

***NTPC VIDYUT VYAPAR NIGAM
LIMITED***

(A wholly owned Subsidiary of NTPC Limited)



BIDDING DOCUMENTS

FOR

***ANDAMAN & NICOBAR
GAS POWER PROJECT CIVIL WORKS
PACKAGE***

BIDDING DOCUMENT NO.: NVVN/C&M/RE-342/2024-25

(This Document is meant for the exclusive purpose of bidding against this Bid Document No./ Specification and shall not be transferred, reproduced or otherwise used for purposes other than that for which it is specifically issued.)

INVITATION FOR BIDS

NTPC VIDYUT VYAPAR NIGAM LIMITED
(A wholly owned Subsidiary of NTPC Limited)

CONTRACT & MATERIALS, NEW DELHI

SECTION I

DETAILED INVITATION FOR BIDS (IFB)

FOR

ANDAMAN & NICOBAR GAS POWER PROJECT

CIVIL WORKS PACKAGE

AT

**Hope Town, Sri Vijaya Puram, Andaman
& Nicobar Islands**

			INVITATION FOR BIDS (IFB)
1.	Introduction	1.1	NTPC VIDYUT VYAPAR NIGAM LIMITED (NVVN) invites online Bids from eligible bidders on single stage two envelope (i.e. envelope-I techno commercial Bid and envelope-II price Bid), for aforesaid Package, as per the Brief Scope of Work mentioned hereinafter.
2.	BRIEF SCOPE OF WORK		
			The scope of civil, structural and architectural works shall include topographical survey, geotechnical investigation, site clearance, site levelling, preparation of design documents and drawings and getting approval of the same from the Employer and construction of all civil, structural and architectural works including supply of all construction materials for all buildings, equipment and facilities for the project. The nature of work generally involves geotechnical investigation if required, earthwork in excavation in all types of soil and rock including controlled blasting/ mechanical means, de-watering, backfilling around completed structures, plinth filling, disposal of surplus earth/rock/excavated material/dismantled material, concreting including reinforcement and form work, plastering, corrosion protection measures including painting, wall cladding, roofing and flooring including permanent steel decking, false ceiling, fabrication of structures, pre assembly of fabricated structures, transportation of pre-fabricated structures and erection of steel structures and miscellaneous steel works (i.e., steel staircase, cable supports, pipe supports, ladders, walkways, railing, chequered plate/grating floors,

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		<p>inserts etc.), painting of structures, paving, gravel filling, providing pre-cast covers, damp proofing, roof water proofing, roads, drainage, sewerage, rain water harvesting, final grading and site clearance before handing over and any other item of work required for completion of all systems under the scope of work complete.</p> <p>Detailed scope of work has been specified in the Section VI of the bidding Documents.</p>	
3.	NVVN intends to finance subject Package through External Commercial Borrowings / Domestic Commercial Borrowings / Own sources.		
4.	<p>Bid Security for an amount of ₹1,00,00,000/- (Indian Rupees One Crore only) shall be submitted in a sealed envelope separately offline by the stipulated bid submission closing date and time.</p> <p>“ANY BID NOT ACCOMPANIED BY AN ACCEPTABLE BID SECURITY IN A SEPARATE SEALED ENVELOPE SHALL BE REJECTED BY THE EMPLOYER AS BEING NON-RESPONSIVE AND SHALL NOT BE OPENED. IN CASE, THE BID SECURITY IS SUBMITTED THROUGH ELECTRONIC FUND TRANSFER (EFT), BIDDER TO SUBMIT THE PROOF OF E-PAYMENT OF BID SECURITY EITHER IN SEPARATE SEALED ENVELOPE OR IN THE E-TENDERING PORTAL.”</p>		
5.	Detailed Specification, Scope of Work and Terms & Conditions are given in the Bidding Documents, which are available for examination and Sale at our GePNIC e- procurement portal https://eprocurementpc.nic.in as per the following schedule:		
		Issuance of IFB	As per GePNIC Portal
		Document Sale Dates	As per GePNIC Portal
		Last Date for receipt of queries for clarification from prospective Bidders	As per GePNIC Portal
		Last date and time for submission of online Bids comprising of Techno commercial and Price Bid	As per GePNIC Portal
		Bid Opening Date & Time for Techno-commercial Bid	As per GePNIC Portal
		Bid Opening Date & Time for Price-Bid	Shall be intimated separately by NVVN
		Cost of Bidding Document in INR	₹ 9000/- (Rupees Nine Thousand only)
		Estimated Cost of Work	₹ 86.19 Crores (Rupees Eighty Six Crores Nineteen Lakhs only)
6.	QUALIFYING REQUIREMENTS FOR BIDDERS		

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	In addition to the requirements stipulated under section Instructions to Bidder (ITB), the Bidder should also meet the qualifying requirements stipulated hereunder in Clauses 6.1 and 6.2 along with the notes:	
	6.1.	TECHNICAL CRITERIA
	6.1.1	<p>The bidder should have executed/completed Similar Works during the last seven (7) years, as on last date of the month preceding the month of publication of NIT, having minimum contract/ order values as indicated below: -</p> <p>(a) One order of value not less than Rs.58.43 Crore,</p> <p style="text-align: center;">OR</p> <p>(b) Two orders, each of value not less than Rs.36.52 Crore,</p> <p style="text-align: center;">OR</p> <p>(c) Three orders, each of value not less than Rs.29.21 Crore.</p> <p>Similar Work means works comprising of "Construction of Civil, Structural & Architectural works including excavation in rock, Reinforced cement concrete works, steel structural works in a power plant or Industrial Plant or Jetty or Infrastructure project (Road & bridges).</p>
	Notes:-	<p>(i) The term "executed/completed" means the bidder should have achieved the criteria specified at Clause No. 6.1.1 of QR above, even if the total contract/order is not completed / closed. In case of contract/order under execution as on last date of the month preceding the month of publication of NIT, the value of work executed against contract/order till such date shall be considered, provided the same is certified by the Owner/Project Authority.</p> <p>(ii) Reference work executed by a Bidder as a sub-contractor may also be considered provided the certificate issued by main contractor is duly certified by Owner/Project Authority specifying the scope of work executed by the sub-contractor in support of Qualifying Requirements.</p> <p>(iii) In case of composite work/BOQ, the bidder shall have to furnish Certificate from Owner/Project Authority certifying the value of specific nature of work, as mentioned in clause 6.1.1</p> <p>(iv) For the purpose of arriving at the executed value of order specified at 6.1.1 above, basic amount only shall be considered. In case of an order/contract inclusive of Taxes, agency has to provide the break-up of basic value and tax.</p> <p>(v) The bidder can meet the requirements stipulated under clause 6.1.1. above either in a single order or collectively in multiple orders (not more than two or three, as applicable).</p>
6.2. Financial Criteria:		
	6.2.1	The average annual turnover of the Bidder, in the preceding three
ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE		BIDDING DOCUMENT NO. NVVN / C&M/ RE-342 /2024-25 SECTION - I (IFB)
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			<p>(3) financial years as on the date of techno-commercial bid opening, should not be less Rs.36.52 Crore (Indian Rupees Thirty-Six Crores Fifty-Two Lacs only) or in equivalent foreign currency.</p> <p>In case a Bidder does not satisfy the average annual turnover criteria, stipulated above on its own, its Holding Company would be required to meet the stipulated turnover requirements as above, provided that the Net Worth of such Holding Company as on the last day of the preceding financial year is at least equal to or more than the paid-up share capital of the Holding Company. In such an event, the Bidder would be required to furnish along with its Techno-Commercial bid, a Letter of Undertaking from the Holding Company, supported by the Holding Company's Board Resolution, as per the format enclosed in the bid documents, pledging unconditional and irrevocable financial support for the execution of the Contract by the Bidder in case of award.</p>
		6.2.2	<p>Net worth should not be less than 100% (hundred percent) of the bidder's paid up share capital as on the last day of the preceding financial year. In case the Bidder does not meet the Net worth criteria on its own, it can meet the requirement of Net worth based on the strength of its Subsidiary(ies) and/or Holding Company and/or Subsidiaries of its Holding companies wherever applicable. In such a case, however the Net worth of the Bidder and its Subsidiary(ies) and/or Holding Company and/or Subsidiary(ies) of the Holding Company, in combined manner should not be less than 100% (hundred percent) of their total paid up share capital. However individually, their Net worth should not be less than 75% (seventy five percent) of their respective paid up share capitals.</p> <p>Net worth in combined manner shall be calculated as follows:</p> <p>Net worth (combined) = $(X1+X2+X3) / (Y1+Y2+Y3) \times 100$</p> <p>Where X1, X2, X3 are individual Net worth which should not be less than 75% of the respective paid up share capitals and Y1,Y2,Y3 are individual paid up share capitals.</p>
		6.2.3	<p>In case the Bidder is not able to furnish its audited financial statements on standalone entity basis, the unaudited unconsolidated financial statements of the Bidder can be considered acceptable provided the Bidder furnishes the following further documents for substantiation of its qualification:</p> <ul style="list-style-type: none"> i. Copies of the unaudited unconsolidated financial statements of the Bidder along with copies of the audited consolidated financial statements of its Holding Company. ii. A Certificate from the CEO/CFO of the Holding Company, as per the format enclosed in the bidding documents, stating that the unaudited unconsolidated financial statements form part of the Consolidated

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		Annual Report of the Company.
	6.2.4	<p>In cases where audited results for the last financial year as on the date of Techno Commercial bid opening are not available, the financial results certified by a practicing Chartered Accountant shall be considered acceptable.</p> <p>In case, the Certificate from a practicing Chartered Accountant certifying financial results is not available, the audited results of three consecutive financial years preceding the last financial year shall be considered for evaluating the financial parameters. Further, a Certificate would be required from the respective CEO/CFO as per the format enclosed in the bidding documents stating that “the financial results of the Company are under audit as on the date of Techno-commercial bid opening and the financial results certified by a practicing Chartered Accountant are not available”.</p>
	NOTES:	<p>(i) Net worth means the sum total of the paid-up share capital and free reserves. Free reserve means all reserves credited out of the profits and share premium account but does not include reserves credited out of the revaluation of the assets, write back of depreciation provision and amalgamation. Further any debit balance of Profit and Loss account and miscellaneous expenses to the extent not adjusted or written off, if any, shall be reduced from reserves and surplus.</p> <p>(ii) Other income shall not be considered for arriving at annual turnover.</p> <p>(iii) "Holding Company" and "Subsidiary Company" shall have the meaning ascribed to them as per Companies Act of India.</p> <p>(iv) For annual Turnover indicated in foreign currency, the exchange rate as on seven (7) days prior to the date of Techno-Commercial bid opening shall be used.</p> <p>(v) For Turnover and Net worth, only standalone Financial Statement of Bidder/Associate/Collaborator/Holding/subsidiary(s) shall be considered.</p>
7.	<p>NVVN reserves the right to reject any or all Bids or cancel / withdraw the Invitation for Bids" without assigning any reason whatsoever and in such case no Bidder / intending Bidder shall have any claim arising out of such action.</p>	
8.	<p>A complete set of Bidding Documents may be downloaded from https://eprocurementpc.nic.in by any interested Bidder. Tender Fee (₹ 9000), in the form of A/C PAYEE DEMAND DRAFT / BANKERS CHEQUE / PAY ORDER in favor of "NTPC VIDYUT VYAPAR NIGAM LIMITED", payable at NEW DELHI, as mentioned above is required to be submitted in a separately sealed envelope at the address mentioned in the bidding document, before the stipulated date</p>	

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	<p>& time of submission of bid. For any assistance, please email to nvvncontracts@ntpc.co.in / kushankkumar@ntpc.co.in or contact Sr. Manager-C&M, NTPC VIDYUT VYAPAR NIGAM LIMITED, 5th Floor, EOC Complex, NTPC Limited, A-8A, Sector-24 Noida 201301.</p> <p>Alternatively, Bidder can submit the tender fee at following account, details of the same needs to be shared in Fee portal of e-procurement portal:</p> <p>(i) Bank Name: ICICI Bank Limited</p> <p>(ii) Branch: CONNAUGHT PLACE BRANCH</p> <p>(iii) Bank Address: 9A, PHELPS BUILDING, INNER CIRCLE, NEW DELHI-110001</p> <p>(iv) IFSC Code: ICIC0000007</p> <p>(v) Account No.: 000705008910</p> <p>It is required by the agency to register and follow the guidelines / FAQ provided in the e-portal https://eprocurrentpc.nic.in for participating in the tender BID is to be submitted online on that portal. Any amendment(s) / corrigendum / clarifications with respect to this Bid shall be uploaded on https://eprocurrentpc.nic.in only. The Bidder should regularly follow up for any Amendment / Corrigendum / Clarification on the above website.</p> <p>Note: No hard copy of Bidding Documents shall be issued.</p>
9.	Issuance of Bidding Documents to any Bidder shall not construe that such Bidder is considered to be qualified. Bids shall be submitted online and opened at the address given below in the presence of Bidder's representatives who choose to attend the Bid Opening. Bidder shall furnish Bid Security, Power of Attorney, Tender Fee, Deed of Joint Undertaking / JV Agreement (as applicable) in physical form as detailed in Bidding Documents before the stipulated bid submission closing date and time at the address given below.
10.	Transfer of Bidding Documents purchased by one intending Bidder to another is not permissible.
11.	Address for communication:
	<p>For the detailed IFB and bidding documents please visit e-portal https://eprocurrentpc.nic.in or may contact:</p> <p>General Manager (C&M) / Sr. Manager (C&M), NTPC VIDYUT VYAPAR NIGAM LIMITED, 5th Floor, Engineering Office Complex, NTPC Limited, A-8A, Sector-24 Noida - 201301 Tel No. (+91)-120-4947239 E-mail: kushankkumar@ntpc.co.in / nvvncontracts@ntpc.co.in/ Corporate Identification Number: U40108DL2002GOI117584, Website: www.nvvn.co.in</p>

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		INVITATION FOR BIDS (IFB)	
12.	Registered Office		
	NTPC VIDYUT VYAPAR NIGAM LIMITED NTPC Bhawan, Core-7, SCOPE Complex, 7, Institutional Area, Lodhi Road, New Delhi – 110003 Corporate Identification Number: U40108DL2002GOI117584 Website: www.nvvn.co.in		
13.	Other Instructions		
	13.1	Please use “Online Bidder Enrolment” link provided on portal https://eprocurementpc.nic.in (GePNIC) to register.	
	13.2	Go through Help, FAQ etc as provided on above portal.	
	13.3	Class III Digital Signature (DSC) is required for submission of BID on above portal.	
	13.4	<p>Important Note: It is strongly recommended that all authorized users of Supplier organizations should thoroughly peruse the information provided under the relevant links and take appropriate action. This will prevent hiccups and minimize teething problems during the use of GePNIC.</p> <p>GePNIC Helpdesk Telephone: 24x 7 Customer Support: +91-120-4001 002 / +91-120-4200 462 / +91-120-4001 005 / +91-120-6277 787</p>	

***NTPC VIDYUT VYAPAR NIGAM
LIMITED***

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BIDDING DOCUMENTS

FOR

***ANDAMAN & NICOBAR
GAS POWER PROJECT CIVIL WORKS
PACKAGE***

BIDDING DOCUMENT NO.: NVVN/C&M/RE-342/2024-25

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INSTRUCTION TO BIDDERS

1	General				
1.1	Mode & Type of Bidding	The bidding shall be done online through e-tender portal named in the Bid Data Sheet (BDS) as per the mode (i.e. Domestic Competitive Bidding (DCB)) and type (i.e. Single stage two envelope) stipulated in BDS. Bidders are required to register on referred e-tender portal (https://eprocurementpc.nic.in) and go through the Guidelines provided there.			
1.2	Bidders Eligible for bidding	Bidding is open to bidders from within / outside the Employer's country			
1.3	Synonymous Words	Throughout these Bidding Documents, the term “Bid” and “Tender” and their derivatives (Bidder/Tenderer, Bidding/Tendering, Bidding Document/Tender Document, etc.); Bill of Quantity / Schedule of Quantity / Schedule of Quantities/ Bill of Quantities; Employer / NTPC/NVVN; Security Deposit / Performance Security/ Performance Guarantee; Engineer-in- Charge / Engineer, appearing anywhere in the Bidding Documents shall have the same meaning and are synonymous to each other.			
2.	Source of Funds				
2.1	NTPC Vidyut Vyapar Nigam Limited (hereinafter called 'NVVN' or 'Employer') intends to finance the package named in the Bid Data Sheet (BDS), through Domestic commercial borrowings / own resources.				
3.	Conflict of Interest				
3.1	Each Bidder shall submit only one bid either by himself, or as a partner in a joint venture or consortium, if so permitted in the Bidding Documents. A Bidder who submits or participates in more than one bid in this bidding will be disqualified from the bidding.				
3.2	Bidders should not be associated, or have been associated in the past, directly or indirectly, with a firm or any of its affiliates that has been engaged by the Employer to provide consultancy services for the preparation of the design, specifications, and other documents to be used for the execution of Works under this Invitation for Bids.				
4.	Bidder’s Site Visit				
4.1	<p>The Bidder is advised to visit and examine the site where the work is to be executed and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the bid and entering into a contract for execution of the facilities.</p> <p>The costs of visiting the site shall be borne by the bidder fully.</p>				
4.2	The Bidder and any of its personnel or agents will be granted permission by the Employer to enter upon its premises and lands for the purpose of such inspection, but only upon the express condition that the Bidder, its personnel and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof and will be responsible for death or personal injury, loss of or damage to property and any other loss, damage, costs and expenses incurred as a result of the inspection.				
5.	Content of Bidding Documents				
5.1	The set of Bidding Documents issued for the purpose of bidding includes one set of the following,				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; text-align: center;">ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE</td> <td style="width: 33%; text-align: center;">BIDDING DOCUMENT NO. NVVN / C&M/ RE-342 /2024-25 SECTION - II (ITB)</td> <td style="width: 33%; text-align: center;">PAGE 1 OF 32</td> </tr> </table>			ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE	BIDDING DOCUMENT NO. NVVN / C&M/ RE-342 /2024-25 SECTION - II (ITB)	PAGE 1 OF 32
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	<p>which should be read in conjunction with amendments, if any, issued in accordance with ITB Clause 7.0 below:</p> <p>Section I – Invitation for Bids (IFB)</p> <p>Section II – Instructions to Bidders (ITB)</p> <p>Section III – Bid Data Sheet (BDS)</p> <p>Section IV – General Conditions of Contract (GCC)</p> <p>Section V – Special Conditions of Contract (SCC)</p> <p>Section VI – Technical Specifications (TS)</p> <p>Section VII – Forms and Procedures (FP).</p>
5.2	The Bidder is expected to examine all instructions, forms, terms, conditions, specifications, and other information in the bidding documents. Failure to furnish all information required as per the bidding documents or submission of a bid not substantially responsive to the bidding documents in every respect will be at the Bidder's risk and may result in rejection of its bid.
6.	Clarification on Bidding Documents
6.1	A prospective Bidder requiring any clarification to the bidding documents may notify the Employer through e-mail or in writing by post at the Employer's address indicated in the Bid Data Sheet. The Employer will respond to any request for clarification or modification of the bidding documents that it receives not later than the date specified in IFB. Any amendment(s) / corrigendum / clarifications with respect to this Bid shall be uploaded on https://eprocurementpc.nic.in . The Bidder should regularly follow up for any Amendment / Corrigendum / Clarification on the above website.
6.2	The Bidder is advised to visit and examine the site where the facilities are to be installed and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the bid and entering into a contract for supply and installation of the facilities. The costs of visiting the site shall be borne by the bidder fully.
6.3	The Bidder and any of its personnel or agents will be granted permission by the Employer to enter upon its premises and lands for the purpose of such inspection, but only upon the express condition that the Bidder, its personnel and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof and will be responsible for death or personal injury, loss of or damage to property and any other loss, damage, costs and expenses incurred as a result of the inspection.
7.	Amendment to Bidding Documents
7.1	At any time prior to the deadline for submission of bids, the Employer may, for any reason, whether at its own initiative, or in response to a clarification requested by a prospective Bidder, amend the bidding documents.
7.2	Any amendment(s) / corrigendum / clarifications with respect to this Bid shall be uploaded on https://eprocurementpc.nic.in website only. The Bidder should regularly follow up for any Amendment / Corrigendum / Clarification on the above website. Bidders are

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	advised to regularly check their emails and follow up for any Amendments / Corrigendum/ Clarifications on the above website.	
7.3	In order to provide prospective Bidders reasonable time in which to take the amendment into account in preparing their bid, the Employer may, at its discretion, extend the deadline for the submission of bids.	
7.4	Bidders are also advised to regularly check their e-tender Portal/e-mail.	
8.	Cost of Bidding	
8.1	The Bidder shall bear all costs associated with the preparation and submission of his bid and the Employer will in no case be responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.	
9.	Language of Bid & Unit of Measure	
9.1	<p>The bid prepared by the Bidder and all correspondence and documents related to the bid exchanged between the Bidder and the Employer shall be written in English language, provided that any printed literature furnished by the Bidder may be written in another language, as long as such literature is accompanied by a translation of its pertinent passages in English language in which case, for purposes of interpretation of the bid, the translation shall govern.</p> <p>The English Translation of the documents shall be carried out by professional translators and the translator shall certify that he is proficient in both languages in order to translate the document and that the translation is complete and accurate. Further, translation shall be authenticated by the Indian Consulate located in the Country where the documents have been issued or the Embassy of that Country in India.</p>	
9.2	The units of measurement shall be metric system of measures, unless otherwise specified elsewhere.	
10.	Documents Comprising the Bid	
	<p>Single Stage Two Envelope Bidding procedure shall be followed as under</p> <p>Envelope-I: Techno-Commercial Bid and Envelope-II: Price Bid</p> <p>Techno-Commercial Bid shall be evaluated for completeness and in regard to fulfilment of the qualification requirements and eligibility conditions. Price Bid Bids shall be opened at a later date and time intimated in writing separately by the Employer.</p> <p>The Bid shall comprise of following components:</p>	
10.1	Techno-Commercial Bid (to be submitted in GePNIC portal eprocurementpc.nic.in shall comprise of the following:	
10.1.1	Envelope-I: Techno-Commercial Bid	
	The Techno-Commercial Bid comprises of following two categories of documents:	
10.1.1.1		Documents to be submitted in physical form (offline) in separate sealed

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		<p>envelope(s) duly marked in accordance with ITB clause15:</p> <p>(a) Attachment 1: Bid Security</p> <p>Bid security of INR 1,00,00,000/- (Rupees One Crore Only) shall be furnished in accordance with ITB Clause 13.</p> <p>(b) Attachment 1A: Tender Fee</p> <p>The tender fee shall be submitted in the form of crossed Demand Draft/ Bankers Cheque/Pay Order for an amount specified in section-I (IFB) in favour of “NTPC VIDYUT VYAPAR NIGAM LIMITED” payable at NEW DELHI.</p> <p>(c) Attachment-2: Documents related to legal status of Bidder.</p> <p>Documents relating to legal status of the bidder shall be submitted in accordance with ITB Clause No. 10.3b).</p> <p>(d) Other Attachments if specified in BDS.</p>
	10.1.1.2	<p>Documents to be submitted online through e-tender mode:</p> <p>The Bid Form (Techno-Commercial Bid) as per Section-VII, Part 1 of 3, duly completed together with the relevant attachments shall be uploaded in the technical cover prescribed at e- tendering portal.</p> <p>Each Bidder shall submit with its bid the following attachments to Bid Forms (Techno-Commercial Bid and Price Bid, as the case may be) duly completed in all respect.</p>
10.1.2	The Techno-Commercial Bid should not contain any price content entry. In case, the Techno-Commercial Bid is found to contain any price content, such bid shall be liable for rejection.	
10.1.3	<p>Attribute in General Data</p> <p>The Attributes, if mentioned in General Data, requiring any confirmation / information are to ticked / fill up suitably.</p>	
10.2	<p>Envelope-II: Price Bid (to be submitted online in Financial Part on GePNIC portal)</p> <p>The Price Bid shall comprise of the following documents, which shall be uploaded by the Bidder in the “Finance” cover prescribed at e-tender portal.</p>	
10.2.1	Price Bid should not contain any matter in respect of Technical and / or Commercial aspects other than the details specifically sought in the Price Bid. If the Technical/commercial matters indicated in Price Bid are found to be in contradiction with the details furnished in Techno-Commercial Bid, the details furnished in Techno- Commercial Bid shall prevail.	
10.3	<p>Each Bidder shall submit his bid together with the following attachments to the Bid Form for “ENVELOPE-1 (TECHNO-COMMERCIAL) & ENVELOPE-2 (PRICE)” in the manner specified at ITB clause 10.1.1:</p> <p>(a) Attachment 1: Bid Security</p> <p>Bid Security shall be furnished in accordance with ITB Clause 13 in a separate sealed envelope. Bid not accompanied by the requisite Bid Security in a separate sealed envelope, or bid accompanied by Bid Security of insufficient value, shall not be entertained and in such case, the bid shall be returned to the Bidder without</p>	

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being opened pursuant to ITB Sub-Clause 13.4.

(b) Attachment 2: Documents related to legal status of Bidder

The Bidder and his associate, as the case may be, shall furnish the following declarations, information, legal documents so as to ascertain his/their legal status and to check that the person(s) signing the bid has/have the authority to sign the bid; and thus that the bid is binding upon the Bidder and his associate during the full period of its validity in accordance with ITB Clause No.12.

1. In case of Sole Proprietorship Concern

- i) The full name of an individual proprietor, his/her parentage, documentary proof of his/her age, permanent address and present postal address/ contact details.
- ii) A deed of declaration by the Proprietor, that no other individual or company has any share in the concern.

2. In case of Partnership Firm

- i) Certified photocopy of the Partnership Deed, with upto date amendments (if any).
- ii) Registration certificate issued by the Registrar of Firms concerned.
- iii) In case of change in the constitution of the firm due to retirement or death or addition of an incoming partner, photocopy of Deed of Dissolution, fresh registration Certificate and the fresh / extant Partnership Deed, as applicable.

3. In case of Private Limited Companies

- i) Certified to be true and upto date amended copy of Memorandum and Articles of Association of the Company.
- ii) Certificate of incorporation of the Company.

Board resolution authorising the Executive Director(s) to sign the bid/ execute contracts/agreements etc. and affix common seal thereon in accordance with the provision of Articles of Association of the Company.

OR

Original Power of Attorney issued by Competent Officer under the common seal of the Company, authorising the person to sign the bid/ execute contracts/agreements etc.

4. In case of Public Limited Companies and Statutory Corporations.

- i) Certified to be true copy of Memorandum and Articles of Association of the Company and/or the relevant Statute/Act.
- ii) Certificate of Incorporation of the company - In case of public limited Co. only.
- iii) Certificate of Commencement of Business - In case of public limited Co. only.
- iv) Board resolution authorising the Director(s)/ Executive Director(s) to sign the bid/ contracts/agreements and affix common seal thereon in accordance with the provisions of Article of Association of the Company.

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OR

Original Power of Attorney issued by Competent Officer under the common seal of the Company authorising the person to sign the bid/ execute contracts/agreements etc.

5. In case of Consortium/ Joint Venture bid (Applicable in case of Consortium/Joint Ventures as specified in QR)

- i) The information listed in Qualifying Requirements in Bidding Data Sheet shall be submitted for each Joint Venture or Consortium partner.
- ii) The bid, shall be signed so as to be legally binding on all partners;
- iii) One of the partners shall be nominated as being in charge and shall be designated as leader; this authorisation shall be evidenced by submitting with bid, a power of attorney signed by legally authorised signatories of all the partners;
- iv) The leader shall be authorised to receive instructions for and on behalf of any and all partners of the Joint Venture/Consortium.

The entire execution of the contract shall be done by Joint Venture/Consortium. The records of execution of work by Partners of Joint Venture/Consortium shall be kept at site.

The bidder shall open a Bank Account at site in the name of Joint Venture/Consortium and the Employer shall release all the payment into that account.

- v) All partners of the Joint Venture shall be liable jointly and severally for the execution of the Contract in accordance with the Contract terms, and a relevant statement to this effect shall be included in the authorisation mentioned under

(iii) above as well as in the Bid Form and in the Agreement (in the case of a successful bid) and;

- vi) Original Joint Venture / Consortium Agreement entered into by the Joint Venture or Consortium partners shall be submitted with the bid. The Joint Venture or consortium Agreement shall clearly specify the work and responsibility of each partner.

- vii) Satisfactory evidence of authority of the person signing on behalf of the Bidder shall be furnished with the bid.

- viii) A copy of the Partnership Deed/Memorandum of Association/Certificate of incorporation of the prime bidder and all the Joint Venture Partners shall also be enclosed.

(c) **Attachment 3: Bidder's Qualifications**

Documentary evidence establishing that the Bidder is qualified to perform the contract shall be furnished in Attachment-3 to the bid. The documentary evidence of the Bidder's qualifications to perform the contract, if his bid is accepted, shall establish to the Employer's satisfaction that the Bidder has the capabilities and capacities necessary to perform the contract and meet the experience and other criteria outlined below:

The Bidder shall provide satisfactory evidence that he and/or, where applicable, his Collaborator/Associate

- (i) Regularly undertake the execution of the type of work specified and has relevant

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experience.

(ii) Does not anticipate a change in ownership during the proposed period of execution of Works (if such a change is anticipated, the scope and effect thereof shall be defined).

(iii) Has adequate financial stability and status to meet the financial obligations pursuant to the Works covered in the Bidding Documents.

(iv) Has adequate capability and capacity to perform the Works properly and expeditiously within the time period specified.

In addition to the general requirements stipulated above, the Bidder should also specifically meet the qualifying requirements stipulated in Section-I, Intimation for Bid (IFB). However, the documentary evidence of the proposed sub-contractor's qualifications against the sub qualifying requirements if so specified in the bidding documents, shall also be furnished in Attachment - 3. - See Sub-Clause (g) below.

Notwithstanding anything stated above, the Employer reserves the right to undertake a physical assessment of the capacity and capabilities including financial capacity and capability of the Bidder / his Collaborator(s) / Associate(s) / Subsidiary(ies) / Group Company(ies) to perform the Contract, should the circumstances warrant such assessment in the overall interest of the Employer.

The physical assessment shall include but not be limited to the assessment of the office/facilities/banker's/reference works by the Employer. A negative determination of such assessment of capacity and capabilities may result in the rejection of the Bid.

The above right to undertake the physical assessment shall be applicable for the qualifying requirements stipulated in both Section - ITB and in Section - BDS

Bidders shall certify their compliance on "Qualifying Requirements" of Employer by accepting the following attribute at e-tender portal:

" Do you certify full compliance on Qualifying Requirements "

Acceptance of above attribute shall be considered as bidder's confirmation to the following conditions:

- (a) The number of reference Plants/Orders quoted by Bidder in Attachment-3 of the bid, for establishing compliance to the specified Qualifying Requirement (QR), are in accordance with the provision specified in Bid Data Sheet (BDS).
- (b) The reference Plants/ Orders declared, shall only be considered for evaluation/ establishing compliance to Qualifying Requirement (QR). Any reference Plants/ Orders declared more than as specified in Bid Data Sheet (BDS) shall not be considered for evaluation/establishing compliance to Qualifying requirements.
- (c) No change or substitution in respect of reference Plants / Orders for meeting the specified Qualifying Requirement (QR) shall be offered by the bidder.

(c1) Attachment 3B: Details of Available bid Capacity

Declaration by the Bidder regarding maximum value of works performed during the last 7 (Seven) years as on the date of bid opening of Techno-Commercial bids and details of existing commitments and works to be completed during the next 3 years as on the date of bid opening of Techno-Commercial bids.

(c2) Attachment 3C: Certificate Regarding Ownership change

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Declaration by the Bidder confirming that they do not anticipate any in change ownership during proposed period of execution of the work (if such a change is anticipated, the scope and effect there of shall be defined).

(d) Attachment 4: List of similar Works on hand & percentage completed

The Bidder shall provide the details of similar works being executed by him in Attachment – 4 to his bid.

(e) Attachment 5: List of Contracts executed

The Bidder shall furnish the details of the Contracts executed by him in the last ten (10) years in Attachment – 5 to his bid.

(f) Attachment 6: Equipment/ Machinery deployment Schedule

The Bidder shall indicate the quantum and schedule of the equipment/ machinery/ lab equipment etc. he proposes to deploy for the work under this bid

(g) Attachment 6A: Safety Equipment & Safety Personal Protective Equipment

The Bidder shall indicate the quantum and schedule of the Safety Equipment and Safety Personal Protective Equipment etc. he proposes to deploy for the Work under this bid over and above the minimum requirement mentioned in **Attachment-6A**.

(h) Attachment 7: Subcontractors Proposed by the Bidder

The Bidder shall furnish the names of the agencies for each sub-contract(s) along with the broad scope of work for each of the sub-contracting works proposed for subcontracting. The Bidder shall not propose sub-contracting of the whole of the Works. The subcontracting of Work shall preferably be of a sizeable quantum of work in specific work areas. While proposing the subcontractor(s), Bidder should consider the progress/ requirements as per work schedule and accordingly assess the capacity & capability of the agency(s).

The Bidder shall also furnish the complete credentials of each of the agencies in Attachment- 7 which inter-alia shall include the following:

- (i) Details of similar works executed in Industrial/Infrastructure projects in the last seven (7) years including achievements. Details shall clearly indicate the name, address & contact details of the client, period of execution, the nature/scope of work, major civil/structural/ architectural quantities in his scope and physical progress achieved on monthly/yearly basis.
- (ii) List of plant & equipment proposed for deployment indicating whether the plant & equipment are lying idle and/or will be diverted from other works indicating likely date of release by client.
- (iii) Details of technical manpower available for deployment.
- (iv) Details of financial status for last three (3) years.
- (v) Letter of confirmation from the proposed sub-contractor, signifying his confirmation to execute the work.

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(i) Attachment 8: List of Financial Documents

Following documents shall be furnished in Attachment - 8 to the bid:

1. Balance Sheet and Profit and Loss Account Statement (of last 3 years duly certified by a practicing Chartered Accountant).
2. List of immovable assets of proprietor/ partners (In case of Proprietary/ Partnership firm).
3. Cash flow statement for execution of the subject package. ("**TO BE SUBMITTED WITH THE PRICE BID**")
4. PAN Number
5. GST Identification Number (GSTIN)

(j) Attachment 9: General Declaration of Bidder

Declaration that the Bidder has carefully examined the Bidding Documents in totality and his authorised personnel have visited the site for assessment of all factors for the purposes of bidding

(k) Attachment 10: Details of Accidents

The Bidder shall furnish the details of the fatal/non-fatal accidents taken place in the last three (3) years in various works executed/ being executed by the Bidder

(l) Attachment 11: Declaration of Import Content (To be submitted along with Price Bid):

Where the Bidder has quoted taking into account the Customs Duty benefits available for import of equipment and materials for facilitating the execution of the Works, he shall give all information required for issue of relevant Certificate by the Employer in Attachment - 11 to his bid

(m) Attachment 12: Declaration for import of Construction equipment (To be submitted along with Price Bid):

Where the Bidder has quoted taking into account the Customs Duty benefits available for import of construction equipment as per the extant Customs Acts and Notifications of Govt. of India, he shall give all information required for issue of relevant Certificate by Employer in Attachment - 12 to his bid.

(n) Attachment 13: Electronic Fund Transfer Authorisation Form

Authorization Form for release of payments through Electronic Fund Transfer System.

