) included in the tender document along with respective quantities.

1.3 Words importing the singular number shall also include the plural and vice versa where the context requires.

CREDENTIALS OF CONTRACTORS

2. Application for Registration:

2.1 Works of construction and of supply of material shall be entrusted for execution to contractors whose capabilities and financial status have been investigated and approved to the satisfaction of the Railway. A list of approved contractors shall be maintained in the Railway. The said list be revised periodically once in a year or so by giving wide publicity through advertisements etc. A contractor including a contractor who is already on the approved list shall apply to the concerned General Manager (Construction) / Chief Administrative Officer (Construction) / Principal Chief Engineer / Principal Chief Signal & Telecommunication Engineer / Principal Chief Mechanical Engineer / Principal Chief Electrical Engineer / Divisional Railway Manager, furnishing particulars regarding:

- (a) his position as an independent contractor specifying engineering organization available with details of partners / staff / engineers employed with qualifications and experience;
- (b) his capacity to undertake and carry out works satisfactorily as vouched for by a responsible official or firm; details about the transport equipments, construction tools and plants etc. required for the work, maintained by him;
- (c) his previous experience of works similar to that to be contracted for, in proof of which original certificates or testimonials may be called for and their genuineness verified, if needs be, by reference to the signatories thereof;
- (d) his knowledge from actual personal investigation of the resources of the area/zone or zones in which he offers to work;
- (e) his ability to supervise the work personally or by competent and duly authorized agent;
- (f) his financial position;

2.2 An applicant shall clearly state the categories of works and the area/zone/division(s)/district(s) in which he desires registration in the list of approved contractors.

2.3 The selection of contractors for enlistment in the approved list would be done by a committee for different value of slabs as notified by Railway.

2.4 An annual fee as prescribed by the Railway from time to time would be charged from such approved contractors to cover the cost of sending notices to them and clerkage for tenders etc. Notices shall be sent to them on registered e-mail address and registered postal address.

TENDERS FOR WORKS

3. Tender Form: Tender Forms shall embody the contents of the contract documents either directly or by reference and shall be as per specimen form, Annexure-I. e-Tender Forms shall be issued free of cost to all tenderers.

4. Omissions & Discrepancies: Should a tenderer find discrepancies in or omissions from the drawings or any of the Tender Forms or should he be in doubt as to their meaning, he should at once notify the authority inviting tenders. The tender inviting authority may, if deemed necessary, clarify the same to all tenderers. It shall be understood that every endeavour has been made to avoid any error which can materially affect the basis of tender and successful tenderer shall take upon himself and provide for the risk of any error which may subsequently be discovered and shall make no subsequent claim on account thereof.

5. Bid Security:

- (1) (a) The tenderer shall be required to submit the Bid Security with the tender for the due performance with the stipulation to keep the offer open till such date as specified in the tender, under the conditions of tender. The Bid Security shall be as under:

Value of the Work	Bid Security
For all works	2% of the estimated cost of the work

Note:

- (i) The Bid Security shall be rounded off to the nearest ₹100. This Bid Security shall be applicable for all modes of tendering.
- (ii) Any firm recognized by Department of Industrial Policy and Promotion (DIPP) as 'Startups' shall be exempted from payment of Bid Security detailed above.
- (iii) Labour Cooperative Societies shall submit only 50% of above Bid Security detailed above.

(As per Advance correction slip no.11 to IRS GCC of April-2022)

- (b) It shall be understood that the tender documents have been 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 Engineer. Should the tenderer fail to observe or comply with the said stipulation, the aforesaid amount shall be liable to be forfeited to the Railway.
 - (c) If his tender is accepted, this Bid Security mentioned in sub Para (a) above will be retained as part security for the due and faithful fulfillment of the contract in terms of Clause 16 of the Standard General Conditions of Contract. The Bid Security of other Tenderers shall, save as herein before provided, be returned to them, but the Railway shall not be responsible for any loss or depreciation that may happen thereto while in their possession, nor be liable to pay interest thereon.
- (2) The Bid Security shall be deposited either in cash through e-payment gateway or submitted as Bank Guarantee bond from a scheduled commercial bank of India or as mentioned in tender documents. The Bank Guarantee bond shall be as per **Annexure-VIA** and shall be valid for a period of 90 days beyond the bid validity period.
- (3) **In case, submission of Bid Security in the form of Bank Guarantee, following shall be ensured:**
- i. A scanned copy of the Bank Guarantee shall be uploaded on e-Procurement Portal (IREPS) while applying to the tender.
 - ii. The original Bank Guarantee should be delivered in person to the official nominated as indicated in the tender document before closing date for submission of bids **(i.e. excluding the last date of submission of bids)**.

- iii. Non submission of scanned copy of Bank Guarantee with the bid on e-tendering portal (IREPS) and/or non-submission of original Bank Guarantee within the specified period shall lead to summary rejection of bid.
- iv. The Tender Security shall remain valid for a period of 90 days beyond the validity period for the Tender.
- v. The details of the BG, physically submitted should match with the details available in the scanned copy and the data entered during bid submission time, failing which the bid will be rejected
- vi. The Bank Guarantee shall be placed in an envelope, which shall be sealed. The envelope shall clearly bear the identification “**Bid for the ***** Project**” and shall clearly indicate the name and address of the Bidder. In addition, the Bid Due Date should be indicated on the right hand top corner of the envelope.
- vii. The envelope shall be addressed to the officer and address as mentioned in the tender document.
- viii. If the envelope is not sealed and marked as instructed above, the Authority assumes no responsibility for the misplacement or premature opening of the contents of the Bid submitted and consequent losses, if any, suffered by the Bidder.

6. Care in Submission of Tenders:

- (a) (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 and that the rates he enters in the tender forms are adequate and all inclusive to accord with the provisions in Clause-37 of the Standard General Conditions of Contract for the completion of works to the entire satisfaction of the Engineer.
- (a) (ii) Tenderers 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. Tenderers will ensure that full benefit of Input Tax Credit (ITC) likely to be availed by them is duly considered while quoting rates.
- (a) (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 railway 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.
- (a) (iv) In case the successful tenderer is not liable to be registered under CGST/IGST/UTGST/SGST Act, the railway shall deduct the applicable GST from his/their bills under reverse charge mechanism (RCM) and deposit the same to the concerned authority.
- (a)(v) Contractor shall be liable to pay/refund the amount collected as GST to the Indian Railways along with interest and penalties, if any imposed by the authorities, in case GST input tax credit of Indian Railways is denied/rejected by the tax authorities due to reasons mentioned below but not limited to:

Wrong/incorrect invoice s issued by Contractor;

No-filing of GST returns;

Non-payment of GST collected from Indian Railways to the authorities;

Any other non-compliance done by Contractor;

General Indemnity: Contractor hereby agrees to indemnify and hold harmless the Indian Railways from and against any and all losses, including loss on account of Input Tax Credit and all losses incurred by the Indian Railways relating to or arising out of or in connection with any actual or threatened claim, legal action, proceedings, prosecution or inquiry by or against the Indian Railways arising out, directly or indirectly, of failure by the contractor to comply with the provisions of GST and related laws, or based upon or arising from any failure by the Contractor.

Retention Money: Any payment liable to be paid by Indian Railways to contractor against the goods or services or both supplied by such contractor to Indian Railways shall be kept on hold in case supplier makes any non-compliance of any of the GST law provisions including non-reporting of invoices in GST returns. Such payment shall be released after proper verification of records and availability of ITC to Indian Railways as per provisions of GST Law.

- (b) When work is tendered for by a firm or company, the tender shall be signed by the individual legally authorized to enter into commitments on their behalf.
- (c) The Railway 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 execution of the contract. It may, however, recognize such power of attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the Contractor.

- 6.1** The tenderers shall submit a copy of certificate stating that all their statements/documents submitted along with bid are true and factual. Standard format of certificate to be submitted by the bidder is enclosed as **Annexure-V. In addition to Annexure-V, in case of other than Company/Proprietary firm Annexure-V(A) shall also be submitted by the each member of a Partnership Firm / Joint Venture (JV) / Hindu Undivided Family (HUF) / Limited Liability Partnership (LLP) etc., as the case may be.** Non submission of above certificate(s) by the bidder shall result in **summarily** rejection of his/their bid. It shall be mandatorily incumbent upon the tenderer to identify state and submit the supporting documents duly self-attested/digitally signed by which they/he is qualifying the Qualifying Criteria mentioned in the Tender Document. (**Authority:** Advance correction slip No.2 published vide Railway Board letter No.2022/CE-I/CT/GCC-2022/Policy, New Delhi, dt.13.12.2022).

CONSIDERATION OF TENDERS

7. Right of Railway to Deal with Tenders: The Railway reserves the right of not to invite tenders for any of Railway 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 reject any tender or all tenders without assigning reasons for any such action. In case if tender is accepted in part by Railway administration, Letter of Acceptance shall be issued as counter offer to the Tenderer, which shall be subject to acceptance by the Tenderer.

7A. Two Packets System of Tendering: With a view to assess the tenders technically without being influenced by the financial bids, 'Two Packets System of tendering' shall be adopted wherein tender documents provide for the same.

7B. Pre Bid Conference: Intenders having advertised value more than Rs 50 Crore or as mentioned in the tender document, Railway shall conduct Pre Bid Conference(s) with the prospective bidders.

7C. Make in India Policy: 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.

7D. 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.

7E. Clarification of Bids: To assist in the examination, evaluation & comparison and pre-qualification of the Tender, the Railway 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 Railway shall not be entertained or considered. The Railway request for clarification and the response of the bidder in this regard shall be in writing.

However, if a Bidder does not provide clarification of its bid by the date and time communicated in the Railway request for clarification, the bid shall be evaluated as per the documents submitted along with the bid.

8. Execution of Contract Document: The Tenderer whose tender is accepted shall be required to appear in person at the office of General Manager/General Manager (Construction), Chief Administrative Officer (Construction), Divisional Railway Manager or concerned Engineer, as the case may be, or if tenderer is a firm or corporation, a duly authorized representative shall appear (there would be no need for appear in person if agreement is signed digitally) and execute the contract agreement within seven days of notice from Railways that the Contract Agreement is ready. Failure to do so shall constitute a breach of the agreement affected by the acceptance of the tender. The Contract Agreement shall be entered into by Railway only after submission of valid Performance Guarantee by the Contractor. In such cases the Railway may determine that such tenderer has abandoned the contract and there upon his tender and acceptance thereof shall be treated as cancelled and the Railway shall be entitled to forfeit the full amount of the Bid Security and other dues payable to the Contractor under this contract. The failed Contractor shall be debarred from participating in the re-tender for that work.

9. Form of Contract Document: Every contract shall be complete in respect of the document it shall so constitute. Not less than 2 copies of the contract document shall be signed by the competent authority and the Contractor and one copy given to the Contractor (there would be no need of signing two copies if agreement is signed digitally).

a) For Zone Contracts, awarded on the basis of the percentage above or below the applicable chapter(s) of Standard Schedule of Rates (SSOR) for the whole or part of financial year, the contract agreement required to be executed by the tenderer whose tender is accepted shall be as per specimen form, Annexure-II. During the currency of the Zone Contract, work orders as per specimen form Annexures-III, for works not exceeding ₹ 5,00,000 each, shall be issued by the Divisional Railway Manager / Executive Engineer under the agreement for Zone Contract.

(b) For contracts for specific works, the contract document required to be executed by the tenderer whose tender is accepted shall be an agreement as per specimen form Annexure- IV.

**CENTRAL RAILWAY
TENDER FORM (First Sheet)**

e-Tender Notice No.: DyCECBSL-03-2026-27 dated 22.06.2026

Name of Work: Construction work required for Yard Remodeling at Manmad, Nandgaon & Chalisgaon section including Earthwork/blanketing, Retaining Wall/drain, Minor/Major bridges and Track works including Ballast Supply in connection with Jalgaon-Manmad 4th line project of Central Railway. (Two packet System)

To

The President of India

Acting through the Dy.Chief Engineer(C)/BSL, Central Railway

1. I/We _____ have read the various conditions to tender attached hereto and agree to abide by the said conditions. I/We also agree to keep this offer open for acceptance for a period of **90** days from the date fixed for closing of the tender and in default thereof, I/We will be liable for forfeiture of my/our "Bid Security". I/We offer to do the work for Central Railway, at the rates quoted in the attached bill(s) of quantities and hereby bind myself/ourselves to complete the work in all respects within **18 (Eighteen)** months from the date of issue of letter of acceptance of the tender.

2. I/We also hereby agree to abide by the Indian Railways Standard General Conditions of Contract, with all correction slips up-to-date and to carry out the work according to the Special Conditions of Contract and Specifications of materials and works as laid down by Railway in the annexed Special Conditions/Specifications, Standard Schedule of Rates (SSOR) with all correction slips up-to-date for the present contract.

3. A Bid Security of **Rs. 1,73,60,200.00** has already been deposited online/submitted as Bank Guarantee bond. Full value of the Bid Security shall stand forfeited without prejudice to any other right or remedies in case my/our Tender is accepted and if:

- (a) I/We do not submit the Performance Guarantee within the time specified in the Tender document;
- (b) I/We do not execute the contract documents within seven days after receipt of notice issued by the Railway that such documents are ready; and
- (c) I/We do not commence the work within fifteen days after receipt of orders to that effect.

4. I/We am/are a Startup firm registered by Department of Industrial Policy and Promotion (DIPP) and my registration number is valid upto (Copy enclosed) and hence exempted from submission of Bid Security.

5. We are a Labour Cooperative Society and our Registration No. is with.....and hence required to deposit only 50% of Bid Security.

6. Until a formal agreement is prepared and executed, acceptance of this tender shall constitute a binding contract between us subject to modifications, as may be mutually agreed to between us and indicated in the letter of acceptance of my/our offer for this work.

Tenderer/s

For Dy.CE(C)BSL

Signature of Tenderer(s)

Date _____

Address of the Tenderer(s)

Note: This form (Annexure-I) should be uploaded duly filled with the Name & seal of the participating firm/s viz. Proprietary firm / Company / Partnership Firm / Joint Venture (JV) / Hindu Undivided Family (HUF) / Limited Liability Partnership (LLP) etc., as the case may be, and signature of Authorised signatory.

TENDER FORM (Second Sheet)

1. Instructions to Tenderers and Conditions of Tender: The following documents form part of Tender / Contract:

- (a) Tender Forms – First Sheet and Second Sheet
- (b) Special Conditions/Specifications (enclosed)
- (c) Bill(s) of quantities (uploaded separately)
- (d) Standard General Conditions of Contract and Standard Specifications (Works and Materials) of Indian Railways as amended/corrected upto latest correction slips, copies of which can be seen in the office of the Chief Engineer(C), Central Railway or obtained from the office on payment of prescribed charges.
- (e) Standard Schedule of Rates (SSOR) as amended / corrected upto latest correction slips, copies of which can be seen in the office of the Chief Engineer(C), Central Railway or obtained from the office on payment of prescribed charges.
- (f) All general and detailed drawings pertaining to this work which will be issued by the Engineer or his representatives (from time to time) with all changes and modifications.

2. Drawings for the Work: The Drawing for the work can be seen in the office of the Dy.CE(C)/BSL and / or Chief Engineer(C) /North, Central Railway at any time during the office hours. The drawings are only for the guidance of Tenderer(s). Detailed working drawings (if required) based generally on the drawing mentioned above, will be given by the Engineer or his representative from time to time.

3. The Tenderer(s) shall quote his / their rates as a percentage above or below the Standard Schedule of Rates (SSOR) of Indian Railway as applicable to Central Railway Division except where he/they are required to quote item rates and must tender for all the items shown in the Bill(s) of Quantities attached. The quantities shown in the attached Bill(s) of Quantities are given as a guide and are approximate only and are subject to variation according to the needs of the Railway. The Railway does not guarantee work under each item of the Bill(s) of Quantities. The tenderer(s) shall quote rates / rebates only at specified place in Tender Form supplied by Railway. Any revision of rates / rebates submitted (quoted) through a separate letter whether enclosed with the bid (Tender Form) or submitted separately or mentioned elsewhere in the document other than specified place shall be summarily ignored and will not be considered.

4. Tenders containing erasures and / or alterations of tender documents are liable to be rejected. Any correction made by tender(s) in his/their entries must be attested by him / them.

5. The works are required to be completed within a period of **18 (Eighteen)** months including monsoon from the date of issue of acceptance letter.

6. Bid Security:

(a) Subject to exemptions provided under Para 5(1) (a) of Part-1 (ITT) of this document, the tender must be accompanied by a Bid Security as mentioned in tender documents, failing which the tender shall be summarily rejected.

(b) The Tenderer(s) shall keep the offer open for a minimum period of **90 days** from the date of closing of the Tender. It is understood that the tender documents have been issued to the Tenderer(s) and the Tenderer(s), is / are permitted to tender in consideration of the stipulation on his / their part that after submitting his / their tender subject to the period being extended further, if

Tenderer/s

For Dy.CE(C)BSL

required by mutual agreement from time to time, he will not resile from his offer or modify the terms and conditions thereof in a manner not acceptable to Central Railway. Should the tenderer fail to observe or comply with the foregoing stipulation, the amount deposited or Bank guarantee bond submitted as Bid Security for the due performance of the above stipulation, shall be forfeited to the Railway.

(c) If his tender is accepted,

- (i) the Bid Security mentioned in sub Para(a) above deposited in cash through e-payment gateway will be retained as part security for the due and faithful fulfillment of the contract in terms of Clause 16 of the Standard General Conditions of Contract;
- (ii) the Bid Security mentioned in sub Para(a) above submitted as Bank guarantee bond, will be encashed as part security for the due and faithful fulfillment of the contract in terms of Clause 16 of the Standard General Conditions of Contract.

The Bid Security of other Tenderers shall, save as herein before provided, be returned to them, but the Railway shall not be responsible for any loss or depreciation to the Bid Security that may happen thereto while in their possession, nor be liable to pay interest thereon.

(d) In case Contractor submits the Term Deposit Receipt/Bank Guarantee Bond towards either the Full Security Depositor the Part Security Deposit equal to or more than Bid Security, the Railway shall return the Bid Security so retained as per sub Para(c) above, to the Contractor.

7. Rights of the Railway to deal with Tender: The authority for the acceptance of the tender will rest with the Railway. It shall not be obligatory on the said authority to accept the lowest tender or any other tender, and tenderer(s) shall neither demand any explanation for the cause of rejection of his/ their tender nor the Railway to assign reasons for declining to consider or reject any particular tender or tenders.

8. If the tenderer(s) deliberately gives / give wrong information in his / their tender or creates / create circumstances for the acceptance of his / their tender, the Railway reserves the right to reject such tender at any stage.

9. If any partner(s) of a partnership firm expires after the submission of its tender or after the acceptance of its tender, the Railway shall deem such tender as cancelled/contract as terminated under clause 61 of the Standard General Conditions of Contract, unless the firm retains its character as per partnership agreement. If a sole proprietor expires after the submission of tender or after the acceptance of tender, the Railway shall deem such tender as cancelled / contract as terminated under clause 61 of the Standard General Conditions of Contract.

10. Eligibility Criteria:

10.1 Technical Eligibility Criteria:

(a) The 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 the tender, or
- (ii) Two similar works each costing not less than the amount equal to 40% of advertised value of the tender, or

(iii) One similar work costing not less than the amount equal to 60% of advertised value of the tender.

(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.

Note for b (1): Separate completed works of minimum required values shall also be considered for fulfillment of technical eligibility criteria for different components.

(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.

(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.

However, if required in tender documents by way of Special Conditions, a formal agreement duly notarised, 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 fulfillment of technical eligibility. Such subcontractor must fulfill technical eligibility criteria as follows:

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.

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

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.

Note for Item 10.1:

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.

10.2. Financial Eligibility Criteria: The tenderer must have minimum average annual contractual turnover of 'V/N' or 'V' whichever is less; where,

V = Advertised value of the tender in crores of Rupees

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

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.

The tenderers shall submit requisite information as per Annexure-VIB, along with copies of Audited Balance Sheets duly certified by the Chartered Accountant/ Certificate from Chartered Accountant duly supported by Audited Balance Sheet.

10.3 Bid Capacity: The tender/technical bid will be evaluated based on bid capacity formula detailed as Annexure-VI.

10.4 No Technical and Financial credentials are required for tenders having advertised value up to Rs.50 lakh.

10.5 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.

[Explanation for Para 10 of the Tender Form (Second Sheet) including Para 10.1 to 10.5 - 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 Note for Item 10.1 Para 10 of the Tender Form (Second Sheet), 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.*
7. *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 $0.3 \times 0.2 \times \text{value of the work done in the previous entity}$. 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.*
8. *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.*
9. *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 6 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.*
10. *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.*
11. *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.*
12. *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.

- 13. 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.*
- 14. In case a tenderer is LLP, the credentials of tenderer shall be worked out on above lines similar to a partnership firm.*
- 15. In case company A is merged with company B, then company B would get the credentials of company A also.]*

11. Tenderer Credentials:

Documents testifying tenderer previous experience and financial status should be produced along with the tender.

Tenderer(s) who is / are not borne on the approved list of the Contractors of Central Railway shall submit along with his / their tender:

- (i) Certificates and testimonials regarding contracting experience for the type of job for which tender is invited with list of works carried out in the past.
- (ii) Certificates which may be an attested Certificate from the client, Audited Balance Sheet duly certified by the Chartered Accountant etc. regarding contractual payments received in the past.
- (iii) The list of personnel / organization on hand and proposed to be engaged for the tendered work. Similarly list of Plant & Machinery available on hand and proposed to be inducted and hired for the tendered work.
- (iv) A copy of certificate 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 certificate to be submitted by the bidder is enclosed as Annexure-V. **In addition to Annexure-V, in case of other than Company/Proprietary firm Annexure-V(A) shall also be submitted by the each member of a Partnership Firm / Joint Venture (JV) / Hindu Undivided Family (HUF) / Limited Liability Partnership (LLP) etc., as the case may be.** Non submission of a copy of certificate by the bidder shall result in summarily rejection of his/their bid. It shall be mandatorily incumbent upon the tenderer to identify, state and submit the supporting documents duly self-attested / digitally signed by which they/he are/is qualifying the Qualifying Criteria mentioned in the Tender Document. (Authority: Advance correction slip No.2 published vide Railway Board letter No.2022/CE-I/CT/GCC-2022/Policy, New Delhi, dt.13.12.2022).
- (v) The Railway 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 Railway, 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 Railway shall not relieve the bidder of its obligations or liabilities hereunder nor will it affect any rights of the Railway thereunder.
- (vi) (a) In case of any information submitted by tenderer is found to be false forged 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 a period of upto **two** years.

(b) In case of any information submitted by tenderer is found to be false forged or incorrect after the award of contract, the contract shall be terminated. Bid Security, Performance Guarantee and Security Deposit available with the railway shall be forfeited. In addition, other dues of the contractor, if any, under this contract shall be forfeited and agency shall be banned for doing business for a period of upto **two** years.

12. Non-compliance with any of the conditions set forth therein above is liable to result in the tender being rejected.

13. Execution of Contract Documents: The successful Tenderer(s) shall be required to execute an agreement with the President of India acting through the Chief Engineer (C)/MTP, Central Railway for carrying out the work according to Standard General Conditions of Contract, Special Conditions / Specifications annexed to the tender and Standard Specifications (Works and Materials) of Railway as amended/corrected upto latest correction slips, mentioned in tender form (First Sheet).

14. Documents to be Submitted Along with Tender

(i) The tenderer shall clearly specify whether the tender is submitted on his own (Proprietary Firm) or on behalf of a Partnership Firm / Company / Joint Venture (JV) / 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.

(ii) Following documents shall be submitted by the tenderer:

(a) Sole Proprietorship Firm:

(i) All documents in terms of Para 10 of the Tender Form (Second Sheet) above.

(b) HUF:

(i) 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.

(ii) All documents in terms of Para 10 of the Tender Form (Second Sheet) above.

(c) Partnership Firm:

(i) All documents as mentioned in Para 18 of the Tender Form (Second Sheet).

(d) Joint Venture (JV): All documents as mentioned in Para 17 of the Tender Form (Second Sheet).

(e) Company registered under Companies Act 2013:

(i) The copies of **MOA (Memorandum of Association) / AOA (Articles of Association)** of the company

(ii) A copy of Certificate of Incorporation

- (iii) A copy of Authorization/Power of Attorney issued by the Company (backed by the resolution of Board of Directors) in favour of the individual to sign the tender on behalf of the company and create liability against the company.
- (iv) All documents in terms of Para 10 of the Tender Form (Second Sheet) above.

(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 favour 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 Standard General Conditions of Contract.
- (v) All other documents in terms of Para 10 of the Tender Form (Second Sheet).

(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 favour of the individual to sign the tender documents and create liability against the Society/Trust.
- (iv) A copy of Rules & Regulations of the Society
- (v) All other documents in terms of Para 10 of the Tender Form (Second Sheet) above.
- (iii) If it is NOT mentioned in the submitted tender that tender is being submitted on behalf of 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.
- (iv) After opening of the tender, any document pertaining to the constitution of Sole Proprietorship Firm / Partnership Firm / Registered Company/ Registered Trust / Registered Society / HUF / LLP etc. shall be neither asked nor considered, if submitted. Further, no suo moto cognizance of any document available in public domain (i.e., on internet etc.) or in Railway's record/office files etc. will be taken for consideration of the tender, if no such mention is available in tender offer submitted.
- (v) A tender from JV / Partnership firm etc. shall be considered only where permissible as per the tender conditions.
- (vi) The Railway will not be bound by any change of power of attorney or in the composition of the firm made subsequent to the submission of tender. Railway may, however, recognize such power of attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the Contractor.

15. The tenderer whether sole proprietor / a company or a partnership firm / registered society / registered trust / HUF / LLP etc. if they want to act through agent or individual partner(s), should submit along with the tender, a copy of power of attorney duly stamped and authenticated by a Notary Public or by Magistrate in favour of the specific person whether he/they be partner(s) of

the firm or any other person, specifically authorizing him/them to sign the tender, submit the tender and further to deal with the Tender / Contract up to the stage of signing the agreement except in case where such specific person is authorized for above purposes through a provision made in the partnership deed / Memorandum of Understanding / Article of Association / Board resolution, failing which tender shall be summarily rejected.

A separate power of attorney duly stamped and authenticated by a Notary Public or by Magistrate in favour of the specific person whether he/they be partner(s) of the firm or any other person, shall be submitted after award of work, specifically authorizing him/them to deal with all other contractual activities subsequent to signing of agreement, if required.

Note: A Power of Attorney executed and issued overseas, the document will also have to be legalized by the Indian Embassy and notarized in the jurisdiction where the Power of Attorney is being issued. However, the Power of Attorney provided by Bidders from countries that have signed the Hague Legislation Convention 1961 are not required to be legalized by the Indian Embassy if it carries a conforming Apostille certificate.

16. Employment/Partnership etc. of Retired Railway Employees:

(a) Should a tenderer

- i) be a retired Engineer of the gazetted rank or any other gazetted officer working before his retirement, whether in the executive or administrative capacity or whether holding a pensionable post or not, in the Engineering or any other department of any of the railways owned and administered by the President of India for the time being, OR
- ii) being partnership firm / joint venture (JV) / registered society / registered trust etc have as one of its partners/members a retired Engineer of the gazetted rank or any other gazetted officer working before his retirement, OR
- iii) being an incorporated company have any such retired Engineer of the gazetted rank or any other gazetted officer working before his retirement as one of its directors

AND

in case where such Engineer or officer had not retired from government service at least 1 year prior to the date of submission of the tender

THEN

the tenderer will give full information as to the date of retirement of such Engineer or gazetted officer from the said service and as to whether permission for taking such contract, or if the Contractor be a partnership firm or an incorporated company, to become a partner or director as the case may be, has been obtained by the tenderer or the Engineer or officer, as the case may be from the President of India or any officer, duly authorized by him in this behalf, shall be clearly stated in writing at the time of submitting the tender.

- b) In case, upon successful award of contract, should a tenderer depute for execution of the works under or to deal matters related with this contract, any retired Engineer of gazette rank or retired gazetted officer working before his retirement in the engineering or any other department of any of the railways owned and administered by the President of India for the time being, and now in his employment, then the tenderer will ensure that retired Engineer or retired gazetted officer had retired from government service at least 1 year prior to the date of his employment with tenderer and in case he had retired from service within a year then he possesses the requisite permission from the President of India or any officer, duly authorized by him in this behalf, to get associated with the tenderer.
- c) Should a tenderer or Contractor being an individual, have member(s) of his family or in the case of partnership firm/ company / joint venture (JV) / registered society / registered trust etc. one or more of his partner(s)/shareholder(s) or member(s) of the family of

partner(s)/shareholder(s) having share of more than 1% in the tendering entity employed in gazetted capacity in the Engineering or any other department of the railway, then the tenderer at the time of submission of tender, will inform the authority inviting tenders the details of such persons.

Note: If information as required as per 16.a), b), c) above has not been furnished, contract is liable to be dealt in accordance with provision of clause 62 of Standard General Condition of contract.

JOINT VENTURE (JV) IN WORKS TENDERS

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

17.1 Separate identity/name shall be given to the Joint Venture.

17.2 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%.

17.3 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.

17.4 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.

17.5 Bid Security 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.

17.6 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.

17.7 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.

17.8 Approval for change of constitution of JV shall be at the sole discretion of the Railway. 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.

17.9 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.

17.10 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.

17.11 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 Railways 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 railway 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:

17.11.1 Joint and Several Liability - Members of the entity to which the contract is awarded, shall be jointly and severally liable to the Railway 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 Railways during the course of execution of the contract or due to non-execution of the contract or part thereof.

17.11.2 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.

17.11.3 Governing Laws - The Registered Entity shall in all respect be governed by and interpreted in accordance with Indian Laws.

17.12 Authorized Member - Joint Venture members in the JV MoU shall authorize Lead member on behalf of the Joint Venture to deal with the **Contract**, 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.

17.13 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 Railway in respect of the said tender/contract.

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

17.14.1 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 favour 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 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 Standard General Conditions of Contract.

NOTE: THIS DOCUMENT SHOULD BE SIGNED BY ALL THE PARTNERS OF THE FIRM.

17.14.2 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.

17.14.3 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.

17.14.4 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 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 Standard General Conditions of Contract.

17.14.5 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.

17.14.6 All other documents in terms of Para 10 of the Tender Form (Second Sheet) above.

17.14.7 A Power of Attorney executed and issued overseas, the document will also have to be legalized by the Indian Embassy and notarized in the jurisdiction where the Power of Attorney is being issued. However, the Power of Attorney provided by Bidders from countries that have signed the Hague Legislation Convention 1961 are not required to be legalized by the Indian Embassy if it carries a conforming Apostille certificate.

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

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

(a) For Works without composite components

The technical eligibility for the work as per Para 10.1 above, 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 10.1 above, 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 the 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 10.1 above, shall be satisfied by either the 'JV in its own name & style' or 'Lead member of the JV' and technical eligibility for other component(s) of work as per Para 10.1 above, shall be satisfied by either the 'JV in its own name & style' or 'any 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 10.1 above, 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 the 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.

Note for Para 17.15.1:

- a) *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.

- b) *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.*

17.15.2 Financial Eligibility Criteria

The JV shall satisfy the requirement of “Financial Eligibility” mentioned at Para 10.2 above. The “financial capacity” of the lead member of JV shall not be less than 51% of the financial eligibility criteria mentioned at Para 10.2 above.

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.

17.15.3 Bid Capacity

The JV shall satisfy the requirement of “Bid Capacity” requirement mentioned at Para 10.3 above. The arithmetic sum of individual “Bid capacity” of all the members shall be taken as JV’s “Bid capacity” to satisfy this requirement.

18. Participation of Partnership Firms in works tenders:

18.1 The Partnership Firms participating in the tender should be legally valid under the provisions of the Indian Partnership Act.

18.2 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.

18.3 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.

18.4 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 Railway 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 Railways 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 Railway 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 Standard General Conditions of Contract.

18.5 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.

18.6 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.

18.7 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.

18.8 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.

18.9 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 Railway 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 Railway 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/altered/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 Railway, shall constitute a breach of the contract, liable for determination of the contract under Clause 62 of the Standard 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 Railway.

18.10 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 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 Standard General Conditions of Contract.

NOTE: THIS DOCUMENT SHOULD BE SIGNED BY ALL THE PARTNERS OF THE FIRM.

(iv) All other documents in terms of Para 10 of the Tender Form (Second Sheet) above.

18.11 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 10 of the Tender Form (Second Sheet) above.

19.0 Advances to Contractor:

If specifically provided in Tender Documents of tender having advertised value more than Rs.50.00 Crores, Railway shall make payment, as an Interest-bearing advances, as per Contractor's request. **These advances shall carry a simple interest @ RBI Bank Rate + 5% (five percent).** The payment and recovery of such advances shall be made as per manners prescribed in Clause 46.4 of the Standard General Conditions of Contract.

(Signature)

(Designation)

Central Railway

Date

Signature of Tenderer(s)

Date:

TENDER FORM (Third Sheet)**Name of Work:** _____**BILL OF QUANTITIES****1. Standard Schedule of Rates (SSOR) Items:**

SL	Item No. of SSOR	Description of Item of Work	Approximate Quantity	Unit	Rates in Figures and Words to be filled by tenderer (₹)	Amount (₹)
1	2	3	4	5	6	7

2. Non Standard Schedule of Rates (SSOR) Items:

SL	Item No.	Description of Item of Work	Approximate Quantity	Unit	Rates in Figures and Words to be filled by tenderer (₹)	Amount (₹)
1	2	3	4	5	6	7

The quantities shown in above Bill of Quantities are approximate and are as a guide to give the tenderer(s) an idea of quantum of work involved. The Railway reserves the right to increase/decrease and/or delete or include any of the quantities given above and no extra rate will be allowed on this account.

I/We undertake to do the work at _____ % above/below the Standard Schedule of Rates (SSOR) of the _____ Railway as applicable to _____ Division or at the rates quoted above for each item.

Dated _____

Signature of the Tenderer(s)

Note: Columns 1 to 5 shall be filled by the office of the Authority inviting tender. Columns 6 & 7 shall be filled by the Tenderer(s) only when percentage tenders are not invited.

AGREEMENT FOR ZONE CONTRACT

CONTRACT AGREEMENT No. _____ DATED _____. ARTICLES OF AGREEMENT made this _____ day of _____ between the President of India acting through the _____, _____ Railway hereinafter called the "Railway" of the one part and _____ hereinafter called the "Contractor" of the other part.

WHEREAS the Contractor has agreed with the Railway during the period of _____ months from _____ to _____ for the performance of:

(a) New Works, additions and alterations to existing structures, special repair works and supply of building materials subject to the contract value for such works not exceeding ₹ _____.

(b) All ordinary repair and maintenance works at any site between kilometer _____ and kilometer _____ as will be set forth in the work orders (which work orders shall be deemed and taken to be part of this contract) that will be issued during the said period at _____ % above/below the Standard Schedule of Rates (SSOR) of the _____ Railway, corrected up to the latest correction slips and Standard Specifications of the _____ Railway corrected upto latest correction slips and the Special Conditions and Special Specifications, if any in conformity with the drawings (if any) that will be issued with the work order, aforesaid AND WHEREAS the performance of the said work is an act in which the public are interested.

NOW THIS INDENTURE PRESENTS WITNESSETH That in consideration of the payment to be made by the Railway, the Contractor will duly perform the works set forth in the said Work Order and shall execute the same with great promptness, care and accuracy, in a workman like manner to the satisfaction of the Railway and will complete the same on or before the respective dates specified therein in accordance with the said specifications and said drawings (if any) and said conditions of contract and will observe, fulfill and keep all the conditions therein mentioned, (which shall be deemed and taken to be part of this contract as if the same had been duly set forth herein), AND the Railway both here-by agree that if the Contractor shall duly perform the said work in the manner aforesaid and observe and keep the said terms and conditions, the Railway will pay or cause to be paid to the Contractor for the said works on the completion thereof the amount due in respect thereof at the rates specified above.

Contractor _____

Designation _____

Address _____

Railway _____

(For President of India)

Witnesses (to signature of Contractor):

Signature of witnesses with address _____

Date _____

Signature of witnesses with address _____

Date _____

ANNEXURE - III

WORK ORDER UNDER ZONE CONTRACT

WORK ORDER NO. _____, DATED _____ UNDER CONTRACT AGREEMENT NO. _____ DATED _____.

Name of Work _____ (SITE) _____

Schedule of Drawings _____

Authority _____ Allocation _____

The Contractor(s) _____ is / are hereby ordered to carry out the following works at _____ % above/below the Standard Schedule of Rates (SSOR) of _____, updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents under Zone Contract Agreement here-in-before referred to:

SL	Item No.	Description of Item of Work	Approximate Quantity	Unit	Rates in Figures and Words (₹)	Amount (₹)
1	2	3	4	5	6	7
Total Approximate Value of Work = ₹ _____						

The works herein mentioned are required to be completed on or before _____ (Date). The quantities provided herein are approximate and subject to variation under Clause 42 of the Standard General Conditions of Contract updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents.

Divisional Railway Manager/Divisional _____ Engineer

_____ Division

_____ Railway

Date _____

for President of India

I agree to complete the works herein set forth on or before the date specified under the Zone Contract Agreement herein before referred to in conformity with the drawings hereto annexed and in accordance with the General and Special (if any) Conditions of Contract updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents and the Standard Specifications of _____ Railway updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents .

I also agree to maintain such works for the period specified below from the date of completion:

- (a) Repair and maintenance work including white/color washing: three calendar months from date of completion.

Tenderer/s

For Dy.CE(C)BSL

(b) All new works except earth work: Six calendar months from date of completion.

Contractor _____ (Signature)

Railway: Designation _____

Address _____

For President of India)

Date _____

Date _____

Signature of Witnesses (to Signature of Contractor) with address

- | | | |
|----|-------|-------|
| 1. | _____ | _____ |
| | _____ | _____ |
| | _____ | _____ |
| 2. | _____ | _____ |
| | _____ | _____ |
| | _____ | _____ |

CENTRAL RAILWAY
CONTRACT AGREEMENT OF WORKS

CONTRACT AGREEMENT NO. _____ DATED _____

ARTICLES OF AGREEMENT made this _____ day of _____ 20____
 between President of India acting through the Railway Administration hereafter called the
 "Railway" of the one part and _____ herein after called the
 "Contractor" of other part.

WHEREAS the Contractor has agreed with the Railway for performance of the works
 _____ set forth in the Bill(s) of Quantities hereto annexed upon the Standard
 General Conditions of Contract, updated with correction slips issued up to date of inviting tender
 or as otherwise specified in the tender documents and the Specifications of _____
 updated with correction slips issued up to date of inviting tender or as otherwise specified in the
 tender documents and the applicable Standard Schedule of Rates (SSOR) of _____ updated
 with correction slips issued up to date of inviting tender or as otherwise specified in the tender
 documents and the Special Conditions and Special Specifications, if any and in conformity with
 the drawings here-into annexed AND WHEREAS the performance of the said works is an act in
 which the public are interested.

NOW THIS INDENTURE WITNESSETH that in consideration to the payments to be
 made by the Railways, the Contractors will duly perform the said works in the said Bill(s) of
 Quantities set forth and shall execute the same with great promptness, care and accuracy in a
 workman like manner to the satisfaction of the Railway and will complete the same in accordance
 with the said specifications and said drawings and said conditions of contract on or before the
 _____ day of _____ 20____ and will maintain the said works for a period of
 _____ Calendar months from the certified date of their completion and will observe, fulfill and
 keep all the conditions therein mentioned (which shall be deemed and taken to be part of this
 contract, as if the same have been fully set forth herein), AND the Railway, both hereby agree that
 if the Contractor shall duly perform the said works in the manner aforesaid and observe and keep
 the said terms and conditions, the Railway will pay or cause to be paid to the Contractor for the
 said works on the final completion thereof the amount due in respect thereof at the rates specified
 in the Bill(s) of Quantities hereto annexed.

Contractor _____ (Signature) Railway: Designation _____

Address _____ (For President of India)

Date _____ Date _____

Signature of **Witnesses** (to Signature of Contractor) with address:

Witnesses:

**FORMAT FOR CERTIFICATE TO BE SUBMITTED / UPLOADED BY TENDERER
ALONGWITH THE TENDER DOCUMENTS**

I..... (Name and designation)**appointed as the attorney/authorized signatory of the tenderer,
M/s_____ (hereinafter called the tenderer) for the purpose of the Tender documents for the work of _____ as per the tender No. _____ of _____ (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 railway 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 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/JV/Society/Trust.
8. I/we understand that if the contents of the certificate 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 Bid Security and may also lead to any other action provided in the contract including banning of business for a period of upto **two** year. Further, I/we (*insert name of the tenderer*) **_____ and all my/our constituents understand that my/our offer shall be summarily rejected.
9. I/we also understand that if the contents of the certificate submitted by us are found to be false/forged or incorrect at any time after the award of the contract, it will lead to termination of the contract, along with forfeiture of Bid Security/Security Deposit and Performance guarantee and may also lead to any other action provided in the contract including banning of business for a period of upto **two** year.

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 fulfill 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.**

Note:-This form (Annexure-V) should be uploaded duly filled with the Name & seal of the participating firm/s viz. Proprietary firm / Company / Partnership Firm / Joint Venture (JV) / Hindu Undivided Family (HUF) / Limited Liability Partnership (LLP) etc., as the case may be, and signature of Authorised signatory.

(This certificate is to be given by attorney/authorized signatory / each member of Partnership firm / Joint Venture (JV) / Hindu Undivided Family (HUF) / Limited Liability Partnership (LLP) etc.)

I/We (Name), attorney/authorized signatory of the (constituent firm/constituent partner) and member/partner of the (tendering firm) hereby solemnly affirm and state as under:

1. I/We certify that (constituent firm/constituent partner) 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 / JV / Society / Trust.
2. 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 fulfill 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 CONSTITUENT FIRM/CONSTITUENT PARTNER

Place:

Dated:

Note: In addition to Annexure-V, in case of other than Company/Proprietary firm Annexure-V(A) shall also be submitted by the each member of a Partnership Firm / Joint Venture (JV) / Hindu Undivided Family (HUF) / Limited Liability Partnership (LLP) etc., as the case may be. Non submission of above certificate(s) by the bidder shall result in summarily rejection of his/their bid. It shall be mandatorily incumbent upon the tenderer to identify, state and submit the supporting documents duly self-attested/digitally signed by which they/he is qualifying the Qualifying Criteria mentioned in the Tender Document. *(Authority: Advance correction slip No.2 published vide Railway Board letter No.2022/CE-I/CT/GCC-2022/Policy, New Delhi, dt.13.12.2022).*

Reference -Para 10.3 & 17.15.3 of Tender Form (Second Sheet) of Annexure I of ITT

TENDERER'S CREDENTIALS (BID CAPACITY)

CENTRAL RAILWAY

For tenders having advertised value more than Rs.10.00 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 bid value of the present tender. The available bid capacity shall be calculated as under:

$$\text{Available Bid Capacity} = [A \times N \times 2] - 0.33 \times N \times B$$

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 the prescribed proforma of Railway 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 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 prescribed proforma of Railway 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.

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 prescribed proforma of Railway 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

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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.

Annexure –VIA

Para 5 of the Instructions to Tenderers

(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).***Name of the Bank:** -----

President of India,

Acting through,

..... Railway,

Beneficiary: Railway

Date:.....

Bank Guarantee Bond No.:**Date:**-----

In consideration of the President of India acting through----- (*Designation & address of Contract Signing Authority*), Railway,, (hereinafter called "The Railway") 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 Railway:

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 Railway 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 Railway any amount up to and including aforementioned full amount without any demur, reservation or recourse. Any such demand made by the Railway 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 Railway without any reference to the Bidder and without the Railway 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 Railway and the Bidder, will in any way absolve the Bank from the liability under this guarantee; and the Bank, hereby, waives

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any requirement for notice of any such change, addition or modification made by Railway at any time.

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.
7. The Bank Guarantee is unconditional and irrevocable.
8. The expressions Bank and Railway 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 Railway. 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	SBIN000RAIL
IFSC TYPE	BRANCH
BANK NAME	STATE BANK OF INDIA
BRANCH NAME	RAIL
CITY NAME	NAVI MUMBAI
ADDRESS	SECTOR-11, CBD BELAPUR, NAVI MUMBAI
DISTRICT	NAVI MUMBAI
STATE	MAHARASHTRA
BG ENABLED	YES

11. The Guarantee shall be valid in addition to and without prejudice to any other security Guarantee(s) of Bidder in favour of the Railway. The Bank, under this Guarantee, shall be deemed as Principal Debtor of the Railway.

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

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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.

Reference -Para 10.2 & 17.15.2 of Tender Form (Second Sheet) of Annexure I of ITT

Each Bidder or each member of a 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)

Part II

STANDARD GENERAL CONDITIONS OF CONTRACT

1. (1) Definitions: In these Standard General Conditions of Contract, the following terms shall have the meaning assigned hereunder except where the context otherwise requires:

- (a) "Railway" shall mean the President of the Republic of India or the Administrative Officers of the Railway or of the Successor Railway authorized to deal with any matters which these presents are concerned on his behalf.
- (b) "General Manager" shall mean the Officer in-charge of the General Superintendence and Control of the Railway and shall also include Addl. General Manager, the General Manager (Construction) and shall mean and include their successors, of the successor Railway.
- (c) "Chief Engineer" shall mean the Officer in-charge of the Engineering Department of Railway and shall also include Chief Engineer (Construction), Chief Signal & Telecommunication Engineer, Chief Signal & Telecommunication Engineer (Construction), Chief Electrical Engineer, Chief Electrical Engineer (Construction), Chief Mechanical Engineer and shall mean & include their successors, of the Successor Railway.
- (d) "Divisional Railway Manager" shall mean the Officer in-charge of a Division of the Railway and shall mean and include the Divisional Railway Manager of the Successor Railway.
- (e) "Engineer" shall mean the Divisional Engineer or the Executive Engineer, Divisional Signal & Telecom Engineer, Divisional Electrical Engineer, Divisional Mechanical Engineer in executive charge of the works and shall include the superior officers of Open Line and Construction organizations on the Railway of the Engineering, Signal & Telecom, Electrical and Mechanical Departments, i.e. the Senior Divisional Engineer/Deputy Chief Engineer, Senior Divisional Signal & Telecom Engineer / Dy.Chief Signal & Telecom Engineer, Senior Divisional Electrical Engineer / Deputy Chief Electrical Engineer, Senior Divisional Mechanical Engineer and shall mean & include the Engineers of the Successors Railway.
- (f) "Engineer's Representative" shall mean the Assistant Engineer, Assistant Signal & Telecommunication Engineer and Assistant Electrical Engineer, Assistant Mechanical Engineer in direct charge of the works and shall include any Sr. Section/Junior Engineer of Civil Engineering/Signal and Telecommunication Engineering/Mechanical Engineering/Electrical Engineering Departments appointed by the Railway and shall mean and include the Engineer's Representative of the Successor Railway.
- (g) "Contractor" shall mean the Person/Firm/LLP/Trust/Co-operative Society or Company whether incorporated or not who enters into the contract with the Railway and shall include their executors, administrators, successors and permitted assigns.
- (h) "Contract" shall mean and include the Agreement, the Work Order, the accepted Bill(s) of Quantities or Chapter(s) of Standard Schedule of Rates (SSOR) of the Railway modified by the tender percentage for items of works quantified, or not quantified, the Standard General Conditions of Contract, the Special Conditions of Contracts, if any; the Drawing, the Specifications, the Special Specifications, if any and Tender Forms, if any.
- (i) "Works" shall mean the works to be executed in accordance with the contract.
- (j) "Specifications" shall mean the Standard Specifications for Materials & Works of Railway as specified by Railway under the authority of the Chief Engineer or as amplified, added to or superseded by Special Specifications, if any.
- (k) Standard Schedule of Rates (SSOR) shall mean the schedule of Rates adopted by the Railway, which includes-

1. "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,
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updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents;

2. "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.

(l) "Drawing" shall mean the maps, drawings, plans and tracings or prints there of annexed to the contract and shall include any modifications of such drawings and further drawings as may be issued by the Engineer from time to time.

(m) "Constructional Plant" shall mean all appliances or things of whatsoever nature required for the execution, completion or maintenance of the works or temporary works (as hereinafter defined) but does not include materials or other things intended to form or forming part of the permanent work.

(n) "Temporary Works" shall mean all temporary works of every kind required for the execution completion and/or maintenance of the works.

(o) "Site" shall mean the lands and other places on, under, in or through which the works are to be carried out and any other lands or places provided by the Railway for the purpose of the contract.

(p) "Period of Maintenance" shall mean the specified period of maintenance from the date of completion of the works, as certified by the Engineer.

(q) 'Contractor's authorized Engineer' shall mean a graduate Engineer or equivalent, having more than 3 years' experience in the relevant field of construction work involved in the contract, duly approved by Engineer.

(r) 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.

(s) "Bill of Quantities" shall mean Schedule of Item(s) included in the tender document along with respective quantities and rates, accepted by the Railway.

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 and Marginal Headings: The headings and marginal headings in these Standard 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 the contract.

GENERAL OBLIGATIONS

2. (1) Execution Co-Relation and Intent of Contract Documents: The contract documents shall be signed in triplicate by the Railway and the Contractor. The contract documents are complementary and what is called for by anyone 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 proper execution of work. Materials or works not covered by or properly inferable from any heading or class of the specifications shall not be supplied by the Railway 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 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 in all respects as if the Contractor and the Successor Railway/Project were parties thereto 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, the contract shall, notwithstanding any things contained herein contrary there to, be binding on the Contractor and the Successor Railway in the same manner and take effect in all respects as if the Contractor and the Successor Railway had been parties thereto from the date of this contract.

3. (1) Law Governing the Contract: The contract shall be governed by the law for the time being in force 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 bye-laws of any local 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 reason 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 thereof.

3.(3) Environmental and Forest clearances:

The Railway represents and warrants that the environmental and forest clearances pertaining to the work commensurate with the progress of work/agreed programme, will be obtained by Engineer. In the event of any delay in securing respective clearances leading to delay in execution of work, the Contractor shall be entitled to Extension of Time for the period of such delay in accordance with the provisions of Clause-17A(ii).

4. Communications to be in Writing: All notices, communications, reference and complaints made by the Railway or the Engineer or the Engineer's Representative or the Contractor inter-se concerning the works shall be in writing or e-mail on registered e-mail IDs i.e. the e mail id provided for correspondence in the contract agreement, otherwise email id registered with IREPS and no notice, communication, reference or complaint not in writing or through e-mail, shall be recognized.

5. Service of Notices on Contractors: The Contractor shall furnish to the Engineer the name, designation and address of his authorized agent and all complaints, notices, communications and references shall be deemed to have been duly given to the Contractor, if delivered to the Contractor or his authorized agent 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/ e-mail 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 shall be occupied by the Contractor without the permission of the Railway. 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 Chief Engineer, save as provided below. Any breach of this condition shall entitle the Railway to rescind the contract under Clause 62 of these Conditions and also render the Contractor liable for payment to the Railway 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 Chief Engineer for the same. While submitting the proposal to railway, Contractor shall ensure the following:

- (a) (i) The Contractor shall not sub- contract the Works comprising more than 40% (forty per cent) of the Contract Price and shall carry out Works for at least 60% (sixty per cent) of the total Contract Price directly under its own supervision and through its own personnel. The Parties expressly agree that for the purposes of computing the value of sub-contracts under this Clause 3.2.1, the Contract Price shall exclude for the any sub-contract procurement of goods and equipment like [rails, sleepers and track fittings, signaling and telecommunication & Power supply equipment]. The Parties agree that all obligations and liabilities under this Agreement for the entire Railway Project shall at all-time remain with the Contractor. {The Parties agree that works equal to at least 30% (thirty per cent) of the Contract Price shall be discharged solely by the Lead Member.}\$

Procurement of material, hire of equipment or engagement of labour by prime contractor or procuring entity will not mean sub-contracting.

\$ May be deleted if the Contractor is not a Consortium/Joint Venture.

(As per Advance Correction slip no.11 to IRS GCC of April-2022)

- (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 Railway, costing not less than 35% value of work to be subletted, through a works contract. For fulfillment 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 Railway and work experience certificate issued by a person authorised by the Public Listed Company to issue such certificates.

Note: for subletting of work costing up to Rs.50.00 lakh no previous work experience shall be asked for by the Railway.

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.

- (ii) There is no banning of business with the sub-contractor in force over IR.
- (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 Chief Engineer, 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 Railway, with prior intimation to Chief Engineer.
- (f) The Contractor shall indemnify railway against any claim of subcontractor.
- (g) The Contractor shall release payment to the Sub-contractor(s) promptly and shall endeavour 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 experience 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 Chief Engineer, based on documents, is satisfied that the subcontractor has successfully carried out subletted work; without issuance of work experience certificate to subcontractor at this stage, the Chief Engineer can, **only once**, consider the successfully completed subletted 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 Railway 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 Railway and shall not relieve the Contractor of any responsibility under the Contract.

8. Assistance by Railway for the Stores to be obtained by the Contractor: Owing to difficulty in obtaining certain materials (including Tools & Plant) in the market, the Railway may have agreed without any liability therefore to endeavour 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 the day to day position regarding their availability and accordingly adjust progress of works including employment of labour and the Railway 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 non-supply.

9. Railway Passes: No free railway passes shall be issued by the Railway to the Contractor or any of his employee/worker.

10. Carriage of Materials: No forwarding orders shall be issued by the Railway for the conveyance of Contractor's materials, tools and plant by train which may be required for use in the works and the Contractor shall pay full freight charges at public tariff rates therefor.

11. Use of Ballast Trains: The Railway may agree to allow the Contractor use of the ballast or material trains under such conditions as shall be specially prescribed, provided that the Contractor shall pay for the use thereof charges calculated at public tariff rates on the marked carrying capacity of each vehicle subject to specified minimum charge per day or part of day and provided further that the Contractor shall indemnify the Railway against any claims or damages arising out of the use or misuse thereof and against any liabilities under the Workmen's Compensation Act, 1923 or any statutory amendments thereto.

12. Representation on Works: The Contractor shall, when he is not personally present on the site of the works place, keep a responsible agent 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 Railway to rescind the contract under Clause 62 of these Conditions.

13. Relics and Treasures: All gold, silver, oil, other minerals of any description, 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 Railway and the Contractor shall duly

preserve the same to the satisfaction of the Railway and shall from time to time deliver the same to such person or persons as the Railway 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, stone, clay ballast, earth, trees, 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 Railway 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 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 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, and whether or not any damage shall have been 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 Railways as part of security for the due and faithful fulfillment 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 or irrevocable Bank Guarantee Bond from a Scheduled commercial bank of India, either towards the Full Security Depositor the Part Security Deposit equal to or more than Bid Security, the Railway 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, 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 Railway 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 Standard 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 Railway 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 railways 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 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

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 Railway, 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 railway shall be entitled to forfeit Bid Security and other dues payable to the contractor against that particular contract, subject to maximum of PG amount. In case a tenderer has not submitted Bid Security 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) amounting to 5% of the original contract value and Additional Performance Guarantee as per clause 16(4) (h) in any of the following forms:-

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- (i) A deposit of Cash;
- (ii) Irrevocable Bank Guarantee;
- (iii) Insurance Surety Bond as per Annexure-XVII.

Note:

In case of extension of Date of Completion, selected bidder needs to submit extended Insurance Surety Bond/Fresh Insurance Surety Bond/Fresh Performance Security, in any form as given above, before expiry of existing Insurance Surety Bond.

- (iv) Government Securities including State Loan Bonds at 5% below the market value;
 - (v) Pay Orders and Demand Drafts tendered by any Scheduled Commercial Bank of India;
 - (vi) Guarantee Bonds executed or Deposits Receipts tendered by any Scheduled Commercial Bank of India;
 - (vii) Deposit in the Post Office Saving Bank;
 - (viii) Deposit in the National Savings Certificates;
 - (ix) Twelve years National Defence Certificates;
 - (x) Ten years Defence Deposits;
 - (xi) National Defence Bonds and
 - (xii) Unit Trust Certificates at 5% below market value or at the face value whichever is less. Also, FDR in favour of Dy.FA&CAO (free from any encumbrance) may be accepted.
- (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 is based on original contract value and shall not change due to subsequent variation(s) in the original contract value.
- (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.
- (g) The Engineer shall not make a claim under the Performance Guarantee except for amounts to which the President of India 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 President of India 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 these conditions.
- (h) If a tender is accepted on the quoted rates of bidder which is below the advertised tender value, an additional performance security shall be submitted by the bidder as below:

Bid quoted in % of advertised cost	Additional Performance Guarantee (%)
Below 0-5% (inclusive)	Nil
Below 5%	5%

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/pandemics, strikes, lockouts or acts 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.

17A 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 Railway or Contractor:** If in the opinion of the Engineer, the progress of work has any time been delayed by any act or neglect of Railway's employees or by other Contractor employed by the Railway 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 Railway 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 endeavours 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 Railways:** In the event of any failure or delay by the Railway 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 Railway 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 Railway 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 17A(i) or/and 17A(ii) or/ and 17A(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.

17B 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 17A, the Railway 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 Annexure-VII) as the Engineer may decide. On such extension the Railway will be entitled without prejudice to any other right and remedy available on that behalf, to recover from the Contractor as agreed damages and not by way of penalty for each week or part of the week, a sum calculated at the rate of Liquidated Damages as decided by the Engineer, between 0.05% to 0.30% of contract value of the 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 Railway 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 Railway 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 17A can also be considered under exceptional circumstances. Such extension(s) of time under clause 17A 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.

17C 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 railway 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: Procuring authorities as well as bidders, contractors and consultants should observe the highest standard of ethics and should not indulge in the following prohibited practices, either directly or indirectly, at any stage during the procurement process or during execution of resultant contracts:

- i) “Corrupt practice”: making offers, solicitation or acceptance of bribe, rewards or gifts or any material benefit, in exchange for an unfair advantage in the procurement process or to otherwise influence the procurement process or contract execution;
- ii) “Fraudulent practice”: any omission or misrepresentation that may mislead or attempt to mislead so that financial or other benefits may be obtained or an obligation avoided. This includes making false declaration or providing false information for participation in a tender process or to secure a contract or in execution of the contract;
- iii) “Anti-competitive practice”: any collusion, bid rigging or anti-competitive arrangement, or any other practice coming under the purview of The Competition Act, 2002, between two or more bidders, with or without the knowledge of the procuring entity, that may impair the transparency, fairness and the progress of the procurement process or to establish bid price at artificial, non-competitive levels;
- iv) “Coercive practice”: any coercion or any threat to impair or harm, directly or indirectly, any party or its property to influence the procurement process or affect the execution of a contract;
- v) “Conflict of interest” (COI): any personal, financial, or business relationship between the bidder and any personnel of the procuring entity who are directly or indirectly related to the procurement or execution process of the contract, which can affect the decision of the procuring entity directly or indirectly;
- vi) “Undue Advantage”: improper use of information obtained by the bidder from the procuring entity with an intent to gain an unfair advantage in the procurement process or for personal gain. This also includes if the bidder (or his allied firm) provided services for the need assessment/ procurement planning of the tender process in which he is participating;
- vii) “Obstructive practice”: materially impede the procuring entity’s investigation of a procurement process either by deliberately destroying, falsifying, altering; or by concealing of evidenced material to the investigation; or by making false statements or by threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to such investigation or from pursuing the investigation; or by impeding the procuring entity’s rights of audit or access to information;

18.(2) Punitive Provisions:

Without prejudice to and in addition to the rights of the procuring entity to other penal provisions as per the bid documents or contract, if the procuring entity comes to a conclusion that a (prospective) bidder/ contractor directly or through an agent, has violated this code of integrity in competing for the contract or in executing a contract, the procuring entity may take appropriate measures including one or more of the following:

- i) If his bids are under consideration in any procurement
 - a) Forfeiture or encashment of bid security;
 - b) Calling off of any pre-contract negotiations; and
 - c) Rejection and exclusion of the bidder from the procurement process
- ii) If a contract has already been awarded

- a) Cancellation of the relevant contract and recovery of compensation for loss incurred by the procuring entity;
- b) Forfeiture or encashment of any other security or bond relating to the procurement;
- c) Recovery of payments including advance payments, if any, made by the procuring entity along with interest thereon at the prevailing rate;

iii) Provisions in addition to above:

- a) Removal from the list of enlisted contractors and banning/debarment of the bidder from participation in future procurements of the procuring entity for a period not less than one year;
- b) In case of anti-competitive practices, information for further processing may be filed under a signature of the Joint Secretary level officer, with the Competition Commission of India;
- c) Initiation of suitable disciplinary or criminal proceedings against any individual or staff found responsible.

Any question or dispute as to the commission of any such offence or

Compensation payable to the Railway under this Clause shall be settled by the General Manager of the Railway, in such a manner as he shall consider fit & sufficient and his decision shall be final & conclusive.

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 15 days after the receipt by him of an order 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 30 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 organisation (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 fulfill 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 of New Line/Gauge Conversion/Doubling/Railway Electrification, finalized through 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/Sure Track/MS Project etc.** 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) Setting out of Works: The Contractor shall be responsible for the correct setting out of all works in relation to original points, lines and levels of reference at his cost. The Contractor shall execute the work true to alignment, grade, levels and dimensions as shown in the drawing and as directed by the Engineer's representative and check these at frequent intervals. The Contractor shall provide all facilities like labour and instruments and shall co-operate with the Engineer's representative for checking of all alignment, grades, levels and dimensions. If, at any time, during the progress of the works any error appear or arise in any part of the work, the Contractor, on being required so to do by the Engineer's representative shall, at his own cost rectify such errors, to the satisfaction of the Engineer's representative.

Such checking shall not absolve the Contractor of his own responsibility of maintaining accuracy in the work. The Contractor shall carefully protect and preserve all bench marks, sight rails, pegs and other things used in setting out the work.

20.(1) Compliance to Engineer's Instructions: The Engineer shall direct the sequence 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 authorised, except under written instructions 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 Railway.

20.(4) Separate Contracts in Connection with Works: The Railway 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 upon 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 site and the detailed drawings shall be made available to the contractor commensurate with the accepted programme of work submitted under clause 19(3). 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 therefrom and shall be responsible for all loss to the Railway.

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 Railway to the Contractor are deemed to be the property of the Railway. 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 Railway 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, additional instructions by means of drawings or otherwise, necessary for the proper execution of the works or any part thereof. All such drawings 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 Chief Engineer 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 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 or the lives, persons or property of others from whatsoever cause in connection with the works until they are taken over by the Railway, although all reasonable and proper precautions may have been taken by the Contractor. In case the Railway shall be called upon to make good any costs, loss or damages, or to pay any 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 may incur in reference thereto, shall be charged to the Contractor. The Railway 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, Storehouses and Yards: The Contractor shall at his own expense provide himself with sheds, storehouses 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, storehouses and yards 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 plant which the Engineer may object to shall not be brought upon or used in the works, but shall be forthwith removed from the sheds, storehouses 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 directions to his workmen and to see that they execute their work in sound & proper manner and shall employ only such supervisors, workmen & 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 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 as 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 Railway 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(s) or equivalent, or qualified Diploma Engineer(s), as prescribed in the tender documents.

26A.2 In case the Contractor fails to employ the Engineer, as aforesaid in Para 26A.1, he shall be liable to pay liquidated damages at the rates, as prescribed in the tender documents.

26A.3 No. of qualified Engineers required to be deployed by the Contractor for various activities contained in the works contract shall be specified in the tender documents as 'Special Condition of Contract'.

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 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 Railway 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 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 evicted by the Railway, necessary expenses incurred by the Railway 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) Water Supply from Railway System: The Railway may supply to the Contractor part or whole of the quantity of the water required for the execution of works from the Railway's existing water supply system at or near the site of works on specified terms and conditions and at such charges as shall be determined by the Railway and payable by the Contractor, provided that the Contractor shall arrange, at his own expense, to effect the connections and lay additional pipelines and accessories on the site and that the Contractor shall not be entitled to any compensation for interruption or failure of the water supply.

31.(3) Water Supply by Railway Transport: In the event of the Railway arranging supply of water to the Contractor at or near the site of works by travelling water tanks or other means, the freight and other charges incurred thereby, including demurrage charges that may be levied, shall be paid by the Contractor in addition to the charges referred to in Sub-Clause (2) of the Clause provided that the Contractor shall not be entitled to any compensation for interruption or failure of the water supply.

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.

(b) Electric Supply from the Railway System: The Railway may supply to the Contractor part or whole of the electric power wherever available and possible, required for execution of works from the Railway's existing electric supply systems at or near the site of works on specified terms and conditions and such charges as shall be determined by the Railway and payable by the Contractor provided the cost of arranging necessary connections to the Railway's Electric Supply systems and laying of underground/overhead conductor, circuit protection, electric power meters, transmission structure, shall be borne by the Contractor and that the Contractor shall not be entitled to any compensation for interruption or failure of the Electric supply system.

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 be deemed to be the property of the Railway. 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 Railway 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 Railway 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 Railway: The Contractor shall take all reasonable care of all tools, plant and materials or other property whether of a like description or not belonging to the Railway 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 sub-contractor, 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 Railway's Plant: The Railway may hire to the Contractor such plant as concrete mixers, compressors and portable engines 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: During the execution of works, unless otherwise specified, the Contractor shall at his own cost provide the materials for and execute all shoring, timbering and strutting works as is necessary for the stability and safety of all structures, excavations and works and shall 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, alteration, diversion or obstruction to such roads or water courses by the Contractor or his agent or his staff shall be recoverable from the Contractor's bills/Security Deposit or any other dues of Contractor with the Government of India.

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 be interrupted by reasons of the execution of the works and shall react and 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 vigour 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 railway property and shall post such look out men as may, in the opinion of the Engineer, be required to comply with regulations appertaining to the work. Contractor shall ensure placement of barricading / partitions at the place of work to ensure safety of habitants of adjacent area, failing which Engineer may advise stoppage of work as per his discretion.

34.(5) Display Board: The Contractor shall be responsible for displaying the details of works i.e. name of work, approximate cost, expected date of completion, name and address of the Contractor and address of Engineer on a proper steel Board of size not less than 1m x 1m.

35. Use of Explosives: Explosives shall not be used on the works or on the site by the Contractor without the permission of the Engineer and then also only in the manner and to the extent to which such permission is given. Where explosives are required for the works, they shall be stored in a special magazine to be provided by and at the cost of the Contractor in accordance with the Explosive Rules. The Contractor shall obtain the necessary license for the storage and the use of explosives. All operations in which or for which explosives are employed shall be at the sole risk

and responsibility of the Contractor and the Contractor shall indemnify the Railway in respect thereof.

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. If such suspension is:

- (a) Provided for in the contract, or
- (b) Necessary for the proper execution of the works or by the reason of weather conditions or by some default on the part of the Contractor, and or
- (c) Necessary for the safety of the works or any part thereof, or
- (d) Necessary for the safety of adjoining public or other property or safety of the public or workmen or those who have to be at the site, or
- (e) Necessary to avoid disruption of traffic and utilities, as also to permit fast repair and restoration of any damaged utilities, or
- (f) Due to instruction of The National Green Tribunal or any other statutory authority due to high level of pollution in the city of worksite.

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 suspension exceeds 14 days, the Contractor shall be entitled to such extension of time for completion of the works as the Engineer 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 Railway.

37. Rates for Items of Works:

(i) The rates, entered in the accepted Bill(s) of Quantities 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 of materials, stores, patterns, profiles, moulds, fittings, centerings, 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 Railway, 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 Railway, the setting of all work and of the construction, repair and upkeep of all center lines, bench marks and level pegs thereon, 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 or 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.

However, if rates of existing GST or cess on GST for Works Contract is increased or any new tax /cess on Works Contract is imposed by Statute after the date of opening of tender but within the original date of completion/date of completion extended under clause 17 & 17A and the Contractor thereupon properly pays such taxes/cess, the Contractor shall be reimbursed the amount so paid.

Further, if rates of existing GST or cess on GST for Works Contract is decreased or any tax/cess on Works Contract is decreased / removed by Statute after the date of opening of tender, the reduction in tax amount shall be recovered from Contractor's bills/Security Deposit or any other dues of Contractor with the Government of India.

38. Demurrage and Wharfage Dues: Demurrage charges calculated in accordance with the scale in force for the time being on the Railway and incurred by the Contractor failing to load or unload any goods or materials within the time allowed by the Railway for loading as also wharfage charges, of materials not removed in time, as also charges due on consignments booked by or to him shall be paid by the Contractor, failing which such charges shall be debited to the Contractor's account in the hands of the Railway and shall be deducted from any sums which may become due to him in terms of the contracts.

39.(1) Rates for Extra Item(s) 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 in 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 Railway 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 hereuntofore-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 the 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 Chief Engineer within 30 days of getting the decision of the Engineer, supported by analysis of the rates claimed. The Chief Engineer's decision after hearing both the parties in the matter would be final and binding on the Contractor and the Railway.

40.(1) Handing over of Works: The Contractor shall be bound to hand over the works executed under the contract to the Railway 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 the 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 Railway 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.

40A 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 14 (Fourteen) days suo-moto notice (as per annexure- VIIA), 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 Railway/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 annexure- VIIB). 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 required to be modified after the contract documents have been signed, the modifications shall be made in writing and signed by the Railway 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 Railway unless and until the same is incorporated in a formal instrument and signed by the Railway and the Contractor, and till then the Railway shall have the right to repudiate such arrangements.

42.(1) Powers of Modification to Contract: The Engineer on behalf of the Railway 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 special conditions of the contract, the accepted variation in quantity of each individual item of the contract would be upto 25% of the quantity originally contracted, except in case of foundation work (in which no variation limit shall apply). However, the rates for the increased quantities shall be as per sub- Para (iii) below.

(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 upto the limit of 25% variation in quantity of individual item of works.

(iii) In case an increase in quantity of an individual item by more than 25% of the agreement quantity is considered unavoidable, then same shall be executed at following rates

- a. 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;
- b. 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;
- c. Variation in quantities of individual items beyond 150% will be avoided and would be permitted only in exceptional unavoidable circumstances and shall be paid at 96% of the rate awarded for that item in that particular tender.
- d. Variation to quantities of Minor Value Item:

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 contract value.

d.(i) Quantities operated upto and including 100% of the agreement quantity of the concerned minor value item, shall be paid at the rate awarded for that item in that particular tender;

d.(ii) Quantities operated in excess of 100% but upto 200% of the agreement quantity of the concerned minor value item, shall be paid at 98% of the rate awarded for that item in that particular tender;

d.(iii) Variation in quantities of individual minor value item beyond 200% will be avoided and would be permitted only in exceptional unavoidable circumstances and shall be paid at 96% of the rate awarded for that item in that particular tender.

(iv) In case of earthwork items, the variation limit of 25% shall apply to the gross quantity of earthwork items and variation in the quantities of individual classifications of soil shall not be subject to this limit.

(v) As far as Standard Schedule of Rates (SSOR) items are concerned, the variation limit of 25% would apply to the value of SSOR schedule(s) as a whole and not on individual SSOR items. However, in case of Non Standard Schedule of Rates (SSOR) 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).

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 expressively included and provided for in the Specifications and Drawings and the amounts to be paid therefor shall be calculated in accordance with the accepted Bill(s) of Quantities. Any extra item(s)/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.

CLAIMS

43.(1) Quarterly Statement of Claims: The Contractor shall prepare and furnish to the Engineer once in every quarter commencing from the month following the month of issue of Letter of Acceptance, 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 quarter and no claim for payment for 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 Railway under or by virtue of or arising out of this contract, nor shall the Railway entertain or consider any such claim, if made by the Contractor, after he shall have signed a "No Claim" Certificate in favour of the Railway in such form as shall be required by the Railway 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 Bill(s) of Quantities Annexed to Contract: The quantities set out in the accepted Bill(s) of Quantities with items of works quantified are the estimated quantities of the works and they shall not be taken as the actual and correct quantities of the work to be executed by the Contractor in fulfillment of his obligations under the contract.

45(i). Measurement of Works by Railway: The Contractor shall be paid for the works at the rates in the accepted Bill(s) of Quantities 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 Railway. The quantities for items the unit of which in the accepted Bill(s) of Quantities 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 Bill(s) of Quantities 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 measurements. 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 open 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 (in case the contract provides for the same):

(a) The Contractor shall be paid for the works at the rates in the accepted Bill(s) of Quantities 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 Railway. The quantities for items the unit of which in the accepted Bill(s) of Quantities 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 Bill(s) of Quantities 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 checks 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:

- (i) It shall be open to the Contractor to take specific objection to test checks of any recorded measurement within 7 days of date of such test checks. Any re-test check done by the concerned Railway's authority in the presence of the Contractor or in his absence after due notice given to him in consequent 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.
- (ii) 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.

(b) Incorrect measurement, actions to be taken: If in case during test check or otherwise, it is detected by the 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 recover liquidated damages equal to 10% of claimed gross bill value.
- (ii) On any next occasion of noticing any exaggerated/false measurement, railway shall recover liquidated damages equal to 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, measurements shall be done by railway 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/Engineer's Representative's certificates of measurements or Engineer's certified "Contractor's authorized 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 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 ₹1 will be reckoned as ₹ 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/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) If payment(s) of Advances are applicable in the contract, as mentioned in the Tender Documents, Railway shall make payment(s) of Interest bearing advances, on the request of contractor. The payment and recovery of such Advances shall be made as under:

(a): Mobilisation Advance –

This shall be limited to 10% of the Contract value and shall be paid in 2 stages :

Stage 1 – 5% of Contract Value on signing of the contract agreement.

Stage 2 – 5% on mobilization of site-establishment, setting up offices, bringing in equipment and actual commencement of work.