(o) Attachment 14: Integrity Pact - Accepted through GTE

(p) Attachment 15: Checklist for Techno Commercial Bid

10.4 Filling the information in the attachments with answers like "shall be given later" "or" "shall be mutually discussed and finalised" or "information already submitted at the time of enlistment" etc. shall not be accepted. Even if the information required in the attachments has been given in response to any other recent invitation for bids of the Employer or in some other reference, it is mandatory for the Bidder to give the information along with his bid as asked for. Non-compliance with the above or leaving the attachment(s) blank may lead to the rejection of the bid. The information furnished by the Bidder should be consistent, correct and true. The Employer reserves the right to verify the information given and if found incorrect, the bid may be rejected & Bid

INSTRUCTION TO BIDDERS

	security shall be forfeited.			
11	Bid Prices & Price Basis			
11.1	The currency of the bid and currency of payment shall be Indian Rupees.			
11.2	<p>The Bidder shall fill in unit rates/prices for all items of Works described in the Schedule of Quantities in figures and in words. The rates/prices quoted in the Schedule of Quantities shall also be deemed to include any incidentals not shown or specified but reasonably implied or necessary for the proper completion and functioning of the specified Works in accordance with the Bidding Documents. Items of the work described in the Schedule of Quantities for which no rate or price has been entered therein by the Bidder, shall also be considered as an abnormally quoted item and shall be governed by the relevant provisions of ITB Sub-Clause 23.4.</p> <p>Bidders are advised to price their bids in such a manner that the component for 'Amount linked to Safety Aspects/ compliance to Safety Rules' should not be less than the minimum percentage (as specified in BDS) of the total Contract price.</p>			
11.3	<p>The rates/amount quoted in the Schedule of Quantities shall be inclusive of all taxes, duties, levies, fees, royalty, etc, except Goods and Service Tax (GST). The Goods and Services Tax (GST) applicable on all items of Works described in the Schedule of Quantities, shall be quoted separately in the Attachment entitled "Taxes & Duties". The GST quoted by the bidder shall be as applicable in the Employer's country as on seven (7) days prior to the deadline for submission of Techno-Commercial Bids.</p> <p>Due Input Tax credits under GST as per the relevant Govt. Policy, wherever applicable, shall be taken into account by the Bidder while quoting his price.</p>			
11.4	The award of the Contract shall be on 'Works Contract' basis. The Employer shall bear and pay/reimburse to the Contractor Goods and Services Tax (GST) applicable on the items of Works Contract described in the Schedule of Quantities. However, the taxes, duties & levies as may be applicable on the materials used for Works Contract shall be to the contractor's account and no separate claim in this regard will be entertained by the Employer. Further, in case of any variation in the rates of the GST after the date seven (7) days prior to deadline set for submission of the Techno-Commercial bids, the same shall be paid/ reimbursed to/ recovered from the Contractor subject to submission of documentary evidence.			
11.5	It shall be incumbent upon the successful Bidder to obtain a registration certificate under the GST Law, and other law(s) relating to levy of tax, duty, cess etc. and necessary evidence to this effect shall be furnished by the successful Bidder to the Employer. If the successful Bidder intends to engage itself in quarrying or mining of soil/earth, sand, stone/aggregates, metals, minerals or minor minerals required for the Works, as the case may be, it shall obtain necessary permits under the applicable law for such mining or quarrying from the State/Central Government authorities and pay the fee or charges applicable thereto.			
11.6	The Bid Price shall also be inclusive of any Royalties or Seigniorage Fee or Cess or other charges payable on the quarried or mined metal, minerals, or minor minerals, as the case may be, at the rate(s) prevailing as on seven (7) days prior to the deadline set for Price Bid submission.			
11.7	If a new tax, duty or levy is imposed under statute or law in India after the date seven (7) days prior to date of Techno-Commercial bid opening and the successful bidder becomes liable there			
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	under to pay and actually pays the said new tax, duty or levy for bonafide use on the Works contracted, the same shall be reimbursed to the Successful Bidder against documentary evidence of proof of payment, provided that the amount thus claimed is not paid/payable under price variation provision of the Contract.			
11.8	The payment/reimbursement of statutory variations in the rates of tax and/or of new tax, duty or levy imposed under statute or law in India as per ITB Sub-Clauses 11.4, 11.5, 11.6 and 11.7 above, would be restricted only to direct transactions between the Employer and the successful bidder.			
11.9	The Employer shall be entitled to make necessary tax deductions at source as per the prevalent laws. The Contractor shall be required to submit the PAN details to the Engineer-in-Charge before the submission of the first bill.			
11.10	The Bidder shall himself be informed of all the applicable laws, notifications, rules, circulars and other communications of the State or Central or other authorities with regard to levy of any tax, duty, cess, levy or fee such that his bid prices take into account all of them.			
11.11	Unless otherwise provided in the Bid Data Sheet and Special Conditions of Contract, the rates and prices quoted by the Bidder will be subject to adjustment for price escalation during the performance of the Contract in accordance with GCC Clause 25. Any bid stipulating Price Adjustment provisions other than those specified in GCC Clause 25/SCC shall run the risk of rejection.			
11.12	In case 'Amount linked to Safety Aspects / compliance to Safety Rules' is less than aforesaid minimum percentage specified of the total Contract Price, the amount by which it is lower shall be retained proportionately from the other components of the Contract price while releasing payments of each RA bill. No interest shall be payable on the amounts linked to Safety Aspects / Compliance to Safety Rules including aforesaid retained amount. The amounts linked to Safety Aspects / Compliance to Safety Rules including aforesaid retained amount shall be payable in part or full based on safety compliance duly certified by EIC and Safety-in-charge on quarterly basis.			
12.	Bid Validity			
12.1	The bidder shall initially keep his bid (both Techno-Commercial Bid and Price Bid) valid for a period of six (6) months from the date of opening of Techno-commercial Bid. The bidder agrees not to vary, alter or revoke his bid either in whole or in part during that period.			
12.2	In exceptional circumstances, prior to the expiry of the original bid validity period, the Employer may request the Bidders to extend the period of validity for a specified additional period. The request and the responses thereto shall be made in writing. A Bidder agreeing to the request will not be permitted to modify his bid, but will be required to extend the validity of his bid security for the period of the extension.			
13.0	Bid Security			
13.1	The Bidder shall furnish, as part of its Bid, a Bid Security in a separate sealed envelope in the amount and currency as stipulated in the Bid Data Sheet (BDS). In case bid security amount is deposited as EFT, Proof of e-payment of Bid Security, shall be submitted in the e-tendering portal or in a separate sealed envelope.			
13.2	The Bid Security shall, at the Bidder's option, be in the form of Electronic Fund Transfer (EFT)/ irrevocable Letter of Credit or a bank guarantee from any of the banks specified in the Bid Data Sheets or an Insurance Surety Bond from an Insurer as per guidelines issued by Insurance Regulatory and Development Authority of India (IRDAI). Upon successful e-payment of the Bid Security on the NTPC e-tender portal, an e-			
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	<p>receipt shall be generated by the system, a copy of which is to be submitted by the bidder as a part of its bid, in the e-tendering portal or in a separate sealed envelope, as a proof of e-payment of Bid Security.</p> <p>In case of Foreign Bidders, the Bid Security can be from any other Bank also in addition to the Banks specified in the Bid Data Sheets. If the Bank Guarantee is from a Bank not specified in the Bid Data Sheets, then the Bank Guarantee shall be confirmed by any of the Banks specified in the Bid Data Sheets.</p> <p>The format of the Bank Guarantee/ Insurance Surety Bond shall be in accordance with the form of bank guarantee/ Insurance Surety Bond towards bid security included in the Bidding Documents. Bid Security shall remain valid for a period of forty-five (45) days beyond the original Bid validity period and beyond any extension of bid validity subsequently requested under relevant clause of ITB.</p>			
13.3	Not Used			
13.4	Any bid not accompanied by an acceptable bid security in a separate sealed envelope shall be rejected by the employer as being non-responsive and shall not be opened. In case, the bid security is submitted as EFT, bidder to submit the proof of e-payment of bid security either in separate sealed envelope or in the e-tendering portal. Further Stage-II (Price Bid) (in case of Two Stage bidding) not accompanied by requisite bid security extension (in case Bid Security is submitted in the form of BG/ Insurance Surety Bond) in a separate sealed envelope shall be rejected by the Employer as being non-responsive and shall not be opened.			
13.5	<p>BG against Bid Security issued by a Bank outside India needs to bear stamp duty of appropriate value applicable to the place in NTPC where BG is to be submitted. The BG may be got adjudicated by the employer from Collector of Stamps, within 3 months of arrival of BG in India. Expenses incurred in this regard shall be borne by Employer.</p> <p>Insurance Surety Bond against Bid Security issued by an Indian Insurance company outside India needs to bear stamp duty of appropriate value applicable to the place in NVVN where Insurance Surety Bond is to be submitted. The Insurance Surety Bond may be got adjudicated by the employer from Collector of Stamps, within 3 months of arrival of Insurance Surety Bond in India. Expenses incurred in this regard shall be borne by Employer.</p>			
13.6	Subject to clause 12.8 below, the Bid Security of the Bidder whose Techno-Commercial Bid has not been found acceptable, shall be returned along with letter communicating rejection of Techno-Commercial Bid. The Bid Security of the bidders who are unsuccessful after opening of Price Bids shall be returned expeditiously.			
13.7	The Bid Security of the successful Bidder to whom the contract is awarded will be returned when the said Bidder has signed the Contract Agreement and has furnished the required Performance Securities pursuant to relevant clauses of ITB.			
13.8	<p>The Bid Security may be forfeited:</p> <p style="margin-left: 40px;">(a) if the Bidder withdraws or varies its Bid during the period of Bid Validity;</p> <p style="margin-left: 40px;">(b) If the Bidder does not accept the correction of its Bid Price pursuant to ITB Sub-Clause 26.2;</p> <p style="margin-left: 40px;">(c) If the Bidder refuses to withdraw, without any cost to the</p>			
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		<p>Employer, any deviation, variation, additional condition or any other mention anywhere in the bid, contrary to the provisions of bidding documents;</p> <p>(d) In the case of a successful Bidder, if the Bidder fails within the specified time limit to furnish the required Contract Performance Guarantee/Security Deposit in accordance with relevant clause of ITB.</p> <p>(e) If the bidder/his representatives commit any fraud while competing for this contract pursuant to Fraud Prevention Policy of NTPC.</p> <p>(f) In case the Bidder/Contractor is disqualified from bidding process in terms of Section 3 and 4 of Integrity Pact.</p>
13.9	Confirmation of BG through Structured Financial Messaging System (SFMS)/SWIFT	<p>While issuing the physical BGs, the Bidder's Bank shall also send electronic message through secure SFMS (in case of BGs issued from within India) or SWIFT (in case of BGs issued from outside India) to Employer's Beneficiary Bank whose details are provided herein below:</p> <p>(i) Bank Name: ICICI Bank Limited</p> <p>(ii) Branch: CONNAUGHT PLACE BRANCH</p> <p>(iii) Bank Address: 9A, PHELPS BUILDING, INNER CIRCLE, NEW DELHI-110001</p> <p>(iv) IFSC Code: ICIC0000007</p> <p>(v) Account No.: 000705008910</p> <p>BG issuing/amending bank must send the BG advice in the form of message format via SFMS (Structured Financial Messaging System) as provided by RBI. The format of the message for confirmation of the BG shall be as below:</p> <p>BG advising message: IFN 760COV/ IFN 767COV via SFMS</p> <p>Field Number: Particulars (to be mentioned in Row 1)</p> <p>7037: NVVNBG8910 (unique identifier)</p>
13.10	13.10.1	<p>Wherever the submission of Bid Security has been prescribed in the Bidding Documents, the Bid must be accompanied by the Bid Security in a separate envelope. The envelope must be clearly marked on top to evidence the presence of bid security.</p> <p>In case the Bid Security is deposited by the Bidder/ vendor at the tendering portal through e-payment, as applicable, bidder to submit the proof of e- payment of bid security either in separate envelope or in the e-tendering portal.</p>

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13.10.2	<p>In case of Bidders opting for Bank Guarantee as Bid Security but unable to submit the Original Bank Guarantee in physical form at the tender opening location, before the deadline for submission of bids, following shall also be considered acceptable, subject to para 13.10.2.1 below:</p> <p>(i) The issuing bank shall intimate through their own official e-mail id to concerned C&M department with a copy to Bidder regarding issuance / extension of Bank Guarantee (BG) along with following documents, before the deadline of submission of bids: -</p> <p style="margin-left: 40px;">a) The scanned copy of the BG.</p> <p style="margin-left: 40px;">b) SFMS / SWIFT message acknowledgement copy sent to Employer / Employer's banker stating the date of sending.</p> <p style="margin-left: 40px;">c) An undertaking from the issuing Bank strictly as per format enclosed at Annexure-III to BDS.</p> <p style="margin-left: 40px;">SFMS / SWIFT message must be sent to the Employer/Employer's bank, details of which are mentioned in Bidding documents.</p> <p>(ii) Bidders shall also be required to upload the scanned copy of the BG on e-Tender Portal in Fee Cover.</p>
13.10.2.1	<p>The bidder shall be required to submit all the documents in the manner as specified at para 13.10.2 above, to reach Employer before the deadline for submission of bids, failing which its bid shall be rejected as being non- responsive.</p> <p>In such a case, Bidder shall also be required to submit the Original BG in physical form to reach Employer at the address mentioned in Bidding Documents, not later than 10 days from the date of submission of Techno-Commercial bids or before the Price Bid opening, whichever is earlier, failing which its bid shall be rejected and not considered for further evaluation.</p>
14.	Work Schedule
	<p>The entire Work covered under the contract of this bid shall be completed within the time specified in the Bid Data Sheet and further elaborated in the Technical Specifications. The Work shall be performed in time and to achieve the targets, the Contractor shall have to plan adequate mobilisation of all resources. List of equipment, construction methodology, site organisation setup and a detailed Work Schedule shall be discussed with the successful Bidder after the award of the Contract and agreed to and such agreed Work Schedule shall form part of Contract Agreement.</p>
15.	Format and Signing of Bid
	<p>The bid including all documents submitted online shall be digitally signed using Class- III signature by a duly authorized representative of the Bidder to bind him to the contract. The authorization shall be indicated by written power of attorney as per ITB Clause 10.1.1 and shall be submitted in physical form prior to date & time for opening of Techno-Commercial Bid.</p>
16.	Sealing and Marking of Bids

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	<p>Bid shall be submitted through e-tender mode in the manner specified elsewhere in bidding document. No Manual/ Hard Copy of the Bid shall be acceptable.</p> <p><u>Bidder should note that file related to particular Attachment/ Schedule including their annexures/ appendices, if any, shall be given name of that Attachment/ Schedule only. Bidders to further ensure that documents uploaded online are being downloaded properly. Employer shall not be responsible for corrupt files, if any</u></p>	
16.1		<p>Documents to be submitted in physical form (as brought out at ITB clause 10.1) shall be sealed and marked in the following manner:</p> <p>(a) Techno-Commercial Bid:</p> <p>(i) The bid security furnished in accordance with ITB Clause 13 shall be sealed in a separate envelope duly marking the envelope as "ATTACHMENT-1: BID SECURITY".</p> <p>(ii) Cost of Bidding Documents ₹ 22,500</p> <p>(iii) The Legal document/power of attorney furnished in accordance with ITB Clause 10.1.1 shall be sealed in a separate envelope duly marking the envelope as "ATTACHMENT-2: POWER OF ATTORNEY".</p> <p>The envelopes shall then be sealed in an outer envelope.</p>
16.2		<p>The inner and outer envelopes shall:</p> <p>(a) be addressed to the Employer at the address given in the Bid Data Sheets and bear the Package name indicated in the Bid Data Sheets, the Invitation for Bids number indicated in the Bid Data Sheets, and the statement "DO NOT OPEN BEFORE [date]," to be completed with the time and date specified in the Bid Data Sheets, pursuant to ITB clause 20.</p> <p>(b) The inner envelopes shall also indicate the name and address of the Bidder.</p> <p>(c) If the outer envelope is not sealed and marked as required by ITB Sub-Clause</p> <p>i) above, the Employer will assume no responsibility for its misplacement.</p> <p>ii) Bidders are requested to submit offer/proposal in e-tender portal as under</p> <p>I. Online Bid</p> <p>i. Acceptance of conditions of GTE</p> <p>Following conditions shall be specified in the GTE:</p> <p>A. Compliance of All Provisions of Bidding Documents</p> <p>No deviation, whatsoever, is permitted by Employer, to any provisions of the Bidding Documents. The bidders are advised that while making their Bid proposals and quoting prices, all conditions may appropriately be taken into consideration</p> <p>Bidders shall certify their full compliance to all the provisions of Bidding Documents and its subsequent Amendment(s) / Clarification(s) / Addenda /</p>

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Errata, if any, issued by the Employer by accepting (i.e. selecting the option "YES") in E-Tender Portal:

"DO YOU CERTIFY FULL COMPLIANCE TO ALL PROVISIONS OF BID DOC?".

Acceptance of above attribute under "GTE" shall be considered as bidder's confirmation to the following:

a. Confirm that we comply with all terms, conditions and specifications of the Bidding Documents read in conjunction with Amendments(s)/ Clarification(s) /Addenda /Errata (if any) issued by the Employer prior to opening of Techno-Commercial Bids and the same has been taken into consideration while making our Techno-Commercial Bid & Price Bid and we declare that we have not taken any deviation in this regard.

b. Any deviation, variation or additional condition etc. or any mention, contrary to Bidding Documents and its Amendments(s)/Clarification(s) /Addend/Errata (if any) found anywhere in our Techno-Commercial Bid and/ or Price Bid, implicit or explicit shall stand unconditionally with drawn, without any cost implication whatsoever to Employer, failing which the bid security shall be forfeited.

B. Bidders are required to certify their compliance on "Qualifying Requirements" of Employer by accepting (i.e. selecting the option "YES") the following in GTE:

"Do you certify full compliance on Qualifying Requirements?"

Bids cannot be submitted without acceptance of above attribute.

Acceptance of above attribute shall be considered as bidder's confirmation to the following conditions:

a. The number of reference plants/works/installations quoted by bidder in Attachment 3 of their bid, for establishing compliance to the specified Qualifying Requirement (QR) are not more than the number of works as mentioned in Bid Data Sheets.

b. The reference plants/works/installations declared more than the number of works as mentioned in Bid Data Sheets, shall not be considered for evaluation/establishing compliance to Qualifying Requirement (QR).

c. No change or substitution in respect of reference plants/ works/ installation (as declared by bidder) by new/additional plants/ works/ installations for meeting the specified Qualifying Requirement (QR) shall be offered by bidders.

C. Bidders are required to certify their compliance to the "Fraud Prevention Policy" of Employer by accepting (i.e. selecting the option "YES") the following attribute in Electronic Form on e-tender site.

"Do you accept Fraud Prevention Policy of Employer?"

Bids can be submitted by clicking on the "Submit" Tab and attaching relevant Digital Certificates.

Any other condition, if mentioned in GTE, requiring any confirmation/information are to ticked/ filled up suitably.

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		<p>Upload the following in Cover-I</p> <ul style="list-style-type: none"> i) Attachment 1: BID Security ii) Cost of Bidding/Tender Documents (scanned copy) iii) Power of Attorney <p>Upload the following in Pre-Qual/Technical Cover/Envelope</p> <p>Techno-Commercial Bid covered under ITB Clause 10.3 i.e. The Techno-Commercial Bid (comprising the Bid Form (Techno-Commercial Bid) as per Section-VII, Part 1 of 3, together with all its Attachments) is to be submitted in the Technical Cover. Bidders to ensure that all uploaded documents must be digitally certified.</p> <p>Upload the following in Price Cover</p> <p>Price Bid (comprising the Bid Form (Price Bid) as per Section-VII, Part 2 of 3, together with its Attachments and Price Schedules) shall be submitted under Price Bid. Bidders will attach the completed Bid Form (Price Bid), Attachments and all Price Schedules along with all annexure in Financial Part. Bidders to ensure that all uploaded documents must be digitally certified. Bidder to further ensure that documents are uploaded properly. Employer shall not be responsible for corrupted files, if any, uploaded. Further file related to Attachment/ Schedule including their annexure/appendices, if any, shall be given name of that Attachment/Schedule only.</p> <p>The Price Bid is strictly in conformity with the provisions of the Bidding Documents; Amendments/Clarifications thereof issued and does not contain any matter or deviation to any of the provisions of the Bidding Documents, including all Amendments/Clarifications.</p> <p>After opening of Price Bid, if any deviation to any of the provisions of the Bidding Documents (including all amendments/Clarifications) is observed in the Price Bid, the same shall be ignored by Employer and considered as withdrawn by Bidder without any cost implication to Employer.</p> <p>The on-line bid is to be digitally signed using a valid Class III digital certificate as per Indian IT Act from the licensed Certifying Authorities (CA) operating under the Root Certifying Authority of India (RCAI) namely Controller of Certifying Authorities (CCA) of India, failing which the bid shall be rejected.</p>
17.	Deadline for Submission of Bids	
17.1	<p>Bids must be submitted online, no later than the time and date stated in the Bid Data Sheet.</p> <p>Original Bid Security, Tender Fee, and Power of Attorney, shall be submitted in physical form before stipulated bid submission time at the address specified in BDS. Employer shall not be liable for loss / non-receipt / late receipt of above documents in postal transit.</p>	
17.2	<p>Employer may, at its discretion, extend this deadline for submission of bids by amending the bidding documents in accordance with ITB Sub-Clause 7.3, in which case all rights and obligations of Employer and Bidders will thereafter be subject to the deadline as extended.</p>	
17.3	<p>The time and date for opening of Envelope-II (Price) Bid shall be intimated</p>	
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		separately.	
18.	NOT USED		
19.	Modification and Withdrawal of Bids		
	19.1	The Bidder may modify or withdraw its bid after submission prior to deadline prescribed for bid submission. In case of withdrawal a letter giving the reason is to be uploaded. once a bid is withdrawn, the bid cannot be resubmitted.	
	19.2	No bid may be withdrawn in the interval between the bid submission deadline and the expiration of the bid validity period specified in ITB Clause 13. Withdrawal of a bid during this interval may result in the Rejection of the Bid.	
20.	Opening of Bids		
	20.1	Techno-Commercial Bid Opening	
	20.1.1	<p>The Employer will first open Techno-Commercial Bids in the presence of bidders' representatives who choose to attend the opening at the time, on the date and at the place specified in the Bid Data Sheet. In the event of the specified date for the opening of bids being declared a holiday for EMPLOYER, the bids will be opened at the appointed time on the next working day. All important information and other such details as EMPLOYER, at its discretion, may consider appropriate, will be announced at the opening.</p> <p>The Employer shall first open the Bid Security, Power of Attorney, and Tender Fees of all the bidders. Based on the offline documents, bids of only those bidders will be opened whose documents are found in order and acceptable.</p>	
	20.1.2	In case requisite bid security pursuant to ITB Clause 13 specified in Bidding Documents are not submitted before the stipulated bid submission closing date and time, then Bid shall be rejected by EMPLOYER as being non- responsive and shall not be opened.	
	20.1.3	Techno-Commercial Bids which are generally responsive to the operating and performance requirements as laid out in Technical Specifications of bidding documents will then be considered for evaluation.	
	20.1.4	The Price Bid will remain unopened and shall be opened separately by EMPLOYER after completion of evaluation of Techno-Commercial Bids.	
	20.2	Envelope-II Price Bid Opening	
	20.2.1	After evaluation of Techno-Commercial Bid, Price bid from the bidders who have been considered qualified and whose bid has been considered Techno-Commercially responsive will be opened. Bidders, whose Techno-Commercial Bid is not substantially responsive, shall also be rejected in e-procurement portal and their Price bid will be rejected and shall not be opened and their bid security shall be returned prior to opening of Price Bid.	
	20.2.2	Price bids of those Bidders, who have been considered qualified and whose Techno- Commercial Bid found to be responsive, will be opened online in presence of the Bidder's authorised representatives who choose to attend.	
21.	Clarification on Bids		
	21.1	During the bid evaluation, the Employer may, at its discretion, ask the Bidder for a	
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		clarification of its bid including documentary evidence pertaining to only the reference works/installations declared in the bid for the purpose of meeting Qualifying Requirement specified in Bid Data Sheet. The request for clarification and the response shall be in writing and no change in the price or substance of the bid including substitution of reference works / installations in the bid by new / additional work / installation for conforming to Qualifying Requirement shall be sought, offered or permitted.
	21.2	Subject to ITB Clause 21.1, no Bidder shall contact Employer on any matter relating to its bid, from the time of the opening of bids to the time the contract is awarded. Any effort by a Bidder to influence Employer in bid evaluation, bid comparison or contract award decisions may result in rejection of the Bidder's bid.
22.	Evaluation and Comparison of Bids	
22.1	Evaluation of Techno-commercial proposals Including Qualification Data	
	22.1.1	The Employer will initially determine whether each Techno-Commercial bid is of acceptable quality, is generally complete and is substantially responsive to the Bidding Documents. For purposes of this determination, a substantially responsive bid is one that conforms to all the terms, conditions and specifications of the Bidding Documents without material deviations, objections, conditionalities or reservations. A material deviation, objection, conditionality or reservation is one (i) that affects in any substantial way the scope, quality or performance of the contract; or (ii) that limits in any substantial way, inconsistent with the Bidding Documents, the Employer's rights or the Bidder's obligations under the contract; or (iii) whose rectification would unfairly affect the competitive position of other Bidders who are presenting substantially responsive bids.
	22.1.2	<p>Compliance with the Provisions of Bidding Documents</p> <p>No deviation, whatsoever, is permitted by EMPLOYER to any provisions of Bidding Documents. The Bidders are advised that while making their Bid proposals and quoting prices, all conditions may appropriately be taken into consideration. Bidders shall certify their compliance to the complete Bidding Documents by accepting the following attribute at e-tender portal through GTE:</p> <p>“Do you certify full compliance to all provisions of Bid Doc?”</p> <p>Acceptance of above attribute shall be considered as Bidder's confirmation that any deviation to the any Provisions found anywhere in their Bid Proposal, implicit or explicit, shall stand unconditionally withdrawn, without any cost implication whatsoever to the Employer, failing which the bid shall be rejected.</p>
	22.1.3	The Employer's determination of a bid's responsiveness is to be based on the contents of the bid itself without recourse to extrinsic evidence. If a bid is not substantially responsive, it will be rejected by the Employer, and may not subsequently be made responsive by the Bidder by correction of the nonconformity
	22.1.4	<p>Bidders shall certify their compliance on "Qualifying Requirements" of Employer by accepting the following attribute at e-tender portal through GTE:</p> <p>" Do you certify full compliance on Qualifying Requirements "</p> <p>Acceptance of above attribute shall be considered as bidder's confirmation to the</p>

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		<p>following conditions:</p> <p>a. The number of reference Plants/Orders quoted by Bidder in Attachment-3A of the bid, for establishing compliance to the specified Qualifying Requirement (QR), are in accordance with the provision specified in Bid Data Sheet.</p> <p>b. The reference Plants/Orders/declared, shall only be considered for evaluation / establishing compliance to Qualifying Requirement (QR). Any reference Orders declared more than as specified in Bid Data Sheet shall not be considered for evaluation/establishing compliance to qualifying requirements.</p> <p>c. No change or substitution in respect of reference Plants/Orders for meeting the specified Qualifying Requirement (QR) shall be offered by the bidder.</p>
	22.1.5	<p>EMPLOYER, by the examination of Techno-Commercial Bid, will determine to its satisfaction whether the participating bidders are qualified to satisfactorily perform the contract in terms of the qualifying requirements stipulated in the Bid Data Sheet. The determination will take into account the bidder's financial and technical capabilities, in particular its contracts, works in hand, future commitments and current litigation. It will be based upon an examination of documentary evidence of bidder's qualification submitted by the bidder in relevant attachment to the Bid Form of Techno-Commercial Bid as well as such other information as EMPLOYER deems necessary and appropriate. Notwithstanding anything stated anywhere else in the bidding documents, EMPLOYER reserves the right to seek in writing information relating to qualifying requirements in addition to details contained in the bid. The bidder shall furnish required information promptly to EMPLOYER. EMPLOYER will shortlist the Bidders meeting the stipulated Qualifying Requirements</p>
	22.1.6	<p>An affirmative determination of meeting the qualifying requirements will be a prerequisite for further evaluation of Techno-Commercial bid and holding clarification meeting, if any, with the Bidder. A negative determination will result in rejection of the Bidder's Techno-Commercial Bid in which event EMPLOYER will not open the Price Bid of the concerned bidder and his bid security shall be returned.</p>
	22.1.7	<p>The capabilities of the vendors and subcontractors, proposed in Attachment-7, may also be evaluated for acceptability. Should a vendor or subcontractor be determined to be unacceptable, the Bidder will be required to substitute an acceptable vendor or subcontractor without any change in the Contract price.</p>
	22.1.8	<p>The Employer will carry out a detailed evaluation of the Techno-Commercial bids in order to determine whether the technical aspects are in accordance with the requirements set forth in the bidding documents. In order to reach such a determination, the Employer will examine and compare the technical aspects of the bids on the basis of the information supplied by the bidders, taking into account the following factors:</p> <p>(a) overall completeness and compliance with the Technical Specifications and Drawings; deviations from the Technical Specifications as identified in Attachment 6 to the bid; suitability of the facilities offered in relation to the environmental and climatic conditions prevailing at the site; and quality, function and operation of any process control concept included in the bid. The bid that does not meet minimum acceptable standards of completeness, consistency and detail will be rejected for non- responsiveness.</p> <p>(b) achievement of specified performance criteria by the facilities</p> <p>(c) type, quantity and long-term availability of mandatory and recommended</p>

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		<p>spare parts and maintenance services</p> <p>(d) any other relevant factors, if any, listed in the Bid Data Sheet, or that the Employer deems necessary or prudent to take into consideration</p> <p>(e) Compliance with the time schedule as specified in the bidding documents.</p> <p>Time schedule (program of performance)</p> <p>The plant and equipment covered by this bidding document are required to be shipped and installed and the facilities are to be completed within the period named in the Bid Data Sheet after the effective date specified in the Contract Agreement. Bidders are required to base their prices on the time schedule given in Appendix-4 to the form of Contract Agreement (Time Schedule) or, where no time schedule is given, on the completion date(s) given in the Bid Data Sheet. No credit will be given for earlier completion.</p> <p>(f) Demonstration Parameters</p> <p>Bidders shall state the demonstration parameters for the proposed facilities in response to the Technical Specifications. In case a minimum (or a maximum, as the case may be) level of parameters is specified in the Technical Specifications for the bids to be considered responsive, bids offering plant and equipment with such functional guarantees less (or more) than the minimum (or maximum) specified may be rejected.</p>
22.2	Opening of Price Proposal and Evaluation	
	22.2.1	After the evaluation process of Techno-Commercial bid is completed, Employer will inform in writing the eligible Bidders regarding date, time and venue set for the opening of Price Bid. Bidders, whose Techno-Commercial Bid is not substantially responsive or does not meet the Qualification Requirements set forth in the bidding documents, shall also be informed in writing and their bid will stand rejected, a price bid shall not be opened.
	22.2.2	Price Proposals of those Bidders, whose Techno-Commercial Proposal found to be substantially responsive, will be opened in presence of the Bidder's authorised representatives (not exceeding two per Bidder) who choose to attend. All important information and any such other detail, as may be considered appropriate by the Employer will be read out during the bid opening.
	22.2.3	The Employer will determine whether the Price Proposals are complete, (i.e. whether they have taken into account cost of all services/items of the corresponding Techno- Commercial proposals, if not, the Employer will add cost of the same to the initial price) and correct any computational errors.
	22.2.4	<p>Arithmetical errors in the Price Proposals will be rectified on the following basis:</p> <p>If on check there are found to be differences between the rates/prices given by the Bidder in words and figures or in the amount worked out by him in each section of the Schedule of Quantities and in the Grand Total of all the sections of Schedule of Quantities, the same shall be adjusted in accordance with the following rules:</p> <p>a) In the event of a discrepancy between description in words and figures in respect of item rates quoted by a Bidder, the description in words shall prevail.</p> <p>(b) In the event of an error occurring in the amount column of Schedule of</p>

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		<p>Quantities as a result of wrong extension of the quantity and the unit rate, the unit rate shall be regarded as firm and extension shall be amended on the basis of the unit rate.</p> <p>(c) All errors in totalling in the amount column and in carrying forward totals shall be corrected.</p> <p>(d) The totals of various sections of Schedule of Quantities amended shall be carried over to the General Summary and the bid sum amended accordingly. The bid sum so altered shall, for the purpose of bid, be substituted for the sum originally bid and considered for evaluation and comparison of the bids and also for acceptance of the bid, instead of the original sum quoted by the Bidder.</p>
	22.2.5	The evaluation shall be based on the evaluated cost of fulfilling the contract in compliance with all commercial, contractual and technical obligations under this Bidding Document. The Employer's evaluation of a bid will also take into account the GST specified by the Bidder in its Bid (applicable on the items of Works described in Schedule of Quantity), which will be added to each Bidder's bid price to arrive at an "Evaluated Bid Price".
22.3	Abnormally High or Low Rated Items	
	22.3.1	If the rates/prices quoted by the successful bidder for certain items of the Bill of Quantities (wherever such rates/prices have been called for in the bids,) are found to be having a variation of +/-25% or above in relation to Employer's estimate of the cost of work to be performed under the contract, then such items of works shall be identified as abnormally high rate (AHR) or abnormally low rate (ALR).
	22.3.2	<p>After evaluation of the rates/prices analysis which includes early cash flow analysis, Employer/NTPC may require the successful bidder to provide a suitable undertaking to execute the items of works including the ALR items and complete the entire work under the contract.</p> <p>Further, the Employer may invite the successful bidder for discussions/tieups to safeguard the interest of the Employer/NTPC and ensure that the Bidder executes the ALR items of works and completes the entire work under the contract.</p>
23.	Award Criteria	
	23.1	Prior to the expiration of the bid validity prescribed by the Employer, the Employer will issue a Letter of Award(LOA) to the successful Bidder containing reference of the documents which form the Contract, Scope of Work, Contract Price, period of completion of the Works, terms of payment, price adjustment, and other important aspects in consideration of the execution and completion of the Works and the remedying of any defects therein by the Contractor as prescribed by the Contract.
24.	Employer's Right to Accept Any Bid and to Reject Any or All Bids	
	24.1	Notwithstanding ITB Clause 23, the Employer reserves the right to accept, (whole or in part) and the Bidder shall be bound to perform the same at his quoted rate, or reject any bid for any reasons including national defence and security consideration and to annul the bidding process and to reject all bids at any time prior to award of contract without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the Employer's action. Decision of Employer shall be final and binding in this regard.
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25.	Letter of Award	
	25.1	Prior to the expiration of the bid validity prescribed by the Employer, the Employer will issue a Letter of Award(LOA) to the successful Bidder containing reference of the documents which form the Contract, Scope of Work, Contract Price, period of completion of the Works, terms of payment, price adjustment, and other important aspects in consideration of the execution and completion of the Works and the remedying of any defects therein by the Contractor as prescribed by the Contract.
	25.2	This Letter of Award will constitute the formation of the Contract.
26.	Contract Performance Security	
	26.1	Within forty-five (45) days from the date of Letter of Award or prior to release of 1st RA bill/Mobilization advance whichever is earlier, the successful Bidder shall furnish to the Employer a Contract Performance Guarantee (CPG) towards faithful performance of the Contract for an amount equivalent to 10% of the Contract Price
	26.2	The CPG shall be in the form of a Bank Guarantee issued by a Bank as per the list enclosed in the Bidding Documents. The format of the said bank guarantee shall be in accordance with the format included in the Bidding Documents.
	26.3	While issuing the physical BG(s), the Bidder's Bank shall also send electronic message to Employer's Beneficiary Bank, pursuant to ITB sub-clause titled 'Confirmation of BG through Structured Financial Messaging System (SFMS)/SWIFT'.
27.	Signing of Contract Agreement	
	27.1	The Successful Bidder/ Contractor shall prepare and finalize the Contract Documents for signing of the formal Contract Agreement and enter into a Contract Agreement with the Employer within forty-five (45) days from the date of Letter of Award or within such other time, as may be desired by the Employer.
	27.2	<p>Manner of Execution of Contract Agreement</p> <p>i) Unless and until a formal contract is prepared and executed, the Letter of Award read in conjunction with the Bidding Documents will constitute a binding contract.</p> <p>ii) The Contract Agreement shall be signed at the office of the Employer. The Contract Agreement will be signed in three originals and the Contractor shall be provided with one signed original and the other two originals will be retained by the Employer.</p> <p>iii) The Contract Agreement shall comprise of the following:</p> <p>(a) The Contract agreement alongwith its appendices, namely,</p> <ol style="list-style-type: none"> 1. Invitation for Bids (IFB), 2. General Conditions of Contract, including any amendment/ errata thereto, 3. Special Conditions of Contract, including any amendment/ errata thereto, 4. The bid submitted by the Bidder i.e. Bid Form alongwith its Attachments