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

The stage 2 of advance shall be payable at the time of mobilisation, only after submission of an 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 Equipment is hypothecated to the President of India by a suitable bond or alternatively covered by an irrevocable Bank Guarantee from a scheduled commercial bank of India for full cost of the Plant & Equipment in a form acceptable to Railways. The Plant & Equipment shall be insured for the full value and for the entire period, they 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.

The advances under sub clause (a) and (b) above, are subject to the following conditions -

(i) The full amount of Advances shall be recovered from contractor dues. 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 installments on each "on account bill" will be on pro-rata basis.

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 principal is effected) and adjusted fully against on-account bill along with pro-rata 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.

(ii) The advances shall be used by the Contractor for the purpose of the Contract, and for the purpose for which they are paid. Under no circumstances, shall the advances be diverted for other purposes. Any such diversion shall be construed as a breach of the Contract and the Contractor shall be asked to return the advance at once and pay interest at 15% per annum till the advance is recovered back from him. The Contractor shall return the advance and pay the interest in one go without demur. The Contractor, if required by the Engineer shall provide the details of utilisation of Mobilisation advance.

(iii) If the Contractor is found to have contravened the provision, it will constitute a breach of contract and Railway shall be entitled to terminate the contract and forfeit his Performance Guarantee as well as Security Deposit.

(iv) In cases, where the Contract is rescinded as per clause 62 of the contract or short closed under any other condition(s) of the contract, without making full recovery of advances and accrued interest thereon, by the Railway, such balance of advances and accrued interest thereon shall immediately become due and payable by the Contractor to the Railway. The same shall be recovered from any due of Contractor with the Government of India.

46.(5) Manner of Payment: Unless otherwise specified payments to the Contractor will be transferred electronically to his bank account.

46A. Price Variation Clause (PVC):

46A.1 Applicability: Price Variation Clause (PVC) shall be applicable only in tender having advertised value **above Rs.2 Crores**. Provided further that, in a contract where PVC is applicable, following shall be outside the purview of price adjustments (i.e. shall be excluded from the gross value of the work for the purpose of price variation) :

- a) Materials supplied by Railway to the Contractors, either free or at fixed rate;
- b) Any extra item(s) included in subsequent variation falling outside the purview of the Bill(s) of Quantities of tender, under clause 39. (1)(b) of these Standard General Conditions, unless applicability of PVC and 'Base Month' has been specially agreed, while fixing the rates of such extra item(s).

46A.2 Base Month: The Base Month for 'Price Variation Clause' shall be taken as the one month prior to closing of tender, unless otherwise stated elsewhere. The quarter for applicability of PVC shall commence from the month following the Base month. The Price Variation shall be based on the average Price Index of the quarter under consideration.

46A.3 Validity:

Rates accepted by Railway Administration shall hold good till completion of work and no additional individual claim shall be admissible except:

- (a) Payment/recovery for increase/decrease in GST on works contract or imposition/removal of any tax/cess on Works Contract as per Clause 37,
- (b) Payment/recovery for overall market situation as per Price Variation Clause given hereunder.

46A.4 Components of various items in a contract on which variation in prices be admissible, shall be steel, cement, ferrous material, non-ferrous material, insulators, zinc and other materials, labour, plant & machinery, fuel, explosives, detonators etc. Adjustment for variation in prices of these items shall be determined in the manner prescribed.

46A.5 No price variation shall be admissible for fixed components.

46A.6 The percentages of various components in various type of works shall be as specified for all item (s)/ Bill(s) of Quantities in tender document and the same shall be fixed as per table & classifications given below:

(I). For Civil Engineering Works

S N	Classification		1A, 2 & 3A	4A	5A	6A	7	8A	9A	1B, 3B, 4B, 5B, 6B 8B & 9B	1C, 3C, 4C, 5C, 6C, 8C & 9C	3D, 4D, 5D, 6D, 8D & 9D	3E, 4E, 5E, 6E, 8E & 9E
	Components												
1	Fixed	*	15	15	15	15	15	15	15	15	15	15	15
2	Labour	L _c	20	25	30	20	50	20	20	0	0	10	25
3	Steel	S _c	0	0	0	0	0	0	0	85	0	50	0
4	Cement	C _c	0	0	15	0	0	0	0	0	85	0	0
5	Plant Machinery & Spares	PM _c	30	15	5	20	15	20	30	0	0	10	30
6	Fuel & Lubricants	F _c	25	15	5	15	15	20	15	0	0	10	20
7	Other materials	M _c	10	15	30	30	5	25	20	0	0	5	10
8	Detonators & Explosive	E _c	0	15	0	0	0	0	0	0	0	0	0
Total			100	100	100	100	100	100	100	100	100	100	100

* It shall not be considered for any price variation.

The classification mentioned in the table above represents following type of item(s) in the work(s)

1	Earthwork in Formation	
	1A	All Item(s) excluding 1B or/and 1C
	1B	Item(s) for supply of Steel
	1C	Item(s) for supply of Cement
2	Ballast Supply Works	
3	Tunnelling Works (Without Explosives)	
	3A	All Item(s) excluding 3B or/and 3C or/and 3D or/and 3E
	3B	Item(s) for supply of Steel
	3C	Item(s) for supply of Cement or/and Grout
	3D	Item(s) for Fabrication & Erection of Structures including supply of Steel
	3E	Item(s) for Fabrication & Erection of Structures excluding supply of Steel.
4	Tunnelling Works (With explosives)	

	4A	All Item(s) excluding 4B or/and 4C or/and 4D or/and 4E
	4B	Item(s) for supply of Steel
	4C	Item(s) for supply of Cement or/and Grout
	4D	Item(s) for Fabrication & Erection of Structures including supply of Steel
	4E	Item(s) for Fabrication & Erection of Structures excluding supply of Steel.
5	Building Works	
	5A	All Item(s) excluding 5B or/and 5C or/and 5D or/and 5E
	5B	Item(s) for supply of Steel
	5C	Item(s) for supply of Cement
	5D	Item(s) for Fabrication & Erection of Structures including supply of Steel
	5E	Item(s) for Fabrication & Erection of Structures excluding supply of Steel.
6	Bridges & Protection work	
	6A	All Item(s) excluding 6B or/and 6C or/and 6D or/and 6E
	6B	Item(s) for supply of Steel
	6C	Item(s) for supply of Cement
	6D	Item(s) for Fabrication, Assembly, Erection& Launching of Girders including supply of Steel
	6E	Item(s) for Fabrication, Assembly, Erection & Launching of Girders excluding supply of Steel
7	Permanent Way linking	
8	Platform, Passenger Amenities	
	8A	All Item(s) excluding 8B or/and 8C or/and 8D or/and 8E
	8B	Item(s) for supply of Steel item/fittings
	8C	Item(s) for supply of Cement Item
	8D	Item(s) for Fabrication & Erection of Structures including supply of Steel
	8E	Item(s) for Fabrication & Erection of Structures excluding supply of Steel
9	Any Other Works not covered in Classification 1 to 8	
	9A	All Item(s) excluding 9B or/and 9C or/and 9D or/and 9E
	9B	Item(s) for supply of Steel
	9C	Item(s) for supply of Cement or/and Grout
	9D	Item(s) for Fabrication & Erection of Structures including supply of Steel
	9E	Item(s) for Fabrication & Erection of Structures excluding supply of Steel

46A.7 Formulae: The Amount of variation in prices in various components (labour, material etc.) shall be worked out by the following formulae:

- (i) $L = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (L_Q - L_B) \times L_C}{L_B \times 100}$
- (ii) $M = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (M_Q - M_B) \times M_C}{M_B \times 100}$
- (iii) $F = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (F_Q - F_B) \times F_C}{F_B \times 100}$
- (iv) $E = \frac{(W) \times (E_Q - E_B) \times E_C}{E_B \times 100}$
- (v) $PM = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (PM_Q - PM_B) \times PM_C}{PM_B \times 100}$

Tenderer/s

For Dy.CE(C)BSL

$$PM_B \times 100$$

$$(vi) \quad S = \frac{(W \text{ or } W_S \text{ or } W_{SF}) \times (S_Q - S_B) \times S_C}{S_B \times 100}$$

$$(vii) \quad C = \frac{(W \text{ or } W_C) \times (C_Q - C_B) \times C_C}{C_B \times 100}$$

(II) For Railway Electrification Works:

$$(viii) \quad T = [0.4136 \times (C_Q - C_B) / C_B] \times 85$$

$$(ix) \quad R = [0.94 \times (R_T - R_O) / R_O + 0.06 \times (Z_T - Z_O) / Z_O] \times 85$$

$$(x) \quad N = [(P_T - P_O) / P_O] \times 85$$

$$(xi) \quad I = [(I_T - I_O) / I_O] \times 85$$

$$(xii) \quad G = [(M_Q - M_B) / M_B] \times 85$$

$$(xiii) \quad Er = [(L_Q - L_B) / L_B] \times 85$$

Where,

L Amount of price variation in Labour

M Amount of price variation in Materials

F Amount of price variation in Fuel

E Amount of price variation in Explosives

PM Amount of price variation in Plant, Machinery and Spares

S Amount of price variation in Steel Supply Item

C Amount of price variation in Cement Supply Item

T Percentage variation payable on the gross value of bill of Concreting (Bill(s) of Quantities for concrete items)

R Percentage variation payable on the gross value of bill of Ferrous Items (Bill(s) of Quantities for ferrous items)

N Percentage variation payable on the gross value of bill of Non-Ferrous Items (Bill(s) of Quantities for non-ferrous items)

I Percentage variation payable on the gross value of bill of Insulator (Bill(s) of Quantities for Insulator items)

G Percentage variation payable on the gross value of bill of General Works (Bill(s) of Quantities for General items)

Er Percentage variation payable on the gross value of erection (Bill(s) of Quantities for Erection Item)

L_C % of Labour Component in the item(s)

M_C % of Material Component in the item(s)

F_C % of Fuel Component in the item(s)

E_C % of Explosive Component in the item(s)

PM_C % of Plant, Machinery and Spares Component in the item(s)

S_C % of Steel Supply item Component in the item(s)

C_C % of Cement Supply item Component in the item(s)

- W Gross value of work done by Contractor as per on-account bill(s) excluding the Gross value of work under W_S or/and W_C or/and W_{SF} or/and W_F or/and W_{SFL} or/and W_{FL} and cost of materials supplied by Railway either free or at fixed rate,
- W_S Gross value of work done by Contractor for item(s) of supply of steel.
- W_C Gross value of work done by Contractor for item(s) of supply of cement and /or supply of grout material.
- W_{SF} Gross value of work done by Contractor for item(s) of Fabrication & Erection of Structures including supply of Steel.
- W_F Gross value of work done by Contractor for Fabrication & Erection of Structures excluding supply of Steel.
- W_{SFL} Gross value of work done by Contractor for item(s) of Fabrication, Assembly, Erection / Launching of Girders including supply of Steel.
- W_{FL} Gross value of work done by Contractor for item(s) of Fabrication, Assembly, Erection / Launching of Girders excluding supply of Steel.
- L_B Consumer Price Index for Industrial Workers - All India: Published in R.B.I. Bulletin for the base period
- L_Q Consumer Price Index 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
- M_B Wholesale Price Index: All commodities – as published in the R.B.I. Bulletin for the base period
- M_Q Wholesale Price Index: All commodities – as published in the R.B.I. Bulletin for the average price index of the 3 months of the quarter under consideration
- F_B The average of official prices of Diesel available on the official website of ‘Petroleum Planning and Analysis cell’ under Ministry of Petroleum and Natural Gas for Delhi, Kolkata, Mumbai & Chennai, for the base period
- F_Q The average of official prices of Diesel available on the official website of ‘Petroleum Planning and Analysis cell’ under Ministry of Petroleum and Natural Gas for Delhi, Kolkata, Mumbai & Chennai, for the 3 months of the quarter under consideration
- E_B Index number of Monthly Whole Sale Price Index for the category ‘Explosive’ of (g). Manufacture of other chemical products under (J) MANUFACTURE OF CHEMICALS AND CHEMICAL PRODUCTS, published by Office of Economic Adviser, Govt. of India, Ministry of Commerce & Industry, Department of Industrial Policy & Promotion (DIPP), for the base period.
- E_Q Index number of Monthly Whole Sale Price Index for the category ‘Explosive’ of (g). Manufacture of other chemical products under (J) MANUFACTURE OF CHEMICALS AND CHEMICAL PRODUCTS, published by Office of Economic Adviser, Govt. of India, Govt. of India, Ministry of Commerce & Industry, Department of Industrial Policy & Promotion (DIPP), for the average price index of 3 months of the quarter under consideration.
- PM_B Index Number of Wholesale Prices in India by Groups and Sub Groups (Averages) for ‘Manufacture of machinery for mining, quarrying and construction’– published in RBI (Reserve Bank of India) Bulletin, for the base period.
- PM_Q Index Number of Wholesale Prices in India by Groups and Sub Groups (Averages) for ‘Manufacture of machinery for mining, quarrying and construction’– published in RBI (Reserve Bank of India) Bulletin, for the average price index of 3 months of the quarter under consideration.

- S_B The average rate provided by the Joint Plant Committee for the relevant category of steel item as mentioned in Clause 46A.9; for the base period.
- S_Q The average rate provided by the Joint Plant Committee for the relevant category of steel item as mentioned in Clause 46A.9; for the 3 months of the quarter under consideration.
- C_B Index No. of Wholesale Price Index of sub-group Cement, Lime & Plaster as published in RBI Bulletin for the base period
- C_Q No. of Wholesale Price Index of sub-group Cement, Lime & Plaster as published in RBI Bulletin for the average price index of the 3 months of the quarter under consideration
- R_T IEEMA price index for Steel Blooms (size 150mmx150mm) for the month which is two months prior to date of inspection of material.
- R_O IEEMA price index for Steel Blooms (size 150mmx150mm) for the month which is one month prior to date of opening of tender.
- P_T IEEMA price index for Copper wire rods for the month which is two months prior to date of inspection of material.
- P_O IEEMA price index for Copper wire rods for the month which is one month prior to date of opening of tender.
- Z_T IEEMA price index for Zinc for the month which is two months prior to date of inspection of material
- Z_O IEEMA price index for Zinc for the month which is one month prior to date of opening of tender
- I_T RBI wholesale price index for the sub-group “Insulators” for the month which is two months prior to date of inspection of material
- I_O RBI wholesale price index for the sub-group “Insulators” for the month which is one month prior to date of opening of tender

(III) **SIGNALING & TELECOMMUNICATION WORKS:**

- (a) The following expressions and meanings are assigned to the value of the work done for signalling and telecommunication works:

SIGWK = Value of signalling works for a stage payment of the item signalling works;

INVSIG = Value of inventory for signalling works for a stage payment of the item inventory for signalling works;

INTGTESTSIG = Value of integrated testing and commission for signalling works of the Railway Project;

COMWK = Value of telecommunication works for a stage payment of the item telecommunication works;

INVCOM = Value of inventory for telecommunication works for a stage payment of the item inventory for telecommunication works; and

INTGTESTCOM = Value of integrated testing and commission for telecommunication works of the Railway Project.

- (b) Price adjustment for changes in cost of signalling works and telecommunication works shall be paid in accordance with the following formula:

- (i) $VSIGWK = 0.85 \text{ SIGWK} \times [\text{PELEX} \times (\text{ELEX}_i - \text{ELEX}_o) / \text{ELEX}_o + \text{POFC} \times (\text{OFC}_i - \text{OFC}_o) / \text{OFC}_o + \text{PLB} \times (\text{LBI} - \text{LBO}) / \text{LBO} + \text{POTH} \times (\text{OTHi} - \text{OTH}_o) / \text{OTH}_o + \text{S30C} \times (\text{P30C}_i - \text{P30C}_o) / \text{P30C}_o + \text{S24C} \times (\text{P24C}_i - \text{P24C}_o) / \text{P24C}_o + \text{S19C} \times (\text{P19C}_i - \text{P19C}_o) / \text{P19C}_o + \text{S12C} \times (\text{P12C}_i - \text{P12C}_o) / \text{P12C}_o + \text{S9C} \times (\text{P9C}_i - \text{P9C}_o) / \text{P9C}_o + \text{S6C} \times (\text{P6C}_i - \text{P6C}_o) / \text{P6C}_o + \text{S4C} \times (\text{P4C}_i - \text{P4C}_o) / \text{P4C}_o + \text{S2C} \times (\text{P2C}_i - \text{P2C}_o) / \text{P2C}_o + \text{S12C2.5} \times (\text{P12C2.5}_i - \text{P12C2.5}_o) / \text{P12C2.5}_o + \text{S2C2.5} \times (\text{P2C2.5}_i - \text{P2C2.5}_o) / \text{P2C2.5}_o + \text{S2C25} \times (\text{P2C25}_i - \text{P2C25}_o) / \text{P2C25}_o + \text{QC} \times (\text{PQC}_i - \text{PQC}_o) / \text{PQC}_o];$
- (ii) $VINVSIG = 0.85 \text{ SIGWK} \times [\text{PELEX} \times (\text{ELEX}_i - \text{ELEX}_o) / \text{ELEX}_o + \text{POTH} \times (\text{OTHi} - \text{OTH}_o) / \text{OTH}_o];$
- (iii) $VINTGTESTSIG = 0.85 \text{ INTGTESTSIG} \times [\text{PLB} \times (\text{LBI} - \text{LBO}) / \text{LBO} + \text{POTH} \times (\text{OTHi} - \text{OTH}_o) / \text{OTH}_o];$
- (iv) $VCOMWK = 0.85 \text{ COMWK} \times [\text{PELEX} \times (\text{ELEX}_i - \text{ELEX}_o) / \text{ELEX}_o + \text{POFC} \times (\text{OFC}_i - \text{OFC}_o) / \text{OFC}_o + \text{PLB} \times (\text{LBI} - \text{LBO}) / \text{LBO} + \text{POTH} \times (\text{OTHi} - \text{OTH}_o) / \text{OTH}_o + \text{S30C} \times (\text{P30C}_i - \text{P30C}_o) / \text{P30C}_o + \text{S24C} \times (\text{P24C}_i - \text{P24C}_o) / \text{P24C}_o + \text{S19C} \times (\text{P19C}_i - \text{P19C}_o) / \text{P19C}_o + \text{S12C} \times (\text{P12C}_i - \text{P12C}_o) / \text{P12C}_o + \text{S9C} \times (\text{P9C}_i - \text{P9C}_o) / \text{P9C}_o + \text{S6C} \times (\text{P6C}_i - \text{P6C}_o) / \text{P6C}_o + \text{S4C} \times (\text{P4C}_i - \text{P4C}_o) / \text{P4C}_o + \text{S2C} \times (\text{P2C}_i - \text{P2C}_o) / \text{P2C}_o + \text{S12C2.5} \times (\text{P12C2.5}_i - \text{P12C2.5}_o) / \text{P12C2.5}_o + \text{S2C2.5} \times (\text{P2C2.5}_i - \text{P2C2.5}_o) / \text{P2C2.5}_o + \text{S2C25} \times (\text{P2C25}_i - \text{P2C25}_o) / \text{P2C25}_o + \text{QC} \times (\text{PQC}_i - \text{PQC}_o) / \text{PQC}_o + \text{PCEQP} \times (\text{CEQP}_i - \text{CEQP}_o) / \text{CEQP}_o];$
- (v) $VINVCOM = 0.85 \text{ SIGWK} \times [\text{PELEX} \times (\text{ELEX}_i - \text{ELEX}_o) / \text{ELEX}_o + \text{PCEQP} \times (\text{CEQP}_i - \text{CEQP}_o) / \text{CEQP}_o + \text{POTH} \times (\text{OTHi} - \text{OTH}_o) / \text{OTH}_o];$ and
- (vi) $VINTGTESTCOM = 0.85 \text{ INTGTESTCOM} \times [\text{PLB} \times (\text{LBI} - \text{LBO}) / \text{LBO} + \text{POTH} \times (\text{OTHi} - \text{OTH}_o) / \text{OTH}_o].$

Where,

$VSIGWK$ = Increase or decrease in the cost of signalling works during the period under consideration due to changes in the rates for relevant components as specified in sub-Paragraph (h);

$VINVSIG$ = Increase or decrease in the cost of inventory for signalling during the period under consideration due to changes in the rates for relevant components as specified in sub-Paragraph (h);

$VINTGTESTSIG$ = Increase or decrease in the cost of integrated testing and commissioning of signalling works of the Railway Project during the period under consideration due to changes in the rates for relevant components as specified in sub-Paragraph (h);

$VCOMWK$ = Increase or decrease in the cost of communication works during the period under consideration due to changes in the rates for relevant components as specified in sub-Paragraph (h);

$VINVCOM$ = Increase or decrease in the cost of inventory for telecommunications works during the period under consideration due to changes in the rates for relevant components as specified in sub-Paragraph (h);

$VINTGTESTCOM$ = Increase or decrease in the cost of integrated testing and commissioning of telecommunication works of the Railway Project during the period under consideration due to changes in the rates for relevant components as specified in sub-Paragraph (h);

PCEQP, PELEX, PIC, PLB, POFC, and POTH are the percentages of communication equipment, electronics, PVC insulated cables, labour, optical fibre cables, and other materials respectively;

CEQP_o = The wholesale price index as published by the Ministry of Commerce and Industry, Government of India (hereinafter called “WPI”) for communication equipment for the month of the Base Month;

CEQP_i = The WPI for communication equipment for the average price index of the 3 months of the quarter under consideration;

ELEX_o = The WPI for electronics for the month of the Base Month;

ELEX_i = The WPI for electronics for the average price index of the 3 months of the quarter under consideration;

P30C_i = Price payable per Km as adjusted in accordance with price variation Clause for size 30C x 1.5 sq mm signalling cable

P30C_o = Price per Km of cable as per purchase order/ Contract agreement.

S30C = Percentage of size 30C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P24C_i = Price payable per Km as adjusted in accordance with price variation Clause for size 24C x 1.5 sq mm signalling cable

P24C_o = Price per Km of cable as per purchase order/ Contract agreement.

S24C = Percentage of size 24C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P19C_i = Price payable per Km as adjusted in accordance with price variation Clause for size 19C x 1.5 sq mm signalling cable

P19C_o = Price per Km of cable as per purchase order/ Contract agreement.

S19C = Percentage of size 19C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P12C_i = Price payable per Km as adjusted in accordance with price variation Clause for size 12C x 1.5 sq mm signalling cable

P12C_o = Price per Km of cable as per purchase order/ Contract agreement.

S12C = Percentage of size 12C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P9C_i = Price payable per Km as adjusted in accordance with price variation Clause for size 9C x 1.5 sq mm signalling cable

P9C_o = Price per Km of cable as per purchase order/ Contract agreement.

S9C = Percentage of size 9C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P6C_i = Price payable per Km as adjusted in accordance with price variation Clause for size 6C x 1.5 sq mm signalling cable

P6C_o = Price per Km of cable as per purchase order/ Contract agreement.

S6C = Percentage of size 6C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P4C_i = Price payable per Km as adjusted in accordance with price variation Clause for size 4C x 1.5 sq mm signalling cable

P4C_o = Price per Km of cable as per purchase order/ Contract agreement.

S4C = Percentage of size 4C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P2C_i = Price payable per Km as adjusted in accordance with price variation Clause for size 2C x 1.5 sq mm signalling cable

P2C_o = Price per Km of cable as per purchase order/ Contract agreement.

S2C = Percentage of size 2C x 1.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P12C2.5_i = Price payable per Km as adjusted in accordance with price variation Clause for size 12C x 2.5 sq mm signalling cable

P12C2.5_o = Price per Km of cable as per purchase order/ Contract agreement.

S12C2.5 = Percentage of size 12C x 2.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P2C2.5_i = Price payable per Km as adjusted in accordance with price variation Clause for size 2C x 2.5 sq mm signalling cable

P2C2.5_o = Price per Km of cable as per purchase order/ Contract agreement.

S2C2.5 = Percentage of size 2C x 2.5 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

P2C25_i = Price payable per Km as adjusted in accordance with price variation Clause for size 2C x 25 sq mm signalling cable

P2C25_o = Price per Km of cable as per purchase order/ Contract agreement.

S2C25 = Percentage of size 2C x 25 sq mm signalling cable shall govern the price adjustment of the contract price for signalling and telecommunication works.

PQC_i = Price payable per Km as adjusted in accordance with price variation Clause for size 0.9mm dia, 6 Quad cable.

PQC_o = Price per Km of cable as per purchase order/ Contract agreement.

QC = Percentage of size 0.9mm dia, 6 Quad cable shall govern the price.

LBo = The consumer price index for industrial workers – All India, published by Labour Bureau, Ministry of Labour, Government of India, (hereinafter called “CPI”) for the month of the Base Month;

LBi = The CPI for industrial workers – All India for the average price index of the 3 months of the quarter under consideration;

OFCo = The WPI for fibre cables for the month of the Base Month;

OFCi = The WPI for fibre cables for the average price index of the 3 months of the quarter under consideration;

OTHo = The WPI for all commodities for the month of the Base Month; and

OTHi = The WPI for all commodities for the average price index of the 3 months of the quarter under consideration.

(c) The following percentages shall govern the price adjustment of the Contract Price for signalling and telecommunication works:

Works / Component	Signalling			Telecommunication		
	Signalling Works	Signalling inventory	Integrated testing and Commissioning	Telecommunication Works	Telecomm inventory	Integrated testing and Commissioning
Electronics (PELEX)	***0%	***0%	—	***0%	***0%	—
Communication Equipment (PCEQP)	—	—	—	***0%	***0%	—
Optical Fibre Cable (POFC)	***0%	—	—	***0%	—	—
30C x 1.5 sq mm signalling cable(S30C)	***0%	—	—	***0%	—	—
24C x 1.5 sq mm signalling cable (S24C)	***0%	—	—	***0%	—	—
19Cx 1.5 sq mm signalling cable (S19C)	***0%	—	—	***0%	—	—
12C x 1.5 sq mm signalling cable (S12C)	***0%	—	—	***0%	—	—
9C x 1.5 sq mm signalling cable (S9C)	***0%	—	—	***0%	—	—
6C x 1.5 sq mm signalling cable (S6C)	***0%	—	—	***0%	—	—
4C x 1.5 sq mm signalling cable (S4C)	***0%	—	—	***0%	—	—
2C x 1.5 sq mm signalling cable (S2C)	***0%	—	—	***0%	—	—
12C x 2.5 sq mm signalling cable (S12C2.5)	***0%	—	—	***0%	—	—
2C x 2.5 sq mm signalling cable (S2C2.5)	***0%	—	—	***0%	—	—
2C x 25 sq mm signalling cable (S2C25)	***0%	—	—	***0%	—	—
0.9 mm dia, 6Quad cable (QC)	***0%	—	—	***0%	—	—
Labour (PLB)	***0%	—	***0%	***0%	***0%	***0%
Other materials	***0%	***0%	***0%	***0%	***0%	***0%

Works / Component	Signalling			Telecommunication		
	Signalling Works	Signalling inventory	Integrated testing and Commissioning	Telecommunication Works	Telecomm inventory	Integrated testing and Commissioning
Total	100%	100%	100%	100%	100%	100%

(Note- the percentages may be finalized by tendering authority depending on BOQ)

FORMULAE FOR SIGNALING & TELECOM CABLE

The price payable for signalling cables is variable as per Price Variation Formula given below:

For Signalling Copper Cables:

$$P_i = P_o + CuF (Cu - C_{uo}) + CCFCu (CC - C_{Co}) + FeF (Fe - Fe_o)$$

For Telecom Copper Cables For Jelly Filled, 0.9 mm dia, 6 quad cable

$$P_i = P_o + CuF (Cu - C_{uo}) + AlFCu (Al - A_{lo}) + CCFCu (CC - C_{Co}) + FeF (Fe - Fe_o)$$

For Aluminium Power Cables:

$$P_i = P_o + AlF (Al - A_{lo}) + CCFAI (CC - C_{Co}) + FeF (Fe - Fe_o)$$

Where,

P_i = Price payable per KM as adjusted in accordance with Price variation clause.

P_o = Price per KM of cable as per Purchase order.

CuF = Variation factor for Copper

C_{uo} = Price of copper Rod in Rs. Per MT

$CCFCu$ = Variation factor for PVC Compound for Copper Signalling & Telecom cable

C_{Co} = Price of PVC Compound in Rs. Per MT

AlF = Variation factor for Aluminium

A_{lo} = Price of EC grade LME Aluminium rods (Properzi rods) in Rs. Per MT.

$CCFAI$ = Variation factor for PVC Compound for Aluminium power cable

FeF = Variation factor for Steel

Fe_o = Price of Steel for Armour (Flat strip 4 mm. x 0.8mm/ Round 1.4mm dia) in Rs. Per MT

(Prices per MT for C_{uo} , C_{Co} , Fe_o , A_{lo} as applicable on the 1st working day of the month, one month prior to the deadline for submission of bids. The above prices and indices are as published by IEEMA vide circular reference no. IEEMA (PVC) /CABLE --/--/-- one month prior to the deadline for submission of bids.)

Cu = Price of Copper Rod in Rs. Per MT.

C_C = Price of PVC Compound in Rs. Per MT.

Fe= Price of Steel for Armouring (Flat strip 4mm x 0.8 mm/ Round 1.4mm dia) in Rs. Per MT.

Al = Price of EC grade LME Aluminium rods (Properzi rods) in Rs. Per MT.

(Prices per MT for Cu, CC, Fe, Al as prevailing on 1st working day of the calendar month covering the date One month prior to the date of inspection call letter will be applicable for the calculation of updated price. The above prices and indices are as published by IEEMA vide circular reference no. IEEMA (PVC) /CABLE --/--/-- one month prior to the date of inspection.)

The value of variation factors for copper, steel and PVC Compound are different for different sizes of signalling cables. Accordingly, the PVC formula for some of the types of signalling cable is as given under:-

Underground Railway Signalling Cable unscreened and armoured copper conductor

- (i) Size 30 C x 1.5 sq.mm.

$$P_{30C_i} = P_{30C_o} + 0.391(Cu - C_{uo}) + 0.557(CC - CC_o) + 0.425(Fe - Fe_o)$$

For armouring, price of steel flat strip of size 4mmx0.8mm is to be taken into consideration.

- (ii) Size 24C x 1.5 sq.mm

$$P_{24C_i} = P_{24C_o} + 0.313(Cu - C_{uo}) + 0.481(CC - CC_o) + 0.398(Fe - Fe_o)$$

For armouring, value of steel flat strip of size 4mmx0.8mm is to be taken into consideration.

- (iii) Size 19C x 1.5 sq.mm

$$P_{19C_i} = P_{19C_o} + 0.248(Cu - C_{uo}) + 0.395(CC - CC_o) + 0.343(Fe - Fe_o)$$

For armouring, value of steel flat strip of size 4mmx0.8mm is to be taken into consideration.

- (iv) Size 12C x 1.5 sq.mm

$$P_{12C_i} = P_{12C_o} + 0.157(Cu - C_{uo}) + 0.277(CC - CC_o) + 0.289(Fe - Fe_o)$$

For armouring, value of steel wire size 1.4mm dia is to be taken into consideration.

- (v) Size 9C x 1.5 sq.mm

$$P_{9C_i} = P_{9C_o} + 0.117(Cu - C_{uo}) + 0.241(CC - CC_o) + 0.383(Fe - Fe_o)$$

For armouring, value of steel wire size 1.4mm dia is to be taken into consideration.

- (vi) Size 6Cx 1.5 sq.mm

$$P_{6C_i} = P_{6C_o} + 0.078(Cu - C_{uo}) + 0.199(CC - CC_o) + 0.329(Fe - Fe_o)$$

For armouring, value of steel wire size 1.4mm dia is to be taken into consideration.

- (vii) Size 4Cx1.5 sq.mm

$$P_{4C_i} = P_{4C_o} + 0.052(Cu - C_{uo}) + 0.152(CC - CC_o) + 0.277(Fe - Fe_o)$$

For armouring, value of steel wire size 1.4mm dia is to be taken into consideration.

- (viii) Size 2C x 4 sq.mm(multistrand)

$$P_{2C_i} = P_{2C_o} + 0.073(Cu - C_{uo}) + 0.156(CC - CC_o) + 0.3(Fe - Fe_o)$$

For armouring, value of steel wire size 1.4mm dia is to be taken into consideration.

- (ix) Size 12C x 2.5 sq.mm

$$P12C2.5_i = P12C2.5_o + 0.282 (Cu-Cu_o) + 0.371 (CC-CC_o) + 0.342 (Fe-Fe_o)$$

For armouring, value of steel flat strip of size 4mmx0.8mm is to be taken into consideration.

- (x) Size 2C x 2.5 sq.mm

$$P2C2.5_i = P2C2.5_o + 0.047 (Cu-Cu_o) + 0.139 (CC-CC_o) + 0.277 (Fe-Fe_o)$$

For armouring, value of steel wire size 1.4mm dia is to be taken into consideration.

- (xi) Size 2C x 25 sq.mm PVC insulated, armoured, Aluminium power cable

$$P2C25_i = P2C25_o + 0.146 (Al-Al_o) + 0.303 (CC-CC_o) + 0.306 (Fe-Fe_o)$$

For armouring, value of steel flat strip of size 4mmx0.8mm is to be taken into consideration.

- (xii) For Jelly filled, 0.9mm dia, 6 quad cable

$$PQC_i = PQC_o + 0.135 (Al-Al_o) + 0.139 (Cu-Cu_o) + 0.515 (CC-CC_o) + 0.693 (Fe-Fe_o)$$

For PVC Compound Grade CW-22, is to be taken into consideration.

46A.8 The demands for escalation of cost shall be allowed on the basis of provisional indices as mentioned above in Clause 46A.7. Any adjustment needed to be done based on the finally published indices shall be made as and when they become available.

46A.9: (1) Relevant categories of steel for the purpose of operating Price Variation formula as mentioned in this Clause shall be as under:

SL	Classification	Rates to be used for calculating SQ or SB
1.	Reinforcement bars and other rounds	Average of per tonne rates of 10mm dia TMT & 25mm dia TMT; confirming IS1786; Fe 500
2.	All types and sizes of angles, channels and joists	Average of per tonne rates of 'Angle 75x75x6mm, Mild Steel Plate 10mm thickness and Channel 150x75mm; confirming IS2062, E250 Gr "A"
3.	All types and sizes of plates	Average of per tonne rates of 'MS Plates 10mm thickness and 25mm thickness; confirming IS2062, E250 Gr "A"
4.	Any other section of steel not covered in the above categories	Average of price for the 3 categories covered under SL 1, 2 & 3 in this table.

(2). Relevant city for referring "JPC (Joint Plant Committee)" rates of steel items (SQ /SB) in different Zonal Railways shall be as under :

SL	City	Railway
1.	Delhi	Northern , North Central, North Eastern, North Western
2.	Kolkata	Eastern, East Central, East Coast, Northeast Frontier, South Eastern, Southeast Central
3.	Mumbai	Central, Western, West Central
4.	Chennai	Southern, South Central & South Western

46A.10 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 17A of the Standard General Conditions of Contract. However, where extension of time has been granted due to Contractor's failure under Clause 17B of the Standard 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 17A, the price adjustment for the period of extension granted under Clause 17B shall be limited to the amount payable as per the Indices applicable to the last month of the original completion period or the extended period under Clause 17A of the Standard 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 17A, as the case may be; then the lower indices shall be adopted for the price adjustment for the period of extension under Clause 17B of the Standard General Conditions of Contract.

47. 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 issue 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 Railway 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 work has been completed and has satisfactorily passed any final test or tests that may be prescribed, 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 certificate, inter alia, should mention that the work has been completed in all respects and that all the contractual obligations have been fulfilled by the Contractor and that there is no due from the Contractor to Railways against the contract concerned.

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 Railway. 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 the Railway 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 Annexure XIV, the parties shall execute the Final Supplementary Agreement as per Annexure XIV.

49. 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, if applicable, 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) to 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 Railway.

The Competent Authority to issue above Maintenance Certificate shall normally be the authority who is competent to sign the contract. If this Competent Authority is of the rank lower than JA Grade, then a JA Grade Officer (concerned with the work) should issue the Certificate. The Certificate, inter alia, should mention that the work has been completed in all respects and that all the contractual obligations have been fulfilled by the Contractor and that there is no due from the Contractor to Railways against the contract concerned

50.(2) Cessation of Railway's Liability: The Railway shall not be liable to the Contractor for any matter arising out of or in connection with the contract for execution of the works unless the Contractor has 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 Railway 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 rates accepted in Bill(s) of Quantities 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 signed delivered to the Engineer enclosing either a full account in detail of all claims he may have on the Railway 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 Standard 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 Railway 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 Railway 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 of any excess amount paid to him till the release of security deposit or settlement of claims, whichever is later, if as a result of such examination any over-payment to him is discovered to have been 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 Standard 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. 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 Railway 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 Railway 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 Railway 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 Railway 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 Railway will be kept withheld or retained as such by the Railways 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 company, the Railway 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 / company, as the case may be whether in his individual capacity or otherwise.

52-A 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 Railway, against any claim of this or any other Railway or any other Department of the Central Government in respect of 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 Railway in regard to terminated contracts may be made from the Final Bill, 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 Railway'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 Railway will be kept withheld or retained as such by the Railway 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. 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 Railway 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 and sufficient discharge as aforesaid provided that nothing in this Clause contained shall be deemed to prejudice or effect any claim which the Railway 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. 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 thereunder in respect of any employees directly or through petty Contractors or sub-contractors employed by him 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 Railways whether in connection with any work being executed by the Contractor or otherwise for the purpose of the Railway 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 Railway, such money shall be deemed to be moneys payable to the Railway by the Contractor and on failure by the Contractor to repay the Railway any moneys paid by it as aforesaid within seven days after the same shall have been demanded, the Railways shall be entitled to recover the same from Contractor's bills/Security Deposit or any other dues of Contractor with the Government of India.

54-A. Apprentices Act: The Contractor shall be responsible to ensure compliance with the provisions of the Apprentices Act, 1961 and the Rules and Orders issued thereunder 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 Railway 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.

55. Provisions of Payments of Wages Act: The Contractor shall comply with the provisions of the Payment of Wages Act, 1936 and the rules made thereunder in respect of all employees employed by him either directly or through petty Contractors or sub-contractors 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 nevertheless 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 Railways deduct the same from any moneys due to the Contractor in terms of the contract. The Railway shall be entitled to recover the same from Contractor's bills/Security Deposit or any other dues of Contractor with the Government of India all moneys paid or payable by the Railway by 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.

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

55-A.(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 Railway from and against any claims under the aforesaid Act and the Rules.

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

55-A.(3) The Contractor shall pay to the labour employed by him directly or through sub-contractors 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 sub-contractors in connection with the said work, as if the labour had been immediately employed by him.

55-A.(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.

55-A.(5) In every case in which, by virtue of the provisions of the aforesaid Act or the rules, the Railway 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 Railway due to the Contractor's failure to fulfill his statutory obligations under the aforesaid Act or the rules, the Railway 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 Railway under the Section 20, Sub-Section (2) and Section 2, Sub-Section (4) of the aforesaid Act, the Railway shall be at liberty to recover such amount or part thereof from Contractor's bills/Security Deposit or any other dues of Contractor with the Government of India. The Railway shall not be

bound to contest any claim made against it under Sub-Section (1) 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 Railway full security for all costs for which the Railway might become liable in contesting such claim. The decision of the Chief Engineer regarding the amount actually recoverable from the Contractor as stated above shall be final and binding on the Contractor.

55-B. 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 Railway from and against any claims under the aforesaid Act and the Rules.

55-C (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 Standard General Conditions of Contract. In order to ensure the same, an application has been developed and hosted on website 'www.shramikkalyan.indianrailways.gov.in'. 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 shramikkalyan 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 shramikkalyan 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 Railway's Shramikkalyan portal at 'www.shramikkalyan.indianrailways.gov.in' till ____Month, ____Year."

55-D. 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, shall 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 by 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. Reporting of Accidents: 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 make every arrangement to render all possible assistance.

57. 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, Railway is obliged to pay compensation to a workman directly or through petty Contractor or sub-contractor employed by the Contractor in executing the work, Railway will recover from the Contractor the amount of the compensation so paid, and, without prejudice to the rights of Railway under Section 12 Sub-section (2) of the said Act, Railway shall be at liberty to recover such amount or any part thereof from Contractor's bills/Security Deposit or any other dues of Contractor with the Government of India. Railway 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 Railway full security for all costs for which Railway might become liable in consequence of contesting such claim.

57-A. 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 thereunder 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 Railway from and against any claims under the Mines Act, or the rules and regulations framed thereunder, by or on behalf of any persons employed by him or otherwise.

58. Railway not to Provide Quarters for Contractors: No quarters shall normally be provided by the Railway for the accommodation of the Contractor or any of his staff employed on the work. In exceptional cases where accommodation is provided to the Contractor at the Railway's discretion, recoveries shall be made at such rates as may be fixed by the Railway for the full rent of the buildings and equipments therein as well as charges for electric current, water supply and conservancy.

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 creche (Bal-Mandir) where 50 or more women are employed at a time. Suitable sites on Railway 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 Railway. 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, bye-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 endeavours to

(i) Prevent any riotous or unlawful behaviour 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

(ii) Security of property in the neighbourhood of the works. In the event of the Railway 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 Railway 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 the Railway Medical Authority and permit inspection of all sanitary arrangements at all times by the Engineer, the Engineer's Representative or the Medical Staff of the Railway. Should the Contractor fail to make the adequate sanitary arrangements, these will be provided by the Railway and the cost thereof 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 Railway Medical Authority. 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 healthy sites as required by the Engineer, failing which within the time specified in the Engineer's requisition, the work may be done by the Railway and the cost thereof recovered from the Contractor.

59.(6) Treatment of Contractor's Staff in Railway Hospitals: The Contractor and his staff, other than labourers and their families requiring medical aid from the railway hospital and dispensaries will be treated as private patients and charged accordingly. The Contractors' labourers and their Families will be granted free treatment in railway hospitals and dispensaries where no other hospitals or dispensaries are available provided the Contractor pays the cost of medicines, dressing and diet money according to the normal scale and additional charges for special examinations such as pathological and bacteriological examination, X-Ray, etc. and for surgical operation.

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 Railway Medical Authority 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) Restrictions on the Employment of Retired Engineers of Railway Services 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 President 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 his Performance Guarantee as well as Security Deposit.

60.(1) Non-Employment of Labourers below the age of 15: The Contractor shall not employ children below the age of 15 as labourers directly or through petty Contractors or sub-contractors 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 Annexure-VIII) 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 this 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 is fit to work in the capacity stated in the certificate.

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 Railway to Determine the Contract: The Railway shall be entitled to determine and terminate the contract at any time should, in the Railway'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 Railway 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 Railways shall admit and consider such claims as are deemed reasonable and are supported by vouchers to the satisfaction of the Engineer. The Railway'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 for 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 8 of the Instructions to Tenderers.
- (x) Fail to submit the documents pertaining to identity of JV and PAN in terms of Para 17.11 of Tender Form (Second Sheet) of Annexure I available in the Instructions to Tenderers.
- (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 these Conditions, or
- (xiii) Fail to afford the Engineer or Engineer's representative proper facilities for inspecting the works or any part thereof as required under Clause 28 of these 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 Railway or to any person on his or on their behalf in relation to the execution of this or any other contract with this Railway.
- (xv) Fail to adhere to the provisions of Para 16 of Tender Form (Second Sheet) of Annexure I of the Instructions to Tenderers, or provision Clause 59(9) of these Conditions.
- (xvi) Submits copy of fake documents / certificates in support of credentials, submitted by the tenderer

Then and in any of the **said Clause**, the Engineer on behalf of the Railway may serve the Contractor with a notice (Proforma at Annexure-IX) in writing to that effect and if the Contractor does not within seven days after the delivery to him of such notice proceed to make good his default in so far as the same is capable of being made good and carry on the work or comply with such directions as aforesaid of the entire satisfaction of the Engineer, the Railway shall be entitled after giving 48 hours' notice (Proforma at Annexure-X or XII, as the case may be) 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 Annexure-XI or XIII, as the case may be) should be issued.

Note: Engineer at his discretion may resort to the part termination of contract with notices (Proforma at Annexure- IX, XII and XIII), only in cases where progress of work is more than or equal to 80% of the original scope of work.

62.(2) Right of Railway 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 this 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 railways 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 plant 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.

SETTLEMENT OF DISPUTES – INDIAN RAILWAY ARBITRATION AND CONCILIATION RULES

63. Conciliation of Disputes:

(i) This clause is applicable in the tender having advertised value less than or equal to Rs.50 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 "Chief Engineer" or "Divisional Railway Manager" 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. Chief Engineer or Divisional Railway Manager 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) 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.
- (v) 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.
- (vi) The conciliation proceedings shall be terminated as per Section 76 of 'The Arbitration and Conciliation Act, 1996.

63.1 Matters Finally Determined by the Railway: 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 GM and the GM 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 Standard 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 Railway authority, thereon shall be final and binding on the Contractor; provided further that 'excepted matters' shall stand specifically excluded from the purview of the 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 Retired Railway Officers, retired not below senior administrative grade (SAG). 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 General Manager's office. The complete panel, which shall not be less than five members, shall be sent by Chief Engineer 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 Chief Engineer shall nominate one member from the same panel as Railway 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 Railway, Contractor and the respective DAB members. The terms of the remuneration of each member shall be as fixed by Ministry of Railways 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 Chief Engineer 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 Railway 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 Railway 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 90 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 The DAB decision shall not be binding on both the Parties. In case any party is not satisfied by the decision of DAB, then the aggrieved party may approach Arbitral Tribunal for arbitration proceedings.

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 by either party within 180 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 Railway 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.(1) : 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 Railway of any certificate to which the Contractor may claim to be entitled to, or if the Railway 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 63.1 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): Arbitration as a method of dispute resolution should not be routinely or automatically included in procurement contacts/tenders, especially in large contracts. .

64.(1)(i)(c): As a non, arbitration as a method of dispute resolution may be restricted to disputes with a value less than Rs. 10 crore. This figure is with reference to the value of the dispute (not the value of the contract, which may be much higher)..

64.(1)(i)(d): Inclusion of arbitration clauses covering disputes with a value exceeding Rs. 10 crore, should be based on careful application of mind and recording of reasons and with the approval of an officer not below the rank of Senior Administrative Grade (SAG) or the Accepting Authority of the tender whichever is higher.

64.(1)(ii)(a): 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 Railway, shall be referred to arbitration and other matters shall not be included in the reference.

64.(1)(ii)(b): 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 under Annexure XV of these conditions.

64.(1)(iii)(a): The Arbitration proceedings shall be assumed to have commenced from the day, a written and valid demand for arbitration is received by the Railway.

64.(1)(iii)(b): The claimant shall submit his claims stating the facts supporting the claims alongwith all the relevant documents and the relief or remedy sought against each claim within a period of 30 days from the date of appointment of the Arbitral Tribunal

64.(1)(iii)(c): The Railway shall submit its defence statement and counter claim(s), if any, within a period of 60 days of receipt of copy of claims from Tribunal, unless otherwise extension has been granted by Tribunal.

64.(1)(iii)(d): Place of Arbitration: The place of arbitration would be within the geographical limits of the Division of the Railway where the cause of action arose or the Headquarters of the concerned Railway or any other place with the written consent of both the parties

64.(1)(iv): 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)(v): 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 Railways that the final bill is ready for payment, he/they will be deemed to have waived his/their claim(s) and the Railway 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 Railway 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): Appointment of Arbitrator:

64.(3)(a): The Arbitral Tribunal shall consist of a panel of three arbitrators. General Manager/Additional General Manager will appoint two arbitrators, one railway nominee and other from among the contractor's nominee. Contractor can recommend his nominee either from approved panel of Railways or from approved panel of Indian Council of Arbitration (ICA) within 30 days from the date of dispatch of approval of written and valid acceptance of demand for arbitration by the General Manager/Additional General Manager.

64.(3)(a)(i): If contractor wants to choose his nominee from Railway panel, the Railway will send a panel of at least four (4) names of retired Railway Officers empanelled to work as Arbitrator within 30 days from the day when a written and valid demand for arbitration is received by the General Manager/Additional General Manager. Contractor will be asked to suggest to General

Manager/Additional General Manager 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 Railway. The General Manager/Additional General Manager shall appoint at least one out of them as the Contractor's nominee within 30 days from the receipt of the names of Contractor's nominees. The railway panel shall be provided free of cost to the contractor.

64.(3)(a)(ii): If contractor wants to choose his nominee from Indian Council of Arbitration panel, Contractor will send at least 2 names of Arbitrators from the ICA panel for appointment as Contractor's nominee within 30 days from the date of dispatch of the request by Railway. The General Manager/Additional General Manager shall appoint at least one out of them as the Contractor's nominee within 30 days from the receipt of the names of Contractor's nominees. Nomination and appointment of arbitrators from ICA panel shall be as per the ICA Rules for Domestic Commercial Arbitration and amended from time to time.

Some general guidelines of ICA Rules for Domestic Commercial Arbitration are as under:-

- i. Contractor may access the ICA's panel of arbitration through ICA's official webpage: <https://icaindia.co.in/pdf/Engineers.pdf>.
- ii. A formal request for nomination shall be submitted to ICA, accompanied by:-
 - a. A brief Statement of Claim outlining the nature and quantum of the disputes.
 - b. A copy of the relevant contract and any supporting documents.
 - c. A copy of the notice intimating the other party of the initiation of arbitration proceedings, with proof of delivery (if any).
- iii. Ad-hoc appointment fees for the nomination and appointment of arbitrators shall be as per the ICA Rules for Domestic Commercial Arbitration and revised from time to time and shall be submitted along with the request.

64.3.(a)(iii): The serving railway officer working in arbitral tribunal in the ongoing arbitration cases as per clause 64.(3)(a)(i) and clause 64.(3)(a)(ii) above, can continue as arbitrator in the tribunal even after his retirement

64.(3)(b): Two selected arbitrators are free to select presiding arbitrator (3rd arbitrator) within thirty (30) days from the date of their appointment. The presiding arbitrator may be selected from approved panel of Railways or approved panel of Indian Council of Arbitration (as per mutual agreement), which will be approved by General Manager/Additional General Manager. General Manager/Additional General Manager shall complete this exercise of appointing the Arbitral Tribunal within 30 days from the receipt of the names of all the three arbitrators

64.(3)(c)(i): If one or more of the arbitrators appointed as above refuses to act as arbitrator, withdraws from his office as arbitrator, or vacates his/their office/offices or is/are unable or unwilling to perform his functions as arbitrator for any reason whatsoever or dies or in the opinion of the General Manager fails to act without undue delay, the General Manager shall appoint new arbitrator/arbitrators to act in his/their place in the same manner in which the earlier arbitrator/arbitrators had been appointed. Such re-constituted Tribunal may, at its discretion, proceed with the reference from the stage at which it was left by the previous arbitrator (s).

64.(3) (c)(ii): (a) The Arbitral Tribunal shall have power to call for such evidence by way of affidavits or otherwise as the Arbitral Tribunal shall think proper, and it shall be the duty of the parties hereto to do or cause to be done all such things as may be necessary to enable the Arbitral Tribunal to make the award without any delay. The proceedings shall normally be conducted on the basis of documents and written statements.

(b) Before proceeding into the merits of any dispute, the Arbitral Tribunal shall first decide and pass its orders over any plea submitted/objections raised by any party, if any, regarding appointment of Arbitral Tribunal, validity of arbitration agreement, jurisdiction and scope of the Tribunal to deal with the dispute (s) submitted to arbitration, applicability of time 'limitation' to

any dispute, any violation of agreed procedure regarding conduct of the arbitral proceedings or plea for interim measures of protection and record its orders in day to day proceedings. A copy of the proceedings duly signed by all the members of tribunal should be provided to both the parties

64.(3)(c)(iii): (i) Qualification of Railway Empanelled Arbitrator(s):

- (a) Retired Railway Officers not below SA Grade level, one year after his date of retirement.
- (b) Age of arbitrator at the time of appointment shall be below 70 years.
- (c) Persons not involved in any current vigilance/CBI cases or against whom disciplinary or prosecution proceedings are not in process.
- (d) Persons who had not been imposed a major penalty or two or more minor penalties or against whom administrative action has not been taken three times or more or
- (e) Persons who have not been imposed one minor Penalty and against whom two administrative actions have not been taken as a result of vigilance/CBI action while in service on Railways.
- (ii) An arbitrator may be appointed non withstanding the total number of arbitration cases in which he has been appointed in the past.
- (iii) While appointing arbitrator(s) under Sub-Clause 64.(3)(a), 64.(3)(a)(i), 64.(3)(a)(ii) & 64.(3)(b) above, due care shall be taken that he/they is/are not the one/those who had an opportunity to deal with the matters to which the contract relates or who in the course of his/their duties as Railway servant(s) expressed views on all or any of the matters under dispute or differences. A certification to this effect as per annexure- XVI shall be taken from Arbitrators also. The proceedings of the Arbitral tribunal or the award made by such Tribunal will, however, not be invalid merely for the reason that one or more arbitrator had, in the course of his service, opportunity to deal with the matters to which the contract relates or who in the course of his/their duties expressed views on all or any of the matters under dispute.

64.(3)(d)(i): The arbitral award shall state item wise, the sum and reasons upon which it is based. The analysis and reasons shall be detailed enough so that the award could be inferred therefrom

64.(3)(d)(ii): A party may apply for corrections of any computational errors, any typographical or clerical errors or any other error of similar nature occurring in the award of a Tribunal and interpretation of a specific point of award to Tribunal within 60 days of receipt of the award

64.3(d)(iii): A party may apply to Tribunal within 60 days of receipt of award to make an additional award as to claims presented in the arbitral proceedings but omitted from the arbitral award.

64.(4): Any ruling on award shall be made by a majority of members of Tribunal. In the absence of such a majority, the views of the Presiding Arbitrator shall prevail.

64.(5): 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.(6): The cost of arbitration shall be borne by the respective parties. If all the three arbitrators are selected from the Railway Panel, the fee of the arbitrators shall be determined as per the rates fixed/revised by Railway Board 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 Annexure XV to these conditions after/ while referring these disputes to Arbitration. However, if any of the three arbitrators is selected from the Panel of Indian Council of Arbitration (ICA), the fee of the arbitrators shall be determined as per the rates fixed/revised by the Indian Council of Arbitration 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 Annexure XV to these conditions after/ while referring these disputes to Arbitration.

64.(7) Subject to the provisions of the aforesaid Arbitration and Conciliation Act 1996 and the rules thereunder and relevant Para of the Standard General Conditions of Contract and any

statutory modifications thereof shall apply to the appointment of arbitrators and arbitration proceedings under this Clause.

64.(8) In case arbitration award is challenged by a party in the Court of Law, 75% of award amount, pending adjudication by Court of Law, shall be made by party to other party. In case payment is to be made by Railway to Contractor, the terms & conditions as incorporated in the Ministry of Railways letter No. 2016/CE(I)/CT/ARB/3(NITI Aayog)/Pt. dated 08th Mar,2017 as amended from time to time, shall be followed. In case Contractor has to pay to the Railway, then 75% of the award amount shall be deducted by the Railway from the Contractor's bills, Performance Guarantee/ Security Deposit or any other dues of Contractor with the Government of India.

PART-II ANNEXURES

ANNEXURE – VII

Reference Para 17B

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 liquidated damage fixed earlier) will be recovered from you as mentioned in Clause 17B of the Standard 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 Standard General Conditions of Contract.

Yours faithfully

For and on behalf of the President of India

PROFORMA OF 14 DAYS NOTICE FOR OFFLOADING OF PART OF CONTRACT WORK**RAILWAY**

(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 40A of the Standard 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 40A of the Standard 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 on behalf of the President of India

NOTICE FOR PART OF CONTRACT WORK OFFLOADED

_____ **RAILWAY**

(Without Prejudice)

To

M/s _____

Dear Sir,

Contract Agreement No. _____

In connection with _____

1. Fourteen days' notice under Clause 40A of the Standard 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 40A of the Standard 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 A of the Standard 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 alongwith 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 (A) or/and 45 (B) of the Standard 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.....:

Tenderer/s

For Dy.CE(C)BSL

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 on behalf of the President of India

CERTIFICATE OF FITNESS

1. (a) Serial Number _____
(b) Date _____
 2. Name of person examined _____
 3. Father's Name: son/daughter of _____
Residing at _____
 4. Sex _____
 5. Residence: _____
 6. Physical fitness _____
 7. Identification marks _____
 8. Date of birth, if available, and/or certified age _____
I certify that I have personally examined (name) _____ 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.
- I certify 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 and cause of the physical disability should be clearly stated.

ANNEXURE – IX

(Reference Clause 62. (1)

Registered Acknowledgement Due

**PROFORMA OF 7 DAYS NOTICE FOR WORKS AS A WHOLE/ IN PARTS
(DETAILS OF PART OF WORK TO BE MENTIONED)****RAILWAY**

(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 start work/show adequate progress and/or submit detailed programme for completing the work/part of work (details of part of work 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 7 days' notice in accordance with Clause 62 of the Standard General Conditions of Contract to commence works / to make good the progress, failing which further action as provided in Clause 62 of the Standard 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 President of India

ANNEXURE – X

Reference Para 62(1)

Registered Acknowledgement Due

PROFORMA OF 48 HRS. NOTICE FOR WHOLE WORK**RAILWAY**

(Without Prejudice)

To

M/s _____

Dear Sir,

Contract Agreement No. _____

In connection with _____

Seven days' notice under Clause 62 of the Standard 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 the Standard 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 be 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 any other consequences which may please be noted.

Kindly acknowledge receipt.

Yours faithfully

For and on behalf of the President of India

ANNEXURE – XI

Reference Para 62.(1)

Registered Acknowledgement Due

PROFORMA OF TERMINATION NOTICE**RAILWAY**

(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 the Standard 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.

The Final measurements of work executed by you against the said contract will be taken/started on _____ at _____ hrs. at site. The measurement will be continued till all the measurement are taken. You are advised to be present at site on the above mentioned date and time to witness the measurements, otherwise measurements will be taken ex-parte and thereafter, variation (addendum & corrigendum) & final bill of work executed till date of termination based on ex-parte final measurements shall also be processed ex-parte.

Yours faithfully

For and on behalf of the President of India

Tenderer/s

For Dy.CE(C)BSL

PROFORMA OF 48 HRS. NOTICE FOR PART OF THE WORK.....

(DETAILS OF PART OF WORK TO BE MENTIONED)

RAILWAY

(Without Prejudice)

To

M/s

Dear Sir,

Contract Agreement No. _____

In connection with _____

1. Seven days' notice under Clause 62 of the Standard 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 the Standard 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 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 of work being executed through the part terminated contract.
4. The contract value of part terminated contract shall stands reduced to

Kindly acknowledge receipt.

Yours faithfully

For and on behalf of the President of India

ANNEXURE – XIII

Reference Para 62.(1)

Registered Acknowledgement Due

**PROFORMA OF TERMINATION NOTICE FOR PART OF THE WORK.....
(DETAILS OF PART OF WORK TO BE MENTIONED)**

_____ **RAILWAY**

(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 to be mentioned).
2. Your above part of work in contract(details of part to be mentioned) stands rescinded in terms of Clause 62 of the Standard 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 of work being executed through the part terminated contract.
4. The contract value of part terminated contract stands reduced to

Kindly acknowledge receipt.

Yours faithfully

For and on behalf of the President of India

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

Tenderer/s

For Dy.CE(C)BSL

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:_____

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(6) of the Standard General Conditions of Contract.

Signature of Claimant_____ Signature of Respondent _____

*Strike out whichever not applicable.

**Certification by Arbitrators appointed under Clause 63 & 64 of Indian Railways General
Conditions of Contract**

1. Name:
2. Contact Details:
3. Prior experience (Including Experience with Arbitrations):
4. **I do not have more than ten on-going Arbitration cases with me.**
5. I hereby certify that I have retired from Railways w.e.f. _____ and empanelled as Railway Arbitrator as per 'The Arbitration and Conciliation Act- 1996'.
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:

Insurance Surety Bond for Performance Security

Name of the issuer of surety bond:

President of India,
Acting through.....,
.....
Railway.Date:.....
.....Surety Bond No:.....
Amount of Bond:.....Issue Date:.....
Expiry Date:.....

WHEREAS, In consideration of the President of India acting through..... (Designation & address of contract signing authority),Railway,....., (hereinafter called "The Railway") having accepted the bid of M/S XXXXX hereinafter called the contractor, for the work of XXX,' under invitation for bids No XXXX, Dated XXXXX, Vide Letter of Acceptance No.....

AND

WHEREAS, the contractor is required to furnish Performance Security for the sum of ₹.XXXX (**Rupees XXXX Only**), in the form of Surety Bond, being a condition precedent to the signing of the contract agreement.

SB No:

Date

Tenderer/s

For Dy.CE(C)BSL

WHEREAS, we, _____, (Name of insurance company) hereinafter called the Surety, acting through [Designation(s) of the authorised person of the Surety], have, at the request of the M/s. XXXX contractor, agreed to give Bond for performance security/ additional performance security as hereinafter contained:

1. KNOW ALL MEN by these present that I/We, the undersigned [Insert name(s) of authorized representatives of the Surety], being fully authorized to sign and incur obligations for and on behalf of the Surety, confirm that the Surety, hereby, unconditionally and irrevocably Bond to pay the Railway the full amount in the sum of XXXX (Rupees XXXX Only) as above stated.
2. The Surety undertakes to immediately pay on presentation of demand by the Railway any amount up to and including aforementioned full amount without any demur, reservation or recourse. Any such demand made by the Railway on the Surety shall be final, conclusive and binding, absolute and unequivocal notwithstanding any disputes raised/pending before any Court, tribunal, arbitration or any authority or any threatened litigation by the Bidder or Bank.
3. On payment of any amount less than aforementioned full amount, as per demand of the Railway, the Bond shall remain valid for the balance amount i.e. the aforementioned full amount less the payment made to the Railway.
4. The Surety shall pay the amount as demanded immediately on presentation of the demand by Railway without any reference to the contractor and without the Railway being required to show grounds or give reasons for its demand or the amount demanded.
5. The Surety Bond shall be unconditional and irrevocable.
6. The Bond hereinbefore shall not be affected by any change in the constitution of the Surety or in the constitution of the Contractor.
7. The Surety agrees that no change, addition, modifications to the terms of the Contract Agreement or to any documents, which have been or may be made between the Railway and the Contractor, will in any way release us from the liability under this Bond; and the Surety, hereby, waives any requirement for notice of any such change, addition or modification to the Surety.
8. This Bond is valid and effective from the date of its issue, which is [insert date of issue]. The Bond and our obligations under it will expire on XXXX (Expiry Date). All demands for payment under the Bond must be received by us on or before that date.
9. The Surety agrees that the Railways right to demand payment of aforementioned full amount in one instance or demand payments in parts totalling up to the aforementioned full amount in several instances will be valid until either the aforementioned full amount is paid to the Railway or the Bond is released by Railway before the Expiry date.
10. The Surety agrees that its obligation to pay any amount demanded by the Railway before the expiry of this Bond will continue until the amount demanded has been paid in full.
11. The expressions Surety and Railway hereinbefore used shall include their respective successors, administrators and assigns.
12. The Surety hereby undertakes not to revoke the Bond during its currency, except with the previous consent in writing of the Railway. This Bond is subject to the Uniform Rules for Demand Bonds, ICC Publication No. 758.
13. We, the Surety Insurer, further agree that the Authority shall be the sole judge to decide as to whether the Bidder is in default of due and faithful fulfilment and compliance with the terms and conditions contained in the Bidding Documents including, inter alia, the failure of the Bidder to keep its Bid open during the Bid validity period set forth in the said Documents, and the decision of the Authority that the Bidder is in default as aforesaid shall

- be final and binding on us, notwithstanding any differences between the Authority and the Bidder or any dispute pending before any Court, tribunal, arbitrator or any other authority.
14. The Bond shall be in addition to and without prejudice to any other security Bond (s) of the contractor in favour of the Railway available with the Railway. The Surety, under this Bond, shall be deemed as Principal Debtor of the Railway.

Notwithstanding anything to the contrary contained in these presents,

- a. Our liability under this Surety Bond shall not exceed **XXXX** (Rupees **XXXX** Only).
- b. This Surety Bond shall be valid up to **XXXX** (being the date of expiry);
- c. Unless the bank is served a written claim or demand on or before **XXXX** [date of expiry] all rights under this Bond shall be forfeited and the Surety shall be relieved and discharged from all liabilities under this Bond irrespective of whether or not the original Surety bond is returned to the Surety.

Dated _____ the day of 2024

15. The Insurance Surety Bond shall be verified by sending mail to [customer.care@sbigeneral.in].

Place.....

Bank's Seal and authorized signature(s)
[Name in Block letters].....

[Designation with Code No.].....

[P/Attorney] No.

Witness

1.

2.

* * * * *

[Note: All italicized texts are for guidance on how to prepare this Insurance Surety Bond and shall be deleted from the final document.]

e-Tender Notice No.: DyCECBSL-03-2026-27 dated 22.06.2026

Name of Work: Construction work required for Yard Remodeling at Manmad, Nandgaon & Chalisgaon section including Earthwork/blanketing, Retaining Wall/drain, Minor/Major bridges and Track works including Ballast Supply in connection with Jalgaon-Manmad 4th line project of Central Railway. (Two packet System)

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SPECIAL CONDITIONS OF CONTRACT (PART-I) (SCC)

These Special Conditions of Contract will supersede the corresponding provision of the **Indian Railways Standard General Conditions of Contract (G.C.C.)** wherever there is any contradiction between the two. GCC clause shall remain in force unless the same is modified, altered, substituted partially or fully by the provisions / clauses / explanations furnished in the SCC.

1. Additions / Modifications / Substitutions to G.C.C.:

The Additions / Modifications / Substitutions to G.C.C. are as under:

S. No.	GCC Clause	Additions / Modifications / Substitutions
1.	Sub-Clause 1.01: (Page No.1 of GCC, April 2022)	<p><u>Order of Precedence of Documents:</u></p> <p><u>Add the following as Item No.(iii)</u></p> <p><i>(iii) Additional Special Conditions of Contract</i></p> <p><u>Item Nos.(iii) to (xi) should be renumbered as:</u></p> <p><i>Item Nos.(iv) to (xii)</i></p> <p><u>Add the following below Item No.(xii):</u></p> <p><i>(xiii) Any Other Specifications</i></p> <p><i>The Railway's decision in this regard will be final and binding on the contractor.</i></p>
2.	Sub-Clause 7. (Annexure-I, Tender Form (Second Sheet): (Page No.11 of GCC, April 2022)	<p><u>Right of the Railway to deal with Tenders:</u></p> <p>Add the following at the end of Sub-Clause 7:</p> <p>Should the Railway decide to negotiate with a view to bring down the rates, the original offer will still be binding in case nothing materialises out of the negotiations.</p>

S. No.	GCC Clause	Additions / Modifications / Substitutions			
3.	Sub-Clause 10.1. (Annexure-I, Tender Form (Second Sheet): (Page Nos.12 & 13 of GCC, April 2022))	Technical Eligibility Criteria: Add the following below sub- Para (b) (1) of Sub-Clause 10.1: This is a Composite Work. Definition of “Similar Work” is as under: <ul style="list-style-type: none">➤ Three similar works each costing not less than the amount equal to 30% of advertised value of each component of tender as specified below, or➤ Two similar works each costing not less than the amount equal to 40% of advertised value of each component of tender as specified below, or➤ One similar work each costing not less than the amount equal to 60% of advertised value of each component of tender as specified below.			
		Sr. No.	Primary Nature of Work	Value (Rs. In Crore)	Definition of “similar nature of work”
		1	Earthwork/blanketing in formation/cutting, Object controller Building, Dismantling Works, Utility Shifting Work (Sch. A -Part-I, II, III, Sch.-H- PART-I to IV)	40,22,46,139.89 (46.34% of the estimated cost)	As per HQ. L No. EW/187/R/465/Eligibility Criterion –II dated 17.10.2023. Sr. 2 in 2.1 “ Any Civil Engineering work involving building construction work.”
		2	Drain Work, Minor bridge, Major bridge, Retaining Wall, RUB (Sch.-B-PART-I to IV, Sch.-C-PART-I to V., Sch.-D-PART-I to V Sch.-E-PART-I to VI Sch.-F-PART-I to IV.	22,55,85,219.22 (25.99% of the estimated cost)	As per HQ. L No. EW/187/R/465/Eligibility Criterion –II dated 17.10.2023. Sr. 1 in 1.2 “ Any bridge work involving PSC/Steel/Composite Super-structure work”
		3	Track P.way Work & Ballast Supply (Schedule-G-PART-I, II).	24,01,75,668.19 (27.67% of the estimated cost)	As per HQ. L No. EW/187/R/465/Eligibility Criterion –II dated 17.10.2023. Sr. 1 in 1.2 “ Any Permanent Way work”
			Total	86,80,07,027.30	

2. A) Completion Period:

The works are required to be completed within a period of **18 (Eighteen) months including monsoon** from the date of issue of acceptance letter.

The sequence in which work is programmed to be carried out shall be represented by a network chart to be prepared by the Contractor and approved by the Engineer before commencement of the work.

B) Extension of completion Period:

The contractor shall apply for extension to completion period well in advance before expiry of completion period as per **Clause No.17 of Part-II: Standard General Condition of Contract**. In case the contractor has failed to complete the work by the agreed date of completion and neither seeks nor willing to seek extension even after expiry of the agreed date of completion, **the Railway reserves right to terminate the contract with effect from date of completion, original or extended by giving a notice to this effect.**

During the extended period of completion also, time shall be deemed to be essence of the contract.

- C) **Maintenance Period**: The work shall be maintained after completion for a period of **04 (Four) Years for works involving the construction of ROB/RUB/LHS, new Rail Briges/ROB, and re-Building of existing bridges And 03(Three) Years for tenders related to quarters and other buildings** by the contractor and he shall make good any defects, imperfection, shrinkage or faults which may appear, at his own cost.

AGREEMENT FOR WORKSCONTRACT AGREEMENT No.; Dated:

Articles of Agreement made this ____ day of _____, between the President of India acting through the Railway Administration hereinafter called the “Railway”, of the one part and _____, hereinafter called the “Contractor” on the other part.

Whereas in response to the Tender Notice No. **DyCECBSL-03-2026-27** dated **22.06.2026**, Corrigendum No. _____ dt. _____, hereto annexed as ‘**Annexure-I**’, for the work of “Construction work required for Yard Remodeling at Manmad, Nandgaon & Chalisgaon section including Earthwork/blanketing, Retaining Wall/drain, Minor/Major bridges and Track works including Ballast Supply in connection with Jalgaon-Manmad 4th line project of Central Railway”. the Contractor has submitted their **Offer dt.** _____ (Price Bid opened on _____), hereto annexed as ‘**Annexure-II**’, which has been accepted by Railways vide Letter of Acceptance (LOA) No. _____; dt. _____, hereto annexed as ‘**Annexure-III**’.

Whereas the Contractor has agreed with the Railway for the performance of the work “Construction work required for Yard Remodeling at Manmad, Nandgaon & Chalisgaon section including Earthwork/blanketing, Retaining Wall/drain, Minor/Major bridges and Track works including Ballast Supply in connection with Jalgaon-Manmad 4th line project of Central Railway”. **on or before _____._____._____ (i.e. 18 months from the date of issue of LOA)**, strictly according to the various provisions in Annexure-I, II & III, hereto attached & as per scope of work, set forth in the schedule hereto annexed upon the Standard General Conditions of Contract, corrected up to latest correction slips and the Specifications of Central Railway, corrected up to latest correction slips and the Schedule of Rates of Central Railway, corrected up to latest correction slips and the Special Conditions and Special Specifications, if any and in conformity with the drawings here-into annexed AND WHEREAS the performance of the said work is an act in which the public are interested.

NOW THIS INDENTURE WITNESSETH that in consideration of the payments to be made by the Railway, the Contractors will duly perform the said works in the said schedule set forth and shall execute the same with great promptness, care and accuracy in a workman like manner to the satisfaction of the Railway and will complete the same in accordance with the said specifications and said drawings and said conditions of contract on or before the ____ day of _____ **(i.e. 18 months from the date of issue of LOA)**, and will maintain the said works for a period of 04 (Four) Years for works involving the construction of ROB/RUB/LHS, new Rail Briges/ROB, and re-Building of existing bridges And 03(Three) Years for tenders related to quarters and other buildings from the certified date of their completion and will observe, fulfil and keep all the conditions

therein mentioned (which shall be deemed and taken to be part of this contract as if the same had been fully set forth herein) AND the Railway do hereby agree that if the Contractor shall duly perform the said works in the manner aforesaid and observe and keep the said terms and conditions, the Railway will pay or cause to be paid to the Contractor for the said works on the final completion thereof the amount due in respect thereof at the rates specified in the schedule hereto annexed.

In witnesseth whereof the parties have hereunto set and prescribed their respective hands and / or seal, the day, month and year respectively mentioned against their respective signature.

Signature of Contractor
Address:

Dy.Chief Engineer(C)/BSL
Central Railway, BSL
For and on behalf of
The President of India.

Date:

Signature of Witnesses:

(1).....

(2).....

APPENDICES***Appendix-I*****e-Tender Notice No.: DyCECBSL-03-2026-27 dated 22.06.2026**

Name of Work: “Construction work required for Yard Remodeling at Manmad, Nandgaon & Chalisgaon section including Earthwork/blanketing, Retaining Wall/drain, Minor/Major bridges and Track works including Ballast Supply in connection with Jalgaon-Manmad 4th line project of Central Railway”.

PARTICULARS OF TENDER(S)

1. Full name of Contractor/ Construction firm	
2. Year of establishment of Firm	
3. Registered Head Office Address, Telephone no, Fax no, E-mail address.	
4. Branch office Address, Telephone no, Fax no, E-mail address	
5. Details of Constitution of firm, names of Partners/ Executives/Power of Attorney holders, etc.	
6. Particulars of Registration with Government/ Semi-Govt. Organisation, Public Sector Undertaking & Local Bodies etc.	

e-Tender Notice No.: DyCECBSL-03-2026-27 dated 22.06.2026

Name of Work: “Construction work required for Yard Remodeling at Manmad, Nandgaon & Chalisgaon section including Earthwork/blanketing, Retaining Wall/drain, Minor/Major bridges and Track works including Ballast Supply in connection with Jalgaon-Manmad 4th line project of Central Railway”.

LIST OF WORKS COMPLETED in last 07 (seven) years, ending last day of month previous to the one in which tender is invited

Sr No	Name of Work	Name of Organization for whom executed and Contract awarding authority	Contract agreement No and date of Award	Approx. Value of contract		Date of Commencement	
				Agreement value	Final Value	Scheduled	Actual
1	2	3	4	5	6	7	8

Date of Finish		Period of completion		Main features of the work	Remarks
Scheduled	Actual	Scheduled	Actual		
9	10	11	12	13	14

Note:

- (i) *Supporting documents/certificates (duly attested) from the organisations with whom worked/are working should be enclosed.*
- (ii) *Certificate from private individuals for whom such works are executed/ being executed shall not be accepted.*

e-Tender Notice No.: DyCECSL-03-2025-26 dated 22.06.2026

Name of Work: Construction of Platforms, Good Shed, Earthwork/ blanketing in formation/cutting, Retaining Wall & Drain, COP &, FOB extension, Bridge (Br. No.371/3,371-4,372-1,373-1,373-2,374-1,374-2,374-3,375-1), Object controller Building, etc. work and Dismantling and Track Works for Pachora Jamner Yard Remodelling, including Ballast Supply in connection with Jalgaon-Manmad 4th line project of Central Railway. (Two packet System)

LIST OF WORKS ON HAND: DETAILS OF EXISTING COMMITMENTS, BALANCE AMOUNT OF ONGOING WORKS AND WORKS AWARDED NOT YET STARTED

All works in progress and also the works which are awarded to tenderer but yet not started up to the date of opening of tender. In case of no works in hand, a 'NIL' statement should be furnished. This statement should be submitted duly verified by Chartered Accountant.

Sr No	Name of Work	Name of Organization for whom executed and Contract awarding authority	Contract agreement No and date of Award	Approx. Value of contract			Date of Commencement	
				Agreement Value	Payment received	Approx. balance to be received	Scheduled	Actual
1	2	3	4	5	6	7	8	9
Date of Finish		Period of completion		% age Progress		Reasons for Delay, if any	Main features of the work	Remarks
Scheduled	Expected	Scheduled	Expected	Physical	Financial			
10	11	12	13	14	15	16	17	18

Note:

- (i) Supporting documents/certificates (duly attested) from the organisations with whom worked/are working should be enclosed.
- (ii) Certificate from private individuals for whom such works are executed/ being executed shall not be accepted.

Tenderer/s

For Dy.CE(C)BSL

e-Tender Notice No.: DyCECBSL-03-2026-27 dated 22.06.2026

Name of Work: “Construction work required for Yard Remodeling at Manmad, Nandgaon & Chalisgaon section including Earthwork/blanketing, Retaining Wall/drain, Minor/Major bridges and Track works including Ballast Supply in connection with Jalgaon-Manmad 4th line project of Central Railway”.

**LIST OF PERSONNEL / ORGANISATION AVAILABLE ON HAND AND PROPOSED
TO BE ENGAGED FOR THE SUBJECT WORK**

Sr. No.	Name & Designation	Qualification	Professional Experience	Remarks

Note- Supporting documents should be attached

I hereby certify that no retired Engineer/Gazetted Officer of the Railways who has retired within 1 year of date of submission of tender and has not obtained permission of competent authority has been engaged by me/our firm. I also certify that none of my relative is engaged in Engineering Department in Central Railway.

Signature of Tenderer(s)

e-Tender Notice No.: DyCECBSL-03-2026-27 dated 22.06.2026

Name of Work: “Construction work required for Yard Remodeling at Manmad, Nandgaon & Chalisgaon section including Earthwork/blanketing, Retaining Wall/drain, Minor/Major bridges and Track works including Ballast Supply in connection with Jalgaon-Manmad 4th line project of Central Railway”.

A. LIST OF PLANT & MACHINERY (OWNED) AVAILABLE ON HAND AND PROPOSED TO BE INDUCTED ON THE SUBJECT WORK

Sr. No.	Particulars of equipment's	No. of units	Kind/Make	Capacity	Age and condition	Remarks

B. LIST OF PLANT & MACHINERY PROPOSED TO BE HIRED FOR THE WORK

Sr. No.	Particulars of equipment's	No. of units	Capacity	Remarks

e-Tender Notice No.: DyCECBSL-03-2026-27 dated 22.06.2026

Name of Work: “Construction work required for Yard Remodeling at Manmad, Nandgaon & Chalisgaon section including Earthwork/blanketing, Retaining Wall/drain, Minor/Major bridges and Track works including Ballast Supply in connection with Jalgaon-Manmad 4th line project of Central Railway”.

DECLARATION FOR SITE VISIT

I/We hereby solemnly declare that I/We visited the sites of work personally and have made myself/ourselves fully conversant of the conditions therein and in particular the following:

- (i) Topography of the area
- (ii) Soil strata at site of work
- (iii) Sources and availability of construction materials
- (iv) Rates for construction materials, water, electricity including all local taxes, royalties, octroi, etc.
- (v) Availability of local labour (both skilled and unskilled) and relevant labour rates and labour laws
- (vi) Existing roads, approaches, pathways to site of work
- (vii) Space for stacking of materials, stores, office etc.
- (viii) Availability and rates of private land, etc. required for various purposes
- (ix) Trees, shrubs, bushes, debris etc. required to be removed for site clearance
- (x) Need of dewatering/pumping etc.
- (xi) Climatic conditions and availability of working days and working hours
- (xii) Frequency/pattern of rail traffic, electrified tracks, road traffic etc.
- (xiii) Availability of rail/road traffic block
- (xiv) Law and order situation.
- (xv) Any other conditions, which may affect rates.

I/We have quoted my/our rates for various items in the tender schedule taking into account all the above factors likely to be encountered during execution of work. I/We shall not be entitled for any claim against Railway on account of the above factors.

Signature of Tenderer(s)

e-Tender Notice No.: DyCECBSL-03-2026-27 dated 22.06.2026

Name of Work: “Construction work required for Yard Remodeling at Manmad, Nandgaon & Chalisgaon section including Earthwork/blanketing, Retaining Wall/drain, Minor/Major bridges and Track works including Ballast Supply in connection with Jalgaon-Manmad 4th line project of Central Railway”.

MANDATE FORM FOR PAYMENT THROUGH ECS/NEFT

Firm's name	
Firm's address / Tel. No. /FAX No./Email.ID	
Name of the bank	
Bank Branch Name Address / Tel. No./ Fax No. / Email ID	
Account No. (as per Core Banking)	
Type of Account	Saving / Current / Others (please specify)
MICR Code & IFSC Code	

IMPORTANT NOTE :

Tenderer/s should ensure that they attach a copy of this ‘**Mandate Form**’, **duly verified & signed by the Bank Officials** along with the EMD instruments, in order to enable Railway to release the EMD amount quickly to the unsuccessful tenderers through ECS/NEFT.

Signature of the Tenderer/s

**MEMORANDUM OF UNDERSTANDING
FOR JOINT VENTURE AGREEMENT**

1. This Memorandum of understanding executed this _____ day of _____ 20__ between _____ (Name of Co.) _____ a company registered under the Companies Act 1956 having its registered office at _____ represented through its Director / Authorized Representative _____ (hereinafter referred to as _____ which expression shall unless repugnant to the context thereof includes its successors) of the **FIRST PART**

OR

M/s. _____ a partnership firm registered under the Indian Partnership Act 1932, having its registered office at _____ represented through its Partner Shri _____ / Authorized Representative _____ (hereinafter referred to as _____ which expression shall unless repugnant to the context thereof includes its successors) of the **FIRST PART**

AND

2. M/s. _____ (Name of Co.) _____ a company registered under the Companies Act 1956 having its registered office at _____ represented through its Director or Authorized Representative _____ (hereinafter referred to as _____ which expression shall unless repugnant to the context thereof includes its successors) of the **SECOND PART**.

OR

M/s. _____ a partnership firm registered under the Indian Partnership Act 1932, having its registered office at _____ (hereinafter referred to as _____ which expression shall unless repugnant to the context thereof includes its successors) of the **SECOND PART**

AND

3. This Memorandum of understanding executed this _____ day of _____ 20__ between _____ (Name of Co.) _____ a company registered under the Companies Act 1956 having its registered office _____ through its Director or Authorized Representative _____ (hereinafter referred to as _____ which expression shall unless repugnant to the context thereof includes its successors) of the **THIRD PART**

OR

M/s. _____ a partnership firm registered under the Indian Partnership Act 1932, having its registered office at _____ through its Partner or Authorized Representative _____ (hereinafter referred to as _____

_____ which expression shall unless repugnant to the context thereof includes its successors) of the **THIRD PART**.

4. This Memorandum of Understanding executed this _____ day of _____ 200____ between _____ (Name of Co.) _____ a company registered under the Companies Act 1956 having its registered office _____ through its Director or Authorized Representative _____ (hereinafter referred to as _____ which expression shall unless repugnant to the context thereof includes its successors) of the **FOURTH PART**

OR

M/s. _____ a partnership firm registered under the Indian Partnership Act 1932, having its registered office _____ through its Partner or Authorized Representative _____ (hereinafter referred to as _____ which expression shall unless repugnant to the context thereof includes its successors) of the **FOURTH PART**

5. This Memorandum of Understanding executed this _____ day of _____ 20____ between _____ (Name of Co.) _____ a company registered under the Companies Act 1956 having its registered office _____ through its Director or Authorized Representative _____ (hereinafter referred to as _____ which expression shall unless repugnant to the context thereof includes its successors) of the **FIFTH PART**.

OR

M/s. _____ a partnership firm registered under the Indian Partnership Act 1932, having its registered office at _____ through its Partner or Authorized Representative _____ (hereinafter referred to as _____ which expression shall repugnant to the context thereof includes its successors) of the **FIFTH PART**.

Whereas, Central Railway, Mumbai CST hereinafter referred to as Owner/Customer has invited Tender No/s. _____ hereinafter referred to as the CR Tender for the work of _____ hereinafter referred to as the said work.

Whereas, the party of the first part i.e. M/s. _____ (details to be supplied of the expertise in their field).

Whereas, the party of the second part, M/s. _____ (details to be supplied of the expertise in their field).

Whereas, the party of the third part, M/s. _____ (details to be supplied of the expertise in their field).

Whereas, the party of the fourth part, M/s. _____ (details to be supplied of the expertise in their field).

Whereas, the party of the fifth part, M/s. _____ (details to be supplied of the expertise in their field).

AND whereas parties to this MOU, have agreed to co-operate with each other to associate jointly and to form a Joint Venture Firm to participate in the CR Tender of Indian Railways.

Tenderer/s

For Dy.CE(C)BSL

Now, therefore, in consideration of the premises and mutual promises and of the undertaking contained herein, it is hereby agreed as follows:-

1. **The purpose of MOU -**

M/s. _____ and _____ agree to co-operate with each other for the purpose of joint participation in the CR Tender and in the event, the contract is awarded, to jointly execute the contract. The board interfaces and scope of work of each party is set forth below:-

2. The name of the Jt. Venture firm shall be _____ (as per Sub-Clause 17.1. of Annexure-I, Tender Form (Second Sheet))

3. The parties, hereto, represent that:

- a) They are in possession of all approvals and valid authorization for the purpose of execution of this MOU.
- b) They have not entered into any agreement/MOU of equal or similar nature with any third party for the CR Tender.

That each of the parties of the JV, agrees and undertake to place at the disposal of the JV, benefits of its individual experience, technical knowledge and skill and shall in all respects bear its share of the responsibility, including the provision of information advice and other assistance required in connection with the works. The share and the participation of the partners in the JV shall broadly be follows:

M/s. _____ %

M/s. _____ %

M/s. _____ %

M/s. _____ %

M/s. _____ %

Lead Member :

That one of the member 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%.

And all rights, interest, liabilities, obligations, work experience and risks (net profits or net losses) arising out of the contract shall be shared or borne by the Parties in proportionate to these shares. Each of the parties shall bound by guarantees, sureties required for the work as well as its proportionate share in working capital and other financial requirements.

4. The parties to this MOU undertake:

- a) That after submission of the tender, the MOU shall not be modified / altered / terminated during the validity of the tender except when modification becomes inevitable due to

Tenderer/s

For Dy.CE(C)BSL

succession laws etc., provided further that there is no change in qualification of minimum eligibility criteria by JV after change of composition. The parties to this MOU further agree that, the Lead Member shall continue to be the Lead Member of the JV.

- b) That after the contract is awarded the constitution of the J.V. firm shall not be altered during the currency of contract except when modification becomes inevitable due to Succession Law etc. but in no case the minimum eligibility criteria should get vitiated.

5. **JOINT & SEVERAL LIABILITY:**

In respect of the CR Tender, all terms shall be complied by each party on back-to-back basis as per specifications of the CR Tender or any other mutually agreed terms with the Owner/Customer. The Parties hereto shall, if awarded the contract for the project for which the Joint Venture is formed, be jointly and severally liable to the Indian Railways for execution of the project in accordance with the contract. The Parties hereto also undertake to be liable jointly and severally for the loss, damages caused to the Indian Railways in course of execution or due to non-execution of the contract or part thereof or arising out of the contract.

6. Shri _____ shall be authorized partner/person on behalf of the Joint Venture to deal with tender, to 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 CR tender/Contract. All notices/correspondence with respect to the contracts would be sent only to this authorized member of the JV Firm.
7. Notwithstanding anything contained herein, in respect of the CR Tender with regard to the internal relationship, the inter se liabilities between the parties shall be in proportion to their respective scope of work and shall be subject to the provisions of this MOU.
8. The Parties agree that with respect of the CR Tender neither Party, nor any subsidiary company of either Party, nor any joint venture company or any other entity, in which the Party/ies, is or are in any way interested, shall compete together with or through any third party, nor shall the Parties advise, consult for, engage in or otherwise assist in any way any person or entity or any affiliate thereof in respect of any orders or contracts related to the CR Tender.

9. **Responsibility**

Each party shall assume and accept full responsibility for its Scope of Work and the obligations imposed in the Contract and in this MOU as if it was, with regard to its Scope of Work, an independent partner contracting individually with the Customer. In the event of any defect and damage or any claim arising from the Customer under the Contract or any third party in relation to or as a consequence of any failure to meet the performance specification the Party, within whose Scope of Work the claim arises, shall be entirely responsible for the claim and shall indemnify and hold harmless the other Party from any liability, demand, claim burden cost, expense attorney's fees and costs arising from thereof.

10. **Assignability**

No party to the Joint Venture has right to assign or transfer the interest, right or liability in the contract without the written consent of the other party and that of the Railway.

11. **Use of Machinery, Instruments, Labour Force etc.**

The Parties hereto undertake that whatever the machinery, instruments, Labour force (including unskilled, skilled, inspectors, Engineers etc.) they possess at the time of entering into Joint Venture Agreement or which subsequently shall come in their possession and if such machinery, instruments, labour force is required for the speedy and efficient execution of the

work, the Party/Parties having the control over the said machinery, instrument, labour force etc. without having any regard to their share of profit and loss agreed to between the Parties in Joint Venture Agreement shall hand over the same at the disposal of the other party who is actually executing the work for purpose of execution of the contract without any hindrances and obstacle.

12. Duration of MOU

It shall be valid during entire currency of contract including the period of extension, if any and also till the maintenance period is over or till all the contractual liabilities including warranty/guarantee obligations are discharged completely.

13. Applicable Law

This MOU and any arrangement/agreements regarding the performance shall be construed and interpreted in accordance with and governed by the Laws of India and shall be subject to the exclusive jurisdiction of the courts at MUMBAI.

14. Settlement of Disputes

In the event of disputes arising from this MOU, the Parties to the MOU undertakes to endeavour to settle the said disputes amongst them amicably. However, if the parties fail to resolve the disputes amongst them amicably, the said disputes arising out of or in connection with the present MOU shall be resolved through Arbitration as per the provisions enshrined under the Arbitration and Conciliation Act, 1996 or/and amendments thereof.

15. All communications or notices provided for herein shall be in English language and be delivered, mailed, or tele-faxed to the Parties addresses as indicated below :-

M/s.-----

M/s.-----

All correspondence and notices to the Joint Venture shall be addressed to the Lead Member, i.e. M/s. _____/Shri _____ at the address stated herein below:-

M/s. -----

Such communication or notices shall be deemed to have been duly given when so delivered or, if mailed, when received at destination.

16. Each part shall have full and sole responsibility to bear the expense of and effect the payment of any taxes, duties, special insurance, fees or assessments of any nature whatsoever (including personal income taxes level or imposed on any of its employees or personnel or any of its sub-contractor's employees or personnel) including penalties and interest, if any, levied in connection with the execution of this MOU.
17. The parties to this MOU declare and certify that they have not been black listed or debarred by Railways or any other Ministry/Department of the Govt. of India/State Govt. from participation in tenders/contract on or before the date of opening of bids either in their individual capacity or the JV firm or partnership firm in which they were member/partners.

In witness whereof, the Parties have caused this MOU to be executed by their respective authorized representatives on the date and year mentioned herein above.

Signature:-

Shri _____ of

M/s. _____

Signature:-

Shri _____ of

M/s. _____

Signature:-

Shri _____ of

M/s. _____

Signature:-

Shri _____ of

M/s. _____

Signature:-

Shri _____ of

M/s. _____

Witnesses:-

1) Name :

2) Name:

Address:-

Address:-

SECTION
“*B*”
SPECIAL
CONDITIONS
OF CONTRACT
(Part-II)

e-Tender Notice No.: DyCECBSL-03-2026-27 dated 22.06.2026

Name of Work: “Construction work required for Yard Remodeling at Manmad, Nandgaon & Chalisgaon section including Earthwork/blanketing, Retaining Wall/drain, Minor/Major bridges and Track works including Ballast Supply in connection with Jalgaon-Manmad 4th line project of Central Railway”.

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Tenderer/s

For Dy.CE(C)BSL

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SPECIAL CONDITIONS OF CONTRACT (PART-II)

1. These special conditions supplement the Regulations and Conditions of Tenders and Contracts (Section A), the **Indian Railways Standard General Conditions of Contract (G.C.C.)** and the notes appearing under the relevant chapters and sub-chapters of the Central Railway's Unified Standard Schedule of Rates, 2021 & CPWD DSR 2021 and should be considered a part of the contract document. Where the provisions of these conditions are at variance with the Standard General Conditions of Contract, these special conditions shall prevail.

The **Indian Railways Standard General Conditions of Contract (G.C.C.)** will mean the Standard General Conditions of Contract as amended and/or corrected from time to time and up to the date of opening of the tender. It should be the responsibility of the Contractor before submitting his tender and again before entering into said agreement to ascertain all amendments and or corrections made to the said Standard General Conditions of Contract.

2. The code Nos., Description and Rates given in the schedule are based on the Central Railway's Unified Standard Schedule of Rates, 2021 (USSOR, 2021) & CPWD DSR 2021. Any discrepancy noticed during the execution of the work, in the working rates, quantity of cement etc., will be rectified by reference to the printed schedule which shall be treated as authoritative and binding on the contractor. The relevant notes applicable to the respective Sub-chapters will apply to the items of the tender schedule and should be considered as having been incorporated in the Contract agreement and binding on the contractor.
3. For any other items not specially shown in the Schedule of Rates appended to the tender document, Executive Engineer will offer rates as shown in the Central Railway's USSOR, 2021 & CPWD DSR 2021, subject to the same percentage adjustment accepted in the contract being applicable to the additional items.
4. Any foot note/s appearing below the item/s of the contract schedule will take precedence over these Special Conditions. For detailed order of preference refer clause No.8 of Section A.
5. Any Specifications/conditions stated by the tenderer in the covering letter submitted along with his tender shall be deemed to be a part of the contract only to such extent as have been explicitly accepted by the Railway.

6. HIRE OF PLANT & MACHINERY AND OTHER FACILITIES:

- 6.1. The contractor shall make his own arrangements for all plant and machinery other facilities equipment, tools, including spare parts, fuel and consumable stores, and all labour and other facilities required to ensure efficient methodical execution of the work. The rates quoted and accepted shall be deemed to be inclusive of all charges of such items.
- 6.2. On the contractor's request, the Railway may, however, give on hire plant and machinery/other facilities, equipment and tools, if available spare with the Railway, without any commitment on the part of the Railway to do so, in which case, the hire charges for plant and machinery will be calculated to cover interest, ordinary repairs and maintenance charges at 5%, special repairs and maintenance charges at 10%, depreciation charges as per extant rules of the Railway, and an additional 10% on the total of these four above, on the cost of the Plant and Machinery, which will be present day market value plus freight and other incidental charges increased by 12 ½% supervision charges.
- 6.3. Hire charges for items other than plant and machinery, which do not require any form of repair and maintenance shall only take into account interest on capital, depreciation and an additional 10% on these two.

- 6.4. The hire charges per day shall be arrived at by dividing the annual hire charges by 250, which shall be assumed to be the number of working days in a year for this purpose only. These hire charges will be payable from the day the plant is handed over to the day it is returned to the Railway administration. If, however, during this period the plant remains out of order for reasons beyond the control of the contractor, or is withdrawn for periodic overhaul or any repairs, such periods shall not be counted for levy of hire charges. The contractor shall enter into a separate agreement in this respect and the terms and conditions as per the agreement will be final and binding on the contractor.
- 6.5. In the event of a plant or equipment or facility given on hire to the contractor not being returned to the railway administration in a reasonably good working order considering depreciation that it would have suffered for the period of hire, the Railway shall treat the plant/facility as on sale, as per extant orders of the Railway, from the date it was initially given on hire, withdrawing the hire terms and charges.
- 6.6. If, however, the plant and machinery/other facilities, equipment and tools requisitioned by the contractor are not available in Railway's stock or the Railway decides not to supply the same for reasons whatsoever, neither the Railway shall be bound to arrange for the supply thereof nor will the Railway's inability to supply them be accepted as an excuse for delay in the completion of the works/or for any claims thereof.

7. SUPPLY OF MATERIALS BY RAILWAYS:

- 7.1. Railway's materials issued to the contractor if any, will be used by the Contractor for the work in such quantities as are indicated in the schedule or in relevant specifications or drawings or as approved by the Engineers whose, decision thereon shall be final. Wastage of or damage to such materials in any manner shall be totally avoided. If surplus material issued, if any, is not returned in good condition immediately after completion of the work or if any quantity of material supplied by the Railway is consumed in excess or wasted or damaged or lost or not satisfactorily accounted for in that case recovery will be made from the Contractor at twice the market rate or twice book rate at the time of last issue whichever is higher plus 5% freight and 2% incidental charges plus 12 ½% supervision charges on the above cost arrived at for the quantity of material consumed in excess or wasted or damaged, lost or not satisfactorily accounted for.
- 7.2. In case it is discovered that the quantity of steel or any other items issued by the Railway as actually used in the work is less than the quantity/quantities specified to be used, the cost of steel and for other such items not so used shall also be recovered from the Contractors on the basis stipulated in sub-Para above.
- 7.3. Action under this Clause will be without prejudice to the right of the Railway to take action against the Contractor/s under the conditions of the Contract for not doing/completing the work according to the prescribed specifications and
- 7.4. Railway's materials will be issued on specific requisitions by the Contractor and as per requirement consistent with the progress of works and/or progress of supply of fabricated materials to the Railway, if the Railway materials required to be issued to the Contractor for the works, are to be taken to the Contractors workshop outside Railway premises, a guarantee bond for the amount to cover cost of Railway material should be furnished by the Contractor before such materials are issued to him.

- 7.5. All material left over as 'Surplus' or as 'scraps' out of materials supplied by the Railway, should be returned to the Railway's Stores at failing which the cost will be recovered, as per the provision of clause 10.1 of the special conditions of Contract.

8.0 USE OF RAILWAY MATERIALS SECURED WITH GOVERNMENT ASSISTANCE:

- 8.1 The Railway shall not supply from its own quota to the contractors controlled or imported commodities. Assistance will, however be given by recommending to appropriate authorities on contractor's application for issue of import licenses and release of controlled commodities if the Engineer is satisfied that this materials is actually required by the contractors for carrying out the work and is not available in the country.
- 8.2. Where any raw materials for the execution of the contract are procured with the assistance of Government either by issue from Government, stocks or purchases under arrangements made or permit(s) or license(s) issued by the Government, the Contractor shall hold the materials as trustee for the Government and use such materials economically and solely for the purpose of the contract against which they are issued and not dispose them without permission of the Government and return, if required by the Government, all surplus or unserviceable materials that may be left by him after completion of the contract or at its termination of the materials. The freight charges for the return of the materials according to the direction of the purchaser shall be borne by the contractor, in the event of contract being cancelled for any default on his part. The decision of Government shall be final and conclusive.
- 8.3. In the event of a breach of the aforesaid conditions, the contractor shall in addition to throwing himself open to action for contravention of terms of the license (s) or the permit (s) and/or for original breach of trust be liable to account to Government for all moneys, advantages or profits resulting or which in the usual course would have resulted to him by reason of such breach.

9.0 ROYALTIES AND PATENT RIGHTS:

- 9.1. The contractor shall defray the cost of all royalties, fees and other payments in respect of patents. Patent rights and licenses which may be payable to patented licensee or other person or corporation and shall obtain all necessary licenses. In case of any breach (wilfully or inadvertently) by the contractor of this provision, the contractors shall indemnify the Railway Audit officers, servants, representatives against all claims, proceedings, damages, cost charges, loss and liability which they or any of them may sustain incur or be put to by reason or in consequence of, directly or indirectly, any such breach and against payment of any royalties damages, or other monies which the Railway may have to make to any person or paid in total to the patent rights in respect of the users of any machine, instructions, process, articles, matters or thing constructed manufactured, supplied or delivered by the contractor to his order under this contract.

9.2 Payment of Royalty Charges:

a.) For all the works, except works of earth work for embankment / cutting and supply of ballast:

All rates quoted in the tender shall be deemed to be inclusive of all taxes, royalties payable by the contractor/s to the Govt. or public body or local authority and no additional amount will be paid or claim entertained on this account by the Railway. Contractor shall not have any claim whatsoever as a result of the increase in the rates for such royalties, taxes, duties or any other forms of levies etc. (Concessional Sales Tax Form and Octroi Exemption Certificate will be issued to Contractor on his specific request, if legally

permissible, but Railway shall not be responsible if such form/certificate is not accepted by the concerned authority).

b.) For works of earth work for embankment / cutting and/or supply of ballast

- i. All the rates quoted in the tender shall be deemed to be inclusive of all royalties, taxes, duties, octroi or any form of levies etc. payable by the contractor/s to the Govt. or public body or local authority as applicable on the date of opening of tender.

The rate of royalty considered in the rates of tender schedule are as per rates circulated by the Government of Maharashtra vide **Govt. Resolution dated 04.06.2021 which is Rs.600/- per brass (Rs.212.01 per cum).**

Claim towards such royalty should be unfailingly accompanied by proof of payment and rate thereof. In the absence of these, royalty payment will not be released.

- ii. However, in case of any subsequent increase in the rates of royalties, the increased amount will be reimbursed to the contractor, only on production of documentary proof of payment of royalty at such increased rates along with State Govt.'s order. It is clarified that any increase in the statutory taxes, levies, duties etc. shall not be paid by the Railway during the extended completion period if the extension is granted under clause 17(B) of the General Conditions of Contract.
- iii. Similarly in case of decrease in the rate of royalty charges or its waiver, payment of royalty will be regulated by such reduced rate and recovery shall be affected from the contractor accordingly.
- iv. Reimbursement/recovery, if required, shall be worked out separately and submitted along with claims for on-account payments.
- v. In case of all other taxes, duties, octroi or any form of levies etc. no additional amount will be paid or claim entertained on this account by the Railway. Contractor shall not have any claim whatsoever as a result of the increase in the rates for such taxes, duties or any other form of levies etc.
- vi. The amount of reimbursement or recovery, as the case may be, as per revised rate of royalty shall be applicable only for the quantity of works executed by the contractor after the Government Resolution for revision of rate of royalty has come into effect.
- vii. The reimbursement/recoveries as per the revised rate of royalty shall be effective only for the original completion period of the work. However, the amount as per revised rate of royalty is payable/recoverable during the extended period of the contract, provided the PVC was part of the original contract & the extension has been granted on administrative ground, i.e. under Clause 17-A(i), (ii) or (iii) of GCC. Where extensions of time has been granted due to contractor's failure under Clause 17(B) of the General Conditions of Contract, the reimbursement due to increase in rate of royalty shall not be payable for such extended periods, but in case of any decrease in the rate of royalty or its waiver, the difference in the amount will be recovered from the payment of the contractor for such extended periods under Clause 17(B) of GCC.

- 9.3. The contractor will at his own expenses obtain such permits or parwana from whomsoever necessary for carrying out work or for any other purpose as may be necessary to enable him to perform his part of the contract. The Railway will not under any circumstances be liable to obtain any permit, or parwana whatsoever, for the contractor.

10.0 Use of Patented Items in Works Contract:

- 10.1 In case, the agency supplying the patented item is not the contractor to whom the work is assigned and these items are being procured by the Contractor, the concerned contractor will obtain prior approval from the Engineer-in-charge of the work (Min. JA Grade Officer), who will ensure that all design and safety aspects are taken care of. For any specific requirement concerning execution, warranty etc. an agreement / MOU is to be entered between the main contractor and the party supplying the patented items, clearly bringing out the responsibility of party supplying such patented items. A copy of such MOU will be furnished to the Engineer-in-charge by the main contractor to whom work has been assigned by the Railway and after the approval of Engineer-in-charge, such item can be used in work.
- 10.2 The agency supplying the patented item shall provide complete details / specifications / drawings of the items including the manner in which it is to be used.
- 10.3 During the installation of such patented items, authorised representative of the firm supplying such patented / propriety items shall be present and after the execution of work, a certificate to be issued by the firm supplying the patented item in record by the concerned Engineer-in-charge executing the contract, before releasing payment for the work done.

11. LEGAL CHARGES:

A fee of **Rs.400/-** per legal document like partnership deed or power of attorney executed before or after the execution of the contract will be recovered from the contractor for obtaining legal Advice in the Law Office.

12. TAXES / ENVIRONMENT CESS:

- i). GST, Turn Over Tax on works contract, Octroi, royalty, Toll Tax, Local tax, duties / levies as well as services and any other tax levied by Central Government, State Govt. Or Local bodies, as applicable on the date of quoting the rates shall be payable by the contractor
- ii). **Environment cess of Rs.1/- per m³ of Earthwork** in filling in embankment shall be levied as per the State Govt.'s directives prevalent during execution of work.

13. INCOME TAX:

Under Section 194(C) of the Income Tax Act 1961 deduction of 2% plus surcharge if applicable on Income Tax will be made for sums paid for carrying out the work under this contract. The percentage of deduction may however vary as per the amendments if any made in the section 194(C) of IT Act 1961.

14. EMPLOYMENT OF STAFF

The contract is liable for cancellation if either the contractor himself or any of his employee is found to be a person of Gazetted rank of Engineering Department which includes Civil, Mechanical, Electrical, Signal Telecommunication Departments of Railways whether pensionable or non-pensionable who after retirement has sought engagement as contractor for or in connection with the execution of public works whether on Railway. P.W.D. or Defence Forces or as an employee of such contractor within 1 year of his retirement without obtaining the permission of the President of India before, taking up such engagement or employment.

15.0 Deployment of Qualified Engineers at Work Sites by the Contractor:

This is to be read in conjunction with Clause 26A of Indian Railways Standard General Conditions of Contract (G.C.C.), Part-II (Page No.56 of GCC, July 2022).

- 15.1 The Contractor shall employ at least two experienced graduate Civil engineers having minimum 3 years of experience in the work of construction of bridges.
- 15.2 In case the contractor fails to employ the Engineers, as aforesaid in Para 16.1, he shall be liable to pay penalty at the rate of Rs.40,000/- (Rupees Forty Thousand only) per month or part thereof, for the default period for the provisions.
- 15.3 The decision of the Engineer-in-charge as to the period & suitability for which, required technical staff was not employed by the contractor and as to the reasonableness of the amount to be deducted on this account shall be final and binding on the contractor.

16. Handling Vitiating during Variation in Contract Quantities:

- 16.1 The aspect of vitiating of tender with respect to variation in quantities should be checked and avoided.
- 16.2 As a result of variation, a contract shall be considered “vitiating” only when, the following percentage variation in contract value between tenderers are noticed to have been exceeded:

SN	Value of Contract	Percentage difference between present Contractor and new L-1 as a result of variation (percentage shall be calculated with base as the revised contract quantities multiplied by the rates of the present contractor)
1	Small value contracts (Tender value less than Rs.50 lakh)	10
2	Other than small value contracts (Tender Value equal to or more than Rs.50 lakh)	5

- 16.3 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.
- 16.4 The Railway 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.
- 16.5 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. The provisions of Railway Board's letter No.2007/CE.I/CT/18/Pt.XII dated 31.12.2010 hereby gets superseded.
 - b) These instructions will be similarly applicable to earning contracts with H-1, H-2 substituted for L-1, L-2 and so on.

- c) 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.
- d) 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.

17.0 Price Variation for Extra Items:

- 17.1 The Base Month for 'Price Variation Clause' for Extra USSOR 2021 & CPWD DSR 2021 items shall be as per **Clause 46A.2 of Indian Railways Standard General Conditions of Contract (G.C.C.), Part-II (Page No.69 of GCC, April 2022).**
- 17.2 In case of Extra NS items, the Base Month for 'Price Variation Clause' shall be taken as month of Sanction by the competent authority, unless otherwise stated elsewhere. The quarter for applicability of PVC shall commence from the month following the month of Sanction of extra items by the competent authority. The Price Variation shall be based on the average Price Index of the quarter under consideration.

18. STORAGE OF INFLAMMABLE ARTICLES:

No inflammable materials, such as petroleum oil etc. within the meaning of the Indian Petroleum Act and Indian Explosive Act shall be stored at site or adjacent land until the approval of the Railway and necessary license under the Act has been obtained by the Contractor. All due precautions required under the Acts shall be taken by the contractor.

19. ANTI-LARVAL WORKS:

The contractor shall at his cost carry out all anti-larval works as per the Bye-law of the local authorities concerned or as may be directed by the Engineer during the execution of the work/s under this contract. If the contractor/s fails to carry out such work/s the Railway may carry out the same and recover the cost thereof from the contractor in the same way, as other Railway amounts are recoverable.

20. LAND, SERVICE ROADS, APPROACHES:

- i) The Contractor has to provide a Site office (approx. 20m² area) with basic amenities to Railway staff for controlling day-to-day activities along with toilets, urinals, water/electric connections, etc. at each work site.
- ii) The rates for all items of the schedule shall be inclusive of the cost of all arrangements for crossing obstructions to be crossed in the course of the work over land or across water and the cost of providing and maintenance of approach and/or service roads that may be necessary for bringing and removing the plants, machinery and material to and from the site of work including rent for use and /or compensation for damage if any to intervening private land reversed by such approach/service roads, and including cost of acquisition of land, if required for the purpose. The contractor will be permitted to make use of available service roads of the Railways free of cost. Railway reserves the right to make use of the contractor service road without paying any charges to him.

- iii) After completion of the work, the Contractor shall clear all the land under his temporary occupancy to useable condition without any cost to CENTRAL RAILWAY and hand over to the concerned parties before the completion of Maintenance period.

21. Telephone Facilities

The Contractor shall have to make an arrangement for providing telephone facilities at the site of work at his own cost. The telephone facilities provided by the Contractor shall be allowed to be used by the Railway staff without any charges.

22. EMERGENCY WORKS / SAFE WORKING METHODS:

- i) In the event of any accident or failure occurring in, on or about the work or arising out of or in connection with the construction, completion or maintenance of the work, which in the opinion of the Engineer requires immediate attention, the Railway may bring its own workmen or other agency to execute or partly execute the necessary work or carry out repairs if the Engineer considers that the contractor is not in a position to do so in time, and charge the cost thereon, as to be determined by the Chief Engineer, CENTRAL RAILWAY, CSMT, Mumbai to the contractor.
- ii) The contractors shall at all times, adopt such safe methods of working as will ensure safety of structures, equipment and labour, Safety rules that should be adhered to are given as guidelines in Appendix-IX. If at any time, the Railway finds the safety arrangements inadequate or unsafe, the contractor shall take immediate corrective action as directed by the Railway's representative at site. Any directions in the matter shall in no way absolve the contractor of his sole responsibility to adopt safe working methods. The contractor is responsible for providing skilled personnel and adequate expert supervision so as to ensure complete safety.
- iii) The contractor shall design and execute temporary works such as form work and supports so as to ensure absolute safety of contractors personal as well as Railways staff & personnel engaged on the work. The contractor should indemnify Railway against damages and injury to workmen. Railway reserves the right to enforce safety regulations on the contractor and recover any cost which may be incurred for this purpose.
- iv) The following standard safety codes of practice may be followed for general guidance:-
 - a. IS 3764 – 1992 : Safety code for excavation
 - b. IS 3696 (Part-I) – 1987: Safety Code for Scaffolds& Ladders.
 - c. IS 3696 (Part-II) – 1991: Safety Code for Scaffolds& Ladders.
 - d. SP 70 : 2001 – Hand book on Construction Safety Practice

23. NIGHT WORK:

The provision in clause 23 of Standard General Conditions of Contract should be noted regarding execution of work between sunrise and sunset. If the Railway, is however, satisfied that the work is not likely to be completed in time except by resorting to night work, by special order, the contractor would be required to carry out the work even at night without conferring any right on the contractor for claiming extra payment for introducing night working. The decision of the engineer in this regard will be final and binding on the contractor.

24. NOTICE TO PUBLIC BODIES:

The contractor shall give to the Municipality, Police and other authorities all notices that may be required by the law and obtain all requisite licenses for temporary obstructions, enclosures and pay all fees, taxes and charges which may be leviable on account of his own operation in execution the contract. He should make good any damage to adjoining premise whether public or private and provide and maintain any light etc. required in night.

25. FIGURES, DIMENSIONS:

Figures and dimensions on drawings shall supersede measurements by scale, and drawings to a large scale shall take precedence over those to a smaller scale.

26. PLEA OF CUSTOM:

The plea of 'Custom' prevailing will not on any account be permitted as an excuse for infringement any of the conditions of contract or specifications.

27. DAMAGE FROM ACCIDENTS, FLOODS OR TIDES:

- i) The contractor shall take all precautions against damage from accidents, floods or tide. No compensation will be allowed to the contractor for his tools, plants, materials machines and other equipment lost or damaged by any cause whatsoever. The contractor shall be liable to make good the damages to any structure or part of a structure, plant or material of every description belonging to the Railway administration, lost or damaged by any cause during the course of contractor's work.
- ii) The Railway Administration will not be liable to pay to the contractor any charges for rectification or repairs to any damage, which may have occurred from any cause whatsoever, to any part of the new structures during construction. No claims in this regard will be arbitrable.

28. TRESPASS:

The contractor shall at all times be responsible for any damage or trespass committed by his agents and workmen in carrying out the work, unless such trespass is authorised by the Engineer.

29. BLASTING:

- 29.1. In the procurement, transport, storage, issue and use of explosives, the contractor shall abide by the specification and provisions incorporated in the IS Specification No.4081-1986 and IS Specification No. 4756-1992 as amended from time to time. He shall also abide by all the rules and regulations provided in the Indian Explosives Act 1884 amended from time to time and such other Acts and rules as may be enacted and laid from time to time by the Government for such works.
- 29.2. Prior to carrying out any blasting the contractor shall obtain the concurrence of the engineers and shall be at all times bound to carry out his instructions regarding provision of blanketing, the type, number, size and placing and firing of charges. Where the blasting has to be carried out close to running line, the engineer may restrict the sizes and number of shots to be fired at a time so that adjoining tracks and works are not adversely affected and so that the rock beyond the desired profile of the cutting etc. is not cracked or disturbed. Blasting in close proximity to track structures and power lines will be carried out only under traffic power blocks. For works near telephone or telegraph wires, the contractor must advise the engineer in good time, so that he can satisfy himself that safe working methods are being adopted. The

contractor will only fire charges at the time notified to him by the engineer and will observe all precautions considered necessary as ordered by the engineer. The contractor will have no claim for damages or loss due to any delay established or claimed to have occurred to the progress of any part of the work as a result of obeying such instruction of the engineer or taking such safety precautions as to the engineer may order to be taken from time to time.

30. Payment Through ECS/EFT.

- a. Tenderer should give consent in a mandate form for receipt of payment through ECS/EFT.
- b. Tenderer to provide the details of bank A/c in line with RBI guidelines for the same. These details will include bank name, Branch name and address, Account type, Bank A/c No. and bank & Branch Code as appearing on MICR cheque issued by bank.
- c. Tenderers to attach certificate from their bank certifying the correctness of all above mentioned information (as mentioned in Para (b) above.)
- d. In case of non-payment through ECS/EFT or where ECS/EFT facility is not available, payment will be released through cheques.

31. CONSTRUCTION PROGRAMME:

Construction work should be planned in such a way, that there will be unhindered progress of the bridge construction. For this purpose, construction programme will be finalised by the contractor in consultation with Engineer of CENTRAL RAILWAY, Mumbai whose decision will be final & binding.

Apart from the above, the contractor shall afford all reasonable facilities to other contractors employed by CENTRAL RAILWAY, Mumbai or by any other authority to execute work on the site. This includes instrumentation, testing, etc. In case of disputes, decisions of the Engineer shall be final & binding.

32. Records, Registers and Returns:

The Contractor/s shall maintain accurate records, plans and charts showing the dates and progress of all main operations and the Engineer shall have access to this information at all reasonable times. Records of tests made shall be handed over to the engineer's Representative after carrying out the tests. The following registers will be maintained at site by the Contractor/s, which should be seen and signed by the Contractor or his authorised representative on daily basis for compliance of instructions recorded therein for satisfactory completion of work.

(i) Site order Register and Site Instruction Register:

The Contractor/s shall properly sign in site order register, orders given by the Engineer or his representative or his superior officers and comply with them. The Contractor/s shall report the compliance to the Engineer in good time so that it can be checked.

(ii) Labour Register:

This register will be maintained to show daily strength of labour in different categories by the contractor/s.

(iii) Cement Registers:

The register will be maintained to record daily consumption of cement. The quantum of work done for the Ordinary Portland Cement issued on a particular date will also be maintained.

(iv) Steel Register: (Technical):

This register will record the receipts of steel items and details of reinforcement and members wherever steel is used.

(v) LOG book of events:

All events are required to be chronologically logged in this book shift wise and date wise. Register at item (i), (ii), (iii), (iv) and (v) will be signed by the representative of the Engineer and the Contractor will have to sign. The register, Performa Charts etc. will be the property of the Railway.

(vi) Daily progress register:

Which shall indicate daily progress of work done by the contractor shall be got signed at least once in three days Engineer in token of acceptance. The format of the Register will be advised by the Engineer.

(vii) Hindrance Register:

Which shall indicate the obstacles caused due to any reasons such as monsoon, shortage of labours, failure of machinery, natural calamities, strike, shortage of material etc.

(viii) Any other register considered necessary by the Engineer shall be maintained at site in which the representative to the Engineer and the Contractor/s or his/their authorised representative will have to sign. The registers, programs, charts etc. will be the property of the Railway.

33. Precautions while working in the vicinity of track:

(a) When the work is required to be done along or near the existing Railway track the contractor/s shall take such steps as are necessary for the safety of the track and labour working at site. He/they will also be required to program his/their working so as not to interfere with the movement of trains. In this regard, contractor will not take up the track work on running lines without the presence of authorised representative of Railway. No extra payment shall be allowed for these precautions and also for crossing track/tracks, if required during the execution of the work. It should be ensured that the ballast of the track (s) is not spoiled or mixed with earth.

(b) In addition to the precaution by the contractor/s for the safety of the track and labour, it may necessary to post flagman in same locations as an additional safety measure, for which the cost shall be recoverable from the contractor/s on the basis of the expenditure incurred by the railways enhanced by 12½% department charges. The contractor/s shall be fully responsible for any damage to or trespass caused by his/their men to any surrounding structure, Railways bear no liability whatsoever on this account.

(c) Training to Supervisors and Operators of Contractor:

The Supervisors and Operators of the Contractor proposed to be deployed at work site, which is close to the running track, shall be imparted mandatory training by the Railway about the safety measures to be adopted while working in the vicinity of running track. Engineer-in charge of the work shall decide the scale, extent & adequacy

of training. In case training is imparted at a recognized Rly training institute, the charges for the same, as decided by Rly, shall be recovered from contractor. A competency certificate to this effect to the individual Supervisor/Operator shall be issued as given below, by a Railway Officer not below the rank of Assistant level. No Supervisor/Operator of the Contractor shall work or allowed to work in the vicinity of running track who is not in possession of valid competency certificate.

Competency Certificate

Certified that Shri _____ Supervisor/Operator of M/s _____ has been trained and examined in safety measures to be followed while working in the vicinity of running Railway track for the work _____. His knowledge has been found satisfactory and he is capable of supervising the work safely. This certificate is valid only for the work mentioned in this certificate only.

Signature and designation of the officer

All the labour, materials, tools, plants etc. required for ensuring safe running of trains shall be provided by Contractor at his own cost. Wherever lookout men are provided by Railway, charges at the rate of Rs.300/- per man per day shall be recovered from Contractor.

34. WORK PREPARED AWAY FROM THE SITE:

The contractor shall give the Engineer written notice of the preparation or manufacture at a place away from site, of any materials or components to be used on the works, stating the place & time of preparation or manufacture, so that the Engineer may inspect all stages of the production process. Failure to give such notice may result in the rejection of the materials or components.

35. INTERRUPTION OF WORKS DURING MONSOON:

The contract period shall extend over a few monsoon seasons. Normal period of monsoon in the area is from 15th June to 30th September. The contractor should therefore, plan and program his work bearing this fact in mind as completion period in inclusive of monsoon.

36. COMPLETION DRAWINGS:

Contractor should submit to Railways one set of completion drawings (all detailed drawings) after completion of work, on polyester based tracing films (75 microns thick, one side mat of superior quality) in black indelible ink duly incorporating all additions and alterations in red ink along with a copy of the same on a CD, 6 blue prints and 1 copy on RTF. It will be paid under relevant item.

37. HANDING OVER OF WORK:

In addition to what has been stipulated in clause 40 of Standard General Condition of Contract, it is made clear that all the works and materials before being finally taken over by CENTRAL RAILWAY will be entirely liability of the contractor for guarding, maintaining and making good any damages of any magnitude. It is however understood that before taking over such work CENTRAL RAILWAY will not put it to its regular use as distinct from casual or incidental one except as specially mentioned elsewhere in this contract or mutually agreed to.

38. ALTERNATIVE DUE TO REJECTED WORK:

In the event of any sub-structure or super-structure are abandoned on account of rejection by the Railway, the extra cost involved in providing further alternative arrangements shall be borne by the Contractor. The rates offered shall be deemed to have provided for this contingency.

39. Determination of Contract / Determination of Contract Owing to Default of Contractor:

This shall be dealt with as per Clause 61 & 62 of Standard General Conditions of Contract.

40. SETTLEMENT OF DISPUTES:

40.1 Settlement of disputes and differences arising out of contract shall be done as per clauses 63 and 64 of the Standard General Conditions of Contract-April 2022 and amendments from time to time.

40.2 **Claims to be restricted to 20% of contract value-** The provision of Clauses 63 & 64 of the Standard General Conditions of Contract will be applicable only for settlement of claims or disputes between the parties for value less than or equal to 20% of the value of the contract and when claims of disputes are of value more than 20% of the value of the contract, provision of clause 63 & 64 and other relevant clause of the Standard General Conditions of Contract will not be applicable and arbitration will not be a remedy for settlement of such disputes.

40.3 **Arbitrators to be appointed only by General Manager of Railways.**

40.4 The Claimant Contractor shall seek reference to Arbitration to settle the disputes only within the ambit of conditions of mentioned above.

40.5 **Any dispute that arises with regard to this tender / contract shall be dealt within the jurisdiction of Mumbai Court only.**

41. Issue of Identity cards by Contractors:

- (i) The Contractor is bound to issue Identity card to each and every person employed by him and deployed for execution of the Contract work as per the prescribed format provided in the tender document (Appendix-XII), at his cost. Failure on the part of the Contractor to issue Identity cards to their employees will be treated as breach of contract conditions and therefore will be dealt as per Clause No.62 (vii) of General Conditions of Contract.
- (ii) It is mandatory on the part of every employee, deployed by the Contractors to keep in his possession the Identity card, issued by the Contractor throughout the execution of the work. Failure to possess such Identity will be treated as unauthorised presence in the Railway premises. Such persons shall be liable for prosecution as per law.
- (iii) It is mandatory for the Contractors to submit the list of the employees issued with the Identity cards and deployed for execution of the particular contract, to the Railway's Engineer at site before commencement of the work and also for any subsequent changes made during the execution of the work.
- (iv) No claims whatsoever arising out of implementation of special conditions pertaining to issue of Identity cards shall be admissible.

42. Special condition of contract for drafting the vehicle and equipment of Contractor in case of accident/natural calamities involving human lives:

- i) Railway reserves the right to withdraw/draft/take over possession of any of the vehicles and equipment of the contractor deployed by him at the work site in case of Railway accident/natural calamities involving loss of human lives occur and deploy, utilize, engage them for work of relief, restoration of Railway service etc. The said vehicles and equipment along with Drivers/operators shall be immediately handed over to Railway Administration on advice of Engineer or Engineer's Representative. The decision of the Railway as to type, number of vehicle and period of engagement shall be final and binding on the contractor.
- ii) The crew, fuel and maintenance of the vehicles during the above period shall be provided by the Contractor to the satisfaction of Railways.
- iii) The Contractor shall be paid hire charges for the drafted vehicles/equipment by operating suitable Non-Schedule items at the rates decided mutually between the Engineer and the Contractor. Operation of Non-Schedule item will be approved with the vetting of associate finance by DY. CE(C) operating the contract. However, if the Contractor is not satisfied with Engineer's decision, he may appeal to the CAO(C) within 30 days of getting the decision of the Engineer supported by the analysis of the rates claimed. The CAO(C)'s decision after hearing both the parties in the matter would be final and binding on the contractor.
- iv) In case Railway withdraws/drafts/takes possession of Contractor's vehicle/equipment, log book will be maintained by Railway's representative and it will be jointly signed by Railway's authorized representative & contractor's driver of vehicle/operator of equipment. Payment will be made accordingly on agreed rates.
- v) The contractor shall provide following information about the vehicle/equipment available with them at the time of entering into contract.

Sr. No.	Particulars of Vehicle/equipment	No. of Unit	Kind/ Make	Capacity	Age & Condition	Present Location	Remarks

43. Approval of Drawings:

- 43.1 It should be specifically noted that some of the detailed drawings may not have been finalized by the Railways and will, therefore, be supplied to the contractor as and when they are finalized. No compensation whatsoever on this account shall be payable by the Railway administration.
 - 43.2 No claim whatsoever shall be entertained by the Railway on account of any delay or hold up of the work / works arising out of delay in approval of drawings, changes, modifications, alterations, additions, omission and the site layout plans or details drawings and design and/or late supply of such materials as are required to be arranged by the Railway or due to any other factor on Railway account.
- 44. No claim for idle labours and/or idle machinery etc. on any account will be entertained. Similarly, no claim shall be entertained for business loss or any such loss.**

45. Safety measures at work site:

In addition to various instructions/provisions made in the contract document following discipline will be enforced during execution of the work at contractor's own cost.

- i) The equipment can enter Rly premises only from nominated entry points.
- ii) Even in case contractor engage separate supply agency, they have to take permission for the drivers being engaged and ensure presence of assistant driver/competent lookout man who will responsible for all action of movement of vehicle. He should be in proper uniform and with hand signals, warning device etc.
- iii) Night working should be done under direct supervision of Railway official.
- iv) All protective signals, boards etc. shall be provided by the contractor at his cost, for which no extra payment shall be made being incidental to the work.

46. Precautions while movement/Operation of vehicles/Equipment near running tracks:

- 46.1 These instructions apply to the plying of Railway's/Contractor's vehicles, trucks, trailers, working of plants/equipment/machinery near running tracks in Gauge conversion/doubling, yard remodelling or other works.
- 46.2 Do ensure that normally a road vehicle is run or machinery is worked so as to maintain a minimum distance of 6.0 m. from centre line of nearest running track.
- 46.3 Do ensure that the land strip adjacent to running tracks, where road vehicle is to ply or machinery is to work, is demarcated by lime in advance to ensure that vehicles/machinery do not come closer to 6.0m of running tracks. Wooden pegs at interval not exceeding 75 mts. should be provided along the lime marking as permanent marks.
- 46.4 If a road vehicle or machinery is to work closer to 6.0m due to site conditions or requirement of work, do ensure to observe the following precautions.
- 46.5 The road vehicle is run or machinery is worked to maintain a minimum distance of 3.5m from centre line of track.
- 46.6 Demarcation of land is done by bright coloured ribbon/nylon chord suspended on 75 cm high wooden/bamboo posts at distance of 3.5 m from centre line of nearest running track.
- 46.7 An authorized Railway's representative is present during plying of vehicle or working of machinery.
- 46.8 Suitable caution order to whistle freely is issued to drivers of approaching train about road vehicles plying or machineries working close to running tracks, whistle boards shall be provided wherever considered necessary.
- 46.9 Look out men are posted along the track at a distance of 800 m from such locations who will carry red flag whistles to warn the road vehicle/machinery users about the approaching trains. On curves where visibility is poor, additional lookout men shall be posted.
 - a) Contractor will provide lookout man
 - b) The lookout man shall be properly trained in warning to staff at work site about approaching train.

- c) Only that lookout man shall be provided at site who have been issued with a competency certificate by the railway supervisor.
 - d) In case it is felt necessary to provide lookout man by railway, it will be charged at rate of Rs.300/- per day per person and shall be recovered from contractor's payments.
- 46.10 Under unavoidable conditions, if road vehicle is to ply or machinery is to work closer to 3.5m due to site conditions or requirement of work, do ensure to observe the following precautions.
- a) Plying of vehicle or working of machinery closer to 3.5m of running track is done only under protection of track, the site is protected as per provisions of Para 806 & 807 of P.Way as case may be.
 - b) Traffic block is imposed wherever considered necessary.
 - c) Presence of a Railway's supervisor is ensured at work site.
- 46.11 When a road vehicle is reversed, do ensure the following:
- a) The location where vehicle is to take a turn is properly demarcated.
 - b) The road vehicle driver should always face the Railway track during the course of turning /reversing his vehicle.
 - c) Presence of an authorized Railway's representative is ensured at such location.
- 46.12 Road vehicle should not ply only between sunset and sunrise –
- a) Do not allow a road vehicle to ply or a machinery to work along the track during night hours.
 - b) In unavoidable situations, however, these may be allowed to work during night hours only in the presence of an authorized Railway's representative and where adequate lighting arrangements are made in addition to other precautions.
 - c) Do not allow a road vehicle machinery/plant etc. when stabled near running tracks to be left at site unattended. It should be properly secured against any possible roll off and always be manned even during off hours.
- 46.13 Electrical cables and singling cables are running along the railway line. Care shall be taken to protect such cables during execution and vehicle movements. Contractor shall take all required precautions as prescribed in Joint Procedural order for undertaking digging work in the vicinity of underground signalling, electrical and telecommunications cable as communicated vide Rly Board's letter No. 2003/Tele/RCIL/1/Pt. IX dated 24.06.2013 in this regard, copy of which can be obtained from the office of Dy.CE(C).
- 46.14 Contractor shall obtain copy of hand book on safety at construction worksite prepared by Central Railway Construction Organisation free from this office on award of contract and religiously follow all safety instructions prescribed therein to see that the work is executed in a safe manner. However GIST of safety instruction issued by Central Railway is given in Appendix-X.
- 47. Implementation of GST Act, 2017 – Procedure for payment of Contractual Bill** (Railway Board's letter No. 2016/CE-I/CT/12/GST/Pt.I; dated 29.06.2017).

On Indian Railways presently work executed by contractor is recorded in measurement books by railway, duly accepted by contractor. Railway prepares on account / final contract certificate' for the payable amount based on the work executed and the rates quoted by the contractor duly deducting various statutory taxes like – work contract tax / service

tax/royalties/income tax etc. As per applicable rates. Further, railways deposit the statutory deductions themselves to the concerned authorities.

With GST act in force, it will be the responsibility of service providers (i.e. Contractors) to submit the invoice (bill) duly segregating the GST component from the Gross amount of work executed.

(A) (i) All works contracts are to be provided with goods /service code based on the type of contract. In case contract consists of both goods & service, then interpretation regarding nature of contract shall be done as per clause 8, Chapter III of CGST Act, 2017. The goods/service code is notified by Ministry of Finance and can be downloaded from the website www.cbec.gov.in.

(ii) The 'On account / final contract certificate' shall be prepared by the Railway on the basis of quantity of work executed and agreement rates, duly segregating the GST component as detailed in Para (iii) below.

(iii) Since the agreement rates of contracts are inclusive of all taxes as per clause 37 of GCC-2014, the calculation of 'Gross amount of work executed', 'Amount of work executed excluding GST amount' and 'GST amount' in the 'on account / final contract certificate' shall be done as under:

Let Z = Gross amount of work executed on the basis of quantum of work executed and agreemental rates.

X = Amount of work executed excluding GST amount.

Y = GST amount as per applicable OST rate for that goods/service code.

Z = Percentage rate of GST for that goods/service code.

Then, $Z = X + Y$, $Y = X \cdot R / 100$.

(iv) Percentage rate of GST for various types of goods/services as finalised by GST council can be downloaded from the website www.cbec.gov.in.

(B) (i) Once the 'on account / final contract certificate' is prepared by railway and communicated to contractor, the contractor shall submit invoice (bill) on his Letter head duly segregating the 'Amount of work executed excluding GST amount' (i.e. "X" & "Y" as mentioned in Para 3(A) (iii) above) along with Invoice No. (bill No.) and all other details required under GST act. The sample GST compliant invoice is annexed herewith.

(ii) In case is liable to be registered under GST Act, Railway shall pay to the Contractor 'Gross amount of work executed' (i.e. "Z" as mentioned in Para 3A(iii) above) duly deducting all other leviable taxes like II Tax, labour cess, royalty etc. as applicable. Contractor shall be liable to pay 'GST amount' to respective authority himself. Whereas, railway shall deposit all other taxes deducted to concerned authority as is being done presently.

(iii) In case contractor is not liable to be registered under GST Act, contractor shall be paid "Amount of work executed excluding GST amount" (i.e. "X" as mentioned in Para 3A(iii) above) duly deducting all other leviable taxes like I/Tax, labour cess, royalty etc. as applicable. Railway shall deposit 'GST amount' as well as all other taxes deducted to concerned authority.

- (iv) In case any need arises to modify the Invoice (Bill) due to any reason, contractor shall submit amended fresh invoice for processing the payment.

Note:-

- ❖ All rates quoted in the tender shall be deemed to be inclusive of GST (Goods Service Tax) payable by the contractor/s to the Govt. or public body or local authority as on the date of opening of tender and no additional amount will be paid or claim entertained on this account by the Railway.
- ❖ However, in case of any subsequent increase in the rates of GST, the increased amount will be reimbursed to the contractor, only on production of documentary proof of payment of GST at such increased rates along with State/Central Govt.'s order.
- ❖ Similarly in case of decrease in the rate of GST charges or its waiver, payment of GST will be regulated by such reduced rate and recovery shall be affected from the contractor accordingly.
- ❖ Reimbursement, if required, shall be worked out separately by the contractor and submitted along with claims for on-account payments.
- ❖ Recovery, if required, shall be worked out separately by Railways and the amount so worked out shall be deducted from Contractor's Bills for on account payments.
- ❖ The amount of reimbursement or recovery, as the case may be, as per revised rate of GST shall be applicable only for the quantity of work executed by the contractor after the Government Resolution for revision of rate of GST has come into effect.
- ❖ The reimbursement/recoveries as per the revised rate of GST shall be effective only for the original completion period of the work. However, the amount as per revised rate of GST is payable / recoverable during the extended period of the contract, and the extension has been granted on administrative grounds i.e. under Clause 17-A (i), (ii) or (iii) of GCC. Where extensions of time has been granted due to contractor's failure under Clause 17 (B) of the General Conditions of Contract, the reimbursement due to change in rate of GST shall not be payable for such extended period, however decrease in the rate of GST or its waiver, the difference in the amount will be recovered from the payment of the contractor for such extended periods under Clause 17 (B) of GCC.

The provision made by these amendments or by any further orders of the Railway Board in connection with the provision of the CGST and SGST Acts, as on the date of opening of the tender, will supersede any other provision in this Tender document if in contradiction.

48. MEASUREMENT AND RECORDING OF 'EXECUTED WORKS' BY THE CONTRACTOR IN RAILWAY CONSTRUCTION WORKS:

(Railway Board's letter No. 2016/CE-I/CT/14/Measurement/3; dt.21.09.2017 & No.2017/CE-I/CT/9; dt.31.05.2023)

Contractor shall be responsible for carrying out measurements of work executed and recording of measurements for the release of on account/final payment. In such cases, the detailed procedure for recording of measurements, provisional payment, test check and final payment shall be as follows:

Measurement recorded by the Contractor shall be test checked by Railway within 45 days of submission of measurements.

While processing 75% provisional payment bill, concerned Executives shall ensure that supply items given by the Contractor are commensurate with requirement for execution of works.

Tenderer/s

For Dy.CE(C)BSL

The word Deputy CE or its equivalent shall mean equivalent Branch Officer of the Division/RE organization. XEN/AXEN shall mean their equivalent counterparts in Division/RE organization.

Contractor's Measurement Book:

1. Railway shall arrange contractor's measurement book (CMB), each having sheet No. 1A to 4A (Form E 1313), followed by 100 machine number pages (Form E 1313, sheet No. 5A) (Appendix-XIII/1A to 5A). On the top of each sheet of CMB, there shall be provision for recording the name of the work, agreement number, name of contractor and CMB number.
2. CMBs shall be printed in such a way so as to keep a clear margin of 50 mm on the left side of page. Further, the left side shall have pinhole tear line at a distance of 15 mm from edge for ease of taking out sheets from these books. The binding shall be within 15mm of the margin available between edge and pinhole tear line. This shall ensure availability of minimum 35 mm clear margin to re-bind measurement books later on.

Movement and upkeep of Contractor's Measurement Book:

3. Dy.Chief Engineer in charge of contract (Dy.CE/C) shall hand over required No. of CMBs to Assistant/Executive Engineer in-charge of contract (AEN / XEN) after taking receipt of the same on sheet No. 2A (Form E.1313) for further issuance to contractor time to time as per progress of work.
4. CMB shall be registered with unique No. in the Register of Measurement Books (Form E.1314) maintained in the office of Dy.CE/C. Separate accountal of CMBs for each agreement shall be maintained in the office of Dy.CE/C and AEN / XEN.
5. In case of change of 'contractor's authorized engineer', fresh approval shall be taken from Dy.CE/C before recording of measurement.
6. While issuing the CMB to contractor, AEN / XEN shall take out sheet No. 2A to 4A from the CMB, take receipt of CMB from contractor on sheet No. 3A (Form E 1313), and keep the same in safe custody.
7. Similar system as for CMB, shall be followed for issuing Field Book/ Level Book (E.131 7/A) to contractor for recording of levels in the field book/level book.

Measurement

8. The contractor's authorized engineer shall record the measurements in CMB neatly in his own handwriting, without any use of eraser/overwriting, without use of any typing fluid or any such thing. All cuttings shall be initialed. No page shall be damaged / destroyed. No page shall be kept blank in between the measurements.
9. The Contractor shall communicate the date of measurement to AEN / XEN in sufficient advance to witness any measurement. Witnessing of measurement by railways is not compulsory except for initial levels in case of earthwork and hidden measurements. Initial levels of earthwork and hidden measurements are to be recorded in the presence of railway officials and test checked as prescribed.
10. In on account contract certificate, measurement shall be recorded for the items and quantities to be paid in the concerned on account contract certificate.
11. However, in every 4th on account contract certificate and final contract certificate, the recording of measurement for works executed shall include all the items and their

quantity included in previous on account contract certificates, irrespective of whether to be paid or not in the current On Account Contract Certificate/ Final Contract Certificate.

12. No payment shall be processed on Lump sum measurement taken by contractor's authorized engineer except for earthwork. For earthwork, every 4th bill shall be based on actual levels taken and detailed calculations carried out for the work done.
13. The contractor shall take out carefully from CMB the used pages of CMB with one extra blank page for processing the bill; staple them for submission to AEN / XEN along with bill, duly signing the measurements. The contractor shall keep a photocopy of the measurements with him for future reference.
14. At the time of submission of final bill, the contractor shall submit all the remaining CMBs (unused as well as partially used) with him along with bill to AEN / XEN.
15. The contractor shall submit required copies of invoice and on account contract certificate / final contract certificate (similar to form E.1337 and Form E.1338) to the AEN / XEN duly marking them - original or duplicate copy. Original shall be used for release of payment whereas duplicate copies shall be used for record purpose in different offices.
16. In case contractor requires provisional payment of on-account bill, the contractor shall submit his invoice and provisional on account contract certificate for 75% of amount of work done (before deduction of taxes). The contractor shall write 'For Provisional Payment' on top of such on-account contract certificate.
17. AEN/XEN while issuing receipt of stapled sheets of CMB to contractor shall clearly record the same in sheet 4 (E.1314) of concerned CMB, kept in the office of AEN / XEN.

Release of Provisional Payment

18. Senior Section Engineer / 'Junior Engineer with 5 year experience' (SSE/JE) and AEN / XEN shall sign & record a certificate on the original provisional 'on account contract certificate' as under:

"Certified that the payment being made is less than the amount due for the quantities of works executed by the contractor".

In case of payment of earthwork items in any contract, calculation of quantity of such items along with field book / level book must be enclosed. This shall be cross checked, as considered appropriate by SSE/JE & AEN/XEN, to ensure that no excess payment is being made.

At this stage no test check of measurements by railway is required.

19. AEN / XEN shall keep a copy of contractor's invoice & provisional on account contract certificate in his office, and submit original invoice & original provisional on account contract certificate along with required number of duplicate copies, and used sheets of CMB to the Dy.CE/C unit for passing the bill and release of payment.
20. The provisional on account contract certificate shall be passed by Dy.CE/C and payment shall be released by associate finance based on above certification of SSE/JE and AEN / XEN. After release of payment, blank sheet of CMB (if any) shall be crossed by Dy.CE/C before sending the measurement sheets back to AEN / XEN for carrying out required test checks. At this stage measurements shall not be crossed.
21. No provisional payment shall be allowed in final contract certificate. Further, once provisional payment has been released in any on-account contract certificate, the next on account contract certificate can be raised by contractor only when accounts of previous on account certificate (Provisional as well as remaining payment) has been finalised.

Tenderer/s

For Dy.CE(C)BSL

Test Check

22. Necessary test checks shall be carried out by the SSE/JE and AEN/XEN for the works done before full payment of on-account contract certificate/final contract certificate. SSE/JE and AEN / XEN shall communicate the date of test checks to contractor in advance. The contractor can accompany during test check. The contractor shall provide support staff and all required tools & plants to facilitate test check by railway officials.
23. The stipulated test checks for AEN / XEN and SSE/JE Level is tabulated as under:

S. No.	Description of Works	Test Check in terms of % of value by	
		SSE / JE	AEN / XEN
(a)	Measurement of Ballast, pitching stone, Earth work and hidden items	100%	100%
(b)	Measurement of all other items	100%	20%
(c)	Initial and Final levels along centre line for earthwork in embankment and cutting	100%	100%
(d)	Intermittent levels along centre line for earth work in embankment and cutting	100%	20%
(e)	Initial, intermittent and final levels except centre line for earth work in embankment and cutting	100%	20%

Note: The check regarding levels of earthwork invariably shall be carried out in cross sections having heavy cross slopes.

24. Contractor's recorded measurement sheets shall be checked for any corrections/ over writing during test check. All the corrections/over writing shall be initialed by SSE/JE.
25. The discrepancy noted (if any) during test check of recorded measurement shall be communicated by AEN / XEN to the contractor.
26. In case of discrepancy noticed during test check, the contractor shall submit original and required copies of fresh invoice of amount corrected for discrepancy, and in case provisional payment has been released earlier, the required copies of fresh invoice of remaining amount corrected for discrepancy (if any), along with on account/final contract certificate to AEN / XEN.

Full payment of On Account Contract Certificate/Final Contract Certificate

27. AEN / XEN shall submit original copy of invoice and on account contract certificate of remaining amount/ Final Contract Certificate, along with required number of duplicate copies and used sheets of CMB (all used/blank CMBs in case of final contract certificate), duly signed by SSE/JE and AEN / XEN to the Dy.CE/C for passing the bill and release of payment.
28. Once the payment is released, Dy.CE/C shall return back the used sheets of CMB to AEN / XEN for safe custody, duly crossing of measurements by finance officer.
29. Once all used sheets of a particular CMB is received back by AEN / XEN from Dy.CE/C, the AEN / XEN shall re-bind all 100 pages of CMB along with sheet No. 1A to 4A for submission of CMB to Dy.CE/C office. Dy.CE/C office shall record the receipt of same in sheet No. 2A of CMB and Register of Measurement Books (Form E1314).
30. The final contract certificate shall be passed by Dy.CE/C only after receipt of all CMBs (used/blank) from AEN / XEN.

31. The provisions of this Para shall be applicable to all the departments of Indian Railways and to be executed through equivalent authorities of respective departments.

49. Public Procurement (preference to Make in India) Order 2017:

(Railway Board's letter No.2015/RS(G)/779/5; dt.27.12.2017)

The work shall be carried out only with indigenous resources including men, material, machinery and financial resources. In exceptional cases, where foreign resources are proposed to be deployed, explicit prior written approval of CAO(C) shall be obtained.

50. Option to take payment from Railways through a letter of credit (LC) arrangement:

(Railway Board's letter No.2018/CE-I/CT/9; dt.04.06.2018)

- (i) For all tenders having advertised cost of Rs.10 lakh or above, the contractor shall have the option to take payment from Railways through a letter of credit (LC) arrangement.
- (ii) This option of taking payment through LC arrangement has to be exercised in IREPS (Indian Railway Electronic Procurement System – the e-application on which tenders are called by Railways) by the tenderer at the time of bidding itself, and the tenderer shall affirm having read over and agreed to the terms and conditions of the LC option.
- (iii) The option so exercised, shall be an integral part of the bidder's offer.
- (iv) The above option of taking payment through LC arrangement, once exercised by the tenderer at the time of bidding, shall be final and no change shall be permitted, thereafter, during execution of contract.
- (v) In case tenderer opts for payment through LC, following shall be the procedure to deal release of payment through LC:
 - (a) The LC shall be a sight LC.
 - (b) The contractor shall select his Advising / Negotiating bank for LC. The incidental cost towards issue of LC and its operation thereof shall be borne by the contractor.
 - (c) SBI, New Delhi, Main Branch will be the nodal branch for issue of LCs based on online requests received from Railway Accounts Units for tenders opened in financial year 2018-19. SBI branches where the respective Railway Accounts Office has its Accounts (local SBI branch) will be the issuance / reimbursing branch for LC issued under this arrangement. The Bank shall remain same for this tender till completion of contract. The incidental cost @0.15% per annum of LC value, towards issue of LC and operation thereof shall be borne by the contractor and shall be recovered from his bills.
 - (d) The LC shall be opened initially for duration of 180 to 365 days in consultation with contractor. The LC shall be extended time to time as per the progress of the contract, on request of the contractor. The value of LC to be opened initially as well as extended thereafter shall be finalised by the engineer in consultation with the contractor on the basis of expected progress of work.
 - (e) The LC terms and conditions shall inter-alia indemnify and save harmless the Railway from and against all losses, claims and demands of every nature and description brought or recovered against the Railways by reason of any act or omission of the contractor, his agents or employees, in relation to the Letter of Credit (LC). All sums payable / borne by Railways on this account shall be considered as reasonable compensation and paid by contractor.
 - (f) The LC terms and conditions shall inter-alia provide that Railways will issue a Document of Authorisation (format enclosed as Annexure XVII) after passing the

bill for completed work, to enable contractor to claim the authorised amount from their bank.

- (g) The acceptable, agreed upon document for payments to be released under the LC shall be the Document of Authorisation.
- (h) The Document of Authorisation shall be issued by Railway Accounts Office against each bill passed by Railways.
- (i) On issuance of Document of Authorisation, a copy of Document of Authorisation shall be posted on IREPS for download by the contractor. A digitally signed copy of Document of Authorisation shall also be sent by Railway Accounts Office to Railway's bank (Local SBI Branch).
- (j) The contractor shall take print out of the Document of Authorisation available on IREPS and present his claim to his bank (advising Bank) for necessary payments as per LC terms and conditions. The claim shall comprise of copy of Document of Authorisation, Bill of Exchange and Bill.
- (k) The payment against LC shall be subject to verification from Railway's Bank (Local SBI Branch).
- (l) The contractor's bank (advising bank) shall submit the documents to the Railway's Bank (Local SBI Branch).
- (m) The Railway's Bank (issuing bank) shall, after verifying the claim so received w.r.to the digitally signed Document of Authorisation received from Railway Accounts Office, release the payment to contractor's bank (advising bank) for crediting the same to contractor's account.
- (n) Any number of bills can be dealt within one LC, provided the sum total of payments to contractor is within the amount for which LC has been opened.
- (o) The LC shall be closed after the release of final payment including PVC amount, if any, to the contractor.
- (p) The release of performance guarantee or security deposit shall be dealt directly by Railway with the contractor i.e. not through LC.