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		<p>and Schedule of Quantities</p> <p>5. Technical Specifications and Bid Drawings, including any amendment/errata thereto.</p> <p>(b) Agreed Quality Assurance Plan</p> <p>(c) Letter of Award alongwith its appendices.</p> <p>iv) The Contractor shall provide free of cost to the Employer all the engineering data, drawings and descriptive materials submitted as a part of his bid, in at least three (3) copies to form an integral part of the Contract Agreement within twenty-eight (28) days after issuing of Letter of Award. The Contractor shall further provide for signing of the Contract Agreement as per prescribed proforma enclosed in the Bidding Documents, appropriate Power of Attorney and the requisite stamp papers. All the other documents required for the preparation of the Contract Agreement shall be provided by the Employer.</p> <p>v) Unless and until the Contract Agreement is signed as above, no payments under the Contract as per GCC Clauses entitled 'Payment On Account/Progressive Interim Payments' and 'Time Limit for Payment of Final Bill' shall be released to the Contractor by the Employer nor any materials shall be issued to the Contractor as stipulated in the Special Conditions of Contract or otherwise agreed to be issued by the Employer.</p> <p>vi) Subsequent to signing of the Contract Agreement, the Contractor at his own cost shall provide the Employer with ten(10) copies of electronic version of the signed Contract Agreement on CD-ROM/USB drive within twenty (20) days of its signing.</p>
28.	Ineligibility for Future Tenders	
28.1	Notwithstanding the provisions regarding forfeiture of Bid Security specified in ITB Sub-Clause 13.7, if a Bidder after having been issued the Letter of Award, either does not sign the Contract Agreement, or does not submit an acceptable Initial Security Deposit/Entire Security Deposit in line with the provisions of the Contract and which results in retendering of the package then such bidder shall be treated ineligible for participation in re-tendering of this particular package	
28.2	If a bidder after opening of tenders where EMD is 'NIL/Not applicable' or exempted for bidders as per policy guidelines, withdraws its offer within the validity period of the offer, then such bidder shall be treated as ineligible for participation in the future tenders issued from the location specified in BDS for a period of 6 months from the date of withdrawal of the bid.	
28.3	If a bidder after having been issued the Letter of Award of a package where EMD is 'NIL/Not applicable' or exempted for bidder as per policy guidelines, either does not sign the Contract Agreement pursuant to ITB Clause titled 'Signing the Contract Agreement' or does not submit an acceptable Performance Security pursuant to ITB Clause titled 'Performance Security', and which result in retendering of the package then such bidder shall be treated ineligible for participation in re-tendering of this particular package. Further, such vendor shall also be dealt as per	

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		<p>the provisions of the policy for Withholding and Banning of Business Dealings.</p>
28.4		<p>Contractor Performance Feedback and Evaluation System:</p> <p>The Employer has in place an established “Contractor Performance and Feedback System” against which the Contractor’s performance during the execution of the Contract shall be evaluated on a continuous basis at regular intervals on the following seven parameters.</p> <ul style="list-style-type: none"> * Engineering and QA Capability * Finance * Supply * Construction and Installation * Field Quality * Safety * Claims and Disputes <p>The Score based feedback formats based on which Contractor’s performance shall be evaluated is enclosed at Annexure-A to GCC.</p> <p>In case the performance of the Contractor is found unsatisfactory, the Contractor shall be considered ineligible for participation in future tenders for three years.</p> <p>On completion of the above ineligibility period, the contractor would be required to submit a request to NTPC for participating in future tenders specifying the measures taken to improve their performance. The Contractor may also request for early revocation of suspension after completion of at least two (2) year of the suspension period. On receipt of such request, the performance of the Contractor shall be assessed/re-evaluated by NTPC and if the performance is found to be satisfactory, the Contractor shall be considered eligible for participation in future tenders.</p>
29.	Adherence to Fraud Prevention Policy	
	<p>The Bidder along with its associate/collaborators/sub-contractors/sub-vendors/consultants/service providers shall strictly adhere to the Fraud Prevention Policy of Employer displayed on its tender website https://ntpctender.ntpc.co.in/ or www.nvvn.co.in and shall immediately apprise Employer about any fraud or suspected fraud as soon as it comes to their notice. If in terms of above policy it is established that the bidder/his representatives have committed any fraud while competing for this contract then the bid security of the bidder shall be forfeited.</p> <p>Bidders shall certify their compliance on “Fraud Prevention Policy” of Employer by accepting the following GTE at the e-Tender Portal:</p> <p>“Do you certify full compliance to all provisions of Bidding Document?”</p>	
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	<p>Acceptance of General Technical Evaluation (GTE) of the Tender at e-Tender Portal shall be considered as bidder's confirmation that they have read the contents of the Fraud Prevention Policy as displayed on tender website at https://ntpctender.ntpc.co.in/ or www.nvvn.co.in under section 'policy docs' and undertake that they along with their associate/collaborator/subcontractors / sub vendors / consultants / service providers shall strictly abide by the provisions of the Fraud Prevention Policy.</p>	
30.	<p>Policy for Debarment from Business Dealings</p> <p>The Employer has in place a Policy for Debarment from Business dealings displayed on the website www.ntpc.co.in / www.ntpctender.ntpc.co.in. The version of Policy presently applicable is mentioned in BDS. Bidder/Contractor may be debarred from Business dealings on account of any of the grounds and following the procedures as detailed in the said Policy for Debarment from Business Dealings.</p> <p>Bidders shall certify their compliance on "Policy for Debarment from Business Dealings " of Employer by accepting the following General Technical Evaluation (GTE) of the Tender at e-Tender Portal https://eprocurementpc.nic.in/:</p> <p>“Do you certify full compliance to all provisions of Bidding Document?”</p> <p>Acceptance of above GTE shall be considered as bidder's confirmation to the following conditions:</p> <p>(1) Bidder have read the contents of Debarment Policy (applicable version mentioned in BDS) displayed on the website www.ntpc.co.in / www.ntpctender.ntpc.co.in and agreed to abide by this policy.</p> <p>a) Bidder is not Banned/Blacklisted by Ministry of Power or Deptt. of Expenditure, Ministry of Finance as on date of submission of bid.</p> <p>b) Bidder have not employed any public servant dismissed/removed or person convicted for an offence involving corruption or abetment of such offences.</p> <p>c) Bidder's Director(s)/ Owner(s)/ Proprietor/ Partner(s) have not been convicted by any court of law for offences involving corrupt and fraudulent practices including moral turpitude in relation to business dealings with Government of India or NTPC or NTPC's group companies during the last five years.</p> <p>(2) Bidder further confirms as under:</p> <p>that if at any point subsequent to award of Contract, the declarations given above are found to be incorrect, NVVN/ Employer shall have the full right to terminate the Contract and take any action as per applicable laws for breach of contract including forfeiture of Bid Security/Performance Bank Guarantee.</p>	
31.	<p>Benefits on Custom Duty</p>	
31.1	<p>The Owner shall issue Essentiality Certificate, as per relevant policies of the Govt. of India, to facilitate the bidders to avail any such benefits on import of goods under Chapter 98.01 of the Customs Tariff Act, which are required for incorporation in the Works under the contract. For the issue of such Essentiality Certificate by the Owner, the bidders shall be required to indicate the import content included in their bid price, in Attachment-11. However, the bidders shall themselves be solely responsible for availing such benefits, which they have considered in their bid. In case of failure of the bidders to receive the benefits partly or fully from the Govt. of India</p>	

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		<p>and / or in case of any delay in receipt of such benefits and/or withdrawal of such benefits by the Govt. of India, the Owner shall neither be liable nor responsible in any manner whatsoever.</p>	
31.2		<p>Bidders may like to ascertain availability of Customs Duty benefits available for import of Construction Equipment, if any, as per the extant Customs Acts & Notification of Govt. of India. The bidders shall be solely responsible for obtaining such benefits which they have considered in their bid and in case of failure to receive such benefits, the Employers will not compensate the Bidders. The Bidder shall furnish along with their bid, declarations to this effect in Attachment-12.</p> <p>Where the Bidder has quoted taking into account the Customs Duty benefits available for import of Construction Equipment, he must give all information required for issue of relevant Certificate by Owner alongwith his bid in Attachment- 12. The relevant Certificate will be issued on this basis only. Further, if such Certificate is required to be issued by any department/Ministry of Govt. of India or State Govt. where the Project is located other than the Employer, the bidder shall itself be responsible for obtaining such certificates from the concerned departments/Ministries. In such a case, the Employer may issue recommendatory letter to the Bidder. The bidders shall be solely responsible for obtaining the Customs Duty benefits available for import of Construction Equipment from the Govt. of India. In case of failure of the bidders to receive the benefits partly or fully from Govt. of India or in case of any delay in receipt of such benefits, the Owner shall neither be responsible nor liable in this regard in any manner whatsoever.</p>	
32.	Integrity Pact		
		<p>Bidders are required to unconditionally accept all the conditions of the "Integrity Pact (IP)" as per Attachment-14 to the Bidding Documents which has been pre-signed by the Employer.</p> <p>Bidders shall certify their compliance on "Integrity Pact " by accepting the following General Technical Evaluation (GTE) of the Tender at e-Tender Portal:</p> <p>“Do you certify full compliance to all provisions of Bidding Document?”</p> <p>On Bidder’s acceptance to the above GTE condition, Bidder confirms to have read, understood and unconditionally accept & commit to all the contents, terms, conditions and undertakings mentioned in the Integrity Pact which has been pre-signed by the Employer and enclosed with the Bidding Documents. Where the Joint Venture(s) / Consortium are permitted to participate in the bid pursuant to ITB Clause 8.1.2(a), acceptance of above GTE by bidder shall mean that all the JV Partner(s)/ Consortium members have read, understood and unconditionally accept & commit to all the contents, terms, conditions and undertakings mentioned in the Integrity Pact which has been pre-signed by the Employer and enclosed with the Bidding Documents.</p> <p>On Acceptance of the above GTE, Integrity Pact shall be considered signed by the Bidder</p>	
ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE		BIDDING DOCUMENT NO. NVVN / C&M/ RE-342 /2024-25 SECTION - II (ITB)	PAGE 27 OF 32

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/ JV Partner(s)/ Consortium members and the same shall come into force from the date of submission of bid.

It may also be noted that subsequent to Employer’s evaluation of Bids, resulting into award of Contract to a particular Bidder, the Integrity Pact so submitted shall form an integral part of the Contract.

32.1 Independent External Monitors (IEMs)

In respect of this package, the Independent External Monitors (IEMs) would be monitoring the bidding process and execution of contract to oversee implementation and effectiveness of the Integrity Pact Program.

The Independent External Monitor(s) (IEMs) as mentioned at NVVN website (<https://nvvn.co.in/>) under Integrity Pact tab have been appointed by NVVN, in terms of Integrity Pact (IP) which forms parts of the NVVN Tenders/Contracts.

This panel is authorized to examine /consider all references made to it under this tender. The bidder(s), in case of any dispute(s) / complaint(s) pertaining to this package may raise the issue with the designated 'Nodal Officer' in NVVN.

The Independent External Monitors (IEMs) have the right to access without restriction all Project documentations of the Employer including that provided by the Contractor. The Contractor will also grant the IEMs, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his Project Documentations. The same is applicable to Subcontractors. The IEMs are under contractual obligation to treat the information and documents of the Bidder / Contractor / Sub-Contractors/ JV partners/Consortium member with confidentiality.

The Nodal Officer for necessary coordination with Independent External Monitors shall be

Concerned Group: Head in C&M	:	if the issue pertains to awarding of Contract by C&M
Concerned Head of Department	:	if the issue pertains to other departments
Concerned Head of of Department	:	if the issue pertains to post- award execution of Contract

33. Purchase Preference to Make in India

33.1 Only Class-I local supplier & Class-II local supplier are eligible for participation in the tender. Purchase preference shall be given to 'Class-I local supplier' in the manner specified in BDS Annexure II.

34. “Restrictions on procurement from a Bidder of a country which shares a land border with India”

34.1 Any Bidder (including its Collaborator/Associate/DJU Partner/JV partner/Consortium Member/Assignee, wherever applicable) from a country which shares a land border with India will be eligible to bid in this tender only if bidder is registered with the Competent Authority as mentioned in GCC/Special Conditions of Contract (SCC).

Such registration should be valid for the entire period of bid validity or any extension thereof. However, in case the validity period of registration is less than

INSTRUCTION TO BIDDERS

		<p>bid validity period, the Bidder shall be required to submit the extension of the validity period of registration before the opening of price bids, failing which the bid shall be rejected.</p> <p>Further the successful bidder shall not be allowed to sub-contract supplies/ services /works to any “Sub-contractor” from a country which shares a land border with India unless such Sub-contractor is registered with the competent Authority as mentioned in GCC/SCC.</p> <p>However, the said requirement of registration will not apply to bidders/sub-contractors from those countries (even if sharing a land border with India) to which the Government of India has extended lines of credit or in which the Government of India is engaged in development projects. Bidders may apprise themselves of the updated lists of such countries available in the website of the Ministry of External Affairs.</p>
	34.2	<p>“Bidder” (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency, branch or office controlled by such person, participating in a procurement process.</p>
	34.3	<p>“Sub-contractor” (including the term ‘Sub-vendor’/Sub-supplier’ in certain contexts) means any person or firm or company, every artificial juridical person not falling in any of the descriptions of Sub-contractors stated here in before, including any agency branch or office controlled by such person, participating in a procurement process.</p>
	34.4	<p>“Bidders from a country which shares a land border with India” / “Sub- contractor from a country which shares a land border with India” mentioned in para 34.1 above means;</p> <ul style="list-style-type: none"> a) An entity incorporated, established or registered in such a country; or b) A subsidiary of an entity incorporated, established or registered in such a country; or c) An entity substantially controlled through entities incorporated, established or registered in such a country; or d) An entity whose beneficial owner is situated in such a country; or e) An Indian (or other) agent of such an entity; or f) A natural person who is a citizen of such a country; or g) A consortium or joint venture where any member of the consortium or joint venture falls under any of the above.
	34.5	<p>The beneficial owner for the purpose of clause “34.4” above will be as under;</p> <ul style="list-style-type: none"> a) In case of company of Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means. <p style="text-align: center;">Explanation</p>

INSTRUCTION TO BIDDERS

		<p>i. "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent of shares or capital or profits of the company;</p> <p>ii. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholdings or management rights or shareholders agreements or voting agreements;</p> <p>b) In case of a partnership firms, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more judicial person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;</p> <p>c) In case of an unincorporated associations or body of individuals, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;</p> <p>d) Where no natural person is identified under (a) or (b) or (c) above, the beneficial owner is the relevant natural person who holds the position of senior managing officials;</p> <p>e) In case of a trust, the identifications of beneficial owner(s) shall include identification of the author of trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.</p>
	34.6	An Agent is a person employed to do any act for another, or to represent another in dealings with third person.
	34.7	<p>Bidders shall certify their compliance to ITB Clause "Restrictions on procurement from a Bidder of a country which shares a land border with India" by accepting the following General Technical Evaluation (GTE) of the Tender at e-Tender Portal:</p> <p>"Do you certify full compliance to all provisions of Bidding Document?"</p> <p>Acceptance of above attribute shall be considered as Bidder's confirmation that Bidder has read and understood the ITB Clause regarding "Restrictions on procurement from a Bidder of a country which shares a land border with India" and its bid is in compliance to this clause.</p> <p>In case it is established that Bidder has provided any false information in pursuance of the aforesaid ITB Clause, while competing for this contract, then its bid shall be rejected and bid security shall be forfeited.</p> <p>In case of a successful bidder, if it is established that the Bidder has not complied with terms of aforesaid ITB Clause, during execution of contract, this would be considered as fraudulent practices as mentioned in 5.1 (j) of "Policy for Debarment from Business Dealings" and shall be dealt accordingly.</p>
35.0	Adherence to NTPC Safety Policy	
	The Employer has in place a Policy for Safety Rules as enclosed at General Conditions of Contract (GCC) of the Bidding Documents. Bidders are to adhere to the attached Policy for the complete scope of work.	

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36.0	<p>ABAC (Anti-Bribery and Anti-Corruption) Policy</p> <p>The Bidder and its employees along with its Associate/ Collaborator/ Sub-Contractors / Sub-Vendors / Consultants / Service Providers and all other persons associated with business of Employer shall strictly adhere to Anti-Bribery and Anti-Corruption (ABAC) Policy of Employer displayed on tender website https://ntpctender.ntpc.co.in/.</p> <p>Bidders shall certify their compliance on “Anti-Bribery and Anti-Corruption (ABAC) Policy” of Employer by accepting the following GTE at the e-Tender Portal:</p> <p>“Do you certify full compliance to all provisions of Bidding Document?”</p> <p>Acceptance of General Technical Evaluation (GTE) of the Tender at e-Tender Portal shall be considered as bidder's confirmation that they and their employees along with their associate / collaborator/ subcontractors / sub vendors / consultants / service providers shall strictly abide by “Anti-Bribery and Anti-Corruption (ABAC) Policy” of Employer as displayed on tender website at https://ntpctender.ntpc.co.in/ under section ‘policy docs’ and undertake that they represent and confirm that they are aware of, understand, and will comply with all applicable laws and regulations relating to anti- corruption and anti-bribery and the ABAC Policy of Employer.</p>
37.0	<p>Conflict of Interest</p>
37.1	<p>A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Employer’s interests. A bidder may be considered to have a conflict of interest with one or more parties in the bidding process, if:</p> <ul style="list-style-type: none"> a) they directly or indirectly control, are controlled by or are under common control of another entity; or b) they have the same legal representative/agent for purposes of their bids; or c) they have relationship with each other, directly or through common third party(ies), that puts them in a position to have access to information about or influence on the bid of another Bidder; or d) Bidder and/or any of its allied entity(ies), which directly or indirectly control(s) or is(are) controlled by or is(are) under common control of another entity has(ve) participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the tender; or e) Bidder participates in more than one bid in this bidding process. <p>For the purposes of this clause the term ‘control’ shall have the following meaning:</p> <p>“control” shall include the right to appoint majority of the directors or to control the management or policy decisions exercisable by a person or persons acting individually or in concert, directly or indirectly, including by virtue of their shareholding or management rights or shareholders’ agreements or voting agreements or in any other manner.</p> <p>Note: If two or more CPSEs/State PSEs participate in a tender, they will not be deemed to fall under the 'Conflict of Interest' provisions solely because they are under common control of Government of India/State Government.</p>
37.2	<p>Bidders shall certify their compliance to ITB Clause “Conflict of Interest” by accepting the following General Technical Evaluation (GTE) of the Tender at e-Tender Portal:</p> <p>“Do you certify full compliance to all provisions of Bidding Document?”</p> <p>Acceptance of above GTE shall be considered as Bidder's confirmation that Bidder has read and understood the ITB Clause regarding “Conflict of Interest” and its bid is in</p>

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	<p>compliance to this clause.</p> <p>In case it is established that Bidder has provided any false information in pursuance of the aforesaid ITB Clause, while competing for this contract, then its bid shall be rejected and bid security shall be forfeited.</p> <p>In case of a successful bidder, if it is established that the Bidder has not complied with terms of aforesaid ITB Clause, during execution of contract, this would be considered as fraudulent practices as mentioned in para 5.1 (j) of "Policy for Debarment from Business Dealings" and shall be dealt accordingly.</p>
38.0	<p>Corrupt or Fraudulent Practices</p> <p>38.1 Employer requires that Bidders, Contractors and Suppliers observe the highest standard of ethics during the procurement/tendering and execution of the contracts. In pursuance of this policy, Employer:</p> <p>(a) defines, for the purposes of this provision, the terms set forth below as follows:</p> <p>(i) "corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement/tendering process or in contract execution; and</p> <p>(ii) "fraudulent practice" means a misrepresentation of facts in order to influence a procurement/tendering process or the execution of a contract to the detriment of the Employer and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Employer of the benefits of free and open competition.</p> <p>(b) will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question.</p> <p>(c) will declare a firm ineligible, either indefinitely or for a stated period of time, to be awarded a contract if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for or in executing a contract of the Employer</p>
39.0	<p>Pre-Bid Conference</p> <p>The Bidder or his authorised representative (s) is invited to attend the pre-bid conference which will take place as per details stipulated in Bid Data Sheets. Bidders are advised to visit and examine the site during the pre-bid conference, regardless of their visit to site earlier.</p> <p>The purpose of the conference will be to clarify any issue regarding the Bidding Documents subsequent to Site visit by Bidder.</p> <p>The Bidder is requested to submit questions in writing at the e-Tender Portal or by email before and/or after the pre-bid conference to reach the Employer at the address indicated in BDS, not later than the date as specified at the e-Tender Portal. Employer's responses to the queries raised by the bidders shall be in the form of Clarification to the bidding documents, which will be uploaded / posted on the e-tender portal.</p> <p>Any queries submitted by Bidder after the specified last date shall not be responded to by Employer and the Bidder will be required to submit their bid based on the Bidding documents read in conjunction with Amendments/Clarifications/Errata thereof.</p> <p>Any modifications of the Bidding Documents which may become necessary as a result of the pre-bid conference shall be made by the Employer exclusively through an amendment to the bidding documents.</p>

INSTRUCTION TO BIDDERS

	Non-attendance at the pre-bid conference will not be a case for disqualification of a bidder. However, Bidder is expected to visit and examine the site to acquaint itself with the ground situations and attend the pre-bid conference subsequently.
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SECTION – III
BID DATA SHEET (BDS)

FOR

ANDAMAN & NICOBAR
GAS POWER PROJECT CIVIL WORKS
PACKAGE

AT

HOPE TOWN, SRI
VIJAYAPURAM ,
ANDAMAN AND NICOBAR

IFB DOCUMENT NO.: NVVN / C&M / RE-342 /
2024-25

BDS Item No.	ITB Clause Ref., if any	DATA
<p>SECTION - III</p> <p>BID DATA SHEET (BDS)</p> <p>NAME OF PACKAGE: ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE</p> <p>The following bid specific data for the Plant & Equipment to be procured, shall amend and/or supplement the provisions in the Instructions to Bidders (ITB). Whenever there is a conflict, the provisions herein shall prevail over those in the ITB.</p>		
1.0	ITB 1.1	<p>A. INTRODUCTION</p> <p>Instructions Related to E-Tendering:</p> <p>Bidder are required to go through the Guidelines provided at following e-tendering site:</p> <p>https://eprocurrentpc.nic.in</p> <p>Name of the Package: ANDAMAN & NICOBAR GAS ENGINE POWER PROJECT CIVIL WORKS PACKAGE</p>
2.0	ITB 5.1	<p>B. THE BIDDING DOCUMENTS</p> <p>Name and address of Employer:</p> <p>GM (C&M) / Sr Manager (C&M), NTPC Vidyut Vyapar Nigam Limited, 5th floor, Engineering Office Complex, NTPC Limited, A-8A, Sector-24 Noida – 201301, India.</p> <p>Telephone No. (+91) - (120) - 4947239</p>
3.0	ITB 8.1.2 (a)	<p>C. PREPARATION OF BIDS</p> <p>Qualification Requirements</p> <p>In addition to the requirements stipulated under section Instructions to Bidder (ITB), the Bidder should also meet the qualifying requirements stipulated hereunder in IFB clauses 6.1.0 or 6.2.0 or 6.3.0 as the case may be and the IFB clause 6.4.0 along with the notes.</p>
3.1		

BDS Item No.	ITB Clause Ref., if any	DATA
3.2		Bids not meeting the requirements as stated above shall be rejected.
3.3		Whether JVs are permitted : No
		Whether Associate/Collaborator permitted : No
4.0	New Clause	<p>The reference plants whose details have been declared as per the specified format in the relevant attachment [i.e. Attachment No.-3A] shall only be considered to ascertain the bidder's compliance to the specified Qualifying Requirement (QR). Bidders wishing to provide additional reference plants are required to declare the same in similar format which shall be additionally attached. However, bidders are not permitted to quote more than three (03) times of the reference works/plants wherever specified in the Qualifying Requirements for this purpose.</p> <p><i>“Bidders are required to furnish the details of past experience based on which selection is to be made as per format enclosed in the bidding documents for the same and enclose relevant documents like copies of authentic work order, completion certificate, agreements etc. supporting the details/data provided in the format. No claims without supporting documents shall be accepted in this regard. However, if any of the reference work pertains to the Contract(s)/Works executed by Bidder for NVVN/NTPC in the past then in respect of such Contract(s)/Works Bidder shall not be required to enclose Client Certificate(s) along with its bid.”</i></p> <p>The Employer at its discretion may seek any clarification and/or documentary evidence only for the reference plants as mentioned above. However, no change or substitution of the reference plants as new/additional plant for conforming to the specified Qualifying Requirement shall be sought, offered or permitted.</p> <p>i. After issuance of IFB/ NIT, Employer shall issue a communication separately to prospective bidders, who have been considered qualified meeting similar Technical QR in another tender in the past, stating that while submitting their bid, they are not required to submit the details/ documents pertaining to reference plants/ works/ past experiences in support of meeting Technical QR to the extent mentioned in the communication.</p>

BDS Item No.	ITB Clause Ref., if any	DATA
		<p>In case the bidder who has been issued such communication from the Employer, intends to seek qualification under the same clause/ route (along with the same Associate/ Collaborator/ JV partner/ Consortium partner, if applicable) as mentioned in such communication, then such bidder shall not be required to submit details/ documents pertaining to reference plants / works / past experiences in support of meeting Technical QR while submitting their bid.</p> <p>Such bidder shall be required to declare in Attachment-3A (Attachment seeking Bidder's Technical Qualification Detail) that they have received communication from the Employer and are not required to submit details/ documents pertaining to reference plants/ works/ past experiences for meeting Technical QR.</p> <p>However, the bidder shall be required to submit any other details pertaining to Technical QR such as applicable Deed of Joint Undertakings/ Joint Venture Agreements/ Technology Transfer Agreements etc. (as applicable).</p> <p>ii. In case such bidder, who has been issued above communication from Employer, wishes to seek qualification under a different clause/ route of QR and/ or with the support of a different Associate/ Collaborator/ JV partner/consortium partner, then the bidder shall be required to furnish the requisite details pertaining to reference plants/ works along with supporting documents as sought in the bidding documents. In such a case, communication issued by the Employer as mentioned above shall not be considered applicable.</p> <p>iii. All other bidders, who are required to submit the details of the past experiences, shall submit all the documents, in support of Technical Qualification Requirements (such as copy of Purchase Orders/ Work Orders/ Contract Agreements/ Client Certificates etc.), duly certified and verified for authenticity from Independent Statutory Auditor of their Company or specified Third-Party Inspection Agency (TPIA). Further, wherever information can be drawn from books of accounts, records and other relevant documents, Bidders can also submit a certificate issued by their Independent Statutory Auditor certifying the data required for meeting the Technical Qualification Requirements.</p>

BDS Item No.	ITB Clause Ref., if any	DATA
		<p>Such bidder shall be required to submit duly certified and verified documents from their Statutory Auditors or specified TPIA in support of meeting Technical QR along with a certificate regarding verification of authenticity of documents as per the format placed at Appendix A to Attachment-3A (Undertaking from Statutory Auditor) and/ or Appendix B to Attachment-3A (Undertaking from TPIA). All the documents submitted by the bidder in support of meeting Technical QR shall be digitally signed by the Statutory Auditor and/ or specified TPIA.</p> <p>iv. In case documents are certified & verified for authenticity through TPIA, the verification and certification of authenticity of documents is acceptable from any of the following TPIAs:</p> <ol style="list-style-type: none"> 1) Société Générale de Surveillance / SGS India Pvt. Ltd. (SGS) 2) International Certification Services Pvt. Ltd. 3) TUV Rheinland (India) Pvt. Ltd. 4) TÜV SÜD South Asia Pvt. Ltd. 5) TUV India Pvt. Ltd. (TÜV Nord Group) 6) Intertek India Pvt. Ltd. 7) Moody International (India) Pvt. Ltd. 8) RINA India Pvt. Ltd. 9) Competent Inspectorate and Consultants Pvt. Ltd. 10) KBS Certification Services Pvt. Ltd. 11) ICS India Pvt. Ltd. 12) Assure Quality Management Certification Services Pvt. Ltd. 13) International Inspection Services Private Limited 14) Hertz Inspection & Services Pvt. Ltd. 15) Quality Evaluation & Systems Team Pvt. Ltd. 16) Industrial Inspection and Verification Services (I) Pvt. Ltd. 17) Ravi Energie Pvt. Ltd. 18) IRCLASS Systems & Solutions Private Limited 19) Quality Services & Solutions Pvt. Ltd. 20) Certification Engineers International Ltd. 21) Aaditech Inspections & Services Pvt. Ltd. 22) Phistream Consulting Pvt. Ltd. 23) Conformity India International Pvt. Ltd. 24) Geochem Laboratories Pvt. Ltd. 25) Edlipse Engineering Global Private Limited 26) Dr. Amin Controllers Pvt. Ltd. (Amin) 27) Leon Inspection & Testing Pvt. Ltd. 28) LRQA Inspection Service India LLP (LRQA) 29) Electrical Research and Development Association

BDS Item No.	ITB Clause Ref., if any	DATA
4.1		<p>30) IRC Engineering Services India Pvt. Ltd. 31) RSJ Inspection Service Limited (RSJ) 32) Bureau Veritas (India) Pvt. Ltd. 33) Astron Certification India Pvt. Ltd. 34) TCRC Inspections Pvt. Ltd. 35) DNV Business Assurance India Pvt. Ltd. 36) BSCIC Certifications Pvt. Ltd.</p> <p>In case documents are certified & verified for authenticity through TPIA, the verification and certification of authenticity of documents is acceptable from any of the TPIAs as mentioned at NTPC tender website (https://ntpctender.ntpc.co.in/) under "Policy for Document Authentication Process in Tenders of NTPC Ltd" tab. However, Bidders must verify the accreditation validity of the designated TPIA before proceeding to engage them for document certification. The following website may be referred for contact details and accreditation validity of above mentioned TPIAs: http://nabcb.qci.org.in/accreditation/reg_bod_inspection_bodies.php</p> <p>Any document pertaining to reference works/ plants in support of Technical QR, which is not certified by specified TPIA or Statutory Auditor of the bidder, as per the format enclosed with the bidding documents, shall not be considered verified/ certified for the purpose of evaluation, and the bid shall be liable for rejection.</p> <p>v. The Bidder shall be responsible for getting their documents/ credentials in support of Qualifying Requirements verified & certified by their Statutory Auditor(s) and/ or specified TPIAs. All the costs pertaining to third party verification and certification (including those by statutory auditors) shall be borne by the Bidder. Employer shall have no liability (financial or otherwise) towards the same and shall not be liable for any claim/ dispute between the bidder and TPIA and/ or Statutory Auditor.</p> <p>The Employer also reserves the right to access the capacity and capability of the bidder / collaborator / associate to satisfactorily execute the contract. Such assessment shall include but not limited to the evaluation of adequacy of facilities services, resources, design / engineering capacity & financial capability.</p>

BDS Item No.	ITB Clause Ref., if any	DATA
5.0	ITB 11.2	Minimum Percentage of total Contract price linked to Safety Aspects/Compliance to Safety Rules: 2%
6.0	ITB 11.11	Not Applicable (The Contract Price is subject to price adjustment as per Clause 25 of the GCC.)
7.0	ITB 13.1	Amount of Bid Security: INR 1,00,00,000/- (Indian Rupees One Crore only). All the bids must be accompanied by Bid Security for an amount equivalent to INR
8.0	ITB 14.0	Period of Completion: 24 Months
9.0.	Taxes & Duties	GST shall be quoted in the field given & shall be extra as applicable. NOTE: If bidder keep GST field blank / "0" then price shall be considered inclusive GST. The rates/amount quoted in the Schedule of Quantities shall be inclusive of all other taxes, duties, levies, fees, royalty, etc.
10.0	ITB 6.0, 19.0	D. SUBMISSION OF BIDS Any clarification sought on the bidding documents, the bidder's bid, any modification or withdrawal of bids shall be addressed to the Employer. However, they are required to be submitted as per address given below: GM (C&M) / Sr Manager (C&M), NTPC Vidyut Vyapar Nigam Limited, 5th floor, Engineering Office Complex, NTPC Limited, A-8A, Sector-24 Noida – 201301, India. Telephone No. (+91) - (120) - 4947239 Email: nvncontracts@ntpc.co.in
11.0	ITB 16.1, ITB 10.1.1.1	Bids shall be submitted online. Only Bid Security, Tender Fee, and Power of Attorney are to be submitted in original (hard copy) at address specified at BDS no. 10.0.

BDS Item No.	ITB Clause Ref., if any	DATA
12.0		<p>Deadline for Bid Submission- as stated in GepNIC Portal and subsequent amendment, if any.</p> <p>E. BID OPENING AND EVALUATION</p>
13.0	ITB 20.1	<p>Location of Bid Opening :-</p> <p>NTPC Vidyut Vyapar Nigam Limited, 5th floor, Engineering Office Complex, NTPC Limited, A-8A, Sector-24 Noida – 201301, India.</p> <p>Currency chosen for: Indian Rupees purpose of evaluation</p>
14.0	MSE Benefits	Not Applicable (Not applicable for Works Contract)
15.0	ITB 33.0	Only Class I & Class II Bidders are eligible to bid.
16.0	ITB 33.0	<p>Methodology regarding Purchase Preference is specified in Annexure-II to BDS as per DPIIT circular dated 04.06.2020 regarding “Make in India”.</p>

ANNEXURE – I

**LIST OF BANKS ACCEPTABLE FOR SUBMISSION
OF BANK GUARANTEE FOR BID SECURITY**

SCHEDULED COMMERCIAL BANKS

A. STATE BANK OF INDIA

B. NATIONALISED BANKS

- 1 Bank of Baroda
- 2 Bank of India
- 3 Bank of Maharashtra
- 4 Canara Bank
- 5 Central Bank of India
- 6 Indian Overseas Bank
- 7 Indian Bank
- 8 Punjab National Bank
- 9 Union Bank of India
- 10 Punjab & Sind Bank
- 11 UCO Bank

C. SCHEDULED PRIVATE BANKS (INDIAN BANKS)

- 1 Axis Bank Ltd
- 2 Bandhan Bank Limited
- 3 CSB Bank
- 4 City Union Bank
- 5 DCB Bank Ltd
- 6 Dhanlaxmi Bank Ltd
- 7 Federal Bank Ltd
- 8 HDFC Bank Ltd
- 9 ICICI Bank Ltd
- 10 IndusInd Bank Ltd
- 11 IDFC FIRST Bank Limited
- 12 Jammu & Kashmir Bank Ltd
- 13 Karnataka Bank Ltd
- 14 Karur Vysya Bank Ltd
- 15 Kotak Mahindra Bank
- 16 Lakshmi Vilas Bank Ltd
- 17 Nainital Bank Ltd
- 18 RBL Bank Limited
- 19 South Indian Bank Ltd
- 20 Tamilnad Mercantile Bank Ltd
- 21 Yes Bank Ltd
- 22 IDBI Bank Ltd.