SAFETY RULES

[Para 23(ii)]

1. Suitable scaffolds should be provided for workmen for all works that cannot safely be done from the ground or from solid construction except such short period work as can be done safely from ladders. When a ladder is used an extra labourer shall be engaged for holding the ladder and if the ladder is used for carrying materials as will, suitable foot-holds and hand holds shall be provided on the ladder and the ladder shall be given an inclination not steeper than one horizontal to four vertical.
2. Scaffolding or staging more than 3.5 metres above the ground or floor swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached bolted, braced and otherwise secured above the floor or platform of such scaffolding or staging and extending along the entire length thereof with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.
3. Working platform gangways and stairways should be so constructed that they should not sag unduly or unequally, and where the height of the platform or the gangway or the stairway is more than 3.5 meters above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened as described in the Para above.
4. Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 10 meters in length while the width between side rails in swung ladder shall in no case be less than 300 mm for ladder up to and including 3.5 meters in length. For longer ladders this width should be increased by at least 20 mm for each additional meter of length. Uniform steps spacing shall not exceed 300 mm. Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sides of work shall be so stacked or placed as to cause danger for inconvenience to any persons or the public.

The contractor shall provide all necessary fencing and lights to protect the public from accident, and shall be bound to bear the expenses of defence of every suit, action or other proceedings at law that may be brought by any persons for injury sustained owing to neglect of the above precautions and to pay any damages and cost which may be awarded in any such suit, action or proceedings to any such persons or which may with the consent of the contractor be paid to compromise any claim by any such person.

5. Before any demolition work is commenced and also during the process of the work: -
 - (a) All roads and open areas adjacent to the work site shall either be closed or suitably protected.
 - (b) No electric cable or apparatus which is liable to be a source of danger over a cable or apparatus used by the operator shall remain electrically charged.
 - (c) All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion of flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render it unsafe.
6. All necessary personal safety equipment as considered adequate by the Engineer-in-charge should be kept available for the use of the persons employed on the site and maintained in a condition suitable for immediate use and the contractor should take adequate steps to ensure proper use of equipment by these concerned.

- (a) Workers employed on mixing asphalt materials, cement and live mortar shall be provided with protective goggles.
 - (b) Those engaged in white washing and mixing or attaching of cement bags or any materials which are injurious to the eyes shall be provided with protective goggles.
 - (c) Those engaged in welding works shall be provided with welder's protective eyesight lids.
 - (d) Stone breakers shall be provided with protective goggle and protective clothing and seated at sufficiently safe intervals.
7. In case the contractors have to ply vehicles for the purpose connected with the contract adjacent to Railway track, the Railway Administration will be at liberty to post an experienced staff as flag man for guidance of the movements of such vehicles so as to prevent accidents and the contractor will bear wages including all etc. of the staff posted as flag man for the period of Contract for such periods during which such staff is posted for the purposes. The Railway Administration will be sole judge in the absolute discretion, of the fact that it is necessary to post any staff, that which of the staff will be suitable for the purpose, that what should be the wages and other allowance payable by the contractor for staff posted for the purpose. The Railway Administration will have a right without prejudice to other remedies to deduct the wages etc. of such staff from the bills of the contractor in respect of this contract of from any moneys or the contractor, whatsoever, available with the Railway Administration. The contractor will be liable for any over payments under Workman Compensation Act on account of any injury sustained to Railway servant during that period.
8. When the work is done near any place where there is risk of drowning, all necessary equipment should be provided and kept ready for use and all necessary steps taken for prompt rescue of any persons in danger and adequate provision should be made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.
9. Use of hoisting machines and tackle including their attachment anchorage and supports shall confirm the following standards or conditions:
- (a) (i) These shall be of good mechanical construction, sound materials and adequate strength and free from patent defect and shall be kept in good repair and in good working order.
 - (ii) Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength and free from patent defects.
 - (b) Every Crane Driver or hoisting appliances operator shall be properly qualified and no person under the age of 21 years shall be in-charge of any hoisting machine including any scaffolding.
 - (c) In case of every hoisting machine and of every cabin ring, shackle, swivel and pulley block used in hoisting or as means of suspension, safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked within the safe working load.
In case of a hoisting machine having a variable safe working load, each safe working load of the conditions under which it is applicable shall be clearly indicated. No part of any machinery or any gear referred to above in this Paragraph shall be loaded beyond the safe working load except for the purpose of testing.
 - (d) In case of departmental machine, the safe working load shall be notified by the Electrical Engineer-in-charge. As regards contractor's machines, the contractor shall notify safe working load of the machine to the Engineer-in-charge whenever he brings any machinery to site of work and get it verified by the Electrical Engineer concerned.

10. Motors, gearing transmission, electric wiring and the dangerous part of hoisting appliances should be provided with efficient safe guards. Hoisting appliances should be provided with such means as will reduce to the minimum, the risk of accidental descent of the load. Adequate precautions should be taken to reduce to the minimum, the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations, which are already energised insulating mats, wearing apparel, such as gloves, sleeves and both as may be necessary should be provided. The workers should not wear any rings, watches and carry keys or other materials, which are good conductors of electricity.
11. All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe condition and no scaffold ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near places of work.
12. These safety provisions should be brought to the notice of all concerned & displayed on a notice board at a prominent place at the work spot. The persons responsible for compliance of the safety code shall be named herein by the contractor.
13. To ensure effective endorsement of the rules and regulations relating to safety precautions, the arrangements made by the contractor shall be open to inspection by Labour Officer/Engineer-in-charge of the Department or their representative.
14. Notwithstanding the above clause from (1) to (12) there is nothing in these to exempt the contractor from the operation of any other act or Rule in force in the Republic of India.

GIST of safety instruction of Central Railway

1. The instructions/guidelines regarding safety at work site issued from time to time can be seen in the Office of **Dy.Chief Engineer(C)** at any time during office hours. The successful tenderer shall obtain copy of hand book and copies of instructions/guidelines on safety at construction worksite issued by Central Railway Construction Organisation free of cost from his office on award of contract and religiously follow all safety instructions prescribed therein to see that the work is executed in a safe manner.

The list of important instructions issued in the last five years on safety measures at work site are given as under, copies of which shall be collected by the successful bidder from the Office of the **Dy.Chief Engineer(C)** for ensuring strict compliance of execution of work:

Sr. No.	Date	Letter No.	Subject
1	28/7/2002	EW/187/R/465/9/Vol.II	Compendium on training to supervisors and operators of contractors
2	6/11/2002	EW/187/R/465/9/Vol.II	Compendium of instruction on safety issued by Northern Railway
3	9/2/2004 & 8/6/2004	EW/187/R/465/C ompendium Cir.	Handbook on safety at construction work sites
4	1/9/2004	EW/187/R/WKS-Policy/V	Correction slip No. 69 dated 23.5.2001 for Para No. 826 of IRPWM regarding safe working.
5	17/8/2006	CON/CAO(C)/Misc./Genl./2006	Safety measures to be adopted at work sites
6	15/12/2006	EW/187/R/465/Safety Policy	Safety in dismantling of bridges and structures
7	18/01/ 2008	CE Circular No. 190 vide letter No. T103/PWT/-18 / XXI dated 18.01.2008.	Procedural order for ensuring safety at work site issued by PCE, Central Railway.
8	24/06/ 2013	Rly Board's letter No. 2003/Tele/RCIL/1/Pt.IX	Procedure for Undertaking digging work in the vicinity of underground signaling, electrical and telecommunication cables.

The GIST of important instructions on the above subject are given as under:

- I. The contractor shall not start any work without the presence of railway supervisor at site.
- II. 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 & feasible as per site condition.**
 - (a) The road vehicle shall be run or machinery shall be worked so as not to come closer than 6.0m from centre line of nearest running track.

- (b) The land strip adjacent to running tracks, where road vehicle is to ply or machinery is to work, shall be demarcated by lime in advance in consultation with the Railway's supervisor. Wooden pegs at interval not exceeding 75m, shall be provided along the line marking as permanent marks. The road vehicles shall ply or machinery shall work so as not to infringe the line of demarcation.
- (c) (i) In no case the road vehicle shall run or machinery shall work at distance less than 3.5m from central line of track.
- (ii) Demarcation of land shall be done by bright coloured ribbon/nylon chord suspended on 75cm. high wooden/bamboo posts at distance of 3.5m from centre line of nearest running track.
- (iii) Railway Supervisor shall issue suitable caution order to driver of approaching train about road vehicles plying or machineries working close to running tracks. The train driver shall be advised to whistle freely to warn about the approaching train. Whistle boards shall be provided wherever considered necessary.
- (iv) Look out men shall be posted along the track at a distance of 800m from such locations who will carry red flag and whistle to warn the road vehicle/machinery user about the approaching train.
- (v) On curves where visibility is poor, addition look out men shall be posted
- (d) Under unavoidable condition, if road vehicles is to ply or machinery is to work closure to 3.5m due to site conditions or requirement of work, following precautions shall be observed.
 - *Plying of vehicle or working of machinery closure to 3.5m of running track shall be done only under protection of track. Traffic block shall be imposed wherever consider necessary.
 - *Railway supervisor shall issue suitable caution order to driver of approaching train about road vehicles plying or machineries working close to running track. The train driver shall be advised to whistle freely to warn about the approaching train.
- (e) The location where vehicle will take a turn shall be demarcated duly approved by railway representative. The road vehicle driver shall always face the Railways track during the course of turning/reversing his vehicle. Presence of an authorized Railways representative shall be ensured at such location.

III. The road vehicles will ply only between sun rise and sun set.

IV. Road vehicle shall not be allowed to run along the track during night hours generally. In unavoidable situation, however, vehicle shall be allowed to work during night hours only in the presence of an authorized railway's representative and where adequate lighting arrangement are made and where adequate precaution as mentioned earlier have been ensured.

V. Nominated vehicle and drivers will be utilised for work in the presence of at least one flagman and one supervisor certified for such work.

VI. The contractor shall fully responsible for ensuring safety and in case of any accident, shall bare cost of all damages to this equipment and men and also damages to railway and its passengers.

VII. Assistant Officer/Sr. Scale Officer shall issue competency certificate after checking license and their working to all driver of nominated vehicles/machinery. Inspector at site shall ensure that the driver who does not possess competency certificate will not work at site.

VIII. Vulnerable locations where construction work adjacent to running line can cause accident should be protected by suitable strong barrier which should be included as a paid item in

contract schedule. This location should be decided by Executive Engineer in-charge of the work at the beginning of construction and intimated to contractor in writing. The barrier should be painted with retro reflective paint at suitable interval to give warning at night.

2. Electrical cables and singling cables are running along the railway line. Care shall be taken to protect such cables during execution and vehicle movements. Contractor shall take all required precautions as prescribed in Joint Procedural order for undertaking digging work in the vicinity of underground signalling, electrical and telecommunications cable as communicated vide Rly Board's letter No. 2003/Tele/RCIL/1/Pt. IX dated 24.06.2013. Tenderers can see copy of this joint procedural order in the Office of **Dy. Chief Engineer(C)**. Successful tenderers shall obtain the copy of this order before commencement of work for their guidelines and ensuring strict compliance.
3. 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 OF Rly Board's letter No. 2003/Tele/RCIL/1/Pt. IX dated 24.06.2013 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 cable on the fixed pre-determined date and time.
4. Penalty to be imposed for damages to cable from the contractor due to default on the part of the contractor shall be as under. The decision of Engineer-In-Charge on fixing up of responsibility on contractor on this account will be final and binding on the contractor.

Cable Damaged	Penalty per Location
Only Quad cable or Signalling Cable	Rs. 1.00 Lakh
Only OFC	Rs. 1.25 Lakh
Both OFC & Quad	Rs. 1.50 Lakh
Electrical Cable	Rs. 1.00 Lakh

IDENTITY CARD OF RAILWAY CONTRACTOR'S LABOUR

(Space for Photo)

- I) Sr. No.**
- II) Name of Establishment :**
- III) Name of Contractor:**
- IV) Name of Contract Worker with address :**
- V) Signature of Card Holder :**
- VI) Signature of Contractor on the Photograph with his seal:**

**(Countersigned by concerned
Supervisor of Railway)**

Validity date of Identity Card Sr.

PERFORMANCE GUARANTEE BOND

In consideration of the President of India (hereinafter called “The Government”) having agreed to exempt _____ (here in after called “the said contractor/s) from the demand, under the terms and conditions of an agreement made between and for (***mention Name of Work with LOA No. & Date***) (here in after called “the said agreement”), of performance Guarantee for the due fulfilment by the said contractor/s of the terms and conditions contained in the said agreement, on production of a Bank Guarantee Bond for Rs. (Rupees.....only)

1. We..... (*indicate the name of the Bank*) hereinafter referred to as the Bank, at the request of ----- contractor(s) do hereby undertake to pay to the Government an amount not exceeding Rs. (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 of any of the terms or conditions contained in the said agreement.
2. We..... (*indicate the name of the bank*) do hereby undertake (and promise) to pay the amounts due and payable under this guarantee without any demur merely on a demand from the Government stating amount / claim 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. (Rupees..... Only).
3. (a) We (*indicate the name of Bank*) undertake to pay to the Government any money so demanded notwithstanding any dispute or disputes raised by the contractor(s) in any suit or proceeding pending before any court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

(b) The payment so made by us under this bond shall be a 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*) do 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 or till Office (***of LOA issuing Authority***) / Department / Ministry of _____ 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. Unless a demand or claim under this guarantee is made on us in writing on or before the _____ we shall be discharged from all liability under this guarantee thereafter.
5. We, (*indicate the name of Bank*) further agree with the Government 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 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 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 forbearance 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 would, but for this provision have effect of so relieving us.

6. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).
7. We, (*indicate the name of the Bank*) lastly undertake not to revoke this guarantee except with the previous consent of the Government in writing.

Dated: the day of for
 (indicate the name of bank)

(to be signed by two Bank Officials)

Signature of Bank Authorised official	Signature of Bank Authorised official
Name	Name
Designation	Designation
Code	Code
Full Address	Full Address

Witness

1.....

2.....

COVER**E.1313****(Sheet IA)****Railway** _____**CMB No.** _____**CONTRACTOR'S MEASUREMENT BOOK**

Department _____

Division/Construction Unit _____

Name of Work _____

Agreement No. _____

Name of Agency _____

Name to Whom Issued _____

Designation _____

Date of issue _____

Date of return _____

(Title page)

E.1313

(Sheet 2A)

Railway _____ CMB No. _____ CONTRACTOR'S MEASUREMENT BOOK	
Department _____	
Division/Construction Unit _____	
Name of Work _____	
Agreement No. _____	
Name of Agency _____	
Issued to _____ <div style="text-align: center;">(Name & designation)</div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;">_____</div> <div style="width: 10%; text-align: center;">on</div> <div style="width: 45%;">_____</div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 45%; text-align: center;">(station)</div> <div style="width: 10%;"></div> <div style="width: 45%; text-align: center;">(date)</div> </div>	
Received by _____ <div style="text-align: center;">(Signature)</div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;">_____</div> <div style="width: 10%; text-align: center;">on</div> <div style="width: 45%;">_____</div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 45%; text-align: center;">(Designation)</div> <div style="width: 10%;"></div> <div style="width: 45%; text-align: center;">(Station)</div> </div> <div style="display: flex; justify-content: flex-end; margin-top: 10px;"> <div style="width: 45%;">_____</div> <div style="width: 10%; text-align: center;">on</div> <div style="width: 45%;">_____</div> </div> <div style="display: flex; justify-content: flex-end; margin-top: 5px;"> <div style="width: 45%;"></div> <div style="width: 10%;"></div> <div style="width: 45%; text-align: center;">(date)</div> </div>	
Date of first entry _____	
Date of last entry _____	
Date received back in Division/Const. Unit office after completion of book } _____	
Certified that this Measurement Book contains 100 machine numbered pages from _____ to _____ (both pages inclusive) which have been counted by me and found correct.	
<div style="text-align: right; margin-right: 100px;">Signature _____</div> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">Date _____</div> <div style="width: 45%;">Designation _____</div> </div>	

(Sheet 3A)

Railway _____ CMB No. _____ CONTRACTOR'S MEASUREMENT BOOK					
Name of Work _____					
Agreement No. _____					
Name of Agency _____					
Issued to _____					
(Contractor's name)					
_____ on _____					
(station)			(date)		
Certified that this Measurement Book contains 100 machine numbered pages from _____ to _____ (both pages inclusive) which have been counted by me and are correct. No sheet is torn.					
I understand that the measurement book is very important document and hence shall ensure its proper upkeep and safe custody.					
Received by _____					
(Signature of contractor)					
_____		_____		_____	
(Name)		(Station)		(Date)	
Date of first entry _____					
Date of last entry _____					
Certified that this Contractor's Measurement Book pages returned by contractor have been counted by me and are correct. The details of pages received by me is as under:					
S. No.	On Account Bill No.	Page No. From To	No. of Pages	Date of receipt in AEN / XEN Office	Sign & Designation of Railway official
1					
2					
3					
4					
5					
6					
7					

(Sheet 4A)

Railway _____

CMB No. _____

CONTRACTOR'S MEASUREMENT BOOK

Name of Work _____

Agreement No. _____

Name of Agency _____

INDEX OF M.B.

[illegible]

Railway _____

CMB No. _____

Division / Construction Unit _____

*Space for Machine numbering
with six digits unique number

CONTRACTOR'S MEASUREMENT BOOK

Name of Work _____

Agreement No. _____

Name of Agency _____

INDEX OF M.B.

Particulars	No.	L.	B.	D.	Contents

SECTION

“C”

NATURE & SCOPE OF
WORK

&

ADDITIONAL
SPECIAL
CONDITIONS OF
CONTRACT

e-Tender Notice No.: DyCECBSL-03-2026-27 dated 22.06.2026

Name of Work: “Construction work required for Yard Remodeling at Manmad, Nandgaon & Chalisgaon section including Earthwork/blanketing, Retaining Wall/drain, Minor/Major bridges and Track works including Ballast Supply in connection with Jalgaon-Manmad 4th line project of Central Railway”.

NATURE & SCOPE OF WORK & ADDITIONAL SPECIAL CONDITIONS OF CONTRACT

NATURE & SCOPE OF WORK:

1.0 Introduction

“Construction work required for Yard Remodeling at Manmad, Nandgaon & Chalisgaon section including Earthwork/blanketing, Retaining Wall/drain, Minor/Major bridges and Track works including Ballast Supply in connection with Jalgaon-Manmad 4th line project of Central Railway”.

Tentative Scope of work is as under:

MMR - JL 4th Line Project (MMR, NGN, CSN Yard)			
Minor Bridges			
S. No.	Bridge No.	Span Arrangements	Type of Bridge
1	284/1	3/3.75 X 2.50	RCC BOX
2	284/2	1/3.05 X 2.30	RCC BOX
3	286/2	1/1.5 X 1.35	RCC BOX
4	286/3	1/2.65 X 2.0	RCC BOX
5	287/1	1/1.60 X 2.0	RCC BOX
6	325/1	2/2.975 X 2.05	RCC BOX
7	325/2	1/6.0 X 3.126	RCC BOX
8	326/1	2/3.99 X 3.20	RCC BOX
9	326/2	1/1.0 X 1.35	RCC BOX
10	326/3	1/1.0 X 1.35	RCC BOX
11	328/1	1/2.75 X 1.95	RCC BOX
12	329/1	1/1.0 X 1.35	RCC BOX
Major Bridges			
S. No.	Bridge No.	Span Arrangements	Type of Bridge
1	284/3	3x9.15	PSC SLAB
LHS (Extension Work)			
S. No.	Bridge No.	Span Arrangements	Type of Bridge
1	LHS 114	1/6 X 3	RCC BOX
Earthwork			
S. No.	Description	Cum	
1	In Filling	310000	
2	In Cutting	290000	
3	Cutting in Soft Rock	60000	
4	Cutting in Hard Rock	45000	
5	In Blanketing	60000	

Drain Work		
S. No.	Description	Length (Km)
1	MMR, NGN & CSN Yard	4.30
Retaining Wall		
S. No.	Description	Length (Km)
1	MMR, NGN & CSN Yard	2.50
Track Work		
S. No.	Description	Quantity
1	Linking Work	31 Km
2	Turnout Dismantling	54 Nos
3	Turnout Laying	126 Nos
4	SEJ Dismantling	60 Nos
5	SEJ Laying	120 Nos
6	DS Dismantling	0 Nos
7	DS Laying	06 Nos
Ballast Work		
S. No.	Description	CUM
1	MMR, NGN & CSN Yard	1,30,000
Utility Shifting Work		
S. No.	Description	Name of Utility
1	MMR Yard	Machine Shop at MMR Workshop
2		Cutting Shop at MMR Workshop
3		Glued Joint/Tool Room Shop at MMR Workshop
4	NGN Yard	Elevated Water Tank at NGN Yard
5	CSN Yard	CSN Booking Office
6		CSN Circulating Area
7		CSN AEN Office
8		CSN Station Building

Any other Ancillary work required for MMR, NGN & CSN Yard remodelling as directed by Engineer-in-Charge.

The above list and scope thereon are tentative and may be changed as per the requirement of work as per site condition. Actual requirement and type may therefore vary as per the requirement of the work due to technical or any other considerations. Tenderer may please note that they are bound to execute the bridge as per approved type and configuration of bridge by Railways and no claim whatever will be accepted on this account. Contractor will be bound to execute all works as per scheme decided by Railways including changes made from time to time.

NOTE:

1. The scope of work stands stated above is tentative and Railway reserves the right to modify / expand or reduce the scope of work.
2. The quantities and chainages mentioned above are tentative only for assessment of work in section. Earthwork in formation is required to be executed as per levels at site.
3. Pipe lines already laid across proposed alignments are crossing at various locations are to be encased by appropriate diameter and various types of pipes given in the schedule. These existing pipe lines have to be exposed by making manual / machine trenches, disconnection for encasing, carrying out encasing and then reconnection. The payment for the encasing of pipe will be made under relevant

Tenderer/s

For Dy.CE(C)BSL

MS/NS Items.

4. Drainage work is involved in different cutting sections & also in station yards as the casemay be
5. Safety shall be prime concern during the work as the work, is to be carried out in the vicinity of existing railway line. Shoring arrangement shall be got approved from Railway. Relevant Safety instructions contained in CE Circular No.190 issued by PCE/Central Railway vide L.No.T-103/PWT-18/XXI dated 18.01.2006 shall be implemented during execution of work. Necessary barricading, as required in safety circular shall be provided by contractor. The work will be done mostly without requiring any speed restriction on the existing Railway Line.
6. The scope of work stated above is tentative and Railway reserves the right to modify / expand or reduce the scope of work. Rail Bridge mentioned may also change.
7. Boring/Drilling operation for piling work shall be done only by Rotary Hydraulic Feed Drilling Rig as approved by Engineer-in-Charge. Boring/Drilling equipment shall have suitable & adequate accessories for boring/drilling through all the type of strata expected at site.

The location mentioned above are tentative and meant for information about scope of work at time of tendering. There may be change in location/ type of /Bridges/FOB/quarter/ service building/ anywhere in the work, etc., as per decision of Engineering in charge as per final approved drawing. Contractor will not be entitled to raise any claims on this account.

A. ADDITIONAL SPECIAL CONDITIONS OF CONTRACT:

1. The structures shown in GAD are tentative; actual size & shape of structural members of drain/RCC Structure will be as per detailed RCC/Steel design drawings. GAD is available in the office of Hd. Quarters – CSMT / Dy.CE(C)/BSL office. Tenderer may study the same before submitting the offer: -

i) It should be specifically noted that some of the detailed drawings may not have been finalized by the Railway and will, therefore, be supplied to the contractor as and when they are finalized on demand. No compensation whatsoever on this account shall be payable by the Railway Administration.

ii) No claim whatsoever will be entertained by the Railway on account of any delay or hold up of the work/s arising out of delay in approval of drawings, changes, modifications, alterations, additions, omission and the site layout plans or details drawings and design and or late supply of such material or Railway or due to any other factor on Railway Accounts.

iii) No claim for idle labour and or idle machinery etc. on any account will be entertained. Similarly, no claim shall be entertained for business loss or any such loss.

Ref: {CAO(C)CSTM's L.no. EW/187/R/465/Spl.Conditions Dt. 24.05.2007}.

2. It is primary responsibility of the contractor to obtain all necessary and statutory permissions, parvanas etc. from all concerned authorities such as Forest, Revenue Department, CIDCO, NMMC, Traffic Police, etc. However, Railway may provide necessary assistance for obtaining the permissions. Contractor is not entitled for any compensations such as idling of machinery, staff etc. on account of any delay in the work for getting these permissions.

3. There are no motorable approach roads up to most of the sites. Contractor has to make temporary approach road from the nearby motorable road, through private / government / forest land, at his own cost during the construction. It is the responsibility of the contractor to obtain necessary permission from all concern for the said temporary roads at their cost. Railway will not make any payment for making any such approaches roads, these will be incidental to the work.

4. While doing the work, if any obstruction is met with, such as water pipeline, sewerage, gas pipeline, electrical cable, telephone cable or any other structure which is to be cleared, it will be removed by the Railway at their own cost or the Tenderer/Contractor will be asked to remove the obstruction for which necessary payment shall be made to the Contractor.

5. Contractor has to provide all necessary signages, boards etc. for road traffic diversion if required. Being incidental to work, no extra payment for the same will be made. Contractor has to take all necessary precaution for the safety of the road traffic.

6. The Contractor has to provide one site office with one Conference room for capacity of minimum 10 staff duly furnished with all facilities to keep record updated and to furnish information about progress to higher ups with e- updates, fully developed lab including technical staff at site for testing of various materials. A list of equipment/machinery to be kept in the laboratory is given ANNEXURE – XIII in the tender document. No extra payment for setting up the lab will be paid to the contractor. It is expected to establish laboratory within 2 months from start of the work. If contractor fails to establish laboratory within 2 months from start of work, penalty of Rs. 5000/- per week will be imposed on the contractor till establishment of laboratory at site. Further, if contractor fails to establish laboratory within 4 months from start of work, additional fine of Rs.1,00,000/- (Rs. One Lakh only) will be recovered from the payment of the contractor. Decision of Railway Engineer will be final and binding on the contractor. After completion of work all the equipment's / machinery shall be property of the contractor.

7. As the work is away from main road, contractor will arrange road transport for Railway supervisor/staff from nearest Railway station to centralized site office and from the centralized site office to the work sites and vice versa at their cost. No payment will be made to the contractor on this account.

8. The tenderer is expected to visit the site and get him fully familiarized with the site conditions before submitting the tender. They shall consider all the site conditions likely to be encountered including availability of materials, resources, approach road and other local conditions before tendering.

9. The railway administration will not provide any facilities such as water, electric power, service roads etc. and tenderer will have to make their own arrangement for such services and also for camp, stacking material etc. However, they can make use of existing service road, if any.

10. The rate quoted by the tenderer should be inclusive of all taxes, levies, GST, royalty charges etc. leviable by State/Central Govt. or by local authorities. No claims for increase in the rates on account of increase in any type of tax (except royalty on earth), shall be entertained by Railways.

11. One AutoCAD Operator, Two Data Entry Operators shall be arranged for Railways under Railway's disposal by the contractor immediately after acceptance letter is received by the contractor and shall continue to remain till completion of the work for carrying out necessary day to day works like layout marking, assisting in measurement, handling of various survey instruments records, register etc. They can be deployed anywhere on site / Dy.CE(C)'s office for works related to this contract. The Data Entry Operator should be well conversant with computer working in MS WORD, MS EXCEL etc. for day-to-day site office working. No payment for this will be made. Failure to comply this condition will invite necessary recovery. Record of attendance of all such staff shall be maintained at the office where these staff are deployed. Rate of recovery will be: Data Entry Operator: Rs.600/- per day of absence.

12. The Contractor shall employ at least 2 qualified Graduate Civil Engineer/s having minimum 3 years if experience of the work of construction of Earthwork/ blanketing in formation/cutting and Track Works, etc. in accordance with Railway Board's letter no. 2012/CE- I/CT(/)/20 dated 10.05.2013, exclusively for this work. In case the contractor fails to employ the technical staff as aforesaid, he shall be liable to pay a reasonable amount not exceeding sum of Rs. 40,000/- (Rs. Forty Thousand Only) for each month or part thereof for the default period. Persistent failure to engage suitable technical staff suitable for this type of specialized work will lead to termination of contract under clause 62 of GCC.

13. FIRST-AID: The contractor shall maintain in a readily accessible place first aid box including an adequate supply of sterilized dressing and sterilized cotton wool. The appliance shall be placed under the charge of responsible person who shall be available during working hours.

14. For smooth execution of work and ensuring availability and implementation of the various codes, manuals, drawings etc. **One numbers** all in one Desktop/Laptop with latest configuration may be kept at site work / Site office for Railway with necessary software such as e reader etc. along with **One A4 size** all-in-one colour printer/s to facilitate the execution and monitoring of the work from the commencement of the work till the completion, at his own cost. This complete unit with all attachments will be the property of Contractor after completion of work. All the records/details and drawing will become the property of Railway after completion of work. These equipment's should be supplied within one Month after commencement of the work. *No extra payment on this account will be entertained.* Recovery of Rs.50,000/- per Computer & Rs.25,000/- per Printer will be made, if these are not provided.

15. The erection of tubular trusses & other structural members, if required to be carried out in

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day/night during traffic & power block considering safety of passengers & trains, same shall be done by contractor for which no extra payment or additional item will be paid for the same.

16. Contractor shall arrange all survey instrument such as auto level, Theodolite, Total station etc. on own cost whenever required.

17. Contractor shall arrange to provide 01 Nos. Four wheeler MUV / SUV vehicle each at either end such as Scorpio, Innova or similar vehicles continuously from commencement of work to completion of work for Railways Supervisors and Engineers and all required equipment's, tools and plants such as level, staff, theodolite etc. connected with the proposed work, for their day to day movement to site from nearest Railway station to site of work as and when required No separate payment for these facilities shall be made. The intending tenders should take into account/consider all the probable expenditure on this account while quoting the overall rate in the tender. Recovery of Rs.50000/- per month per vehicle will be made for non-provision of vehicle/s. Record of vehicles provided will be maintained at Dy.CE(C)'s office & will be produced with each bill, duly certified by the concerned Railway official using the vehicle.

18. Contractor shall depute surveyor with Total Station survey equipment having microprocessor for giving layout at every stage of the work. Otherwise, if required, for carrying out accurate survey work, survey towers should be built at minimum 3 locations. The towers should be built in two parts i.e. inner tower and outer tower, securely founded and braced. The inner tower shall support the instrument only, and the outer shall support the observer / surveyor. The inner and outer towers should be independent of each other. The height of the tower shall not be less than the pier height. The contractor shall be solely responsible for planning and erection of suitable type of towers which should be maintained throughout the construction period.

This being incidental work, no extra payment will be made to the contractor for erection of survey tower or surveying with Total station.

19. The tenderer should not stipulate any conditions while submitting his tender. Any condition quoted by the tenderer involving financial implication shall be mentioned on the offer sheet itself and the tenderer shall clearly indicate the monetary value of that condition, in absence of which such conditional offer shall be summarily rejected.

20. Contractor shall survey entire section covered under this contract to collect details of all trees required to be cut for earthwork under the contract and develop drawing showing details of trees i.e. types, diameter of girth, location of tree, species etc. Contractor has to obtain all necessary permissions required for cutting of trees from concerned department. Cost towards obtaining permission for tree cutting from concerned department will be reimbursed to the contractor by Railway on submission of original payment receipt.

Cutting of trees will be done by contractor. For this no extra payment will be made for tree girth up to 30cm (measured at a height of 1.00m above ground level). For trees of girth more than 30cm (measured at a height of 1.00m above ground level), cutting of trees will be paid under relevant updated USSOR Item.

21. The contractor shall submit a programme for completion of the work before the commencement of work.

22. All record /register regarding materials quantity, labour strength or any other register suggested by Engineer –in-charge will be maintained by contractor/ his representative.

23. All works shall be done in presence of Railway Staff.

24. At the close of daily work special care is to be taken to clear sites from loose materials to

avoid misuse of the same for sabotage.

25. In the section, other works are in progress, Contractor has to co-ordinate with those agencies for executing the work smoothly, without disturbing the work of other agencies.

26. All RCC members in contact with earth shall be painted with coal tar epoxy which will be paid under relevant item.

27. The work shall be carried out strictly in accordance with the contract specifications. In absence of any specification for any work or material, relevant Indian Standard Specifications would be applicable, and where no Indian Standard Specifications exist, relevant International specification or the specifications given by Railway would be followed. Decision of Railway in this regard would be final and binding on the contractor.

28. Any items, if not required as per site conditions can be deleted or new items required to be executed will be operated according to the modification of drawings/specifications or as per the instructions of Engineer-in-charge, governed by the provision of General Condition of Contract. No claim whatsoever in this regard shall be entertained.

29. Cement shall be supplied/arranged by contractor as per specification attached. The rates of various Concrete NS items are inclusive of cost of cement. For SOR concrete item, rates are exclusive of cost of cement thus, it shall be paid under relevant items of schedule.

30. Reinforcement steel of various diameters shall be supplied by contractor as per specification attached, payment for which (both SOR & NS items) shall be made under relevant items of schedule.

31. All the testing of material required to be done from outside laboratory shall be done from the laboratory having approval of National Accreditation Board for Laboratory Certification (NABL).

32. LIST OF APPROVED MANUFACTURERS & SUPPLIERS:

All materials and products shall conform to the relevant standard specification, BIS codes and other relevant codes etc.

The list of approved makes for products and materials is given below. Other equivalent manufacturers may also be considered with prior approval of the engineer if found confirming to all standards, subject to submission of documentary proof of non-availability of the material, from the Approved Manufacturers listed below:

SN.	Description	Approved Manufacturers
1	Cement	Ultratech, ACC, GRASIM, Ambuja, JK and Birla
2	Reinforcing steel bars	TISCO, SAIL, RINL, Jindal, Electro Steel, or (any other primary steel manufacturers) as per latest RDSO vendor list.
3	Structural steel	TISCO, TATA, SAIL, RINL, Jindal (any primary steel manufacturers)
4	Admixture	FOSROC, SIKKA or approved equivalent.
5	Shuttering oil	FOSROC, SIKKA or approved equivalent.
6	Paint	Asian Paint, Berger, Nerolac, ICI Dulux
7	Glazed/ceramic Tiles	Johnson, Kajaria, Bell, Nitco, Spartek or approved equivalents
8	G.I. Pipe	Tata, Zenith, Bharat, Prakash with ISI mark or approved equivalent
9	Flush door	Sejpal, Kutty, Orchid or other approved brands.
10	Glazing	Hindustan, Pilkington, triveni, Float glass of Modi ASAHI or approved equivalent
11	Aluminum frames/ Shutters	Jindal, Indian Aluminium section or approved equivalent
12	Hardware	Shalimar, Navbharat, Amarbhoy Dossaji or approved equivalent
13	Sanitary fittings	ISI marked or approved equivalent
14	GI fittings	ISI marked or approved equivalent

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15	Sanitary ware	Cera, Hindustan, parryware, Johnson or other approved equivalent brands.
16	PVC pipe	Prince, Supreme or approved equivalent with ISI mark.
17	SW pipe	BURN or approved equivalent.
18	Water proofing materials	Dr. FIXIT, Sunanda, Fosroc, Sika or approved equivalent.
19	Kitchen Stainless steel sink	Nirali or approved equivalent.
20.	Light weight auto calved aerated block.	Ultra tech/Siporex or approved equivalent.
21	Shuttering oil	FOSROC, Sika or approved equivalent.

Note:-

- i) Contractor shall ensure that material source and material are approved by Engineer-in- Charge before commencement of work.
 - ii) The material for which manufacturers are approved by RDSO, manufacturer's approval should be within validity period.
33. There is limited working space; therefore, the tenderer is requested to visit the site to explore the possibility of making sufficient area for stacking materials.
 34. Railways by experience have observed that shuttering material becomes bottleneck in achieving desired progress. Contractor shall, therefore, make note of this and accordingly make arrangement for required shuttering material for enabling smooth and speedy execution of work. Contractor has to arrange new shuttering material of MS shuttering plates for execution of this work. Use of plywood as shuttering material will not be permitted. Shuttering shall be properly designed and fabricated in workshop. Supporting props shall be of steel tubular pipes with screw jack type arrangement. Contractor has to arrange sufficient shuttering material (plates, props etc.). Shuttering/Formwork shall be strong enough to be suitable for pump concreting.
 35. Minimum Testing frequency of various materials is given in technical specification. Tenderer/ contractor to note that testing cost for less number of tests for any material than minimum prescribed will be recovered at the market rate from the payment of the contractor. Railway's decision in this regard will be final and binding on the contractor.
 36. The alignment, layout of circulating area/Road/Drain/RCC structure shall be given by the contractor's engineer with total station survey instrument (Leica or Trimble make) having memory and able to give points in field from stored co-ordinates of points taken from CAD drawing. Electronic Total station survey equipment shall be always available with one experience surveyor at work site for survey work.
 37. Contractor should submit to Railways one set of completion drawings (all detailed drawings) after completion of work, on polyester-based tracing films (75 microns thick, one side mat of superior quality) in black indelible ink duly incorporating all additions and alterations in red ink along with a copy of the same on a CD, 6 white prints and 1 copy on RTF. It will be paid under relevant item.
 38. Scope of Earthwork includes earthwork for rain-cuts embankment at isolated locations.
 39. Payment of earthwork and cutting shall be based on the cross section calculated on levels taken at various stages for LS bill. The final payment shall be based on the cross section on Initial Ground level and Final work done levels only.
 40. Disposal of the rejected structure: If any structure is rejected by Railway, the contractor shall dispose of the rejected structure at his own cost in the manner indicated by the Engineer. No payment will be made for construction of such rejected structures.
 41. Any temporary work done by contractor for execution of work shall be removed by the contractor immediately on completion of work at his cost.

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ANNEXURE - XIII**List of Equipment / Apparatus in Field Laboratory**

List of materials and the works. The lab should be manned, managed & maintained by suitable, qualified personnel from the contractor. The following minimum items/equipments shall be provided in the field laboratory.

1	Electronic Balance of 5 kg capacity with least count of 0.1 gm. and a physical Balance of 20 kg capacity.	2 Nos.
2	Platform balance 300 kg capacity	1 Number
4	<u>Water testing kit for chloride, sulphate and pH value</u>	1 set
5	<u>Thermo meter (Mercury in glass and digital)</u>	2 Nos. each
6	<u>Kerosene or gas stove or electric hot plate</u>	1 Number
7	<u>Glassware's, spatulas, wire gauzes, steel scales, measuring tape, casseroles, enameled trays of assorted sizes, pestle-mortar, porcelain dishes, gunny bags, plastic bags, chemicals, digging tools like pickaxes, shovels etc.</u>	As required
8	<u>First aid box</u>	1 set
9	Slump Testing Apparatus	1 Set
10	Compression strength testing machine of 200 tonne capacity	1 Number
11	Permeability testing moulds	1 Set
12	Cube mould of size 15 cm x 15 cm x 15 cm	30 Nos.
13	2 volt test apparatus for testing of CPCC / FBEC	1 Number
16	Alcometer. (Magnetic gauge)	1 Number
17	67.5 volts holiday detector for testing of fusion bonded epoxy coating to reinforcement steel	
18	All required BIS/IRS codes	1 Set
19	One 6 kg and 3 kg hammer , feeler gauges	1 each

Note: The items and their numbers listed above are tentative and shall be finally decided by the engineer in charge as per requirement of the works.

SECTION “*D*”

Technical specifications

TECHNICAL SPECIFICATIONS

1. GENERAL:

1.1. **Central Railway Specifications** for Materials & works shall be adopted. Some additional specifications are added herewith. Notwithstanding any provisions made in the C.R specifications, the provisions made in the technical specifications shall be binding. In the absence of any specification for any work on material the relevant Indian standard specification would be applicable and where no Indian standard specification exists, relevant international specification or the specification given by Railway would be followed. Decision of Railway in this regard would be final and binding on the contractor.

1.2. **Field Laboratory:** - The work covers the provision and maintenance of an adequately equipped field laboratory as required for site control on the quality of materials and the works. The lab should be manned, managed & maintained by suitable, qualified personnel from the contractor. The equipment given in Annexure XIII shall be provided in the field laboratory.

1.3. Setting Out:

The Contractors authorized/nominated Engineer/s shall establish working Bench Marks tied with the Reference Bench Mark in the area soon after taking possession of the site. The working Bench Marks/levels should be got approved from the Engineer. All dimensions and levels shown on the drawings or mentioned in documents forming part of or issued under the Contract shall be verified by the Contractor on the site and he shall immediately inform the Engineer of any apparent errors or discrepancies in such dimensions or levels.

SPECIFICATIONS FOR EARTH WORK

(As per “Comprehensive Guidelines and Specifications for Railway formation - Specification No. RDSO/2022/GE : IRS-0004, Sept. 2022”.)

Formation works:-

- (i) Earthwork in Embankments with Railway's earth.
 - (ii) Earthwork in Embankments with Contractor's earth.
 - (iii) Earthwork in Cuttings in Soil.
 - (iv) Earthwork in Cuttings in Rock not requiring blasting.
 - (v) Earthwork in Cuttings in Rock requiring blasting.
 - (vi) Supplying and Spreading Blanketing material.
- 1 The above item of work envisage earthwork in Railway Formations and other works incidental thereto including earthwork in level crossing, road approaches, trolley refuges, man refuges, side drains catch water drains, nallah diversions, road diversions and all other earthwork items incidental to the Railway Formation works as directed by the Engineer whose decision in this regard being final and conclusive.
 - 2 Without in anyway restricting or modifying the provisions of the General Conditions of Contract in this regard, the rates for the above works shall be inclusive of all costs of the following elements.
 - a) Site clearance & dough-belling as required; setting out profiles, maintenance and provisions of level pegs, centre line and other pegs, bench marks, providing necessary dressing and drainage of borrow pits in the Railway land as required, etc. complete with all Contractor's labour, materials, tools, plants and machinery including fuel, crew etc.
 - b) Excavations in borrow pits, cuttings in all types of soils, rocks etc. as applicable and in all conditions. Whether dry, moist, wet or slushy inclusive of pumping out of water as may be required for the execution of work etc. complete with all contractor's labour, materials, explosives, other consumable materials, tools, plants and machinery, fuel crew etc.
 - c) All leads; all crossings, of Railway lines, road and nallahs as required; all lifts & all descents etc. required for forming the embankments or disposing the excavated materials from the cuttings by stacking or in any other manner, in embankment, spoil dumps, stacks or any other location as directed by the Engineer whose decision in this regard being final and conclusive; providing earth bunds for stagnating water on embankments and dressing up of all slopes, surfaces etc. complete with all contractor labour, material, tools, plants and machinery including fuel, crew etc.
 - d) Spreading the earth or the excavated materials from cuttings or blanketing material in layers of specified thickness adding water as required, compaction with contractor's approved type of compacting / rolling equipment etc. complete with all contractors' labour, materials, tools, plants and machinery, fuel, crew etc.
 - e) For earthwork in embankments with Contractor's earth and supplying and spreading of blanketing material in addition to the above, the rates will be inclusive of the cost of acquisition of the earth or blanketing material, by purchase of land or payment of royalty charges or in any other manner, transportation and all other incidental works, complete, for bringing the earth or blanketing material from outside the Railway land.
 2. The payment for the earthwork and supplying and spreading of blanketing material will be made on the basis of cross sections for the compacted work as accepted by the Engineer.
 3. The quality of the materials used and the workmanship shall be as per Central Railway's relevant, Specifications as applicable and as amended up to the date of award of contract.

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4. The supply of materials and execution of the work shall conform to the following specifications in addition to the RDSO Guidelines for Earthwork in Railway Projects (GE: G-1) of July 2003 and Central Railway's relevant specifications as applicable and as amended up to the date of award of Contract.
5. Where there is a conflict between the Specifications given herein under and the Central Railway's relevant Specifications as applicable and referred to above, the provisions in RDSO Guidelines for Earthwork in Railway Project (GE No. 1) of July 2003 shall prevail.
6. The earthwork with Railway's soil shall be executed only from the borrow areas specified by the Engineer for this purpose. The earthwork with Contractor's soil and supplying and spreading of the blanketing material shall be executed from the Contractor's borrow areas after approval by the Engineer, whose decision in this regard shall be final and conclusive.
7. For the purpose of determining the suitability of the soil, the blanketing material and the measures to be adopted for the field quality control, the contractor shall extract adequate number of samples of the soil/blanketing material from the nominated borrow areas and cuttings as directed by the Engineer from time to time. The samples shall be extracted in manner specified in the relevant Indian Standard Specifications (ISS) or the Indian Standard Code of practice (ISC).
8. The soil/blanketing material samples mentioned herein above shall be tested as prescribed in the relevant ISC or ISS to determine as required by the Engineer among other things the following:-
 - a. The suitability of the soil and the blanketing material for the work.
 - b. The natural dry density of soil in the top 300 mm of the formation in the cuttings.
 - c. For the soil to be used in the embankments and as obtained in the top surface of the cuttings finished to final level, the Maximum Dry Density (MDD) & the Optimum Moisture Content OMC) as obtained from Heavy Compaction in accordance with IS-2720 (part VIII) unless the soil is coarse grained containing fines passing a 75 micron IS sieve up to 5% if the fines are plastic and up to 12% if the fines are non-plastic.
 - d. For the blanketing material, the MDD and OMC as obtained from Heavy Compaction in accordance with IS-2720 (Part VIII).
 - e. Suitable type of Rolling/Compaction equipment.
 - f. The measures to be adopted for Field quality control of compaction.
 - g. Any other parameter of the material characteristics as considered necessary by the Engineer for the proper execution of the work.
10. The decision of the Engineer on the number of samples, their locations, the frequency of the extractions, soil/blanketing material characterization/field control measures to be determined from the testing of the samples, the acceptance and application of the test results to decide if the soil/blanketing material is suitable for the work and determine the quality control measures for the execution of the work etc. shall be final and conclusive.
11. The expenditure on extraction and testing of soil/blanketing material samples (when done through an outside agency, other than Railway, as decided by the Engineer whose decision in this regard being final and conclusive) as mentioned herein above shall be borne by the Contractor and is deemed to have been included in the contracted rates for the work.
12. Before commencing the work and during the progress of the work as and when considered necessary by the Engineer, the method for field control of moisture and compaction will be determined by the Engineer adopting any of the methods specified in IS-10379. All the tests required to be performed for this purpose to determine the field

- quality control system shall be carried out by the contractor as specified herein above with contractor's equipment's.
- 13 For earthwork in embankments, after site clearance all pockets and depressions left in the soil, if any shall be made good and compacted.
 - 14 The blanketing work shall cover the entire width of the embankment and/or cutting from shoulder to shoulder. If the material is erodible, it shall be confined in a trench with berms of width as specified by the Engineer. In such cases adequate sand drains as directed by the Engineer shall be provided across the cess to drain the track and the blanket.
 - 15 The earthwork in embankments / spreading of the blanketing materials shall be done in layers not exceeding 600 mm thick where vibratory rollers are used, or 300 mm thick in other cases or the optimum thickness as determined after carrying out the specified field test as applicable, the thickness of the layers being reckoned in the loose state. Where the compaction is done with sheep-foot rollers, the depth of each layer of loose soil/blanketing material shall not exceed by more than 10 mm the length of their feet. The type of the rolling/compaction equipment to be used in the work, the number of passes required of the rolling/compacting equipment etc. shall be as directed by the Engineer whose decision in this regard shall be final and conclusive.
 - 16 The earthwork in embankments, the formation level surface of cutting and the blanketing work shall be compacted as directed by the Engineer whose decision in this regard shall be final and conclusive. The compaction should preferably be done at the OMC. Depending on site conditions, the Engineer, at his sole discretion may permit the variation in the moisture content at the compaction stage of say (-) 2% with respect to the OMC subject to the acceptance criteria for the field compacted density specified herein below being achieved. The compaction at moisture content higher than the OMC may be permitted by the Engineer at his sole discretion subject to the moisture content being less than the plastic limit for the type of material being used in the embankment/blanketing layers.
 - 17 Where the soil/blanketing material is dry, water shall be sprinkled either in the borrow pit or over the spread layers, as convenient, in order to attain a workable moisture content before rolling/compaction is commenced. Where the natural moisture of the soil/blanketing material in any layer is higher than OMC, soil/blanketing material may be left for drying for a suitable period till the moisture content is reduced to the OMC level or the rolling/compaction commenced under specific permission of the Engineer as provided herein above.
 - 18 The acceptance criteria for the compaction work shall be as under: -
 - a) Coarse grained or cohesion less soil/blanketing material which may contain fines passing 75 microns IS sieve up to 5% for plastic fines and up to 12% for non-plastic fines shall be compacted so as to obtain a minimum Density Index (Relative density of 70% as obtained in accordance with the I.S. 2720 (Part XIV).
 - b) All other types of soils used in the embankments and all types of blanketing materials other than coarse grained blanketing material as specified herein above shall be compacted so as to obtain 95% to 98% of the MDD as determined using heavy compaction in accordance with I.S. 2720 (Part VIII) 1983, the actual percentage of the MDD to be obtained within the above range being as determined by the Engineer based on the field trials carried out in the manner specified herein above.
 19. Subject to other directives issued by the Engineer the compaction method adopted for the earthwork/blanketing layer shall ensure among other things the following.
 - a) Each layer shall be compacted to the desired density over its entire width commencing

from the two sides, before another layer is started.

- b) While compacting, it shall be ensured that there is a minimum overlap of 150 mm between each run of the rolling/compaction equipments.
 - c) Care shall be taken during the rolling/compaction, to slope the surface of the embankment/blanketing material to facilitate shedding and to minimize the absorption of rainwater with special attention being given to the prevention of ponding.
 - d) The top of the embankment/cutting surface/blanketing layer shall be finished to a slope of 1 in 30 away from the centre.
 - e) Extra width of 500 mm shall be provided on either side to facilitate compaction to obtain a full compacted embankment mass of the final size and shape. After completing the embankment to the final height, the portion of the loose earth, if any at the edges of the above mentioned extra widths on either side which could not be compacted on account of the rolling/compacting equipment not being able to reach/compact such edges shall be cut and dressed along the slopes of the embankment.
20. To ensure a proper and adequate quality control of the work, the contractor among other things shall ensure the following: -
- a) Adequate arrangements for control of compaction are provided during the construction so that the required degree of density is obtained in each layer of the earthwork/blanketing material.
 - b) The density of each layer of the compacted soil/blanketing materials shall be ascertained as under: -
 - i. At least one density check for every 200 sq. m. for blanketing layer and top 1m of sub grade.
 - ii. At least one density check for every 500 sq. m. for other than blanket layer and top 1m of sub grade.
 - iii. In case bridge approaches or special location closer frequency may be adopted.
 - iv. The samples shall be collected either using Sand Replacement or core Cutter Method (as per IS 2720 / part-XXVIII & XXIX respectively).
 - v. For each layer, a minimum of 1 sample at a predetermine interval (in compliance with the requirement stated in above point i & ii) along the centreline of alignment, would be taken in staggered pattern so as to attain minimum frequency of test as given in the Para 7.2.2.1 (b) of RDSO guidelines GE: G-1. For subsequent layer the staggered should be such that the point of sampling does not fall vertically on the earlier sampling point immediately below.
 - vi. Additional sampling points can be taken as considered necessary.
 - vii. The overall quality of work as determined from the average value of the density obtained should be equal to or more than the respective minimum compacted densities specified.
 - viii. The quality of work shall be determined by considering the mean density of the samples in each layer. The mean dry density shall be equal to or exceed the minimum specified density. In no individual case shall the density be less than the minimum value specified by more than 2 percent; otherwise further rolling shall be done at the appropriate location.
21. In case of earthwork/blanketing with soil/blanketing material classified as good or cohesion less, the above mentioned tests for quality control for compaction can be suitably modified or waived at the sole discretion of the Engineer except for the top 1 m. height of the embankment/blanketing layer. This modification/waiver shall, however, be further subject to the work in the concerned section (excluding top 1 m. height) being done in the prescribed thickness of layers with watering as directed by the Engineer and the number of passes of the approved type of rolling/compacting equipment being given in the specified manner.
22. Only after compacting each layer and the acceptance of the compaction by the Engineer

or his representative, the Contractor shall be permitted to lay a further layer of the soil/blanketing material in the formation.

In order to interconnect the borrow pits and to ensure efficient drainage, a channel should be made connecting the borrow pits on the side remote from the bank.

23. **CLEARANCE OF SITE:** Before work is started the whole area between the toes of banks or tops of cuttings shall be properly and effectually cleared by the contractor of all trees, felled trees, roots, heavy grass and other obstructions and the work of this nature is deemed to be covered by the initial rate for earth work unless stated to the contrary in the contract. Any trees cut down by the contractor or any building material or any useful material released from the obstructions shall be stacked by the contractor as directed by the Engineer. All these shall be considered as property of the Railway. Trees with girth 30 cm or more as measured at the height of one meter above ground level shall be considered as large trees and clearing/felling of the same will be paid separately.
24. **DAGBELLING REFERENCE LINES:** The contractor before starting work, is to demarcate with a furrow at least 23 cm wide and 15 cm deep, the toes of bank and the outside limits of cutting on both sides of the centre line, the boundary of the bottom and the top of the slopes of the borrow pit, and also lines parallel to and 60 cm. outside the toes of slopes of banks. This is to be considered as part of the setting out of work and preliminary to his being allowed to break down and this dabbelling is to be maintained and renewed by him when necessary and when ordered by the Engineer. The cost of this work is deemed to be covered in the initial rate for earthwork.
25. **UNSUITABLE MATERIAL:** The Engineer shall decide materials not suitable for use in the bank and his decision shall be final and binding on the contractor. When the bank crosses a tank, ditch or bed of a stream the contractor shall when so ordered by the Engineer clear mud and silt, in order to ensure a good base before the bank is commenced (excluding the bridge portion wherever it is provided). The excavations shall be paid under relevant items.
26. **PROFILES CENTRE LINES:** Profiles for banks shall be setup where every cross section has been taken, and in flat country where there may be no cross-sections, at least at every 50 meters on the straight, every 20 meters on curves with radius sharper than 500 meters, Profiles shall also be setup in any additional places if ordered by the Engineer. The Contractor must at his own expense, provide all stakes, bamboos, string, pegs and labour etc. necessary in this connection, for profiles requisite for the correct execution of the work and for making out borrow pit and slopes and will be responsible to ensure that they are maintained in proper order. The cost of this is deemed to be included in the initial rate for earthwork. The Contractor before starting any work, shall take over all benchmark, centre line, tangent points, demarcation and other field stones and pegs and be responsible for their subsequent preservation and should they disappear or be destroyed after he had taken them over, he shall pay the cost of their replacement.
27. **CLODS:** **All** large clods shall be broken up in the borrow pit or bank by Workmen specifically detailed for this work.
28. **SIDE SLOPES:** Side slopes shall be carried up simultaneously with the rest of the work and not filled in afterwards. This can only be ensured by carrying out the work in the whole width from the toe of slopes going on simultaneously.

29. **BACKING TO BRIDGES:** In filling in the approaches of a bridge or spandrels between arches, the earth filling shall be raised simultaneously with the wing walls in the former case and with the face walls in the latter, in order that the filling in may be well trodden down under the pact of the laborers. While filling in foundations and backing to revetments, the earthwork shall similarly be brought up level as the masonry proceeds. Filling for the backing of bridges or culverts will conform to Central Railway Specification No.204 for earth filling behind abutments and in floors or as shall be ordered by the Engineer. No extra payment will be made for carrying out the work in the manner prescribed above.
30. **USE OF SPILS FROM BRIDGE FOUNDATIONS:** If the excavated earth from the foundations of a bridge is thrown up to form embankment backing for a bridge or guide bund, the same shall be deducted from the particular item and no payment beyond the excavation items of the bridge will be made.
31. **RIVER DIVERSION:** When it has been decided to divert a stream adjoining a bank, the excavation for this work is to be undertaken and completed before any borrow pit work is done at site and all earth out of such diversion is to be put into the embankment except when the Engineer orders otherwise. This quantity shall be deducted from the particular item and no payment beyond excavation items for the diversion will be made.
32. **TURFING:** When so specified, the finished and trimmed side slopes of the embankment shall be turfed with turfing material of approved species. The grass should be removed along with root in such a manner that the roots are not damaged and a handful of the original soil still clings to the roots. The grass shall be planted on the embankment slope within 6 hours of the removal from original soil. The planting shall preferably be done after a heavy shower when it can be ensured that the bank slope will remain wet for a long time after planting the grass. The work of turfing shall be paid for separately.
33. **GULLIES AND WATER CUTS:** When gullies or water cuts commence to form on the slopes of embankments or cuttings, the erosion is to be checked as early as practicable and made good with suitable material well rammed into place. When a gully or water cut has not been checked at its commencement, it must be cut/or stepped before filling it in.
34. **DRESSING OF SIDE SLOPES:** In case of embankments, pitching, and/or providing agricultural soil/turfing will be done on the finished surface of the embankment. Payments for the above will be under relevant items of the contract schedule/standard schedules of rates. Pitching work shall generally conform to Railway's specification 601. Wherever spalls are used as backing material, smaller pieces shall be laid close to the embankment and larger ones away from it. The thickness of the backing material will be decided by the Engineer. Payment will be made under the relevant item of the schedule.
35. **CATCH WATER DRAIN:** When required, catch water drains will be constructed outside the top of each slope as ordered by the Engineer. The material from these drains will be deposited to make a uniform slope from the edge of the cutting towards the drain and the excavation will be paid under relevant items of the schedule.
36. **BERM AND SPOIL BANKS:** No spoil shall be deposited within a distance of 6 meters from the top edge of the slope of any cutting. The spoil heap shall be roughly dressed and

shall form a continuous bund along the top of the cutting. In cutting where there is any cross fall, sufficient spoil should be thrown on the uphill side of the cutting to supplement the catch water drains.

37. **DRAINAGE OF CUTTINGS:** In excavating cuttings, special precautions are to be taken to ensure that the excavation may drain themselves. To ensure this, the central block of earth or gullet is first to be excavated. This will be done in such a manner that the bottom of the excavation shall wherever possible, slope downwards from the centre of the cutting towards the ends. It will be made in such cuts or slopes as may from time to time be directed.
38. **DETERMINATION OF SIDE SLOPES:** When so ordered, the Centre portion of gullet of the cutting shall be first taken out to full width formation, to enable the Engineer to determine the slopes suitable to the particular cutting or to different lengths of it. When the gullet is out to its full depth in shallow cuttings, or to the depth of the first cut in deep cuttings, the side portions of triangular section up to the slopes may be excavated. In deep cutting the second cut will not be started until the top portion is thus completed.
39. **SPOILS PROPERTY OF THE RAILWAY:** All material excavated from cuttings, suitable for pitching ballast, masonry or any other purpose whatever shall be the property of the Railway and shall be stacked or disposed of as directed by the Engineer's representative. This is deemed to have been included in the accepted rate.
40. **FORMATION IN CUTTING IN B.C. & OTHER VICIOUS SOILS:**
 - a) The Engineer may at his discretion call upon the contractor to utilize suitable cut spoils for various works like masonry, concrete, pitching etc. forming part of the contract, in which case, a sum of Rupees as fixed per cum. will be deducted from the rate for the particular item of work on the finished payable quantity for the work.
 - b) In case the formation in cuttings is in black cotton soil, excavation is to be done initially to 60 cms/45 cms. below the final formation level. On this, 45 cms. layer of granular material shall be laid and consolidated as by the Engineer. Over this surface at the discretion of the Engineer the top 15 cms. may be ordered to be carried out by spreading sand which is not required to be rolled, Payment for this excavation in the cutting below formation level and for spreading granular material or sand will be made under the relevant items of the schedule.
41. **EXCAVATION IN CUTTING:** The whole of the excavation in cutting shall be classified and paid for under the following categories.
 - (a) All soils excluding rock as given in item (ii) & (iii) below stone or boulders measuring under 0.03 m³ also will come under this category.
 - (b) Rock not requiring blasting – this shall comprise of soft rock which can be excavated by means of bars and picks. Under this class will also be included detached masses of rock measuring more than 0.03 cubic meter, and less than 0.50 cubic meter, which can be completely and properly removed with the use of picks and bars and levers and without blasting, all fissured stone will also be included in this class.
 - (c) Rock requiring blasting- This will comprise of rock in solid beds or masses in their original position which can best be excavated only by blasting. Compact stone and boulders and detached rocks measuring over 0.5 m³ will also be included in this class.

42. **BASIC FOR MEASUREMENT:**

- (a) Payment for earthwork in bank & cutting will be made on the basis of cross-sections taken before starting the work and final levels taken after the completion of the work. The contractors will have to sign ground cross sections in token of acceptance before starting the work and also cross sections of completed profiles after completing the work. Any discrepancies in the initial or final cross sections must be brought to the notice of the Engineer, for verification as necessary.
- (b) Should the Engineer so desire, he may at any stage of the work order the contractor to increase or reduce the slopes or widths of any cuttings, or bank or alter the formation level; the work actually carried out within the scope of instructions given from time to time shall only be paid for at the accepted rate.
- (c) Embankments are to be made up to the profile shown on the cross section. No payment will be made for extra work done outside the specified profile, except when such work is to order by the Engineer.
- (d) No payment will be made for additional earthwork done over and above the specified profile in the embankments towards “Shrinkage Allowance” referred to in Para 22.4. Also no payment will be made for rain water bunds which shall be made on the top of the banks before handing over the embankments to the Railway. While calculating the work done on the basis of cross-section deduction for all openings including bridge abutments will be made in full.
- (e) **CUTTING LED TO BANK:** Materials excavated from cutting shall be led to bank as may be decided by the Engineer and payment shall be made in the respective item. This includes Spreading in layers, dressing etc. payments for the compaction in layers shall be made separately in the respective item.
- (f) The rates include lifts to all height for all works and to all depths of the foundations and banks and no extra will be paid against the lift for notwithstanding the relevant notes applicable to the respective chapter of Standard Schedule of Rates 1990.
- (g) Except where otherwise directed, the inclinations of the slopes in cuttings in ordinary ground shall be approximately one horizontal to one vertical, in rock cuttings, approximately one quarter horizontal to one vertical and in embankments two horizontal to one vertical. Where there is ordinary ground above the rock in cutting, a bench shall be formed on the surface of the rock, about 0.6 metres wide, measuring from the top edge of the rock to the bottom of the slope of the ordinary ground.
- (h) Plans showing the size, location, depth, slopes, etc. borrow pits should be got approved by the Engineer before earthwork is permitted to be started. Care should be taken not to make borrow pits close to structures like telegraph poles, electric poles, level crossings, bridges, inhabited areas, etc. endangering the drainage / stability of structures or damage to underground drains, water mains etc.
- (i) Borrow pits should not be dug from the toe of the embankment closer than 3 M. plus the height of the bank subjected to a maximum of 9 M, unless otherwise permitted by the Engineer. In case of any damage, the contractor should make good the same at his own expenses. In station limits, no borrow pits should be dug without Engineer's prior permission. Where the ground is low and swampy, the outer or most distance half of the borrow pits is to be excavated first, so that in the event of the pits being flooded by rain, there will still be ground available for work.

43 **FINAL MEASUREMENTS:**

- (a) Work before being finally paid for is to be correctly brought up or carried down to proper level and to be otherwise completed in all respects. Final measurements will only

be made after settlement is completed by the exposure of the bank work at least to one complete monsoon and when taken over before lapse of one monsoon by an allowance of extra earthwork for which no payment will be made sufficient to bring the earthwork to its proper level, after final settlement has taken place. Until the certified completion is obtained by the Engineer, all banks and cutting are to be maintained by the contractor, who will be held responsible for their handing over to the Railway in proper condition and for their restoration to such condition as necessary.

- (b) The Contractor shall make good all loss due to subsidence wastage on guttering due to rain, wind, wear, wash or from any cause whatever and shall have no claim for extra work payment on this account.
- (c) In addition to the items which are deemed to be covered by the initial rate as already mentioned, no separate payment will be made for the following items. They will also be considered as included in the initial rate of earthwork of the bank:-
 - i. Removals of boulders from borrow pit area to facilitate operation of earth moving machines.
 - ii. Addition of water to borrow pit soil to attain optimum moisture contents
 - iii. Construction of approach ramps.
 - iv. Construction of Berms, making of channel to connect borrow pits for drainage etc.

2. OPEN FOUNDATION

- 2.1 **EXCAVATION:** After the site has been cleared, the limits of excavation shall be set out true to lines, curves and slopes.
- 2.2. Excavation shall be taken to width at the lowest step of the foundation and the sides shall be left plumb where the nature of soil allows it. Where the nature of soil or the depth of the trench and season of the year do not permit vertical sides, the Contractor at his own expense shall put up necessary shoring, strutting and planking or cut slopes to a safer angle or both with due regard to the safety of personnel and works and to the satisfaction of the Engineer.
- 2.3. The depth to which the excavation is to be carried out shall be as shown on the drawings, unless the type of material encountered is such as to require changes, in which case the depth shall be as ordered by the Engineer.
- 2.4. Where blasting is to be resorted to, the same shall be carried out to prevent any damage. The work has to be carried out with supervision by qualified personnel.
- 2.5. **Dewatering and Protection:** Open foundations shall be laid dry. If water is met within excavation, the Contractor shall take adequate measures such as bailing, pumping constructing diversion channels, drainage channels, bunds, depression of water level by well point system and other necessary works to keep the foundation trenches dry and to protect the green concrete against damage by erosion or sudden rising of water level.
- 2.6. Pumping from the interior of any foundation enclosure shall be done in such a manner as to preclude the possibility of the movement of water through any fresh concrete. No pumping shall be permitted during the placing of concrete or for any period of at least 24 hours thereafter, unless it is done from a suitable sump separated from the concrete work by a watertight wall or other similar means.
- 2.7. At the discretion of the Contractor, cement grouting or other approved methods may be used to prevent or reduce seepage and to protect the excavation area.
- 2.8. The Contractor shall take all precautions in diverting channels and, in discharging the drained water as not to cause damage to the works or any other property. No separate payment shall be made on this account.
- 2.9. **Preparation of Foundation:** The bottom of the foundation shall be levelled both longitudinally and transversely or stepped as directed by the Engineer. As rock or other hard strata is being to be encountered, it shall be freed of all soft and loose material, cleaned and cut to a firm surface either level and stepped as directed by the Engineer.
- 2.10. **Backfilling:** Backfilling shall be done with approved material after concrete is fully set and carried out in such a way as not to cause undue thrust on any part of the structure. All space between foundation concrete and the sides of excavation shall be refilled to the original surface in layers not exceeding 150 mm compacted thicknesses. The compaction shall be done with the help of suitable equipment

such as mechanical tamper, rammer, plate vibrator etc., after necessary watering, so as to achieve a density not less than the field density before excavation.

- 2.11. **Disposal of Excavated Materials:** All the excavated materials shall be the property of the Railways. The good/usable material obtained from the excavation of foundation shall be used for back filling of foundation, and the existing pits in the right-of-way and filling in that embankment, including loading of surplus good earth into truck, transporting, unloading, spreading, watering, ramming, levelling, etc. with all lifts and lead as per specifications of Earthwork and as directed by the Engineer. Unsuitable and surplus material not intended for use shall also, if necessary, be transported with all lifts and lead, disposed of out of railway land or used as directed by the Engineer and no extra payment shall be admissible.
- 2.12. **Measurement for Payment:** Excavation for structures shall be measured in cum for all class of material encountered, limited to the dimensions shown on the drawings or as directed by the Engineer. Side slope payable for excavation is limited to 1 horizontal to 1 vertical (1H:1V) or actual whichever is less. Excavation over increased width, cutting of slopes, shoring, shuttering and planking shall be deemed as convenience for the Contractor in executing the work and shall not be measured and paid. Rate of excavation is inclusive of dewatering & refilling. No separate payment will be made for dewatering and refilling.

3. STRUCTURAL CONCRETE

3.1 MATERIALS

3.1.1 Cement:

- a) Cement older than 3 months from the date of manufacture shall not be used.
- b) The cement used shall be any of the following, with prior approval of the engineer in charge.
 - Ordinary Portland Cement (53 grade) conforming to IS 12269- 1987
 - Ordinary Portland Cement (43 grade) conforming to IS:8112-1989
 - Ordinary Portland Cement (33 grade) conforming to IS:269-1989
 - Portland slag cement confirming to IS:455-1989
 - Portland pozzolana cement confirming to IS:1489 (Part-I) -1991 fly ash based

Note: 1) All updated specifications up to date of opening of tender are applicable.

- 2) Only readymade Portland Pozzolona Cement [confirming to IS:1489 (Part-I) -1991 fly ash based] shall be allowed to use. **Mixing of fly ash and OPC cement at site/ RMC plant to produce Portland Pozzolona Cement shall not be allowed.**

- 3) In case of blended cement i.e. Portland pozzalana cement and Portland slag cement rate of development of strength is slow as compared to ordinary Portland cement hence period of removal of formwork and period of curing should be suitable increased.

- 4) Only Ordinary Portland Cement (53 grade) conforming to IS 12269-1987 shall be allowed for Prestressed Concrete work (PSC).

- c) Cement manufactured by the following company shall only be allowed to use.

- Ambuja
- ULTRATECH
- ACC
- Birla
- Grasim
- JK

- d) **Testing frequency for cement:**

Sr. No.	Type of test	Test frequency	Remark.
1	Physical test	One sample for every 50 MT of cement consumed or part thereof or each batch of cement in case of time lapse of 15 days in supply of consecutive batches and manufacturer's test certificate for each lot.	Test to be done. a. Initial and final setting time. B Fineness. c. Compressive strength. d. Soundness e. Specific Gravity.

Sr. No.	Type of test	Test frequency	Remark.
2	Chemical test.	One sample for every 100 MT of cement consumed or part thereof or each batch of cement in case of time lapse of 15 days in supply of consecutive batches and manufacturers test certificate for each lot.	a) Lime saturation factor. b) Alumina Iron ratio c) Insoluble residue d) Magnesium oxide. e) Sulphuric Anhydride f) Loss of Ignition g) Chlorides h) C ₃ A content. i) Specific Surface.

3.1.2 Fine Aggregates (Sand)

- Creek sand shall not be used in the construction of any concrete/Masonry work.
- Sand, if found too coarse, shall be suitably blended with finer sand obtained from approved resources to obtain the desired grading. The provision of two types of sand, their stacking separately and their mixing in the specified proportions shall be at the contractor's cost.
- The river sand shall not contain silt more than a total of 3% by weight. Chloride content in sand shall not be greater than 0.04% by weight.
- Artificial or crushed sand may be allowed to be used subject to passing from 75 micron sieve shall not be more than as provided in the IS code.
- The grading of the sand shall conform to IS: 383.

f) Test frequency for FINE AGGREGATE:

[Confirming to IS: 383-1970, IS-2386-1963]

Sr.No.	Characteristics to be checked	Acceptance Criteria		Method of testing	Test Frequency	
PHYSICAL TESTS		Code	Value			
1	Determination of particle size – Grading zones (Sieve Analysis)	Table 4 of IS:383 – 1973	Zone-II		Part –I of IS:2386	One sample per Lot of every 50M ³ or part from each source for each site
			Sieve	Passing %		
			10	100		
			4.75	90-100		
			2.36	75-100		
			1.18	55-90		
			600	35-59		
			300	8-30		
			150	0-10		
2	Silt Content		Not more than 3% by wt.& shale, clay, and other structurally weak particles- 2% by weight.			
3	Specific Gravity		2.6 to 2.85			One sample randomly 500m3 of concrete or change of source.
4	Absorption Value		Not more than 3%		Part III of IS:2386 – 1963	
5	Soundness of Aggregate	Cl. 3.6 of IS ; 383	Not more than 10% with Na ₂ SO ₄ & 15% with MgSO ₄		Part IV of IS: 2386 –1963	

Sr.N o.	Characteristics to be checked	Acceptance Criteria		Method of testing	Test Frequency
6	Presence of deleterious material (total)		5% Max(Total)		
7	Coal and Lignites	Table (1) of IS:383	1.0% Max.	Part –II of IS:2386	
8	Clay lumps		1.0% Max.		
9	Material finer than 75 micron		3.0% Max.		
10	Soft fragments		-Nil-		
11	Shale		1.0% Max.		
	<u>CHEMICAL</u>				
12	Cl – content	Cl. – 4.2.2of CBC	0.04% Max.		
13	SO3- Content	Cl. – 4.2.2of CBC	0.4% Max.		

3.1.3 Coarse Aggregates

- Coarse aggregates for the works shall be crushed stone aggregates conforming to IS:383 obtained from approved sources
- Coarse aggregate containing flat or flaky pieces or mica shall be rejected.
- Test frequency for COARSE AGGREGATE:**
[Confirming to IS: 383-1970, IS-2386-1963 & IS: 456-2000]

Physical Tests

Sr. No.	Characteristics to be checked	Acceptance Criteria				Method of testing	Test Frequency
		Code	Value				
1	Determination of particle size (Sieve Analysis)	Table (2) of IS:383	Sieve size	40 mm	20mm	IS :2386 (part I) –1963	One sample every 50m3 or part thereof
	63mm		100	-			
	40mm		85–100	100			
	23mm		0–20	85-100			
	10 mm		0-5	0-20			
	4.75mm			0-5			
2	Moisture Content		As per site condition Max. 4 %				
3	Flakiness Index	Client	Not more than 30%				
4	Elongation index	--do --	Not more than 30%				
5	Specific gravity		2.60 to 2.85				One sample per Lot of every 500 M³ of concrete or part thereof
6	Absorption value		Not more than 3%				
7	Crushing Value	Cl.3.3 of IS:383	Not more than 30% for concrete for wearing surfaces & 45% for other concrete			IS :2386 (part IV) –1963	

Tenderer/s

For Dy.CE(C)BSL

Sr. No.	Characteristics to be checked	Acceptance Criteria		Method of testing	Test Frequency
		Code	Value		
8	Impact Value	Cl.3.4 of IS: 383	Not more than 30% for concrete for wearing surface & 45% for other concrete	--DO --	from each source.
9	Abrasion Value	Cl.3.5 of IS:383	Not more than 30% for concrete for wearing surface & 50% for other concrete	--DO --	

Water :

Creek water shall not be used. Potable water of proper quality should be used.

a) The permissible limits for solids shall be as follows:

	Permissible limits (Max.)
Organic	200 mg/lit.
Inorganic	3000 mg/lit.
Sulphates (SO ₄)	500 mg/lit.
Chlorides (Cl)	2000 mg/l for plain concrete works, 500 mg/l for reinforced concrete works and 500 mg/l for prestressed concrete works.
Suspended matter	2000 mg/lit.
Acidic material	2 mg/lit.

b) The PH value shall not be less than 6.

c) Test frequency for water.

[Confirming to Cl.5.4 of IS: 456 – 2000 & IR Bridge Code]

Sr.N o.	Characteristics to be checked	Acceptance Criteria		Method of testing	Test Frequency
		Code	Value		
1	PH Value	Cl.-5.4.2 of IS:456	Not less than 6	IS: 3025	100 m3 of concrete at site
2	Chloride content		Not more than 2000 mg/l for plain concrete works, 500 mg/Litre for reinforced concrete works and prestressed concrete works.	Part -32	
3	Sulphate content	Table (1) Cl. 5.4	Not more than 400 ppm	Part -24	
4	Organic impurities	Table (1) Cl. 5.4 IS:456	200 mg/ lt.	Part –18	Every 3 month
5	Inorganic impurities		3000 mg /lit	IS : 3025	
6	Suspended matter		2000 mg/lit.	Part –17 of IS; 3025	
7	Alkalinity		10mg/lit	Part 22& 23 of IS:3025	
8	Acidity		2 mg / lit		

Concrete Admixtures:

Concrete admixtures are proprietary items of manufacture and shall be obtained only from established manufacturers with proven track record, quality assurance and full-fledged laboratory facilities. The brand and type of admixture should be tested at site for various properties imparted to the concrete and to be used only if found suitable with prior approval of the engineer in charge.

a) Test frequency for admixture.

[Confirming to IS: 9103 & IRC CBC 1997]

Sr. No.	Characteristics to be checked	Acceptance Criteria Value	Method of testing	Test Frequency
1	Chloride content	NIL	IS:6925	Each batch Up to 4000Kg
2	Air content	< Air content of controlled mix +1%	IS:1199	
3	Uniformity test	As per table 1 as given below.	Annexure E OF 9103	Each batch
4	Bleeding	kk< 5%	TABLE 1 A of IS:9103	Regular at site with various trial

Table 1

Uniformity test & Requirements of Admixtures:

Sr. No.	Properties to be checked	Values	Test method
1	Dry moisture content	Within 3 % of MTC	Annexure E of 9103
2	Ash content	Within 1 % of MTC	Annexure E of 9103
3	Relative density	Within 0.02 % of MTC	Annexure E of 9103
4	Chloride ion content	Within 10% of the value or Within 0.2 % of MTC whichever is greater as stated by the manufacturer	Annexure E of 9103
5	Ph value	7 – 8	Annexure E of 9103
6	SO ₃	NIL	CBC:4.4.2

* MTC= Manufacturers Test Certificate.

3.2 **Storage of Materials**

a. General:

All materials should be stored at proper places so as to prevent their deterioration or intrusion by foreign matter and to ensure their satisfactory quality and fitness for the work. All such materials even though stored in approved godowns/places, must be subjected to acceptance test prior to their immediate use.

b. Aggregates:

Aggregate stockpiles should be made on ground that is denuded of vegetation, is hard and well drained. If necessary, the ground shall be covered with 50 mm plank. Aggregates placed directly on the ground shall not be removed from the stockpile within 15 cm of the ground until the final cleaning up of the work, and then only the clean aggregate will be permitted to be used. Aggregate shall be stored in such a way as to prevent segregation of sizes and avoid contamination with fines and other undesirable material.

c. Cement :

Cement shall be transported, handled and stored on the site in a godown in such a manner as to avoid deterioration or contamination. Cement shall be stored above ground level in perfectly dry and water-tight sheds and shall be stacked not more than eight bags high.

- d. The Contractor shall prepare and maintain proper records on site in respect of delivery, handling, storage and use of cement and these records shall be available for inspection by the Engineer at all times.

3.3 Design Mix :

For all items of concrete only design mix shall be used. Prior to the start of construction, the contractor shall design the mix, the proportions of materials, including chemical admixtures to be used and submit to the Engineer for approval. Water-reducing admixtures (including plasticisers or super-plasticisers, retarders) or mineral admixture such as fly ash, GGBS or silica fumes may be used at the Contractor's option, subject to the approval of the Engineer, attaining the required strength and other properties of the concrete. Following are the requirements for Designed Mixes,

- a) The cement content shall not exceed 500 kg/cum.
b) The minimum cement content and maximum water cement ratio to be taken for the design mix shall be as follows:

	Plain Concrete	RCC	PSC
Minimum cement content	300	350	440
Maximum water cement ratio	0.50	0.45	0.35

- c) Target Mean strength for design mix of concrete shall be as per IS 456
d) The contractor may be allowed to use mineral additive like fly ash / silica fumes etc. to achieve the required strengths at his own cost.
e) Whenever there is significant change in the quality of any of the ingredients for concrete, the Engineer may at his discretion order to carry out of fresh trial mixes. All costs for trial mixes & tests shall be to the contractors account and held to be included in the contract rates.
f) When the proportions of a concrete mix have been approved by the Engineer, the contractor shall not vary the quality or source of the materials or the mix without the written approval of the Engineer.

3.4 Special Measures:

- a) Mixing Concrete: Concrete shall be mixed in a microprocessor controlled automatic batching and mixing plant, as per these specifications. Hand mixing shall not be permitted. The mixers or the plant shall invariably be fitted with water measuring (metering) devices. The Engineer shall approve the concrete mixer or the plant.
- b) Mixing shall be continued till materials are uniformly distributed and a uniform colour of the entire mass is obtained, and each individual particle of the coarse aggregate shows complete coating of mortar containing its proportionate amount of cement.
- c) To have the uniformity and homogeneity and to achieve the strength, and durable concrete, contractor shall use RMC (Ready Mix Concrete) from renowned approved microprocessor controlled automatic batching plant like L&T or the contractor shall install his own microprocessor/computer controlled automatic batching and mixing plant of concrete having capacity of mixing minimum 0.50 cum of concrete in one batch with minimum rated capacity of 30cum of concrete per hour at site.
- d) The method of transporting and placing concrete shall be approved by the Engineer. Concrete shall be transported and placed as near as practicable to its final position, so that no contamination, segregation or loss of its constituent materials takes place.
- e) When concrete is conveyed by chute, the plant shall be of such size and design as to ensure practically continuous flow. Slope of the chute shall be so adjusted that the concrete flows without any segregation of its ingredients. The delivery end of the chute shall be as close as possible to the point of deposit. Concrete shall not be moved by vibrators. The chute shall be thoroughly flushed with water before and after each working period and the water used for this purpose shall be discharged outside the formwork.
- f) All formwork and reinforcement contained in it shall be cleaned and made free from standing water, dust, snow or ice immediately before placing of concrete.
- g) No concrete shall be placed in any part of the structure until the approval of the Engineer has been obtained. If concreting is not started within 24 hours of the approval being given, approval shall have to be obtained again from the Engineer. Concreting then shall proceed continuously over the area between the construction joints
- h) Except where otherwise agreed to by the Engineer, concrete shall be deposited in horizontal layers to a compacted depth of not more than 300 mm
- i) Concrete for RCC and PSC, when deposited shall have a temperature of not less than 5 degrees Celsius, and not more than 30 degree Celsius. Use of ice may be required to lower the temperature of the concrete at the discretion of the engineer in charge.
- j) Concrete shall be thoroughly compacted by vibration using electrically driven needle vibrators or other suitable means to produce a dense homogeneous void-free mass having the required surface finish. When immersion type vibrator needles are used, contact of needle with reinforcement and all inserts like ducts

etc. shall be avoided. Additional vibrators in serviceable condition shall be kept at site so that they can be used in the event of breakdowns.

- k) The permanent structure shall not be allowed to come in contact with sea water for at least 72 hours
- l) Special precaution to be taken at Ready Made Concrete mixing plant
 - i. Calibration of plant shall be checked from authorized independent agency once in 6 months.
 - ii. Minimum initial setting time of concrete shall be 3 Hrs.

3.5 Construction Joints:-

Construction joints shall be avoided as far as possible. Sequencing of concrete placement should be organized in such a way that cold joints are totally eliminated. The sequence of concreting shall be submitted for approval of Railway prior to concreting of the structural element. Construction joints shall be located so as not to impair the strength of the concrete. Concrete placed to form the face of a construction joint shall have all laitance removed. One of the method to remove laitance is applying retarders by brush on freshly laid concrete and wash it by water jet after initial setting of concrete. The laitance at top does not get set and easily removed by washing. Before concreting is resumed, all loose matter on the existing concrete surface shall be removed.

3.6 Concreting Under Water:

All concreting shall preferably be done under dry conditions & concreting under water conditions shall be avoided as far as possible. If concreting under water is not avoidable then following precaution shall be taken.

The permanent structure shall not be allowed to come in contact with sea / creek water for at least 72 hours. When it is necessary to deposit concrete under water, the methods, equipment, materials and proportions of mix to be used shall be got approved from the Engineer before any work is started and in such cases concrete shall contain 10 per cent more cement than that required for the same mix placed in the dry.

All under-water concreting shall be carried out by tremie method only, using tremie of appropriate diameter. The tremie concreting when started should continue without interruption for the full height of the member being concreted. The concrete production and placement equipment should be sufficient to enable the underwater concrete to be completed uninterrupted within the stipulated time

3.7 Protection and Curing: Concreting operations shall not commence until adequate arrangements for curing have been made by the Contractor. Curing and protection of concrete shall start immediately after compaction of the concrete to protect it from:

- Premature drying out particularly by solar radiation and wind
- Avoiding plastic shrinkage cracks

- High internal thermal gradients
- Leaching out by rain and flowing water
- a) **Water Curing:** Only potable water shall be used. Sea/creek water shall not be used for curing. Sea/creek water shall not come into contact with concrete members unless it has attained adequate strength.

Exposed surface of concrete shall be kept continuously in a damp or wet condition by pounding or by covering with a layer of sacks, canvas, Hessian or similar materials and shall be kept constantly wet for a period of not less than 14 days from the date of placing of concrete. In case of the Portland pozzolana cement and Portland slag cement curing period shall be 28 days.

- b) **Curing compound:** Curing compounds shall normally not be used. If proposed to be used, they can be permitted at selected locations, at the directive of the Engineer.

3.8 Finishing:

- a) Immediately after removal of forms, exposed bars or bolts, if any, shall be cut inside the concrete member to a depth of at least 50 mm below the surface of the concrete and the resulting holes filled with polymer cement grout .
- b) All construction and expansion joints in the completed work shall be left carefully tooled and free from any mortar and concrete. Expansion joint filler shall be left exposed for its full length with clean and true edges.
- c) The finished surfaces of concrete after removal of formwork should be such that no touching up is required. All kind of fins / protrusion caused by formwork joints, if any, shall be ground using electric surface grinder.
- d) Immediately on removal of forms, the concrete work shall be examined by the Engineer before any defects are made good.
- e) The work that has sagged or contains honeycombing to an extent detrimental to structural safety or architectural appearance shall be rejected.
- f) Surface defect of a minor nature may be accepted. On acceptance of such work by the Engineer, the same shall be rectified as directed by Engineer.

3.9 Equipment:

All equipment used for concreting shall have the approval of engineer in charge.

3.10. Measurement for Payment :

Structural concrete shall be measured in cubic meters. In reinforced or pre-stressed concrete, the volume occupied by reinforcement or pre-stressing cables and sheathing shall not be deducted. Payment shall be made based on the dimensions as per the drawing if the structure is within prescribed tolerance.

3.11 TESTS AND STANDARDS OF ACCEPTANCE

Concrete shall conform to the surface finish and tolerance as prescribed in these specifications for respective components.

a) Open Foundation:

i)	Variation in dimensions.	:	+ 50 mm, - 12 mm
ii)	Misplacement from specified position in plan.	:	15 mm
iii)	Surface irregularities measured with 3m straight edge.	:	3 mm

b) Substructure /Superstructure:

i)	Variation in cross-sectional dimensions.	:	+ 12 mm, - 6 mm
ii)	Misplacement from specified position in plan.	:	10 mm
iii)	Variations from plumb over full height.	:	\pm 10 mm

3.12 Sampling and testing:a) Compressive strength

- Green concrete, for making 3 test cubes, shall be taken from a batch of concrete at point of delivery into construction, according to procedure laid down in IS:1199. Frequency shall be as per IS:456:

Quantity of Concrete in work, m ³	No. of samples For 28 days	No. of samples For 7 Days
1-5	1 Set	1 Set
6-15	2 Sets	2 Sets
16-30	3 Sets	2 Sets
31-50	4 Sets	3 Sets
51 and above	4 Sets plus one Set additional sample for each additional 50 m ³ or part thereof.	3 Sets plus one Set additional sample for each additional 50 m ³ or part thereof.

Note: At least one sample shall be taken from each shift of work. Each set consists of 3 cubes.

- 150 mm cubes shall be made, cured and tested at the age of 28 days for compressive strength in accordance with IS: 456-2000.
- Three test specimens shall be made from each sample for testing at 28 day. Additional cubes shall be made for various purposes such as to determine the strength of concrete at 7 days for any other purpose as given in above table.
- The test strength of the sample shall be the average of the strength of 3 cubes.

b) Permeability test to be done as follows:

- Prepare the cylindrical test specimen 150 mm dia. and 160 mm high.
- After 28 days of curing, the test specimen is fitted in a machine such that the specimen can be placed in water under pressure up to 7 bars.
- At first a pressure of one bar is applied for 48 hours, followed by 3 bars for 24 hours and 7 bars for next 24 hours.

- After the passage of the above period, the specimen is taken out and split in the middle by compression applied on two round bars on opposite sides above and below.
- The water penetration in the broken core is to be measured with a scale and the depth of penetration assessed in mm (max. permissible limit 25 mm).
- Frequency of testing for permeability: 2 sets of 3 sample each per 100 m³ of RCC/PSC concrete.

c) Test for Total chlorides and Sulphates in concrete.

Sr. No.	Characteristics to be checked	Acceptance Criteria (Value)	Test Frequency
1	Total Chlorides in concrete as cl	0.06% by wt. Of Cement for PSC (0.29Kg./m ³) 0.15% by wt. of Cement for RCC(0.66kg/m ³)	Every 500 m ³ of concrete.
2	Total Sulphate content as SO ₃	4% by the mass of cement	

- d) Concrete shall also be tested for tensile strength. Similarly, concrete used for deck slab shall also be tested for flexure test. The flexural and splitting tensile strengths of concrete shall be tested as described in IS 516 and IS 5816 respectively. **The actual modulus of elasticity, flexural and splitting tensile strengths of concrete shall be measured before approval of design mix.**

3.13 Acceptance criteria:

- The strength requirement of any particular grade of concrete will be considered satisfactory if the 28 days' compressive strengths of individual sets (each set consists of 3 cubes) and of individual cubes satisfy the acceptance criteria as given in the IS 456-2000.
- Whenever a mix is redesigned due to a change in the quality of aggregate or cement or for any other reason, it shall be considered a new mix and initially subject to the acceptability criteria above.
- If the concrete produced at site does not satisfy the above strength requirements, the Engineer will reserve the right to require the contractor to improve the methods of batching, the quality of the ingredients and redesign the mix with increased cement content, if necessary. The contractor shall not be entitled to claim any extra cost for the extra cement used for the modifications stipulated by the Engineer for fulfilling the strength requirements specified.
- It is the complete responsibility of the contractor to design the concrete mixes by approved standard methods and to produce the reinforced concrete conforming to the specification and the strength requirements approved by the Engineer.
- As frequently as the Engineer may require, testing shall be carried out in the field for:
 - Moisture content and absorption and density of sand and aggregate.

- b. Silt content of sand, Grading of sand and aggregates.
 - c. Slump test of concrete.
 - f) Before concreting commences on any section of the works the contractor shall obtain approval of the Engineer or his representative as regards the formworks and reinforcements conforming to the drawings. He shall also indicate to the Engineer in writing and obtain his approval for positions of construction joints.
- 3.14 Cracks: If cracks develop in concrete construction, which in the opinion of the Engineer may be detrimental to the strength of the construction, the contractor shall dismantle the construction, carry away the debris, replace the construction and carry out all consequential work thereto.

If any cracks develop in the concrete construction, which in the opinion of the Engineer, are not detrimental to the stability of the construction, the Contractor at his own expense shall grout the cracks with polymer cement grout of approved quality and also at his own expense and risk shall make good to the satisfaction of the Engineer.

The Engineer's decision as to the extent of the liability of the Contractor in the above matter shall be final and binding.

- 3.15 Defective Concrete : Should any concrete be found honeycombed or in any way defective which may be suspected to affect the performance of the structure, shall be rejected outright. However, some surface defects like minor honey combing etc. not affecting the structural properties shall on the instruction of the Engineer repaired as per the approved procedure.

3.16 **Additional Specification Ready Mixed Concrete:**

The concrete should conform to the specifications given in IS-4926.

3.16.1 **Quality control:**

The producer of RMC shall adopt quality assurance programme, which shall get approved by Engineer. It shall cover forward, immediate and retrospective control. He shall have necessary laboratory facilities to carry out tests to ensure quality control at each stage during production of concrete. In case, few tests are done outside, which are not required frequently, the record of test results shall be available with RMC manufacturer.

3.16.2 **Approval of Design Mix concrete:**

Only design mix concrete shall be produced for the required grade and strength of concrete. For design of concrete mix IS:10262 or any other standard may be used for guidance. The design mix computation shall be submitted in advance to the Engineer for approval indicating the testing of mix for workability, initial setting time, permeability, total chloride content & sulphate content. In case there is any change in ingredients or in the process/ plant, design mix shall be redesigned and got approved from Engineer.

3.16.3 Loss in workability and strength of concrete during transportation:

The loss in workability and strength during the transit time from batching plant to the place of work, shall be determined and shall be accounted for while designing the concrete mix.

3.16.4 Access to Engineer/representative to Ready Mixed Concrete plant:

RMC manufacturer shall allow the Engineer to supervise/inspect the operations and materials, process of manufacture and delivery of concrete involved in concrete production. He shall also provide adequate facility to the Engineer to take samples of materials used.

3.16.5 Accessibility of technical records maintained by RMC manufacturer :

RMC manufacturer shall allow Engineer to peruse the past and present technical records maintained by him.

3.16.6 Deputation of Engineer :

Manufacturer shall allow deputation of Engineer at Ready Mixed Concrete plant to ensure that concrete is being produced as per the requirement of work and as per approved mix design. Every transit mixture shall be provided with computer (Mixing & Batching plant of concrete) generated batch slip giving details of various ingredients used in each batch of concrete mixed.

3.16.7 Temperature of concrete:

Temperature of produced concrete shall not be less than 5 ° C and shall not exceed 35 ° C.

3.16.8 Transportation of concrete:

The concrete shall be transported in concrete transit agitators conforming to IS:5892. Agitating speed of the agitators during transit shall not be less than 2 revolution per minute but not more than 6 revolution per minute.

3.16.9 Transit time and placement of concrete:

- (a) The concrete shall be delivered at the site of work and discharge shall be completed within specified hours of adding mixing water to the dry mix of cement and aggregate. Concrete received after the transit time, as specified above, shall not be accepted.
- (b) Concrete, thereafter, shall be placed in position within the designed initial setting time. At the end of initial setting time, the left over portion of concrete, if any, shall be rejected.

3.16.10 Re-mixing of water:

Under any circumstances addition of any water shall not be allowed after the initial mixing of concrete.

3.16.11 Testing for workability and strength at the time of placement of concrete:

The concrete shall be tested for the required workability and strength at the time of placement. Concrete shall be deemed to satisfy/ comply with the strength requirement when it full fills the criteria laid down in IRS Concrete bridge Code clause 8.7.6.

3.16.12 Dosing of admixture at site of concreting:

After arrival of Ready Mixed Concrete at site, additional dose of admixture, if provided for in approved mix design, shall be added in presence of Engineers representatives.

4 FORMWORK

- 4.1 Description: Formwork shall include all temporary or permanent forms required for forming the concrete of the shape, dimensions and surface finish as shown on the drawing or as directed by the Engineer, together with all props, staging, centring, scaffolding and temporary construction required for their support.
- 4.2 Materials: Materials and components used for formwork shall be examined for damage or excessive deterioration before use and shall be used only if found suitable after necessary repairs. Forms shall be constructed with metal. The metal used for forms shall be of such thickness that the forms remain true to shape. The use of approved internal steel ties or steel or plastic spacers shall be permitted. All shuttering plates, props, H frames, screw jacks and all necessary fittings required for formwork shall be of steel. **Wooden planks and props shall not be allowed to be used for formwork and staging work.**
- 4.3 Design of Formwork: The Contractor shall furnish the drawing of complete formwork (i.e. the forms as well as their supports) for approval of the Engineer before any erection is taken up. Notwithstanding any approval or review of drawing and design by the Engineer, the Contractor shall be entirely responsible for the adequacy and safety for formwork. The foundation of all supports shall be designed to suit the bearing capacity of soil to support the designed loads without settlement
- 4.4 The formwork shall be robust and strong and the joints shall be leak-proof.
- 4.5 The number of joints in the formwork shall be kept to a minimum by using large size panels. The design shall provide for proper “soldiers” to facilitate alignment. All joints shall be leak proof and must be properly sealed. Use of PVC JOINT sealing tapes, foam rubber or PVC T-section is essential to prevent leakage of grout.
- 4.6 As far as practicable, clamps shall be used to hold the forms together.
- 4.7 Use of ties shall be restricted, as far as practicable. Wherever ties are used they shall be used with HDPE sheathing so that the ties can easily be removed. No parts prone to corrosion shall be left projecting or near the surface.
- 4.8 Unless otherwise specified, or directed, chamfers or fillets of sizes 25 mm x 25 mm shall be provided at all angles of the formwork to avoid sharp corners. The chamfers, bevelled edges and moulding shall be made in the formwork itself. Opening for fixtures and other fittings shall be provided in the shuttering as directed by the Engineer.
- 4.9 Shuttering for walls, sloping members and thin sections of considerable height shall be provided with temporary opening to permit inspection and cleaning out before placing of concrete.
- 4.10 The formwork shall be so made as to produce a finished concrete true to shape, line and levels and dimensions as shown on the drawings, subject to the tolerances specified in respective sections of these specifications, or as directed by the Engineer.

- 4.11 Where metal forms are used, all bolts and rivets shall be countersunk and well ground to provide a smooth, plane surface.
- 4.12 Forms shall be made sufficiently rigid by the use of ties and bracings to prevent any displacement or sagging between supports. They shall be strong enough to withstand all pressure, ramming and vibration during and after placing the concrete. Screw jacks or hard wood wedges, where required, shall be provided to make up any settlement in the formwork either before or during the placing of concrete.
- 4.13 The formwork shall be coated with an approved release agent that will effectively prevent sticking and will not stain the concrete surface.
- 4.14 The formwork shall be constructed with pre-camber to the soffit to allow for deflection of the formwork.
- 4.15 Formed Surface and Finish: The formwork shall be lined with material approved by the Engineer so as to provide a smooth finish of uniform texture and appearance. This material shall leave no stain on the concrete and so fixed to its backing as not to impart any blemishes. It shall be of the same type and obtained from only one source throughout for the construction of any one structure. The contractor shall make good any imperfections in the resulting finish as required by the Engineer. Internal ties and embedded metal parts shall be carefully detailed and their use shall be subject to the approval of the Engineer.
- 4.16 Precautions:
- i) Special measures in the design of formwork shall be taken to ensure that it does not hinder the shrinkage of concrete. The soffit of the formwork shall be so designed as to ensure that the formwork does not restrain the shortening and/or hogging of beams during prestressing. The forms may be removed at the earliest opportunity subject to the minimum time for removal of forms with props retained in position.
 - ii) Provision shall be made for safe access on, to and about the formwork at the levels as required.
 - iii) Close watch shall be maintained to check for settlement of formwork during concreting. Any settlement of formwork during concreting shall be promptly rectified
- 4.17 Preparation of Formwork before Concreting:
- The inside surfaces of forms shall, except in the case of permanent form work or where otherwise agreed to by the Engineer be coated with a release agent supplied by approved manufacturer or of an approved material to prevent adhesion of concrete to the formwork.
- Before re-use of forms, the following actions shall be taken:
- i) The contact surfaces of the forms shall be cleaned carefully and dried before applying a release agent.

- ii) It should be ensured that the release agent is appropriate to the surface to be coated. The same type and make of release agent shall be used throughout on similar formwork materials and different types should not be mixed.
- iii) The form surfaces shall be evenly and thinly coated with release agent. The vertical surface shall be treated before horizontal surface and any excess wiped out.
- iv) The release agent shall not come in contact with reinforcement or the hardened concrete.

All forms shall be thoroughly cleaned immediately before concreting.

The Contractor shall give the Engineer due notice before placing any concrete in the forms to permit him to inspect and approve the formwork, but such inspection shall not relieve the contractor of his responsibility for safety of formwork, men, machinery, materials and finish or tolerances of concrete.

4.18 Removal of Formwork:

The scheme for removal of formwork (i.e. de-shuttering and decentering) shall be planned in advance and furnished to the Engineer for scrutiny and approval. No formwork or any part thereof shall be removed without prior approval of the Engineer.

The formwork shall be so removed as not to cause any damage to concrete. Centring shall be gradually and uniformly lowered in such a manner as to permit the concrete to take stresses due to its own weight uniformly and gradually to avoid any shock or vibration.

4.19 Measurements for Payment:

The rate for concrete in Plain Concrete or Reinforced Concrete or Prestressed Concrete shall be deemed to include all formwork and temporary works required in accordance with this section and that shall not be paid separately.

5. REINFORCEMENT

- 5.1. **Steel:** Steel used in the works shall be Thermo Mechanically Treated high yield strength bars of grade FE-500 conforming to IS:1786-2008 manufactured by primary manufacturers i.e. SAIL, TISCO, RastriyaIspat Nigam Limited and Jindal only.

5.2. **Inspection & Testing:**

Every bar shall be inspected before assembling on the works and any defective, brittle, excessively rusted or burnt bars shall be removed. Cracked ends of bars shall be cut out.

Physical and Chemical tests:.

Test Frequency:

i)	Upton 10 mm. dia.	:	One sample for 25 MT or part thereof for each dia. of bar.
ii)	Above 10 mm. dia.	:	One sample for 40MT or part thereof for each dia. of bar.

5.3. **Lapping & Welding:**

- i) As far as possible, bars of the maximum length available shall be used.
- ii) In case the Contractor wishes to use shorter bars, laps shall be provided at the Contractor's cost in the manner and at the locations approved by the Engineer. Such overlaps shall not be paid for.
- iii) **If theoretical required length of reinforcement bar is more than 12 m then only overlaps will be measured for payment as authorized overlaps.**
- iv) **The number of authorised overlaps payable, if theoretical cut length of bar is more than 12 m, are as per table given below.**
- v) **Overlaps are also payable if there is change in diameter of bar (i.e. bars of different diameter are to be overlapped) as per approved detailed structural drawing.**
- vi) No other overlaps will be measured for payment:

Sr. No.	Required Theoretical length of Bar	Number of overlap payable
1	More than 12m but less than 23m	1 (one).
2	More than 23 m	1+1 for every 11m or part thereof in excess of 23m.

5.4. **Spacing, Supporting & Cleaning:**

- i) All reinforcement shall be placed and maintained in the positions shown on the drawings.
- ii) The Contractor shall provide approved types of supports as specified on the drawings for maintaining the top bars of the slab in position during concreting. All cover blocks shall be of concrete (not sand cement mortar) and of the same strength as that of the surrounding concrete and properly

compacted and vibrated on a vibrating table. They shall be cured for a minimum period of 21 days before they are used in the works. PVC or similar material cover blocks can be permitted with specific approval of engineer in charge.

- iii) 18 SWG G.I. wire shall be used as binding wire. All frame crossing one another shall be bound with this wire twisted tight to make the skeleton on network rigid so that the reinforcement is not displaced during placing of concrete.
- iv) Bars must be cleaned before concreting commences of all scale, rust or partially set concrete which may have been deposited there during placing of a previous lift of concrete.

5.5. Measurement for Payment

- a) Reinforcement shall be measured in length separately for different diameters as actually used in the works as per drawing, excluding overlaps and over weights. From the length so measured, the weight of reinforcement shall be calculated in tonnes on the basis of standard weights as per IS:1732.
- b) Lengths shall include hooks at ends, authorized overlaps (as mentioned in Para 5.3 above), chairs and spacer bars.
- c) Wastage, overlaps(Except those overlaps as mentioned in Para 5.3 above), coupling, welded joints etc., and annealed G.I. wire (18 SWG) for binding, cover blocks shall not be measured and cost of these items shall be deemed to be included in the rates of reinforcement.

The bending, placing, binding, welding and fixing in position of reinforcement steel as shown on the drawings and as directed by the Engineer will be paid under separate item. It shall also include cost of all devices for keeping reinforcement in approved position, cost of jointing as per approved method and all wastage.

6. Specification for Fusion Bonded Epoxy Coating for Reinforcing Bars

Fusion Bonded Epoxy Coating to reinforcement steel bars shall be as per IS 13620:1993 (Some important Para of the above IS code are reproduced below for information and guidance).

1. SCOPE:

This standard covers deformed steel reinforcing bars with protective epoxy coating applied by electrostatic spray method.

2. REFERENCES:

The Indian Standards mentioned below are a necessary adjunct to this standard:

IS No.	Title
1786 : 2008	High strength deformed steel bars and wires for concrete reinforcement
6885 : 1973	Method for knoop hardness testing of metals

3. COATING MATERIALS:

3.1 The coating material shall meet the requirements specified in Annex A.

3.2 The patching or repairing material or both, shall be compatible with the coating, inert in concrete and feasible for repairs at the coating plant or in the field. The material shall be approved by the purchaser prior to use. The patching or repair shall be performed in accordance with the recommendation of the material manufacturer.

4. REINFORCING STEEL:

4.1 Steel reinforcing bars to be coated shall conform to IS 1786 :2008.

5. SURFACE PREPARATION:

5.1 The surface of the steel reinforcing bars to be coated shall be cleaned by abrasive blast cleaning to near white metal. The surface profile shall be free from mill scale, rust and foreign matter when viewed under well-lit conditions.

5.2 The coating shall be applied to the cleaned surface as soon as possible after cleaning. Any formation of rust blooms on the cleaned bars is to be removed by blast cleaning before application of the coating. However, in no case shall the coating be delayed more than eight hours after cleaning unless otherwise permitted by the purchase.

6. APPLICATION OF COATING:

The coating shall be applied as an electro statically charged dry power sprayed onto the grounded steel bar using an electro static spray gun. The powder may be applied to either a hot or cold bar. The coated bar shall be given a thermal

treatment specified by the manufacturer of the epoxy resin which will provide a fully cured finish coating. Temperature shall be controlled as recommended by the manufacturer of the coating to ensure a workman like job without blistering or other defects.

7. REQUIREMENTS OF COATED BARS:

7.1 Coating Thickness:

For acceptance purpose at least 90 per cent of all coating thickness measurements shall be 0.1mm to 0.3mm after curing. The coating thickness limits do not apply to patched areas. A minimum of 15 measurements shall be taken approximately evenly spaced along each side of the test bar. At least 90 percent of these measurements shall be within the specified limited.

NOTE: By mutual agreement between the purchaser and the manufacturer, thicker coating may be accepted where the bars are not to be bent or worked after the coating has been applied.

7.2 Continuity of Coating:

The coating shall be visually inspected after curing for continuity of the coating and shall be free from holes, voids, contamination, cracks and damaged areas discernible to the unaided eye. In addition, there shall be not more than an average of two holidays per 300mm when tested in accordance with 8.2.

7.3 Adhesion:

The adhesion of coating shall be evaluated on a representative number of bars selected in accordance with 9.4 from each production lot no visible cracks of disbanding in the coating on the outside radius shall be allowed when tested in accordance with 8.3.

8. TEST METHODS:

8.1 The thickness of the coating shall be measured on the body of reinforcing bar between deformations and ribs or both, on a straight length. Non-destructive coating thickness measurements using magnetic gauges shall be used.

8.1.1 'Pencil' type pull-off gauges which require the operator to observe the reading at the instant the magnet is pulled from the surface and do not hold shims tightly against the steel plate during calibration are not recommended for use.

8.1.2 Gauge calibrating with shims shall be performed on a smooth, clean, low-carbon steel plate (at least 75 x 75 x 13mm), rather than on a clean reinforcing bar.

8.1.3 A correction factor defining the effect of the bar preparation process shall be obtained as the difference between (a) the average of the 10 gauge readings on a cleaned but uncoated reinforcing bar of the size and lot being coated and (b) the average of 5 gauge readings on a smooth mild steel plate. This correction factor shall then be subtracted from all subsequent gauge readings on coated bars.

- 8.1.4 Fixed probe gauges shall be checked to ensure that the force generated by the spring loaded probe housing is sufficient to ensure intimate contact between the probe tip and the coating on the curved bar surface. If intimate contact does not result, it will be necessary⁶ to remove the probe housing and utilize hand-pressure to obtain valid indicated thicknesses.

8.2 **Holidays:**

A 67.5 volts holiday detector shall be used in accordance with detector manufacturer's instructions. Detector may be an in line DC detector or a hand held DC detector.

8.3 **Adhesion of Coating:**

The adhesion of the coating shall be evaluated by bending production coated bars 120 degrees (after rebound) around a mandrel of size of prescribed in Table 1. The bend test shall be made at a uniform rate and shall take up to 90 seconds to complete. The two longitudinal deformations shall be placed in a plane perpendicular to the mandrel radius and the test specimen shall be at thermal equilibrium between 25 C and 35 C.

NOTE: The fracture of partial failure of steel reinforcing bar in the bend test for adhesion of coating shall not be considered as an adhesion failure of the coating:

Table-1: Mandrel diameter for Bend Test Requirement (Clause 8.3)

Bar diameter (mm)		Mandrel Diameter (mm)
6		60
7		80
10		100
12		100
16		125
18		150
20		150
22		200
25		200
28		225
32		280
36		280
40		400
45		450
50		500

9. **FREQUENCY OF TEST:**

- 9.1 Coating thickness shall be tested at a frequency of not less than one full length bar every twenty bars for each size.
- 9.2 Continuity of coating shall be determined by testing one full length bars for each size.

- 9.3 Coating thickness over the whole of the coated bar section shall be determined by sectioning and examining one bar in every twenty tones for each size.
- 9.4 For testing adhesion of coating, samples shall be selected from each size according to the frequency given below:

Nominal Bar Size/mm	No. of Samples
Up to 16	1 for every 1 T
Above 16 and up to 25	1 for every 2 T
Above 25	1 for every 4 T

10. RETEST:

- 10.1 If the specimen for coating thickness or for adhesion of coating fails to meet the specified requirements, twice the number of samples originally selected shall be tested for each failure test. If the results of these retests meet the specified requirements, the coated bar represented by the samples shall be accepted.

11. HANDLING AND IDENTIFICATION:

- 11.1 All systems for handling coated bars shall have padded contact areas. All bundling shall be used to prevent damage to the coating. All bundles of coated bars shall be lifted with a strong back, spreader bar, multiple supports, or a platform bridge to prevent bar-to-bar abrasion from sags in the bundles of coated bars. The bars or bundles shall not be dropped or dragged.
- 11.2 The identification of all reinforcing bars shall be maintained throughout the fabrication and coating processes to the point of shipment.

12. INSPECTION:

All Tests and inspection shall be made at the place of manufacture prior to shipment, unless otherwise specified.

13. PERMISSIBLE COATING DAMAGE AND REPAIR AFTER COATING APPLICATION

- 13.1 Coating damage due to fabrication and handling need not be repaired in case where the damaged area is 40 mm² or smaller.
- 13.2 All damaged areas larger than 40 mm² shall be repaired with patching material.
- 13.3 Maximum amount of damage shall not exceed 2 percent of the surface area of each a bar (total of damage in 13.1 and 13.2)
- 13.4 Patching shall be done in accordance with the patching material manufacturer's recommendations.

14. REJECTION:

Coated bars represented by the samples that do not meet the requirements of this specification shall be rejected. By mutual agreement between the purchaser and the manufacturer, such bar may be stripped of coating, re-cleaned, re-coated and resubmitted for acceptance test in accordance with the requirements of the specification.

15. MANUFACTURER'S CERTIFICATE:

If requested by the purchase, the manufacturer shall furnish at the time of shipment a written certificate that coated reinforcing bars meet the requirements of this specification.

16. IDENTIFICATION AND MARKING:

16.1 The manufacturer or supplier shall mark the bars in such a way that all finished bars can be traced to the cast from which they are made or the original identification mark of the bars.

16.2 Each bundle containing the bars may also be suitably marked with the Standard Mark in which case the concerned test certificate shall also bear the Standard Mark. For each bundle of bars a tag shall be attached indicating the Cast No./Lot No., grade and size of bars.

17. Payment:

Anticorrosive treatment will be paid extra under another item and the measurement for quantity will be taken same as recorded for the supply and providing of reinforcement steel. No payment will be made for the laps, chairs, wastage etc. Only theoretical length as per drawing will be measured for payment.

ANNEXURE- A**Annexure to Specification of Fusion Bonded Epoxy Coating of reinforcement steel:****REQUIREMENTS FOR ORGANIC COATINGS:****A-1 COATING MATERIAL:**

The coating material shall comply with the requirements given in A-2 to A-8 the pigment, if used may be inorganic compound.

A-2 CHEMICAL RESISTANCE:

A-2.1 The Chemical resistance of coating shall be evaluated by immersing coated reinforcing bars in each of the following:

- a) Distilled water,
- b) A 3 M aqueous solution of CaCl_2
- c) A 3 M aqueous solution of NaOH, and
- d) A solution saturated with Ca(OH)_2

A-2.2 Specimens without holidays and specimens with 6mm diameter intentional holes drilled through the coating shall be tested. The temperature of the test solution shall be 30 ± 5 degree C. Minimum test time shall be 45 days. The coating shall not blister, soften, lose bond, nor develop holidays during this period. The intentionally made holes shall exhibit no undercutting during the 45-day period.

A-3 RESISTANCE TO APPLIED VOLTAGE (TYPE OF ACCELERATED CORROSION TEST):

A-3.1 The effects of electrical and electrochemical stresses on the bond of coating to steel and on the film integrity of the coating shall be assessed.

A-3.2 Apparatus and Electrolyte**A-3.2.1 Test Vessel:**

A non-conductive plastic material shall be used for the vessel or as a lining in a metallic vessel. Dimensions of the vessel shall permit the following requirements:

- a) Test specimens shall be suspended vertically in the vessel with at least 25mm clearance from the bottom
- b) Test specimens shall be separated by not less than 40mm
- c) Test specimens shall be separated from any wall of the vessel by not less than 40mm
- d) Depth of the electrolyte shall permit the test length of the specimen to be immersed, but the immersed area shall not be less than 23, 200 mm².

A-3.2.2 Electrodes:

Tenderer/s

For Dy.CE(C)BSL

The cathode and anode shall be reinforcing bars coated with the proposed material.

A-3.2.3 Electrolyte:

The electrolyte shall be an aqueous solution of 7 percent NaCL.

A-3.2.4 Electrical Connection:

A potential of 2 V shall be applied.

A-3.3 No film failures as evidenced by evolution of hydrogen gas at the cathode or appearance of corrosion products of iron at the anode, shall take place during first hour of testing.

A-3.4 The test shall be continued for 30 days and the elapsed time for development of the first holiday shall be recorded. No undercutting of the coating shall occur at any holiday that develops during the test. If no holiday has developed during the 30 days, single intentional hole 6 mm in diameter shall be made in both the cathode and the anode. Then the test shall be continued for an additional 24 h in which time no undercutting shall occur.

A-4 ADHESION OF COATING:

A-4.1 The adhesion of the coating shall be evaluated by bending three coated reinforcing bars 120 degrees (after rebound) around a 150mm diameter wooden mandrel. The bend test shall be made at a uniform rate and shall take up to 1 min to complete. The two longitudinal deformations may be placed in a plane perpendicular to the mandrel radius and the specimen shall be at the thermal equilibrium of 30 ± 5 degree C.

A-4.2 No cracking of the coating shall be visible to the unaided/naked eye on the outside radius of any of the three bent bars.

A-5 BOND STRENGTH TO CONCRETE:

A-5.1 The bond strength of the reinforcing bars in concrete shall be determined with pull-out specimens (two coated bar specimens and two uncoated uncleaned bar specimens) by method outlined in IS 1786 : 2008 as modified in A-5.2 to A-5.8. The test specimens shall be coated and uncoated bars of 20 mm nominal diameter. Bond strength shall be calculated from the load at a measured slip of 0.025 mm and 0.25 mm.

A-5.2 The age of the concrete shall be 28 days.

A-5.3 The test shall be carried out applying axial force on the bar and by measuring the slip at free end of the bar. The test shall be continued up to the failure of the bond between bar and the surround concrete. The failure shall deemed to have occurred when the free end slip of the bar exceeds 0.2 mm.

A-5.4 The load and slip measurements are recorded at slip of 0.01 mm, 0.1 mm and at failure.

A-5.5 The mean bond strength at the measured slip of 0.025 mm and 0.25 mm for coated bars shall not be less than 80 percent of the corresponding mean bond strength for uncoated bars.

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A-6 ABRASHION RESISTANCE:

- A-6.1 The resistance of the coating on each of the steel panels to abrasion by a Taber abrasor or its equivalent using CS-10 wheels and 1 kg.load shall be such that the weight loss shall not exceed 100 mg/1000 cycles.

A-7 IMPACT TEST:

- A-7.1 The resistance of the reinforcing bar coating to mechanical damage shall be determined by the falling weight test.

A-7.2 Apparatus**A-7.2.1 Tup:**

The tup shall have 1.8 kg mass and should be used over a drop range of 0.60 to 1.25 m. The head of the tup shall terminate in a hemispherical IS:875 mm diameter nose.

A-7.2.2 Drop Tube:

A tube approximately 1.50 m long shall be used to contain the tup and guide it during free fall. A scale shall be attached for measuring the height of the drop to the nearest 2.0mm.

A-7.2.3 Specimen Holder:

The base plate of the apparatus shall include a device for positioning and holding the test specimen on line with the axis of the vertical drop line.

- A-7.3 Impact shall occur on the low laying areas on the coated bars, that is, between deformations and ridges. The test shall be performed at room temperature. With an impact of 9 Nm, no shuttering, cracking, or bond loss of the coating shall occur except at the impact area, that is, area permanently deformed by the tup.

A-8 HARDNESS TEST

- A-8.1 The hardness of the reinforcing bar coating shall be determined by knoop hardness tester according to the method given in IS 6885 : 1973 using a 10 g mass. The average of four individual hardness measurements made in the area between deformations or ribs on at least two coated reinforcing bars shall be equal to, or shall exceed the Knoop Hardness number of 16.

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7. QUALITY CONTROL OF EARTHWORK

7.1 General

Quality of execution of formation earthwork shall be controlled through exercise of checks on the borrow material, blanket material, compaction process, drainage system, longitudinal & cross sectional profiles of the finished embankment. The details of quality control procedure are as follows:

7.2 Quality Control test on Construction Material

This is required to ascertain the suitability of the material for construction of Embankment and to decide the OMC/MDD and other relevant tests, which becomes the quality control inputs. Quality control tests are required to be conducted on borrow material as well as on blanket material.

7.3 Suitability tests at source

7.3.1 Borrow Material (Embankment fill as well as prepared subgrade)

a) Following specific tests to be conducted on borrow Material

- i) Sieve analysis
- ii) Hydrometer analysis
- iii) Consistency limits
- iv) CBR test
- v) Test for organic content in soil
- vi) Crumb test, double hydrometer test, pin hole & chemical test - for Dispersive soil only
- vii) OMC/MDD

Fill material proposed to be used either from Railway land or from outside would have to be assessed for its suitability as well as to decide thickness of the blanket layer after conducting soil classification and other relevant tests as per site requirement. On the basis of the tests, areas for borrow material, especially from outside the Railway land, need to be earmarked. Once the material has been found fit for use as fill material for Embankment, further lab tests, to assess OMC, MDD/ Relative Density, need to be conducted.

In case, slope stability analysis, as explained in **Chapter - 5** is required, triaxial shear test will also need to be done to find effective shear strength parameters.

- b) Frequency of Testing:** The frequency of testing before laying for borrow material should be as detailed in **table 7.2**.

Note: It would be in the interest of the execution agency to have frequent tests conducted at source/manufacturing point on his own to judge the suitability of the material to avoid any complication at a later stage. However the final acceptance of the borrow material should be at the site before laying.

7.3.2 Blanket Material: The source(s) of blanket material needs to be identified based on the final location survey report, tests & studies conducted and conformity to the Specification as stipulated in **Table 3.3 to 3.6**.

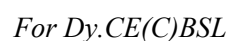
- a) **Method of Test:** Blanket material should be tested as per IS: 2720 (Part 4) to plot particle size distribution curve, so as to assess its suitability. It would be necessary to carry out wet analysis to assess the actual percentage of fines.
- b) **Frequency of Tests:** The frequency of testing at site before laying for blanket material should be as detailed in **Table 7.2**.
- c) **Following tests/checks are to be conducted**
 - i) Sieve analysis and hydrometer analysis to determine C_c , C_u & percentage fines
 - ii) CBR test
 - iii) Los Angeles Abrasion value,
 - iv) Filter criteria, as required
 - v) Gradation Analysis,
 - vi) Check for conformity with enveloping curves

Note: It would be in the interest of the execution agency to have frequent tests conducted at source/manufacturing point on his own to judge the suitability of the material to avoid any complication at a later stage. However the final acceptance of the blanket material should be at the site before laying.

7.4 Quality Control Checks on Finished Earthwork

7.4.1 Compacted Earth: Degree of compaction of each layer of compacted soil should be ascertained by measurement of dry density/Relative Density of soil at locations selected in specified pattern. The method of sampling, frequency of tests, method of tests to be conducted and acceptance criteria to be adopted are as under

- a) **Method of Sampling**
 - i) Various methods of selection of sample points for checking the field dry density are in practice. These methods **are shown in Fig-7.1**. The sampling method should be such that the effectiveness of compaction for the entire area of compacted earthwork can be judged properly. The Engineer in-charge should specify the sampling method depending on the site conditions.
 - ii) For each layer, a minimum of one sample at a predetermined interval along the centerline of the alignment would be taken in a staggered pattern so as to attain a minimum frequency of tests as given in the note below **table 7.2**. For subsequent layer, the stagger should be such that the point of sampling does not fall vertically on the earlier sampling points of the layer immediately below. The process of sampling is explained in **Fig-7.1** for guidance. Additional sampling points can be taken, as considered necessary.
 - iii) In case of embankment widening, sampling should be done at an interval of minimum 200 metres on the widened side(s) of Embankment.



- b) **Methods of In-situ Dry Density Measurements:** Any of the following methods could be adopted as per the requirements at site.

Table–7.1

Method of measurement	Procedure of test	Parameters to be measured	Remarks
i) Sand Replacement Method	As per IS-2720 (Part 28) - latest version	In-situ Dry Density Moisture Content	May be adopted for all type of soils
ii) Core Cutter Method	As per IS-2720 (Part 29) - latest version	-do-	In some of the coarse-grained soils (with little fines) taking core cutter samples is difficult. In such cases, a sand replacement method may be used for density measurement.
iii) Nuclear Moisture Density Gauge	As per Appendix-H	a) Bulk density b) Moisture Content c) Dry density d) Degree of compaction	It is a faster Method and should be widely used for large construction projects.

c) **Acceptance Criteria**

- i) Coarse grained soils which contain fines passing 75 micron IS Sieve, upto 5 percent should have the Density Index (Relative Density) a minimum of 70% as obtained in accordance with IS: 2720 (Part 14) – 1983 (Reaffirmed 2015).
- ii) In field compaction trial, the maximum attainable dry density should not be less than 98% of MDD value as obtained by Heavy Compaction Test (IS: 2720 (Part 8) – (Reaffirmed 2015) in the laboratory. In case, there are difficulties in achieving 98% of the MDD values as obtained by Laboratory test, in the field trials, the same may be relaxed upto 95% of MDD with the specific approval of Chief Engineer/Construction, recording reasons for such relaxation. The level of compaction to be achieved in field, as a percentage of MDD value achieved in field compaction trial, for various layers shall be as per Table 3.3 to 3.6 of Chapter 3. In case of PSU, existing provision of Equivalent authority for acceptance criteria shall continue.
- iii) During widening of embankment in case of gauge conversion and rehabilitation of unstable formation, compaction of earthwork should be minimum 95% of MDD as obtained by Laboratory test as per Heavy Compaction Test (IS: 2720 Part 8 – 2013) or 70% Relative Density for

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Coarse grained soils which contains fines (passing 75 micron IS Sieve) upto 5 percent (IS: 2720 (Part 14) –1983 (Reaffirmed 2015)).

7.4.2 Deformation Modulus (E_v) measurement

It is a parameter expressing the deformation characteristics of a soil. It is calculated taking values from the load settlement curve obtained from the second cycle of loading in the Plate Load Test (Details given in **Appendix-H**). It is to be determined in the field on top of each formation layer i.e. at top of compacted Blanket layer/Prepared sub-grade/Subgrade- Top & Lower layer in accordance with DIN: 18134-2012.

7.4.3 Frequency of Tests

The frequency of testing at finished earthwork should be as specified in the Table 7.2 given below.

7.5 Qualifying and Quality assurance Tests

Qualifying tests as part of pre-selection of good earth for Blanket, Prepared sub-grade, Subgrade is required to be carried out. Also quality of execution of formation earthwork shall be controlled through exercise of checks on the borrow material, blanket material, compaction process to ensure good quality construction. The quality control procedures are summarised in **Table-7.2** below.

Table-7.2: Summary of quality control tests in Borrow material/ finished earthwork

Item / Material	Parameters to be determined	Location of sampling for quality control	IS Code Ref. (Latest version)	Frequency of test	Acceptance Criteria
(i) Borrow material					
(a) Subgrade/ Prepared Subgrade	(i) Soil classification	At site before laying	IS: 1498	At least one test at every change of subgrade/ prepared- subgrade material subject to minimum of one test for every 5000 cum.	Soil should not be “unsuitable type” as given in Para 3.7 and should conform to specification given in Para 3.10 for 25T/32.5T Axle load of Chapter 3
	(ii) CBR		IS: 2720-Part-16		
	(iii) Plasticity Index (Prepared Subgrade)		IS: 2720- Part-5		
	(iv) OMC & MDD		IS: 2720 – Part-8		
(b) Blanket material	(i) Gradation	At site before laying	IS: 2720- Part-4	Minimum one test for every 500 cum or part thereof	
	(ii) Cc & Cu				
	(iii) Fines (passing 75 µ)		IS: 2386 – Part-4		
	(iv) Abrasion value				
	(v) CBR		IS: 2720-Part-		

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	(vi) Filter criteria		IS:2720 – Part-4		
	(vii) OMC & MDD		IS: 2720 – Part-8		
	(viii) γ_{\max} & γ_{\min} (Determined in Relative Density test If fines are upto 5%)		IS:2720-Part- 14		
(ii) Finished earthwork					
(Subgrade /Prepared Subgrade/ Blanket)	(i) E_v	Top of final finished surface of Blanket/ Prepared subgrade & Subgrade	DIN 18134 – 2012	One test per Km (*)	Acceptance Criteria as specified in Para 3.10 of Chapter 3
	(ii) Compaction	Every compacted layer	IS: 2720 (Part-28/29) or NMDG(as per Procedure issued by RDSO)	As per note given below	
	(iii) Density Index (Relative Density if fines are upto 5%)	Every compacted layer	IS: 2720 – Part-14		Minimum 70%

* Additionally this test can also be done by third party (i.e. IIT, NIT, Govt. Labs or any NABL approved Lab) having testing facilities, to cross check the results achieved at site. Frequency of testing in this case shall be decided/approved at the level of Chief Engineer (Con). In PSUs, frequency of such tests shall be decided as per existing delegations for testing.

Note: Frequency of Tests: Density check would be done for every layer of compacted fill/blanket material as per following minimum frequency:

- At least one density check for every 30 m length for blanket layers and top one metre of prepared subgrade/subgrade along the alignment in a staggered pattern of each compacted layer.
- At least one density check for layers other than as specified in (i) above, every 500 m² or 75 m c/c whichever occurs earlier along the alignment in a staggered pattern of each compacted layer.
- In case of important bridge approaches (100 m length on either side), at least one density check for every 25 m length shall be adopted.

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- 7.6 Formation Level:** Finished top of sub-grade level may have variation from design level by ± 25 mm and finished top of blanket layer may also be permitted to have variation from design level by plus 25 mm only. The ballast should be placed only on level formation without ruts or low pockets.
- 7.7 Cross Slope:** Cross slope should be within 1 in 28 to 1 in 30.
- 7.8 Side Slopes:** Side slope should be 2H: 1V or flatter as per design.
- 7.9 Formation Width:** Formation width should not be less than the specified width.
- 7.10 Quality Control Records:** At least, following records of quality control as per proforma given in **Appendix- D & G** needs to be maintained.
- i) Characteristics of borrow materials as per proforma **No. G-1.**
 - ii) Quality of blanket materials as per proforma **No. G-2.**
 - iii) Field compaction trial computation sheet details as per **Table D-4 of Appendix-D.**
 - iv) Quality of compaction of earthwork including blanket material as per proforma no. **G-3** for core cutter method & proforma no. **G-4** for sand replacement method.
 - v) Quality of material and its compaction for backfill behind bridge approaches etc. as per proforma no. **G1, G2, G3 & G4.**
 - vi) Details of machineries engaged in execution of earth work including its output as per proforma decided by field engineers.

7.11 Setting up of GE Lab at Construction/Rehabilitation Site

A well-equipped Geo-technical Engineering (GE) Field Laboratory shall be set up at all construction projects connected with new lines, doubling and gauge conversion works as well as, where rehabilitation of failing formation is being undertaken. (Details are given in Para 6.2.8 of Chapter 6).

7.12 Certification for quality of earthwork

Certification for quality of earthwork in formation in respect of new lines, Gauge Conversion and Doubling projects etc. will be done by Executive authority at SAG level (i.e. CE/Con of respective projects). CE/Con will submit details for certification of quality of earthwork to CRS as per RDSO checklist.

7.13 Checklist for certification of quality of earthwork

Checklist for certification of quality of earthwork in Railway projects was issued by RDSO vide letter no RS/G/95/Main, dated: 11.06.2004. This Checklist has been revised and placed at Appendix –M.

7.14 Special design problems related with construction of formations

Any special design problems related with construction of formations may be referred to RDSO for guidance and advice, if required.

7.15 Widening of Embankment

7.15.1 Widening of Embankment for Gauge conversion

- a) Before taking up widening of Embankment for gauge conversion, it should be ensured

that remedial measures for unstable formation have been taken.

- b) All vegetation shall be uprooted and taken away from the site of work. The loose materials removed from the slope should be dumped to form the bottom most layer on the ground in the width to be widened. If required, it shall be supplemented with local granular soil.
- c) Starting from the toe, benching on the slope at every 30cm height shall be provided on the slope surface as shown in **Fig-7.2** below so as to provide proper amalgamation between the old and new earthwork.

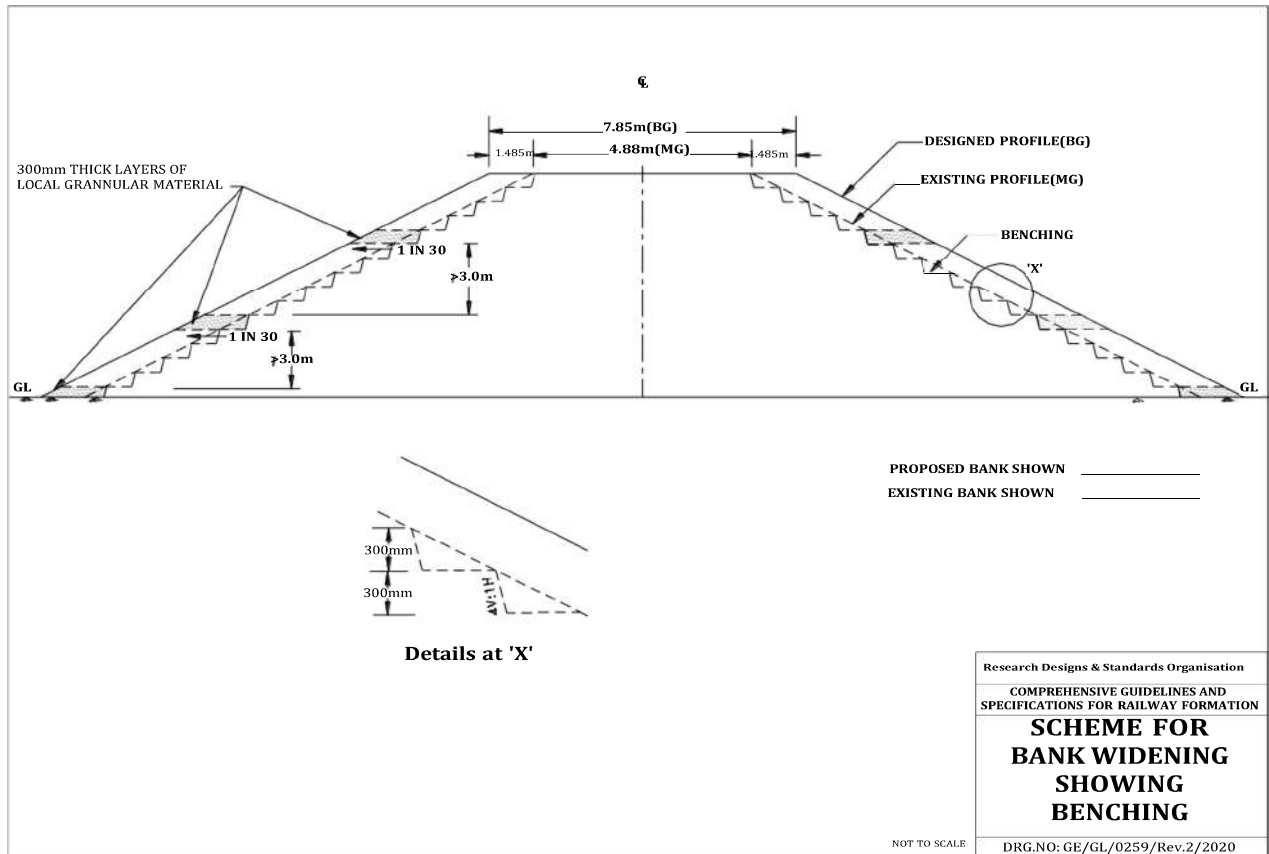


Fig-7.2: Scheme for bank widening showing benching

Earthwork shall be carried out in layers, each layer sloping out 1:30 and compacting it mechanically using vibratory rollers of around 0.9m width (which are available in the market); 6 to 8 passes of such rollers shall usually suffice to provide the compaction to the specified level. Compaction on slope shall be ensured by using slope vibratory roller of 10-20t. Preferably, this should be a separately payable item.

- d) The width of each layer of earthwork shall be in excess by 300mm of the designed profile to enable compaction near the edges. The excess width, thereafter, be cut and dressed, so as to achieve the required embankment profile.

In case of widening for gauge conversion, Earthwork shall be completed upto design formation level with due allowance of provision of blanket (as per RDSO specification) on

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entire formation width i.e. extended portion as well as in existing formation. If blanket layer does not exist on the existing formation, top layer of existing embankment shall be replaced with required depth of blanket layer in pursuance to guideline for fitment of existing formation for running of 25T axle load at 100 kmph (as per details given in **Appendix-I**).

7.15.2 **Widening of Embankment for doubling**

- a) Before taking up widening of Embankment for doubling, it should be ensured that remedial measures for existing unstable formation have been taken.
- b) All vegetation shall be uprooted and taken away from the site of work. The loose materials removed from the slope should be dumped to form the bottom most layer on the ground in the width to be widened. If required, it shall be supplemented with local granular soil.
- c) Starting from the toe, benching on the slope at every 30cm height shall be provided on the slope surface as given in **fig. 7.3**, so as to provide proper amalgamation between the old and new earthwork.

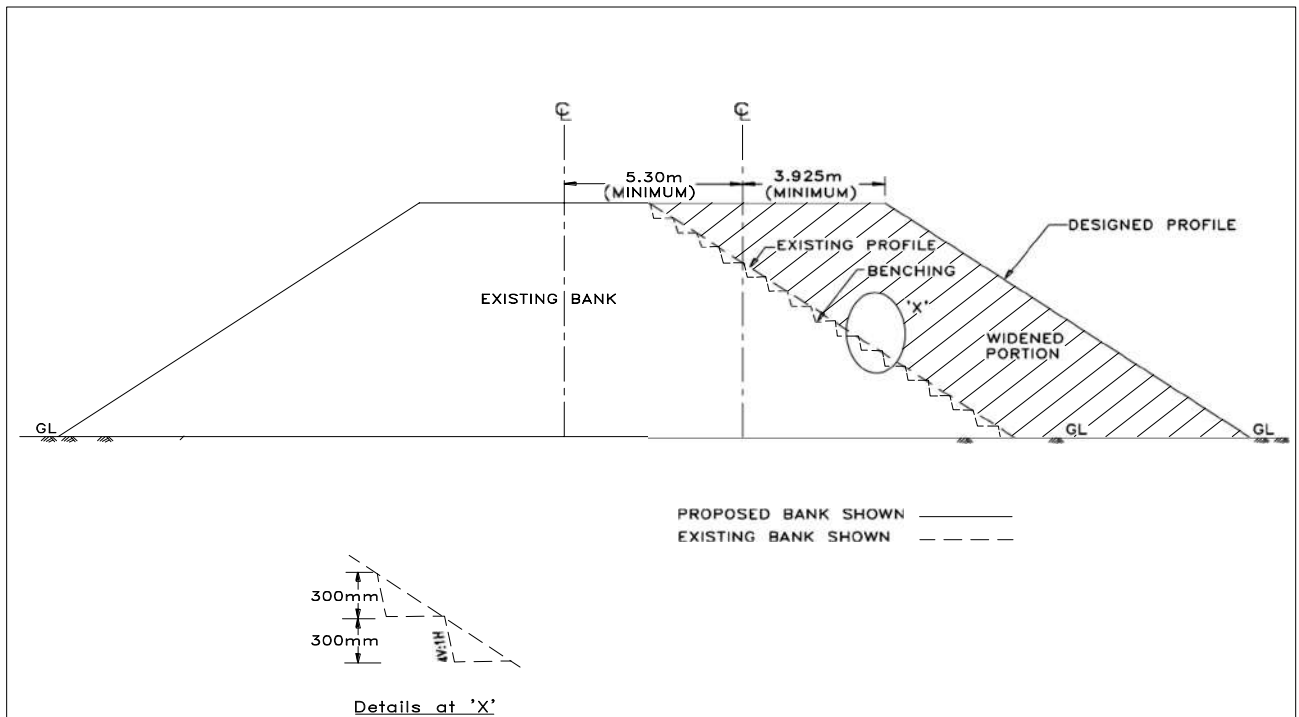


Fig-7.3: Widening of Embankment for doubling

Note 1- In case of existing formation is of minimum 7.85m width, widening isto be done only on one side as indicated in sketch above.

Note 2- In case of widening of existing formation (formation width 6.85 m or below as per previous provisions of IRSOD), the requirement of minimum formation width of 13.16 m & minimum cess width of 900 mm may not be fulfilled on other side of existing embankment which is not widened. In that case, cess width of existing track is to be increased on programmed basis as stipulated in para 9.2. The total formation width i.e. existing plus widened of minimum 13.16m shall have to be ensured as per latest provisions of IRSOD.

Note 3- Additional width of formation on curves should also be accounted for as per relevant provisions of IRSOD/IRPWM.

- d) In case of doubling with widening of existing embankment, various provisions & methodology for new construction as stipulated in **Chapter 3 & 6**, shall be followed.

Note: Design and construction of any detours (for easing out of existing sharp curves, rebuilding of important bridges etc.) shall be carried out in accordance with provisions of new construction as stipulated in Chapter 3 (Table 3.1 to 3.6).

- e) In case, height of embankment (as per required top level of formation) is less than the required depth of formation layers (Blanket/Prepared sub-grade/Top layer of sub-grade), then also provision as stipulated for formation layer shall have to be ensured for effective stress dispersal. If required, excavation below ground level will have to be done as given in **Para 3.11 of Chapter 3 & Appendix-B**.
- f) Suitable drainage arrangement as given in **Chapter 6-Execution of Earthwork** is to be provided.

7.15.3 Raising of Existing Formation

After widening of the embankment to the level of the existing formation, raising shall be done as under:

- a) Raising less than 150mm shall be done with ballast, restricting total ballast cushion to 350mm.
- b) Raising from 150mm to 1000mm: The existing ballast shall be taken out under suitable speed restriction and raising should be done in suitable steps with the material as per specification of blanket material. After raising to the desired level, clean ballast shall be inserted. Limiting value of 1000mm may be reduced depending on the site conditions.
- c) Raising of more than 1000mm, shall be done by laying temporary diversion for passage of traffic.

8. MISCELLANEOUS

1. Integrated 4 coat system - Protective coating for Concrete surface:

All concrete surfaces of superstructure and part of substructure above road level shall be provided with Integrated 4 coat system developed by CECRI Karaikudi.

1.1 Material:

Material for epoxy painting shall be procured from the approved licensee of Central Electrochemical Research Institute, Karaikudi and shall be got approved from the Engineer. The following tests shall be carried out on epoxy material prior to use.

- (i) Salt spray Test as per ASTM B 117
- (ii) Scratch hardness Test as per ASTM D2197-68
- (iii) Adhesion Test as per ASTM D3359-83
- (iv) Water absorption Test as per ASTM D-570
- (v) UV test as per ASTM D3361-81
- (vi) Pot life Test.
- (vii) Chemical Resistance Test for Chloride, Sulphates, Dilute Acids (HCl 5% & H₂SO₄ 5%), Alkalis (NaOH) etc.

Each batch of material shall be got tested.

1.2 Surface Preparation:

The surface of concrete to be coated shall be free from dirt, dust, residue of grease, demoulding oil, curing compound and other deleterious material. The surface shall be cleaned with wire brushes. Use of cup brushes attached to the electric grinder shall be preferable. The cracks, depressions in the concrete surface shall be sealed with sealant EPCO-1010. Before application of epoxy paint, it shall be ensured that the concrete surface shall be cured and free of moisture and dust.

1.3. Properties of Materials of various coats:

	First coat primer	Second Coat	Third Coat	Fourth & Final Coat
	EPOXY – Polymide Primer For Coatings Over Concrete Surfaces.	EPOXY – Micaceous Iron Oxide Undercoat For Coatings Over Concrete Surfaces	EPOXY – Polymide Finish Paint For Coatings Over Concrete Surfaces	Aliphatic Acrylic Polyurethane
Pigment				
Main pigment	Red iron oxide 82.5% by Wt. of total pigment.	Micaceous iron oxide – 50.6% by Wt. Of total	TiO ₂ 68.4% Wt. Of total pigment.	

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	First coat primer	Second Coat	Third Coat	Fourth & Final Coat
		pigment.		
Other pigment	Talc.	Silicates & clay materials – 49.4%.	Talc & Silica.	
Binder	Epoxy Resin (Bis-Phenol “A” type) Epoxide equivalent 475-520)	Epoxy Resin (Bis-Phenol “A” type) Epoxide equivalent 475-520).	Epoxy Resin (Bis-Phenol “A” type) Epoxide equivalent 475-520)	Acrylic Resin
Curing Agent	Symbol 125 polyamide (versamide type)	Symbol 125 polyamide (versamide type).	Symbol 125 polyamide (versamide type)	Aliphatic Isocyanate
Solvents	1:1 Xylene – MIBK mixture.	1:1 Xylene O MIBK mixture.	1:1 Xylene MIBK mixture.	-
PVC	33%	36%.	18%.	-
Volume solid.	55%	60%	80%	50%
Specific gravity.	1.5	1.5	1.35	-
Mixing ratio. (Base : catalyst)	3.1 by volume	3.1 by volume (Base : curing agent).	3.1 by volume (Base : curing agent)	4:1 (Base : Curing Agent)
Mode of Application.	Spray / Brush.	Brush/ Air – less spray.	Brush / Air – less spray.	Brush / Roller/ Air – less spray.
Coverage	5.5 – 6m ² /litre.	4-5m ² / litre.	5-6 m ² / litre.	11.4 – 13.3 Sq. m per litre
Dry Film Thickness .(Brush)	55 ± 5 micron	110-120 micron	110 ± 5 micron.	30±5 micron per coat
Recotability	After 24 hrs.	24 hrs.	After 24 hrs.	After 24 Hrs.

Notwithstanding the provisions above any modifications in composition or application procedure, stipulated by CECRI, Karaikudi who would be associated with Railways, in advisory capacity shall be adopted during execution.

1.4 Measurement for Payment:

Protective coating of **Integrated 4 coat system protective coating for Concrete surface** shall be measured in square meters of surface area painted.

2. Specification for Polypropylene Fibre Reinforcement for Concrete & Mortar

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- 2.1 Description: Polypropylene Fibres are extruded from virgin Polypropylene and specially treated and precisely cut for use in Cement Concrete and Mortar. These fibres work as micro reinforcement by mixing thoroughly into the cementitious matrix thereby improving the tensile, anti-cracking and other properties. The PP fibres are added in small dosage and they get uniformly distributed in random orientation to give an ideal two phase composite material.
- 2.2 The Polypropylene Fibres shall comply with the requirements of: ASTM Standard Specification C 1116-4/1.3 Type III for Fibre Reinforced Concrete and Shotcrete.
- 2.3 **Properties:**
1. Nature: 100% Virgin Polypropylene Fibres
 2. Colour : White,
 3. Specific Gravity: 0.91,
 4. Melting Point : 160 degree C
 5. Water Absorption: Nil,
 6. Cut Length : 20mm
 7. Dispersion : Excellent,
 8. Alkali Resistance: Excellent,
 9. Chloride & Sulphates : Nil
 10. Compatible with all Types of Cement & Chemical Admixtures
 11. Safety: No hazards in handling the material
- 2.4 **Dosage:** 1) 20mm Length PP Fibres in Concrete @ 90 gms.per 50 kgs. Cement
- 2.5 **Method of Use:** Add/Sprinkle the recommended Dosage of PP Fibres to the Concrete Mixer after the additional of the dry ingredients along with water and Chemical Admixture and mix for about two minutes to ensure thorough mixing.
- 2.6 **Applications:** The PP Fibre reinforcement can be used in wearing coat of deck slab.
- 2.7 **Measurement for payment:** It is included in the item of fibre reinforced concrete, hence will not be measured separately for payment purpose and as such payment is covered in the item of fibre reinforced concrete .

3. **Coal Tar epoxy**

3.1 **General:**

All RCC substructures in contact with earth shall be given approved 2 coats of coal tar epoxy compound painting. The work shall include preparation of surfaces, application of protective covering and drying of the paint coatings.

3.2 **Surface Preparation:**

Surface to be painted shall be cleaned with wire brush & water to remove earth, dust etc.

3.3 Quality of Paint:

The paints which have been tested for the following qualities as per specifications given in the relevant Indian Standard codes should only be used.

- Weight test (weight per 10 litres of paint thoroughly mixed)
- Drying time
- Flexibility and Adhesion
- Consistency
- Dry thickness and rate of consumption

3.4. Type of Paint:

Primer coat shall consist of 1 coats of epoxy zinc phosphate primer of approved make approx. 20 micron thick. Finishing coat shall consist of 2 coats of coal tar epoxy Hi Build paint of approved make. Total thickness of paint including primer shall not be less than 250 micron.

3.5. Method of Application:

Paint shall be applied either by brush, roller or spray. All painting will be done in accordance with IS: 1477 (Part-1). The primer, intermediate and finishing coats shall all be applied so as to provide smooth coatings of uniform thickness. Wrinkled or blistered coatings or coatings with pinholes, sags, lumps or other blemishes shall not be accepted.

3.6. Tests:

The materials shall be tested in accordance with relevant IS Specifications and necessary test certificates shall be furnished.

Sr. No.	Properties	Acceptability criteria	Frequency of test
		Value	
1	Weight test	Manufacturer's specification	Each batch shall be Compared with Manufacturers Test Certificate.
2	Drying time		
3	Flexibility and adhesion		
4	Consistency		
5	Dry thickness.		
6	Rate of consumption		

3.7 Measurement for Payment:

Protective coating of coal tar epoxy shall be measured in square meters of surface area painted.