D. SCHEDULED PRIVATE BANKS (FOREIGN BANKS)

- 1 AB Bank Ltd
- 2 Abu Dhabi Commercial Bank PJSC
- 3 American Express Banking Corporation
- 4 Australia & Newzealand Banking Group Limited
- 5 Barclays Bank Plc
- 6 Bank of America
- 7 Bank of Bahrain & Kuwait B.S.C.
- 8 Bank of Ceylon
- 9 Bank of China Limited
- 10 Bank of Nova Scotia
- 11 BNP Paribas
- 12 Citi Bank NA
- 13 Cooperatieve Rabobank UA
- 14 Crédit Agricole Corporate and Investment Bank
- 15 Credit Suisse AG
- 16 CTBC Bank Co Ltd
- 17 DBS Bank India Ltd
- 18 Deutsche Bank A.G.
- 19 Doha Bank Q.P.S.C
- 20 Emirates NBD Bank (PJSC)
- 21 First Abu Dhabi Bank PJSC
- 22 FirstRand Bank Ltd
- 23 HSBC Ltd
- 24 Industrial & Commercial Bank of China Ltd
- 25 Industrial Bank of Korea
- 26 JP Morgan Chase Bank, National Association
- 27 JSC VTB Bank
- 28 KEB Hana Bank
- 29 Kookmin Bank
- 30 Krung Thai Bank Public Company Ltd
- 31 Mashreq Bank PSC
- 32 Mizuho Bank Ltd
- 33 MUFG Bank, Ltd
- 34 NatWest Markets Plc
- 35 PT Bank Maybank Indonesia TBK
- 36 Qatar National Bank (Q.P.S.C.)
- 37 Sberbank
- 38 SBM Bank (India) Ltd
- 39 Shinhan Bank
- 40 Societe Generale
- 41 Sonali Bank Ltd
- 42 Standard Chartered Bank
- 43 Sumitomo Mitsui Banking Corporation
- 44 United Overseas Bank Ltd

45 Westpac Banking Corporation
46 Woori Bank

Note - Any Addition/ Deletion/ Modification in Bank list shall be as per changes in Second Schedule List by RBI from time to time.

*** Bidder to take note of NTPC letter ref. NTPC/FC/CS/BG/01 dated 03.09.2014 and SBI letter ref. CAG-I/AMT-1/2014-15/370 dated 04.09.2014 attached herewith this Annexure-I to BDS.**

ANNEXURE - II

PREFERENCE TO MAKE IN INDIA AND GRANTING OF PURCHASE PREFERENCE TO LOCAL SUPPLIERS

It is the policy of the Government of India to encourage 'Make in India' and promote manufacturing and production of Goods and Services in India with a view to enhancing income and employment. In this regard, the following guidelines, concerning the procedure to be adopted for granting purchase preference to local suppliers, are hereby issued:

1.0 Definitions:

a) **'Local content'** means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the goods, services or works procured (excluding net domestic indirect taxes) minus the value of imported content in the goods, services or works (**including all customs duties**) as a proportion of the total value, in percent

b) **'Class-I local supplier'** means a supplier or service provider, whose goods, services or works offered for procurement, meets the minimum local content as prescribed.

'Class-II local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, meets the minimum local content as prescribed for 'Class-II local supplier' but less than that prescribed for 'Class-I local supplier'.

'Non-Local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content less than that prescribed for 'Class-II local supplier'.

c) **'L 1'** means the lowest tender or lowest bid or the lowest quotation received in a tender, bidding process or other procurement solicitation as adjudged in the evaluation process as per the tender or other procurement solicitation.

d) **'Margin of purchase preference'** means the maximum extent to which the evaluated bid price of a 'Class-I local supplier' may be above the L1 for the purpose of purchase preference.

e) **Fraud Prevention Policy** - shall mean the policy related to prevention of fraud displayed on NTPC tender website <http://www.ntpctender.com>.

f) **Policy & Procedure for Debarment from Business Dealings** – shall mean the policy related to Debarment from Business Dealings forming part of Bidding Document.

1.1 Minimum local content

1.1.1 The minimum local content shall be 50%.

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2.0 Eligibility for Participation:

Only Class-I and Class-II Local Suppliers are eligible to Bid. Bids received (if any) from Non Local Supplier shall be out rightly rejected.

3.0 Margin of Purchase Preference

3.1 The margin of purchase preference shall be 20%.

4.0 Requirement of Purchase Preference:

(i) The 'Class-I local supplier' shall get purchase preference over 'Class-II local supplier' as well as 'Non-local supplier', as per following procedure:

- Among all qualified bids and substantially responsive bids, the lowest evaluated bid will be termed as L1. If L1 is 'Class-I local supplier', the contract will be awarded to L1.
- If L1 is not 'Class-I local supplier', the lowest evaluated bidder among the 'Class-I local supplier', will be invited to match the lowest evaluated bid (L1) price subject to Class-I local supplier's evaluated price falling within the margin of purchase preference, and the contract shall be awarded to such 'Class-I local supplier' subject to matching the lowest evaluated bid (L1) price.
- In case such lowest eligible 'Class-I local supplier' fails to match the lowest evaluated bid (L1) price, the 'Class-I local supplier' with the next higher evaluated bid within the margin of purchase preference shall be invited to match the lowest evaluated bid (L1) price and so on and contract shall be awarded accordingly. In case none of the 'Class-I local supplier' within the margin of purchase preference matches the lowest evaluated bid (L1) price, the contract may be awarded to the L1 bidder.

(ii) "Class-II local supplier" will not get purchase preference in any procurement.

(iii) For the purpose of matching of lowest evaluated bid (L1) price, the Class-I local supplier would have to necessarily reduce all components of the quoted price on pro-rata basis. The reduction should not apply on the evaluation loading on account of functional guarantees and other loadings (if any, which are not dependent on quoted price). Further, the Contract shall be awarded on such revised/ reduced quoted price. The summation of the revised / reduced quoted

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price and the evaluation loading on account of functional guarantees and other loadings (if any) shall be equal to the lowest evaluated bid (L1) price.

The bidder has to submit Declaration of Local Content as per format attached, along with the techno commercial bid.

5.0 Verification of Local Content:

5.1 The 'Class-I local supplier'/ 'Class-II local supplier' shall be required to provide, in the Bid Form/relevant Attachment of Techno- Commercial Bid, self-certification /declaration that the Item offered meets the local content requirement for 'Class-I local supplier'/ 'Class-II local supplier' and shall give details of the location(s) at which the local value addition is made.

5.2 In case the total bid price of the supplier / bidder is in excess of INR 10 crore, the 'Class-I local supplier'/ 'Class-II local supplier' shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content during execution prior to submission of last bill for payment.

In case aforesaid Certificate furnished by Contractor/Vendor is not in line with the declaration in respect of Local content in their bid, same shall be treated as false declaration.

5.3 Deleted

5.4 False declarations will be dealt in line with the Fraud Prevention Policy and Policy & Procedure for Withholding and Banning of Business Dealings of NTPC.

5.5 In case of false declaration / violation of the provision of PPP-MII Order, if a bidder has been debarred / banned by NTPC, then the fact and duration of debarment should be promptly brought to the notice of the Member-Convenor of the Standing Committee (as per para 16 of PPP-MII Order) and the Department of Expenditure through Ministry of Power, GOI.

5.6 A supplier who has been debarred / banned by any other procuring entity for

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violation of 'Public Procurement (Preference to Make In India), Order 2017' (PPP-MII Order) dated 15.06.2017 and its subsequent revisions / amendments issued by Department of Industrial Policy and Promotion (DIPP) shall not be eligible for **evaluation/ preference, as applicable**, under the aforesaid procedures for duration of the debarment. The 'Class-I local supplier'/ 'Class-II local supplier' shall be required to furnish a confirmation in this regard in the Bid Form/relevant Attachment of Techno-Commercial Bid.

6.0 Local Sourcing

6.1 The Bidder/its Sub-vendors must be Class-I local supplier for Item(s) mentioned at clause no. 41 of GTR in Technical Specifications, as applicable, in case such item(s) are Self Manufactured/Bought-out.

6.2 The Bidder / Contractor are requested to encourage and promote domestic manufacturing and production of goods and services by sourcing goods and services applicable under the contract / package from domestic suppliers / service providers. In this regard, Bidder shall also follow guidelines / advisory issued by Government of India from time to time, to the extent applicable to them, regarding promotion of local sourcing of goods including Bought out Items and services.

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ANNEXURE III

Format of Undertaking (To be sent by Issuing Bank through official email-ID)

From: xxxbank@xx.in

To: nvvncontracts@ntpc.co.in

We have issued BG No. dated for an amount of Rs. on behalf of [Name of Bidder] towards Bid Security / EMD for Tender No. in favour of [Name of Employer].

Please find enclosed the soft copy of the Bank Guarantee and SFMS acknowledgement. This SFMS is sent on (date).

Any demand / claim made by the 'Employer' shall be conclusive and binding on us irrespective of any dispute or difference raised by the Bidder till the validity period mentioned in the Bank Guarantee.

However, in absence of the physical copy of aforementioned BG with the Employer, we undertake that Employer's demand / claim will be binding and conclusive on us without the physical copy of aforementioned BG till fourteen (14) days from the due date of submission of Techno-Commercial bids.

We undertake not to cancel the aforementioned BG No. without written consent / instruction from NTPC/NVVN.

(Name of Bank Official)

Authority No.

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***NTPC VIDYUT VYAPAR NIGAM
LIMITED***

(A wholly owned Subsidiary of NTPC Limited)



SECTION – IV

***GENERAL CONDITIONS OF CONTRACT
(GCC)***

GENERAL CONDITIONS OF CONTRACT

Table of Clauses – General Conditions of Contract

S. No.	Description
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A. Contract and Interpretation

- | | |
|----|---|
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| 2. | Heading and Marginal Notes to Conditions |
| 3. | Singular and Plural |
| 4. | Order of the Precedence of Documents |
| 5. | Instructions and Notices under the Contract |
| 6. | Laws Governing the Contract |
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B. Subject Matter of Contract

- | | |
|-----|---|
| 8. | Scope of Contract |
| 9. | Notices to Local Bodies |
| 10. | Human Resources |
| 11. | Shift Work |
| 12. | Cooperation with Other Contractors/Agencies |
| 13. | Material Obtained from Excavation |
| 14. | Treasure, Trove, Fossils etc. |
| 15. | Protection of Trees. |
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| 17. | Prevention of Pollution |
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| 19. | Training of Apprentices |
| 20. | Handing Over of Site |
| 21. | Duties and Powers of Engineer-In-Charge and his representatives |

C. Payment

- | | |
|-----|--|
| 22. | Contract Performance Security |
| 23. | Advance |
| 24. | Payment on Account/Progressive Interim Payments |
| 25. | Contract Price Adjustment |
| 26. | Taxes, Duties and Levies |
| 27. | Overpayments and Underpayments |
| 28. | Time Limit For Submission and Payment of Final Bill and Waiver of rights of all claim. |

D. Execution of Facilities

- | | |
|-----|--|
| 29. | Work Commencement, Execution and Delays |
| 30. | Subcontracts |
| 31. | Setting out the Works |
| 32. | Methodology of Construction and Equipment Mobilization |
| 33. | Patent Indemnity |
| 34. | Materials for the Performance of the Contract |
| 35. | Quality Assurance Programme |
| 36. | Inspection and Approval |

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- 37. Records and Measurement
- 38. Methods of Measurement
- 39. Temporary/Enabling Works
- 40. Urgent Works
- 41. Construction Power and Construction water Supply and Staff/Labour Colony
- 42. Site Laboratory
- 43. Completion Certificate

E. Defect Liability

- 44. Liability for Damage, Defects or Imperfections and Rectification Thereof
- 45. Defect Liability Period

F. Risk Distribution

- 46. Employer's and contractors risks and insurance
- 47. Force Majeure

G. Change in Contract Elements/Others

- 48. Change in Constitution
- 49. Powers of Engineer-in-Charge for Alterations/Omissions/Additions/Substitutions
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- 51. Termination
- 52. Adherence to Fraud Prevention Policy
- 53. Withholding/Banning
- 54. Contractor's Labour Information Management System (CLIMS)
- 55. Contractor Performance Feedback and Evaluation System
- 56. Limitation of Liability
- 57. No Claim for Interest or Damage
- 58. Compliance to Carriage by Road Rules 2011
- 59. Procedure for Contract Closing

GENERAL CONDITIONS OF CONTRACT

A. Contract and Interpretation			
1.	Definitions	1.1	<p style="text-align: center;">Definitions</p> <p>The following words and expressions shall have the meanings hereby assigned to them:</p> <p>“Employer” / “Owner” as specified in BDS and shall include their legal representatives, successors and permitted assigns.</p> <p>“Contract” means the Contract Agreement entered into between the Employer and the Contractor, together with contract documents referred therein. The term “Contract” shall in all such documents be construed accordingly and includes special conditions, specifications, designs, drawings, “Schedule of Quantities” with rates and amount. These documents taken together shall be deemed to form the Contract and shall be complimentary to one another.</p> <p>“Contract Documents” mean the following documents that constitute the Contract between the Employer and the Contractor:</p> <ul style="list-style-type: none"> (i) The Contract Agreement along with its appendices (ii) Letter of Award along with its appendices, (iii) Special Conditions of Contract (iv) Technical Specifications and Bid Drawings (v) General Conditions of Contract (vi) The Bid and Schedule of Quantities submitted by the Contractor. <p>“GCC” means the General Conditions of Contract hereof.</p> <p>“SCC” means the Special Conditions of Contract.</p> <p>“Day” means calendar day of the Gregorian Calendar.</p> <p>“Month” means calendar month of the Gregorian Calendar.</p> <p>“Week” means a continuous period of seven (7) calendar days.</p> <p>“Contractor” means the individual or firm or company whether incorporated or not, undertaking the Works and shall include its legal representatives, or successors, or permitted assigns.</p> <p>“Sub-Contractor” shall mean a person or a Corporate body approved by Engineering-Charge who has entered into a contract with the Contractor to complete a part of the Works</p> <p>The “Contract Sum” / “Contract Price” means:</p> <ul style="list-style-type: none"> (i) in the case of Lump Sum Contracts the sum for which the bid is accepted. (ii) In the case of item Rate Contracts the cost of the Works arrived at after extension of the quantities shown in Schedule of

GENERAL CONDITIONS OF CONTRACT

		<p>Quantities by the item rates for the various items and summing them to arrive at the total price..</p> <p>“Engineer-in-Charge” shall mean the person appointed by the Employer or his duly authorized representative who shall direct, supervise and be in charge of the Works for purposes of the Contract.</p> <p>“Market rate” means the rate for an item of Work, determined on the basis of the cost of labour, and material brought to Site and incorporated in the Works and for use of plant and equipment for the Work executed plus 10% (ten percent) of the rate to cover all overheads and profits of the Contractor.</p> <p>““Schedule(s) of Quantities” shall mean the priced and completed Schedule of Quantities forming the part of the bid or such Schedule of Quantities forming the part of the Contract, as the case may be, with amendments, if any, thereto.</p> <p>The “Site” means the land and / or other places on, under, in or through which the Works is to be executed under the Contract including any other land or places which may be allotted by the Employer or used for the purposes of the Contract.</p> <p>“Temporary/ Enabling Works” means all temporary works of every kind required in or about the execution, completion or maintenance of the Works</p> <p>“Urgent Works” shall mean any urgent measures which, in the opinion of the Engineer-in-Charge, become necessary during the progress of the Works to obviate any risk of accident or failure or which become necessary for reasons of security and safety.</p> <p>“The Works” shall mean the Works to be executed in accordance with the Contract or part(s) thereof as the case may be and shall include all extra or additional, altered or substituted works or temporary/ enabling Works and urgent works as required for performance of the Contract.</p> <p>“Cost” shall mean all expenditure reasonably incurred or to be incurred by the Contractor or Employer, as the case may be, whether on or off the Site, including overhead and other charges, but excluding profit.</p> <p>Throughout these Bidding Documents, the term “Bid” and “Tender” and their derivatives (Bidder/Tenderer, Bidding/Tendering, Bidding Document/Tender Document, etc.); Bill of Quantity / Schedule of Quantity / Schedule of Items/Schedule of Quantities/ Bill of Quantities; Employer / NTPC; Bid Security / Earnest Money Deposit; Security Deposit / Performance Security/ Performance Guarantee; Engineer-in-Charge / Engineer, appearing any where in the Bidding Documents shall have the same meaning and are synonymous to each other.</p> <p>“Goods and Services Tax” or “GST” means taxes or cess levied under the Central Goods and Services Tax Act, Integrated Goods and Services Tax Act, Goods and Services Tax (Compensation to States) Act and various State/Union Territory Goods and Services Tax Laws and applicable cesses, if any under the laws in force (hereinafter referred to as relevant GST Laws)</p>
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GENERAL CONDITIONS OF CONTRACT

2.	Heading and Marginal Notes to Conditions	
	Heading and marginal notes to these General Conditions of Contract shall not be deemed to form part thereof or be taken into consideration in the interpretation or construction thereof or of the Contract.	
3.	Singular & Plural	
	WHERE THE CONTEXT SO REQUIRES, WORDS IMPORTING THE SINGULAR ONLY WILL ALSO INCLUDE THE PLURAL AND VICE VERSA.	
4.	ORDER OF THE PRECEDENCE OF THE DOCUMENTS	
	4.1	The several documents forming the Contract are to be taken as mutually explanatory of one another, detailed drawings being followed in preference to small scale drawings, figured dimensions in preference to scale and Special Conditions in preference to General Conditions.
	4.2	In the case of discrepancy between Schedule of Quantities, the Specifications and/or the Drawings, the following order of precedence shall govern: <ul style="list-style-type: none"> (a) Description in Schedule of Quantities (b) SCC (c) Technical Specifications (d) Drawings
	4.3	If there are varying or conflicting provisions made with in any document forming part of the Contract, the Engineer-in-Charge shall be the deciding authority with regard to the intention of the document.
	4.4	Any error in description, quantity or rate in Schedule of Quantities or any omission therefrom shall not vitiate the Contract or release the Contractor from the execution of the whole or any part of the Works comprised therein according to drawings and specifications or from any of his obligations under the Contract.
5.	Instructions and Notices under the Contract:	
	5.1	Subject as otherwise provided in the Contract, all notices to be given on behalf of the Employer and all other actions to be taken on its behalf may be given or taken by the Engineer-in-Charge or any officer for the time being entrusted with the functions, duties and powers of the Engineer-in-Charge by the Employer. All instructions, notices and communications, etc., under the Contract shall be given in writing.
	5.2	Contractor's Representative
	5.2.1	The Contractor shall appoint its Representative within fourteen (14) days of the date of issuance of Letter of Award or before start of work whichever is earlier and shall request the Employer in writing to approve the person so appointed.
	5.2.1.1	The Contractor's representative shall be a regular Employee/ Partner/ Director only and the Contractor shall be required to submit a Power of Attorney in

GENERAL CONDITIONS OF CONTRACT

		<p>original in favour of its representative. Notarized photocopy of the Power of Attorney shall be acceptable only if the Power of Attorney has been registered by the Contractor. The Employer may verify the photocopy of the Power of Attorney with the Original and the Contractor shall be required to produce the original Power of Attorney for verification, if required by the Employer. The relation of the Contractor's representative with the contractor such as Partner/ Employee/Director etc. should be clearly brought out in the Power of Attorney. The Contractor would be required to submit a documentary proof of the relation of the Contractor's representative with the contractor in the form of self-attested copy of any of the following documents:</p> <p>a) Previous financial year's Form 16 as available at TRACES site of Income tax department, if the POA holder is an employee of contractor. In case, the Contractor is not able to submit Form 16 (only in case of recent appointment or where Form 16 details are not uploaded at TRACES), the contractor would be required to submit Appointment Letter/Salary Slip/other documentary evidence of the POA holder along with an affidavit stating the relationship between the POA holder and the Contractor along with. Further, the Contractor shall be required to submit the copy of Form 16 as available through TRACES site for every subsequent year also in respect of the POA holder till the period of authorization.</p> <p>b) Articles of Association / Registered Partnership Deed if the POA holder is a partner or stake holder in Company.</p>
	5.2.1.2	In case, the Contractor's representative is also doing some other Contract(s)/Work(s) as nominee of the same contractor, the Contractor shall give a declaration citing list of all works where the Contractor's representative is the nominee.
	5.2.1.3	If the Employer objects to the appointment giving the reason therefore, then the Contractor shall appoint a replacement within fourteen (14) days of such objection, and the foregoing provisions of this GCC Sub-Clause 5.2.1 shall apply thereto.
	5.2.2	<p>The Contractor's Representative shall represent and act for the Contractor at all times during the currency of the Contract and shall communicate and provide to the Engineer-in-charge all the Contractor's notices, instructions, information and all other communications under the Contract.</p> <p>All notices, instructions, information and all other communications given by the Employer or the Engineer-in-charge to the Contractor under the Contract shall be given to the Contractor's Representative or, in its absence, its deputy, except as herein otherwise provided. The Contractor or its authorised representative shall be in attendance at the Site(s) during all working hours and shall superintend the execution of the Works with such additional assistance in each trade as the Engineer-in-Charge may consider necessary. Orders given to the Contractor's representative shall be considered to have the same force as if they had been given to the Contractor.</p> <p>The Contractor shall not revoke the appointment of the Contractor's Representative without the Employer's prior written consent, which shall not be unreasonably withheld. If the Employer consents thereto, the Contractor shall appoint some other person as the Contractor's Representative, pursuant to the procedure set out in GCC Sub-Clause 5.2.1</p>
	5.2.3	The Contractor's Representative may, subject to the approval of the Employer (which shall not be unreasonably withheld), at any time delegate to any person

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		any of the powers, functions and authorities vested in him or her. Any such delegation may be revoked at any time. Any such delegation or revocation shall be subject to a prior notice signed by the Contractor's Representative, and shall specify the powers, functions and authorities thereby delegated or revoked. No such delegation or revocation shall take effect unless and until a copy thereof has been delivered to the Employer and the Engineer-in-charge. Any act or exercise by any person of powers, functions and authorities so delegated to him or her in accordance with this GCC Sub-Clause 5.2.3 shall be deemed to be an act or exercise by the Contractor's Representative.
	5.2.4	The Employer may by notice to the Contractor object to any representative or person employed by the Contractor in the execution of the Contract who, in the reasonable opinion of the Employer, may behave inappropriately, may be incompetent or negligent, or may commit a serious breach of the Safety regulations provided under GCC Sub-Clause 10.4.9. The Employer shall provide evidence of the same, whereupon the Contractor shall remove such person from the Facilities.
	5.2.5	If any representative or person employed by the Contractor is removed in accordance with GCC Sub-Clause 5.2.4, the Contractor shall, where required, appoint a replacement as per clause 5.2.1.
	5.2.6	In case any of the information/declaration/undertaking provided by Contractor/Contractor's representative is found to be false and/or the contractor/Contractor's representative suppresses any relevant information at any stage, the Contractor will be liable for actions in terms of Employer's Banning policy.
	5.3	The Engineer-in-Charge shall communicate or confirm the instructions to the Contractor in respect of the execution of Work in a 'Works Site Order Book' maintained in the office of the Engineer-in-Charge and the Contractor or his authorised representative shall confirm receipt of such instructions by signing the relevant entries in this Book. If required by the Contractor, he shall be furnished a certified true copy of such instruction(s).
6.	Laws governing the Contract	
	6.1	This Contract shall be governed by the Indian laws for the time being in force. The Courts at Delhi shall have jurisdiction, in all matters unless otherwise stated in the SCC.
7.	Settlement of Disputes	
	7.1	<p>Mutual Consultation</p> <p>If any dispute of any kind whatsoever shall arise between the Employer and the Contractor in connection with or arising out of the Contract, including without prejudice to the generality of the foregoing, any question regarding its existence, validity or termination, or the execution of the Works, whether during the progress of the Works or after their completion and whether before or after the termination, abandonment or breach of the Contract, the parties shall seek to resolve any such dispute or difference by mutual consultation. If the parties fail to resolve such a dispute or difference by mutual consultation, then the dispute may be settled through Expert Settlement Council / Arbitration / other remedies available under the applicable laws.</p>

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7.2		Resolution of Dispute through Expert Settlement Council
7.2.1		If the parties fail to resolve such a dispute or difference by mutual consultation, the dispute if the parties agree, may be referred to Conciliation in cases involving disputed amount up to Rs 250 crores, which is to be arrived at considering the claim and counter claim of the parties to the dispute.
7.2.1.1		<p>Invitation for Conciliation:</p> <p>A party shall notify the other party in writing about such a dispute it wishes to refer for Conciliation within a period of 30 days from the date of raising of the dispute in case of failure to resolve the same through mutual consultation. Such Invitation for Conciliation shall contain sufficient information as to the dispute to enable the other party to be fully informed as to the nature of the dispute, amount of the monetary claim, if any, and apparent cause of action.</p>
7.2.1.2		Upon acceptance of the invitation to conciliate, the other party shall submit its counter claim, if any, within a period of 30 days from the date of the invitation to conciliate. If the other party rejects the invitation or disputed amount exceeds Rs 250 crores, there will be no Conciliation proceedings. There shall be no Conciliation where claim amount is only up to Rs 5 lakhs.
7.2.1.3		If the party initiating Conciliation does not receive a reply within thirty days from the date on which it sends the invitation, or within such other period of time as specified in the invitation, it shall treat this as a rejection of the invitation to conciliate from the other party
7.2.2		Conciliation:
7.2.2.1		Where Invitation for Conciliation has been furnished under GCC sub clause 7.2.1, the parties shall attempt to settle such dispute through Expert Settlement Council (ESC) which shall be constituted by CMD, NTPC.
7.2.2.2		ESC will be formed from experts comprising of three members from the panel of conciliators maintained by NTPC. However, there will be single member ESC for disputes involving claim and counter claim (if any) up to Rs. 1 crore. CMD will have authority to reconstitute an ESC to fill any vacancy
7.2.2.3		The eligible persons for consideration for empanelment in the panel of conciliators shall be amongst Retired Civil Servants of Govt. of India not below the rank of Joint Secretary, Retired Judges, Retired Executive directors/Directors/ Chairman of any Maharatna / Navratna company in India other than NTPC Ltd, Retired Independent Directors who have served on the Board of any Maharatna / Navratna company in India other than NTPC Ltd and Independent experts in their respective fields preferably registered with the Indian Council of Arbitration or Delhi International Arbitration Centre or Federation of Indian Chambers of Commerce and Industry or SCOPE Arbitration Forum
7.2.3		Proceedings before ESC:
7.2.3.1		The claimant shall submit its statement of claims along with relevant

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		documents to ESC members, and to the party(s) indicated in the appointment letter within 30 days of the issue of the appointment letter. The respondent shall file its reply and counter claim (if any) within 30 days of the receipt of the statement of claims. Parties may file their rejoinder/additional documents, if any in support of their claim/counterclaim within next 15 days. No documents shall be allowed thereafter, except with the permission of ESC.																
7.2.3.2	<p>The parties shall file their claim and counterclaim in the following format</p> <p>a. Chronology of the dispute b. Brief of the contract c. Brief history of the dispute d. Issues</p> <table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Description of Claims/ Counter claims</th> <th>Amount (in foreign currency/INR)</th> <th>Relevant Contract Clause</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> <p>e. Details of Claim(s)/Counter Claim(s) f. Basis/Ground of claim(s)/counter claim(s) (along with relevant clause of contract)</p> <p>Note: Statement of claims shall be restricted to maximum limit of 20 pages</p>	Sl. No.	Description of Claims/ Counter claims	Amount (in foreign currency/INR)	Relevant Contract Clause													
Sl. No.	Description of Claims/ Counter claims	Amount (in foreign currency/INR)	Relevant Contract Clause															
7.2.3.3	In case of 3 members ESC, 2 members will constitute a valid quorum and the meeting can take place to proceed in the matter after seeking consent from the member who is not available. However, ESC recommendations will be signed by all the members.																	
7.2.3.4	The parties shall be represented by their in-house employees. No party shall be allowed to bring any advocate or outside consultant/advisor/agent to contest on their behalf. Ex- officers of NTPC/NVVN who have handled the subject matter in any capacity shall not be allowed to attend and present the case before ESC on behalf of the contractor. However, ex- employees of parties may represent their respective organizations. Parties shall not claim any interest on claims/counter-claims from the date of notice invoking Conciliation till execution of settlement agreement, if so arrived. In case, parties are unable to reach a settlement, no interest shall be claimed by either party for the period from the date of notice invoking Conciliation till the date of ESC recommendations and 30 days thereafter in any further proceeding																	
7.2.3.5	ESC will conclude its proceedings in maximum 10 meetings and give its recommendations within 90 days of its first meeting. ESC will give its recommendations to both the parties recommending possible terms of settlement. CMD, NTPC may extend the time/number of meetings, in exceptional cases, if ESC requests for the same with sufficient reasons																	
7.2.3.6	Depending upon the location of ESC members and the parties, the venue of the ESC meeting shall be either Delhi/Mumbai/Kolkata/Chennai or any other city whichever is most economical from the point of view of travel and stay etc. All the expenditure incurred in ESC proceedings																	

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		shall be shared by the parties in equal proportion.																														
7.2.4	<p>Fees & Facilities to the Members of the ESC</p> <p>The cost of Conciliation proceedings including but not limited to fees for Conciliator, Airfare, Local transport, Accommodation, cost towards conference facility etc shall be as provided herein below:</p> <table border="1"> <thead> <tr> <th>S. No.</th> <th>Fees/ Facility</th> <th>Entitlement</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Fees</td> <td>As paid to NTPC Independent Directors [Presently Rs. 20,000 per meeting]. In addition each conciliator to be paid Rs. 10,000 for attending meeting to authenticate the settlement agreement - max. of Rs. 2,10,000 per case per Conciliator.</td> </tr> <tr> <td>2</td> <td>Secretarial expenses</td> <td>Rs. 10,000 lump sum (to 1 member only).</td> </tr> <tr> <td>3</td> <td>Transportation in the city of the meeting</td> <td>Car as per entitlement or Rs. 2,000 per day</td> </tr> <tr> <td>4</td> <td>Venue for meeting</td> <td>NTPC conference rooms</td> </tr> <tr> <td colspan="3">Facilities to be provided to the out-stationed member</td> </tr> <tr> <td>5</td> <td>Travel from the city of residence to the city of meeting</td> <td>As per entitlement of Independent Directors. Executive class air tickets / first class AC train tickets/ Luxury car/ reimbursement of actual fare. However, entitlement of air travel by Business class shall be subject to austerity measures, if any, ordered by Govt. of India.</td> </tr> <tr> <td>6</td> <td>Transport to and fro airport/ railway station in the city of residence</td> <td>Car as per entitlement or Rs. 3,000</td> </tr> <tr> <td>7</td> <td>Stay for out stationed members</td> <td>As per entitlement of Independent Directors.</td> </tr> <tr> <td>8</td> <td>Transport in the city of meeting</td> <td>Car as per entitlement or Rs. 2000 per day</td> </tr> </tbody> </table> <p>Aforesaid fees is subject to revision by NTPC from time to time and subject to government guidelines on austerity measures, if any. All the expenditure incurred in the ESC proceedings shall be shared by the parties in equal proportions. The Parties shall maintain the account of expenditure and present to the other for the purpose of sharing on conclusion of the ESC proceedings.</p>	S. No.	Fees/ Facility	Entitlement	1	Fees	As paid to NTPC Independent Directors [Presently Rs. 20,000 per meeting]. In addition each conciliator to be paid Rs. 10,000 for attending meeting to authenticate the settlement agreement - max. of Rs. 2,10,000 per case per Conciliator.	2	Secretarial expenses	Rs. 10,000 lump sum (to 1 member only).	3	Transportation in the city of the meeting	Car as per entitlement or Rs. 2,000 per day	4	Venue for meeting	NTPC conference rooms	Facilities to be provided to the out-stationed member			5	Travel from the city of residence to the city of meeting	As per entitlement of Independent Directors. Executive class air tickets / first class AC train tickets/ Luxury car/ reimbursement of actual fare. However, entitlement of air travel by Business class shall be subject to austerity measures, if any, ordered by Govt. of India.	6	Transport to and fro airport/ railway station in the city of residence	Car as per entitlement or Rs. 3,000	7	Stay for out stationed members	As per entitlement of Independent Directors.	8	Transport in the city of meeting	Car as per entitlement or Rs. 2000 per day	
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7.2.5	If decision of NTPC is acceptable to the contractor, a Settlement Agreement under section 73 of the Arbitration and Conciliation Act 1996 will be signed within 15 days of contractor's acceptance and same shall be authenticated by all the ESC members. Parties are free to terminate																															

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		Conciliation proceedings at any stage as provided under the Arbitration and Conciliation Act 1996
	7.2.6	The parties shall keep confidential all matters relating to the Conciliation proceedings. Parties shall not rely upon them as evidence in arbitration proceedings or court proceedings.
	7.3	Arbitration
	7.3.1	<p>If the process of mutual consultation and/or ESC fails to arrive at a settlement between the parties as mentioned at GCC Sub-Clauses 7.1 & 7.2 above, Employer or the Contractor may, within Thirty (30) days of such failure, give notice to the other party, with a copy for information to the ESC (as applicable), of its intention to commence arbitration, as hereinafter provided, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given. The mechanism of settling the disputes through arbitration shall be applicable only in cases where the disputed amount (i.e. total amount of Claims excluding claims of interest) does not exceed Rs. 25 crores. In case the disputed amount exceeds Rs. 25 Crores, the parties shall be within their rights to take recourse to remedies as may be available to them under the applicable laws other than Arbitration after prior intimation to the other party. There shall be no arbitration where the claim amount is only up to Rs. 5 lakhs.</p> <p>The parties at the time of invocation of arbitration shall submit all the details of the claims and the counter-claims including the Heads/Sub-heads of the Claims/Counter-Claims and the documents relied upon by the parties for their respective claims and counter-claims. The parties shall not file any documents/details of the claims and counter-claims thereafter.</p> <p>The claims and the counter claims raised by the parties at the time of invocation of the arbitration shall be final and binding on the parties and no further change shall be allowed in the same at any stage during arbitration under any circumstances whatsoever.</p> <p>The parties to the contract shall invoke arbitration within Six months from the date of completion of the execution of work under the contract or the termination of the contract as the case may be and the parties shall not invoke arbitration later on after expiry of the said period of six months. The parties shall not invoke arbitration other than in the case of completion of execution of work or the termination of the contract as mentioned above.</p> <p>Notwithstanding the above, in case of disputes with Indian Contractor who is a Central Government Department /Enterprise /organisation or a State Level Public Enterprise (SLPE), the aforesaid limit of Rs 25 crores shall not be applicable and arbitration proceeding may be commenced irrespective of the amount involved in dispute if the dispute could not be resolved through Conciliation as brought out at GCC Sub Clause 7.2 above.</p>
	7.3.2	Any dispute in respect of which a notice of intention to commence arbitration has been given, in accordance with GCC Sub Clause 7.3.1, shall be finally settled by arbitration.