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9.PRESTRESSING

1. Materials

a)Pre-stressing Steel

Low Relaxation strands conforming to IS:14268-1995 would be used. The pre-stressing steel should be subjected to an acceptance test prior to their actual use, in accordance with BS: 4447.

b)Pre-stressing Accessories

Pre-stressing accessories i.e. anchorages and grips should be subjected to an acceptance test, prior to their actual use on the works, in accordance with BS:4447.

c)Sheathing

i) The sheathing ducts shall be of the spiral corrugated type. Unless otherwise specified, the material shall be either galvanized Cold Rolled Cold Annealed (CRCA) Mild Steel conforming to IS:513 intended for mechanical treatment and surface refining but not for quench hardening or tempering or HDPE sheathing of approved manufacturer.

In view of the aggressive environment, galvanised mild steel strips or HDPE sheathing conforming to IRC: 18-2000 D.3.6.2 shall be used.

The thickness of sheathing shall be as shown on the drawing, but shall not be less than 0.5 mm with sheathing ducts having external diameter of 90 mm or as shown in drawing.

The galvanised sheathing shall conform to the requirement as per tests specified in IRC 18.

The sheathing ducts shall be manufactured at the project site utilising appropriate machines. The manufacturing shed should have concrete flooring. Sheathing will be manufactured just prior to its use. Storage at site shall be kept absolutely minimum. Where sheathing duct joints are unavoidable, such joints shall be made slurry tight by the use of corrugated threaded sleeve couplers which may be tightly screwed onto the outer side of the sheathing ducts.

The length of the coupler should not be less than 150 mm but should be increased up to 200 mm wherever practicable. The joints between the ends of the coupler and the duct shall be sealed with heat shrink adhesive sealing tape to prevent penetration of cement slurry during concreting. The couplers of adjacent ducts should be staggered wherever practicable. As far as possible, couplers should not be located in curved zones.

ii) Cables shall be threaded after concreting. A temporary tendon shall be inserted in the sheathing or the sheathing shall be stiffened by other suitable method during concreting to prevent its collapse or ovalisation. As an alternative HDPE tube of slightly less diameter may also be inserted inside the sheathing.

d) Anchorage

Anchorage shall be procured from authorized/approved manufacturers only viz. Freyssinet system, Dynamic, CCL system etc.. Anchorages shall conform to BS:4447. Test certificates from a laboratory fully equipped to carry out the tests shall be furnished to the Engineer. Such test certificates shall not be more than 12 months old at the time of making the proposal for adoption of a particular system for the project. However, the anchorages will be required to be tested in an approved laboratory.

No damaged anchorages shall be used. Steel parts shall be protected from corrosion at all times. Threaded parts shall be protected by greased wrappings and tapped holes shall be protected by

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suitable plugs until used. The anchorage components shall be kept free from mortar and loose rust and any other deleterious coating.

2 Storage of Materials

2.1 HTS strands should be coated with water soluble oil and wrapped in HDPE wrappers. Prestressing strands should be stored in a godown where humidity is controlled up to 60 percent with the help of electric heaters and a number of perforated pouches of dehumidifying powder may be suspended in the storage godown. Dry & wet bulb thermometers (Hygrometers) may be installed inside the godown to check the humidity from time to time. Double track doors are to be provided in the storing place.

2.2 Sheathing coils, properly wrapped in waterproof wrapper, is to be stored in a humidity controlled godown.

3 Workmanship

3.1 Cleaning

Tendons shall be free of loose rust, oil, grease, tar, paint, mud or any other deleterious substance.

Cleaning of the steel may be carried out by immersion in suitable solvent solution and compressed air.

3.2 Straightening

High tensile strand shall be supplied in coils of sufficiently large diameter such that tendons shall retain their physical properties and shall be straight as it unwinds from the coil. Tendons of any type that are damaged, kinked or bent shall not be used.

The packing of prestressing strand shall be removed only just prior to making of cable for placement. Suitable stands shall be provided to facilitate uncoiling of strands without damage to steel. Care shall be taken to avoid the possibility of strand coming into contact with the ground.

3.3 Positioning

3.3.1 Prestressing tendons shall be accurately located and maintained in position, both vertically and horizontally, as per drawings.

Tendon shall be so arranged that they have a smooth profile without sudden bends or kinks.

3.3.2 Installation of Strands

a) For making the cable at site firstly the strands are cut to length, then made into a cable on a working bench using a device called a former. The cable is tied with wires placed about every 80.0cm. In most of the cases the ties are removed as the cable is introduced in the duct. Since the duct diameter is sufficiently large the ties may be left in place. The cable is threaded into the duct either by pulling it from the far end by suitable means, or by pushing it from the near end. Individual strands can also be threaded using a cable threading machine.

b) Cable Supporters

Sheathing shall be placed in correct position and profile by providing suitable ladders and spacers. Such ladders may be provided at intervals of approximately 0.7 m. Sheathing shall be tied rigidly with such ladders/spacer bars so that they do not get disturbed during concreting.

The method of supporting and fixing shall be such that profile of cables is not disturbed during vibrations, by pressure of wet concrete, by workmen or by construction traffic.

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3.4 Profiling

The profiling of cable should be such as to give a distribution of prestressing in each section which corresponds to the stresses under the applied loads. The profiling of cable is done in accordance with the ordinates of x-axis and y-axis as given in the working drawings. Sufficient number of cable ordinates shall be given to fix exact location of cable. For profiling, the cables are attached to horizontal supporter bars fixed to the stirrups of the beams. The stirrups must be fairly strong and rigid to support the weight of the cable. “U” shaped saddles of 8 mm mild steel welded to one branch of the stirrup are often used to fix the cable. The supporters shall be spaced 70.0 cms. apart. The first support should be 30.00 cm. from the anchorage so as to ensure that the cable is coaxial with the anchorage and firmly held during concreting.

3.5 Precaution During Profiling :- The following precautions should be taken during profiling :-

- a) Tendons shall be handled with care to avoid damage or contamination, to either the tendon or the sheathing. Any tendons damaged or contaminated shall be cleaned or replaced.
- b) Between the points given, the cable must retain a regular curvature without undulations or sharp changes in the direction which will cause increase in the friction loss at the time of stressing.
- c) The cable axis must coincide with the anchorage axis for a length of, at least 40 cm behind the anchorage.
- d) Strand should be uncoiled in such a manner that it is not twisted.
- e) All the strands of the cable should be numerically identified with paint, at both ends, before threading. This will avoid any internal twist of the strands.
- f) When the strands are pulled into the tendon ducts together in bundle, special care should be taken that it does not damage the duct or the strands.
- g) Strands should be cut evenly by abrasive cutter to desired length. Flame cutting shall not be permitted.
- h) Identification label from strand coil should be kept in safe case. Strand data from identification label and the tendon numbers in which the strands is used should be entered in construction note.

3.6 Checking of Cable After Cable Placing

i) Successful and quick stressing and grouting operations largely depend upon the care taken with cable and reinforcement placing. After completion of profiling and placing the following must be checked :-

- a) Cable Profile :- The cable must follow a regular profile, without wobbles. This condition is important to avoid abnormally high friction losses when stressing. The cable ordinates must be checked. The cable must be straight and coaxial with the anchorage for a distance of at least of 70.0cm, from the end of the girder. It must be firmly fixed so as to prevent sagging of cable under the weight of concrete.
- b) Water Tightness of the Cable
The sheath should be inspected when placed. Damages caused by handling and placing must be repaired with adhesive tape.
- c) Strength of the Supports
The cable must be firmly held vertically and horizontally and must remain in position during
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concrete placing and vibration. Welded saddles are the most reliable cable supports.

d) Anchorage Zone

The sheath connection with a precast end block must be water tight. The joint between Anchorage and formwork must also be water tight.

e) Temporary Tendon

A temporary cable comprising of 19T13 strands shall be inserted in the ducts to prevent ovalisation of the ducts. HDPE tube may also be used.

3.7 Cutting :- Cutting and trimming of wires or strands shall be done by suitable mechanical cutters only.

The ends of prestressing steel, keeping 20 mm projection beyond the wedge shall be cut after the grout has set. .

3.8 Protection of Prestressing Steel

Prestressing steel shall be continuously protected against corrosion, until grouted. The corrosion protector shall have no deleterious effect on the steel or concrete or on the bond strength of steel to concrete.

3.9 Concreting

After completion of the profiling, the concreting of the member is done. Special care is required during this operation. The following precautions should be taken during concreting :

- a) The sheathing should be protected from getting punctured by any sharp object. In case of any damage to the sheath it should be repaired immediately with adhesive tape.
- b) Care should be taken that profiling is not disturbed.
- c) The coupler joints should be checked at regular intervals to ensure that joints are sealed properly and mortar is not entering the duct.
- d) The temporary cable/HDPE tube should be hammered from both the ends to prevent the setting of such mortar that may have entered the duct from any loose joint or hole.
- e) The concrete should be of sufficient workability.
- f) When the cable supports are not welded, the concrete must not be dumped on the cables in a manner which would tear away the support.

3.10 Stressing Data & Record to be Maintained

1. Stressing sequence
2. Tendon identification
3. Tendon length (from anchorage end to anchorage end)
4. Design elongation of tendon (l_z)
5. Elastic shortening of concrete = (l_b)
6. Wedge Set at anchorage (l_s)
7. Elongation of the prestressing steel within the stressing jack (from bearing plate to master grip) (l_e)
8. Total calculated elongation $l_o = l_z + l_b + l_e + l_s$

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9. Specified stressing force
10. Specified cross section area of prestressing steel
11. Specified Modulus of prestressing steel
12. Actual cross section area of prestressing steel installed in the tendon
13. Actual Modulus of Elasticity
14. Elongation that may be obtained should be estimated on the basis of modulus of elasticity and cross sectional area of prestressing steel used.

3.11 Stressing

3.11.1 Stressing Schedule

The following information is of prime requirement before stressing operation.

- a) The elongation and jacking force for each cable : The initial prestressing force required and the stress strain diagram of the proposed steel must be used for these calculations.
- b) The minimum concrete strength before stressing.
- c) The stressing sequence of the cable.
- d) Special requirements concerning removal of scaffolding corresponding to the stressing phase.

3.11.2 Prestart Checks

Stressing can begin when the following conditions are met :

- a) Friction loss of the jacks have been determined.
- b) The concrete strength specified has been reached.
- c) The cable ends are accessible.
- d) The stressing equipments are in working order and the gauges are calibrated.
- e) The jack is placed in position.

3.11.3 Stressing Procedure

a) Preparation of the Cable and the Anchorage

The strand surface must be cleaned of all dirt by emery paper so that adequate friction is generated between strand and grips. Traces of mortar must be removed with a steel brush. The internal surface of the guide must be cleaned.

b) Placing of Bearing Plate

The strands may be threaded through the bearing plate and the grips placed in position.

c) Placing the Jack

The grooves of the jack may be greased for easy de-wedging of jacks using graphite grease or if not available, using paraffin wax. The inside of the barrels of anchors must be greased.

The jack may be placed on the anchorage with each strand in a groove of the jack. The jack may be pushed to bring it as close as possible to the concrete face. The wedges are then placed using sharp hammer blows making sure that the strands lie correctly aligned in the grooves of the jack. For jacks with individual grips, the strands may be attached firstly by threading of the barrels and then placing the grips and driving them home using a piece of tube supplied with the jack. The grip serrations may be checked and cleaned when necessary.

3.11.4 Stressing of Cables

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Tensioning force shall be applied in gradual and steady steps and carried out in such a manner that the applied tensions and elongations can be measured at all times. The sequence of stressing, applied tensions and elongations shall be in accordance with the approved drawing or as directed by the Engineer.

It shall be ensured that in no case, the load is applied to the concrete before it attains the strength specified on the drawing or as stipulated by the prestressing system supplier, whichever is more.

After prestressing steel has been anchored, the force exerted by the tensioning equipment shall be decreased gradually and steadily so as to avoid shock to the prestressing steel or anchorage.

The tensioning force applied to any tendon shall be determined by direct reading of the pressure gauges or dynamo-meters and by comparison of the measured elongation with the calculated elongation. The calculated elongation shall be invariably adjusted with respect to the modulus of elasticity of steel for the particular lot as given by the manufacturer.

The operation must be carried out as follows :

- All the leads are plugged.
- One end of the second lead, should be attached to the blocking chamber of the jack so as to discharge the fluid in the blocking chamber into the reservoir of the pump.
- After stressing to 50.0 Kg/cm^2 approximately, release the jack holding arrangement.
- The pump may be operated until the cable has reached the required stress and elongation. The pressure drop should not be allowed while taking readings. Elongation reading may be taken when the pump is stopped.
- The tension in the stressing chamber may be held by closing the valve on the lead.

If the calculated elongation A_0 is reached before the calculated gauge pressure P_0 , stressing is continued until P_0 , provided the elongation does not exceed $1.05 A_0$.

In case this elongation $1.05 A_0$ is reached before P_0 , stressing may be stopped.

If at pressure P_0 the elongation A_0 has not been reached, tensioning may be continued until elongation A_0 has been reached provided the pressure does not exceed $1.05 P_0$.

If the elongation at $1.05 P_0$ is less than $0.95 A_0$ the following measures must be taken in succession to define the cause of this lack of elongation.

- The pressure gauge may be recalibrated.
- The correct functioning of the pump and leads may be checked.
- The cable is detensioned and slid in its duct to check that it is not blocked by mortar which may have entered through holes in the sheath.
- The jack's internal friction should be determined by testing.
- Re-establish the modulus of elasticity of steel.

A complete record of prestressing operations along with elongation and jack pressure data shall be maintained. A format shall be submitted well in advance for approval.

3.12 Grouting :- The following conditions must be present in order to ensure a good grouting operation :

- The grout must completely fill the duct, without air pockets or bleeding pockets.

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- The grout must not contain any component which could attack the steel.
- The duct must in no way have obstacles to the flow of grout and must be as uniform as possible without sudden changes of cross section.
- The area of the free space in the sheath must be at least equal to the area of the prestressing steel.
- The grouting equipment must be sufficiently powerful to ensure the passage of the grout from one end to the other end of the duct, inspite of the head loss.

3.12.1 Properties of Grout :- The water/cement ratio should be as low as possible, consistent with workability, but not exceeding 0.40. The grout should be homogeneous and sufficiently fluid, having maximum bleeding not more than 2%. Only Portland cement not more than 2 months old shall be used. Admixture if used shall be chloride free. The quantum of admixture to be used shall be as per manufacturer's recommendation and field trials.

The compressive strength of 100 mm cubes of grout shall not be less than 17 MPa at 7 days.

The properties and suitability of the grout shall be established by a mock-up trial.

3.12.2 Batching & Mixing of Grout :- All materials shall be batched by weight except the mixing water and liquid admixture which may be batched by weight or volume. The accuracy of batching shall be:

- + 2% for cement and admixture
- + 1% for mixing water

The mixing water shall include the water content of liquid admixture. Depending upon the environmental or material influence e.g. temperature, configuration of the tendon and properties of the materials used, the w/c ratio shall be kept as low as possible giving regard to the required properties of the grout.

The maximum water cement ratio (w/c) shall be 0.40. The grout shall be mixed in a mixing tank filled with motorised high speed colloidal mixer. The grout will then be transferred to an agitation tank where the mixed grout will be continuously agitated with a slow speed agitator. The outlet of the agitation tank will be connected to the grout pump. Unless manufacturers specify otherwise, water shall be added to the mixer first, followed by the dry materials which may be added as a whole or in part in sequence until the total quantities are added. The minimum mixing time determined from grouting trials shall be adhered to and shall generally not exceed 3 minutes.

The temperature of freshly mixed grout shall be 5°C minimum and 25°C maximum.

Grouting procedure shall be as per Appendix-5 of IRC:18.

3.13 Anchorage

- All bearing surfaces of the anchorages shall be cleaned prior to concreting and tensioning.
- Anchor cones, blocks and plates shall be securely positioned and maintained during concreting such that the centre line of the duct passes axially through the anchorage

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assembly.

- The cast iron guide shall be recessed from the concrete surface by a minimum cover of 150 mm.
- After the prestressing operations are completed and prestressing strands are cut, the surface shall be painted with two coats of epoxy of suitable formulation having a dry film thickness of 80 microns per coat and entire recess shall be filled with concrete or non-shrink/pre-packaged mortar or dense cementitious polymer modified mortar. Plastic cap or strands to be fixed with epoxy glue.

3.14 Tensioning Equipment

All tensioning equipment shall be procured from authorised manufacturers only and be approved by the Engineer prior to use. Where hydraulic jacks are used, they shall be power-driven unless otherwise approved by the Engineer. The tensioning equipment shall satisfy the following requirement :

- i. The means of attachments of the prestressing steel to the jack or any other tensioning apparatus shall be safe and secure.
- ii. A single multipull stressing jack shall be used which is capable of tensioning simultaneously all the strands of the tendon. Suitable facilities for handling and attaching the multipull jack to the tendons shall be provided. The jacks shall have hydraulic blocking system.
- iii. The tensioning equipment shall be such that it can apply controlled total force gradually on the concrete without inducing dangerous secondary stress in steel, anchorage or concrete; and
- iv. Means shall be provided for direct measurement of the force by use of dynamo-meters or pressure gauges fitted in the hydraulic system itself to determine the pressure in the jacks. Facilities shall also be provided for the linear measurement of the extension of prestressing steel to the nearest mm and of any slip of the gripping devices at transfer.
- v. Stressing jack shall be tested for friction loss prior to use. Friction loss should not exceed 3 %.

All dynamo meters and pressure gauges including a master gauge shall be calibrated by an approved laboratory immediately prior to use and then at intervals not exceeding 3 months and the true force determined from the calibration curve.

Pressure gauges shall be concentric scale type gauges accurate to within two per cent of their full capacity. The minimum nominal size of gauge shall be 100 mm. The gauge shall be so selected that when the tendon is stressed to 75 per cent of its breaking load, the gauge is reading between 50 per cent and 80 per cent of its full capacity. Suitable safety devices shall be fitted to protect pressure gauges against sudden release of pressure.

Provision shall be made for the attachment of the master gauge to be used as a check whenever requested for by the Engineer.

3.15 Grouting Equipment: - All grouting equipments shall be procured from authorised manufacturers only and be approved by the Engineer prior to use.

Two separate tanks will be fabricated - one for mixing and one for agitation. Grout will be mixed in the mixing tank with a high speed mixer capable of producing a colloidal mix. Mixing time will be generally between 2 to 3 minutes. Tests will be done at site to arrive at the optimum mixing time for a particular equipment. After mixing, grout will be transferred to agitation tank. The grout will be kept under continuous agitation by a slow speed agitator so that there is no settlement of cement particles in the period between mixing and pumping.

Grout pump shall be positive displacement type and should be capable of pumping the grout in a continuous operation and not by way of pulse. The pump must be fitted with a pressure gauge. The pump must have a relief arrangement for bypass of the grout in case of pressure built up. Grout shall be pumped at pressure around 0.3 Mpa which should be gradually increased to 0.5 Mpa. The speed of grouting should not be more than 10 metres per minute.

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A direct feed high pressure water pump shall be available for emergency. The grouting equipment should contain a screen having a mesh size of IS:106. This should be fitted at the exit of the mixing tank.

3.16 Safety Precautions During Tensioning :- Care shall be taken during tensioning to ensure the safety of all persons in the vicinity.

Jacks shall be secured in such a manner that they will be held in position, should they lose their grip on the tendons.

No person shall be allowed to stand behind the jacks or close to the line of the tendons while tensioning is in progress.

The operations of the jacks and the measurement of the elongation and associated operations shall be carried out in such a manner and from such a position that the safety of all concerned is ensured.

A safety barrier shall be provided at both ends to protect against accidental flying of the wedges. During actual tensioning operation, warning sign shall be displayed at both ends of the tendon.

After prestressing, concrete shall neither be drilled nor any portion cut nor chipped away nor disturbed, without express approval of the Engineer. Neither welding shall be permitted on/near tendons, nor any heat shall be applied to tendons. Any tendon which has been affected by welding, weld spatter or heat shall be rejected.

3.17 Transportation and Storage of Precast Units :- Precast girders shall be transported in an upright position. Points of support and the direction of reactions with respect to the girder shall approximately be the same during transportation, and storage as and when the girder is placed in final position. Precast girders shall not be handled before complete hardening of the grout.

When members are to be stacked, they shall be firmly supported at such bearing positions as will ensure that the stresses induced in them are always less than the permissible design stresses. Further, inclined side supports shall be provided at the ends and along the length of a precast girder to prevent lateral movements or instability.

Care shall be taken during storage, hoisting and handling of the precast units to prevent their cracking or damaging. Units damaged by improper storing or handling shall be replaced by the Contractor at his expense.

3.18 Tolerances

Permissible tolerances for positional deviation of prestressing tendons shall be limited to the following :

a)	Variation from the specified horizontal profile.	:	5 mm
b)	Variation from the specified vertical profile.	:	5 mm
c)	Variation from the specified position in member.	:	5 mm

3.19 Measurement for Payment :- Prestressed concrete shall be measured in cubic metres. The volume occupied by mild steel reinforcement/HYSD bars, high tensile steel, sheathing and anchorages shall not be deducted.

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High tensile (prestressing) steel shall be paid for separately and its length shall be measured as actually incorporated in the finished work. From the length so measured its weight shall be calculated in tonnes on theoretical basis and paid for.

Anchorage devices, additional length of cables for attaching jack, ducts or sheathing, grout, non-prestressed steel reinforcement fixed to the anchorage devices, making of recesses and filling the same, protection by painting with epoxy and furnishing samples for testing shall all be deemed to be included in the item of high tensile steel and shall not be measured and paid separately.

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10.Pile Foundation

- (1) **General**:-The construction of pile foundation shall conform to the requirements laid down in IS : 2911 Part-I concrete piles-Section 1 to 3 bored cast in situ piles-1979 and as amended up to date accepting the criteria specified hereunder. Load test on piles shall be carried out as per IS : 2911 (part IV) 1985.
- (2) The pile shall be cast in situ RCC piles. The rate for pile foundation includes building up of earth filled island platform, drilling/boring for all piles through all type of soils including soft and hard rocks, boulder and casting of piles. The payment will be made from cut off level to foundation level.
 - i) **Boring of Piles**: Only hydraulic rotary rigs shall be used for boring of RCC caste in situ piles Bored cast-in-situ piles; manner of concreting only by tremie and choice of boring tools in order to permit a satisfactory installation of a pile. The pile shall be installed as accurately as possible as per the designs and drawings.
 - a. Diameters of the piles shall be the concrete shaft diameters and shall not be less than the diameters specified in the drawing.
 - b. These shall be formed by boring to the founding strata specified on the drawings or as directed on the site. The sides of the boring shall be prevented from collapsing by temporary mild steel liner.
 - c. Piles shall be constructed in a sequence approved by the Engineer. During boring, the contractor shall, where required by the Engineer, take soil, rock or ground water samples & transport them to an approved testing laboratory or carry out soil tests as directed.
 - d. The method adopted shall be chosen giving due considerations to the subsoil data, ground water conditions and to the other relevant.
 - e. The bottom of the steel liner shall be sufficiently in advance of the boring tool so as to prevent settlement of outside soil and formation of cavities.
 - f. Mild steel liners shall continue up to soft rock or hard rock whichever is struck earlier.
 - g. Boring shall be done using hydraulic rotary drilling rigs suiting to different kinds of strata encountered.
 - h. The size of the cutting tool shall not be less than the diameter of the pile minus 75mm.
 - i. The quantum of liners required up to depth of cut off level shall be measured as per drawing.
 - j. Pumping from a borehole shall not be permitted unless a liner has been driven into a stable stratum which prevents flow of external ground water from other strata in significant quantities.
 - k. In case of end bearing piles founded on rock the piles shall be embedded by minimum one pile diameter to three times the pile diameter depending on the condition of the rock or as specified in the drawing. Rock samples of the founding strata shall be preserved at site.
 - ii. Inspection: Each pile boring shall be inspected prior to the placing of concrete in it. Where the diameter of a dry boring is 750 mm or greater, equipment approved by the Engineer shall be provided to enable the contractor and the Engineer to descent into the boring for the purpose of inspection.
 - iii. **Cleanliness of Pile Bases**:-On completion of boring, disturbed or remoulded soil shall be removed from the base of the piles flushing with termite pipe clean water.
 - iv. **Concreting**
 - a. Concreting of boreholes shall start as soon as possible after the boring of piles. Bore hole which is not cased, if left un concreted for more than two hours, it shall be cleaned thoroughly before placing concrete. Concreting under water shall be done in one operation. The method of placing and the workability of the concrete shall be such that continuous monolithic concrete shaft of

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- the full cross section is formed.
- b. The concrete shall be placed without such interruption as would allow the previously placed batch to have hardened. The engineer shall approve the method of placing.
 - c. The contractor shall take all precautions in the design of mix and placing of the concrete to avoid arching of the concrete in the casting. No spoil, liquid or other foreign matter shall be allowed to contaminate the concrete.
 - d. Placing concrete in dry holes (borings) Approved measures shall be taken to avoid segregation and bleeding and that the concrete at the piles is not deficient in grout.
 - e. Concreting of full pile has to be carried out uninterrupted and in one operation. If the concreting is interrupted in between for any reasons, sufficient portion from top surface of the partly concreted pile containing laitance, weak concrete etc. shall be removed so as to obtain a sound concrete surface, which should be cleaned by sand blasting. The engineer shall start further concreting only after inspections and approval of cleaned concrete surface. Precautions as detailed in clause 7.5 IS 2911 (pt. I/Sec.2)-1979 shall be taken in tremie concreting.
 - f. Whenever practicable the concrete should be placed in clean dry hole. Concreting of bored piles in water bearing ground shall be done with utmost care/especially when the hole cannot be bailed of water or to be made dry before tremie concreting. Under such circumstances plug of concrete should be deposited under water in base of the hole by tremie pile, as soon as the concrete has hardened sufficiently the hole should be pumped free of water and the concreting of the shaft shall be done in dry by tremie method up to surface. In exceptional circumstances where concreting in the dry is not possible dewatering should be done to the extent possible before resorting to concreting using a tremie pipe.
 - g. Prolonged delays in the commencement after the completion of the boring shall not be permitted. The time interval between the completion of boring and placing of concrete shall not exceed 6 hours.
 - h. The concrete shall have a minimum slump of 150mm in case of concreting in water free bore. Suitable precautions shall be taken for prevention of segregation. Internal vibrators shall not be used unless the contractor is satisfied that segregation will not result because of vibration and unless the method of use has been approved by the Engineer.
 - i. The concrete for piles under water or in drilling mud shall be placed with a Tremie pipe. The Tremie pipe shall not be less than 200 mm diameter for 20mm aggregate. The joint between the hopper and Tremie pipe as well as the joints in the Tremie pipe shall be watertight and the Tremie pipes shall be thoroughly cleaned after each use. The concrete shall have a minimum slump of 150mm.
 - j. The contractor shall ensure that heavily contaminated drilling mud has not accumulated at the base of boring since this could impair free flow of concrete from the Tremie pipe.
 - k. If the specific gravity of the drilling mud at the base of the bore exceeds 1.2, the placing of concrete shall not proceed.
 - l. The first charge of concrete shall be placed in the hopper over a sliding plate of the bottom of the hopper.
 - m. The Tremie pipe shall at all times penetrate the previously placed concrete with an adequate margin against accidental withdrawal. The Tremie pipe shall not be withdrawn until the completion of concreting. At all times a sufficient quantity of concrete shall be maintained within the pipe to ensure that the pressure from it exceeds that from the seepage water.
 - n. Spot measurements shall be taken at suitable intervals to check that the Tremie pipe has an adequate penetration into previous concrete.
 - o. Concreting of the pile shall be in one single and continuous operation. In case of long piles of large diameter, large size mixers or more mixers shall be used.
 - p. The top of concrete in a pile shall be brought above the cut off level since the top concrete is loose and is weak because of contamination with water/drilling mud. This ensures good concrete at the cut off level.

v. **Disposal of Mud:** The borehole should be maintained full with the drilling fluid, where used throughout the concreting operation. Mud displaced from the borehole by the concrete shall
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be channeled away or pumped into suitable receptacles for disposal to waste or re use.

vi. **Control of Alignment:** The pile shall be positioned as accurately as possible to the vertical. Any pile deviating from its proper alignment to such an extent that the resulting eccentricity cannot be taken care of by strengthening the foundation, pile cap or pile ties shall at the discretion of the engineer in charge, be replaced or supplemented by an additional pile, the cost of which shall be borne by the contractor. As a general guide, the permissible positional deviation for piles shall not be greater than 7.5 cm at the level of bottom of pile cap and shall not exceed 1.5 percent (about 1) from the specified inclination.

vii. **Cut off Level:** The concrete shall be brought out sufficiently above the cut off level (minimum 600 mm) as directed by the engineer to permit all laitance and weak concrete to be removed. Reinforcement from piles shall project out sufficiently to achieve adequate anchorage in to the pile cap. Cut off level of piles shall be indicated in working drawings or as indicated by Engineer In Charge. The top of concrete in pile shall be brought above the cut off level to remove all laitance and weak concrete and to ensure good concrete at cut off level. As per the guideline, for cut off level up to 1.5m below working level, the concrete shall be cast 300mm above COL. For each additional 0.3 m increase in depth of COL an additional coverage of 50mm shall be required. In the circumstances where COL is below ground water level, the need to maintain a pressure should be observed and accordingly length of extra concrete above COL shall be determined by the contractor and approval of Engineer In Charge obtained before concreting. Nothing extra shall be paid for pile chipping above the COL. It is deemed to be included in the quoted rates.

viii. **Setting Out:** The contractor shall check the casing position for each pile.

ix. **Defective Piles:** In case defective piles are formed, they shall be removed or left in place which ever convenient without affecting the performance of adjacent pile or the cap as a whole. Additional piles shall be provided to replace them as suggested by the engineer at site at the cost of the contractor.

- a. Depth of foundation will be reckoned with respect to average founding level of piles.
- b. Ring beam having dimensions as shown in the approved drawing shall be provided over the pile. The reinforcement from the pile shall be well anchored into the ring beam.

x) **Piling Programme:** The contractor shall inform the engineer each day of the programme of piling for the following day and shall give adequate notice of his intention to work outside normal hours at weekends.

xi) **Records:** The contractor shall keep records in a tabulated form as given in below and shall submit to two signed copies of these records to the engineer on the next working day after the pile was installed.

xii) **Damage to Piles:** The contractor shall ensure that the damage does not occur to completed piles. The contractor shall submit to the engineer his proposed sequence and timing for driving or boring piles having regard to the avoidance of damage to adjacent piles.

For each pile boring bore log will be plotted in pile register showing the variations in soil strata. The soil samples can be kept in plastic bottle indicating pile No. & level of boring.

Details of pile

Pile reference No. _____

1. Nominal cross sectional dimensions or diameter.
2. Standing ground water level.
3. Date and time of boring

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4. Date of concreting
5. Length of pile
6. Soil samples taken and in situ test carried out
7. Length and details of reinforcement
8. Concrete Mix
9. Volume of concrete supplied to pile where this can be measured in practice.
10. Length of socketing in rocks.
11. Bottom level (founding level) of pile, Cut off level of pile.

3. Payment of the pile :- Length of the pile will be paid from bottom of founding level to the bottom of pile cap as per the approved drawing. Nothing extra will be paid for empty boring. Rate is inclusive of dismantling/chipping of pile head up to cut off level, and no extra payment will be made.

11. BEARINGS

A. Elastomeric Bearing

1 Elastomeric bearings shall be used as per approved dimensions and materials as specified in technical specification.

1.1 In this bearing system individual, girders are supported on elastomeric bearings.

2 The elastomeric bearings shall have the following specification :

2.1 Raw material :- Chloroprene (CR) only shall be used in the manufacture of bearing. Grades of raw elastomer of proven use in elastomeric bearings, with low crystallisation rates and adequate shelf life (e.g. Neoprene WRT, Bayprene 110, Skyprene B-5 and Denka S-40V) shall be used. No reclaimed rubber or vulcanised wastes or natural rubber shall be used. The raw elastomer content of the compound shall not be lower than 60 per cent by its weight. The ash content shall not exceed 5 per cent (as per tests conducted in accordance with ASTM D-297, sub-section 10). EPDM and other similar candidate elastomer, for bridge bearing use, shall not be permitted.

Properties: The elastomer shall conform to the properties specified in Table 1.

Table 1. Properties of Elastomer

	Properties		Unit	Test Method, IS specification reference	Value of the characteristic specified
1.	Physical Properties				
1.1	Hardness		IRHD	IS: 3400 (Part II)	60 ± 5
1.2	Minimum Tensile Strength		Mpa	IS: 3400 (Part I)	17
1.3	Minimum Elongation at break		Per cent	IS: 3400 (Part I)	400
2.	Maximum Compression Set		Per cent	IS: 3400 (Part X) duration (deg. C) temperature	
	CR			+0 to 24.2 100±1	35
3.	Accelerated Ageing			IS: 3400 duration (deg. C) temperature	
	CR			70 100±1	
3.1	Max change in Hardness		IRHD		+ 15
3.2	Max change in Tensile Strength		Per cent		- 15

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3.3	Max change in Elongation		Per cent		- 40
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Shear modulus of the elastomer bearing shall neither be less than 0.80 Mpa nor greater than 1.0 Mpa.

The adhesion strength of elastomer to steel plates determined according to IS: 3400 (Part XIV) method A shall not be less than 7 kN/m.

For elastomeric bearings (CR) used in adverse climatic conditions the following ozone resistance test shall be satisfied:

The ozone resistance of elastomer shall be proved satisfactory when assessed by test according to IS: 3400 (Part XX). The strain, temperature, duration and ozone concentration of the test shall be 20 per cent, 40 ± 1 degree Celsius, 96 h and 50 pphm by volume respectively.

No cracking detected by visual observation at the end of the test shall be considered satisfactory. No specific tests for assessment of low temperature resistance may be deemed necessary.

Laminates of mild steel conforming to IS: 226 shall only be permitted to be used. Use of any other material like fibre glass or similar fabric as laminates shall not be permitted.

The manufacturers of elastomeric bearings shall satisfy the Engineer that they have in-house facilities for testing the elastomer for carrying out the following tests in accordance with the relevant provisions of ASTM D-297:-

a)	Identification of polymers	To confirm the usage of Chloroprene (Appendix X-2 of ASTM)
b)	Ash content test	To determine the percentage (sub-section 34 of ASTM)
c)	Specific gravity test	(sub-section 15 of ASTM)
d)	Polymer content test	(sub-section 10 of ASTM)

The Engineer shall invariably get the test (a) performed within his presence or in the presence of his authorised representative to satisfy the requirement. In case of any disputes regarding interpretation of results the Engineer may carry out test as per ASTM S-3452-78 (Chromatography test) at the manufacturer's cost in a recognised test laboratory.

The elastomer specimen to conduct the test shall be obtained from the bearings selected at random for destructive test. Remaining part of the test bearing shall be preserved by the Engineer for any test to be done in future, if required.

2.2FabricationU :- Bearing shall be cast as a single unit in a mould and vulcanised under heat and pressure.

Casting of elements in separate units and subsequent bonding shall not be permitted, nor shall cutting from large size cast be permitted.

Bearings of similar size to be used in particular bridge project shall be produced by identical process and in one lot as far as practicable. Phased production may only be resorted to when the total number of bearings is large enough.

The mould used shall have standard surface finish adequate to produce bearings free from any surface blemishes.

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Steel plates for laminates shall be sand blasted, clean of all mill scales and shall be free from all contaminants prior to bonding by vulcanisation. Rusted plates with pitting shall not be used. All edges of plates shall be rounded.

Spacers used in mould to ensure cover and location of laminates shall be maximum size and number practicable. Any hole at surface or in edge cover shall be filled in subsequently.

Care shall be taken to ensure uniform vulcanizing conditions and homogeneity of elastomer through the surface and body of bearings.

The bearings shall be fabricated with the tolerances specified in Table 2.

Table 2.

	Items	Tolerances
1.	Overall plan dimensions	-0, + 6 mm
2.	Total bearing thickness	-0, + 5 %
3.	Parallelism	
a)	Of top surface of bearing with respect to the bottom surface as datum	1 in 200
b)	Of one side surface with respect to the other as datum	1 in 100
4a	Thickness of individual internal layer of elastomer	+ 20 percent (max. of 2 mm)
b)	Thickness of individual outer layer	-0, + 1 mm
5a	Plan dimensions of laminates	- 3 mm, + 0
b)	Thickness of laminates	+ 10 per cent
c)	Parallelism of laminate with respect to bearing base as datum	1 in 100

The vulcanising equipment/press shall be such that between the platens of press the pressure and temperature are uniform and capable of being maintained at constant values as required for effecting a uniform vulcanisation of the bearing.

The moulding dies utilised for manufacturing the bearings shall be so set inside the platen of the press, that the pressure developed during vulcanisation of the product is evenly distributed and the thickness maintained at all places are within acceptable tolerance limits taking into consideration the shrinkage allowance of vulcanizate.

The raw compound which has been introduced inside the metal dies for vulcanisation shall be accurately weighed each time and it must be ensured that sufficient quantity has been put inside the die for proper flow of material at every place so that a homogeneous and compact bearing is produced without any sign of sponginess or deficiency of material at any place.

Before any vulcanizate of any batch of production is used for producing vulcanised bearings, test pieces in the form of standard slab and buttons shall be prepared in accordance with prescribed standards and salient properties tested and recorded regularly against each batch of production to monitor the quality of the products.

2.3 Acceptance Specifications: - The manufacturer shall have all the test facilities required for the process and acceptance control tests installed at his plant to the complete satisfaction of the Engineer. The test facilities and their operation shall be open to inspection by the Engineer on demand.

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All acceptance and process control tests shall be conducted at the manufacturer's plant. Cost of all materials, equipment and labour shall be borne by the manufacturer unless otherwise specified or specially agreed to between the manufacturer and Engineer-in-Charge.

Any acceptance testing delayed beyond 180 days of production shall require special approval of the Engineer and modified acceptance specification, if deemed necessary by him.

All acceptance testing shall be conducted by the Inspector with aid of the personnel having adequate expertise and experience in rubber testing provided by the manufacturer, working under the supervision of the Inspector and to his complete satisfaction.

Lot by lot inspection and acceptance shall be made.

2.4 Acceptance lot

A lot under acceptance shall comprise all bearings, including the pair of extra test bearings where applicable of equal or near equal size produced under identical conditions of manufacture to be supplied for a particular project.

The size and composition of acceptance lot shall be got approved by the Engineer.

For the purpose of grading levels of acceptance, testing lots shall be classified as follows:

- i) A lot size of 100 or larger number of bearings shall be defined as an extra large lot.
- ii) A lot size of 20 to 100 bearings shall be defined as a large lot.
- iii) A lot size of less than 20 bearing shall be defined as a small lot.

2.5 Levels of acceptance inspection

The level of acceptance testing shall be based on number of bearing manufactured in one lot. This shall involve manufacture of extra bearing/s for each lot to be used as test bearing and eventually consumed in destructive testing. The cost of extra bearings shall be borne by the contractor.

2.6 Testing

Acceptance testing shall comprise of general inspection, test on specially moulded test pieces and test on complete bearings or sections for measurement of various quality characteristics detailed below:

2.6.1 Acceptance testing level 1

General Inspection

1. All bearings of the lot shall be visually inspected for any defects in surface finish, shape or any other dissemble superficial defects.
2. All bearings of the lot shall be checked for tolerances specified in Table 2.
3. All bearings of the lot shall be subjected axial load to correspond to σ_m (i.e. average compressive stress) = 15 MPa applied in steps and held constant while visual examination is made to check for descemible defects like:

- a) Misalignment of reinforcing plates.
- b) Poor bond at laminate/steel interface.
- c) Variation in thickness of elastomer layers.
- d) Any surface defects.
- e) Low stiffness

Deflection under loads between $\sigma_m = 5$ MPa and $\sigma_m = 15$ MPa shall be measured and recorded for all bearings with sufficient accuracy (± 5 per cent), Variation in stiffness of any individual bearing from the mean of the measured values for all such bearings of the lot shall not be larger than 20 per cent (of the mean value).

Test on specially moulded test pieces

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Test pieces shall be moulded by the manufacturer with identical compound and under identical vulcanising conditions as used in the manufacture of the bearings of the acceptance, lot. The process shall be open to inspection by the Engineer.

Test pieces offered for inspection shall be identified by suitable markings and duly certified by the manufacturer.

The quality characteristics to be tested are listed below. The specification references in parenthesis shall define the corresponding specification for test piece, test method and criterion for acceptance.

Composition (see note 1 below)
 Hardness (Table-1, 1.1)
 Tensile strength (Table-1, 1.2)
 Elongation at Break (Table-1, 1.3)
 Compression Set (Table-1, 2)
 Accelerated Ageing (Table-1, 3)
 Adhesion strength (Clause 10.2.2.1)
 Ozone Resistance (see Note 2 below)

Note 1.

For acceptance testing the properties enumerated in Clause 10.2.2.1 and specific gravity of elastomer of test pieces from test bearing shall be compared with those for corresponding specially moulded test pieces furnished by the manufacturer. The following variations shall be deemed maximum acceptable:

Specific Gravity ± 2
 Ash Content ± 0.5 per cent
 Hardness (Table-1, 1.1)
 Tensile strength (Table-1, 1.2)
 Elongation at Break (Table-1, 1.3)
 Compression Set (Table-1, 2)
 Accelerated Ageing (Table-1, 3)
 Adhesion strength (Clause 10.2.2.1)

Note 2.

Ozone resistance test can be waived by the Engineer for bearings of CR when satisfactory results of ozone resistance tests on similar grade of elastomer may be available from process control records or development test data furnished by the manufacturer.

Where such process control data are not available or the frequency of testing not deemed adequate, ozone resistance test shall be mandatory for acceptance of bearings of CR.

Process and acceptance control tests for ozone resistance by an independent testing agency shall be acceptable.

Tests on Complete Bearings or Sections:-

One bearing shall be selected at random from the lot as test bearings. In place of complete bearing, manufacturer can be allowed to fabricate smaller size test piece in similar conditions for destructive and adhesion testing. Decision of Engineer in charge will be final and binding. This bearing/s shall be excluded from the lot accepted.

The following tests shall be conducted on test bearings:

- Determination of vertical stress/strain curve
- Determination of modulus G.
- Determination of ultimate strength in compression.
- Determination of adhesion strength between elastomer & plate.

The test specifications and acceptance criteria shall conform to those given in UIC 772 R.

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2.7 Inspection certificate

A lot under inspection shall be accepted by the Inspector and so certified, when no defect is found with respect to any of the quality characteristics tested on samples drawn from the lot according to specifications laid down in Clause 10.2.2.6 covering general inspection tests on specially moulded test pieces and on complete bearings.

In case of any bearing with defect, the lot shall be rejected by the Inspector and so certified.

In case any bearing is found to be defective with respect to any quality characteristic, discerned by general inspection test specified in Clause.

2.6 shall nevertheless be completed. If the said lot, rejected by general inspection, satisfies the acceptance criteria in respect of these other tests, the lot and individual bearings found defective shall be clearly identified in the inspection certificate.

The manufacturer shall obtain from the inspector, authorised by the Engineer-in-Charge, immediately on completion of his inspection, an inspection certificate which shall include the details of a lot or lots accepted/rejected by him and records of all test measurements.

2.8 Quality control certificate

The manufacturer shall certify for each lot of bearing under acceptance:

- That an adequate system of continuous quality control was operated in his plant.
- That the entire process remained in control during the production of the lot of bearings under acceptance as verified from the quality control records/charts, which shall be open to inspection of Engineer/Inspector on demand.

A certified copy of results of process control testing done on samples of elastomer used in the production of the lot shall be appended and shall include at least the following information:

Composition of compound-raw elastomer and ash content, the grade of raw elastomer used (including name, source, age on shelf), test results of hardness, tensile strength, elongation at break, compression set, accelerated ageing, etc.

2.9 Acceptance

The manufacturer shall furnish the following to Engineer for the acceptance judgment:

1. Quality control certificate as laid down in Clause 10.2.2.8.
2. Inspection certificate as laid down in Clause 10.2.2.7.

The manufacturer shall furnish any supplementary information on the system of quality control and/or process and acceptance control testing as may be deemed necessary by the Engineer.

In case of any evidence of process or acceptance control testing being deemed unsatisfactory by him, Engineer at his sole discretion may call for a special acceptance of the lot according to specifications laid down by him, without any prejudice to his right to reject the lot. The entire cost of such supplementary inspection shall be borne by the manufacturer.

The Engineer shall be the sole authority for acceptance of a lot on scrutiny of the certificates along with any supplementary evidence and complete satisfaction therewith.

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In case of rejection of a lot, the Engineer shall reserve the right to call for special acceptance inspection for the succeeding lots offered for inspection, according to the specifications laid down by him. The entire cost of such tightened inspection shall be borne by the manufacturer.

2.10 Certification and Marking

Bearing shall be transported to bridge site after final acceptance by Engineer and shall be accompanied by an authenticated copy of the certificate to that effect.

An information card giving the following details for the bearings, duly certified by the manufacturer shall also be appended:

- Name of manufacturer
- Date of manufacture
- Elastomer grade used
- Bearing dimensions
- Production batch no.
- Acceptance lot no.
- Date of testing
- Specific bridge location, if any
- Explanation of markings used on the bearing

All bearings shall have suitable index markings identifying the information. The markings shall be made in indelible ink or flexible paint and if practicable should be visible after installation. The top of the bearing and direction of installation shall be indicated.

2.11 Storage and Handling

Each elastomeric bearing shall be clearly labelled or marked. The bearing shall be wrapped in a cover. They shall be packed in timber crates with suitable arrangement to prevent movement and to protect corners and edges.

Care shall be taken to avoid mechanical damage, contamination with oil, grease and dirt, undue exposure to sunlight and weather to the bearings during transport and handling prior to and during installation.

2.12 Installation

Installation of multiple bearings one behind the other on a single line of support shall be of identical dimensions.

Bearings must be placed between true horizontal surfaces (maximum tolerance 0.2 per cent perpendicular to the load) and at true plan position of their control lines marked on receiving surfaces (maximum tolerance + 1 mm in height).

Concrete surfaces shall be free from local irregularities (maximum tolerance + 1 mm in height).

For cast-in place concrete construction of superstructure, where bearings are installed prior to its concreting, the forms around the bearings shall be soft enough for easy removal. Forms shall also fit the bearings snugly and prevent any leakage of mortar grout. Any mortar contaminating the bearings during concreting shall be completely removed before setting.

For precast concrete superstructure elements, fixing of bearing to them may be done by application of epoxy resin adhesive to interface, after specified surface preparation. The specifications for adhesive material, workmanship and control shall be approved by the Engineer. Care shall be taken to guard against faulty application and consequent behaviour of the adhesive layer as lubricant. The bonding by the adhesive shall be

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deemed effective only as a device for installation and shall not be deemed to secure bearings against displacement for the purpose of design.

1.13 **Inspection Of Bearings** :- The bearings should be manufactured from RDSO approved firms, and inspected by Railway's representative

3 Measurement for payment

Bearings shall be measured in volume of finished size of bearing as per approved drawing. Rate shall be inclusive of cost of all material, labour, tools, equipments, testing (Raw material as well as complete finished product), transportation and installation of bearings with all lead & lift.

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12. PTFE POT FIX AND SLIDING BEARINGS**1. MATERIAL**

- a) Top plate, piston and pot base will be made up of cast steel of Gr.280 – 520W of IS 1030. Rectification of casting shall be done as per IS 1030 and 5530.
- b) Stainless steel shall conform to AISI: 316 L with the sliding surface or finished smooth.
- c) Confined PTFE will be of unfilled quality and will have require properties regarding tensile strength etc. as per BS-5400 section 9.2 and BS 3784, grade A.
- d) The confined elastomer inside pot will have the following properties.
- i) Chloroprene (CR) only shall be used in the manufacture of bearing. Grades of raw elastomer of proven use in elastomeric bearings, with low crystallisation rates and adequate shelf life (e.g. Neoprene WRT, Bayprene 110, Skyprene B-5 and Denka S-40V) shall be used. No reclaimed rubber or vulcanised wastes or natural rubber shall be used. The raw elastomer content of the compound shall not be lower than 60 per cent by its weight. The ash content shall not exceed 5 per cent (as per tests conducted in accordance with ASTM D-297, sub-section 10). EPDM and other similar candidate elastomers for bridge bearing use shall not be permitted.

The elastomer shall conform to the properties specified in Table 1.

Table 1. Properties of Elastomer

	Properties	Unit	Test Method, IS specification reference	Value of the characteristic specified
1.	Physical Properties			
1.1	Hardness	IRHD	IS: 3400 (Part II)	50 ± 5
1.2	Minimum Tensile Strength	Mpa	IS: 3400 (Part I)	17
1.3	Minimum Elongation at break	Per cent	IS: 3400 (Part I)	400
2.	Maximum Compression Set	Per cent	IS: 3400 (Part X) duration (i) (deg. C) +0 to 24.2	100+1
	CR			35
3.	Accelerated Ageing		IS: 3400 (Part IVX) duration temperature (i) (deg. C) 70 100+1	
	CR			
3.1	Max change in Hardness	IRHD		+ 15
3.2	Max change in Tensile Strength	Per cent		- 15
3.3	Max change in Elongation	Per cent		- 40

Shear modulus of the elastomer bearing shall neither be less than 0.80 Mpa nor greater than 1.0 Mpa.

- ii) The adhesion strength of elastomer to steel plates determined according to IS: 3400 (Part XIV) method A shall not be less than 7 kN/m.
- iii) For elastomeric bearings (CR) used in adverse climatic conditions the following ozone resistance test shall be satisfied :
- iv) The ozone resistance of elastomer shall be proved satisfactory when assessed by test according to IS: 3400 (Part XX). The strain, temperature, duration and ozone concentration of the test shall be 20 per cent, 40 ± 1 degree Celsius, 96 h and 50 ppm

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by volume respectively.

v) No cracking detected by visual observation at the end of the test shall be considered satisfactory. No specific tests for assessment of low temperature resistance may be deemed necessary.

vi) Laminates of mild steel conforming to IS: 226 shall only be permitted to be used. Use of any other material like fibre glass or similar fabric as laminates shall not be permitted.

vii) The manufacturers of bearings shall satisfy the Engineer that they have in-house facilities for testing the elastomer for carrying out the following tests in accordance with the relevant provisions of ASTM D-297:-

a)	Identification of polymers	To confirm the usage of Chloroprene (Appendix X-2 of ASTM)
b)	Ash content test	To determine the percentage (sub-section 34 of ASTM)
c)	Specific gravity test	(sub-section 15 of ASTM)
d)	Polymer content test	(sub-section 10 of ASTM)

The Engineer shall invariably get the test (a) Performed within his presence or in the presence of his authorised representative to satisfy the requirement. In case of any disputes regarding interpretation of results the Engineer may carry out test as per ASTM S-3452-78 (Chromatography test) at the manufacturer's cost in a recognised test house.

e) Anchors: Screw material as per clause 4.6 of IS 1367 and sleeve material as per IS 226 and details of thread as per IS 1363.

f) Hardness of contact face of pot and piston should be + 300 BHN.

g) Accessories conforming to IS 226

2. The stainless steel shall be welded on the packing plate.

3. Suitable numbers of washers are to be used as a packing to tighten the anchors screw with bearing top plate.

4. Welding:-

All welding will be manual metal arc process conforming to IS 816 and IS 9595 with electro as per IS 814, pre heating and post weld stress relieving to be done if required.

5. Tolerances :

i) Generally as per clause of IRC 83, Pt. III – 2002 subject to the modifications.

a)	Plan dimensions	0 to +5 mm
b)	Overall height	0 to + 3 mm
c)	Height of elastomer	0% to + 5%
d)	Height of any steel component	
	(i) Machine	0 to + 1 mm
	(ii) Unmachine	Class 2 of IS 4897

6. Finishing :

i) All non-working surfaces will be coated with two coats of epoxy primer and one or more coat each of epoxy intermediate and final paint after sand blasting to SA 21/2 quality as per IS 9954. Total dry film thickness shall be more than 150 micron.

ii) Anchor sleeves will be galvanized coated before dispatch.

7. Installation:

i) Installation tolerances:

(a) Location of bearing : + 3mm

(b) Level of bearing : + 5mm (maximum)

(c) Horizontality of bearing : 1 in 200 in any direction

ii) Material in contact with bearing at top & bottom shall be concrete of M-40 grade (Minimum).

iii) Dismantling of bearing at site is not recommended. If required special care should be

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taken. It should not be opened without the approval of Engineer Incharge.

iv) Clamps (for transportation and erection) are to be removed after installation at an appropriate time.

v) The grout of bedding mortar shall be high strength free flow non shrink grout such as PAGEL/CICA/CONBEX/GP2 or its equivalent.

8. **Greasing :**

Silicon grease will be applied at PTFE stainless steel, interface after testing.

9. **Tests:**

(i) Raw material: Necessary test certificates for all raw materials shall be furnished by manufacturer.

(ii) Test on casting: Test specified in IS 1030 will be performed. Casting shall be ultrasonically tested and certificates submitted. Quality level of casting shall be level 3 as per IS 9565.

(iii) Test on Welding: All welding will be tested by dye penetration method. Butt welding will be tested by dyeing penetration method.

(iv) Soundness of the welding shall be certified by the manufacturer.

(v) Acceptance test on bearing:

(a) All tests on bearing will be carried out in presence of representative of Railways.

(b) All bearings will be checked for overall dimensions.

(c) All Bearings will be load tested to 1.1 x design load (vertical and lateral)

(d) Pair of bearings selected at random will undergo testing in order to determine the coefficient of friction (μ). It should be less than or equal to 0.10 at design load.

(e) Two bearings selected at random will be tested for permissible rotation.

(f) The certificate for load testing and dimensions of all bearings shall be submitted.

10. Bearing numbers and direction shall be marked before dispatch.

11. Contractor shall take the prior approval of manufacturer. Railways decision for manufacturer is final and binding on the contractor.

12. Measurement for payment

a) The bearings will be measured in numbers for payment.

b) The rate of item is inclusive of all contractor's material, fabrication, manufacture, transportation, installation, testing of raw materials, testing of bearings, labours, tools and plants, painting with epoxy paint as per 7.3.6(i), greasing, grouting of bedding mortar etc. complete with all lead and lift.

13. The POT PTFE bearing should be manufactured from RDSO approved firms, and inspected by RDSO for which necessary test and inspection certificates of RDSO must be submitted.

POT-PTFE BEARING

- i) POT-PTFE bearing should be procured through RDSO approved vendors issued vide document no QC-M-7.1-1 Ver 5.0 under “Master List of Approved Vendors” for POT-PTFE bearings by RDSO, Lucknow; updated time to time.
- ii) POT-PTFE bearings should be as per drawing and approved Technical Specifications and should be in conformation with IS 2062, IS:1030, AISI:304, AISI:316, IS:6911, BS:3784, IS:3400, IS:226, BS-5400 and Concrete Bridge code.
- iii) The design of the bearings shall be submitted by the manufacturers/contractor and got approved from Railway before fixing.
- iv) Contractor should submit test report from manufacturer before procurement.

**WELDING PROCEDURE QUALIFICATION RECORDS
(WPQR)(FINAL**

APPROVAL TO BE DONE BY RDSO) :- WPQR is the document indicating approval of various welders who are to be deployed for carrying out welding work for fabrication. It contains Name of the welder with photograph, qualification, experience, qualification tests and records for each welding process and joint, welding parameter. Tests are conducted by RDSO official from M&C Directorate before qualifying the welders and then approval is granted through WPQR. Field engineer should ensure that welding is done only by approved welders and no deviation takes place.

LOAD TESTING OF SUPERSTRUCTURE

1. Contractor may be required to conduct load test on one Span of superstructure. Load to be applied shall be as per provision of IRS codes. Contractor shall submit a detailed testing scheme for engineer's/consultant's approval.
2. All arrangements for carrying out the test shall be made by contractor and shall conform to the procedure approved by the engineer. Test results shall conform to the design requirements failing which the work shall be declared substandard and action will be taken as per provisions of contract.
3. Prior to conducting load test. Girders and other members shall be thoroughly examined for any signs of distress such as hairline cracks, etc. and marked so as to differentiate them from any distress that may occur during the load test. These signs of distress shall be closely watched during the test.
4. Load test shall be conducted during such period of the day when temperature variation is least. Prior to starting the loading, temperature and deflection readings of unloading superstructure shall be taken for 24 hours at hourly intervals. Deflect meters with dial gauges shall conform to I.S.2092.

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5. Test load shall be applied in four equal installments and temperature and deflection reading shall be measured hourly and at end of each stage of loading. Total test load shall be maintained for one hour and then removed in four equal installments.
6. Load test shall be accepted as satisfactory subject to the following:
 - a) Observed deflections are equal to or less than theoretical deflections.
 - b) Recovery of deflections on removal of load should conform to relevant codal provision.
 - c) Superstructure shows no signs of distress or defects during the load test.

13. STRUCTURAL STEEL

1.0 Description:

- a) This section is for general structural steel work required for any of the schedules. It shall include supply, fabrication, transportation, erection and painting structural steel, rivet steel, cast steel, steel forgings, cast iron and other incidental metal construction of the kind, size and quantity in conformity with drawings, specifications and as desired by Engineer.
- b) All steel works whether in fabrication, transportation or erection shall be done in accordance with relevant IS and IRS specifications and codes, subject to any further provisions contained in these specifications. In case of any variance, these specifications shall prevail.

2.0 General:

- a. General requirements relating to supply of material shall conform to specification of IS: 1387, for the purpose of which the supplier shall be the contractor and the purchaser shall be the Engineer.
- b. Finished rolled material shall be free from cracks, flaws, injurious seams, laps, blisters, ragged and imperfect edges and other defects. It shall have a smooth, uniform finish, and shall be straightened in the mill before shipment. They shall also be free from loose mill scale, rust, pitting or other defects affecting strength and durability.
- c. The acceptance of any material on inspection at the mill, i.e., rolling mills, foundry or fabricating plant where material for the work is manufactured, shall not be a bar to its subsequent rejection, if found defective.
- d. All steel materials, plates, bars and structural shall have straight edges, flat surfaces and be free from twist. If necessary, they shall be cold straightened or flattened by pressure before being worked or assembled unless they are required to be of curvilinear form. Even formation of curve should be by cold working. Pressure applied should be such as not to injure the material. Adjacent surfaces or edges shall be in close contact or at uniform distance throughout.
- e. Unless specified otherwise, high tensile steel rivet conforming to IS: 1149 shall be used for members of high tensile steel conforming to IS: 961 and shall not be used for mild steel members.
- f. The use of cast steel shall be limited to bearings and other similar parts. Generally all steel pins (including knuckle pins) and rollers shall be of forged steel.
- g. Cast iron shall not be used in any portion of a steel structure, except where it is subject to direct compression.

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3.0 **Materials:**

All materials shall conform to relevant Clause of tender documents. Special requirements are given below:-

- a) Mild steel for bolts and nuts shall conform to IS: 2062 but have a minimum tensile strength of 44 Kg/Sq.m. and minimum percentage elongation of 14. High tensile steel for bolts and nuts shall conform to IS: 961 but with a minimum tensile strength of 58 Kg/Sq.m. High strength friction grip bolts shall be permitted for use only on satisfactory evidence of performance to the requirements of BS, ASTM, DIN or other equivalent specifications as specified by Engineer or included in special provisions.
- b) For cast steel the yield stress shall be determined and shall not be less than 50 percent of minimum tensile strength.
- c) Plain washers shall be of steel. Tapered or other specially shaped washers shall be of steel or malleable cast iron.
- d) Parallel barrel drifts shall have a tensile strength of not less than 55 Kg/sq. mm with elongation of not less than 20 per cent measured on a gauge length of 4 So (So= cross sectional area).
- e) Copper alloys, mechanite or special steels used for bearings or similar other parts shall conform to requirements specified by Engineer or included in special provision.
- f) Mild Steel electrodes shall conform to IS: 814 and those of high tensile steel shall conform to IS: 1442.
- g) All paints and enamels used shall conform to requirements specified on drawings or other special provisions laid down by Engineer. Unless otherwise specified, paints shall conform to relevant IS specification.

4.0 **Fabrication:**

4.1 **General:**

- a) All work shall be in accordance with drawings and as specified in these specifications, care being taken that all parts of an assembly fit accurately together. These shall form the provisions of relevant IS codes supplemented and prevailed by IRS specifications B-1-62, B-3-61, Parts 2 and 4 and IRS steel Bridge Code.
- b) Normally for repetitive works like bridge girders, in industrial structures and sheds when different components are built in units for assembling at site, similar units will be required to be made interchangeable.

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- c) Unless specially required under the contract, corresponding parts need not be interchangeable but the parts shall be match marked as required under relevant Sub-Clause.
- d) Templates, jigs and other appliances used for ensuring accuracy of work shall be of mild steel; where specially required, these shall be bushed with hard steel. All measurements shall be made by means of steel tape or other device properly calibrated. Where bridge materials have been used as templates for drilling, these shall be inspected and passed by Engineer before they are used in the finished structure.
- e) All structural steel members and parts shall have straight edges and blunt surfaces. If necessary, they shall be straightened or flattened by pressure unless they are required to be of curvilinear forms. They shall also be free from twist. Pressure applied for straightening or flattening shall be such as would not injure the materials. Adjacent surfaces or edges shall be in close contact or at uniform distance or edges shall be in close contact or at uniform distance throughout.

4.2 **Preparation of Edges and Ends:**

- a) All structural steel parts, where required shall be sheared, cropped, sawn or flame cut and ground accurately to required dimensions and shape.
- b) In the case of high tensile steel at least 6 mm of material from the flame-cut edge shall be removed by machining.
- c) Longitudinal edges of all plates and cover plates in plate girders and built-up members shall be machined except in the following areas:
 - a. Rolled edges of single universal plates or flats may not be machined.
 - b. Covers to single flange plates may be left un machined.
 - c. Machine flame cutting instead of machining is acceptable for edges of single plates in compression and for edges of single plate, 25 mm or less thick, in tension.
 - d. Edges of single shaped plates over 25 mm thick not capable of being machined by ordinary method may be machine flame cut and the end surface ground.
 - e. Edges of universal plates or flats of same nominal width used in tiers may be left un machined, if so authorized by Engineer.
- d) All edges of splice and gusset plates 12 mm thick and over shall be machined and those less than 12mm thick may be sheared and ground.
- e) The ends of plates and sections forming main components of plate girders or of built-up members shall be machined, machine flame cut, sawn, or hand flame cut and ground.

- f) In joints and splices of compression members, in girder flanges and in tension members where so specified on drawings, the abutting surfaces shall be faced and brought to an even bearing. A tolerance of 0.5 mm may be permitted locally. Where close fitting is not specified, any clearance shall not exceed 3 mm.
- g) Where ends of stiffeners are required to be fitted, they shall be machined, machine flame cut, sawn, sheared and ground, or hand flame cut and ground. The ends of lacing bar shall be rounded unless otherwise required. Other edges and ends of mild steel parts may be sheared and any burrs at edges shall be removed.

4.3 **Preparation of Holes:**

4.3.1 **Drilling and Sub-punching:**

- a) All holes for rivets shall be drilled or drilled in smaller diameter and reamed. However, if preferred, the holes may be sub-punched to a diameter of 6 mm less than the finished size and then reamed to the proper size. Sub-punching is not permitted for truss members of open web girders.
- b) Where several plates or sections form a compound member, they shall, where practicable, be firmly connected together by clamps or tacking bolts and holes drilled through the group in one operation or alternatively, in the case of repetition work plates and sections may be drilled separately using jigs and templates. The jigs and templates shall be checked at least once after 25 operations. All burrs shall be removed.
- c) Forming holes by flame cutting is severely forbidden. Holes finally formed for rivets and bolts shall be 1.5 mm larger in diameter than that of bar or bolt. Care shall be taken not to exceed this limit. In case of holes for turned bolts they shall be drilled to tolerances as per IS or IRS specification B-1 clause 29.5.
- d) In the case of repetition of spans, the erection of every span shall not be insisted upon, except where close tolerance or turned bolts are use, provided that acceptable methods are adopted to ensure strict interchange ability. In such cases, one span in ten or any number less than ten of each type shall be erected from pieces selected at random by Engineer and should there be any failure of pieces to fit, all similar spans shall be erected complete. In the event of the spans being proved completely interchangeable, all corresponding parts shall carry the same mark so that sorting of materials at site is facilitated.

4.3.2 **Block Drilling:**

Where the number of plates to be riveted exceeds three or the total thickness is 90 mm or more, the rivet holes, unless they have been drilled through steel bushed jigs, shall be drilled out in place 3 mm all round after assembling. In such cases, the work shall be thoroughly bolted together.

4.3.3 **Size of Holes:**

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The sizes of holes in millimetre are given in the following table. (Table 800.1).

(TABLE 800.1) DIAMETER OF HOLES FOR RIVETS

<u>Nominal dia. of Rivets (mm)</u>	<u>Dia. of Holes (mm)</u>
12	13.5
14	15.5
16	17.5
18	19.5
20	21.5
22	23.5
24	25.5
27	29.0
30	32.0
33	35.0

4.3.4 Close tolerance bolts and barrel bolts:

- a) The diameter of holes shall be equal to nominal diameter of the bolt shank or barrel minus 0.15 mm to 0.0 mm.
- b) The holes not drilled through all thicknesses at one operation shall be drilled to smaller size and reamed after assembly.

4.4 Rivet and Riveting:

- a) The diameter of rivets shown on drawings shall be the size before heating. Each rivet shall be of sufficient length so as to fill in the hole thoroughly and to form a head of standard dimensions as given in Indian Standard Handbook on Steel Sections, Part I. It shall be free from burrs on the underside of the head. Table 800.1 gives the sizes of holes which are generally found sufficient.
- b) When countersunk heads are required, the heads shall fill the countersunk. The included angle of the head shall be as follows:
 - a. for plates over 14 mm thick: 90 degrees
 - b. For plate's up to and including 14 mm thick: 120 degrees
- c) The tolerance on diameter of rivets shall be in accordance with IS: 1148 and IS: 1149 for mild steel rivets and high tensile steel rivets respectively and unless otherwise specified the tolerance shall be minus tolerance.
- d) Rivets shall be heated uniformly to a "light cherry red" and shall be red hot from head to the point when inserted and shall be upset in its entire length so as to fill the hole as completely as possible when hot. In no case shall tip of the rivet be hotter than the head. Rivets after being heated and before being inserted in the hole shall be made free from scale by striking the hot rivet on a hard surface. Rivets less than 10 mm in diameter may be driven cold.

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- e) The rivets shall be machine driven, preferably by direct acting riveters. The driving pressure shall be maintained on the rivets for a short time after the upsetting is completed. High tensile steel rivets shall be heated up to 1100 degree Celsius. Any rivet whose point is heated more than prescribed shall not be driven. Hand riveting shall not be resorted to except with prior approval of Engineer.
- f) Where flush surface is required, any projecting metal shall be chipped or ground off.
- g) Before riveting is commenced, all work shall be properly and tightly bolted together. The bolts should be frequently tightened as the riveting proceeds.
- h) Drifts shall be used only for drawing the work into position and shall not be used to such an extent as to distort the holes. Drifts of a larger size than the nominal diameter of the hole shall not be used. The riveting shall be done by hydraulic or pneumatic machine unless otherwise specified by Engineer.
- i) Driven rivets, when struck sharply on the head with a quarter-pound rivet testing hammer, shall be free from movement and vibration.
- j) All loose or burnt rivets and rivets with cracked or badly formed defective heads or with heads which are unduly eccentric with the shanks, shall be removed and replaced. In removing rivets, the head shall be sheared off and the rivet punched out so as not to injure adjacent metal and, if necessary, they shall be drilled out. Recouping and caulking shall not be permitted.

4.5 **Bolts, Nuts and Washers:**

4.5.1 **Black Bolts (black all over):**

Black bolts are forged bolts in which the shanks, heads and nuts do not receive any further treatment except cutting of screw threads. They shall be true to shape and size and shall have standard dimensions as shown on drawings.

4.5.2 **Close Tolerance Bolts:**

Close tolerance bolts shall be faced under the head and turned the shank.

4.5.3 **Turned Barrel Bolts:**

The diameter of the screwed portion of turned barrel bolts shall be 1.5 mm smaller than the diameter of the barrel unless otherwise specified by Engineer. The diameter of the bolts as given on drawing shall be the nominal diameter of the barrel. The length of the barrel shall be such that it bears fully on all the parts connected. The threaded portion of each bolt shall project through the nut by at least one thread. Faces of heads and nuts bearing on steel work shall be machined.

4.5.4 **High Strength Structural Bolts:**

HSFG bolts are high strength structural bolts which have been tightened such as to induce predefined tension in the bolt shank. Due to the tension in the bolt, the interface between the plies (steel members in a joint) cannot move relative to each other because of the frictional resistance.

4.5.5 Washers:

- a) In all cases where the full bearing area of the bolt is to be developed, the bolt shall be provided with a steel washer of sufficient thickness under the nut to avoid any threaded portion of the bolt being within the thickness of the part bolted together and to prevent the nut when screwed up, from bearing on the shank of the bolt.
- b) For close tolerance of turned barrel bolts, steel washers whose faces give a true bearing shall be provided under the nut. The washer shall have a hole diameter not less than 1.5 mm larger than the barrel and a thickness of not less than 6 mm to that the nut, when screwed up, will not bear on the shoulder of the bolt.
- c) Taper washers with a correct angle of taper shall be provided under all heads and nuts bearing on bevelled surfaces.
- d) Spring washers may be used under nuts to prevent slackening of the nuts when excessive vibrations occur.
- e) Where the heads or nuts bear on timber, square washers having a length of each side not less than three times the diameter of the bolts or round washers having a diameter of 3.5 times the diameter of bolts and with a thickness not less than one quarter of diameter shall be provided.
- f) The Direct Tension Indicators (DTI washer) are special type of washers with indentations which get pressed when tension is applied. The pressing of indentations to required level indicates that the required tension has been applied in the bolts. HSFG bolts shall be provided with DTI washers.

4.5.6 Studs:

Ordinary studs may be used for holding parts together, the holes in one of the parts being tapped to take the thread of the stud. Counter-sunk studs may be used for making connections where the surfaces are required to be clear of all obstruction, such as protruding heads of bolts or rivets, studs may also be welded on steel work in positions as required.

4.5.7 Service Bolts:

- a) Service bolts shall have the same clearance as black bolts and where it is required that there should be no movement prior to final riveting, sufficient drifts or close tolerance bolts shall be used to assemble and locate the work.

- b) But no drifting to match up unfair holes shall be allowed. Any apparent error in fabrication which prevents assembly or fitting up of parts by the use of drifts shall be investigated immediately. If some ream ring is required and uses of special rivets are called for, same will not be undertaken without prior approval of Engineer. No extra payment shall be admissible for such additional work unless fabrication is done by a different agency and is established to be defective.

4.5.8 Drifts:

The barrel shall be drawn or machined to the required diameter for a length of not less than one diameter over the combined thickness of the metal through which the drifts have to pass. The diameter of the parallel barrel shall be equal to the nominal diameter of the hole subject to a tolerance of +0 mm and -0.125 mm. Both ends of the drift for a length of equal to 1.5 times the diameter of the parallel portion of the bar shall be turned down with a taper to a diameter at the end equal to one-half of that of parallel portion.

4.5.9 Use of Drifts and Bolts:

- a) In cases where the joint seems to withstand stresses arising from special methods of erection before being riveted up, parallel barrelled drifts and bolts shall be used to withstand the full stresses/forces arising thereof. In such case number of drifts used will be subject to a maximum of 40%.
- b) In the event of anticipated emergencies such as staying being in danger of being affected by floods or storms before riveting can be completed, the joints to be riveted shall be made secure by filling 40% holes by drifts and 40% with service bolts fully tightened up. Otherwise, in normal course filling not less than 50% of holes with service bolts shall make joints.

4.6 Pins and Pin Holes:

4.6.1 Pins:

- a) Pins shall be parallel throughout and shall have a smooth surface free from flaws. They shall be of sufficient length to ensure that all parts connected thereby shall have a full bearing on them. Where the ends are threaded, they shall be turned to a smaller diameter at the ends for the thread and shall be provided with a pilot nut, where necessary, to protect the thread when being drawn to place.
- b) Pins more than 175 mm in length or diameter shall be forged and annealed.

4.6.2 Pin Holes:

- a) Pin holes shall be bored true to gauge, smooth, straight, at right angles to the axis of the member and parallel to each other, unless otherwise required. Tolerance in the length of tension members from outside to outside of pin-

holes and of compression members from inside to inside of pin holes shall be one millimetre. In built-up members, boring shall be done after the members have been riveted or welded.

- b) The specified diameter of the pin hole shall be its minimum diameter. The resulting clearance between the pin and the hole shall not be less than 0.5 mm and not more than 1.0mm.

5.0 **Shop Erection and Match-Marking:**

- a) Engineer and inspecting officials shall be given free access to the templating fabrication shop and for frequent inspection of different parts under fabrication.
- b) Before being dispatched, steel work shall be temporarily erected in fabrication shop for inspection by Engineer or other inspecting official either wholly or in such portion as Engineer may require so that he may be satisfied both in respect of alignment camber and fit of all connections. For this purpose, sufficient number of parallel drifts and service bolts tightly screwed up shall be employed. All parts shall fit accurately and be in accordance with drawings and specifications.
- c) After the work has been passed by Engineer and before being dismantled, each part shall be carefully marked for re-erection with distinguishing marks and stamped with durable markings. Drawings showing these markings correctly shall be supplied to Engineer.
- d) Unloading, handling and storage of steel work as per these specifications shall be the responsibility of the contractor. The cost of repairs or of rejected material, its removal and the cost of transporting replacement material to the site shall be borne by the Contractor.
- e) Where close tolerance or turned barrel bolts are used for those cases where interchangeability is not insisted upon, each span shall be erected and members of each span marked distinctly.

6.0 **Welding:**

- a) All welding shall be done with the prior approval of Engineer and workmanship shall conform to provisions of IS: 823 or other relevant Indian Standards as appropriate.
- b) All the welds shall be done by submerged arc welding process either fully automatic or semi-automatic. Manual metal arc welding may be done only with prior permission of Engineer. In case of bridge girders this would be permissible only in case
- c) of very short runs or of minor importance or where access or locations of welds to not permit automatic or semi-automatic welding.

- d) Except for special types of edge or end preparation, like double "U" or single "J" or double "J" (which would be prepared by machining or grouting) the fusion edges of all plates to be jointed shall be prepared by using mechanically controlled automatic flame cutting equipment and then ground to a smooth surface.
- e) When material thickness is 20 mm or more, special precautions like preheating shall be taken, as laid down in IS: 823.
- f) The general welding procedures including particulars of preparation of fusion faces for metal arc welding shall be carried out in accordance with IS: 9595. Welding shall not be done when the air temperature is less than 10 degree Celsius. Welding shall not be done when the surfaces are moist, during periods of strong winds unless the work and the welding operations are adequately protected.
- g) Welding shall be permitted to be performed for the project either in the shop or in the field, only by operators who have passed qualification tests to the satisfaction of Engineer.

7.0 **Tolerances:**

Tolerances work shall be specified on the drawings and shall be subject to the approval of Engineer.

8.0 **Erection:**

8.1 **General:**

The contractor shall erect structural steel, remove temporary construction, and undertake all work required to complete the construction of works included in the contract in accordance with approved drawings and specifications to the entire satisfaction of Engineer.

8.2 **Organization and Equipment:**

- a. The contractor shall submit erection plans prepared by the fabricator, showing the method and procedure of erection, compatible with the details of fabrication.
- b. Unless otherwise provided in the contract, the contractor shall supply and erect all necessary false work and staging and shall supply all labour, tools, tackles, erection plant and other materials necessary to carry out the work complete in all respects.
- c. The contractor shall supply all rivets, bolts, nuts, washers, etc., required to complete erection at site with an allowance for wastage, etc., of 12.5 per cent of the net number of field rivets, bolts, washers required, or a minimum of five number of each item whichever is higher.

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- d. Service bolts and nuts, ordinary platters, washers, and drifts for use in erection work shall be supplied at 60 percent (45 percent bolts and 15 percent drifts) of the number of field rivets per span in each size (this includes wastage). A reduction in quantities of service bolts, etc., may, however, be specified by Engineer if more than one span of each type is ordered.
- e. Deflection and vibratory tests shall be conducted in respect of supporting structures, launching truss as also the structure under erection and unusual observations reviewed; looseness of fittings are to be noted.
- f. For welded structures, welder's qualifications and skill are to be checked as per standard norms. Non-destructive tests of joints as per designer's directives are to be carried out.
- g. Precision non-destructive testing instruments available in the market should be used for noting various important parameters of the structures frequently and systematic record is to be kept.
- h. Safety requirements should conform to IS:7205; IS: 7273 and IS: 7269 as applicable and should be a consideration of safety, economy and rapidity.
- i. Erection work should start with complete resources mobilized as per latest approved drawings and after a thorough survey of foundations and other related structural work. In case of work of greater magnitude, maximum mechanization is to be adopted.
- j. The structure should be divided into erectable modules as per the scheme. This should be pre-assembled in a suitable yard/platform and its matching with members of the adjacent module checked by trial assembly before erection.
- k. The structure shall be set out to the required lines and levels. The stocks and masses are to be carefully preserved. The steelwork should be erected, adjusted and completed in the required position to the specified line and levels with sufficient drifts and bolts. Packing materials are to be available to maintain this condition. Organized "Quality Surveillance" checks need to be exercised frequently.
- l. Before starting work, the contractor shall obtain necessary approval of Engineer as to the method of erection, the number and character of tools and plants, type and quantity of labour to be maintained, and safety precautions taken. Approval of Engineer shall not relieve the contractor of his responsibility for safety of his method or equipment or from carrying out the work fully in accordance with drawings and specifications.
- m. During the progress of the work, the contractor shall have a competent engineer or foreman in charge of work, who shall be adequately experienced in steel erection and acceptable to Engineer.

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9.0 Handling and Storing Materials:

- a) Materials to be stored shall be placed on skids above ground. It shall be kept clean and properly drained. Long members shall be supported on skids placed bear enough together to prevent injury from deflection. The contractor shall be held responsible for loss or damage to any material paid for by the Department while in his care or for any damage to such material resulting from his work.
- b) IS: 7293 and IS: 7969 dealing with handling of materials and equipment for safe working should be followed.

10.0 Formwork and Staging:

Formwork, staging and supports shall be properly designed, substantially built and maintained for all anticipated loads. The contractor, if required, shall submit plans and designs for approval to Engineer. Approval of plans, however, shall not relieve the contractor of his responsibility.

11.0 Straightening Bent Material:

The straightening of plates, angles and other shapes which are slightly bent in transit or handling shall be done by methods not likely to produce fracture or any injury to the material. The metal shall not be heated unless permitted by Engineer for special cases when heating shall not be done to a temperature higher than that producing a dark 'cherry red' colour followed by as slow cooling as possible. Following the straightening of a bend or buckle, the surface shall be carefully investigated for evidence of fracture. Sharp kinks and bends and sign of any fracture may be cause for rejection of material.

12.0 Assembling Steel:

- a. The parts shall be accurately assembled as shown on drawings and match marks shall be followed. The material shall be carefully handled so that no parts will be bent, broken or otherwise damaged.
- b. Hammering, which will injure or distort members, shall not be done. Bearing surface or surfaces to be in permanent contact shall be cleaned, before the members are assembled.
- c. All fasteners shall have a washer under nut or bolt head, whichever is turned in tightening.
- d. Any connection to be riveted or bolted shall be secured in close contact with service bolts or with a sufficient number of permanent bolts before the rivets are driven or before the connections are finally bolted. Joints shall normally be made by filling not less than 50 percent of holes with service bolts and barrel drifts in the ratio 4:1. The service bolts are to be fully tightened up as soon as the joint is assembled. Connections to be made by close tolerance or barrel bolts shall be completed as soon as practicable after assembly.

- e. Any connections, to be site welded, shall be securely held in position by approved methods to ensure accurate alignment, camber and elevation before welding is commenced.
- f. Field riveting, welding and bolted and pin connections shall conform to the requirements of appropriate Sub-Clause.
- g. The correction of minor misfits involving harmless amounts of reaming, cutting and chipping will be considered a legitimate part of erection. However, any error in shop fabrication or deformation resulting from handling and transportation which prevents proper assembling and fitting up of parts by moderate use of drifts or by a moderate amount of reaming and slight chipping or cutting shall be reported immediately to Engineer and his approval of the method of correction obtained. The correction shall be made in the presence of Engineer.

13.0 **Field Inspection:**

- a. All materials, equipment and work of erection shall be subject to inspection of Engineer who shall be provided with all facilities including labour and tools required at all reasonable times. Any work found defective is liable to be rejected and no material or work shall be painted until inspected and approved.
- b. Structural steel and components viz., rivets, bolts, nuts, washers, welding consumables, etc., shall be tested for mechanical and chemical properties to the requirements of appropriate IS codes.
- c. Rivets and riveted connection shall be inspected and tested for compliance of Codal requirements. Welding procedure, welded connection and testing shall be in compliance with Codal requirements. All facilities necessary for stage inspection during welding and on completion shall be provided to Engineer or inspecting official.
- d. Adequate means of identification either by identification mark or other record shall be provided to enable each weld to be traced to the welder(s) by whom it was carried out. The fabricated member/component made out of rolled and built-up section shall be checked for compliance of the tolerances specified in these specifications or as stipulated in relevant IS Codes and the checking for deviations shall be made over the full length.
- e. During inspection, the component/member shall not have any load or external restraint.

14.0 **Painting:**

14.1 **General:**

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- a) Unless otherwise specified, all metal work shall be given approved shop coats as well as field coats of painting. The item of work shall include preparation of metal surfaces, application of protective covering, drying of paint coats and supply of all tools, scaffolding, labour and materials necessary :
- b) General steel work shall be protected against corrosion by :
 - i. Minimum of three coats of paint, or
 - ii. A metal coating followed by two coats of paint.

Unless otherwise specified, all painting and protective coating work shall generally be done in accordance with IS: 1477 (Part 1) and IRS specification B1-79.

14.2 Surface Preparation:

- a. Steel surface to be painted either at fabrication shop or at site of work shall be prepared in a thorough manner with a view to ensuring complete removal of mill scale by one of the following processes as agreed to between fabricator and Engineer:
 - i. Grit and sand blasting;
 - ii. Pickling which should be restricted to single plates, bars and sections;
 - iii. Flame cleaning;
 - iv. Scraping and wire brushing.
- b. Primary coat shall be applied as soon as practicable after cleaning and in case of flame cleaning, primary coat shall be applied while the metal is still warm.
- c. All slag from welds shall be removed before painting. Care shall be taken to brush the surface clean prior to painting. Surfaces shall be maintained dry and free from dirt and oil. Work out of doors in frosty or humid weather shall be avoided.

14.3 Coatings:

- a. Prime coat to be used shall conform to specification of primers approved by Engineer. Metal coatings shall be regarded as priming coats.
- b. All coats shall be compatible with each other. When metal coatings are used, the undercoat shall be compatible with the metal concerned. The undercoat and the finishing coat shall preferably be from the same manufacturer. Successive coats of paints shall be of different shades or colours and each coat shall be allowed to dry thoroughly before the next coat is applied. Particular care shall be taken with the priming and painting of edges, corners, welds and rivets.

14.4 Painting in Shop:

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- a. All fabricated steel shall be painted in shops, after inspection and acceptance, with at least one priming coat, unless the exposed surfaces are subsequently to be cleaned at site or metal coated.
- b. Shop contact surfaces, if specifically required to be painted, shall be brought together while the paint is still wet.
- c. Surface not in contact but inaccessible after shop assembly shall receive the fully specified protective treatment before assembly.
- d. Where surfaces are to be welded, the steel shall not be painted or metal coated within a suitable distance from any edges to be welded, if the specified paint or metal coating would be harmful to welders or is expected to impair the quality of site welds.
- e. Exposed machined surfaces shall be adequately protected.

14.5 Painting at Site:

- a. The methods of application of all paint coatings shall be in accordance with the manufacturer's written recommendation and shall be as approved by the Engineer. Spray painting may be permitted provided it will not cause inconvenience to the public and is appropriate to the type of structure being coated. Areas hard to gain access to for painting and areas shaded for spray application shall be coated first by brushing.
- b. Oil based red lead primers must be applied by brush only, taking care to work into all corners and crevices.
- c. The primer, intermediate and finishing coats shall all be applied so as to provide smooth coatings of uniform thickness. Wrinkled or blistered coatings or coatings with pinholes, sags, lumps or other blemishes shall not be accepted. Where the Engineer so directs, the coating shall be removed by abrasive blast cleaning and replaced at the contractor's expense.
- d. Surfaces, which will be inaccessible after site assembly, shall receive the full-specified protective treatment before assembly.
- e. Surfaces, which will be in contact after site assembly, shall receive a coat of paint (in addition to any shop priming) and shall be brought together while the paint is still wet.
- f. Damaged or deteriorated paint surfaces shall first be made good with the same type of coat as the shop coat.
- g. Where steel has received a metal coating in the shop, this coating shall be completed at site so as to be continuous over any welds, bolts and site rivets.
- h. Specified protective treatment shall be completed after erection

15.0 Tests And Standards of Acceptance:

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- a. The materials shall be tested in accordance with relevant IS and/or IRS specifications/codes and necessary test certificates shall be furnished. Additional tests, if required by Engineer, shall be got carried out by the Contractor at his own cost.
- b. The fabrication, furnishing, erecting, painting of structural steel work shall be in accordance with these specification and shall be got checked and approved by the Engineer.

16.0 **Measurements For Payment:**

- a. Measurements of this item shall be in tones based on net weight of metal in the fabricated structure computed on the basis of nominal weight of materials.
- b. The weight of rolled and cast steel and cast iron shall be determined from the dimensions shown on drawings on the following basis:
- c. Rolled or cast steel: 7.85gm/cu.cm
Cast iron: 7.21 gm/cu.cm
- d. Weight of structural sections shall be nominal weight.
- e. The weight of castings shall be computed from dimensions shown on drawings with an addition of 5 (five) percent for fillets and over-runs.
- f. The weight of weld fillets and the weight of protective coatings shall not be included.
- g. The weight of rivet heads shall be computed by taking the weight of 100 snap head as given in Table 800.2.

WEIGHT OF RIVET HEADS:

Dia. of rivet as manufactured(mm)	Weight of 100 snap heads (kg)
12	1.3
14	2.1
16	3.4
18	4.45
20	6.1
22	8.1
24	10.5
27	15.0
30	20.5
33	27.2

- h. When specially agreed upon, allowance for snap heads may be taken as a flat percentage of the total weight unless otherwise specified in tender documents. This percentage may be taken as 3 per cent or modified by mutual agreement.

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- i. The Contractor shall supply detailed calculation sheets for the weight of metal in the fabricated structures. No additions shall be made for the weight of protective coatings or weld fillets.
- j. Where computed weight forms the basis for payment, the weight shall be calculated for exact cut sizes of members used in the structure, deductions being made for all cuts, except for rivet holes. Additions shall be made for rivet heads as mentioned above.
- k. When especially agreed upon, the basis for payment may be the fabricated structure weight complete, according to specifications included in special provisions of the Contract.

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14. Metalizing

Specification for Metalizing with sprayed Aluminum for Bridge Girders:

1 Surface Preparation:

The surface shall be thoroughly cleaned and roughened by compressed air blasting or centrifugal blasting with a suitable abrasive material in accordance with Clause 3 of IS 6586. Immediately, before spraying it shall be free from grease, scale, rust, moisture or other foreign matter. It shall be comparable in roughness with a reference surface produced in accordance with appendix A of IS-5905 and shall provide an adequate key for the subsequently sprayed metal coating.

2 Metal spraying:

The metal spraying shall be carried out as soon as possible after surface preparation but in any case within such period that the surface is still completely clean, dry and without visible oxidation. If deterioration in the surface to be coated is observed by comparison with a freshly prepared metal surface of similar quality which has undergone the same preparation, the preparation treatment should be repeated on the surface to be coated. The wire method shall be used for the purpose of metalizing the diameter of the wire being 3mm or 5mm. Specified thickness of coating shall be applied multiple layers and in no case less than 2 passes of the metal spraying unit shall be made over every part of the surface. At least one layer of the coating must be applied within 4 hours of blasting and the surface must be completed coated to the specified thickness within 8 hours of blasting.

2.1 Purity of Aluminum:

The chemical composition of aluminum to be sprayed shall be 99.5% Aluminium conforming to IS 2590.

2.2 Appearance of the Coating:

The surface of the sprayed coating shall be of uniform texture and free from lumps, coarse areas and loosely adherent particles.

2.3 Thickness of the Coating:

The nominal thickness of the coating shall be 150 um (microns). The minimum local thickness determined in accordance with procedure given in clause 16.5 below, shall be not less than 110 um (microns).

3 Shop Painting:

Any oil, grease or other contamination should be removed by thorough washing with a suitable thinner until no visible traces exist and the surfaces should be allowed to dry thoroughly before application of paint. The coatings may be applied by brush or spray. If sprayed, pressure type spray guns must be used. One coat of wash primer to IS 5666 shall be applied first. After 4 to 6 hours of the application of the wash primer, one coat of Zinc chrome primer to IS: 104 with the additional proviso that zinc chrome to be used in the manufacture of primer shall conform to type 2 of IS: 51 shall be applied. After hard drying of zinc chrome primer, one coat of Aluminium paint to IS: 2339 (brushing or spraying as required) shall be applied.

4 Site painting:

After the steel girder is erected at site a second cover coat of Aluminium paint to IS: 2339 (brushing or spraying as required) shall be applied after touching up the surface and the cover coat given.

After the steel girder is erected at site a second cover coat of Aluminium paint to IS: 2339 (brushing or spraying as required) shall be applied after touching up the surface and the cover coat given in the shop if damaged in transit.

5 Method for the Determination of Local Thickness.

5.1 Equipment:

Any magnetic or electromagnetic thickness meter that will measure local thickness of paint show Standard with an accuracy of + - 10 percent.

5.2 Calibration of instrument:

Calibrate and check the meter on one of the following standard test piece.

- (i) (Applicable to magnetic and electro-magnetic meters other than the pull off type). A soft brass shim, free from burrs, in contact with the grit-blasted surface of the base metal prior to its being sprayed. The thickness of the shim shall be measured by micro meter and shall be approximately the same as the thickness of the coating.
- (ii) A sprayed metal coating of uniform known thickness approximately the same as the thickness of the sprayed coating to be tested, applied to a base of similar composition and thickness to the article being sprayed, grit-blasted in accordance with Clause 1.

5.3 Procedure:

For each measurement of local thickness, make an appropriate number of determinations, according to the type of instrument used.

With instrument measuring the average thickness over an area of not less than 0.645 cm² the local thickness shall be the result of the one reading. With instruments having one or more pointed or rounded probes, the local thickness shall be the mean of three readings within a circle of 0.645 cm² area.

With meters having two such probes, each reading shall be the average of two determinations with the probes reversed position.

5.4 Method of Test For Adhesion:

Using a straight edge and hardened steel scribe which has been ground to a sharp 30 degree point, scribe two parallel lines at a distance apart equal to approximately 10 times the average coating thickness. In scribing the two lines, apply enough pressure on each occasion to cut through the coating to the base metal in a single stroke.

6 Inspection

6.1 Determination of Local Thickness:

The minimum local thickness shall be determined by the method described above.

6.2 Adhesion:

The sprayed metal coating shall be subjected to an adhesion test using the method described above. If any part of the coating between the lines breaks away from the base metal, it shall be deemed to have failed the test.

Articles, which have been rejected, shall have the defective sections blasted clean of all sprayed metal prior to re-spraying. Where the rejection has been solely due to too thin a

coating, sprayed metal of the same quality may be added provided that the surface has been kept dry and is free from visible contamination.

7.0 Measurement

Measurement of Metalising will be taken in square meter of painted surface area and payment will be made under relevant item.

15-TECHNICAL SPECIFICATIONS (P.Way)

- 1 Railway Specifications for Materials & works shall be adopted. Some additional specifications are added herewith. Notwithstanding any provisions made in the C.R specifications, the provisions made in the technical specifications shall be binding. All provisions in Railways manuals such as Permanent way (IRPWM), LWR, Bridge etc are binding on the contractor and all the provisions in these manuals shall be strictly followed.
- 2 In addition, in case there is any current standard circular of Railway Board / RDSO or Chief Engineer to be followed for any track standard, the same could be enforced to be followed under directives of the Railways Engineer – in – charge of the above work.
- 3 These special conditions supplement the conditions of the tender and the contract and conditions incorporated in specifications for materials and works of the Central Railway corrected up to latest correction slip. When provision of these special conditions are at variance with the General Conditions of Contract and other documents mentioned above, then these special conditions will prevail.
- 4 Contractor must visit the site before quoting rates for the work. He should get acquainted with the approaches, existing site conditions, vicinity of track, vicinity of hutment, availability of labours and other obligatory structures etc. & quote the rate accordingly.
- 5 In the absence of any specification for any work on material the relevant Indian standard specification would be applicable and where no Indian standard specification exists, relevant international specification or the specification given by Railway would be followed. Decision of Railway in this regard would be final and binding on the contractor.
- 6 Setting Out: The Contractor shall establish working Bench Marks tied with the Reference Bench Mark in the area soon after taking possession of the site. The working Bench Marks, alignment / levels pegs should be got approved from the Engineer.
- 7 All dimensions and levels shown on the drawings or mentioned in documents forming part of or issued under the Contract shall be verified by the Contractor on the site and he shall immediately inform the Engineer of any apparent errors or discrepancies in such dimensions or levels.
- 8 The Railway administration reserves the right to operate fully or partly up to any extent or delete any items of this tender schedule as required as per site condition and the contractor will have no right to claim on this account.
- 9 The contractor shall engage adequate number of supervisors with experience and well conversant with track laying work. They will be recruited after specific approval of the engineer about working safety rules. Only those persons declared fit by the Railway Engineer would be employed by the contractor as Supervisors/ Engineers.
- 10 Contractor will depute technically qualified person to represent him at site of work who will be authorized to sign the acknowledgement of instructions and orders given during course of work and inspection. The instructions acknowledged by the representative will be binding on the contractor and no separate instructions will be given to contractor and in absence of such supervisor no work will be allowed to progress.

- 11 Contractor has to make his own arrangement of water and electricity etc. and Railways will entertain no claim on this account.
- 12 The Railway will not provide any new service roads for movement of contractor's vehicles. However, the contractor can use existing service roads within Railways premises free of charges.
- 13 Contractors have to make approach road/service road wherever required even through the private lands. The element of service road with prior permission of land owner is deemed to have been considered while quoting the rate and no extra, what-so-ever, will be paid to the contractor against the premium / compensation paid by them, if any, to the land owners on this account. The Railway however, reserves the rights to make use of these roads formed and maintained by the contractor as and when necessary without any payment to the contractor. The Railways will entertain no claim on this account.
- 14 The contractor will arrange his own tools and plants, crane, lighting equipments, consumable etc. required for doing the work.
- 15 The contractor will be held responsible for any loss or damage or injury caused during the course of work to the labours or to the Railway/ Public Private person due to his negligence. The contractor shall bear all the consequence losses and expenditure thus involved on that account.
- 16 The work should be carried out without any interference to normal working of the Railway track and the structures. The Railway reserves the right to have the damages made good by the contractor. The contractor, if necessary shall provide barricades as required while working near the existing running lines. The decision of Engineer-in-charge will be final and binding on the contractor in this regard.
- 17 The contractor must ensure the safety of labourer engaged by him while crossing the track during the course of execution of work. The Railway will not be responsible for any injury sustained by labourers. Any claim for compensation what so ever arising out of such accident shall be paid by the contractor including any fatal accident.
- 18 Contractors shall have to keep ready necessary first aid facilities etc available all along while working in the day or night for labours while working.
- 19 All safety precautions for running of trains in section are to be followed. Contractors will provide lookout men with the flags/H.S. Lamps during block periods and during normal working period also.
- 20 Activities required blocks and protection shall be carried out under the supervision of Railway Engineer in-charge.
- 21 Tenderers are required to submit a Bar chart along with the tender documents duly indicating the programme for completion of work in view the total completion period. At no point of time, deviation from programmed schedule will be allowed and Railways will have the liberty to determine the contract in case of any shortfall of the progress in different activities.
- 22 The rates of all the items are inclusive of sales tax, royalty fees, octroi duty, as payable under the sales Tax Act or local bodies Act. The Railways will not pay to the contractor any of these taxes and the contractor will not be compensated for any amount paid by him by way of such taxes or duties.

- 23 The Railways will not undertake to supply tools and equipments to the contractors. However under compelling circumstances the tools and equipment can be given on hire basis if available/ separable with/by the Railways. Railways shall decide hire charges for each tool.
- 24 During the execution of work, the contractor will have to work in coordination with Railway's other departments i.e. Bonding, OHE and S&T etc. and will have to carryout the work according to standards laid down such as bending / jim crowing of stock and tongue rails for proper housing of tongue rails with stock rails, fixing of all stretcher bars, switch, ring tie plates, bending of fish plates, hot and cold work in coordination with S&T for lengthening or shortening of stretcher bars / rods etc.
- 25 Wherever lead or lift is not mentioned it should be clearly understood that it mean "All lead and all lifts" for which no extra payment shall be made unless specified.
- 26 Contractor will have to provide labour for taking measurements of work done or during course of work whenever necessary with all equipments needed such as Gauge level, tapes etc. as approved by the Railway no extra payment will be made for the same.
- 27 Contractors will have to apply Grease (Specification for Grease No.IS: 480-1981) to 'O' graphite on the central leg of ERC and eye of the MCI insert and then clip should be driven while linking & laying of track or in turnouts.
- 28 Site order books, progress report register and material issue register shall be maintained at site and entries will be recorded on day-to-day basis in the register and signed jointly by Railway supervisor and contractor or his authorized representative.
- 29 All details of handing and taking over sections for different stages of packing, imposition and removal of speed restrictions, measurement of track parameters, accountal of released material etc., should be recorded.
- 30 Contractor will have to provide labour for taking measurements of work done or during course of work whenever necessary with all equipments needed such as Gauge level, tapes etc. as approved by the Railway no extra payment will be made for the same.
- 31 Wherever the unit per metre has been used it means per running metre of tracks as a whole consisting of operation on both the rails. It shall not mean that separate payment for left and right will be given unless otherwise specified.
- 32 Use of Railway premises should be informed in advance & should be used on prior approval of the competent authority.
- 33 During execution of the work including excavations, the tenderer may have to encounter electrical cables, Signaling & Telecommunication cables, other cables, water supply pipelines, sewage & sewerage lines, other lines/ complexities etc. The locations and depths of these electrical cables, signaling and telecommunication cables, other cables, water supply pipe lines, sewage & sewerage lines, other lines / complexities etc. are not known. The tenderer shall note this while quoting his rates. The rates shall include extra expenditure due to inconveniences / difficulties due to all these obstacles / encumbrances (all types of cables, pipe lines etc). Nothing extra shall be paid on these accounts. However, the cost of diversion of these cables, water

supply pipe lines sewage & sewerage lines etc. shall be paid separately, if got done through the tenderer.

- 34 The traffic / power block in night could be on any day. No definite assurance can be given. The Blocks shall be depending upon the traffic. However, advance intimation /notice will be given to the contractor about blocks by the Railways at least 24 hrs. in the advance. No claim shall be entertained for non-operation and non-availability of block at the last moment.
- 35 The scope of work, workmanship and other specification will be as per provisions of IRPWM, Schedule of Dimensions, Track Manual, Standard Drawings issued by RDSO and CE, G&SR and other administrative Circulars. In case of any ambiguity in the meaning and interpretation of the works, the provisions contained in the above codes / manuals shall be applicable. The contractor has to follow prescribed pattern and procedures although the details may not be included in the description of item. The contractor must therefore make himself fully aware of the safety precautions, auxiliary and subsidiary operations in connection with the item and relevant method of execution before hand as the rates includes working to specified procedures without adopting any short cut. No extra payment will be admissible on account of such subsidiary operation in connection with execution of work.
- 36 In case of loading / unloading from Railway wagons all commercial formalities shall be observed. All demurrage / wharfage charges accruing due to neglect of contractor will be recovered from outstanding bills of contractors.
- 37 Contractor will be paid for full operation of NS items and if the part payment is to be made, it will be as specified in the description of NS items.
- 38 Contractor will indemnify for the loss due to train accident at site to an amount of loss incurred by the Railway, if the accident is due to the negligence of the contractor.

[C] CONDITIONS:

[1] Transportation of Track materials:

1. For sleepers to be transported from sleeper factory, the loading will be done by Concrete Sleeper factory free of cost. The sleepers passed and in complete sets will only be transported.
2. Unloading will be done at the site with the help of the crane by the Contractors trained/skilled staff and the sleepers/ rails shall be stacked in proper sequenced batches, thus avoiding the possibility of mixing up. The unloading shall be done near the track to the extent approachable road exists and stacked as directed by the Site Engineer.
3. Railway will not be responsible for any damage or accident to the vehicles as well as any labour working on the vehicle during the contract.
4. The concrete sleeper should be handled carefully during transportation, unloading and stacking. The contractor will be held responsible for any damage or loss to the concrete sleeper during transit.
5. The contractor will arrange transit Insurance for the sleepers being transported.
6. Payment for the transportation charges will be arranged only after the receipt of the materials by the consignee and not on proof of dispatch.

7. All incidental charges like Octroi, Road tax, entry tax, etc. will be borne by the contractor.
8. Material and fittings will, generally, be supplied from the Railway Depot either at Bhusawal or Manmad. However it may be required to transport the material from other locations also.
9. Contractor will be paid for the full operation of non-schedule items and no part payment is being made.
10. The rates for loading and unloading are same for new or second hand materials.
11. All the materials shall be kept clear of infringement during loading, unloading and handling.
12. Weighbridge charges, if any are to be done by the Contractor.
13. Rate of transportation includes making up of temporary approach roads to the locations / Points of unloading and stacking of sleepers / rails in the section at the location as directed by Engineer-in-Charge.
14. Excess material unloaded in section shall have to be re-transported and stacked to correct locations by the contractor at his own cost as per instruction of Engineer-in-Charge.
15. All efforts will be made by Railways to supply required number of sleepers / Railway within stipulated completion period. However, if due to unforeseen reasons beyond the control of manufacture, supply is delayed, the contractor shall be granted suitable extension. However, no claim or compensation on this account will be entertained.
16. Railway's materials in charge of contractor may be subjected to check by the Railway officials at any time and the contractor shall give all facilities for inspection / counting of the materials.
17. After unloading of the Rails the same should be stacked as per para 254 of Indian Railway P. Way Manual and as directed by Engineer-in-Charge whose decision in this regard will be final and binding on the contractor and only then the item will be considered as completed.
18. Measurement:
 - a. For sleepers of any kind, transported from a sleeper factory, the weight given by the factory will be taken.
 - b. For transportation of released / second hand sleepers, actual weighment will be done initially to arrive at the unit weight per sleeper and subsequently the payment will be done on unit weight thus arrived.
 - c. For transportation of loose fittings, miscellaneous items, mixed items, the payment will be done on actual weighment.
 - d. For transportation / hauling of released / second hand rails, wherever feasible actual weighment will be taken, otherwise 5% deduction will be made for wear and tear from the nominal sectional weight.

[2] Issue and accountal of new / released material:

1. Joint inspection of the site shall be done for making inventory of material to the released from work site under joint signature of Engineer-In-charge representative of Railway & contractor before handing over site for undertaking the work by him. This will ensure proper accountal of

released materials and the running bill of the contractor, should also be subject to his lifting, transporting, sorting properly stacking and accountal of the released materials at nominated site and handing over of released material at nominated depot.

2. All released and surplus materials, till they are disposed off to depots will remain with contractor and will be responsible for safeguarding the same. Any loss will be recovered at double the prevailing rates as decided by Railway
3. The Railway's material will be issued on specific requisition of the contractor and as per requirements consistent with progress of work from the railway's depots or at any other specified location as per direction of Engineer -in-charge at site.
4. The contractor will be responsible for safe custody of all the track fittings and materials handed over to him for linking of track and any losses due to breakages, thefts or misuse will have to be made good by the contractor before the track is handed over by the contractor to the railway.
5. Track materials issued by the Railway shall be used solely and economically for the purpose of the work covered by this contract only. The materials shall be used in such quantities and proportions as specified in the terms of work & as are indicated in the Schedule & in the relevant specification of drawings as approved by the Engineer whose decision thereon shall be final. Wastage of or damage to such materials in any manner shall be totally avoided.
6. Any materials left over as surplus or as scrap out of the material supplied by the railways free of cost, shall be returned to the Railways at railway's depots or other godowns anywhere as directed by engineer -in-charge at site. Materials shall be returned in good and whole condition.
7. Contractor will be responsible for collecting released material if any and transporting it to Railway stores depot and stacking as directed by Engineer in charge.
8. In case it is noticed that on completion or termination of the work, the consumption of the material has been found in excess of the quantities laid down and the contractor is unable to account fully for the material issued either due to neglect in the safe custody or for any other reasons the cost of such quantity of the material will be recovered from the contractors at twice the prevailing procurement cost, at the time of last issue i.e. 2 times purchase price plus 5% freight charges.
9. In case some of the newly placed fittings are found to be damaged, broken, it shall be replaced by contractor free of cost.
10. Any loss due to possible theft or any other account will be contractor's responsibility for which the Railways will make no payment. Final payment will be made as per fittings used and counted in the completed track.
11. Security of Track fittings when fixed in track or at his depot will be contractor's responsibility.
12. The materials like small fittings etc. form site depot to actual place of work will have to be transported by the contractor at his own cost. No claim will be entrained on account of crossing of the track if any and the rate quoted

should be inclusive of all lead and handling and also cover all precautions to lift and stack properly as are considered necessary during the course of execution.

3] Precautions and safety measures:

1. The contractor must ensure the safety of labour engaged by him while crossing the track during the course of execution of work. The Railway will not be responsible for any injury sustained to labour for any accident. Contractor should issue photo identity card to all his laborers and workers
2. All safety precautions for running of trains in section are to be followed. Contractor will provide lookout men with the flags/ H.S. lamp during block period.
3. The work should be carried out without any interference to normal working of the Railway track and the structure. The Railway reserves the right to have the damage made good by the contractor.
4. The contractor at his own cost, if necessary should provide barricades as required while working near the existing running track. The decision of Engineer, engineer-in-charge at site will be final. Necessary barricades will also have to be provided to restrict the movement of passengers for safety of users.
5. The Contractor shall take all precaution / utmost care and adopt all safety measures for his labour while handling / transporting of sleepers etc. the contractor shall maintain proper ledgers for counting the materials loaded in to trailer / truck, transported & stacked in section by him and shall keep proper account of the same in a manner as directed by the Engineer-in-Charge.
6. If the contractor requires to ply vehicles along the side of the track, he will have to inform Engineer-In-charge or his representative. The vehicles will not ply till arrangements for protection of Rail traffic and vehicles have been made. The cost of such protection works shall have to be borne by contractor. Nothing extra shall be paid on this account.
7. While carrying out the excavation in the yard for executing any work all precautions should be taken to avoid damages to cables pipe lines etc and the damage cost will be borne by agency.
8. The agency will have his own arrangements for safety of life of labourer's while working in yard to watch the movement of trains to avoid any untoward incidents including OHE installation.
9. If due to any unsafe working from contractor side causing any untoward incident than Rs.1.0 Lac penalty will be imposed other than the losses occurred to Railways.

[4] Deep Screening:

1. The work is to be done as per procedure and standard laid down in concerned paras of IRPWM.
2. Depth in deep screening means depth below bottom of sleeper at rail seat.
3. Contractor must use screens of approved design and size to ensure proper cleaning of ballast failure of which may render stoppage of work cost of which will be entirely borne by him. In general 20 mm sieves (size of the holes) will be used for screening the ballast.

4. Muck will be defined as material passing through these sieves. This muck will be thrown sufficiently away from cutting so that it does not flow down the cutting in monsoon.
5. The contractor will be required to stop deep screenings work during rainfall and no compensation will be made for this.
6. No ballast will be wasted on the slopes of banks or in cuttings. All ballast from the slopes shall be picked up and put in the track as directed by Engineer.

[5] Replacement of existing Turnouts:

1. Laying and insertion of assembled Turnout to be done in phases under traffic/with traffic block as directed by Railway Engineer. Dismantling of existing turnout, D.S. and renewal is to be done in various stages.
2. Switch to be assembled separately and made fit from S&T point of view before insertion in the track.
3. Sleepers in lead and crossing portion shall be renewed in stages in such a manner that work does not hampered the traffic movement.
4. Rails in lead portion shall be prepared in advance including insertion of glued joints as may be required so that rail renewal can be done in a single block. CMS crossing shall be inserted in same block arranged for rail renewal.
5. The stock joint of the switch to be kept perfectly square.
6. All fittings and components as per standard drawing of turnouts are to be provided in proper manner.
7. Provision of stretcher bars and allied fixtures will have to be done in collaboration with S&T department.
8. Holes and cuts will be paid extra.
9. The Turnouts will be assembled as per RDSO Drg.No.T-4733 & 4734 for 1 in 12 (52 Kg), T-4866 and 4877 for 1 in 8½ (52 Kg), T-4219 and 4220 the standard drawings. For 1 in 12 (60 kg), T-4966 and 4967 for 1 in 8½ (60 Kg).
10. This item includes provision of switch gauge tie plates also.
11. Tongue rail will have to be set flush with stock rails over tapered portion of tongue rail by jim-crowing and other adjustment like packing, lifting of adjoining switch and the length of stretcher bars etc. Opening of 115 mm will be ensured at both LH & RH sides of the toe of the switches.
12. The gap between the top of leading stretcher bar and bottom of stock rail should not be more than 1.5 mm on both LH and RH sides. This item will be carried out in collaboration with S&T department.
13. In switch portion contractor has to carryout all ancillary works for S&T requirement i.e. housing of tongue rail with stock rail, for adequate length, grinding of head of stud bolt, grinding of special chair etc. as directed by site Engineer. This work should be finished during traffic block only. The payment of assembly will be made after completion of works for S&T requirement and commissioning of switch satisfactorily in the track.
14. Contractor shall be responsible for maintaining perfect gauge, cross level alignment and tightening of fittings. If gauge demand grinding of

special chairs, cutting and re-welding etc. it shall be done by contractor free of cost.

15. Post maintenance and attention to newly laid Track/T-Outs after completion of traffic block involves lifting, leveling, aligning, tightening of all fittings, packing, boxing of ballast to maintain the track fit for 30 kmph. This includes picking of slacks as directed by Engineer at site. The parameters should be maintained as per stipulations contained in IRPWM. No extra payment will be made for this.

[6] Dismantling of Turnouts etc.:

1. The work involves removal of fastening and fittings all kinds such as fishbolts, fish plates, keys, cotters, spikes, rail screws, plate screws, elastic rail clips, liners, bearing plates, CI block and nuts and bolts etc.
2. The rates is inclusive of 100 meters lead and all lifts / decent and crossing adjacent tracks, signals, wires, yard, trains etc. The rate also includes clearing of site and stacking dismantled material up to the lead of 100 meters.

[7] Working on running line:

1. In all cases the work shall be carried out under supervision of competent Railway's official. Contractor will provide lookout men with the flags/ H.S. lamp during block period. Protection of running lines and erection of speed restriction boards would be arranged by Railway. Under no circumstances the contractor shall commence work on running lines without Railway's official permission and presence at site.
2. If any unsafe working is resorted to by contractor. Railway supervisor would be free to stop further work & contractor will have no claim for compensation due to stoppage of unsafe working.
3. In case there is delay or any defects in carrying out any operation by contractor. Railway Supervisor would be free to deploy Railway labour as required and suitable recovery shall be made from contractor's bills equivalent to departmental cost. The same condition will be applicable if the contractor's labour leaves the job unfinished and it is considered necessary to attend the job by Railway labour in the interest of safety.
4. No compensation shall be payable to the contractor if the work cannot be done due to non-availability of traffic block, sudden rains or any other reason whatsoever. The contractor should take into account the probability of labour utilization depending on the traffic density of the section and quote his rate accordingly.
5. Contractor should be able to arrange sufficient labour for work so as to take optimum advantage of traffic blocks.
6. For works requiring traffic block and imposition of restriction / caution order, Contractor will arrange for protection/erection of speed restriction boards.

[8] Spreading out stone ballast from stack:

1. Ballast will be carried from ballast stacks along the alignment and will be spread evenly wherever required as directed by Railway Engineer.
2. The ballast from the stack should be removed right up to the bottom of the stack till stacking ground becomes visible.

3. As far as possible, the stack once broken should be completely run out unless instructed otherwise by the Inspector Supervisor at site.
4. Railway will provide ballast in stacks on or near the formation however, in case there is less ballast central drain will have to be made and ballast so collected will be utilised for series of packing. In case of single line, excess ballast in the central portion to be utilized for the packing and maintaining the track parameter. Rate shall include this aspect.
5. For leading out ballast, the measurements of Railways stacks already done will be adhered to for the sake of payments.

[9] Laying and linking of track:

1. The work will involve Laying and fixing predrilled and pre-cut rails on properly laid sleepers, fixing fish plates and fish bolts and other rail and rail-sleeper fastenings such as clamps as per Railway's drawing and / or as per extant instructions, fixing keys/ clips and other rail and rail-sleeper fastenings to obtain gauge as per Railway's drawing and / or as per extant instructions, fixing grooved rubber pads liners and elastic rail clips as per standard drawing and as per extant instructions.
2. Rates shall be inclusive of the following items of work of assembling of track:
 - a) Incidental loading, unloading of stone ballast by head load or by any other means such as trucks, dumpers Contractor's dip lorry etc.
 - b) Incidental loading, unloading and stacking at site all Railways materials/released material during transportation of the same.
 - c) Straightening the rails/rail panels by JIM-Crowing or by mechanical Hydraulic rail benders before linking them in the track.
 - d) Incidental hauling of rails, and MBC sleepers to bring on exact location while laying and linking of track.
 - e) Making up standard ballast profile after initial packing.
 - f) Standard gap has to be maintained on the rails joints.
3. Removing shrubs, weeds, grass and all other unwanted materials from formation and dressing and leveling before the laying of track.
4. The center line and levels will be given for the alignment of track by the Railway, which should be maintained by the contractor and adhered to while laying the track.
5. The above item of the work envisages laying and linking of sleepers and rails of section as specified in the schedule and fixing rail and rail-sleeper fastenings and fittings etc. Including all leads, lifts / descents etc, unless otherwise mentioned in the respective items, and all incidental works.
6. The measurements for payment shall be per running metre of track as stipulated in the item, measure to the nearest centimetre.
7. The work shall be carried out as per the Railway's standard drawings, project sheets, provisions contained in Indian Railway's Permanent Way Manual and the extant instructions.
8. Rail / Rail panels of equal length shall be used in pair for laying and fixing.

9. Rail joints shall be square to alignment, while on the curved alignment; cutting of inner rails shall be done at suitable intervals when lead of inner rail is equal to half pitch. (Cuts to be paid for separately).
10. The fish bolts shall be applied one coat of black oil as prescribed. Hammering of fish bolts is prohibited. The fish bolts shall not be over tightened and shall be tightened with standard spanner / torque spanner. The inner two fish bolts should be tightened first.
11. The gapless joints are required to be provided at specified locations such as at combination fishplates, joints behind CMS Crossings and SEJs with closure etc.
12. It shall be ensured that the handling of rail is as per extant instructions and shall not infringe the Railway's schedule of Dimensions.
13. Use of kinky rail should be avoided.
14. Marking on rails with punch or chisel is prohibited.
15. The driving of the keys / clamps shall be done with a standard keying Hammer / approved mechanical means.
16. The above keying / clamping operation shall be completed on the base rail first which shall be first aligned and fixed in position before the other rail is fixed to the gauge as stipulated.
17. The gauge shall be maintained as per para 403 of the Indian Railways Permanent Way Manual or as per extant instructions.
18. Oiling and greasing of fish plates before fastening the rails will have to be done with contractors tools and consumables like plumage, kerosene oil, black oil, brushes etc. For 100 nos. of single rails joints the requirement is approximately as under: No extra payment for this will be made. Rate of linking track should include this work.

Plumago	-	11 lbs/5Kgs.
Kerosene oil	-	7-1/2 lbs/3.40 Kg.
Black oil	-	6 lbs/2.72 Kg.
19. No extra payment shall be made either for testing or rectification of defects. Engine shall be provided by Railway without hire charges for testing of track.
20. All lead will mean lead up to one Km. on either side unless otherwise specified in the description of non-scheduled items of laying and linking of track.
21. Contractor should quote his rates inclusive of all the works arising out of Special Conditions of Contract incidental, applicable to each non-scheduled item for which no separate payment is intended to be made to the contractor.
22. The hiring and position of crane for lifting of sleepers and rails is entirely the responsibility of contractor.
23. Contractor will have to give spacing for laying MBC sleepers on rails as per drawing supplied to them at the rate of 1660 / 1540 Nos. in a KM , as directed at site by the engineer.

24. Contractor will be responsible for giving correct alignment in straight and in curve portion required as per proposal depending upon degree of curvature, until alignment is approved by PWI-in-charge. It will be responsibility of contractor to rectify the defects till it is approved by Engineer -in-charge for this work no extra payment will be made.
25. Contractor shall arrange his own dip lorry or material lorry/dolly etc. for carrying of rails, fittings etc. over track wherever required as per site conditions. Labour for protection of track, wherever required, is to be arranged by contractor under directives of Railways engineer at site.
26. The materials like small fittings from site depot to actual place of work will have to be transported by the contractor at his own cost. No claim will be entrained on account of crossing of the track if any and the rate quoted should be inclusive of all lead and handling and also cover all precautions to lift and stack properly as are considered necessary during the course of execution.
27. The consumable stores like graphite, oil, cotton waste, coal tar, paint, painting brushes etc. required for the work will have to be arranged by the contractor at his own cost required as per the current prevailing circulars.
28. 1st and 2nd through packing will be done in accordance with the relevant provisions of IRPWM to make the track fit for 20 KMPH and 45 KMPH respectively as stipulated in the items.
29. Contractor shall be permitted to construct temporary sheds for his labour/stores etc subject to condition that hygienic condition shall be maintained at all the level in the surrounding. The contractor at his own cost shall arrange water supply and electric connections. All this temporary sheds/stores so constructed shall be removed by the contractor and site cleared of all debris, leftover material etc. shall be handed over back to Railway otherwise Railway reserves the right to stop refund of security deposit and /or/ payment of final bill etc. In this matter decision of the Railway Authorities shall be final and binding on the contractor.
30. After the work is over, the ballast section, cess and side drains will conform to ballast profile as laid down in manuals.
31. Squaring of sleepers-Gauge variations and kinks inevitably result from sleepers getting out of square.
32. The spacing of sleepers on the sighting rail should first be checked and correctly chalk- marked. Corresponding marks should then be made on the other rail using the square at every point.
33. Squaring should be done by planting the crowbars firmly against the sleeper and pushing it. Under no circumstances should sleepers be hammered. Sleepers that are squared should be re-gauged immediately, the fastenings tightened and repacked.
34. Contractors will have to apply Grease (Specification for Grease No.IS:480-1981) to 'O'graphited on the central leg of ERC and eye of the MCI insert and then clip should be driven while linking and laying of track or in turnouts. No extra payment shall be allowed for the same.
35. Track geometry after laying the track shall conform to Track Geometry Standard during initial laying

a)	<u>Gauge</u>	<u>Sleeper to sleeper variation</u>	<u>(+/-)</u>	<u>2 mm</u>
b)	<u>Expansion gap</u>	<u>Over average gap worked out by recording 22 successive gap</u>	<u>(+/-)</u>	<u>2 mm</u>
c)	<u>Joints</u>	i) <u>Low joints not permitted</u>		
		ii) <u>High joints not more than</u>	<u>(+/-)</u>	<u>2 mm</u>
		iii) <u>Squareness of joints on straight</u>	<u>(+/-)</u>	<u>10 mm</u>
d)	<u>Spacing of sleepers</u>	<u>With respect to theoretical spacing</u>	<u>(+/-)</u>	<u>20 mm</u>
e)	<u>Cross level</u>	<u>To be recorded on every 4th sleeper</u>	<u>(+/-)</u>	<u>3 mm</u>
f)	<u>Alignment</u>	<u>On straight on 40 metre above</u>	<u>(+/-)</u>	<u>2 mm</u>
		<u>On curves of radius more than 300 mm on 20 metre variation over theoretical versions.</u>		<u>5 mm</u>
		<u>On curves of radius less than 500. on 20 metre variation over theoretical versions</u>		<u>10 mm</u>
g)	<u>Longitudinal level</u>	<u>Variation in longitudinal level with reference to approved longitudinal sections.</u>		

[10] Gauging: The basic requirement is uniform gauge over a continuous stretch so long as it is within the permissible limits of tightness or slackness. Gauging should only be done after ensuring that sleepers are truly square, Standard key hammers shall always be used, Beaters and heavier hammers should not be used, as this causes over driving of keys/ER Clips and strain M.I. inserts. The Track gauge should be held firm with one lug against the base rail and the other end being swiveled over the opposite rails. The tightest position obtained determines the correct point to test the gauge.

[11] Boxing of ballast section and tidying:

- a. After completing the preceding operations in sequence, clean ballast should be dressed to the specified dimensions, template being used for the purpose, Hemp chords 6mm dia of a sufficient length should be used for lining the top and bottom edges of the ballast, if inadequate, full section of

ballast should be provided near the rail seat, the deficiency being reflected along the centre of the track and not under the rails or in the shoulder.

- b. The cess should then be tidied up. Where earth ridging exists at the edge of the bank, this should be removed. Cess should be maintained to the correct depth below rail level according to the ballast section and formation profile.
- c. If track Geometry is not maintained and any mishap takes place on the track being maintained by contractor, due to track deficiency, contractor will be held responsible for the same and loss to Railway will be recovered from the contractor as deemed fit.
- d. In switch portion contractor has to carry out all ancillary works for S&T requirement i.e. housing of tongue rail with stock rail, for adequate length, grinding of head of stud bolt, grinding of special chair etc. as directed by site Engineer. The payment of assembly can be made after completion of works for S&T requirement on producing written certificate from Site Engineer

[12] Specification for cutting of rails:

1. The above item of work envisages cutting of rails on cess / running track as specified in the schedule at isolated locations / nominated Depots / Stacks complete with handling of rails and all incidental works.
2. The measurements for payment shall be for each complete cut at the specified points.
3. The work shall be carried out as per provisions in Permanent Way Manual.
4. The cut shall be made by Rail cutting machine (say type) or by abrasive Rail cutter as specified in the contract.
5. The cut shall be made in a plane at right angle to the foot as well as the running edge of the rail. The burr, if any, shall be removed.
6. Flame / Gas cutting is forbidden use of Jim-crow to aid cutting is forbidden.
7. The contractor shall arrange for the rail cutting machine (saw type) and hacksaw blade and / or the abrasive rail cutter and abrasive disc which should be procured from the approved firm(s) for manufacture / supply of the same, a list of which is given in the Annexure. The rate includes cost of operation and maintenance of these machines.
8. For cutting of rails and drilling holes in rails, these shall be done through mechanical means only preferably petrol driven machines. For cutting of rail in block, use of abrasive rail cutter will be mandatory. The Contractor will be required to keep sufficient number of machines for such purposes in the section along with stand by, as no delay on account of non-availability of these machines will be acceptable.

[13] Specification for drilling holes in rails:

1. The above item of work envisages drilling and chamfering of holes of prescribed diameter in rails on cess / running track as specified in schedule at isolated locations / nominated Depot / Stacks complete with handling of rails and all incidental works.
2. The measurements for payment shall be for each hole drilled including chamfering complete.

3. The work shall be carried out as per the Railway's standard drawings and / or as given in Indian Railways Permanent Way Manual.
4. The drilling shall be done by Rail drilling machine only. Punch or Reaming / Drifting shall not be permitted. After drilling the hole, the same shall be chamfered with chamfering tools to remove burrs and for work hardening the hole, on both sides of rail web. The use of flame / gas cutting equipment is forbidden.

[14] Handling and Protection of rail surface:

1. Surface notches of even less than 0.75mm depth are liable to cause rail fracture in service, therefore avoid impact abrasion of rails against separators in wagons and round link chains slings for securing the rails.
2. Use conventional slings for lifting rails made of flat link chains. Lifting of rails preferably with magnet lifting device.
3. These rails are thermally very sensitive and are likely to develop metallurgical defects, if exposed to localised heating which produces very hard, brittle ad failures, therefore avoid heating, flame cutting on or adjacent to rails and contact with electric arcs and molten metal splashes, i.e. from loose cables or adjacent welding operations.
4. Do flame cutting when found essential after pre-heating, a minimum of 10 cm. of rail length on either side of the cutting about 250-350 degrees uniform movement of heating torch before starting cutting operations.
5. The rails can with stand normal degree of corrosion but localised corrosion in fitting may cause subsequent rail fractures therefore avoid contact with injurious substances, which produce high corrosion of steel, i.e. acids, alkalis, salts etc. Stack rails on a well-drained place over uniform supports of wooden battens.
6. The single point slinging increases risk of excessive bending and surface damage to the rails. The overhang beyond the outer lifting point should not be greater than one half the distance between lifting points therefore avoid single point slinging. Use two point slinging for rail length up to 10 meter. Next four point slinging with 36 metre rails.
7. Railways will give recommended locations of lifting points for various rail lengths on demand by contractors. Suitably increase to number of lifting points when handling welded panel of longer length. Use of lifting beams fitted with slings is desirable.
8. Safety of personnel: Avoid standing under suspended loads. Use protective gloves and clothing to minimize the risk of skin abrasion. Wear distinctive coloured helmet and clothing for easy identification by crane and machinery drivers to avoid accident.

[15] First and subsequent packing:

1. Provision has been kept for two round of thorough packing for making the track fit for speed of 45 Kmph. Details of track parameters for which thorough packing is enclosed with the specifications of the tender and in Permanent Way Manual. The work should be carried out strictly as per the direction of the Engineer In-charge.

2. Through packing of newly laid plain track/ slewed track or Turnouts includes spacing, squaring, gauging, aligning on straight/ curved portion, bringing the track parameters within limits prescribed in IRPWM, boxing, dressing, ballast section as per standard profile with contractor's labour, tools and plants etc.
3. Before carrying out any through packing joint measurement of track parameters as mentioned in IRPWM will be jointly recorded by Railway's representative and contractor's representative. The parameters will be again jointly recorded after the completion of through packing the contractor.
4. Each round of through packing will be carried out as per Item No. 224 of IRPWM. The track parameters should be brought within the tolerances as per para No. 316 of IRPWM.

[16] Assembly and lying of turnouts:

1. The turnouts should be assembled on uniform layer of stone ballast of specified thickness for which payment will be made under the item of running out of ballast.
2. The stock joint of the switch to be kept perfectly square.
3. All fittings and components as per standard drawing of turnouts are to be provided and they will be fully tightened. This item includes provision of switch and crossing gauge tie plates.
4. Rail closer for turnouts will be cut as per standard drawing for the turnouts on PSC sleepers.
5. Provision of stretcher bars and allied fixtures will have to be done in collaboration with S&T department.
6. Holes and cuts will be paid extra.
7. The Turnouts will be assembled as per RDSO Drg.No.T-4733 & 4734 for 1 in 12 (52 Kg), T-4866 and 4877 for 1 in 8½ (52 Kg), T-4219 and 4220 the standard drawings. For 1 in 12 (60 kg), T-4966 and 4967 for 1 in 8½ (60 Kg).
8. For making a machine joints, a drill of 27.5 mm or 28 mm will be used.
9. Tongue rail will have to be set flush with stock rails over tapered portion of tongue rail by jim-crowing and other adjustment like packing, lifting of adjoining switch and the length of stretcher bars etc.
10. Opening of 115 mm will be provided at both LH & RH sides of the toe of the switches.
11. The gap between the top of leading stretcher bar and bottom of stock rail should not be more than 1.5 mm on both LH and RH sides.
12. This item includes fixing of gauge tie plate on switch portion and may involve filing of butt plate, drilling of additional hole etc. to setting of switch.
13. This item will be carried out in collaboration with S&T department.
14. In switch portion contractor has to carryout all ancillary works for S&T requirement i.e. housing of tongue rail with stock rail, for adequate length, grinding of head of stud bolt, grinding of special chair etc. as

directed by Site Engineer. This work should be finished during traffic block only. The payment of assembly can be made after completion of works of S&T requirement on producing written certificate from Site Engineer.

[17] Maintenance of track:

On completion of work in all respect the same will be handed over to open line within one month, till such time all work shall be maintained by the contractor under his possession in safe manner so the same can be used without any hindrance to the traffic.

[18] Miscellaneous:

1. **Through packing** of newly laid plain track/ slewed track or Turnouts includes spacing, squaring, gauging, aligning on straight/ curved portion, bringing the track parameters within limits prescribed in IRPW, boxing, dressing, ballast section as per standard profile with contractor's labour, tools and plants etc.
2. Main Line Concrete sleepers to be removed without damaging inserts etc. Sized ERC to be removed properly (to be paid separately) so that sleepers could be taken out easily.
3. Railways wooden sleepers to be cut at contractors cost in suitable size, for providing below welded joints. Rates includes making notches to receive weld collar in the wooden block as required.
4. **Sized ERC** to be surveyed before removing and entered in a register, payments to be made on this basis only. Rates includes all labours, materials, consumables etc.
5. For **slewing of track** of any description item includes opening of track, by removing shoulder, crib ballast and refilling it after slewing. Slewing is to be done in stages without lifting the track beyond acceptable limits.
6. The item for **inserting / adjusting to longer sleeper** for motor point includes all operation of opening track, removing and reinserting sleepers, all fittings etc. fixing gauge type plate etc and all other ancillary works as per requirement of S&T Department.
7. **Insertion of glued joints** to be done in traffic blocks for running lines. Work to be planned in such a way that all operations are done in one block and track made fit for traffic. If required for welding of joints separate blocks will be taken. Item includes removal of rail and inserting Railway's glued joints, cutting of glued joints to specified length, hauling it upto 500 m and stacking the released material within free lead of 100 m. If stacking is required to be done beyond 100 m excess lead over 100 m will be paid. This item will not be applicable for dead lines, closure of turnouts or any other locations where insertion of glued joints does not require traffic block, for such locations.
8. **Planning of Railway's Fish plates for 52 kg / 90 Lbs Rails** section up to 24" long including conversion of 25 mm dia holes into 32 mm dia holes for insulated rail joints as per sample with contractor's materials, equipment, labours etc.
 - i) Layer of requisite thickness on fishing plane of fishplate shall be grinded to facilitate interposing of insulating ferrules between the Rail and the fishplate. Similarly the diameter of all 4 bolts in the fishplate will be enlarged to 32 mm.

- ii) The grinded surface of fishing plane should be smooth uniform and free from burs and undulations. The edges of the widened holes should be smooth, uniform and free from burs.
- iii) No separate payment will be made for transporting the fishplates from / to the depot the machine shop and back.
- iv) Work to be done as per the sample supplied by the Railway. No transportation will be paid from the Railway Depot to work shop, or workshop to site etc.

	2-SPECIAL CONDITIONS OF CONTRACT FOR SUPPLY OF SKV PORTIONS & WELDING OF RAIL JOINTS
1.	The special conditions, tender conditions, instructions to tenderers and the General Conditions of Contract as amended upto date shall govern the work under this contract, of there is any conflict between the special conditions & instructions to tenderer on one hand and General Conditions of Contract on the other, the former shall prevail.
2.	(i) The supply shall conform to IRS Specification No.T-19-1994 fusion welding of rails by Alumino Thermic Progress with the latest amendments. (ii) The contractors should have the RDSO's / Railway Board's approval for various type of portions and proof thereof should be submitted along with the tender. (iii) Work of welding is to be done as per manual for "fusion welding of rails by the Allumino Thermic process-2006" issued by RDSO with latest amendments. (iv) Preheating shall be done with compressed air petrol/LPG. Technology.
3.	Portions to be supplied in moisture proof packing.
4.	Inspection: Inspection of thermit portion of welding will be done by RDSO.
5.	Variation in quantities: The number of portion in various categories is approximate and is likely to vary. The tenderer should not have any objection to supply portion according to the requirements of the Railway.
6.	The total quantity under all the items combined can be increased or decreased upto 25% of the contracted quantity at the discretion of Railway. The variation under individual item can be upto any extent as long as the variation in aggregate quantity is upto 25%. The contractor shall not prefer any claims for compensation or for any extra payment on account of such variation. However Railway will give reasonable notice in writing of any such variation and will also suitably consider the extension of completion period to cover supply of additional quantity of portion.
7.	Dispatch: Consignee particulars for dispatch of portions to Sr.DSK (C)BSL at BSL. Will be furnished by Dy.CE@BSL
8.	Portion will have to be supplied to Sr. DSK @BSL@ BSL.
9.	Payment: The testing charges for estimation of aluminium by spectrometer in thermit steel will be borne by the contractor wherever such estimation of aluminium is to be done by the inspecting Agency.
10	Wherever octrai is charged, necessary octrai clearance exemption certificate will be issued by Railways on specific request from the contractor. Further it is clarified that Railway will not reimburse the contractor if such certificates are not accepted by the Municipal Corporation/ Municipal Councils.
11.	The contractor should start the work of manufacture of portions as early as possible, so as to complete the supply within completion date on receipt of the acceptance letter.
12.	Portion along with accessories/complementary materials shall be supplied with each consignment while working out the requirements of accessories/ complementary items traction shall be rounded off to the next higher figure treating each consignment as a unit.
13.	The contractor shall not directly or indirectly use any invention so as to infringes such patents or so as to involve the Railway in any infringement thereof and the contractor shall hold Railway harmless and indemnified against all costs, damages, charges or expenses etc. arising out of or in connection with any such infringement.
14.	The Railway reserves the right to bye-pass lowest/lower rates and to award the contract in full or in part to reject into without assigning any reason.
15.	He should make his own arrangements to protect the work against wind and whether during the course of actual execution.
16	The contractor should be able to deploy sufficient number of welding supervisor for carrying out the work. The contractor should organize the work at sufficient number of locations, so as to obtain the prescribed progress of work. Contractor to arrange portion at site either supplying directly or the same may be supplied to Sr. DSKI's depot at Bhusawal and then taken to site, for this transportation nothing extra will be paid.

17	Price variation: The accepted rate will be based on the base price of commercial grade aluminum ingots as on date of opening of tender including excise duty. For this purpose, quantity of aluminum shall be taken as 3.0 kg/portion.
18	Any variation in the rate of aluminium from base price will be to the account of the Railway. Accordingly the accepted rate of thermit portion shall be increased or decreased by paise thirty per portion for every increase or decrease of Rs.100/-per 320hei in the base price of aluminium ingots. While claiming price escalation the contractor shall produce documentary proof in support of his claim. The aluminium rate prevailing on the date of testing recorded in RDSO's test certificate will be considered for effecting increase/decrease on the rates of thermit portions. Necessary certificate for variation in cost shall be produced from M/s Bharat Aluminium Co. Ltd./National Aluminium Co. Ltd. increase/decrease of less than Rs. 100/- per 320hei will be ignored for this purpose. If there is decrease in rates of aluminium then the recovery will be made.
19	The contractor should start the work of manufacture of portions as early as possible, so as to complete the supply within the completion period on receipt of the acceptance letter.
20	<u>SCOPE OF WORK:-</u>
20.1	The work shall be executed Odh Yard
20.2	These Special conditions cover supply of portions and welding by contractor as a complete job including all stores, labour, transportation, finishing, testing of rail joints and supervision.
20.3	The work shall be carried out by the contractor as per provision of the contract under the supervision of P. way official of the Railways, by deploying the entire welding team of supervisor, skilled and unskilled labour.
20.4	The work shall be carried out strictly in accordance with IRS Specification No. T -19-1994 for Fusion Welding of Rails and manual for fusion welding of rails by the Alumino Thermit SKV process with UPTODATE amendments.
20.5	The work of thermit welding of rail joints shall be done either inside the track or on the cess or in depots with or without traffic block or with caution order as decided by the Railways. Contractor will have no claim on this account whatsoever.
20.6	If work is being done in situ under traffic block, the contractor shall have no claim on the railway even if adequate and regular block/caution order as decided/planned by the Railway is not arranged.
20.7	The Railway shall be entitled at any time during the currency of the contract to increase or decrease quantity of any item in the contract and will give reasonable notice in writing for any such increase or decrease, to the contractor.
20.8	The rates quoted for the work shall be firm and inclusive of excise duty and any other tax or duty locally leviable, as well as license fees and royalty charges, if any. The rates shall not be subject to any variation for any reason whatsoever during the currency of the contract, except to the extent escalation is provided for in the PV clause.
20.9	The rails to be welded will conform to any of the IRS specification Nos. The contractor shall satisfy himself, from time to time, as required, about the metallurgical properties of the rails to be welded and apply correct technique to produce satisfactory welds. For this purpose, he may arrange for chemical analysis of test rail pieces which will be supplied to him by the Railway, free of cost.
20.10	The contractor shall be responsible to ensure that the rails are correctly aligned vertically, longitudinally and transversely and spiked and held in position, with the proper gap

	between the rails ends.
21.0	SATISFACTORY PERFORMANCE
21.01	Relevant clauses of IRS/T-19 (with upto date amendments) pertaining to execution guarantee and acceptance test shall be strictly followed. Special attention is invited to clause pertaining to USFD testing of the welds which provides that all the fusion welded joints shall be ultrasonically tested by the purchaser (Rly representative) as per the procedure for ultrasonic testing of thermit welded rail joints. This testing shall be completed as early as possible but before the welding team leaves the welding site, all the joints which are found to be defective shall be cut and rewelded by the contractor's welding team free of cost. Such welded joints shall also be tested ultrasonically and if found defective, will have to be cut and rewelded free of cost".
21.2	The contractor will be responsible for the welded joints remaining satisfactory for the guarantee period as provided in the specification and a sum of equal to 1% of the total amount billed will be kept as a security deposit for two years (guarantee period extendable to three years). If necessary, for every joint failing during the guarantee period, 3 times of the cost of the welding as being paid to the contractor for one rail joint will be recovered from the security deposit, if the joint is not rewelded by the contractor.
21.3	Railway will ensure that the joint welded by the party are tested ultrasonically progressively and partly will not be detained unnecessarily after completion of work. Scanning of all the new welds done by USFD machine will generally be done within 30 days of welding. If testing is delayed on Railway account, the payment of the contractor will not be held up.
22.0	WORK TO BE DONE BY THE CONTRACTOR
22.1	The entire set of welding equipments as required for carrying out the welding work shall be arranged by the contractor. This will also include grinding machine alongwith grinding stone/ files, prefab moulds and other consumable materials etc.
22.2	Thermit portion suitable as per IRS specifications T-19-1994 for the welding technique, for the type of rail section and its rail chemistry will be used by the contractor. Only such thermit portions shall be used by the contractor which has been manufactured by RDSO approved firm for portion manufacturing and inspected and tested by the RDSO's authorized representative.
22.3	The contractor shall provide to each welding party metallic straight edges of 1 m and 10cm lengths and 1 set of filler gauges in units of 0.1 mm to 2 mm.
22.4	The contractor carrying out the work shall be approved by the RDSO for the welding technique and type of rail section. His welder / supervisor having competency certificate from RDSO for the particular type of work and portion etc only shall be permitted to carry out the work. Contractor shall produce competency certificate issued by RDSO in favour of such staff before taking up the welding work. Provision of relevant part of IRS specification T-19-1994 shall be strictly followed.
22.5	The welding work shall be carried out by the self-contained units at each location so that all type of work concerning each points i.e. lifting, leveling, aligning, moulding, welding, chipping, grinding and final finishing shall be done by the same party.
22.6	The contractor shall organize the work at a sufficient number of locations, sites and other stations with adequate plants and equipment so as to the required progress of welding per day to complete the work in time. The contractor shall be responsible for ensuring that the

	rails are brought to correct alignment and level before welding.
22.7	In case of welding on the cess, rails shall be spreaded and paired by Railway, other jobs of leveling, alignment etc. shall be the responsibility of the contractor. The contractor shall be responsible for ensuring that the rails are brought to correct alignment and level before welding.
22.8	The contractor shall be responsible for proper filing, grinding of the joints and their finishing to the specified tolerance after welding within two days.
22.9	The Contractor shall normally carry out work between sun rise and sun set. He should made his own arrangement to protect the work against wind and weather during the actual execution of the work. Whether welding is required on a panel longer than 3 rails length or for welding in falling temperature, use of rails tensors is a must in case of the situ welding. Rail tensions shall be provided by the Railway free of cost.
22.10	As weld collars shall be painted in terms of RDSO letter No.MRC/W/1 dated 12/89 (amended upto date).
22.11	During the course of the welding work in situ, the contractor shall be responsible for :- <ul style="list-style-type: none"> i. Creation of required amount of gap for welding if not welded within 15 days after providing gap by Railway. ii. Shifting of sleeper for inserting wooden block/ wedges for alignment of track and welding of joints will be done by his own labour. iii. Removal of defective joints including cutting of rails and leading of rails for its removal be done by the contractor at his own cost including labour and machine and released rail/ material will be deposited at the nearest station in the store of SSE/P.way/DSK(C) BSL. iv. Leading means for cartings the welding material will be arranged by the contractor at his own cost. v. All track fitting which are required to be released for setting right the alignment of rail ends before welding will be refixed in the original correct position before leaving the site. vi. Released P.way materials such as fish plates and bolts etc. will be deposited by the contractor in the store of SSE/C/P.way/DSK(C) BSL at nearest railway station.
23.0	WORK TO BE DONE BY THE RAILWAYS
23.1	The railway will provide their permanent way official for supervision of the work and follow their instruction for safe execution of work, if any.
23.2	The railway shall provide USFD equipment and the staff for testing of joints welded by the contractor.
23.3	The permanent way supervisor in charge of the work will make necessary arrangement for safe working and if needed will arrange the traffic blocks.
23.4	The Railway shall remove kinks and twists in the railway particularly within two metres of each joint before handing over the same to the contractor for welding.
23.5	During the course of the welding work in situ, the railway shall be responsible for deploying of flagmen only for protection of railway track.