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7.3.3

Any dispute raised by a party to arbitration shall be adjudicated by a Sole Arbitrator appointed by CMD, NTPC from the List of empaneled Arbitrators of NTPC in the following manner: -

- a) A party willing to commence arbitration proceeding shall invoke Arbitration Clause by giving 60 days notice to the other party.
- b) If the Arbitrator so appointed dies, resigns, becomes incapacitated or withdraws for any reason from the proceedings, it shall be lawful for CMD, NTPC to appoint another person in his place in the same manner as aforesaid. Such person shall proceed with the reference from the stage where his predecessor had left.
- c) It is agreed between the parties that the Arbitration proceedings shall be conducted as per the provisions of Fast Track Procedure as provided under section 29B of the Arbitration and Conciliation Act, 1996 as amended.

d) Arbitrator shall be paid fees at the following rates:

Amount of Claims and Counter Claims (excluding interest)	Lump sum fees (including fees pleadings, case material, writing secretarial charges etc.) to be shared by parties.
Upto Rs 50 lakhs	Rs. 10,000 per meeting subject to a ceiling of Rs. 1,00,000/-.
Above Rs 50 lakhs to Rs 1 crore	Rs. 1,35,000/- plus Rs. 1,800/- per hour there of subject to a ceiling of Rs. 2,00,000/-.
Above Rs. 1 crore and upto Rs. 5 Crores	Rs. 2,25,000/- plus Rs. 33,750 per hour there of subject to a ceiling of Rs. 3,00,000/-.
Above Rs. 5 crores and upto Rs. 10 crores.	Rs. 3,60,000/- plus Rs. 22,500/- per hour there of subject to a ceiling of Rs. 4,00,000/-.
Above Rs. 10 crores	Rs. 4,72,500 plus Rs. 18,000/- per hour thereof subject to a ceiling of Rs. 10,00,000/-.

If the claim is in foreign currency, the SBI Bills Selling Exchange rate prevailing on the date of claim shall be used for the purpose of converting the claim in Indian Rupee which may be used for determining the arbitration fee as brought out above.

- e) If after commencement of the Arbitration proceedings, the parties agree to settle the dispute mutually or refer the dispute to Conciliation, the arbitrator shall put the proceedings in abeyance until such period as requested by the parties. Where the proceedings are put in abeyance or terminated on account of mutual settlement of dispute by the parties, the fees payable to the arbitrator shall be determined as under:
 - (i) 40% of the fees if the Pleadings are complete.
 - (ii) 60% of the fees if the Hearing has commenced.
 - (iii) 80% of the fees if the Hearing is concluded but the Award is yet to be passed.
- f) Each party shall pay its share of arbitrator's fees in stages as

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		<p style="text-align: center;">under:</p> <p style="margin-left: 40px;">(i) 40 % of the fees on Completion of Pleadings. (ii) 40% of the fees on Conclusion of the Final Hearing. (iii) 20% at the time when arbitrator notifies the date of final award.</p> <p>g) The Claimant shall be responsible for making all necessary arrangements for the travel/ stay of the Arbitrator including venue of arbitration, hearings. The parties shall share the expenses for the same equally.</p> <p>h) The Arbitration shall be held at Delhi only.</p> <p>i) The Arbitrator shall give reasoned and speaking award and it shall be final and binding on the parties.</p> <p>j) Subject to the aforesaid conditions, provisions of the Arbitration and Conciliation Act, 1996 and any statutory modifications or re-enactment thereof shall apply to the arbitration proceedings under this clause.</p>
	7.3.4	In case the Indian Contractor is a Central Government Department/Enterprise/organisation or a State Level Public Enterprise (SLPE), the dispute arising between the Employer and the Contractor shall be resolved as per Administrative Mechanism for Resolution of CPSEs Disputes(AMRCD) specified in Office Memorandum No. 4(1) 2011DPE(GM)/FTS-1835 dated 22.05.18 and 04.07.18 issued by Government of India, Ministry of Heavy Industries and Public Enterprises, Department of Public Enterprises and its further modifications and amendments.
	7.4	Notwithstanding any reference to the Conciliation or Arbitration herein, <p>(a) the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree.</p> <p>(b) the Employer shall pay the Contractor any monies due to the Contractor.</p>
		B. Subject Matter of Contract
8.	Scope Of Contract	
	The Work to be carried out under the Contract shall be as delineated in Bidding Documents and shall, except as otherwise provided in these conditions, include all labour, materials, tools, plant, equipment, and transport which may be required in preparation of and for and in the full and entire execution and completion of the Works.	
9.	Notices to Local Bodies	
	9.1	The Contractor shall comply with and give all notices required under any Governmental authority, instrument, rule or order made under any Act of Parliament, State Laws or any regulation or bye-laws of any local authority relating to the Works. He shall before making any variation from the "Technical

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		Specification / Tender Drawings / Construction Drawings" necessitated by such compliance give to the Engineer-in-Charge a written notice giving reasons for the proposed variation and obtain the Engineer-in-Charge's instructions thereon, in writing.
	9.2	The Contractor shall pay and indemnify the Employer against any liability in respect of any fees or charges payable under any Act of Parliament, State laws or any Government instrument, rule or order and any regulations or bye-laws of any local authority in respect of the Works.
10.	Human Resources	
	10.1	The Contractor for the purpose of the Contract shall engage / employ adequate number of key personnel in all areas such as design / engineering (wherever applicable), planning, scheduling and construction and carrying out of all maintenance of his plant and equipment (as detailed in the SCC) and competent and skilled work force as directed by the Engineer-in-Charge. The Engineer-in-Charge will approve any proposed replacement of such key personnel including work force only if their qualifications, experience, competence and capabilities are substantially equal to or better than those personnel originally identified and approved by the Engineer-in-Charge.
	10.2	<p>The Engineer-in-Charge may require the Contractor to remove from Site of Works or from any other area of Work related to the Contract, any member of the Contractor personnel or work force who</p> <ul style="list-style-type: none"> (i) Persists in any misconduct or lack of care (ii) Performs his duties incompetently or negligently or otherwise carelessly (iii) Fails to conform with any provisions of the Contract or (iv) Persists in any conduct which is prejudicial to the safety, health or protection of the Work and environment. <p>If appropriate, the Contractor shall appoint a suitable replacement within fourteen (14) days or within such period as may be agreed between the Engineer-in-Charge and Contractor.</p>
	10.3	The Contractor shall unless otherwise provided in the Contract, make his own arrangement for engagement of all staff and labour, local or otherwise and for their payment, housing, transport, lodging and welfare as may be required by law and or by industry practice. The Contractor shall provide the Engineer-in-Charge a return in detail in such form and at such intervals as he may reasonably prescribe showing the staff and number of the several classes of labour and other staff from time to time employed by the Contractor at Site or in connection with the Work along with such information as the Engineer-in-Charge may reasonably require.
	10.4	Labour laws and Regulations and compliance thereof
	10.4.1	During the entire period of Contract, the Contractor and his Sub-Contractors shall, at all times abide by all existing labour enactments, rules made therein, regulations, notifications and bye-laws by the appropriate government, local authority or any other labour laws or notification that may be issued under any labour law prevailing as on the date seven (7) days prior to the deadline set for submission of the bids, published by the State or Central Government or Local

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			<p>Authorities. An illustrative list of applicable acts, notifications, rules etc. in connection with the labour as applicable is provided in SCC. This list is not in any way exhaustive and shall not absolve the Contractor from any of his liabilities or responsibilities in compliance with any other laws, regulations, notifications that may be in force during the tenure of Contract.</p>
		<p>10.4.1.1</p>	<p>During the entire period of Contract, the Contractor and his Sub-Contractors shall, at all times abide by the following Acts/ Statutes related to Human Resources</p> <ol style="list-style-type: none"> 1. Factories Act, 1948; Contract Labour (Regulation & Abolition) Act, 1970; 2. EPF & MP Act, 1952; 3. Building & Other Construction Workers (Regulation of Employment & Conditions of Service) Act, 1996; 4. ESI Act, 1948; 5. Minimum Wages Act, 1948; 6. Payment of Wages Act, 1936; 7. Payment of Bonus Act, 1965; 8. Payment of Gratuity Act, 1972; 9. Workmen's Compensation Act, 1923; 10. ID Act, 1947; 11. Maternity Benefit Act, 1961; 12. Inter-State Migrant Workmen (Regulation of Employment & Conditions of Service) Act, 1979; 13. Fatal Accidents Act, 1855 14. Model Welfare Code <p>The above will deem to include all relevant/ applicable rules made thereunder, regulations, notifications and bye laws of the State or Central Govt. or the local authority and any other labour law (including rules) regulations, bye laws as well as those that may be passed or notification that may be issued under any labour law present and in future either by State or Central Govt. or by local authority.</p>
	<p>10.4.2</p>		<p>The Contractor and his Sub-Contractors shall indemnify the Employer, from any action taken against the Employer by any competent authority in connection with the enforcement of the applicable laws, regulations, notifications, on account of contravention of any of the provisions therein, including amendments thereto. If the Employer is caused to pay or otherwise made liable, such amounts as may be necessary for non-observance of the provisions stipulated in the laws, rules, notifications including amendments, if any on the part of the Contractor and/or his Sub-Contractors, the Engineer-in-Charge / Employer shall have the right to deduct any such money from any amount due to the Contractor including his performance security, under the Contract. The</p>

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		Employer shall also have the right to recover from the Contractor any sum required or estimated as required for making good any loss or damage suffered / likely to be suffered by the Employer, on this account.
	10.4.3	If due to an enactment of any new Act or Statute and rules made thereunder or any modification to the Acts/Statute or rules made thereunder, all after seven (7) days prior to the deadline set for submission of the bids and as a consequence thereof, the Contractor has to incur additional cost or expenditure, the same will be reimbursed by the Employer to the Contractor, excepting those due to reasons attributable to the Contractor and those being already compensated by other provisions of the Contract, like Price Adjustment, Taxes and Duties etc
	10.4.4	It is specifically agreed that the Contractor and his Sub-Contractors shall obtain all the necessary registration, licenses, permits, authorisations etc. required under various enactments / Regulations enforced from time to time, specifically registration as employer under Provident Fund Act and Contract Labour Regulation & Abolition Act, and the Employer shall not be liable for any violation by the Contractor in this regard
	10.4.5	The employees of the Contractor or his Sub-Contractor(s) shall in no case be treated as the employees of the Employer at any point of time.
	10.4.6	The Contractor and his Sub-Contractors shall be liable to make all due payments to all their employees and ensure compliance with labour laws. If the Employer, is held liable as 'PRINCIPAL EMPLOYER' or otherwise to incur any expenditure or to make any contributions under any legislation of the Government or Court decision, in respect of the employees of the Contractor or his Sub-Contractors, then the Contractor would reimburse the amounts of such expenditure/contribution so made by the Employer.
	10.4.7	In case the ESI act is not applicable to the area where the Work is executed, as evidenced by the Certificate/Letter submitted to this effect from the local authorities, the Contractor shall be liable to arrange and pay for the expenses towards the medical treatment in respect of all labour employed by him for the execution of the Contract
	10.4.8	Staff quarters & labour hutments at Site if available, may be provided to the Contractor on chargeable basis at the discretion of the Engineer-in-Charge on mutually agreed terms and conditions
	10.4.9	<p>Safety</p> <p>The Employer has formulated Safety Rules for Construction & Erection of Power Plants and is enclosed at Annexure-B to GCC. These Safety Rules lay down the safety requirements for safe execution of project activities, responsibilities of the Contractor, and all concerned involved in Construction and Erection. The Contractor, including his subcontractors, while executing the Works, shall strictly comply with these Safety rules and statutory requirements (including amendments thereof), as applicable, in respect of safety of personnel, equipment and materials at site area under execution of the Contractor.</p> <p>In addition to other clauses specified in 'NTPC Safety Rules for Construction and Erection of Power Plants' [as enclosed with GCC/SCC], Contractor shall adhere to the following provisions for payment linked to Safety Compliances as</p>

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specified in Payment Terms:

i) Safety Personnel

Contractor shall adhere to the requirements of Clause 2.3 (requirement of Safety personnel) of 'NTPC Safety Rules for Construction and Erection of Power Plants'.

ii) Personal Protective Equipment & Safety Equipment

Contractor shall adhere to the requirements of Clause 4 (Personal Protective Equipment) of 'NTPC Safety Rules for Construction and Erection of Power Plants' and the provisions of the Bidding Documents with regards to number of Safety Equipment/PPEs to be provided by the Contractor.

In case Contractor fails to comply with aforesaid requirement, EIC/Safety Officer shall issue a warning letter/Non-compliance Memo to the Contractor regarding the same advising him to take corrective action.

EIC/NTPC Safety Officer shall maintain written record of all such incidents when Warning letter/Non-compliance Memo is issued to the Contractor for not meeting the requirements of Clause 4.0 (Personal Protective Equipment) and the provisions of the Bidding Documents.

iii) Safety Induction and Training

Contractor shall adhere to the requirements of imparting Safety training as per Clause 8.0 (Safety Induction and Training) of 'NTPC Safety Rules for Construction and Erection of Power Plants'.

Contractor shall maintain written record of Safety trainings imparted to its Employees/ workmen for purpose of aforesaid payment. These records shall be available for review of EIC/NTPC Safety Officer all the time.

iv) Medical and First Aid Amenities

Contractor shall adhere to the requirements of Clause 13 (Medical and First Aid Amenities) of 'NTPC Safety Rules for Construction and Erection of Power Plants'.

NTPC Safety Officer/EIC shall maintain written record of incidences when requisite Medical and first aid amenities as per Clause 13 of Safety Rules were not available for purpose of aforesaid payment.

v) Compliance to Work Permit System

Contractor shall adhere to the requirements of Clause 17 (Work Permit System) of 'NTPC Safety Rules for Construction and Erection of Power Plants'.

In case Contractor fails to obtain work permit or fails to comply to any requirements of aforesaid Work permit system, he will be issued a warning letter/Non-compliance Memo by EIC/Safety Officer of NTPC regarding the same advising him to take corrective action.

NTPC Safety Officer / EIC shall maintain written record of all such incidents when Warning letter / Non-compliance Memo is issued to Contractor for not complying with the requirements of Work Permit System as per Clause 17 of

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		Safety Rules for purpose of aforesaid payment
11.	Shift Work	
	11.1	To achieve the required rate of progress in order to complete the Works within the Time for Completion, the Contractor may carry on the work, round the clock, in multiple shifts per day, as may be necessary. The Contractor shall however be responsible to comply with all applicable laws in this regard.
	11.2	No additional payment will be made on account of round the clock working in multiple shifts
	11.3	Wherever the work is carried out at night adequate lighting of working areas and access routes for pedestrians or vehicles shall be provided by the Contractor at his cost. Sufficient notice should be given by the Contractor to the Engineer-in-Charge regarding the details of works in shifts so that necessary supervision could be provided.
12.	Cooperation with other Contractors/ Agencies	
	12.1	The Contractor shall extend all reasonable cooperation to other Contractors, agencies etc. of the Employer engaged in connection with the Work or any other Work not in the scope of this Work as may be required by the Engineer-in-Charge.
	12.2	The Contractor shall attend at his cost, all the meetings with the Engineer-in-Charge, other contractors and the Consultants of the Employer for the purposes of the Contract. The Contractor shall attend such meetings as and when required by the Engineer-in-Charge.
13.	Materials obtained from Excavation	
	13.1	Materials of any kind obtained from excavation on the Site shall remain the property of the Employer and shall be disposed of as the Engineer-in-Charge may direct.
14.	Treasure, Trove, Fossils, etc	
	14.1	All fossils, coins, articles of value or antiquity and structures and other remains or things of geological or archaeological interest discovered on the Site shall be the absolute property of the Employer and the Contractor shall take reasonable precautions to prevent his workmen or any other person from removing or damaging any such article or thing, shall immediately upon discovery thereof and before removal acquaint the Engineer-in-Charge with such discovery and carry out the Engineer-in-Charge's directions as to the disposition of the same, at the cost of the Employer
15.	Protection of Trees	
	15.1	Trees designated by the Engineer-in-Charge shall be protected from damage during the course of the Works and earth level within at least one (1) meter of each such tree shall not be disturbed. Where necessary, such trees shall be protected by providing temporary fencing at the cost of the Employer.

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16.	Security Watch and Lighting	
	16.1	The Contractor shall provide and maintain at his own expense all lights, guards, fencing and watching when and where necessary or required by the Engineer-in-Charge for the protection of the Works or for the safety and convenience of those employed on the Works or the public.
17.	Prevention of Pollution	
	17.1	The Contractor shall make necessary arrangement to prevent pollution of the ground water and water in any adjacent water bodies including stream, springs, nallah, river and lakes etc. The Contractor shall be solely responsible and liable for all damage caused by any pollution that may take place during the execution of the Work
18.	Explosives	
	18.1	Permission for the use of explosives shall be obtained from the Engineer-in-Charge or from any appropriate authority as directed by the Engineer-in-Charge and all explosive materials shall be used only under close supervision. It shall be the responsibility of the Contractor to seek and obtain any necessary permits, and to ensure that the requirements of the authorities are complied with, in all respects. Failure to do so may result in the Engineer-in-Charge withdrawing permission to use explosives. The indemnification provided for, under the General Condition of Contract shall include indemnification against all claims in respect of any incident arising from the use of explosives.
19.	Training of Apprentices:	
	19.1	The Contractor shall during the currency of the Contract when called upon by the Engineer-in-Charge engage and also ensure engagement by Sub-Contractors employed by the Contractor in connection with the Works, such number of Apprentices in the categories and for such periods as may be reasonably required by the Engineer-in Charge. The Contractor shall train them as required under the Apprentices Act, 1961 and shall be responsible for all obligations of the Employer under the Act including the liability to make payment to apprentices as required under the Act.
20.	Handing over of Site	
	20.1	The Employer shall make available the Site to the Contractor as soon as possible after the award of the Contract free of encumbrance. The Contractor shall not be permitted to enter on (other than for inspection purposes) or take possession of the Site until instructed to do so by the Engineer-in-Charge in writing
	20.2	The Employer reserves the right to hand over the Site in parts progressively to the Contractor. The Contractor will be required to take possession of the Site without any undue delay and do Work on the released fronts in parts without any reservation whatsoever.
	20.3	However, in case of any delay in handing over of the Site to the Contractor, which delays the performance of the Work, commensurate to the resources mobilised by the Contractor, then the Contractor will be eligible for suitable extension in time for completion of the Works or any other compensation as per

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		the provisions of GCC Sub-Clause 29.7
	20.4	The portion of the Site to be occupied by the Contractor shall be defined and/or marked on the Site plan, failing which these shall be indicated by the Engineer-in-Charge at Site and the Contractor shall on no account be allowed to extend his operations beyond these areas. Further, the Contractor shall not hinder in any way the working of other contractors on the Site.
	20.5	The Contractor shall plan his work as per available roads at Site. Wherever, the access roads near to the Work Site are not available, the Contractor shall make his own arrangement for approach to the Work Site including borrow/disposal areas and for movement of men, machinery, other equipment etc. required for carrying out the Works included under this Contract. All drainage of Works area and all weather truckable/ haulage roads as required by the Contractor shall be constructed and maintained during the construction period by the Contractor at his own cost.
	20.6	The Contractor shall provide, if necessary, all temporary access to the Work Site and shall alter, adapt and maintain the same as required from time to time and shall take up and clear them away as and when no longer required and, as and when ordered by the Engineer-in-Charge and make good all damage done to the Site.
	20.7	The Contractor shall be permitted the usage of all access roads built by the Employer for the purposes of the Contract. If any damage is done to such roads and associated areas like drains, culverts and the like, by the Contractor, the same shall be made good by the Contractor at his own cost, but as may be directed by the Engineer-in-Charge.
21.	Duties and Powers of Engineer-in-Charge and his representatives	
	21.1	The Engineer-in-Charge shall have the full powers in respect of all the matters in connection with or arising out of this Contract, excepting those specifically reserved for the Employer. However, the Engineer-in-Charge shall not have any power to relieve the Contractor of any of his obligations and responsibilities under the Contract.
	21.2	The duties of the representative of the Engineer-in-Charge are to watch and supervise the Works and to test and examine any materials to be used or workmanship employed in connection with the Works. He shall have no authority to order any work involving any extra payment by the Employer nor to make any variation in the Works, creating a financial liability to the Employer
	21.3	The Engineer-in-Charge may from time to time in writing delegate to his representative any of the powers and authorities vested in the Engineer-in-Charge and shall furnish to the Contractor a copy of all such written delegation of powers and authorities. Any written instruction or written approval given by the representative of the Engineer-in-Charge to the Contractor within the terms of such delegation shall bind the Contractor and the Engineer in-Charge as though it has been given by the Engineer-in-Charge.
	21.4	Failure of the Representative of the Engineer-in Charge to disapprove any work or materials shall not prejudice the power of the Engineer-in-Charge thereafter to disapprove such Work or materials and to order the pulling down, removal or breaking up thereof

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	21.5	If the Contractor shall be dissatisfied with any decision of the representative of the Engineer-in-Charge he shall be entitled to refer the matter to the Engineer-in-Charge who shall there-upon confirm, reverse or vary such decision.
		C. Payment
22.	Contract Performance Security	
	22.1.1	The Contractor shall within Forty Five (45) days of the Letter of Award or prior to release of 1st RA bill/Mobilization advance whichever is earlier, provide a Contract Performance Guarantee (CPG) towards faithful performance of the Contract for ten percent (10%) of the Contract Price. Alternatively, the Contractor may furnish the Contract Performance Guarantee in two Stages viz. a Contract Performance Guarantee for an amount equivalent to 5% of the Contract Price within Forty Five (45) days of the Letter of Award or prior to release of 1st RA bill/Mobilization advance whichever is earlier, to be followed up with another Contract Performance Guarantee for an amount equivalent to 5% of the Contract Price prior to the scheduled completion of 50% of total scope of work
	22.1.2	The Contractor also has the option to furnish an Initial Contract Performance Guarantee (ICPG) equivalent to a minimum of 2% of the Contract Price within Forty-Five (45) days of the Letter of Award or prior to release of 1st RA bill/Mobilization advance whichever is earlier. In case of such a Contractor, who furnishes Initial Contract Performance Guarantee, the Employer shall at the time of making any payment to him for the work done under the Contract deduct towards the Contract Performance Security an amount equivalent to 10% of the gross bill amount accepted for payment until the Contract Performance Security so deducted including the amount of Initial Contract Performance Security becomes equal to 10% of the Contract Price, subject to the condition that whenever the Contract Performance Security so deducted reaches a limit of 2% of the Contract Price, the Contractor may convert the amount into a Bank Guarantee as aforesaid.
	22.1.3	The Contract Performance Guarantee/Initial Contract Performance Guarantee shall be in the form of a Bank Guarantee issued by a Bank from the list enclosed in the Bidding Documents. The format of the said bank guarantee shall be in accordance with the format included in the Section VIII (Forms and Procedures). This bank guarantee shall have an initial validity upto ninety (90) days beyond the completion of Defect Liability Period of the Contract. However, in case the date of completion of defects liability period gets extended, the validity of the Contract Performance Guarantee shall be extended by the period of extension of completion of defects liability.
	22.2	One half (50%) of the Contract Performance Security amount shall be refunded/released to the Contractor on the issuance of Completion Certificate by the Engineer-in-Charge certifying the completion of entire Works under the Contract. The Engineer-in-Charge shall on demand from the Contractor, release/refund the remaining portion of the Contract Performance Guarantee on expiry of the Defects Liability Period or on payment of the amount of the Final Bill payable, whichever is later, provided the Engineer-in-Charge is satisfied that there is no demand outstanding against the Contractor, arising out of the Contract.
	22.3	No interest shall be payable to the Contractor against the Contract Performance Guarantee furnished/recovered by way of deductions from running account

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		payments from the Contractor, by the Employer.
23.	Advance	
	23.1	<p>Mobilization Advance</p> <p>i) A lumpsum mobilisation advance not exceeding 4% of the Contract Value as awarded shall be paid to the Contractor at the rate of interest mentioned in SCC subject to the following conditions:</p> <p>a) On unconditional acceptance of Letter of Award by the Contractor.</p> <p>b) Acceptance and finalisation of detailed Work Schedule and finalisation of equipment mobilization schedule.</p> <p>c) Submission of an irrevocable bank guarantee for the amount equivalent to 110% of the advance plus GST as applicable on the advance payment to be paid to the contractor in the proforma of bank guarantee provided in Section-VIII (Forms and Procedures) - Proforma of Bank Guarantee for Lumpsum Advance from any bank from the list enclosed in Bidding Documents and acceptable to the Employer.</p> <p>d) Finalisation of Quality Assurance Programme in accordance with GCC Clause entitled 'Quality Assurance programme'.</p> <p>e) Submission of an unconditional, irrevocable bank guarantee for the amount of Initial Contract Performance Security Deposit/ Contract Performance Security Deposit from any bank from the list enclosed in Bidding Documents and acceptable to the Employer in the proforma of bank guarantee provided in Section VIII (Forms and Procedures)- Form of Bank Guarantee for Contract Performance Guarantee.</p> <p>f) On completion of the requirement of Qualifying Requirements, the documentation in respect of associate(s), if applicable, in line with the provisions thereof in BDS, and on submission of an unconditional and irrevocable bank guarantee from any bank as per list enclosed in Bidding Documents and acceptable to Employer in the proforma provided in Section VIII (Forms and Procedures).</p> <p>g) The advance payment shall be released only after the verification and confirmation of the above bank guarantees from the issuing bank</p> <p>ii) A further lumpsum mobilisation advance not exceeding 4% of the Contract Value as awarded shall be paid to the Contractor from Project Site at the rate of interest mentioned in SCC subject to the following conditions:</p> <p>a) Fulfilment of conditions mentioned at GCC Sub-Clause 23.1 (i) a, b, d, e & f.</p> <p>b) On certification of the Engineer-in-Charge that the Contractor has opened his office at Site and mobilised the plant and equipment specifically identified in Letter of Award of the Contract for releasing this advance.</p> <p>c) Submission of an irrevocable bank guarantee for the amount equivalent to 110% of the advance plus GST as applicable on the advance payment to be paid to the contractor in the proforma provided in Section-VIII (Forms and Procedures) - Proforma of Bank Guarantee for</p>

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		<p>Lumpsum Advance from any bank from the list enclosed in Bidding Documents and acceptable to the Employer</p> <p>d) The advance payment shall be released only after the verification and confirmation of the above bank guarantees from the issuing bank</p> <p>e) Mobilisation advance shall be released after certification of Engineer-in Charge that the Contractor has brought to site the Safety equipments & Safety Personal Protective Equipments as per minimum quantity specified in the Bidding Documents.</p> <p>In case the Contractor decides not to take Mobilisation advance, the first progressive payment shall be released after certification of Engineer-in-Charge that the Contractor has brought to site the Safety equipments & safety Personal Protective Equipments as per minimum quantity specified in the Bidding Documents.</p>
	23.2	<p>Equipment Advance</p> <p>An amount not exceeding 75% of the purchase price of the new plant and equipment specifically acquired for the Work and brought to Site against production of documents in support thereof and subject to the condition that the Engineer-in-Charge considers the price reasonable and that such plant and equipment are necessary for the Works and not in excess of requirements and are hypothecated in favour of the Employer in the form required by the Employer shall be payable. "In case the Contractor is an entity other than a Sole Proprietorship Concern or a Partnership Firm, the Contractor shall get the Hypothecation Deed thus executed, registered with the Registrar of Companies in the manner and timeframe required as per the Companies Act, 2013 of India." Interest on the advance outstanding, shall be levied at the percentage mentioned in SCC. Total advance amount against plant and equipment shall in no case exceed 6% of the total contract value as awarded. Provided that if a request for loan is made by the Contractor against both the aforementioned provisions of this condition, viz. GCC Sub-Clauses 23.1 and 23.2, the total sum to be given as loan shall not exceed 10% of the total contract value as awarded.</p>
	23.3	All the above advances mentioned at GCC Sub-Clause 23.1(i), 23.2 (ii) and 23.2 shall be interest bearing and the rate of interest for mobilization advance and equipment advance shall be as specified in SCC.
	23.4	Any of the above advances may be claimed by the Contractor at his option in instalments.
	23.5	The above advance shall be utilised by the Contractor for the purposes of this Contract only and for no other purpose.
	23.6	All payments of advances may be released electronically, wherever technically feasible
	23.7	The recovery of the advances as above and interest thereon shall be made by deduction from the on account payments referred to in GCC Clause entitled 'Payment on Account/Progressive Interim Payments' in suitable percentages fixed by the Engineer-in Charge in relation to the total cumulative advances released and the progress of the work, so that all the sums advanced with interest thereon shall be fully recovered starting from the time 10% and ending

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		by the time 80% of the Work as awarded is completed. If the amount payable under any interim bill is not sufficient to cover all deductions to be made for sums advanced with interest and other sums deductible therefrom, the balance outstanding shall be deducted from subsequent interim bill/bills, as may be necessary, failing that, as otherwise provided for in the Contract.
	23.8	If for any reason, except for reasons of default of the Contractor, the Work under the Contract is suspended continuously for more than fourteen(14) days, the Contractor shall be at liberty to remove the plant and equipment or any part thereof hypothecated to the Employer under GCC Sub-Clause 23.2 above, to any other work site of the Contractor for carrying on his other works, on his furnishing prior to such removal a bank guarantee acceptable to the Employer for the amount of the outstanding advance granted under GCC Sub-Clause 23.2 above with interest and upon the Contractor undertaking to bring back to the Site, before expiry of the period of suspension, such plant and equipment as may be necessary for completion of the Works. If any such Plant and Equipment are not brought back, the Contractor shall forthwith repay the amount for the advance outstanding with interest thereon against such plant and equipment.
	23.9	The value of the bank guarantees towards any of the above advances shall be reduced every three (3) months after the date of commencement of recovery of corresponding advance and interest thereon under the Contract in accordance with GCC Sub-Clause 23.7. The quantum of reduction of the value of bank guarantee at any point of time shall be proportional to the quantum of work completed as certified by the Engineer-in-Charge and applicable GST. The Bank Guarantee value shall stand reduced to zero on completion of total work by the Contractor under the Contract as certified by the Engineer in-Charge. It should be clearly understood that reduction in the value of bank guarantee towards advance shall not in any way dilute the Contractor's responsibility and liabilities under the Contract including in respect of the Works for which the reduction in the value of bank guarantee is allowed
24.	Payment on Account/Progressive Interim Payments	
	24.1	<p>"Bills for the progressive payments shall be submitted by the contractor monthly".</p> <p>In order to make the Progressive Interim Payment for the work to be executed on lumpsum basis, the contractor shall submit detailed Billing Break-up (BBU) of the lump-sum amount for Employer's approval. The BBU so submitted by the contractor shall be finalized in consultation with Employer.</p>
	24.2	The progressive payment shall be released after certification by Employer's Field Quality Assurance Department that the Works have been performed in accordance with the Technical Specifications and also upon authorisation for the payment by the Engineer-in Charge. However, the release of first progressive interim payment shall also be subject to submission of documentary evidence by the Contractor towards having taken the insurance policy(ies) in terms of relevant provisions of GCC Clause entitled Contractor's Liability and Insurance' and acceptance of the same by Engineer-in-Charge
	24.3	(i) The Contractor shall maintain a separate account with a Scheduled Bank at Site for the purpose of receiving all the payments under the Contract(s) and for utilization of payments received from the Employer for disbursement to subcontractors, sub-vendors, PRW's etc., of the Contractor. The Contractor shall maintain separate books of accounts for all payments under this Contract

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		<p>and the Engineer-in-Charge shall have access to these at all times</p> <p>(ii) <u>Account Tracking Mechanism</u></p> <p>In case the Contractor wants to withdraw funds from the above bank account for any purposes other than the Contract, he shall be required to submit an undertaking to the Engineer-in-Charge certifying that all due statutory payments, labour payments and payments to all his sub-contractors have been disbursed corresponding to the total payment received by him under the Contract.</p> <p>For tracking of payments received from the Employer, the Contractor shall also submit a monthly statement by 7th of every month certifying the transactions pertaining to the above account along with the purpose of such transactions. In case the Contractors transfers funds for any purposes other than the Contract, without prior consent of the Employer, it will constitute a breach of Contract by the Contractor.</p> <p>(iii) In case the Contractor violates the above provisions, NTPC will have the right to give suitable instructions to the Bank to regulate / freeze the account</p>
	24.4	<p>(i) In case of part acceptance of the Work, the Engineer-in-Charge shall have the right to release payment for that part of the Work.</p> <p>(ii) Acceptance of the Work without fulfilling all the obligations mentioned under rates and measurement in Technical Specifications shall be considered as part acceptance of Work.</p>
	24.5	<p>Payment on account for amount admissible shall be made on the Engineer-in-Charge certifying the sum to which the Contractor is considered entitled by way of interim payment for the following:</p> <p>(a) all Work executed, after deducting therefrom the amounts already paid, the performance security deposit and such other amounts as may be deductible or recoverable in terms of the Contract;</p> <p>(b) 75 per cent of the cost (as assessed by the Engineer-in-Charge) of any materials which are in the opinion of the Engineer-in-Charge reasonably required in accordance with the Contract with respect to the period of utilisation & quantum and have been brought to Site for incorporation in the Works and are safeguarded against loss due to any cause whatsoever to the satisfaction of the Engineer-in-Charge, but have not been so incorporated; provided the Contractor provides an insurance cover for the full cost of such materials.</p> <p>(c) Unless specifically certified/authorised by the Engineer-in-Charge, no such payment shall be made against the materials brought to Site which in the opinion of the Engineer-in-Charge are not likely to be used/incorporated in the Works in the ensuing period of four (4) months</p>
	24.6	<p>The payments against materials brought to Site under (b) above shall be adjusted as and when materials are utilised/ incorporated in the Works.</p>
	24.7	<p>The Contractor shall submit his bill, by the date stipulated by the Engineer-in-Charge, in the prescribed proforma, supported with measurements, jointly acknowledged and accepted in the measurement books. Payments of the Contractor's bill shall be paid by the Employer within twenty-one (21) days from the date of submission of bill subject to the authorisation of the Engineer-in-Charge. Alternatively, if so desired by the Contractor, after preliminary scrutiny</p>

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	<p>and certification by the Engineer-in-Charge, 75% of the certified net payable amount shall be made by the Employer within seven (7) days. The amount certified shall account for all deductions, including statutory deductions as for GST (if applicable), income tax, etc., recoveries for advances and any other amounts due from the Contractor. The balance 25% shall be paid within twenty-one (21) days, from the date of submission of the said bill. Such payments made by the Employer shall not constitute any acceptance of the measurements of items of the Works by the Employer and the Engineer-in-Charge shall have the right to alter, modify, reduce or diminish the quantities or classification entered in the Measurement Books or Bills. The Employer shall have right to recover any amount paid in an earlier bill from any subsequent bill and should the amount to be recovered be more than the amount of the subsequent bill, the Contractor shall on demand from the Engineer-in-Charge or Employer immediately refund the extra amount to the Employer within seven (7) days. Wherever technically feasible, the payments shall be released electronically only as per details of bank account indicated in the Contract</p>
24.7.1	<p>In cases of any discrepancy observed by the Employer in Contractor's bill, clarifications shall be sought in writing by the Employer within ten (10) days from the date of receipt of Contractor's bill/invoice/debit note by the Employer. The Contractor shall be required to submit the requisite clarifications within ten (10) days from the date of issuance of queries by the Employer. In case, no mutual agreement is reached between the Employer and the Contractor on any part of the bill/invoice, within ten (10) days of submission of clarification by the contractor, the Contractor shall issue a revised bill/invoice to avoid mismatch in GST returns of the Employer and the Contractor. Payment against agreed and admissible part shall be processed as per payment procedure within ten (10) days after receipt of the revised bill/invoice. The bill/invoice for the balance amount under question may be separately submitted for consideration of the Employer after resolution of issues of payment by the Employer. In case of non-submission of satisfactory clarification by the Contractor within the stipulated period, NTPC shall not be liable for the delay in making payment. If the bill submitted by Contractor is incorrect and has gross discrepancies, the bill shall be summarily rejected and returned to the Contractor. In the event of dispute, the same shall be settled as per GCC Clause (Settlement of Disputes)</p>
24.7.2	<p>The Employer has established a Vendor Payment Portal where Contractor shall submit their digital Bill/Invoice and may track its status. The Contractor's bill, supported with measurements, as mentioned in clause 24.7 above, shall be digitally signed with Class-2/3 Digital Signature and shall be submitted by the Contractor in Employer's Vendor Payment Portal. No hard/physical copy of such documents will be accepted by the Employer unless otherwise asked for in the PO or instructed by Employer.</p>
24.8	<p>Any interim certificate given relating to Work done or materials delivered, may be modified or corrected by any subsequent interim certificate or by the final certificate. No certificate of the Engineer-in-Charge supporting an interim payment shall itself be conclusive evidence that any Work or materials to which it relates is/are in accordance with the Contract.</p>
24.9	<p>In case of the delayed Work beyond the scheduled completion period, pending consideration of extension of time of completion if it had been requested by the Contractor, interim payments shall continue to be made as herein above provided.</p>
24.10	<p>GST applicable upon on account payment shall be paid/reimbursed to the Contractor along with such payments, on production of satisfactory documentary evidence by the Contractor. However, GST as applicable on</p>

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	<p>Advance payment shall be paid to the Contractor along with the Advance sanctioned. The GST paid along with advance shall be adjusted prorata against the tax due upon on account payment, based on the value of the advance recovered from such on account payment.</p> <p>Notwithstanding anything to contrary contained in the Contract, the Contractor's right to payment under the Contract is subject to issuance of valid tax invoice, payment of applicable GST to the credit of appropriate Government and submission of valid particulars of tax invoice under GST returns in accordance with GST Law.</p> <p>The Contractor shall issue tax invoices, file appropriate returns, and deposit the applicable GST to the account of appropriate government within the time limit prescribed under the GST Law. In the event of any default, Contractor shall be liable to pay any penalty/demand raised on NTPC/NVVN due to default by Contractor, and the same shall be recovered/Contractor shall make good the loss.</p> <p>The Contractor shall be responsible for the issuance of e-way bill and other compliances relating to e-way bill as per GST law.</p>
<p>24.11</p>	<p>Payment of Amount linked to Safety Aspects/ compliance to Safety Rules</p> <p>I. The amount linked to Safety Aspects/ compliance to Safety Rules shall be paid in two parts, viz,</p> <p>A) 10% amount (calculated as 0.1 Y of RA bill) shall be linked to Fatal/Major Accidents, and</p> <p>B) 90% amount (calculated as 0.9 Y of RA bill) shall be linked to various Safety Aspects specified in Safety Rules of NTPC.</p> <p>NOTE:</p> <p align="center">'Amount linked to Safety Aspects/ Compliance to Safety Rules' specified in Price Schedule</p> <p>Y = ----- X 100</p> <p align="center">Total Contract Price</p> <p>II. While raising each RA Bill, Contractor shall claim Amount linked to Safety Aspects/ Compliance to Safety Rules in such a manner that amount claimed is equal to Y% of RA Bill.</p> <p>III. This aforesaid amount at para 24.11 (I.A) shall be withheld from first and second monthly RA bill of the respective quarter/three month period and shall be released in part or full based on safety compliance duly certified by EIC and Safety-in-charge on quarterly basis. The amount for the entire quarter (i.e. RA bills raised during a 3 month period) shall be paid to the Contractors at the end of that three months period along with 3rd/last RA Bill for the quarter/three months period upon complying the following conditions:</p> <p>C) Amount of RA Bill linked to Fatal/ Major Accidents (0.1Y i.e. 10% of amount</p>

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	<p>as elaborated above at para I)</p> <p>Aforesaid amount (on quarterly basis) shall be payable to Contractor only in case, there is</p> <ul style="list-style-type: none"> i) No fatal injury or accident causing death in that three months period <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> ii) No Major injury or accident causing 25% or more permanent disablement to workmen or employees in that three months period. Permanent disablement shall have the same meaning as indicated in The Workmen's Compensation Act' 1923 <p>In case of any fatal injury or accident as elaborated above occurs during that three month period, the stipulated amount (0.1Y) subject to minimum of Rs 10 Lakh per fatality shall be forfeited and shall not be payable to the Contractor under the contract. In case, the amount to be deducted/forfeited exceeds the amount linked to Fatal/ Major Accidents, the same shall be recovered from remaining Amount (0.9Y) linked to Compliance of Safety Rules and/or any other payments immediately due to the Contractor under the Contract.</p> <p>In case of any Major injury or accident causing 25% or more permanent disablement to workmen or employees occurs during that three month period, Rs 4 lakh per Major injury shall be deducted from the amount (0.1Y) linked to Fatal/ Major Accidents and shall not be payable to the Contractor under the contract. In case, the amount to be deducted/forfeited exceeds the amount linked to Fatal/ Major Accidents, the same shall be recovered from remaining Amount (0.9Y) linked to Compliance of Safety Rules and/or any other payments immediately due to the Contractor under the Contract.</p> <p>Further, in case, Contractor doesn't raise RA Bills in any three-month period/quarter and if any fatal injury and/or major accident takes place in that period, EIC shall deduct the amount [Rs 10 Lakh per fatality and Rs 4 lakh per Major injury] pertaining to this particular quarter from his next RA bill/due payment. In case, the amount to be deducted/forfeited exceeds the amount linked to Safety, the same shall be recovered from any other payments immediately due to the Contractor under the Contract.</p> <p>The amount deducted/forfeited as mentioned above shall be in addition to the compensation payable to the workmen / employees under the relevant provisions of the Workmen's Compensation Act' 1923 and rules framed there under or any other applicable laws as applicable from time to time.</p> <p>D) Amount of RA Bill linked to Compliance of Safety Rules (0.9Y i.e. 90% of amount as elaborated above at para G.I.B)</p> <p>Aforesaid amount (on quarterly basis) shall be payable to Contractor in five equal parts under five heads as under:</p> <ul style="list-style-type: none"> (i) Amount payable on deployment of required Safety Personnel <p>One fifth of the amount specified in para 24.11(I.B) (calculated as 0.18Y of RA Bill), on quarterly basis, shall be paid upon certification by EIC in consultation with Safety dept. that required number of Safety personnel as per Clause 2.3 of 'NTPC Safety Rules for Construction and Erection of Power Plants' (as enclosed with GCC/SCC) have been deployed. The aforesaid amount linked to</p>
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		<p>deployment of requisite safety personnel shall be paid as under:</p> <p>a) 50% of the amount referred above at 24.11.III.B.(i), for deployment of Safety Supervisors shall be paid on pro-rata basis depending upon the actual no. of Safety Supervisors deployed vis-à-vis actual requirement:</p> <p style="padding-left: 20px;">Amount to be paid = 0.09Y x RA bill amount x (a/b)</p> <p>Where 'a' is actual no. of Safety supervisors deployed and 'b' is required no. of Safety supervisors as per Safety Rules.</p> <p>In case, actual no. of Safety supervisors deployed is more than requisite number (i.e. a/b is more than 1), the amount to be paid shall be restricted to 0.09Y.</p> <p>b) 50% of the amount referred at 24.11.III.B.(i), for deployment of Safety Officers shall be paid on pro-rata basis depending upon the actual no. of Safety Officers deployed vis-à-vis actual requirement :</p> <p style="padding-left: 20px;">Amount to be paid = 0.09Y x RA bill amount x (a/b)</p> <p>Where 'a' is actual no. of Safety Officers deployed and 'b' is required no. of Safety Officers as per Safety Rules.</p> <p>In case, actual no. of Safety Officers deployed is more than requisite number (i.e. a/b is more than 1), the amount to be paid shall be restricted to 0.09Y.</p> <p>c) In case aforesaid requisite no. of Safety personnel are not deployed by Contractor, amount not to be paid as calculated above for that particular quarter/three month period shall be forfeited and shall not be payable to the Contractor under the contract.</p> <p>(ii) Amount payable on providing requisite Personal Protective Equipment & Safety Equipment</p> <p>One fifth of the amount specified in para 24.11(I.B) (calculated as 0.18Y of RA Bill), shall be paid upon certification by EIC in consultation with Safety dept. that Contractor has adhered to the requirements of Clause 4 (Personal Protective Equipment) of 'NTPC Safety Rules for Construction and Erection of Power Plants' and the provisions of the Bidding Documents with regards to number of Safety Equipment/PPEs to be provided by the Contractor.</p> <p>In case of non-compliance by Contractor, warning letter/Non-compliance shall be issued by EIC/Safety Officer of NTPC as per clause 10.4.9 (ii) of GCC. Further, if more than two such warning letters/Non Compliance Memos are issued in a quarter/three monthly period, above mentioned amount for that particular quarter/three month period shall be forfeited and shall not be payable to the Contractor under the contract.</p> <p>(iii) Amount payable on providing requisite Safety Induction and Training</p> <p>One fifth of the amount specified in para 24.11(I.B) (calculated as 0.18Y of RA Bill), shall be paid upon certification by EIC in consultation with Safety dept. that Contractor has adhered to the requirements of imparting Safety training as per Clause 8.0 (Safety Induction and Training) of 'NTPC Safety Rules for Construction and Erection of Power Plants' to at least 90% of its employees/workmen (who have not been previously provided with requisite</p>
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		<p>training) in a quarter/ three months period.</p> <p>In case Contractor fails in meeting the aforesaid requirement, above mentioned amount for that particular quarter/three month period shall be forfeited and shall not be payable to the Contractor under the contract.</p> <p>(iv) Amount payable on providing requisite Medical and First Aid Amenities</p> <p>One fifth of the amount specified in para 24.11(I.B) (calculated as 0.18Y of RA Bill), shall be paid upon certification by EIC in consultation with Safety dept. that Contractor has adhered to the requirements of Clause 13 (Medical and First Aid Amenities) of 'NTPC Safety Rules for Construction and Erection of Power Plants'.</p> <p>In case Contractor fails to provide Medical and first aid amenities as per requirement of aforesaid Clause 13 even on one incidence in any quarter/three month period, above mentioned amount for that particular quarter/three month period shall be forfeited and shall not be payable to the Contractor under the contract.</p> <p>(v) Amount payable on compliance to Work Permit System</p> <p>One fifth of the amount specified in para 24.11(I.B) (calculated as 0.18Y of RA Bill), shall be paid upon certification by EIC in consultation with Safety dept. that Contractor has adhered to the requirements of Clause 17 (Work Permit System) of 'NTPC Safety Rules for Construction and Erection of Power Plants'.</p> <p>In case of non-compliance by Contractor, warning letter/Non-compliance shall be issued by EIC/Safety Officer of NTPC as per clause 10.4.9 (v) of GCC. Further, if more than two such warning letters/Non Compliance Memos are issued in a quarter/three monthly period, above mentioned amount for that particular quarter/three month period shall be forfeited and shall not be payable to the Contractor under the contract.</p> <p>IV. In case 'Amount linked to Safety Aspects / compliance to Safety Rules' is less than minimum percentage (as specified in BDS) of the total Contract value, the amount by which it is lower shall be retained proportionately from the other components of the Contract price while releasing payments of each RA bill. No interest shall be payable on the amounts linked to Safety Aspects / Compliance to Safety Rules including aforesaid retained amount. The amounts linked to Safety Aspects / Compliance to Safety Rules including aforesaid retained amount shall be payable in part or full based on safety compliance duly certified by EIC and Safety-in-charge on quarterly basis.</p>
25	Contract Price Adjustment	
	25.1.0	The Contract Price (for definition, please refer to GCC Clause titled 'Definitions') as awarded shall be the base Contract Price
	25.2.0	The rates quoted by the Bidder shall be the base price which will be subject to price adjustment in accordance with the conditions and formula prescribed in SCC and further subject to satisfying the requirements specified in this clause only
	25.3.0	A certain fixed percentage of base price shall not be subject to any price adjustment. The balance percentage to be specified shall be of identified Components towards labour, materials, steel, cement and Diesel Oil/ (POL) and shall be subjected to Price Adjustment.

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25.4.0	The value of "F" as specified in Special Conditions of Contract will remain unchanged and fixed component shall not be disputed.
25.5.0	No ceiling limit on Price Adjustment on the base contract price
25.6.0	Price Adjustment(s) shall be calculated for the quantum of works executed for the month or the period of the bill as per agreed Work Schedule. For the purpose of payment/recovery of price variation provisions, the Contractor would be eligible for such claims or shall be liable for refund on the quantum of work scheduled or the actual quantum of work done provided always that the quantum of work done is more than or equal to the scheduled quantum of work as per the agreed Work Schedule. In other words, the Contractor shall not be eligible for these claims nor liable or payment/refund under these provisions if the work has been delayed beyond the scheduled date(s) for reasons attributable to Contractor. However the Contractor would be eligible for claim or liable for refund for price adjustment(s) for quantities of work executed beyond the scheduled dates based on the value of Indices as applicable to the schedule date of execution, for such delayed work provided that if the indices during the extended periods are lower than the indices during scheduled dates of execution, then lower indices shall be applicable
25.7.0	Additional, altered or substituted items of work, derived from the agreed schedule of rate (to be attached in the "Award Letter") will also attract price adjustment as per this clause. No price adjustment is payable for the rate/amount of the additional, altered or substituted items of works, when derived from or based on Market rates as per clause 49 of Section IV, GCC. No price adjustment for the cost of Owner Issued materials (viz. steel & cement or any other item(s) issued from Owner's Store) shall be applicable, which are issued at free of cost to the Contractor
25.8.0	Every month after the award of Contract, the Contractor shall submit to the Engineer-in Charge, a written notice of the changes, if any, that have occurred in the specified indices of materials, labour, Gases or High Speed Diesel Price, during the previous reporting period containing the effective date of such change, the amount of change for the claim of the amount of Contract price adjustment with authenticated documentary evidence of the relevant published indices/diesel price to substantiate the price adjustment.
25.9.0	Provided further that such payment/refund shall not be operative and payable after the Schedule expiry of the Contract period or authorized extended Contract period or extended date of completion of works or items of works in question, whichever is earlier.
25.10.0	In cases, the work or items of work, or group of items of work, are delayed beyond the schedule dates for the work, for reasons attributable to the Contractor, the price adjustment provisions shall not be applicable for the period of time between the schedule date and the actual date, but for as provided above in sub-clause 25.6.0
25.11.0	For this purpose, the schedule date of work shall be as identified in line with provisions of clause entitled " TIME AND EXTENSION FOR DELAY " and/ or "The Work Schedule/ Bar Chart" (which will be discussed and finalised before Award of work) wherein the separate period of completion has been specified/ agreed to for items, or groups of items, or works.
25.12.0	TOTAL ADJUSTED CONTRACT PRICE The total adjusted Contract price shall be Sigma (ACP) + other elements of Contact price if any

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	25.13.0	Except as otherwise specifically provided in the Contract, no other expenditure incurred by the Contractor, due to any reason whatsoever, shall be payable to the Contractor.
	25.14.0	The Contractor shall be required to produce necessary "Price List" for High Speed Diesel at the Indian Oil Corpn. retail outlet nearest to the project and "Monthly Bulletins" issued by office of the Economic Adviser, Ministry of Commerce & Industry, Government of India/ Labour Bureau, Shimla (as published by RBI) or any other related bulletin for materials/ Labour for receiving payments from Employer/ Refund to be made to Employer as required in the Price Adjustment Formula mentioned in SCC.
26.	Taxes and Duties	
	26.1	Except as otherwise specifically provided in the Contract, the Contractor shall be liable and responsible for the payment of all taxes, duties, levies and charges imposed on the Contractor, its Sub-Contractors and those imposed on the Contractor's equipment, materials, supplies and services to be used in the performance of the Contract or furnished under the Contract
	26.2	The Award of the Contract is on 'Works Contract' basis. Notwithstanding GCC Sub Clauses 26.1 above, the Employer shall bear and pay/reimburse to the Contractor, Goods and Services Tax (GST) applicable on the items of Works Contract described in the Schedule of Quantities. However, the taxes, duties & levies as may be applicable on the materials used for Works Contract shall be to the contractor's account and no separate claim in this regard will be entertained by the Employer. Further, in case of any variation in the rates of the GST after the date seven (7) days prior to deadline set for submission of the Techno-Commercial bids, the same shall be paid/ reimbursed to/ recovered from the Contractor subject to submission of documentary evidence.
	26.3	If the Contractor intends to engage itself in quarrying or mining of soil/ earth, sand, stone/aggregates, metals, minerals or minor minerals required for the Civil works, as the case may be, it shall obtain necessary permits under the applicable law for such mining or quarrying from the State/Central Government authorities and pay the fee or charges applicable thereto.
	26.4	The Civil works component of the Contract Price shall be inclusive of any Royalties or Seigniorage Fee or Cess or other charges payable on the quarried or mined metal, minerals, or minor minerals, as the case may be, at the rate(s) prevailing as on seven (7) days prior to the date of Price bid opening.
	26.4.1	It shall be the responsibility of the Contractor to ensure that the Royalties or Seigniorage Fee or Cess or other charges on the quarried or mined metal, minerals or minor minerals are paid to the statutory authorities.
	26.4.2	The component of Royalties or Seigniorage Fee or Cess or other charges, if applicable in a running account bill, shall only be released by the Employer to the Contractor on submission of the following documents in original: A) In case the Contractor is the primary license holder of the quarry / mines: i) Vehicle wise challan / transit permit and proof of payment of royalty, and ii) Any other document required as per the relevant Acts/Rules of the concerned state. B) In case the Contractor is the purchaser of soil/earth, sand, stone/aggregates, metals, minerals or minor minerals: i) Purchase voucher and vehicle wise challan / transit permit and proof of payment of royalty, and ii) Any other document required as per the relevant Acts/Rules of the concerned state
	26.4.3	In case the Contractor fails to provide the required proof of royalty payment with the RA bill then an amount based on the prevailing rates of the royalty shall be

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		retained from the respective RA bill, as security against royalty, which shall be refunded to the Contractor on submission of proof of royalty payment.
	26.4.4	The Contractor shall pay and indemnify the Employer against any default in payment of Royalties or Seigniorage Fee or Cess or other charges by the Contractor or the agency from which the Contractor purchases soil/earth, sand, stone/aggregates, metals, minerals or minor minerals.
	26.4.5	In the event of there being a statutory increase in the rates of royalty charges/fresh levy of royalty on materials, the same shall be reimbursed to the Contractor upon submission of original challan by him of having made the payments at revised rates. In the event of there being a decrease in such rates, the same shall be recovered from the Contractor. The base date for calculating the increase or decrease shall be the rate as on seven (7) days prior to the date of Price bid opening. The total reimbursement (positive or negative) as specified above, to be paid or recovered, shall however be calculated on the quantity of materials actually considered while making the royalty payments to the concerned authorities, or the theoretical consumption of these materials (calculated on the basis of the volume of concrete or fill accepted for payment), whichever is less, and on the basis of documentary evidence of Govt. Notification. However, the Contractor will settle claims, if any, on account of over charge by the State Authorities
	26.5	If a new tax, duty or levy is imposed under statute or law in India after the date seven (7) days prior to deadline set for submission of the bids and the Contractor becomes liable there under to pay and actually pays the said new tax, duty or levy for bonafide use on the Works contracted, the same shall be reimbursed to the Contractor against documentary evidence of proof of payment, provided that the amount thus claimed is not paid/payable under price variation provision of the Contract
	26.6	The payment/reimbursement of statutory variations in the rates of tax and/or of new tax, duty or levy imposed under statute or law in India as per GCC Sub-Clauses 26.2, 26.3, 26.4 and 26.5 above, would be restricted only to direct transactions between the Employer and the Contractor
	26.7	The Employer shall be entitled to make necessary tax deductions at source as per the prevalent laws. The Contractor shall be required to submit the PAN details to the Engineer-in-Charge before the submission of the first bill/ invoice under the Contract.
	26.8	The Contractor shall himself be informed of all the applicable laws, notifications, rules, circulars and other communications of the State or Central or other authorities with regard to levy of any tax, duty, cess, levy or fee etc, which in any manner may impinge upon him in performance of any obligations/responsibilities under or arising out of the Contract.
27	Overpayments and Underpayments	
	27.1	Wherever any claim for the payment of a sum of money to the Employer arises out of or under this Contract against the Contractor, the Contractor upon demand by the Employer or by the Engineer-in-Charge on behalf of the Employer, with explanation of the reasons for such a sum/ claim becoming due, shall forthwith pay the same to the Employer. If the Contractor fails to do so within twenty-one (21) days of such a claim, then the same may be deducted by the Employer from any sum then due or which at any time thereafter may become due to the Contractor under this Contract or from any other sum due to the Contractor from the Employer which may be available with the Employer or from his security deposit
	27.2	The Employer reserves the right to carry out post payment audit and technical examination of the final bill including all supporting vouchers, abstracts, etc. The Employer further reserves the right to enforce and recover any overpayment when detected, notwithstanding the fact that the amount of the final bill may

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		include any item which is under dispute between the parties and referred to for settlement under GCC Clause entitled 'Settlement of Disputes' and notwithstanding the fact that the amount of the final bill figures in the arbitration decision/award.
	27.3	If as a result of such audit and technical examination, any overpayment is discovered in respect of any Work done by the Contractor or alleged to have been done by him under the Contract, it shall be recovered by the Employer from the Contractor by any or all of the methods prescribed above. Similarly, if any underpayment is discovered by the Employer, the amount shall be duly paid to the Contractor by the Employer forthwith.
	27.4	Provided that the aforesaid right of the Employer to adjust overpayments against amounts due to the Contractor under any other Contract with the Employer shall not extend beyond the period of two years from the date of payment of the final bill or in case the final bill is a minus bill, from the date the amount payable by the Contractor under the minus final bill is communicated to the Contractor
	27.5	Any amount due to the Contractor under this Contract for underpayment may also be adjusted against any amount then due or which may at any time thereafter become due from the Employer to the Contractor under any other Contract or account whatsoever.
28.	Time Limit for submission & payment of Final Bill and waiver of rights of all claims	
	28.1	The final bill shall be submitted by the Contractor within three (3) months of physical completion of the Works unless otherwise a longer period is agreed to between the Engineer-in-Charge and the Contractor. No further claims shall be made by the Contractor after submission of the final bill and these shall be deemed to have been waived and extinguished. Payment of the final bill will be made within four (4) months of receipt of the same.
		D. Execution of Facilities
29.	Work Commencement, Execution and Delays	
	29.1	Commencement of Works The execution of the Works shall commence from the 14th day after the date on which the Engineer-in-Charge issues written orders to commence the Work, unless otherwise stated elsewhere in the Contract.
	29.2	Time for Completion The entire scope of Work covered under this Contract shall be completed within the time stated in SCC or within such extended time granted to the Contractor by the Employer under the provisions of GCC Sub-Clause 29.5. The time allowed for execution of the Works as specified in the SCC or the extended time in accordance with these Conditions shall be the essence of the Contract.
	29.3	Work Progress
	29.3.1	Unless already incorporated in the Letter of Award, as soon as possible after the Contract is awarded, the Engineer-in-Charge and the Contractor shall agree upon a Work Schedule which will become the Contract Work Schedule. The Work Schedule shall be prepared in direct relation to the time stated in the Contract documents for the completion of the Works. The Work Schedule shall indicate the forecast of the dates of commencement and completion of various

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		trades or sections of work.
	29.3.2	All the Contractor's activities shall be performed and completed strictly in accordance with the agreed Work Schedule and to achieve the targets, the Contractor shall have to plan adequate mobilisation of all resources. The Engineer-in-Charge, shall however, have the right to review the progress and modify the sequence of carrying out the Work suiting the Site conditions and the Contractor shall be required to comply with such modifications and complete his activities in accordance thereof without any extra cost to the Employer.
	29.3.3	<p>Maintenance of Records of Weekly Progress Review Meetings at Site</p> <p>The Contractor shall be required to attend all weekly site progress review meetings organized by the 'Engineer-in-Charge' or his authorized representative. The deliberations in the meetings shall inter alia include the weekly program, progress of work (including details of manpower, tools and plants deployed by the contractor vis-a-vis agreed schedule), inputs to be provided by Employer, delays, if any, and recovery program, specific hindrances to work and work instructions by Employer. Record of Hindrances / events that lead to slow / stoppage of smooth execution of work shall be maintained in "Hindrance Register". The minutes of the weekly meetings shall be recorded in triplicate in a numbered register available with the 'Engineer-in-Charge', or his authorized representative. These recordings shall be jointly signed by the Engineer-in-Charge or his authorized representative and the Contractor and one copy of the signed records shall be handed over to the Contractor.</p> <p>The following documents shall form the principal basis for consideration of Time Extension pursuant to GCC Clause 29.5 with or without LD, determining the compensation amount pursuant to GCC Clause 29.6 and settlement of extra claims during the execution of contract:</p> <ol style="list-style-type: none"> 1. The joint recordings in "Hindrance Register" and "Weekly Review Register". 2. Records of Technical Coordination Meetings. 3. Records of Contract Review Meetings. 4. Written notices issued by the "Engineer-in-charge" or his authorized representative to contractor in the relevant period. 5. Written requests/ notices by the Contractor to Employer/ Engineer-in-Charge in the relevant period.
	29.4	Contract Coordination Procedures, Coordination Meetings & Progress Reporting
	29.4.1	The Contractor shall prepare and finalise in consultation with the Engineer-in-Charge, a detailed contract coordination procedure within twenty-eight (28) days from the date of issue of Letter of Award, for the purpose of execution of the Contract.
	29.4.2	The Contractor shall have to attend all the meetings at his own cost with Engineer-in Charge or any authorised representative of the Employer during the currency of the Contract, as and when required and fully cooperate with such

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		persons and agencies involved during these discussions.
	29.4.3	During the execution of the Work, the Contractor shall submit at his own cost a detailed monthly progress report to the Engineer-in-Charge in three copies, latest by 14th of every month.
	29.5	Extension of Time for Completion
	29.5.1	<p>The Time for Completion specified shall be extended if the Contractor is delayed or impeded in the performance of any of the obligations under the Contract by reason of any of the following:</p> <p>a) any occurrence of Force majeure as provided in GCC Clause entitled 'Force Majeure', or</p> <p>b) Work Schedules for beyond deviation limits & Extra Items as provided in GCC SubClause 49.5, or</p> <p>c) any default or breach of the Contract by the Employer, or delay on the part of other contractors engaged by the Employer in executing work not forming part of this Contract, or</p> <p>d) any suspension order given by the Employer under GCC Sub-Clauses 50.1 (ii) and 50.1 (iii), or</p> <p>e) Any other sufficient cause which, in the opinion of the Engineer-in-Charge, is beyond the Contractor's reasonable control;</p> <p>by such period as shall be fair and reasonable in all the circumstances and as shall fairly reflect the delay or impediment sustained by the Contractor.</p>
	29.5.2	Except where otherwise specifically provided in the Contract, the Contractor shall submit to the Employer a notice in writing of a claim for an extension of the Time for Completion, together with particulars of the event or circumstance justifying such extension as soon as reasonably practicable, but no later than twenty-eight (28) days after the commencement of such event or circumstance. As soon as reasonably practicable, after the receipt of such notice and supporting particulars of the claim, the Employer shall give a fair and reasonable extension of time for completion of Work. Such extension shall be communicated to the Contractor by the Engineer-in-Charge in writing, within fifty-six (56) days of the date of receipt of such request by the Engineer-in-Charge.
	29.5.3	The Contractor shall at all times use his reasonable efforts to minimise any delay in the performance of his obligations under the Contract
	29.5.4	The compensations, if any, payable to the Contractor on account of any one or more of the above reasons of delay have been separately dealt with under relevant provisions of the Contract.
	29.6 Liquidated Damages for Delay	
	29.6.1	If the Contractor fails to complete the Work on or before the scheduled or extended date of completion as per GCC Sub-Clauses 29.2 and 29.5, he shall, without prejudice to any other right or remedy of the Employer, arising out of the

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		Contract on account of such delay, be liable for payment of liquidated damages, not as penalty, as per provisions of SCC Clause entitled 'Liquidated Damages for Delay'
	29.6.2	<p>The following documents shall form the principal basis for consideration of Extension of Time for Completion pursuant to GCC Sub-Clause 29.5 with or without Liquidated Damages and determining the compensation amount pursuant to GCC Sub-Clause 29.6.</p> <ol style="list-style-type: none"> 1. The joint recordings in "Hindrance Register" and "Weekly Review Register". 2. Records of Technical Coordination meetings, 3. Records of Contract Review meetings, 4. Written notices issued by the Employer and/or the Engineer-in-Charge or his authorized representative to the Contractor in the relevant period. 5. Written requests/ notices by the Contractor to Employer/ Engineer-in-Charge in the relevant period
	29.7	Delays by Employer or his Authorised Representative
	29.7.1	In case the Contractor's performance is delayed due to any act of omission on the part of the Employer or his authorised representative, then the Contractor shall be given appropriate extension of time for the completion of the Works, to the extent such omission on the part of the Employer has caused delay in the Contractor's performance of his work. Regarding reasonableness or otherwise of the extension of time, the decision of the Engineer-in-Charge shall be final.
	29.7.2	If such delays by the Employer have resulted in any increase in the cost to the Contractor, the Contractor shall be eligible to claim demonstrable and reasonable costs supported by full details of such increased costs incurred by him with all documentary evidence. The Employer shall examine the justification for such a request for claim and if satisfied, the extent of compensation shall be mutually agreed depending upon the circumstances at the time of such an occurrence.
30.	Sub Contracts	
	30.1	<p>After the award of the Contract, the Contractor shall not subcontract the Works/ any part of the Works without the prior written consent of the Engineer-in-Charge. Any such consent shall not relieve the Contractor from any liability or obligation under the Contract and he shall be responsible for the acts, defaults and neglects of any Sub-Contractor, his agents, servants or workmen as fully as if they were the acts, defaults or neglects of the Contractor, his agents, servants or workmen.</p> <p>Provided that the Contractor shall not be required to obtain such consent for:</p> <ol style="list-style-type: none"> a) the provision of labour, b) the purchase of materials which are in accordance with the standards specified in the Contract, or c) the subcontracting of any part of the Works for which the sub-

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		<p style="text-align: center;">contractor is named in the Contract.</p> <p>In the event of the Contractor proposing a sub-contractor for any part of the Works after the award of the Contract, he shall be required to take approval from the Engineer-in Charge. If the Engineer-in-Charge approves of the same, he shall stipulate qualifying requirements for the sub-contractors to perform the specified part of Work. The Contractor will then submit the requisite credentials of the agency(ies) he proposes to engage. The details so furnished by the Contractor shall be reviewed by the Employer. In case the agency(ies) proposed by the Contractor for the subcontracting are not considered acceptable, the Contractor will be required to furnish credentials of alternate agency(ies) for approval of Engineer-in-Charge. Based on the review and assessment, the agency(ies) shall be approved by the Engineer-in-Charge within twenty-one (21) days of furnishing of credentials by the Contractor.</p>
	30.2	Where a list of approved agencies for a sub-contracting work is provided in the Contract, the Contractor shall inform the name of the sub-contractor selected by him within a period as agreed with the Engineer-in-Charge, however not later than twenty-eight (28) days of the date of such selection.
31	Setting out the Works	
	31.1	The Engineer-in-Charge shall supply dimensioned drawings, levels and other information necessary to enable the Contractor to set out the Works and the Contractor shall set out the Works and be responsible for the accuracy of the same. He shall amend at his own cost and to the satisfaction of the Engineer-in-Charge any error found at any stage which may arise through inaccurate setting out unless such error is based on incorrect data furnished in writing by the Engineer-in-Charge, in which case the cost of rectification shall be borne by the Employer. The Contractor shall protect and preserve all bench marks used in setting out the Works till date of submission of final bill under the Contract, unless the Engineer-in-Charge directs otherwise.
32.	Methodology of Construction & Equipment Mobilisation	
	32.1	Methodology of construction and the work plan adopted by Contractor shall match the construction methodology/requirements specified in Technical Specifications
	32.2	The suggested minimum plant & equipment and machinery to be deployed by the Contractor for the execution of Work shall be as given in Technical Specifications
	32.3	The Contractor shall arrange at his own expense all tools, plant and equipment including Crane(s) (hereinafter referred to as T&P) required for execution of the work.
	32.3.1	If the Contractor requires any item of T & P on hire from the Employer, the Employer will, if such item is available, hire it to the Contractor at an hourly rate to be fixed by the Engineer-in-Charge
	32.3.2	The T&P shall be given to the Contractor on hire by the Employer for a period of one hour or its multiple thereof. In case the T&P is hired by the Contractor for a period of four hours or less, the hire charges applicable for a minimum period of four hours shall be recovered from the Contractor's bills. In case the T&P is hired by the Contractor for a period exceeding four hours, the hire charges shall be calculated based on the charges applicable as per hourly rate. The hire

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		charges in respect of T&P given on hire to the Contractor by the Employer shall be recovered from the Contractor's bills
	32.3.3	For accounting purpose, total working hours shall be considered to be the period between time of placement of T&P to the Contractor at the requested location and time of release of the same. This shall be logged in Record Book on daily basis and shall be signed between Contractor/ Subcontractor and the Engineer-in-charge or his authorised representative. In case the T&P issued to the Contractor is not owned by the Employer but hired from another agency, the authorised representative of the agency providing the T&P will also sign the said Record Book. In case the Contractor contests correctness of any entry and/or fails to sign the Record Book the decision of the Engineer-in-Charge shall be final and binding on him. Hire charges shall be calculated in accordance with the entries in the Record Book.
	32.3.4	The Contractor will be exempted from levy of any charges for the number of days he is called upon in writing by the Engineer - in- Charge to suspend execution of the work, provided Employer's T & P/ T&P hired by the Employer in question has, in fact, remained idle with the Contractor because of the suspension, provided the Contractor, in case the period of suspension exceeds 11 days, returns Employer's T & P/ T&P hired by the Employer to the place from where it was issued.
	32.3.5.1	<p>T&P owned by Employer</p> <p>The hire charges will cover financing cost, charges of crew, depreciation, stores for maintenance and cleaning purposes and fuel needed to start a machine at the time of issue. All other charges such as cost of fuel for running a machine, engine oil, kerosene oil, etc., for working Employer's T&P, and all unskilled labour and water required for servicing/wash out shall be borne by the Contractor. The Contractor shall permit the Engineer-in-Charge to carry out periodical maintenance of Employer's T&P in accordance with the provision there for in the aforesaid Schedule, and there will be no deduction in hire charges for the period spent on such maintenance.</p> <p>However, the Contractor shall be allowed to return the tools and plants (issued by the Employer) for purposes of repairs and for the duration of such repairs no hire charges shall, be levied.</p> <p>The Contractor shall be responsible for care and custody of Employer's T&P (including employment of chowkidars) during the period Employer's T&P remain with him and any damage (fair wear and tear excepted) to any of the equipment(except for Excepted Risks provided always the Contractor has taken precautions necessary to protect it from such risks) shall be made good at the Contractor's expense to the satisfaction of the Engineerin-Charge unless such damage is caused because of negligence of crew provided by the Employer.</p>
	32.3.5.2	<p>T&P hired by the Employer</p> <p>The hourly hiring rate for T&P hired by the Employer from another agency and issued to Contractor shall be all inclusive rate including the cost of hiring, operation & maintenance charges, fuel charges and other charges</p>
	32.3.6	The Employer gives no guarantee in respect of output of T & P hired to the Contractor and no reduction in rates or any compensation shall be allowed on the ground that out turn or performance of Employer's T & P/ T&P hired by the Employer was not to the Contractor's expectation.
	32.3.7	The T&P hired to the Contractor shall be returned at the place of issue by the Contractor to the Engineer-in-Charge (unless otherwise directed) on execution of the work or section of the work at the end of the day. In case the T&P is used by the Contractor in continuation of previous requisition and the crane has not

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		moved out of his work area, then the movement of crane for fresh requisition(s) by the Contractor within his work area shall be to the Contractor's account.
	32.3.8	The Employer shall be entitled to terminate the hire without assigning any reason whatsoever and the Contractor shall have no claim to any payment of compensation or otherwise whatsoever on account of termination of hire of T&P issued by the Employer. On termination of the hire by the Employer, the Contractor shall return the T&P at the place of issue unless otherwise directed by the Engineer-in-Charge
33.	Patent Indemnity	
	33.1	The Contractor shall indemnify and hold harmless the Employer and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, which the Employer may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright or other intellectual property right registered or otherwise existing at the date of the Contract in the performance of the Contract.
	33.2	In the event of any claim being made or action being brought against the Employer or its representatives or its employees, in respect of any such matters as aforesaid, the Contractor shall immediately be notified thereof. However, such indemnity shall not apply when such infringement has taken place in complying with the specific directions issued by the Employer; but the Contractor shall pay any royalties or other charges payable in respect of any such use, the amount so paid being reimbursed to the Contractor only if the use was as a result of any drawings and/or specifications issued after the award of Contract by the Employer, provided further that the Contractor has brought to the notice of the Engineer-in-Charge, of such infringement immediately upon the instructions of the Engineer-in-Charge or upon the Contractor becoming aware of such infringement.
34.	Materials for the performance of the Contract	
	<p>(a) Materials to be provided by the Contractor</p> <p>1. The Contractor shall at his own expense, provide all materials required for the Works other than those which are to be issued by the Employer.</p> <p>2. All materials to be provided by the Contractor shall be in conformity with the specifications laid down in the Contract and the Contractor shall, if requested by the Engineer-in-Charge, furnish proof to the satisfaction of Engineer-in-Charge that the materials so comply.</p> <p>3. Wherever required by the Engineer-in-Charge, the Contractor shall, at his own expense and without delay, provide samples of materials proposed to be used in the Works. The Engineer-in-Charge shall within seven (7) days thereafter or within such further period as he may require, intimate to the Contractor in writing, whether samples are approved by him or not. If samples are not approved, the Contractor shall forthwith arrange for fresh samples complying with the Technical specifications laid down in the Contract, for approval.</p> <p>4. The Engineer-in-Charge shall have full powers to require removal of any or all of the materials brought to site by the Contractor which are not in accordance with the Contract specifications or do not conform in character or quality to samples approved by him. In case of default on the part of the Contractor in removing rejected materials, the Engineer-in-Charge shall be at liberty to have them removed by other means. The Engineer-in-Charge shall have full powers to order the Contractor to provide other proper materials to be substituted for rejected materials and in the event of the Contractor refusing to comply, he may cause the same to be supplied by other means. All costs, which may attend upon such removal and/or substitution, shall be borne by the Contractor.</p>	

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The Engineer-in-Charge shall be entitled to have tests carried out as specified in the Contract for any materials supplied by the Contractor other than those for which, as stated above, satisfactory proof has already been furnished, at the cost of the Contractor and the Contractor shall provide at his expense all facilities which the Engineer-in-Charge may reasonably require for the purpose. If no tests are specified in the Contract, and such tests are required by the Engineer-in-Charge, the Contractor shall provide all facilities required for the purpose and the charges for these tests including the cost of materials consumed/used in such tests shall be to the account of Employer, except if the tests disclose that the said materials are not in accordance with the provision of the Contract, then the same shall be to the account of the Contractor

5. The Contractor shall indemnify the Employer, its representatives or its employees against any action, claim or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties or other charges which may be payable in respect of any article or material or part thereof included in the Contract. In the event of any claim being made or action being brought against the Employer or its representatives or its employees, in respect of any such matters as aforesaid, the Contractor shall immediately be notified thereof. However, such indemnity shall not apply when such infringement has taken place in complying with the specific directions issued by the Employer; but the Contractor shall pay any royalties or other charges payable in respect of any such use, the amount so paid being reimbursed to the Contractor only if the use was as a result of any drawings and/or specifications issued after the award of Contract by the Employer, provided further that the Contractor has brought to the notice of the Engineer-in-Charge, of such infringement immediately upon the instructions of the Engineer-in-Charge or upon the Contractor becoming aware of such infringement.