23.6	<p>a) Railways will provide scrap wooden blocks for supporting rails wherever required and contractor will deposit the same in store after completion of work. Leading will be done by the contractor.</p> <p>b) Initial gap of rail joints will be provided by railway otherwise will be created by contractor by cutting the rails.</p>
24	TESTING OF JOINTS
24.1	The USFD testing as per IRS specifications No.T-19-1994 will be done by the Railway with their equipments. The testing shall be completed as soon as possible but before contractor's welding team leave the welding site. Railway will provide test pieces of rails for testing welds free of cost.
24.2	No payment shall be made for sample welds to the contractor, but the rails will be supplied free by the Railways. Test sample will be taken initially and after every 108 joints. The Railway will arrange for transportation of these joints at its cost for testing. In case any joint/ joints fails/ fail the period of guarantee of two years, guarantee shall be extended for a further period of one year for the particular km./kms representative joints of which fail/ fails. Test samples to be submitted by contractor to SSE/C/P.way store/DSK(C) BSL at his own cost.
24.3	If during the process of welding, certain joints are found to be defective (D-1/D-2) on USFD testing or do not come upto the required standard they will be declared rejected. No payment shall be made for such rejected joints. No penalty shall be levied for rejection upto 4% of the joints welded but beyond that limit, a sum of Rs.100/- per joint will be recovered by Engineer in charge. If in replacing of one spoiled/ rejected joints, two joints are welded by putting enclosure, then payment for only one joint shall be made.
25.0	TRANSPORTATION OF WELDING EQUIPMENT AND STAFF ETC.
25.1	Sales tax, octroi, royalty toll tax or any other tax/ taxes levied by the central or State Govt or local bodies shall be borne by the tenderer. No part of such taxes on contractor's labour /materials or any other account will be paid by the Railway. This should be kept in view before tendering.
25.2	The sales tax for the sum paid to the contractor for carrying out the work shall be deducted from the bills at the prevailing rates of State Government.
25.3	Rates for non-schedule items include all lead, lift ascent, descent, crossing of Railway track, obstructions, nallahs, handling, rehandling and taxes, octroi royalty etc. as a complete job and nothing extra to rates accepted will be paid to the contractor/s
25.4	Nothing extra whatsoever to the rates accepted will be paid.
25.5	The railway authority shall provide to the contractor one trolley/ diplotry for transporting all plants, equipment's and materials, from nearest railway station to the site of work in the presence of P.way supervisory staff, under block/ caution/ protection and will bring back to store after completion of work daily before sunset.
25.6	No assistance will be provided by the railway for procurement of raw material, equipment's, consumable stores, labour, petrol etc.
26.0	PROTECTION AND STEPS TO BE TAKEN IN ORDER TO AVOID DANGERS TO RAILWAY INSTALLATIONS:

26.1	The work must be carried out most carefully in such a way that they do not hinder the railway operation/ property except as agreed to by the Railway.
26.2	The contractor shall take all precautionary measures in order to ensure protection of his own power channel moving about or working on the Railway premises and shall have to conform to the rules and regulations of Northern Railway, If any unforeseen accident or injury happens while on working the contractor shall be solely responsible for the same.
26.3	The contractor shall see that no damage is caused to Railway property. In case of any damage is caused due to the fault of the contractor or on the part of anyone one on his behalf, damage/ repair required will be carried out by the Railway at the entire cost of the contractor and the amount of expenses thus incurred will be recovered from the payment due to him.
26.4	Railway administration reserve the right to terminate the contract with immediate effect if the contractor is found responsible for causing any accident without giving any further notice/ notices to the contractor.
26.5	<p>The contractor shall not be allowed any road vehicle belonging to him or his suppliers etc. to ply in Rly. Land next to the running line. In special case like supply of ballast earth work, gauge conversion etc when road vehicles are necessary to be used in Railway land next to the Railway line, contractor shall apply to Engineer incharge for permission giving the type and no of individual vehicles names & license particulars of the drivers, location, duration and timings for such work/ movement. The Engineer in charge or his authorized representative will personally counsel, examine and certify the road vehicle driver, contractor's flagman 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.</p> <ul style="list-style-type: none"> (i) The road vehicles will ply only between sun rise and sun set. (ii) Assistant Officer/ Sr.Scale officer shall issue competency certificate after checking licence and their working to all drivers of nominated vehicles/ machinery. Inspector at site shall ensure that the driver who does not possess competency certificate will not work at site. (iii) The area between running line and white line shall not be permitted to become slushy and adequate drainage must be ensured at all items. (iv) Machine/ vehicle shall ply 6 m clear of track and movement/ work at less than 6 m and upto 3.5m clear of track center, shall be done in the presence of Railway employee authorized by Engineer in charge. The Railway employee so deputed shall ensure safety of the track with banner flags, hand signal lamps and detonators. (v) If vehicle/ machinery/materials are to come within 3.5M of existing track, work must be done under the presence of an inspector 324heir324zed324 to do safety works. A caution order shall be issued and track will be protected with the banner flag, hand signal lamp and detonators. (vi) Normally, night working shall be avoided. A night working shall be permitted by AEN/SEN in writing. One inspector shall be specifically deputed to supervise the night working. The site/area where night working is to be done shall be adequately lit. Nothing extra shall be paid for this. (vii) Contractor shall provide 150mm thick white line with lime at a distance of 3.5m from centre of existing track. This white line shall be in the entire length where work is going and /or the vehicles/ machinery plying along the track. Nothing extra shall be paid for this. (viii) Barricading with the help of portable fencing shall be provided in the length where the day work is to be done in close vicinity of the track. The fencing shall consists of self supporting steel column connected with at least 20mm thick red nylon rope. The column shall be of 1.2m height. This will be placed at a distance of 3.5M from centre line of the nearest track.
27.	<p>PENALTIES DUE TO UNSAFE WORK</p> <ul style="list-style-type: none"> a) In the event of accident at the work site, a departmental enquiry shall be held and in case it is established that the accident has occurred on account of contractor's

	<p>negligence or the negligence of his men, penalties up to an upper limit of 10% of the total cost of the work shall be imposed on the contractor.</p> <p>b) Railway administration reserves the right to terminate the contract with immediate effect if the contractor is found responsible for causing an accident without giving any further notice/notices to the contractor.</p> <p>c) In the event of contractor not completing the work or leaving it unsafe at the end of days work so they may serve speed restrictions if required to be imposed, track shall be attended to by the railway immediately at the contractor's cost without any further notice. In addition the labour cost recoverable from the contractor, supervision charges @12-1/2% and train detention charges @ Rs.2000/- every half hour or part thereof shall also be recovered.</p> <p>d) In the event of contractor starting the job without proper supervision causing an accident, he may be prosecuted under railway act for unlawfully interfering with the railway track in addition to the recovery of Rs.20000/- as penalty of every such cases, actual losses, compensation with damages to railway property.</p>
28	GENERAL:-
28.1	The contractor are required to complete the works within the specified period as provided in acceptance/ agreement/work order Dy. Chief Engineer/C is empowered to grant extension to the specified period provided in the order, failing which the financial limits of the powers during the currency of the contract, if considered the same as justified or with penalty as per General condition of contract 1999.
28.2	Every possible fluctuation in the market rates of labour, material and General conditions and other such possibilities and every kind should be considered before quoting the rates and no claim due to any reasons whatsoever be on this account will be entertained afterwards. Sales tax or any other tax levied or leviable by the Central or Sales tax of any other taxes of State Govt. or local bodies shall be borne by the contractor which should also be kept in view before tendering. No such taxes on contractors labour and materials will be paid by the Railway.
28.3	The contractor will be required to give no claim certificate at the time of signing the final bill. Thus no claim certificate furnished by the contractor constitute special agreement under which contractor submits and acknowledged that no money is due to him in connection with executing of the particular contract by him. Thus after the contractor has given no claim certificate and his final bill has been 325heir325zed, the contractor cannot ask for anymore payment even if post audit records show that he had been paid less. Hence after no claim certificate is given, the contractor cannot even ask for arbitration.
28.4	The contractor shall have to co-ordinate his work with other deptt i.e. electrical installation/signal interlocking work which may be related to other contractor or done departmentally .No claim of any kind whatsoever shall be entertained if the execution of any such work being also done by the department/contractor is held up due to their interference or as a result of delay in any of these works.
28.5	The tenderer/s should note that any person such as Engineer of the Gazetted rank and other Gazetted officers whether in execution or Administrative duties in the Engg. Department if pensionable or non-pensionable two years of his/their retirement without proper approval of the competent authority, if anyone found in working as contractor or as employee of the contractor without prior approval of the competent authority, shall be liable to be rejected /terminated for breach of the tender condition.
28.6	The Railway shall not be responsible for any loss or damage to contractor's men, materials, equipment, tools and plants etc. from any cause whatsoever.
28.7	If any work (whether temporary or permanent) or other materials, the value of which has

	been included in on account bills is destroyed or damaged or has/have for any other reasons to be replaced or restored by contractor. The value of the work or other materials destroyed may be recovered at any time from the contractor as debit due provided that no omission to deduct any amount due to the contractor and no payment made by the railway to contractor after the aforesaid amount became due and recoverable shall on any way prejudice or effect the right of the railway to make such deductions at any time or other wise to recover the amount as debit due.
28.8	No claim for extra payment shall be entertained on account of the interruption to work due to rain, floods or due to delay in acquisition of land in some portion or any other cause nor will any extra payment be made for the excavation on this account. No claim for earthwork done in low lying water logged area, local pits and depressions containing water will be entertained by the railway.
28.9	All tests whatsoever required for the work shall be carried out in accordance with ISI code of practice/Indian Railway concrete bridge code, nothing extra shall be payable to the contractor on this account.
28.10	Individual rate for each non schedule items should be for complete finished items, inclusive of all operations and charge and nothing extra will be payable on any account.
28.11	The work will have to be done in close co-operation with the other departments/agencies if any.
28.12	No extra payment will be made for rounding the corners at the junction of the floors, joints, corners and parapet.
28.13	The plan and sites are subject to alterations to suit the local conditions as requirement of the railway and the contractor will have no claim on account of the change in plan and site etc.
28.14	Any sum or sums of money due and payable to the contractor (including the security deposit returnable to him) under the contract maybe withheld or retained by way of lien by the Engineer against any claim of this or any other Railway's or any other department of the Central Govt. in respect of a sum of money arising out of or under any of this or any other Railway or any other department of the central Government.
28.15	For day to day execution of work, any clarification required by the contractor have to be obtained from the engineer in charge in writing and their decision shall be final and binding on contractor.
28.16	The principal contractor will be held responsible for the compliance with provision of wages act 1936 and the rules framed thereunder or even in respect of labour, employee in his/their such contractor in the execution of the work contracted by him/them.
28.16	The contractor shall make his/326heir own arrangements for the provision of sanitary, medical and water supply facilities according to the site nature importance and locations of the labour camp. If the contractor/s fails /fail to provide the requisite medical & sanitary arrangements these will be provided at the contractor's expenses.
28.17	The railway will not take any responsibility of making arrangements for supply of food stuff to the contractor/s to his their staff or labourers.
28.18	The contractor/s shall make his/their own arrangements at his/their own cost for supply of water to his/ their staff and labour and the railway undertakes no responsibility for such supply of water to the contractor/s staff or labour(s).

28.19	The contractor/s shall carry out the provision of the regulations that maybe informed in the areas in which works to be done prohibiting the recruitment of the local labour.
28.20	It will be the responsibility of the contractor/s to intimate direct to the supervisor (Labour) New Delhi or other authorities of the government respective department about the number of men employed by him/them that come under payment of wages Act.
28.21	In case of any dispute regarding interpretation of any of the above clauses, decision of the Chief Engineer/Construction, 'North' Mumbai CSTM, shall be final and binding on the contractor.

16-TECHNICAL SPECIFICATIONS FOR IN-SITU GLUED JOINTS

1. The contract shall be governed by general condition of contract and standard specification laid down in relevant paras of Indian Railway P. Way Manual. In case of any ambiguity regarding interpretation of works, the meaning contained in manual and codes will prevail.
2. Bonded labour system (abolition), 75 would be observed strictly.
3. The contractor shall arrange for “Look out Man”, and megaphone / hooter in addition to Railway’s arrangements for protection to warn the contractor’s labour of any approaching train. No compensation will be paid by Railway in case of injury or death to contractor’s labour and contractor shall indemnify the Railways of any responsibility in regard to his supervisors & labours.
4. For executing the work the contractor has to arrange his own tools and equipment unless otherwise stated in the item. Railway may provide specialized equipment which are specifically mentioned in the description of items. The set of tools / equipment required for each gang for satisfactory execution of work, will be given to contractor immediately after issue of Acceptance letter. Contractor has to arrange the same for verification at least seven days before actual commencement of work.
5. In all cases the work shall be carried out under supervision of competent Railway officials. Protection of running lines and erection of speed restriction boards would be arranged by Railway. Under no circumstances, the contractor shall commence work on running lines without Railway’s official’s permission and his presence at site.
 - i. If any unsafe working is resorted by contractor, Railway Supervisor would be free to stop further work and contractor will have no claim for compensation due to on account of unsafe working.
 - ii. In case there is delay or any defect in carrying out any operation by contractor, Railway Supervisor would be free to deploy Railway labour / track machine as required and suitable recovery shall be made from contractor’s bills equivalent to department cost. The same condition will be applicable if the contractor’s labour leaves the job unfinished and it is considered necessary to attend the remaining job by Railway’s labour in the interest of safety.
6. The contractor should engage the required number of qualified and experienced staff who is well conversant with track relaying work. The contractor shall employ and post at site technical supervisors in sufficient numbers who should be adequately qualified and experienced in execution of P. Way works. The technical supervisor so engaged by the contractor shall have to pass required medical examination and also safety tests. Railway may also organize training for Contractor Supervisor and the cost of such training will have to be borne by the Contractor. After such training, a certificate shall be issued to contractor’s supervisor. Identity Card for such Supervisors will be issued by Engineer-in-charge of the works and the same will be valid for the completion period of Contract.
7. The name of particulars of technical qualification and record of experience of the supervisor employed should be advised to the Engineer-in-charge. If in the opinion of the Engineer-in-charge that supervisor is not fit to be in charge of the work, he should forthwith replaced and the identity card issued to Contractor’s

Supervisor will be cancelled / withdrawn by Engineer. In the matter, decision of the Engineer-in-charge will be final and will be binding on the contractor.

8. The contractor will arrange for safe custody of material supplied to him and arrange for posting of necessary watchman as required. In case of any loss of material the Railway is entitled to recover the cost at the rate of original purchase rate/market rate, whichever is higher plus codal charges.
9. No compensation shall be payable to the contractor if the work can not be done due to non-availability of traffic block, sudden rains or any other reason whatsoever. The contractor should take in to account that the probability of labour utilization depending on the traffic density of the section and quote his rates accordingly.
10. Site order books, progress report register and material issue register shall be maintained at site and entries will be recorded on day-to-day basis in the registers and signed jointly by Railway Supervisor and contractor or his authorized representative. All details of handing and taking over sections for different stages or packing, imposition and removal of speed restrictions, measurement of track parameters, accountal of released material etc. should be recorded.
11. In case loading/unloading from Railway wagons all commercial formalities shall be observed. All demurrage/wharfage charges accruing due to neglect of contractor will be recovered from outstanding bills of contractor.
12. In case trains are detained at the approach of work spot due to their passage being considered unsafe by Railway supervisor because of bad workman ship of contractor's labour or due to abandoning the site leaving the work unfinished. The Railway shall be entitled to recover detention charges from contractor's bill/SD at the following rates;
 - i. In case of trains carrying passengers – ₹ 10000/- per hours.
 - ii. In case if trains carrying goods wages – ₹ 8000/- per hours.
 - iii. In case of light, power/departments trains – ₹ 5000/- per hour.
13. No deep screening work will be carried out during rainfall and no compensation will be paid for loss of time on this account.
14. 25mm sizes screen (size of the holes) will be used for screening the ballast. Muck will be defined as material passing through this screen.
15. No ballast will be wasted on the slopes of banks or in cuttings. All ballast from the slopes shall be picked up and put in the track as directed by Engineer.
16. Speed restriction for carrying out the work will be imposed only when the contractor has arranged sufficient labour for working. The assessment of adequacy of labour will be made on the basis of progress expected per week in relation to completion period and the decision of Engineer in this regard will be final.
17. Contractor should have group insurance of all labours engaged at site for a minimum of Rs.1 lakh each.
18. Contractor will also indemnify for the loss due to train accident at site to an amount of loss incurred by the Railway, if the accident is due to the negligence of the contractor.

19. At locations, where it is not possible to provide specified cushion due to rocky formation or any other reasons, pro-rata deduction will be made from the item of deep screening.
20. Immediately after deep screening and insertion of new sleepers (as applicable) initial packing will have to be given which shall be deemed to have been included in the basic rates. Payments will be made only for first packing after 3 days and second packing after 10 days or as ordered by the Engineer at site to facilitate relaxation of speed 30 Kmph & 50 Kmph respectively.
21. The work shall include sleeper squaring and spacing, if required by the Engineer in charge. No payment will be made for the same.
22. Patches for deep screening to be taken up on a particular day shall be decided in advance and the same patch should be completed before the days work is completed.
23. Unless otherwise provided for in the schedule of rates & quantities accompanying this document, all muck shall be disposed off in railway land adjoining the cess as per the direction of railway's Engineer in charge.
24. Simultaneous clearance of released material and muck shall be ensured by the contractor. No backlog of disposal of released / surplus material / muck etc. beyond one week of progress of work will be permitted otherwise payment for main items will be restricted to 75% of the agreement rate for that items from which material / muck have been released.
25. The Engineer-in-charge of work will issued a calendar of execution of various items along with its location clearly indicating priorities. Contractor will required to deploy his manpower and machinery as per priorities fixed by Engineer. In no case work indicated at lower priorities will be allowed to be executed ahead of higher priorities items / location.
26. All the materials to be used in this contract shall be procured from RDSO approved firms.
27. The contractor will have to procure the materials from RDSO firms and to handed over to SSE/P.Way depot for record and then will have to receive it for execution of the work.
28. The fabrication shall not be carried out during rainy days.
29. The insulation resistance of Glued joint shall be minimum 25 M in dry and 3 K in wet condition.
30. In-situ glued joints shall be checked for insulation as per Railway's satisfaction. The glued joints should behave satisfactorily upto 4 months from date of laying. In case of any defects detected in this period the glued joints shall have to be replaced. Security money shall only be released after certification from site-in-charge regarding satisfactory behavior of all glued joints minimum upto four months from date of laying.

17-TECHNICAL SPECIFICATIONS FOR TRACK BALLAST

(As per RDSO's Specifications of Track Ballast, IRS-GE-1, June 2004)

2.0 TECHNICAL SPECIFICATIONS:

2.1 The execution of all works shall conform to the specifications and codes of practice/manuals mentioned below as amended from time to time.

- A) Specifications of Machine Crushed stone ballast at para 2.3 below.**
- B) Provisions /Instructions & Supplementary instructions of Railway to Indian Railway's Permanent Way manual.**
- C) General and Subsidiary Rules of Railway.**
- D) Standard Schedule of Dimensions.**
- E) Circulars and Engineering Standing orders issued in respect of stone ballast.**

2.2 Railway reserves the right to reject or alter any part of the work executed by the contractor which in the judgment of the Railway does not comply with the requirements of the above specifications. The decision of the Railway shall be final and conclusive for all purpose and binding on the contractor.

2.3 Specifications for Machine Crushed stone ballast for railway track are as under:-
(Reference: RDSO's specification for track ballast issued vide report no. IRS-GE-I (June 2016) with all the correction slips/amendments up to date)

2.3.0 SCOPE: These specifications will be applicable for stone ballast to be used for all types of sleepers on normal track, turnouts, tunnels and deck slabs etc., on all routes. These specifications include guidelines for measurement, quality check and reference to other specifications as required. The details given below are not exhaustive and original RDSO specification vide Report No. IRS-GE-1 with all corrigendum/amendment/ corrections till date of opening of the tender shall apply along with the modifications herein.

2.3.1 DETAILED SPECIFICATIONS: GENERAL

2.3.1.1 **Basic Quality:** Ballast should be hard, durable and as far as possible angular along edges/corners, free from weathered portions of parent rock, organic impurities and inorganic residues.

2.3.1.2 **Particle Shape:** Ballast should be cubical in shape as far as possible. Individual pieces should not be flaky and should have generally flat faces with not more than two rounded / sub- rounded faces.

2.3.1.3 Mode of manufacture:

Ballast for all BG main lines and running lines shall be machine crushed.

On other MG and NG routes not planned/sanctioned for conversion hand broken ballast can be used for which no approval shall be required.

2.3.2 Physical Properties:

2.3.2.1 Ballast sample should satisfy the following physical properties in accordance with IS:2386 Pt.IV-1963 when tested as per the procedure given in Annexure-I & II.

	BG, MG & NG (planned/sanctioned conversion)	NG For NG & MG (other than those planned for conversion)
Aggregate Abrasion value	30% Max.*	35% Max.

Aggregate	Impact value	20% Max.*	30% Max.
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* In exceptional cases, on technical and/or economic grounds relaxable upto 35% and 25% respectively by CTE in open line and CAO/C for construction projects. The relaxation in Abrasion and Impact values shall be given prior to invitation of tender and should be incorporated in the Tender document.

2.3.2.2 To carry out Impact Test on ballast, a test sample of ballast pieces (about 5kg in weight) of size 10 to 12.5 mm will be required. Appropriate care should be taken by the railways that ballast selected for breaking down to 10 mm to 12.5 mm size for Impact Test should be random from the ballast supply to avoid any subjectivity in selection of test sample. Alternatively, the test sample in the recommended range of size be got manufactured along with the blast in sufficient quantity required for this rest.

2.3.2.3 The ‘Water **Absorption**’ tested as per IS 2386 Pt.III-1963 following the procedure given in Annexure III should not be more than 1%.

2.3.2.4 The power of relaxing for water absorption limit should be delegated to CTE in open line/CAO on construction for specified areas. However, maximum water absorption in any case should not be allowed more than 2.5%.

2.3.3 Size and Gradation:

2.3.3.1 Ballast should satisfy the following size and gradation:

- | | | |
|-----|------------------------------------|------------|
| (a) | Retained on 65mm sq mesh sieve | 5% Maximum |
| (b) | Retained on 40mm sq mesh sieve* | 40% to 60% |
| (c) | Retained on 20mm sq mesh sieve *** | |

* For machine crushed ballast only.

*** Not less than 98% for machine crushed ballast
Not less than 95% for hand broken ballast

2.3.3.2 In exceptional cases, where it is considered necessary on technical considerations, to reduce the maximum size of ballast for NG lines, CTE may modify the size & gradation of the ballast as defined above. In case of such modifications, provision given in para 2.3.2 to 2.3.4 below shall also be suitably modified. This will be finalized before invitation of tenders and should be incorporated in the tender documents.

2.3.3.3 Oversize Ballast:

i) Retention on 65mm square mesh sieve:

- i. A maximum of 5% ballast retained 65mm sieve in any stack shall be allowed without deduction in payment.

In case ballast retained on 65mm sieve in any isolated stack exceeds 5% but does not exceed 10%, payment at 5% reduction in contracted rate shall be made for the full stack. Stacks having more than 10% retention of ballast on 65mm sieve shall be rejected.

- ii. In case ballast retained on 40mm square mesh sieve (for machine crushed ballast only) exceeds 60% limit, prescribed in 2.3.3.1(b) above payment at the following reduced rates shall be made for the full stack in addition to the reduction worked out at(i) above.

a) 5% reduction in contracted rates if retention on 40mm sq. mesh sieve is

between 60% (excluding) and 65% (including).

- b) 10% reduction in contracted rates if retention on 40mm sq. mesh sieve is between 65% (excluding) and 70% (including).
- iii. In case retention on 40mm square mesh sieve exceeds 70% the stack shall be rejected.
- iv. In case of hand broken ballast supply, 40mm sieve analysis may not be carried out. The executive may however ensure that the ballast is well graded between 65mm and 20mm size.

2.3.3.4 Under Size Ballast: Ballast shall be treated as undersize and shall be rejected if

- (i) Retention on 40mm Sq. Mesh sieve is less than 40%.
- (ii) Retention on 20mm square mesh sieve is less than 98% (for machine crushed) or 95% (for hand broken).

2.3.4 Sieve Analysis of Ballast

2.3.4.1 The test sieves used for sieve analysis shall conform to the specifications given in Annexure-IV.

2.3.4.2 While carrying out sieve analysis, the screen shall not be kept inclined, but held horizontally and shaken vigorously. The pieces of ballast retained on the screen can be turned with hand to see if they pass through but should not be pushed through the sieve.

2.3.4.3 The percentage passing through or retained on the sieve shall be determined by weight. The weighing equipment used shall NOT have least count more than 100 grams.

3.0 SUBMISSION OF TEST REPORT:

3.1 "The Tenderer is required to submit test report of ballast for impact value, abrasion value, water absorption value from approved laboratories mentioned in the tender documents as per provisions of "Specification of Track Ballast, IRS-GE-1, June 2016 – issued by RDSO/Lucknow (as amended upto date) failing which the offer is liable to be rejected.

3.2 The Tenderer shall also furnish an undertaking that the ballast supply at all times will conform to the laid down Specifications for track ballast as specified by Railway.

3.3 Test Certificate for Ballast: Ballast test certificate from any IIT/NIT/Recognized Engineering College/Railway Laboratory/Government Approved Laboratory only will be acceptable. Along with test certificate, testing Laboratory should also indicate the process/procedure/IS Code followed for testing.

4.0 QUARRY PERMITS & OTHER LEGAL MATTERS:

4.1 Contractor will at his own expense obtain requisite permits/licenses/ parwana for quarrying or for any other purpose as may be necessary to enable him to perform his part of the contract. Railway will not under any circumstances be liable to obtain any permit /licenses/ parwana whatsoever.

4.2 Contractor shall be responsible to follow the provisions of Mining Act and other relevant acts and the Railway will not be responsible for infringement of any of their provisions.

4.3 The contractor will ensure free access to quarry premises where stone is being quarried and crushed, to the Engineer-in-charge or his representative at all times.

5.0 CRUSHING & BREAKING:

Crushing and breaking of ballast shall be carried out by MECHANICAL CRUSHERS ONLY to be installed and operated by the contractor outside Railway land at his own cost. Railway is not responsible for arranging any license, permission etc. for quarry or transporting and the contractor is fully responsible for arranging the same in time.

6.0 SERVICE ROADS & VEHICULAR MOVEMENT:

- 6.1 Necessary service roads for collection of ballast shall be made by the contractor at his cost. Any service roads available within railway land can be used free of cost. Width of Railway land may not be uniform and at some locations, it is interrupted by small streams/road ditches etc., Agency shall make suitable arrangements for plying across such obstructions. The rates quoted shall include costs for such arrangements and the contractor will not be entitled for any additional payment on this account.
- 6.2 In certain situations vehicles for supply of ballast need to be plied through private land also and if so the contractor shall have to make arrangements at his cost. The contractor may have to handle/re-handle the ballast before it reaches the final location of stacking. No additional payment whatsoever shall be admissible on this account.
- 6.3 In no case and under no circumstances, crossing of track by vehicles shall be allowed at unauthorized locations and contractor is solely responsible for all the consequences if he indulges into such unauthorized acts.
- 6.4 For movement of vehicles along the side of track or across, Contractor shall arrange necessary protection including watchman, protective measures and infringement to running trains shall entail heavy penalty on the contractor at the discretion of the Railway.

7.0 HECTOMETER/DEPOT WISE QUANTITY OF COLLECTION:

- 7.1 The quantity of ballast to be collected in each HM post /Depot /Sub Depot should be obtained from the Engineer-in-charge before starting the collection.
- 7.2 In case of cess supply, the collection and stacking of ballast should be completed in all respects in a HM length before measurements are taken, i.e. measurements in a particular HM length shall invariably be taken only once during currency of the contract.
- 7.3 Ballast shall be collected and stacked by the contractor accordingly, in specified quantities on the formation i.e bank / cutting or at the places i.e CESS/Depot/ yards as directed by the Engineer-in charge in convenient stacks.
- 7.4 The contractor shall prepare a programme for collection in accordance with the above directions/stipulations and submit to railways for scrutiny and approval prior to collection.

8.0 SITE PREPARATION:

- 8.1 Stacking shall be done as far as possible on a neat, plain level and firm ground with good drainage alongside/near the Railway alignment in Railway land only. Sites/Plots for stacks (comprising cess / depot /semi-depots) shall be located as directed by AXEN/XEN/Dy.CE(C) & shall be selected with a view to convenient dumping into track /loading into rail lorry/ballast train. All the ballast shall be stacked only on the area identified as above with the written permission for stacking by AXEN/XEN/Dy.CE(C) on the Ballast Passing register.

- 8.2 Stacks on sites not so approved will be rejected and the contractor shall restack the ballast at the specified sites as ordered.
- 8.3 Contractor will be required to develop the site for stacking the ballast with his own labour at locations as specified by the Engineer in charge or his supervisors by making approach roads, levelling, dressing of uneven and undulating ground and drainage arrangement, clean the plots off the rubble/weeds, grass, organic matter, bushes, etc., at his own cost and the rates quoted shall include costs for such arrangements. The contractor will not be entitled for any claim for earthwork or any other temporary work done by him in connection with development of site. No payment whatsoever shall be admissible on this account. However, this will not be applicable for development of new depot. Payment for the same will be made under relevant schedules.
- 8.4 After site preparation and levelling the ground and before commencement of ballast collection, the contractor shall arrange for inspection of site by the SSE/JE in charge of work (test checked by AXEN/XEN/Dy.CE(C)) and certification of levelness of ground. However, in spite of issue of such certificate, the responsibility lies on contractor to ensure levelness of ground before actual collection. In case of stacking area found not in one level/plane (before or after the stack is cleared) a minimum penalty of Rs.1000 per each stack at the discretion of the engineer-in-charge will be imposed in addition to recovery of ballast lost due to such irregular grounds where stacks are made. No claim or representation from the contractor will be entertained and the decision of the railways is final and binding on the contractor.
- 8.5 After expiry of contract, the contractor shall vacate the area and handover the land free of encroachments.

9.0 NORMS FOR STACKING & SIZE OF STACK:

- 9.1 The stacks shall be of u n i f o r m cross section conforming to the standard template dimensions.
- 9.2 Each stack shall be so formed that ratio of longer to smaller side does not exceed 2.5 except for areas where there is constraint of land width in which case the ratio up to 3.5 may be permitted.
- 9.3 The height of stack shall not be less than 1.0m except for hilly areas where it may be 0.5m
- 9.4 The height of ballast stack should not be more than 2.0m.
- 9.5 The side slopes of stack should not be flatter than 1.5:1 (Horizontal: Vertical) normally.
- 9.6 The cubical content of each stack shall not be less than 30 cum in plain areas and 15 cum in hilly areas.
- 9.7 Top width of stack shall not be less than 1 metre.
- 9.8 Top of stack shall be kept parallel to the ground plane.
- 9.9 Stacks made shall not interfere with movement of Road or Railway traffic.

10.0 REGULATION OF COLLECTION:

(Reference: Railway Board's Guide lines and RDSO's Guidelines)

10.1 DEPOT:

- 10.1.1 For Ballast collection in depot & its running out, instruction as given in Para 266 of IRPWM and guidelines issued by the Railway shall be adhered to.
- 10.1.2 In case of large depots with annual training out capacity of more than 50,000 cum, the stacking area of the depot may be divided into convenient number of sub depots. Separate contract may be awarded for each of sub depot, however, number of such sub depots shall not be more than four in one depot. Sub depot shall be distinct, as along a face of siding line and if other wise, a physical barrier shall require to be erected to keep them distinct. Each sub depot shall further be divided into zones for the purpose of segregation and stacking & loading areas. In a zone, in each plot, ballast shall be collected in stacks such that there is only one stack in a plot. The stack/plot would be the basic entity for measurement of the ballast supplied.

Each depot may or may not have sub depots and each sub depot may have one or more zones (normally only one zone should be adopted for depot up to 5,000 cum stacking capacity).

- 10.1.3 For each depot, a depot sketch with proper drawing number and approval of Sr. DEN/DEN in-charge of the depot shall be drawn clearly showing the Sub-Depots (if any), Zones and the Plots with specific identification number for each of the plots. Original of the sketch shall be retained in divisional drawing office for record. At the time of tendering, a copy of the depot sketch shall form part of the tender papers clearly indicating the sub-depot (wherever existing) for which the tender was being invited. A copy of the depot sketch shall be available with AXEN/XEN & SSE/JE in-charge of the depot.
- 10.1.4 For depot(s) with more than one contract i.e having sub-depots, a separate sketch for each of the sub-depot may also be prepared in addition to overall depot sketch for incorporating details after measurement as defined in para 11.2 below.
- 10.1.5 There should be a buffer of at least one zone between the zones of collection and training to adequately segregate collection and training out simultaneously. This restriction, however, shall not be applicable between zones where a physical barrier like Railway track exists between the two zones. In no case simultaneous collection & training out from the same zones shall be permitted. In case of small depots/sub-depots with stacking capacity less than 5,000 cum, simultaneously training out and collection shall not be allowed.
- 10.1.6 Even in case a depot is subdivided as sub-Depots to cater separate contracts, the simultaneous supply and loading of ballast from separate sub-depots shall not be practiced. In exceptional and unavoidable circumstances, Dy.CE/C may authorize such simultaneous supply/loading with reasons recorded in writing and ensuring that proper regulatory system is in place.
- 10.1.7 After the ballast is fully trained out and before authorizing the contractor to commence the second or further round of supply in the same depot, the AXEN/XEN/Dy.CE(C) shall inspect the site, make sure that all the stacks are fully trained out and record a clear certificate in the ballast passing /ground balance register. The contractor shall obtain written permission from Dy.CE/XEN/AXEN to commence the next round of collection and stacking in a depot.

10.2 Cess Supply:-

- 10.2.1 For Ballast collection along cess & its running out, instruction as given in Para 267 of IRPWM and guide lines issued by the Railway shall be adhered to.
- 10.2.2 Written permission for stacking after site preparation shall be certified by AXEN/XEN on the ballast passing register, Supply, as far as possible, shall be completed in one km continuous stretch at a time, without leaving any gaps in any HM and offered for measurement for ease of measurement and effective monitoring.
- 10.2.3 Subsequent collection at the same location is not permitted. For this purpose, proper planning should be made by the contractor and quantities should be collected with the due approval of the AXEN/XEN/Dy.CE(C).
- 10.3 Other instructions as given elsewhere, in case dumping is in progress, ballast collection shall be regulated so that simultaneous collection and dumping does not take place.

11.0 MEASUREMENT OF BALLAST:

- 11.1 The contractor shall take representative samples from the stacks in the presence of SSE/JE, seal the samples and arrange TEST reports before commencement of measurement representing that the ballast supplied conforms to prescribed specifications.

- 11.2 On the day of measurement of fresh stacks, the approved Depot/Sub-depot/Cess Supply sketch shall be augmented by SSE/JE in-charge of the depot with the following in colours/hatching:
- i) Stacks measured on date and yet to be paid forii)
 - iii) Stacks measured earlier but not yet disturbed
 - iv) Stacks measured earlier and already disturbed and
 - iv) Stacks where the supply is in progress.
- 11.3 Besides signatures by SSE/JE, the sketch should be got signed by authorized representative of the contractor and AXEN/XEN, duly certifying that position of stacks on the date of measurement has been correctly incorporated. Availability of the aforesaid augmented sketch shall be a pre-requisite for processing of the bill for payment.
- 11.4 Measurement of ballast shall be done when the contractor has brought in sufficient quantity and stacked properly. No measurement of part stack shall be permitted.
- 11.5 All initial measurements for ballast shall be made and recorded by the in-charge or nominated SSE/JE in the Ballast Passing Register. The stacks so recorded shall be checked, re-measured and verified to 100% extent for measurements, quantity and quality by AXEN/XEN/Dy.CE(C) in the presence of Contractor and he shall make suitable entries in the Ballast Passing Register before recording in the Measurement Books. All recordings/test checks shall normally be made in the presence of contractor. The records made by the JE/SSE and verified by AXEN/XEN/Dy.CE(C) shall be binding on the Contractor. In case of any irregularity of dimension of stack/quality, minimum dimensions/parameters shall be taken into consideration for the purpose of payment. In case the Contractor is not accepting such measurements/quality, the Contractor shall replace/restack to proper standards to take measurement afresh.
- 11.6 If the contractor fails to witness the measurements on the appointed date and time, the supply will be measured in his absence which shall be binding upon the contractor, whether or not he has signed the measurement book, provided always that any objection made by him to any measurement shall be checked/investigated and considered in the manner set out in the General Conditions of Contract.
- 11.7 Test Check:** Dy.CE(C)/XEN, who is the bill passing officer shall exercise 10% check, both in respect of stack measurement and quality before passing the bills. At least 30- 33% of the bills should be covered by the test check to be carried out at the AXEN/XEN/Dy.CE(C) level. Bills should preferably be checked keeping an element of surprise but at no stage, more than three bills should be missed in continuation. The result of test check with respect to quality & quantity shall be binding on Contractor.
- 11.7.2 Ballast may be counterchecked by any other agency either simultaneously or subsequently and results of the same will have binding on the Contractor under the conditions of General Conditions of Contract.
- 11.8 The **volume of** stacks based on measurements of ballast will be arrived as under:

$$V = \{(L1 + L3 + L2 + L4)/4\} \times \{(B1 + B3 + B2 + B4)/4\} \times \{(H1 + H3 + H2 + H4)/4\}$$
 - i) L1, L3, L2, L4, are length of bottom and top on both sides respectively.
 - ii) B1, B3, B2, B4 are the breadth of bottom and top on both sides respectively.
 - iii) H1, H3, H2, H4, are the height taken from four different locations chosen at random. However, if necessary, additional measurements may be taken if the stacks are irregular.
- 11.9 NUMBERING AND MARKING:**
 Soon after the stacks are measured and posted in Ballast Passing register, the stack no. shall be painted on a large sized stone/board as directed by the Engineer in charge. In addition, lime should be sprinkled along all the edges of the stack to indicate that the stack has been measured and posted in the above measures shall be maintained till the stack is cleared.

11.10 SERVICES TO BE RENDERED BY CONTRACTOR:

- 11.10.1 The Contractor shall supply adequate sets of measurement equipments like screens of different sizes steel boxes, and weighting machine & weights, ballast forks, etc. These equipments must be handed over to the ADEN/DEN/Sr. DEN before the first measurement is made.
- 11.10.2 At any time required by the Engineer while collection & stacking, contractor shall provide adequate facilities for inspection of material being collected including the quarry and crushing premises.
- 11.10.3 At the time of measurement, the contractor shall supply labour to facilitate opening of stack up to ground level, if desired by Railways.
- 11.10.4 Transportation arrangements for the movement of sieves /gauges/inspecting tools etc. to site and adequate labour assistance for sieving, weighing, measurement, sampling, sealing etc. shall be provided by the contractor.

12.0 SUPPLY SCHEDULE/MILE STONE PROGRAMME /PROGRESS:

- 12.1 Ballast shall be supplied as per the accepted programme and a steady supply of ballast to the requirement as per tender schedule shall be maintained and ballast must be collected in the sequence as prescribed by the Engineer-in-charge.
- 12.2 Contractor shall prepare a programme chart giving the activity wise details within seven days from the date of issue of acceptance letter. Programme shall be made carefully so that work can be progressed as planned. The progress shall be reviewed w.r.t this programme chart once in fortnight. The contractor shall update the progress fortnightly and continue to resubmit revised bar charts so that completion of each activity matches with stage targets agreed initially deploying additional resources as required.
- 12.3 Ballast supply shall be programmed and undertaken in continuous stretches as MILESTONE TARGETS with an aim to progress uninterrupted supply without leaving any gaps at Bridges/LCs/other special locations. Contractor shall maintain the week/date wise planning in consonance with the above agreed MILESTONE stage targets.
- 12.4 Weekly/Daily progress of the work shall be reported to Railways and any suitable corrective measures as directed by the Engineer-in-charge or his representative should be immediately carried out wherever necessary at no extra cost.
- 12.5 During the course of supply of ballast by the contractor, the Railway Administration reserves the right to direct the contractor to stop supply or dumping of ballast for regulating the progress of work in the interest of the work.
- 12.6 The contractor is required to restack the disturbed ballast stacks at his own cost to facilitate recording of measurements for drawl of final bill in case of closing down of contract either under clause 61 or 62 of General Condition of Contract or for any other reasons. In the event of failure of the contractor to comply with the above, restacking will be done by the Railway on its own or through any other agency and the actual cost involved with necessary supervision charges etc. will be recovered from contractor's bills, security deposit etc. or from any money payable under this or other contract with the Railways/Central Government.
- 12.7 Railway will monitor the supply and will impose penalties / fines as deemed if the progress is not commensurate with the programme as envisaged elsewhere in tender document.

13.0 SAMPLING AND TESTING of SAMPLES /SUPPLIES: (Reference: RDSO Guidelines)**13.1 SAMPLING AND TESTING**

13.1 General

- 13.1.1 The samples shall be drawn with due diligence and adequate precaution so that they represent the true nature and condition of the ballast.
- 13.1.2 Being a heterogeneous material, the gradation of ballast loaded in wagons and/or dumped/inserted in the track may not remain same as that initially checked in stacks, due to lifting, loading, transportation, unloading etc. Similarly, in case of direct loading into wagons, the gradation of ballast at destination may not remain same as that at source, due to loading, transportation etc. Therefore the samples from wagons and track are not representative samples as far as gradation is concerned. Even in the same stack, results of two checks may not be same.
- 13.1.3 The samples from a stack taken after lapse of a long period of stacking are not representative samples of the ballast initially supplied in the stack, due to settling down of smaller size particles in voids underneath, dirt/dust getting accumulated in the stack, rains etc.

13.2 Sampling Frequency:

- In order to ensure supply of uniform quality of ballast, the following norms shall be followed in respect of sampling, testing and acceptance.
- 13.2.1 On supply of the first 100 cum, the tests for size gradation, Abrasion value, Impact value and water absorption (if prescribed) shall be carried out by Railway. Further supply shall be accepted only after this ballast satisfies the specifications for these tests. Railway reserves the right to terminate the contract as per GCC at this stage itself in case the ballast supply fails to conform to any of these specifications.
- 13.2.2 Subsequent tests shall be carried out as follows.

Type of Tests	Supply in stacks	Supply in Wagons
a) Size and Gradation Tests	One for each 100 cum or part thereof in any stack.	One for each 100 cum or part thereof for quantity to be loaded in Wagons.
b) Abrasion value, Impact value and water absorption value (*)	One Test for every 2000 cum	

(*) These tests shall be done for the purpose of monitoring quality during supply. In case of the test results not being as per the prescribed specifications at any stage, further supplies shall be suspended till suitable corrective action is taken and supplies ensured as per specifications.

The above tests may be carried out more frequently, at the discretion of Railway.

- 13.2.3 All tests for Abrasion Value, Impact Value and Water Absorption should be got done through approved laboratories or Railway's own laboratories (List of these laboratories shall be mentioned in the tender document). Costs of all tests shall be borne by the Contractor. If Sr.DEN/DEN desires any of the tests the same may be done in

Railway laboratories/ approved laboratories and cost of the test will be borne by the Contractor.

13.3 Supply of ballast in Stacks

13.3.1 Sampling Procedure

- (i) At the time of formation of stacks, sufficient care should be taken to insure that there is sufficient space around the stack to facilitate movement of JCB/Power Equipments. The length and width of each stack shall be kept in such a way that every part of the stack is accessible to the JCB or Power Equipment, to be deployed for drawing “Samples”.
- (ii) In case of ballast supply in stacks, three “Samples” each of 0.3-0.5 cum volume, one sample each from two sides and one sample from top after removing outer layer (150-200 mm) should be collected from stack for every 100 cum or part thereof, by JCB or other suitable Power Equipment. Same has to be arranged by Contractor/Tenderer.
- (iii) The location (in plan) and depths of sampling points shall be varied for different “Samples” and different stacks in a lot.
- (iv) “Gross Sample” should be prepared by thoroughly mixing the three “Samples” collected as in (i) above, using JCB bucket or any other suitable Power Equipment, on a clean, flat and hard surface.

Note: In exceptional cases of site specific constraints, approval of Competent Authority (Engineer-in-charge) shall be taken prior to invitation of tender, for using manual means for collection and mixing of “Samples”, and this should be incorporated in the Tender Document.

- (v) A “Test Sample” of volume 0.027 cum shall be drawn from each of the “Gross Sample”, by the method described in Para 13.3.1 (vi), for carrying out Size & Gradation tests.
- (vi) Method for drawing “Test Sample”: The ballast in “Gross Sample” shall be scooped into a cone shaped pile by taking care to drop each scoopful exactly over the same spot. After the cone is formed, it shall be flattened by pressing the top of cone with a smooth surface. Then it is cut into quarters by two lines which intersect at right angles at the centre of the cone. The bulk of the sample is reduced by rejecting any two diagonally opposite quarters. The remaining ballast shall be mixed and “test sample” shall be drawn for testing. After drawing “test sample”, the left over ballast of “Gross Sample” shall be dumped back in the stack.
- (vii) In case clean, flat and hard surface is not available then a tarpaulin or any other suitable sheet may be used on a flat surface for mixing, drawing and sieve analysis of samples.

13.3.2 In case of stacks of volume more than 100 cum, more than one “Test Samples” will be tested for Size & Gradation. In such cases, the sieve analysis results of all the “Test Samples” shall individually conform to following gradation, for acceptance/rejection of the whole stack:

- (viii) Retention on 20mm Sq. Mesh Sieve shall not be less than 98% for machinecrushed ballast (not less than 95% for hand broken ballast).
- (ix) Retention on 40mm Sq. Mesh Sieve shall be between 40 to 70%.
- (x) Retention on 65mm Sq. Mesh Sieve shall not be more than 10%.

The full payment/reduced payment for the whole stack, as given in Para 2.3.3, shall be decided based on the average of the sieve analysis results of all the “Test Samples” for a stack.

13.4 Supply of ballast in Heaps for loading directly in Wagons

13.4.1 Sampling Procedure

Samples of ballast shall be collected from heaps of ballast proposed to be loaded into the wagons. For this, the contractor shall inform ADEN in-charge in writing sufficiently in advance before placement of rake, about the locations of ballast heaps from where it is to be loaded into wagons. ADEN in-charge shall decide the location of heaps from which sampling is to be done, judiciously covering the entire quantity of ballast to be loaded in the rake.

13.4.2 Based on the approx. quantity of ballast to be loaded in the rake, methodology for sampling of ballast to be followed shall be the same as in Para-13.3.1 and 13.3.2 above.

13.5.1 A minimum of 3 samples of ballast for sieve analysis shall be taken for measurements done on any particular date even if the numbers of stacks to be measured are less than three and results of any one sample will govern the specification.

13.5.2 The test viz. determination of Abrasion value, Impact Value and Water Absorption should be got done through approved laboratories or Railway's own laboratories (List of approved laboratories are mentioned below)

Railway Laboratories of Construction organization
(1) Virmata Jijabai Tch. Institute, Mumbai.
(2) IIT/Powai, Mumbai.
(3) Government Polytechnic, Samangaon, Nasik Road.
(4) Government Polytechnic, Jalgaon.
(5) Government Polytechnic, Khandwa.
(6) Government College of Engineering, Amravati.
(7) Railway Lab. of Dy.CE(C) Ajni.
(8) Government Polytechnic, Nagpur.
(9) Government Polytechnic, Chandrapur.
(10) Government Engineering College, Pune.
(11) Government Engineering College, Vijaynagar, Karad.
(12) Walchand College of Engineering, Sangli (Affiliated to Maharashtra Govt.).
(13) Government Polytechnic, Ahmadnagar.
(14) Walchand Institute of Technology, Solapur.

13.6 All costs for sampling/testing through the approved laboratories initially and subsequent to award of contract during the course of supply /at the time of measurement / at the time of billing to ascertain that ballast supply conforms to standards shall be done at contractor's cost. Railway reserves the right of getting ballast tested from any of the laboratory from the approved list at the cost of the contractor. Samples tested in Railways laboratory will be charged at Rs.500/- per sample. Adequate labour assistance for sieving, weighing, measurement, sampling, sealing etc. shall also be provided by the contractor.

14.0 SETTING UP OF LABORATORY BY CONTRACTOR:

In contracts where quantity to be supplied is more than 50,000 cum, full- fledged duly manned laboratory should be made at site by contractor at his cost for testing of Abrasion value, Impact value and Water absorption by him. Railways shall also be permitted to use such facilities wherever desired.

15.0 REJECTION OF SUPPLIES AND RECTIFICATION / DISPOSAL.

- 15.1 It shall be understood that the accepted rates for ballast are for materials which conform in all respects with the specifications laid down. The contractor is advised to bring only such material at the site which conform to the specifications, as given above. Any material which falls short of the prescribed standards will be rejected and will have to be removed by the contractor at his own expenses. It should be noted that all materials would be passed at the site of stacking only. No passing will be carried out at the sources or anywhere else.
- 15.2 If the Engineer or his representative deputed to measure the ballast supplied is not satisfied that any of above conditions and specifications are not fully complied with, he is at liberty to:
 - (a) Refuse to measure the ballast supplied after communicating his reasons in writing to the contractor, and
 - (b) Call upon in writing to bring the ballast up to the specifications by either re-screening the ballast to conform to the specified sizes
 - (c) Call upon in writing to remove the material and bring new material.
- 15.3 In case the material offered for supply by the contractor is rejected by the Engineer, the latter will specify the date within which rejected material should be removed by the contractor. The contractor will be liable to pay wharfage/demurrage/ground rent and other damages as per general conditions of contract for the period beyond stipulated.
- 15.4 The Engineer shall mark all rejected ballast in any manner he thinks fit to prevent rejected ballast being mixed with good ballast and the contractor shall remove the rejected ballast to such places as may be directed by the Engineer within a specified period from the date of order of removal.
- 15.5 In the event of the contractor failing to do so, the Engineer may cause it to be removed and all cost of such removal shall be payable by the contractors to the Railway, without prejudice to the Railway to effect any recovery of the losses as per conditions of GCC.

15.6 METHOD OF MEASUREMENT

15.6.1 Stack Measurement

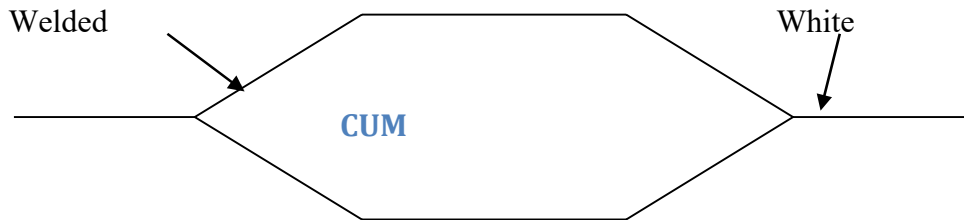
Stacking shall be done on a neat, plain and firm ground with good drainage. The height of stack shall not be less than 1m except in hilly areas where it may be 0.5m. The height shall not be more than 2.0m. Top width of stack shall not be less than 1.0m. Top of stack shall be kept parallel to the ground plane. The side slopes of stack should not be flatter than 1.5:1 (Horizontal : Vertical). Cubical content of each stack shall normally be not less than 30 cum in plain areas and 15 cum in hilly areas.

15.6.2 Wagon Measurement

- 15.6.2.1 In case of ballast supply taken by direct loading into wagons, a continuous white line should be painted inside the wagon to indicate the level to which the ballast should be

loaded. The cubical content in cubic meter corresponding to white line should also be painted on both sides outside the wagon.

- 15.6.2.2 In addition to painted line, mentioned in para 15.6.2.1, short pieces of flats (cut pieces of tie bars or otherwise) with cubical contents punched shall be welded at the centre of all the four sides as permanent reference. In case the supply is taken in general service wagon, actual measurements will be taken.



15.7 Shrinkage Allowance

Payment shall be made for the gross measurements either in stacks or in wagons without any deduction for shrinkage/voids. However, when ballast supply is made in wagons, shrinkage upto 8% shall be permitted at destination while verifying the booked quantities by the consignee.

16.0 ACCOUNTAL OF BALLAST & MAINTGENANCE OF REGISTERS:

16.1 BALLAST PASSING REGISTER

- 16.1.1 Details of authorization for stacking the ballast in a plot by the XEN/AXEN, certification of levelness of ground by SSE/JE shall be entered. Similarly the details of measured ballast stacks shall be entered in a Ballast passing register/ Stack Measurement Register, at the time of measurement in the field itself and the Register should have columns for entering measurements and physical properties checked by SSE/JE, XEN/AXEN and Dy.CE(C). The register shall be an authentic initial record in the form of Measurement Book with machine numbered pages and instruction for preservation/custody etc. shall be incorporated. Manuscript ruled registers if required should be used only by proper machine numbering the pages. The registers shall be issued by Dy.CE(C). and each page shall be pre-signed on top by XEN/AXEN before use.

- 16.1.2 The Ballast Passing register should bear the following information.

- i. Reference to Agreement No.
- ii. Date of measurement.
- iii. Stack No. and hectometer/TP/Chainage/RHS or LHS.
- iv. Measurement as recorded indicating the different dimensions and volume.
- v. Results of the quantity check and qualitative check as per sieve analysis oversize, quantity, dust etc.

- 16.1.3 There should be no overwriting in the register and if any correction is required, the old entry should be struck off by drawing a line over and a fresh entry made and initiated. No blank line should be left while recording. The recordings done at a time should be properly boxed by drawing a line at the start and close of the measurements. All entries made in Ballast Passing register should be entered in the Measurement Book subsequently, which shall form the basis for the contractors' bill.

- 16.1.4 The contractor shall sign the Ballast Passing register at the site of measurement and the Measurement Book later in token of acceptance of measurements for arranging payment by Railways.

16.2 GROUND BALANCE REGISTER:

- 16.2.1 DEPOT:** In case of DEPOT supply, the quantity of ballast measured in each Plot should be entered in the Ground Balance Register. After subsequent training out of ballast from a Plot, the successive reducing balances in that Plot should be reflected date-wise. For the quantities loaded in BT/Rail lorry in the plot, the reference of challan no. should be shown. After the entire quantity in Plot has been trained out, the ground balance should be reduced to zero and the Plot shown as vacant. Further, stacking in the plot of DEPOT/Sub Depot can start only after permission by Dy.CE(C). /XEN/AXEN.
- 16.2.2 CESS:** Similarly, in case of Cess/Semi Depot supply, the Ground Balance Register shall reflect the quantity of ballast measured the successive reducing balances due to dumping, date-wise and balance available on date STACK WISE should be recorded. As far as possible the full quantity of ballast in a stack shall be dumped at a time in case of cess. Further stacking of ballast in the HM in case of Cess/Semi Depot supply after dumping is not permitted.
- 16.2.3 Availability** of Depot/Cess supply diagram augmented at each time of supply/dumping / training out shall be pre-requisite for processing bill for payment both for supply & dumping.

17.0 DUMPING/TRAINING OUT:

- 17.1 Depot:** After collection of ballast/boulders/quarry dust and recording of its measurement by AXEN in a Depot, there should be an interval of at least, a week between the date of recording measurement by the AXEN and the date of commencement of loading and training out operations. In the aforesaid interval of one week, XEN/ Dy.CE(C). has carry out his prescribed test check(s). In case XEN/ Dy.CE(C). does not intend to test check a particular measurement, he shall clearly record the same in Measurement Book and permit the loading and training out of the ballast after passing of the bill. In case XEN/ Dy.CE(C). chooses to recommend training out earlier than a week, he may seek written approval of Dy.CE/C. In case Dy.CE/C is himself in charge of payments, permission of THOD shall be taken. (Para 4.7 of Railway Board's letter no. 2006/CE-II/MB/2 dated 25.05.2007)
- 17.2 `Cess:**
- 17.2.1** In case of supplies taken along the cess, ballast passed by the AXEN should not be put into the track till the bill is passed by the XEN/ Dy.CE(C) and a lapse of further seven days and the ballast is accounted for in the ballast ledger by the subordinate-in-charge and has been collected for 1 Km continuous length, unless a special written personal dispensation is given by the XEN/ Dy.CE(C). to put the ballast into the track in urgent cases. But, in all cases authorization shall specify the date on which the distribution is permitted. This date shall not be earlier than 15 days after the date of initial measurement.
- 17.2.2** There should be a buffer of at least one Kilometer between the location of collection & running out of ballast. Any deviation of the stipulations shall not be allowed except by specific written approval of the Dy.CE(C). for the reasons to be recorded in writing and if he is the passing officer for payments, then deviation being approved by THOD.
- 17.3** Instructions for training out/dumping as prescribed by the Railway from time to time should be compiled with meticulously.
- 17.4** Ballast stacks once measured shall not be disturbed on any account except for dumping/training out after the authorization and disturbances otherwise, if any, will be treated as a case of theft and will be liable for prosecution.
- 17.5** No ballast stack shall be laterally or longitudinally moved by any other means other than BT/Rail lorry without written order of the Dy.CE(C). at any stage. Movement of ballast longitudinally by road for facilitating loading in Rail lorry if found necessary, shall be done only with specific approval of XEN/ Dy.CE(C). in writing and only with

restacking and re-measurement in Ballast Passing Register at the cost of the Contractor who is dumping the ballast. No payment for such restacking/re-measurement will be made by the Railway. Any shortage if notice after re-measurement, will be at the cost of the contractor and will be recovered from his dues.

18.0 GAURDING OF BALLAST:

- 18.1 Till such time, the ballast is measured and taken over by the Railway; its custody shall be responsibility of the contractor.
- 18.2 Subsequent to making payment to the contractor, in case the ballast is found to be none conforming to Specifications or if the Ballast is misappropriated in any form, recovery will be made immediately from contractor's bills/ security deposit etc. or from any money payable under this or other contracts at TWICE the rate paid. In case it is established that the contractor is involved in such fraudulent practices, he is liable to be BANNED from doing business with Railways/Other Central Govt depts.
- 18.3 The contractor shall keep regular watch on all measured stacks till the whole supply is effected and contract is successfully completed.
- 18.4 The contractor shall also keep watch on dumping being undertaken by him / other agencies and ensure that the works are properly done without any misappropriation / mismanagement and any other untoward incidents.

19.0 GENERAL PAYMENT TERMS

- 19.1 Unless and otherwise specified, the BASE rate quoted by the Contractor at the time of tendering and the agreement rate as concluded in the contract for all the items in the schedule shall include the cost of all labour, transportation, consumables, tools, plants, equipments, machinery, all lead, lift, ascent, descent, jungle clearance, making of approach road, handling, re-handling, loading, unloading, transportation, seignorage/royalty, taxes levied by Central/State/Local Government, octroi, cess on GST thereof if any, as per GST Law, crossing railway lines, crossing of nallahs, roads, any other obstructions and cost of protection, guarding and other any safety precautions required, etc. complete. Nothing extra will be payable on any account unless otherwise specified exclusively in the item of schedule.
- 19.2 Contractor shall produce Mineral Revenue Clearance Certificate / Seignorage / Royalty payment receipts other statutory clearance as required along with each On Account bill . In case the contractor does not produce such clearance, recovery of seignorage/other charges as ascertained by Railways will be made from bills. Refunding of such recoveries shall be done only with the clearance of the State Govt./Central Government agencies as required for which the Contractor is solely responsible and no claims/representation whatsoever in this regard shall be admissible.
- 19.3 No claims for extra payment will be entertained on account of interruption of work due to rain, floods, or any other cause. Contractor must nevertheless arrange to carry on this work in rainy season. No claim for work done in low lying water-logged area, local pits and depressions containing rain water, wet earth conditions etc. will be entertained by the railway.

ANNEXURE-I**Aggregate Abrasion Value
(Based on IS:2386 Part IV-1963)****1. Apparatus**

The abrasion test for track ballast shall be carried out using **Los-AnglesMachine** as per fig.1.

The **abrasive charge** shall consist of 12 nos. cast iron or steel spheres approx. 48mm dia and each weighing between 390 and 445 gm ensuring total weight of charge as $5,000 \pm 25\text{gm}$.

IS sieves of sizes 50mm, 40mm, 25mm and 1.70mm.

Drying Oven

2. Test Sample

The test sample of 10,000gm shall consist of clean ballast conforming to the following grading:

Passing 50mm and retained
on 40mm square mesh sieve 5,000 gm@

Passing 40mm and retained 5,000 gm@
on 25mm square mesh sieve

@

tolerance of $\pm 2\%$ permitted.

The sample shall be dried in oven at $100 - 110^\circ\text{C}$ to a constant weight and weighed

(Weight 'A').

3. Test Procedure

The test sample and the abrasive charge shall be placed in the Los-Angeles abrasion testing machine and the machine rotated at a speed of 20-33 revolutions/minute for 1000 revolutions. At the completion of test, the material shall be discharged and sieved through 1.70mm IS sieve.

4. Analysis and reporting of the Result

The material coarser than 1.70mm IS sieve shall be washed, dried in oven at $100 - 110^\circ\text{C}$ to a constant weight and weighed (weight B).

The proportion of loss between Weight "A" and Weight "B" of the test sample shall be expressed as a percentage of the original weight of the test sample. This value shall be reported as:

$$\text{Aggregate Abrasion Value} = \frac{A-B}{A} \times 100$$

ANNEXURE-II**Aggregate impact value
(Based on IS:2386 Part IV-1963)****1. Apparatus**

The apparatus shall consist of the following

- a) **Impact testing machine** conforming to IS:2386 part IV-1963 as per fig.2.
- b) **IS Sieve** of sizes 12.5mm, 10mm and 2.36mm.
- c) **A cylindrical metal measure** of 75mm dia & 50mm depth.
- d) **A tamping rod** 10mm circular cross section and 230mm length, rounded at one end.
- e) **Drying Oven**

2. Test Sample

- 2.1 The test sample shall be prepared out of track ballast so as to conform to following grading:

-	Passing 12.5mm IS sieve	100%
-	Retention 10mm IS sieve	100%

- 2.2 The sample shall be oven dried for 4 hours at a temperature of 100-110°C and cooled.

- 2.3 The measure shall be filled about one-third full with the prepared aggregate and tamped with 25 strokes of the tamping rod. A further similar quantity of aggregate shall be added and a further tamping of 25 strokes given. The measure shall finally be filled to overflowing, tamped 25 times and the surplus aggregate struck off, using and tamping rod as a straight edge. The net weight of the aggregate in the measure shall be determined to the nearest gm (weight 'A').

3. Test Procedure

The cup of impact testing machine shall be fixed firmly in the position on the base of the machine and the whole of the test sample placed in it and compacted by 25 strokes of the tamping rod.

The hammer shall be raised 380mm above the upper surface of the aggregate in the cup and allowed to fall freely on to the aggregate. The test sample shall be subjected to a total of 15 such blows, each being delivered at an interval of not less than one second.

4. Analysis and Reporting of the result

The sample shall be removed and sieved through 2.36mm IS sieve. The fraction passing through shall be weighed (Weight 'B'). The fraction retained on the sieve shall also be weighed (Weight 'C') and if the total weight (B+C) is less than the initial weight (Weight 'A') by more than one gm, the result shall be discarded and a fresh test made.

The ratio of the weight of the fines formed to the total sample weight shall be expressed as a percentage.

Aggregate Impact Value = $(B/A) \times 100$

Two such tests shall be carried out and the mean of the results shall be reported to the nearest whole number as the Aggregate Impact Value of the tested material.

ANNEXURE-III

Water Absorption
(Based on IS: 2386 Part III-1963)

1. Apparatus

The apparatus shall consist of the following:

- a) **Wire Basket-** Perforated, electroplated or plastic coated, with wire hangers for suspending it from the balance.
- b) **Water tight** container for suspending the basket.
- c) **Dry soft Absorbent cloth** 75x45 cm size 2 nos.
- d) **Shallow Tray** of minimum 650 square cm area.
- e) **Air tight container** of capacity similar to basket.
- f) **Drying Oven.**

2. Test Sample

A sample of not less than 2000gm shall be used.

3. Test Procedure

The sample shall be thoroughly washed to remove finer particle and dust, drained and then placed in the wire basket and immersed in distilled water at a temperature between 22-32°C.

After immersion the entrapped air shall be removed by lifting the basket and allowing it to drop 25 times in 25 seconds. The basket and sample shall remain immersed for a period of $24 \pm \frac{1}{2}$ hours afterwards.

The basket and aggregate shall then be removed from the water, allowed to drain for few minutes, after which the aggregate shall be gently emptied from the basket on to one of dry clothes and gently surface dried with the cloth transferring it to second dry cloth when the first will remove no further moisture. The stone aggregate shall be spread on the second cloth and exposed to atmosphere (away from direct sunlight) until it appears to be completely surface dry. The aggregate then shall be weighed (Weight 'A').

The aggregate shall then be placed in an oven at a temperature 100 - 110°C for 24 hours. It shall then be removed from oven, cooled and weighed (weight 'B').

4. Analysis and Reporting of the

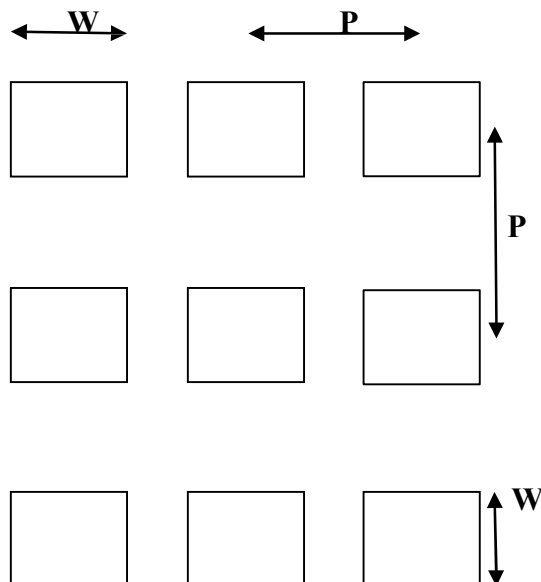
Result Water Absorption = $\{(A-B)/$

$B\} \times 100$

- 4.1 Two such tests shall be made and individual and mean results shall be reported.

ANNEXURE-IV**Specification of Test Sieves used for Sieve Analysis of Ballast**

1. The test sieves shall be perforated plate sieve type with square holes/apertures, mounted on a frame. The test sieves are designated by the nominal size of holes/apertures.
2. **Material of Perforated Plate:** The perforated plate for test sieves shall be manufactured from Brass Sheet or Steel Sheet or Stainless Steel Sheet or Galvanized Steel Sheet or Electroplated Steel Sheet.
3. **Plate Thickness:** The thickness of plate used for making test sieve and the tolerance permitted for this shall be as following:
For 65mm Square Mesh Sieve – 3mm (Plus 1.0mm Minus 0.5mm)
For 40mm Square Mesh Sieve – 2mm (Plus Minus 0.5mm)
For 20mm Square Mesh Sieve – 2mm (Plus Minus 0.5mm)
4. **Arrangement of Holes/Apertures:** The square holes/apertures of size “W” in the perforated plate shall be arranged at Pitch “P” as per the sketch given below:



5. **Sieve Opening Size, Pitch of Openings and tolerances:** The nominal size of individual hole/aperture at mid-section (W), the Pitch of holes/apertures (P) and permissible tolerance for them shall be as under:

Test Sieve of Square Mesh Size	W		P	
	Nominal Size	Tolerance	Distance	Tolerance
65 mm	65 mm	(+/-) 1.5 mm	80 mm	(+) 12.0 mm (-) 8.0 mm
40 mm	40 mm	(+/-) 1.5 mm	50 mm	(+) 7.5 mm (-) 5.0 mm
20 mm	20 mm	(+/-) 1.0 mm	25 mm	(+) 4.0 mm (-) 2.5 mm

6. Sieve Frame: The frame of test sieves shall be manufactured from Hardwood or Steel sheet or Brass sheet. The internal size of the frame (i.e. clear size of perforated plate mounted on frame) shall not be less than 100cm in length, 70cm in breadth and 10cm in height on sides.
7. Marking on test sieves: A label shall be fixed to the frame of each sieve, legibly marked with following information:
 - (i) Nominal Aperture Size,
 - (ii) Material of perforated plate,
 - (iii) Material of sieve frame,
 - (iv) Maker's Name or Trademark, and
 - (v) An Identification Number for the sieve.

FORMAT FOR PRESENTING TEST RESULTS OF BALLAST SAMPLES
WHILE TENDERING

1. Name of Laboratory :
2. Address :
3. Referred by :
4. Quantity / Weight of ballast } : Unit (Cum/Kg.)
Sample offered for testing }
5. Source :
6. Date offered for testing :
7. Date Tested :
8. Test Results in Percentage :
 - i. Abrasion Value :
 - ii. Impact Value :
 - iii. Water Absorption :
9. Remarks :
10. Signature and Designation
of the representative of the
Laboratory }

Annexure-V**DECLARATION**

I hereby declare that the Ballast supply at all times to the Railways under this contract will conform to the RDSO's Specifications of Track Ballast, IRS-GE-1, June 2004 and also to the technical specifications as specified by Railways in this tender document.

Tenderer

Date :

Place:

भारत सरकार GOVERNMENT OF INDIA
रेलमंत्रालय MINISTRY OF RAILWAYS
रेलवे बोर्ड RAILWAY BOARD

No. 2017/Trans/01/Policy

New Delhi, dated: 08 - 02- 2018

The General Manager, All Indian Railways/PUs, NF(Con), CORE
The DG/RDSO & NAIR,
CAOs, DMW/Patiala, WPO/Patna, COFMOW/NDLS, RWP/Bela

Sub: Process Reforms – Works Contracts.**Ref: Railway Board's letter no Trans 01/policy dated 17.11.2017**

In order to expedite decision making and execution of works, following changes have been approved by the Board (ME, FC & CRB).

1.0 Handling Vitiating during Variation in Contract Quantities

In partial modification of existing instructions, it has been decided that as a result of variations, a contract shall be considered "vitiating" only when, the following percentage variation in contract value between tenderers are noticed to have been exceeded.

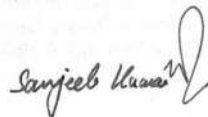
SN	Value of Contract	Percentage difference between present Contractor and new L-1 as a result of variation. (percentage shall be calculated with base as the revised contract quantities multiplied by the rates of the present contractor)
1	Small value contracts (Tender Value less than Rs 50 lakh)	10
2	Other than small value contracts (Tender Value equal to or more than Rs 50 lakh)	5

1.1 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.

The Railway 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.

1.2 The above shall be regulated as under:

- 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. The provisions of Railway Board letter no 2007/CE.I/CT/18/Pt. XII dated 31.12.2010 hereby gets superseded.
- These instructions will be similarly applicable to earning contracts with H-1, H-2 substituted for L-1, L-2 and so on.
- Executives while executing the work shall make all efforts to ensure that no vitiating 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.

- d) 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.

2.0 Dispense with Vetting of Brief Notes & size of TC Recommendation

2.1 It has been decided that all system generated statements from IREPS website, post tender-opening are directly seen by the Tender Committee and vetting of the comparative statement and vetting of brief note is not required for Tender Committee proceedings.

2.2 The Tender Committee proceedings are made brief and crisp.

3.0 System of Verification of Tenderer's credentials:

3.1 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 credentials, 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). Only those documents which are declared explicitly by the tenderer as "documents supporting the claim of qualifying the laid down eligibility criteria", will be considered for evaluating his/their tender. The system shall be applicable once it is made operational in IREPS. This system is already being followed by some of Railway PSUs.

3.2 In all works tender documents, following para may be added in the section describing the qualification and eligibility criteria.

*"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 alongwith bid are true and factual. Standard format of the affidavit to be submitted by the bidder is enclosed as **annexure-A**. Non submission of an affidavit 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 document of tenderer as far as his qualification for the tender is concerned."*

With the submission of the affidavit as mentioned above, the practice of verification of tenderer's documents by the Railways may be dispensed with. Following clause may also be added to the Instructions to Bidders.

- a) *The Railway 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 Railway, 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 railway shall not relieve the bidder of its obligations or liabilities hereunder nor will it affect any rights of the railway thereunder.*
- b) *In case of any wrong information submitted by tenderer, the contract shall be terminated, Earnest Money Deposit (EMD), Performance Guarantee (PG) and Security Deposit (SD) of contract forfeited and agency barred for doing business on entire Indian Railways for 5 (five) years.*

Sujeet Kumar

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- c) With such a system of self-certification of credentials, tender finalization should also be speeded up. It has accordingly been decided that the tender validity period should be reduced to 45 days for single packet and 60 days for two packet system of tendering (in place of the present limits of 90 days and 120 days) for tenders having affidavit based system of credential verification.

4.0 Tender Invitation at short notice period

In continuation of existing instructions, for tenders called with short notice period of 21 days, tender validity period would be 30 days and for tenders called with 14 days notice period, the tender validity would be 20 days only. This would in fact justify the urgency of work.

5.0 Calling tenders pending sanction of detailed estimates

In cases of urgency, open tenders may be called, before sanction of detailed estimates, with the approval DRM/PHOD/CHODs. However, the letter of acceptance shall be issued only after the sanction of detailed estimate.

6.0 Multiple L-1

In case of more than one L-1 bidders, tender may be awarded to tenderer having higher Bid Capacity. In case Bid Capacity is also the same, tenderer having done more value of similar work in last three previous financial years and the current financial year upto the date of opening of the tender, may be selected for the award. Instructions with respect to Bid Capacity will follow.

7.0 Discharge of tenders

Before discharging a tender due to higher rates etc, the TC and TAA may examine the possibility of a cartel formation, getting lower rates as a result of retendering, loss of transparency in re-invited tender, the opportunity cost for delay in the execution of the work and the cost of retendering. Each zonal Railway may workout a model cost estimate for the process of tendering which may be kept in view by the TC and TAA while examining the tender.

8.0 Price variation Clause (PVC)

Price variation Clause (PVC) in Works Contract is dealt with in accordance with provisions of item 46A of GCC-July 2014. In order to simplify and enhance the pace of the works, it has been decided to remove the PVC clause in all works contract tenders having value less than Rs 5 Crore.

9.0 Project Management Consultancy (PMC)

In partial modification to Railway Board's letter no 2007/CE.1/CT/18 dated 05.07.2010, and 14.09.2017, it has been decided to extend the scope of PMC services for all works contracts costing more than Rs 10 Crore in open line, Construction and RE organization while ensuring the following;

- Personal approval of DRM/PHOD/CHOD would be required on case to case basis.
- The proposal to engage PMC services for any project/contract shall be governed as per instructions contained in Railway Boards letters mentioned above (and amended from time to time). These instructions will also be applicable for all the works approved for PMC by DRM/PHOD/CHOD.
- The word Deputy CE or its equivalent mentioned in the instructions above shall mean Equivalent Branch Officer of the Division/Railway Electrification (RE).
- The expenditure incurred on PMCs should be within the D&G charges as per extant instructions.

Ranjeet Kumar

10.0 Contractor's Measurements

In partial modification to Railway Board's letter no 2016/CE-I/CT/14 Measurement/1 dated 21.09.2017, and 2016/CE-I/CT/14 Measurement/3 dated 21.09.2017, it has now been decided to extend the scope of Contractors Measurement for all works costing more than Rs 5 Crore in Divisions, Construction and RE organization, subject to following condition:

- a) Approval of DRM/PHOD/CHOD, without finance concurrence.
- b) The proposal to have works measurements by Contractors for any project/contract shall be governed in accordance with the instructions contained in Railway Board's letters mentioned above (amended from time to time). Such instructions are applicable for all the works approved for Contractors Measurement by DRM/PHOD/CHOD.
- c) The word Deputy CE or its equivalent mentioned in the instructions above shall mean equivalent Branch Officer of the division/RE organization. XEN/AXEN shall mean their equivalent counterparts in Division/RE organization.

11.0 Deposit Works

These works are defined in accordance with para 1843 of IR Code of Engineering Department. The method of execution is also defined therein. The limit of variation by 20% due to reasons other than escalation etc may not be applicable for Deposit Works. Sanction, execution and variations in these works shall be made by the Railway administration in consultation with the sponsoring authority bearing the cost of the deposit works, within the broad guidelines provided in IR Code of Engineering Department and Model SOP-October 2017. Revised detailed estimate should however be within the powers of the sanctioning authority.

- 12.0 This issues with the concurrence of Associate Finance of Transformation Cell Railway Board.


Kindly acknowledge the receipt and ensure compliance.



(T. K. Pandey)

Executive Director, Transformation

1. PFAs, All Indian Railways & Production Units
2. The ADAI (Railways), New Delhi
3. The Director of Audit, All Indian Railways



(Sanjeeb Kumar)

Executive Director (Accounts), Transformation

Copy to

1. The Director, Indian Railway Institute of Civil Engineering, Pune.
2. The Director, Indian Railway Institute of Mechanical and Electrical Engineering, Jamalpur.
3. The Director, Indian Railway Institute of Signal Engineering and Telecommunications, Secunderabad.
4. The Director, Indian Railway Institute of Electrical Engineering, Nasik.
5. The Executive Director, Indian Railways Centre for Advanced Maintenance Technology, Gwalior.
6. The Director, Indian Railway Institute of Transport Management, Lucknow.
7. The Registrar, Railway Claims Tribunal, Delhi.
8. The General Secretary, IRCA, New Delhi.
9. The Chief Commissioner of Railway Safety, Lucknow.
10. The Secretary, Railway Rates Tribunal, Chennai.
11. The Chairman, Railway Recruitment Board, Ahmedabad, Ajmer, Allahabad, Bangalore, Bhopal, Bhubaneswar, Chandigarh, Chennai, Gorakhpur, Guwahati, Jammu & Srinagar, Kolkata, Malda, Mumbai, Muzaffarpur, Patna, Ranchi, Secunderabad and Trivandrum.
12. CMD/MD of all railway PSUs

Copy to:

1. The Genl. Secy., AIRF, Room No. 248, & NFIR Room No. 256-C, Rail Bhavan
2. The Secy. Genl., IRPOF, Room No. 268, FROA, Room No. 256-D & AIRPFA, Room No. 256-D Rail Bhavan

Copy to:

1. PS to MR, MOS(S), MOS(G)
2. CRB, FC, ME, MTR, MRS, MS, MT, SECY, DG (RHS), DG (RPF), DG (Stores), DG(Pers), DG(S&T)
3. All AMs, Principal Executive Director & Executive Directors of Railway Board



(T. K. Pandey)
Executive Director, Transformation

****END OF TENDER DOCUMENT
(TECHNICAL BID) *****