6. Subject as hereinafter provided in GCC Clause entitled 'Contract Price Adjustment' all charges on account of GST and other levies/octroi on materials obtained for the Works from any source (excluding materials issued by the Employer) shall be borne by the Contractor.

(b) Materials to be issued by the Employer:

(i) Materials to be issued by the Employer free of cost

The Employer, if so stipulated in SCC, may issue cement, reinforcement steel and structural steel to the Contractor free of cost for incorporation in the Works as per the terms and conditions specified in the SCC/Technical Specifications.

(ii) Materials to be issued by the Employer on chargeable basis

If after the award of the Contract, the Contractor desires the Employer to issue/supply any other materials, for the purposes of the Contract such materials may be issued by the Employer, if available, at rates and terms and conditions to be fixed by the Engineer-in-Charge. The Employer reserves the right not to issue any such materials. The non-issue of such materials will not entitle the Contractor for any compensation whatsoever either in time or in cost.

(C) General:

1. Materials required for the Works, whether brought by the Contractor or issued by the Employer, shall be stored by the Contractor only at places approved by the Engineer-in-Charge. Storage and safe custody of material shall be the responsibility of the Contractor.

2. Engineer-in-Charge shall be entitled at any time to inspect and examine any materials intended to be used in or on the Works, either on the Site or at factory or workshop or other place(s) where such materials are assembled, fabricated, manufactured or at any place(s) where these are lying or from which these are being obtained and the Contractor shall give such facilities as may be reasonably required for such inspection and examination.

3. All materials brought to the Site shall not be removed off the Site without the prior written approval of the Engineer-in-Charge. But whenever the Works are finally completed and advance, if any, in respect of any such material is fully recovered, the Contractor shall at his own expense forthwith remove from the Site all surplus material originally supplied by him.

4. The Employer may issue all the materials agreed to be issued to

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	<p>the Contractor under the Contract, at its site stores, or nearest railhead. In case the materials are issued at the nearest rail head, the cost of transportation only, from such rail head to the Site will be borne by the Employer, subject to the reasonableness of such transportation cost being certified by the Engineer-in-Charge. All other costs such as loading, unloading, transportation to Contractor's godown, storage etc. till the materials are incorporated in the Works or returned to the Employer shall be to the account of the Contractor.</p> <p>All materials issued to the Contractor, by the Employer for incorporation or fixing in the Works (including preparatory work) shall, on completion or on termination of the Contract, be returned by the Contractor at his expense, at the Employer's store, after making due allowance for actual consumption, reasonable wear and tear and/or waste. If the Contractor is required to deliver such materials at a place other than the Employer's store, he shall do so and the transportation charges from the Site to such place, less the transportation charges which would have been incurred by the Contractor, had such materials been delivered at the Employer's store, shall be borne by the Employer.</p>	
35.	Quality Assurance Programme	
	35.1	Sampling, testing and quality assurance requirements are given in Technical Specifications.
	35.2	All costs associated with testing of materials required as per Technical Specifications shall be deemed to be included in Contract rates/prices in the Schedule of Quantities.
36.	Inspection and Approval	
	36.1	All Works embracing more than one process shall be subject to examination and approval at each stage thereof and the Contractor shall give due notice to the Engineer-in-Charge or his authorised representative when each stage is ready. In default of such notice, the Engineer-in-Charge shall be entitled to appraise the quality and extent thereof.
	36.2	No work shall be covered up or put out of view without the approval of the Engineer-in-Charge or his authorised representative and the Contractor shall provide full opportunity for examination and measurement of any work which is about to be covered up or put out of view and for examination of foundations before further work is placed thereon. The Contractor shall give due notice to the Engineer-in-Charge or his authorised representative whenever any such work or foundation is ready for examination and the Engineer-in-Charge or his representative shall without unreasonable delay, unless he considers it unnecessary and advises the Contractor accordingly' attend for the purpose of examining and measuring such work or of examining such foundations. In the event of the failure of the Contractor to give such notice he shall, if required by the Engineer-in-Charge, uncover such work at his own expense.
	36.3	The Engineer-in-Charge or his authorised representative shall have powers at any time to inspect and examine any part of the Works and the Contractor shall give such facilities as may be reasonably required for such inspection and examination.
	36.4	The Contractor shall uncover any part of the Works and/or make openings in or through the same as the Engineer-in-Charge may from time to time direct for his verification and shall reinstate and make good such part to the satisfaction of the Engineer-in-Charge. If any such part has been covered up or put out of view after being approved by the Engineer-in-Charge and is subsequently found on uncovering to have been executed in accordance with the Contract, the expenses of uncovering and/or making opening in or through, reinstating and making good the same shall be borne by the Employer. In any other case all such expenses shall be borne by the Contractor.

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	36.5	detailed further in the Technical Specifications.
37.	Records and Measurement	
	37.1	The Engineer-in-Charge shall, except as otherwise stated, ascertain and determine by measurement the value of the Work done in accordance with the Contract.
	37.2	All items having a financial value shall be entered in Measurement Book, level book, etc. prescribed by the Engineer-in-Charge so that a complete record is obtained of all Work performed under the Contract.
	37.3	Measurements shall be taken jointly by the Engineer-in-Charge or his authorised representative and the Contractor or his authorised representative.
	37.4	Before taking measurements of any Work the Engineer-in-Charge or his authorised representative for the purpose shall give a reasonable notice to the Contractor. If the Contractor fails to attend or send his authorised representative for taking the measurements after such a notice or fails to countersign or to record the objection, if any, within a week from the date of measurement, then in any such event measurements taken by the Engineer-in-Charge or his authorised representative shall be taken to be correct measurements of the Work.
	37.5	The Contractor shall, without extra charge, provide assistance with every appliance, labour etc. necessary for taking measurements
	37.6	Measurements shall be signed and dated by both parties each day on the Site on completion of measurement. If the Contractor objects to any of the measurements recorded, a note to that effect shall be made in the Measurement Book against the item objected to and such note shall be signed and dated by both parties engaged in taking the measurement. The decision of the Engineer-in-Charge on any such dispute or difference or interpretation shall be final and binding on both the parties and shall be beyond the scope of the provisions of settlement of disputes under the Contract.
38.	Methods of Measurement	
	38.1	Measurement of Contract items of Work shall be taken in accordance with method of Measurement stipulated in the Technical Specifications/Schedule of Quantities. In case of extra items, the Engineer-in-Charge shall also specify the method of measurement for such items at the time of his order for execution of such extra items
	38.2	In case no method of measurement is stipulated in Technical Specifications/ Schedule of Quantities/ Order of the Engineer-in-Charge, then the Method of Measurement of such items shall be as per the relevant Standard Method of Measurement issued by Indian Standards Institution or general industry practice/ local custom
39.	Temporary / Enabling Works	
	39.1	The siting and nature of all offices, access road to the work areas, access tracks to work areas, sumps, and all other Temporary / Enabling Works as may be required for the proper execution of the Works shall be subject to the approval of the Engineer-in-Charge. These Works shall be executed by the Contractor at his own cost. Hard crusting for preassembly/fabrication yard shall be in line with Technical Specifications.
	39.2	All equipment, labour, materials including cement, reinforcement and the structural steel required for the Enabling Works associated with the entire Contract shall have to be arranged by the Contractor only. Nothing extra shall

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		be paid to the Contractor on this account and the unit rates quoted by the Contractor on this account and the unit rates quoted by the Contractor for various items in the Schedule of Quantities shall be deemed to include the cost of Enabling Works.
	39.3	<p>However, for fabrication yard or for fabrication of structural steel, if any, hard crusting made with compacted filling using broken hard stone aggregate with binding material shall be measured and paid under relevant item of stone aggregate filling with binding material as specified in Technical Specifications and Schedule of Quantities.</p> <p>The maximum area of hard crusting that will be paid is limited to consecutive three (3) month peak fabrication quantity in M.T. indicated in the Work Schedule multiplied by 3.5 sq. m per M.T. The hard crusting area arrived as above shall be further subject to availability of appropriate area in the general layout plan and approval of the Engineer-in Charge.</p> <p>Further development of fabrication and assembly bed, power distribution points, cable laying, drains, additional area of hard crusting over and above area stipulated etc., shall be done by the Contractor, at his own cost</p>
	39.4	The Contractor shall make his own arrangement for approach to the work Site, including borrow / disposal area and for movement of men, machinery, other requirement etc. required for carrying out the Work included under this Contract.
40.	Urgent Works	
	40.1	If any Urgent Work becomes necessary and the Contractor is unable or unwilling at once to carry it out, the Engineer-in-Charge may by his own or other means, carry it out as he may consider necessary. If the Urgent Work shall be such as the Contractor is liable under the Contract to carry out at his expenses, all expenses incurred on it by the Employer shall be recoverable from the Contractor and be adjusted or set off against any sum payable to him.
41.	Construction Power and Construction Water Supply and Staff / Labour Colony	
	41.1	Unless otherwise stated in SCC, the provisions for Construction Power and Construction Water Supply and Staff / Labour Colony shall be as under:
	41.1.1	<p>The Contractor shall advise the Engineer-in-Charge, within twenty-eight (28) days from the date of acceptance of the Letter of Award, about his exact requirement of space for his office, storage area, preassembly and fabrication areas, etc. The above requirement shall be reviewed by the Engineer-in-Charge and space as decided by him will be allotted for his use as well as his Sub-Contractor's use.</p> <p>The contractor shall make his own arrangement for construction/ rented premises for labour / staff colony.</p>
	41.1.2	On completion of Work, the Contractor shall handover the land duly cleaned to the Engineer-in-Charge. Until and unless the Contractor has handed over the vacant possession of land allotted to him for the above purpose, the payment of his final bill shall not be made. The Contractor shall be made liable to pay for the use and occupation at the rates to be determined by the Engineer-in-Charge if the Contractor overstays in the land after the Contract is completed.
	41.1.3	The Contractor shall submit to the Engineer-in-Charge within twenty-eight (28) days from the date of acceptance of the Letter of Award, his electrical power requirements, if any, to allow the planning of the same by the Engineer-in-Charge. The Contractor shall be provided with supply of electricity on chargeable basis for the purposes of the Contract only, at two convenient locations in the Site. The Contractor shall make his own further distribution arrangement. All temporary wiring must comply with local regulations and will

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		<p>be subject to Engineer-in-Charge's inspection and approval before connection to supply. The supply of power will not be provided for the use in the labour and staff colony. It shall be the responsibility of the Contractor to take the power supply upto the point of his use. The Contractor shall be charged for power supply at rates prevalent as per the tariff of the electricity distribution entity at the Site.</p> <p>The Engineer-in-Charge may consider additional points of power supply in deserving and exceptional cases</p>
	41.1.4	The Employer does not guarantee uninterrupted power supply and Employer shall not be responsible for any loss or delays which the contractor may suffer on this account. Contractor shall arrange/provide necessary backup arrangement on his own for uninterrupted power supply
	41.1.5	The Contractor shall arrange for drinking water to his workmen/staff at Work Site and other water supply for all purposes for his labour and other personnel at the worksite / colony on his own. The quality of water should meet the requirements for which it is proposed to be used. All Civil and Structural Work associated with the above including borings, pipe lines, valves, pumps, tube wells, pump house, underground storage tank, over ground storage tank, water tankers etc., whatsoever required for taking the water from the underground source or any other source to the place of use shall be provided / erected/ constructed / maintained by the Contractor at his own cost.
	41.1.6	The contractor shall arrange for construction water from underground/local sources. All borings, pipe lines, pumps, water tankers, underground storage tank, over-ground storage tank, etc, whatsoever required for taking the water from the underground source to the site of work shall be provided / erected / constructed / maintained by the contractor at his own cost
	41.1.7	The Contractor shall not be entitled to any compensation on account of the expenditure incurred in arranging the construction water.
42.	Site Laboratory	
	42.1	As part of the Contract, the Contractor shall provide and maintain a site laboratory for the testing of construction materials under the direction and general supervision of the Engineer-in-Charge.
	42.2	The laboratory building shall be constructed and installed with the appropriate facilities. Temperature and humidity controls shall be available wherever necessary during testing of samples.
	42.3	All equipments shall be provided by the Contractor so as to be compatible with the testing requirements specified. The Contractor shall maintain the equipment in good working condition for the duration of the Contract.
	42.4	The Contractor shall provide approved qualified personnel to operate and maintain the laboratory for the duration of the Contract. The number of staff and equipment available must at all times be sufficient to keep pace with the sampling and testing programme as required by the Engineer-in-Charge.
	42.5	The Contractor shall fully service the site laboratory and shall supply everything necessary for its proper functioning, including all transport needed to move equipment and samples to and from sampling points on the site, etc
	42.6	The Contractor shall re-calibrate all measuring devices whenever so required by the Engineer-in-Charge and shall submit the results of such measurements without delay.
43	Completion Certificate	

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43.1	<p>As soon as the Work is completed, the Contractor shall give notice of such completion to the Engineer-in-Charge and within eighty-four (84) days of receipt of such notice the Engineer-in-Charge shall inspect the Work and shall furnish the Contractor with a certificate of completion indicating (a) date of completion, (b) defects, if any, in the Work to be rectified by the Contractor and/or (c) items, if any, for which payment shall be made at reduced rates. When separate periods of completion have been specified for items or groups of items, the Engineer-in-Charge shall issue separate completion certificates for such item or groups of items. No certificate of completion shall be issued nor shall the Work be considered to be complete till the Contractor shall have removed from the premises on which the Work has been executed all scaffolding, sheds and surplus materials (except such as are required for rectification of defects), and the like to the satisfaction of Engineer-in-Charge. If the Contractor shall fail to comply with any of the requirement of the conditions as aforesaid, on or before the date of completion of the Works, the Engineer-in-Charge may, at the expense of the Contractor fulfil such requirements and dispose of the scaffoldings, surplus materials and rubbish etc. as he thinks fit and recover the cost after giving due credit for the realised amount. The term 'completion' used herein means the physical completion of the Work and in no way means to connote the quality or time of performance of the Work.</p>
43.2	<p>If at any time before completion of the entire Work, items or groups of items for which separate periods of completion have been specified, have been completed, the Engineer-in-Charge can take possession of any part or parts of the same (any such part(s) being hereinafter in this Condition referred to as 'the relevant part') notwithstanding anything expressed or implied elsewhere in this Contract.</p>
43.3	<p>In case of such taking over of possession by Engineer-in Charge of the said item or group of items, the following shall govern:</p>
43.3.1	<p>Within twenty-eight (28) days of request by the Contractor, the Engineer-in-Charge shall issue completion certificate for the relevant part as in GCC Sub-Clause 43.1 above provided the Contractor fulfils his obligations under that Condition for the relevant part.</p>
43.3.2	<p>The Defects Liability Period in respect of such items and the relevant part shall be deemed to have commenced from the certified date of completion of such items or the relevant part as the case may be.</p>
43.3.3	<p>The Contractor may reduce the value insured under GCC Clause entitled 'Contractor's Liability and Insurance' to the extent of the value of the completed items or relevant part as estimated by the Engineer-in-Charge and notified for this purpose. This estimate shall be applicable for this purpose only and for no other.</p>
43.3.4	<p>For the purposes of ascertaining liquidated damages for delay under GCC Sub-Clause 29.6 in respect of any period during which the Works are not complete the relevant part will be deemed to form a separate item or group, with date of completion as given in the Contract or as extended under GCC Sub-Clause 29.2 and actual date of completion as certified by the Engineer-in-Charge under this Clause.</p>
E. DEFECTS LIABILITY	
44	Liability for Damage, Defects or Imperfections and Rectification thereof
44.1	<p>If the Contractor or his workmen or employees shall injure or destroy any part of the building / structure in which they may be working or any building, road, fence etc. contiguous to the premises on which the Work or any part of it is</p>

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		<p>being executed, or if any damage shall happen to the Work while in progress, the Contractor shall upon receipt of a notice in writing in that behalf make the same good at his own expense. If it shall appear to the Engineer-in-Charge or his representative at any time during construction or reconstruction or prior to the expiration of the Defects Liability Period, that any work has been executed with unsound, imperfect or unskilled workmanship or that any materials or articles provided by the Contractor for execution of the Work are unsound or of a quality inferior to that contracted for, or otherwise not in accordance with the Contract, or that any defect, shrinkage or other faults have appeared in the Work arising out of defective or improper materials or workmanship, the Contractor shall, upon receipt of a notice in writing in that behalf from the Engineer-in-Charge, forthwith rectify or remove and re-construct the work so specified in whole or in part, as the case may require or as the case may be, and/or remove the materials or articles so specified and provide other proper and suitable materials or articles at his own expense, notwithstanding that the same may have been inadvertently passed, certified and paid for and in the event of his failing to do so within the period to be specified by the Engineer-in-Charge in his notice aforesaid, the Engineer-in Charge may rectify or remove and re-execute the work and/or remove and replace with others, the materials or articles complained of, as the case may be, by other means at the risk and expense of the Contractor.</p>
45.	Defects Liability Period	
45.1	<p>Unless otherwise specified in the SCC, the Contractor shall be responsible to make good and remedy at his own expense within such period as may be stipulated by the Engineer-in-Charge, any defect which may develop or may be noticed before the expiry of twelve (12) months from the certified date of completion.</p>	
45.1.1	<p>On expiry of the period mentioned as defect liability period (GCC Clause 45), contractor's liability ceases except for latent defects. The contractor's liability for latent defect shall be limited to a period of five (5) years from the end of Defect liability period for the subject package. For the purpose of this clause the latent defects shall be the defects inherently lying within the material or arising out of design deficiency which do not manifest themselves during the defect liability period but may surface later.</p>	
F. RISK DISTRIBUTION		
46.	Employer's and Contractor's Risks and Insurance	
46.1	<p>The Employer carries the risks which this Contract states as Employer's risks, and the Contractor carries risks which this Contract states as Contractor's risks, under this clause.</p>	
46.2	<p>Irrespective of the Employer's Risks or Contractor's Risks the Contractor shall execute the Works as per Contract and as directed by Engineer-in-Charge.</p>	
46.3	Employer's Risks	
46.3.1	<p>The 'Excepted Risks' are</p> <p>(1) In so far as they occur in the Union of India and directly affect the execution of the Works:</p>	

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		<p>(a) war and hostilities (whether war be declared or not), invasion, act of foreign enemies.</p> <p>(b) rebellion, revolution, insurrection or military or usurped power or civil war.</p> <p>(c) riot, commotion or disorder, unless solely restricted to employees of the Contractor or of his sub-contractors and arising from the conduct of the Works;</p> <p>(d) ionizing radiations, or contamination by radio activity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radioactive, toxic, explosive, or other hazardous properties of any explosive, nuclear assembly or nuclear component;</p> <p>(e) pressure waves caused by aircraft or other aerial devices traveling at sonic or supersonic speed;</p> <p>(f) any operation of the forces of nature, which is unforeseeable or against which an experienced contractor could not reasonably have been expected to have taken adequate precautions or</p> <p>(2) a cause due to the design of the Works, other than the Contractor's design</p>
	46.3.2	<p>In the event of any loss or damage to the Works or any part thereof and/or to any materials or articles at the Site from out of any occurrence of Excepted Risks, the following provisions shall have effect:</p> <p>(a) The Contractor shall, as may be directed in writing by the Engineer-in-Charge, remove from the Site any debris and so much of the Works as shall have been damaged, take the same to the place identified by the Employer, at the Employer's cost.</p> <p>(b) The Contractor shall, as may be directed in writing by the Engineer-in-Charge, proceed to rectify, repair, reconstruct or replace the damaged articles, materials and the Works under and in accordance with the Conditions of the Contract, at the Employer's cost</p>
	46.3.3	<p>The Contractor shall not be entitled to payment under the above provisions in respect of so much loss or damage as has been occasioned by any failure on his part to perform his obligations under the Contract or not taking precautions to prevent loss or damage or minimize the amount of such loss or damage.</p>
	46.4	Contractor's Risks
	46.4.1	<p>All risks of loss of or damage to the physical property and of personal injury and death, which arise during and in consequence of the performance of the Contract, other than those covered under the Excepted Risks, will be the liability of the Contractor, except as otherwise provided in the Contract</p>
	46.4.2	<p>From commencement to completion of the Works, the Contractor shall take full responsibility for the care thereof and for taking precautions to prevent loss or damage and to minimize loss or damage to the greatest extent possible and shall be liable for any damage or loss that may happen to the Works or any part thereof from any cause whatsoever (save and except due to Excepted Risks) and shall at his own cost repair and make good the same so that at completion,</p>

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		the Works shall be in good order and condition and in conformity in every respect with the requirements of the Contract and instructions of the Engineer-in-Charge.
	46.4.3	The Contractor shall indemnify and keep indemnified the Employer against all losses and claims for injuries or damage to any person or any property whatsoever which may arise out of or in consequence of the construction and maintenance of the Works and against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect of or in relation thereto; Provided always that nothing herein contained shall be deemed to render the Contractor liable for or in respect of or to indemnify the Employer against any Compensation or damage caused by any occurrence of the Excepted Risks.
	46.5	Insurance
	46.5.1	Before commencing the execution of the Works, the Contractor shall, without in any way limiting his obligations and responsibilities under this clause, indemnify the Employer against any damage/ loss or injury which may occur to any property or to any person (including any employee of the Employer) by or arising out of carrying out of the Contract, except due to reasons of 'Excepted Risks'
	46.5.2	<p>Towards this end, the Contractor shall arrange adequate insurance coverages, in the joint names of the Employer and the Contractor, from the date of commencement of the work to the end of the Defects Liability Period for at-least the following:</p> <ul style="list-style-type: none"> (i) loss of or damage to the Works including Employer issued materials; (ii) loss of or damage to the Contractor's T&P; (iii) loss of or damage to the property other than Works including those of third parties; (iv) injury or death of personnel belonging to the Contractor, the Employer or any other party. (v) Worker's Compensation in accordance with the statutory requirements. <p>The Contractor shall be compulsorily required to take Contractor's All Risk Insurance Policy for all risks except those covered under the Excepted risks with minimal deductible for the re-execution value of the Works on completion and replacement cost of the Contractor's T&P/ Plant & Equipment/ Employer's free issue materials/ Third party Property, etc. as mentioned above. For this purpose the re-execution value of the Works on completion/ replacement cost of the Contractor's T&P/ Plant & Equipment/ Employer's free issue materials/ Third party Property shall include all such expenses, costs, taxes, duties, levies, royalties, etc. which in case of total loss, the Employer/ Contractor would be reasonably expected to incur to bring these to the same state as if no damage had occurred.</p> <p>The Contractor and Employer shall mutually decide on the insured sum but in no case it shall be less than the 110% of the value of the Works on completion and Third party Property and 110% of the cost of Contractor's T&P/ Plant & Equipment/Employer's free issue materials delivered to site including all taxes, duties, levies and royalties etc. and escalation during the period of re-execution for the Works and delivery of replacement Contractor's T&P/ Plant &</p>

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		<p>Equipment/ Employer's free issue materials to site. However, in case of any conflict, the Employer's decision regarding the insured sum shall be final and binding on the Contractor. The Employer shall be named co-insured in the policy and it shall include the extended cover at-least for the following:</p> <ul style="list-style-type: none"> a) Third Party Liability b) Cross Liability c) Earthquake d) Cost of removal of debris e) Custom duty as applicable f) Escalation during re-execution g) Employer's surrounding property h) Storage risk at Fabricator's premises as applicable i) Cost of tools and tackles and material handling equipment used for construction purposes. j) SRCC & terrorism
	46.5.3	Where Employer's building or a part thereof is rented by the Contractor, he shall insure the entire building if the building or any part thereof is used by him for the purpose of storing or using materials of combustible nature as to which the decision of the Engineer-in-Charge shall be final
	46.5.4	Contractor shall ensure that the insurance coverage of the above policies include any loss or damage to his Staff, Supervisors, Engineers and others who are not covered by Workmen Compensation Act. Alternatively, the Contractor will take suitable additional or separate insurance policies to cover the same
	46.5.5	All monies payable by the insurers under such policy or policies shall be first to be paid to the Employer who shall pay to the Contractor in instalments for the purpose of rebuilding or replacement or repair of the damaged Works, Contractor's T&P and/or materials destroyed or damaged as the case may be. Such payments of monies will be made in a manner that the payments are commensurate with the progress and cost of the repair, replacement and reconstruction, as may be and as determined by the Engineer-in-Charge in consultation with the Contractor.
	46.5.6	Policies and certificate for insurance shall be delivered by the Contractor to the Project Engineer for the Project Engineer's approval before the date of commencement of the Works.
	46.5.7	If the Contractor has a blanket insurance policy for all his works and the policy covers all or some of the items to be insured under this Clause, the said policy shall be assigned by the Contractor in favour of the Employer; provided however if any amount is payable under the policy by the insurers in respect of works other than the Work under this Contract, the same may be recovered by the Contractor directly from the insurers.
	46.5.8	The aforesaid insurance policy/policies shall provide that they shall not be

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		materially modified/ cancelled till the Engineer-in-Charge has agreed to such modification or cancellation in writing.
	46.5.9	Upon grant of the time extension by the Engineer-in-Charge, it is understood that the Contractor's liability of indemnity will be extended suitably without any further action by the Employer and the Contractor shall promptly furnish documentary evidence to Engineer-in Charge towards extension of insurance policies for the period of time extension.
	46.5.10	The Contractor shall ensure that where applicable, his Sub-Contractor(s) shall take out and maintain in effect adequate insurance policies for their personnel and vehicles and for the part of the Works executed by them under the Contract, unless such Sub-Contractors are covered by the policies taken out by the Contractor.
	46.5.11	If the Contractor and/or his Sub-Contractors (if any) shall fail to effect and keep in force the insurance coverage, referred to above or any other insurance which he/they may be required to effect under the terms of the Contract, then in any such case the Employer may, without being bound to, effect and keep in force any such insurance coverage and pay such premium or premiums, as may be necessary for that purpose from time to time and deduct the amount so paid by the Employer from any monies due or which may become due to the Contractor or recover the same as a debt due from the Contractor.
	46.5.12	If the Contractor does not provide any of the policies and certificates required, the Employer, with due notice to the Contractor may effect the insurance which the Contractor should have provided and recover the premiums, the Employer has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due from the Contractor
47	Force Majeure	
	47.1	Definition of Force Majeure
	47.1.1	"Force Majeure" shall mean any event beyond the control of the Employer or of the Contractor, as the case may be, (but excluding 'Excepted Risks', which shall be dealt in accordance with GCC Clause entitled "Employer's Risks") and which they could not foresee or with a reasonable amount of diligence could not have foreseen and which substantially affect the performance of the Contract
	47.1.2	Notwithstanding the generality of the above, the following events shall be termed as Force Majeure events in respect of the Contract (i) terrorist acts, (ii) confiscation, nationalization, mobilization, commandeering or requisition by or under the order of any government or de jure or de facto authority or ruler or any other act of failure to act of any local state or national government authority, (iii) national/sectoral/illegal strike, sabotage, lockout, embargo, import restriction, port congestion, lack of usual means of public transportation and communication, industrial dispute, shipwreck, epidemics, quarantine and plague

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47.2		Notice of Force Majeure
47.2.1		If either party is prevented, hindered or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within fourteen (14) days after the occurrence of such event.
47.2.2		The party who has given such notice shall be excused from the performance or punctual performance is prevented, hindered or delayed
47.2.3		Notwithstanding any other provision of the Clause, Force Majeure shall not apply to any obligations of the Employer to make payments to the Contractor herein
47.3		Duty to Minimize Delay
47.3.1		The party or parties affected by the event of Force Majeure shall use reasonable efforts to mitigate the effect thereof upon its or their performance of the Contract and to fulfill its or their obligations under the Contract, but without prejudice to either party's right to terminate the Contract under GCC Sub-Clause 47.5
47.4		Consequence of Force Majeure
47.4.1		If the Contractor is prevented from performing its obligations under the Contract by reason of Force Majeure of which notice has been given under Sub-Clause 47.2.1, and suffers delay by reason of such Force Majeure, the Contractor shall be entitled to an extension of time for any such delay, if the Completion is or will be delayed, in accordance with GCC Sub-Clause entitled "Extension of Time for Completion"
47.4.2		No delay or non-performance by either party hereto caused by the occurrence of any event of Force Majeure shall (a) constitute a default or breach of the Contract, (b) give rise to any claim for damages or additional cost or expense occasioned thereby if and to the extent that such delay or non-performance is caused by the occurrence of an event of Force Majeure
47.5		Termination for reasons due to extended Force Majeure
47.5.1		If the performance of the Contract is substantially prevented, hindered or delayed for a single period of more than seventy (70) days or an aggregate period of more than one hundred and forty (140) days or any such extended period as may be agreed to between the parties on account of one or more events of Force Majeure during the currency of the Contract, the parties will attempt to develop a mutually satisfactory solution, failing which either party may terminate the Contract by giving a notice to the other.
47.5.2		In the event of termination pursuant to GCC Sub-Clause 47.5.1, the rights and obligations of the Employer and the Contractor shall be as specified hereunder: (a) the Contractor shall be paid at contract rates for the work already

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		<p>executed by him</p> <p>(b) The Employer shall have an option to take over the Contractor's facilities/materials or any part thereof brought to site by the Contractor's facilities/materials or any part thereof brought to site by the Contractor, at such rates as are determined reasonable by the Engineer-in-Charge.</p>
	47.5.3	In the event of any disagreement of the parties relating to matters at GCC 47.5.2, the dispute shall be settled in accordance with GCC Clause titled "Settlement of Disputes".
G. CHANGES IN CONTRACT ELEMENT		
48	Changes in Constitution:	
	48.1	Where the Contractor is a partnership firm, prior approval in writing of the Employer shall be obtained before any change is made in the constitution of the firm. Where the Contractor is an individual or a Hindu Undivided Family business concern such approval as aforesaid shall likewise be obtained before the Contractor enters into any partnership firm which would have the right to carry out the Work hereby undertaken by the Contractor. If prior approval as aforesaid is not obtained, the Contract shall be deemed to have been assigned in contravention of GCC Sub-Clause 51.3 hereof and the same action may be taken and the same consequences shall ensue as provided for in the said GCC Sub-Clause 51.3
49.	Powers of Engineer-in-Charge for alterations/ omissions/ additions /substitutions	
	49.1	The Engineer-in-Charge shall have power (i) to make alterations in, omissions from, additions to, or substitutions for the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work, and (ii) to omit a part of the Works in case of non-availability of a portion of the Site or for any other reasons he may consider necessary and/or reasonable. Any such alterations, omissions, additions or substitutions shall be ordered by the Engineer-in-Charge as a deviation. The Contractor shall be bound to carry out the said deviation in accordance with instructions given to him in writing by the Engineer-in-Charge and such alterations, omissions, additions or substitutions shall form part of the Contract as if originally provided therein and shall be carried out by the Contractor on the same conditions in all respects on which he agreed to do the original Works, except as otherwise provided herein
	49.2	Permissible deviation limit for variations in Contract Items
	49.2.1	In case of items of Work above ground surface, as it exists at the time of commencement of Work, quantities of which may change due to Site Conditions or any other reasons, the permissible limit of deviations over the original value of each item will be (+)20%.
	49.2.2	In case of items of Work below ground surface, as it exists at the time of commencement of Work, quantities of which may change due to Site conditions or any other reasons, the permissible limit of deviations over the original value of each item will be (+)100% and (-30%).
	49.2.3	For the purposes of GCC Sub-Clause 49.2.1 above, all the quantities of any item actually executed from 0-120% of the Contract quantity will be payable at

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		Contract rates while the rates for the quantities above 120% will be subject to review/revision. Similarly, for the purposes of GCC Sub-clause 49.2.2 above, all the quantities of any item actually executed from 70% to +200% of the Contract quantity will be payable at Contract Rates while the rates for the entire quantity executed from 0% to 69% (if the total quantity executed is in this range) and the entire quantity executed above 200% will be subject to review/revision as provisions herein
	49.2.4	In case the Schedule of Quantities contains sub-items of Work under a Main Item, then the above permissible limits of deviation shall be applicable on the value of each such subitem and not on the entire value of the Main Item.
	49.2.5	The deviations up to the above permissible limits shall be carried out by the Contractor at the same rates and terms as per the Contract.
	49.3	Methodology for Determination of Rates for variations of Contract Items beyond the permissible deviation limits
	49.3.1	For Contract Items which exceed the limits over the original value of that item as mentioned in GCC Sub-Clause 49.2.1 & 49.2.2 above, the Contractor may, within fourteen (14) days of the date of receipt of the order to carry out the said work, inform the Engineer-in-Charge under advice to the Employer of the rate which he proposes to claim for such item(s) of Work on Market Rate(s) basis, supported by analysis of the rate claimed and the relevant documents to substantiate the same. The Engineer-in-Charge shall, within seventy (70) days thereafter, after giving due consideration to the rate(s) claimed by the Contractor, determine the rate(s), in consultation with the Contractor, on Market Rate(s) basis. In the event of disagreement between the Engineer-in-Charge and Contractor, even after the said seventy (70) days from the date of submission of claims of the rate(s) by the Contractor, the Engineer-in-Charge within a further period of twenty-one (21) days thereafter, shall fix the rate(s)/price(s) as are, in his opinion appropriate. The rate(s)/price(s) so fixed shall be notified to the Contractor and shall be final and binding.
	49.3.2	If the Engineer-in-Charge fails to determine and notify the rate(s)/price(s) even after expiry of the said twenty-one (21) days, then the Contractor will be at liberty to refer the matter for resolution to the Employer within a further period of fourteen (14) days after the above said twenty-one (21) days. If the Employer does not determine and cause the Engineer-in Charge to notify the rate(s)/price(s), then the matter would be determined in accordance with the provisions of GCC Clause entitled "Settlement of Disputes". However, in the meanwhile, the Engineer-in-Charge will pay for the items of Work executed beyond the permissible deviation limits, at 75% (seventy-five percent) of the rate(s)/price(s) claimed by the Contractor with satisfactory supporting documents or at Contract Rate, purely on adhoc and provisional basis subject to adjustment
	49.3.3	In the event of the Contractor failing to inform the Engineer-in-Charge, within the stipulated period of fourteen (14) days time, the rate(s) which he proposes to claim, supported by relevant documents to substantiate the same, the rate(s) for such item(s) shall then be determined by the Engineer-in-Charge in consultation with the Contractor (if he so desires) on the basis of Market Rate(s) within seventy (70) days thereafter. The rate(s) /price(s) so determined shall be notified to the Contractor and shall be final and binding
	49.3.4	The provisions of GCC Sub-Clauses 49.3.1, 49.3.2 and 49.3.3 above shall only be applicable to such individual Contract Item(s)/ sub-item(s) of Work whose

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		original value is equal to or in excess of 1% of the total Contract Value (as awarded)
	49.3.5	For individual Contracts Item(s)/ sub-item(s) of Work whose original value as per Letter of Award is less than 1% of the total Contract Value (as awarded) for each such item, there shall be no limit on the extent of deviations over the original value of the Item and shall be paid on the contracted rate(s)/price(s).
	49.3.6	Rates of Items of Work derived on the basis as detailed in GCC Sub-Clause 49.3.1 or 49.3.2, or notified under GCC Sub-Clause 49.3.3 shall not be eligible for price adjustment, provided the period of execution of such items of Work beyond the permissible deviation limit as per the schedule to be finalised in line with GCC Sub-Clause 49.5, is less than or equal to six (6) months
	49.3.7	Further, in case the period of execution of such items of Work is more than six (6) months, such items shall be eligible for price adjustment as per clause entitled 'Contract Price Adjustment'. The base date in such a situation shall be the date as specified by the Engineer-in-Charge while determination of the Market Rate.
	49.4	Methodology for Determination of Rates for Extra Items (Additional, Altered or Substituted Items) of Work
	49.4.1	<p>Rates for Extra Items of Work (comprising of Additional, Altered or Substituted items of Work), shall be determined by the Engineer-in-Charge in the following order:</p> <p>(i) If the rate(s)/price(s) for extra items occurring in a particular schedule of quantities are available in other schedule of quantities forming part of the Contract, the lowest of such rate(s)/price(s) will be used, subject to the nature of work being comparable.</p> <p>(ii) If the rate(s) cannot be derived as per (i) above, then</p> <p>(a) In case of contracts with only one Schedule of Quantities forming the part of the Contract, the rate(s)/price(s) for the extra item(s) shall be derived from the lowest of any similar item(s) in that Schedule.</p> <p>(b) In case of contracts with two or more Schedules of Quantities forming a part of the contract, the rates for the Extra Item(s) will be derived from the nearest similar item appearing in the Schedule in which the extra item is to be executed failing which from any other Schedule in which nearest similar item is available, the rate so derived being the lowest of such derived from nearest similar items in those other Schedules and used.</p>
	49.4.2	If the rate for any additional, altered or substituted item of work cannot be determined in the manner specified in GCC Sub-Clause 49.4.1 (i) & (ii) above, the Contractor shall, within fourteen (14) days of the date of receipt of the order to carry out the said Work, inform the Engineer-in-Charge under advice to the Employer of the rate which he proposes to claim for such item(s) of Work on Market Rate(s) basis, supported by analysis of the rate claimed and relevant documents to substantiate the same. The Engineer-in-Charge shall, within seventy (70) days thereafter, after giving due consideration to the rate(s) claimed by the Contractor, determine the rate(s), in consultation with the Contractor, on Market Rate(s) basis. In the event of disagreement between the Engineer-in-Charge and Contractor, even after the said seventy (70) days from the date of submission of claims of the rate(s) by the Contractor, the Engineer-

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		in-Charge within a further period of twenty-one (21) days thereafter shall fix the rate(s)/price(s) as are, in his opinion appropriate. The rate(s) /price(s) so fixed shall be notified to the Contractor and shall be final and binding.
	49.4.3	If the Engineer-in-Charge fails to determine and notify the rate(s)/price(s) even after expiry of the said twenty-one (21) days, then the Contractor will be at liberty to refer the matter for resolution to the Employer within a further period of fourteen (14) days after the above said twenty-one (21) days. If the Employer does not determine and cause the Engineer in-Charge to notify the rate(s)/price(s), then the matter would be determined in accordance with the provisions of GCC Clause entitled "Settlement of Disputes". However, in the meanwhile, the Engineer-in-Charge will pay for the extra items of Work, at 75% (seventy five percent) of the rate(s)/price(s) claimed by the Contractor with supporting documents, purely on adhoc and provisional basis subject to adjustment
	49.4.4	In the event of the Contractor failing to inform the Engineer-in-Charge within the stipulated period of fourteen (14) days' time the rate(s) which he proposes to claim, supported by relevant documents to substantiate the same, the rate(s) for such item(s) shall then be determined by the Engineer-in-Charge in consultation with the Contractor (if he so desires) on the basis of Market Rate(s) within seventy (70) days thereafter. The rate(s) /price(s) so determined shall be notified to the Contractor and shall be final and binding
	49.4.6	Rates for Extra Items of Work, derived on the basis as detailed in GCC Sub-Clause 49.4.2 or 49.4.3, or notified under GCC Sub-Clause 49.4.4 above shall not be eligible for Price Adjustment, provided the period of execution of such Extra Items of Work beyond the permissible deviation limit as per the schedule to be finalised in line with GCC Sub-Clause 49.5, is less than or equal to six (6) months
	49.4.7	Further, in case the period of execution of such items of Work is more than six(6) months, such items shall be eligible for price adjustment as per clause entitled 'Contract Price Adjustment'. The base date in such a situation shall be the date as specified by the Engineer-in-Charge while determination of the market rate
	49.5	Work Schedules for variation beyond deviation limits & Extra Items
	49.5.1	The Engineer-in-Charge shall finalise a Work Schedule in consultation with the Contractor for items of Work beyond deviation limits and the Extra Items of Work to be executed and the date(s) specified in this agreed Work Schedule shall be considered as the date for working out the Price adjustment amount. The primary consideration by the Engineer-inCharge while determining the time required for execution of the altered or substituted item(s) of Work, would be quantities of the altered or substituted and not the value of altered or substituted item(s) of Work. The Contractor shall not be eligible for Price Adjustment Payment for quantities of items executed beyond the schedule date(s), if execution of the items of the Work has been delayed for the reasons attributable to the Contractor.
	49.5.2	However, the Contractor would be eligible for claim or liable for refund for Price Adjustment(s) for quantities of items of the Work executed beyond the schedule dates based on the value of indices as applicable to the scheduled dates of execution, for such delayed work provided that if the indices during the extended period are lower than the indices during scheduled period of

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		execution, then lower indices shall be applicable
	49.6	Provisional payments
	49.6.1	Pending approval of the Rates for Contract Item(s) of Work beyond the permissible deviation limits as well as for Extra Items (Additional, Altered or Substituted item) of Work, provisional payment at an interim rate (not exceeding 80% of the rate/price determined by the Engineer-in-Charge), shall be made to the Contractor in the interest of progress of Work, which shall be regularized after approval of Competent Authority.
50.	Suspension of Works	
	50.1	<p>The Contractor shall, on receipt of the order in writing of the Engineer-in-Charge, suspend the progress of the Works or any part thereof for such time and in such manner as the Engineer-in-Charge may consider necessary for any of the following reasons:</p> <p>(i) On account of any default on part of the Contractor; or</p> <p>(ii) for proper execution of the Works or part thereof for reasons other than the default on the part of the Contractor; or</p> <p>(iii) for safety of the Works or part thereof, for reasons other than those attributable to the Contractor.</p>
	50.2	The Contractor shall, during such suspension, properly protect and secure the Works to the extent necessary and carry out the instructions given in that behalf by the Engineer-in-Charge.
	50.3	If the suspension is ordered for reasons (ii) & (iii) in Sub-Clause 50.1 above, in so far as it concerns suspension of part of the Works or whole of the balance, the Contractor shall be entitled to an extension of time equivalent to the period of suspension plus 25% thereof. The Contractor shall not be eligible for any other compensation whatsoever for such suspension, except as otherwise provided herein under.
	50.4	If the suspension is ordered for reasons (ii) & (iii) in Sub-Clause 50.1 above, as far as it concerns the entire balance of Works on the date of suspension and if such period of suspension cumulatively exceeds twenty-eight (28) days, then in addition to extension of time as in Sub-Clause 50.2 above, the Contractor shall be eligible for compensation, as the Employer may consider reasonable, in respect of salaries and/ or wages paid by the Contractor to his employees and labour at site, remaining idle during the cumulative period of suspension, adding to the total thereof, a reasonable percentage as determined appropriate by the Engineer-in-Charge, to cover indirect expenses and incidentals of the Contractor, provided the Contractor submits his claim supported by details to establish the reasonableness of his claim to the Engineer-in-Charge under advice to the Employer within fourteen (14) days of the expiry of the said twenty-eight (28) days period
	50.5	If for any reason other than for reasons of Contractor's default as per GCC Sub-Clause 50.1(i) above, if the Contract remains suspended for a continuous period exceeding ninety (90) days, then the Employer and the Contractor shall mutually discuss and agree for a suitable course of action regarding the recommencement/ reinstatement of the suspended work or alternatively treat the suspension as termination / abandonment of the Works by the Employer as

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		per GCC Sub-Clause 51.1 herein. If out of above discussion it is determined that the Contract has to be treated as terminated under the provisions of GCC Sub-Clause 51.1, then the Contractor shall be eligible for compensation as envisaged in GCC Sub-Clause 51.1.1 herein
51.	Termination	
	51.1	<p>Termination by the Employer</p> <p>If at any time after award of Contract, the Employer shall decide to abandon or reduce the scope of the Works for any reason whatsoever and hence not require the whole or any part of the Works to be carried out by the Contractor, the Engineer-in-Charge shall give notice in writing to that effect to the Contractor and the Contractor except as herein under provided, shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the Works in full but which he did not derive in consequence of the said termination of the whole or part of the Works.</p>
	51.1.1	<p>The Contractor shall be paid at Contract rates full amount for works executed at Site and, in addition, a reasonable amount as certified by the Engineer-in-Charge for the items hereunder mentioned which could not be utilised on the Work to the full extent because of the said termination:</p> <ul style="list-style-type: none"> (a) Any cost incurred on preliminary site work, e.g. access roads, labour huts, staff quarters and site offices; storage accommodation and water storage tanks, etc. (b) (i) The Employer shall have the option to take over Contractor's facilities/ materials or any part thereof either brought to Site or of which the Contractor is legally bound to accept delivery from suppliers (for incorporation in or incidental to the Work), provided, however, the Employer shall be bound to take over the materials or such portions thereof as the Contractor does not desire to retain. For materials taken over or to be taken over by the Employer, cost of such materials shall, however, take into account purchase price, cost of transportation and deterioration or damage which may have been caused to materials whilst in the custody of the Contractor. <ul style="list-style-type: none"> (ii) For Contractor's materials not retained by the Employer, reasonable cost of transporting such materials from Site to Contractor's permanent stores or to his other Works, whichever is less. If materials are not transported to either of the said places, no cost of transportation shall be payable. (c) If any materials issued by the Employer are rendered surplus, the same except normal wastage shall be returned by the Contractor to the Employer at rates not exceeding those at which these were originally issued less allowance for any deterioration or damage which may have been caused whilst the materials were in the custody of the Contractor. In addition, cost of transporting such materials from Site to the Employer's stores, if so required by the Employer. (d) Reasonable compensation for transfer of Contractor's T&P from Site to Contractor's permanent stores or to his other Works, whichever is less. If T&P are not transported to either of the said places, no cost of transportation shall be payable.

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51.1.2	The Contractor shall, if required by the Engineer-in-Charge furnish to him wage books, time sheets and other relevant documents as may be reasonably necessary to enable him to certify the reasonableness of the amount payable under this Clause.
51.2	Termination on Contractor's Death
51.2.1	<p>If the Contractor is an individual or a proprietary concern and the individual or the proprietor dies and if the Contractor is a partnership concern and one of the partners dies, then unless the Employer is satisfied that the legal representatives of the individual Contractor or of the proprietor of the proprietary concern and in the case of partnership, the surviving partners, are capable of carrying out and completing the Contract, the Employer shall be entitled to cancel the Contract as to its incomplete part without the Employer being liable in any way to payment of any compensation to the estate of the deceased Contractor and/or to the surviving partners of the Contractor's firm on account of the cancellation of the Contract. The decision of the Employer that the legal representatives of the deceased Contractor or the surviving partners of the Contractor's firm cannot carry out and complete the Contract shall be final and binding on the parties.</p> <p>In the event of such cancellation the Employer shall not hold the estate of the deceased Contractor and/or the surviving partners of the Contractor's firm liable for damages for not completing the Contract.</p>
51.3	Termination for Contractor's Default
51.3.1	<p>If the Contractor:</p> <ul style="list-style-type: none"> (a) at any time makes default in proceeding with the Works with due diligence and continues to do so after a notice of seven (7) days in writing from the Engineer-in-Charge; or (b) commits default in complying with any of the terms and conditions of Contract and does not remedy it or take effective steps to remedy it within seven (7) days after a notice in writing is given to him in that behalf by the Engineer-in-Charge; or (c) fails to complete the Works or items of Work with individual dates of completion, on or before the date(s) of completion, and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer-in-Charge; or (d) has engaged in corrupt or fraudulent practices in competing for or in executing the Contract, in the judgement of the Employer. <p>For the purpose of this Sub-Clause :</p> <p>"corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement/tendering process or in contract execution.</p> <p>"fraudulent practice" means a misrepresentation of facts in order to influence a procurement/tendering process or the execution of a contract to the detriment of the Employer and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the</p>

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		<p>Employer of the benefits of free and open competition; or</p> <p>(e) being an individual, or if a firm, any partner thereof, shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) under any Insolvency Act for the time being in force or make any conveyance or assignment of his affective or composition or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any Insolvency Act for the time being in force, for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors; or</p> <p>(f) being a company, shall pass a resolution or the Court shall make an order for the liquidation of its affairs, or a receiver or manager on behalf of the debenture holders shall be appointed or circumstances shall arise which entitle the Court or debenture holders to appoint a receiver or manager; or</p> <p>(g) assigns, transfers, sublets (engagement of labour on a piece-work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) attempts to assign, transfer or sublet the entire Works or any portion thereof without the prior written approval of the Employer;</p> <p>the Employer may, without prejudice to any other right to remedy which shall have accrued or shall accrue thereafter to the Employer by written notice, cancel the Contract as a whole or only such items of work in default, from the Contract.</p>
	51.3.2	<p>The Employer shall on such cancellation have rights to:</p> <p>(a) take possession of the Works and any materials, construction plant, implements, stores, etc., thereon; and/or</p> <p>(b) carry out the incomplete Work by any means at the risk and cost of the Contractor.</p>
	51.3.3	<p>On cancellation of the Contract in full or in part, the Employer shall determine what amount, if any, is recoverable from the Contractor for completion of Works or part of the Works or in case the Works or part of the Works is not completed, the loss or damage suffered by the Employer. In determining the amount, credit shall be given to the Contractor for the value of the work executed by him up to the time of cancellation, the value of Contractor's material taken over as well as incorporated in the work, and use of tools and plants belonging to the Contractor.</p>
	51.3.4	<p>Any excess expenditure incurred or to be incurred by the Employer in completing the Works or part of the Works or the excess loss or damages suffered or may be suffered by the Employer as aforesaid after allowing such credit shall be recovered from any money due to the Contractor on any account, and if such money is not sufficient the Contractor shall be called upon in writing to pay the same within twenty-eight (28) days.</p>
	51.3.4	<p>Any excess expenditure incurred or to be incurred by the Employer in completing the Works or part of the Works or the excess loss or damages</p>

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		suffered or may be suffered by the Employer as aforesaid after allowing such credit shall be recovered from any money due to the Contractor on any account, and if such money is not sufficient the Contractor shall be called upon in writing to pay the same within twenty-eight (28) days.
	51.3.5	If the Contractor shall fail to pay the required sum within the aforesaid period of twentyeight (28) days, the Engineer-in-Charge shall have the right to sell any or all of the Contractor's unused materials, construction plant, implements, temporary buildings etc. and apply the proceeds of sale thereof towards the satisfaction of any sums due from the Contractor under the Contract and if thereafter there be any balance outstanding from the Contractor, it shall be recovered from him.
	51.3.6	Any sums in excess of the amounts due to the Employer and unsold materials, construction plant etc., shall be returned to the Contractor, provided always that if cost or anticipated cost of completion by the Employer of the Works or part of the Works is less than the amount which the Contractor would have been paid had he completed the Works or part of the Works, such benefit shall not accrue to the Contractor.
52.		<p>Adherence to Fraud Prevention Policy</p> <p>The Contractor along with its Associate / Collaborator / Sub-Contractors / Sub-Vendors / Consultants / Service Providers shall strictly adhere to the Fraud Prevention Policy of Employer displayed on its website http://www.ntpctender.com. The Contractor along with his associate/ collaborator/ subcontractor/ sub-vendor/ consultant/ service provider shall observe the highest standards of ethics and shall not indulge or allow anybody else working in their organization to indulge in fraudulent activities during execution of the contract. The Contractor shall immediately apprise the Employer about any fraud or suspected fraud as soon as it comes to his notice.</p>
53.		<p>Withholding / Banning</p> <p>The Employer has in place a Policy for withholding and banning of Business Dealings as enclosed at Annexure-1 to SCC to this section. Business dealings may be withheld or banned with the Contractor on account of any Default by the Contractor under Clause 51.3.1 or any of the grounds as detailed in the said Banning Policy.</p>
54.		<p>Contractor's Labour Information Management System (CLIMS):</p> <ul style="list-style-type: none"> (a) The Contractor has to necessarily get itself registered in the Contractor's Labour Information Management System (CLIMS), which will be installed by the Employer. (b) The entry and exit of all contract labour to the plant premises will be through Gate Access Control System of above 'Contractor's Labour Information Management System'. (c) It will be the responsibility of the Contractor to ensure timely exit of all labours from the plant premises after completion of job of that day. (d) The contractor has to abide with all the statutory compliance applicable to its workers and employees and update the details of the same in the above System.

GENERAL CONDITIONS OF CONTRACT

55.		<p>Contractor Performance Feedback and Evaluation System</p> <p>The Employer has in place an established 'Contractor Performance and Feedback System' against which the Contractor's performance during the execution of Contract shall be evaluated on a continuous basis at regular intervals on the following seven parameters:</p> <ul style="list-style-type: none"> • Engineering & Quality Assurance Capability • Finance • Supply • Construction/ Installation • Field Quality • Safety • Claims & Disputes <p>The score-based feedback formats based on which Contractor's performance shall be evaluated is enclosed at Annexure-A.</p> <p>In case the performance of the Contractor is found unsatisfactory, the Contractor shall be considered ineligible for participating in future tenders for three years.</p> <p>On completion of the above ineligibility period, the Contractor would be required to submit a request to NTPC for participating in future tenders specifying the measures taken to improve their performance. The Contractor may also request for early revocation of suspension after completion of at least two (2) year of the suspension period. On receipt of such request, the performance of the Contractor shall be assessed/evaluated by NTPC and if the performance is found to be satisfactory, the Contractor shall be considered eligible for participation in future tenders.</p>
56.	Limitation of Liability:	
	56.1	<p>Except in cases of criminal negligence or willful misconduct,</p> <p>(a) neither Party shall be liable to the other Party, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, which may be suffered by the other Party in connection with the Contract, provided that this exclusion shall not apply to any obligation of the Contractor to pay liquidated damages to the Employer and</p> <p>(b) the aggregate liability of the Contractor to the Employer, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to any obligation of the Contractor to indemnify the Employer with respect to patent infringement.</p> <p>(c) the aggregate liability of the Employer to the Contractor, whether under the Contract, in tort or otherwise, at any point of time during the execution/performance of the Contract, shall not exceed the 'total Contract Price less payments already released to the Contractor'.</p>
57.	No Claim for interest or damage	
	57.1	<p>Interest on money due to the contractor:</p> <p>Contractor shall not be entitled to any interest or damage in case of any delay</p>

GENERAL CONDITIONS OF CONTRACT

		on the part of the Employer to pay the amount due upon measurement or as per Contract or otherwise. Contractor shall also not be entitled to interest upon any guarantee/ security/ retention money or payments in arrears or upon any balance which may on the final settlement of his account be due to him.																								
	57.2	<p>No claim for interest or damage:</p> <p>No claim for interest or damage will be entertained or be payable by the Employer in respect of any amount or balance which may be lying with the Employer or may become due upon settlement/adjudication of any dispute, difference or misunderstanding between the parties by way of arbitration or court proceedings or otherwise or in respect of any delay or omission on the part of the Employer in making intermediate or final payment or in respect of any amount/damage which may be claimed through arbitration or court proceedings or in any other respect whatsoever.</p>																								
58.0		<p>Compliance to Carriage by Road Rules 2011</p> <p>All the T&P and materials required for Works, whether bought by Contractor or issued by the Employer, if required to be transported by Road, must necessarily be transported through a registered common carrier as per Carriage by Road Rules 2011 of Central Government of India.</p>																								
59.0	Procedure for Contract Closing																									
	59.1	<p>The closing of Contract shall be effected after completion of the defect liability period and return/refund of CPG/Security Deposit</p> <p>The following thirteen (13) certificates, as per the proforma enclosed in Section VIII (Forms and Procedures), shall be issued by the 'concerned departments of NTPC/' 'Contractor', as applicable, and submitted to the concerned authority designated in NTPC for closing of Contracts:</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="text-align: center;">CERTIFICATE NO.</th> <th style="text-align: center;">CERTIFICATE DESCRIPTION</th> <th style="text-align: center;">RESPONSIBILITY</th> <th style="text-align: center;">LIMITING DATES FOR ISSUANCE OF CERTIFICATE @</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">CCP-01</td> <td>Certificate of Final Amendment to the Contract</td> <td>Site C&M/SSC C&M</td> <td>7 Months from last milestone to be executed/Completed</td> </tr> <tr> <td style="text-align: center;">CCP-02</td> <td>Drawing Receipt Certificate</td> <td>Corporate Engineering</td> <td>2 Months from last milestone to be executed/Completed</td> </tr> <tr> <td style="text-align: center;">CCP-03</td> <td>QA Documents Receipt Certificate</td> <td>CQA&I</td> <td>2 Months from last milestone to be executed/Completed</td> </tr> <tr> <td style="text-align: center;">CCP-04</td> <td>O&M Manual Receipt Certificate</td> <td>Corporate Engineering</td> <td>4 Months from last milestone to be executed/Completed</td> </tr> <tr> <td style="text-align: center;">CCP-05</td> <td>Scope Completion Certificate</td> <td>Site Erection</td> <td>8 Months from last milestone to be executed/Completed</td> </tr> </tbody> </table>	CERTIFICATE NO.	CERTIFICATE DESCRIPTION	RESPONSIBILITY	LIMITING DATES FOR ISSUANCE OF CERTIFICATE @	CCP-01	Certificate of Final Amendment to the Contract	Site C&M/SSC C&M	7 Months from last milestone to be executed/Completed	CCP-02	Drawing Receipt Certificate	Corporate Engineering	2 Months from last milestone to be executed/Completed	CCP-03	QA Documents Receipt Certificate	CQA&I	2 Months from last milestone to be executed/Completed	CCP-04	O&M Manual Receipt Certificate	Corporate Engineering	4 Months from last milestone to be executed/Completed	CCP-05	Scope Completion Certificate	Site Erection	8 Months from last milestone to be executed/Completed
CERTIFICATE NO.	CERTIFICATE DESCRIPTION	RESPONSIBILITY	LIMITING DATES FOR ISSUANCE OF CERTIFICATE @																							
CCP-01	Certificate of Final Amendment to the Contract	Site C&M/SSC C&M	7 Months from last milestone to be executed/Completed																							
CCP-02	Drawing Receipt Certificate	Corporate Engineering	2 Months from last milestone to be executed/Completed																							
CCP-03	QA Documents Receipt Certificate	CQA&I	2 Months from last milestone to be executed/Completed																							
CCP-04	O&M Manual Receipt Certificate	Corporate Engineering	4 Months from last milestone to be executed/Completed																							
CCP-05	Scope Completion Certificate	Site Erection	8 Months from last milestone to be executed/Completed																							

GENERAL CONDITIONS OF CONTRACT

		CCP-06	Liquidated Damages for Delay Certificate	
		(a)	For cases where LD for delay is settled by Corporate Contracts	Corporate Contract Services 7 Months from last milestone to be executed/Completed
		(b)	For cases where LD for delay is settled by the Regions/ Site	Concerned Site/Regional offices 7 Months from last milestone to be executed/Completed
		CERTIFICATE NO.	CERTIFICATE DESCRIPTION	RESPONSIBILITY
				LIMITING DATES FOR ISSUANCE OF @ CERTIFICATE
		CCP-07	Shortfall in Equipment Performance Certificate	<ul style="list-style-type: none"> • Corporate OS: Site Performance Test- Cat-I • Regional OS: Site Performance Test- Cat-II • Site: Site Performance Test- Cat-III 5 Months from Performance and Guarantee (PG) Tests
		CCP-08	"Material Reconciliation" Certificate	Site Erection & Site Materials Mgmt. 6 Months from last milestone to be executed/ Completed
		CCP-09	"Payment Reconciliation" Certificate : Indian Contractor	Site Finance 6 Months from last milestone to be executed/Completed
		CCP-09A	Reconciliation Certificate for Payments by Site : Foreign Contractor	Site Finance 6 Months from last milestone to be executed/Completed
		CCP-09B	Reconciliation Certificate for Payments by Finance: Foreign Contractor	Corporate Finance (IF Deptt.) 6 Months from last milestone to be executed/Completed
		CCP-09C	"Customs Reconciliation" Certificate: Foreign Contractor	Transportation Customs Clearance (T&CC) office 6 Months from last milestone to be executed/Completed

GENERAL CONDITIONS OF CONTRACT

		CCP-10	Certificate regarding Labour Payments and Statutory Requirements to be furnished by Contractor.	Contractor	9 Months from last milestone to be executed/Completed
		CCP-11	"No Demand Certificate" by Contractor	Contractor	6 Months from last milestone to be executed/Completed
		CERTIFICATE NO.	CERTIFICATE DESCRIPTION	RESPONSIBILITY	LIMITING DATES FOR ISSUANCE OF @ CERTIFICATE
		CCP-11	"No Demand Certificate" by Contractor	Contractor	6 Months from last milestone to be executed/Completed
		CCP-12	Certificate Completion of Warranty Period	Site Erection/ O&M*	14 Months from last milestone to be executed/Completed
		CCP-13	Certificate for Return of BGs/ Indemnity Bonds etc.	Site Corporate Finance	All BGs except CPG: 5 Month from Trial Operation / Completion of Facilities CPG: 15 Months from Trial Operation/ Completion of Facilities
		<p>* O&M applicable in case of R&M contracts @ In case the Contract involves more than one unit of the project, the limiting dates shall be in respect of last unit</p>			
	59.3	<p>Both the Contractor and the Employer will make necessary efforts to complete the Contract Closing activities as per the timelines as mentioned at clause 59.2 above.</p> <p>It shall be the responsibility of the contractor to submit the drawings along with the reproducible, QA documents, O&M Manuals, List of Spares, As Built drawings, deliverables, etc., as applicable, in a timely and sequential manner so that the contract closing activities are not delayed/impeded.</p> <p>The Employer shall also use its best endeavours to expedite all activities leading to successful closure of the contract. The Employer will review and approve the documents submitted by the Contractor in a timely and expeditious manner and the approvals shall not be unreasonably withheld</p>			

PERFORMANCE REPORT OF CONTRACTOR

GUIDELINES FOR FILLING THE FORMAT

- 1.0 The feedback shall be based on records, evidences and documents (hindrance register, DPR, monthly PRT MoM, contractor's MPR, etc). Due diligence shall be taken to capture the actual progress, hindrances, if any from the monthly progress report to be submitted by the concerned agency. As Daily Progress Report / Weekly Progress Report / Monthly Progress Report are key documents / inputs for Vendor Performance measurement. Non-submission of the aforesaid documents may also be reckoned as poor performance.
- 2.0 For measurement of contractor performance in various activities in supply, site execution etc, the Contractor shall submit quantified L-2 schedule within 3 months after scheduled completion of Basic Engg or 180 days from date of award, whichever is earlier. Based on the progress of detailed Engg, quantified L-2 shall be updated as and when required.
- 3.0 This vendor performance rating system is applicable for a particular package being executed by the vendor. If the same vendor is executing multiple packages in a project or at number of NTPC projects, the performance report shall be prepared package wise and the screening committee may then take a final view for evaluating the overall performance of the vendor before initiating action for issuance of Notice for Withholding of business dealings with the concerned contractor, in case the performance is found unsatisfactory.

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PACKAGE COMPLETION DATE	

FORMAT FOR ENGG & QA SCORE

(TO BE FILLED IN BY NTPC ENGG.)

S.No.	Parameters	Max Score (A)	Act % age w.r.t. sch (B)	Marks obtained (C) = (A)x(B)
(i)	%age of “ Approval ” category drgs/ docs submitted within submission schedule.	30		
(ii)	%age of “ Information ” category drgs/ docs submitted within submission schedule.	20		
(iii)	%age of drgs/docs approved within approval schedule (in Cat-I/IV)*	20		
(iv)	%age of drgs/docs approved within approval schedule (in Cat-II/IVR)*	20		
(v)	%age of Sub-vendor proposal for items identified in “DR” category & submitted within agreed schedule (i.e. 3 months prior to schedule date of ordering identified in L2)**	10		
	TOTAL	100		

* For (iii) & (iv) above - If all drawings/documents due for approval are approved in Cat-I/IV within approval schedule, then marks allocated against (iii) & (iv) above shall be clubbed for calculation purpose.

** In case no “DR” proposal is submitted and orders are placed on already approved vendors, then full marks shall be given for calculation purpose against item (v).

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FORMAT FOR FINANCE SCORE

(TO BE FILLED IN BY NTPC PM PRT COORDINATOR ON MONTHLY BASIS DURING PRT MEETING, BASED ON DETAILS TO BE FURNISHED BY NTPC SITE P&S)

S. no	Parameters	Max Score (A)	% Rating (B)	Marks Obtained (C) = (A) *(B)
(i)	Number of instances NTPC has to issue Comfort letters to sub-vendors for getting supplies.	25		
(ii)	Number of instances vendor has requested for advance against BG from NTPC (beyond contractual provision)	25		
(iii)	Number of instances of supply delay beyond 1 month after issuance of MDCC.	25		
(iv)	Number of instances of direct supply / diversion of materials / consumables by NTPC.	25		
	TOTAL	100		

*Performance to be captured by NTPC PM PRT Coordinator on monthly basis during PRT Meeting, based on details to be furnished by site P&S.

*(No instances = 100%

Up to 1 instance = 50%

more than 1 instances = 0%).

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FORMAT FOR SUPPLY SCORE

(TO BE FILLED IN BY NTPC CONTRACTS)

S. no	Parameters	Max Score (A)	Actual % w.r.t. L2 schedule (B)	Marks Obtained (C) = (A) *(B)
(i)	Ordering of Bought out items as per approved L2 network*			
	Major Bought out items	20		
	Minor Bought out items	5		
	Number of instances of cancellation / changes of Bol orders (No instances = 100% Up to 1 instances = 50% more than 1 instances = 0%).	10		
(ii)	Supply of Main Equipment per approved L2 network	60		
(iii)	Supply of Mandatory spares as per approved L2 network	5		
	TOTAL	100		

*If Major & Minor Bought out items are not separately identified in L-2 network then both shall be clubbed into single line item with Max score of 25.

Note: Overall % of actual progress vis-à-vis L2 schedule in Col (B) shall be arrived in the following manner:

- (i) Let there be n type of Items/systems identified in L2/Quantified L2 schedule i.e. E1, E2, E3En.
- (ii) Let % progress for each type of Item/system vis-à-vis L2 schedule be %E1, %E2, %E3.....%En.
- (iii) Overall % in Col (B) = (%E1+ %E2+ %E3.....+%En)/n

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FORMAT FOR CONSTRUCTION/INSTALLATION SCORE

(TO BE FILLED IN BY NTPC SITE)

S. no	Parameters	Max Score (A)	% of actual vis-à-vis L2 schedule (B)	Marks Obtained (C)=(A) *(B)
(i)	Physical progress i.e. Installation of equipment / item, Civil works (i.e. Excavation, RCC, Piling, etc), Structural Works (i.e. Structural Fabrication, Erection, etc) as per approved L2 network	95		
(ii)	Project Management Capability and resource Management by Vendor at site. (5 Negative marks per instance)			
	Number of instances of delay due to inadequate deployment of equipment and T&P, based on record maintained in hindrance register, monthly PRT MoM, contractor's MPR, etc.	(-)5		
	Number of instances of direct payment by NTPC to Contractor's sub-vendors to expedite supplies / services / the progress of work at site affected due to strike / delay in payments to labourers.	(-)5		
(iii)	Submission of Monthly Report in specified formats.	5		
	TOTAL	100		

Details of Area-wise performance is mentioned below:

Sr No.	Activities	Scope	L2 Finish Date	Actual Completed till L2 Finish	%age Comp
1	Excavation				
2	RCC				
3	Structural / Equipment Erection				
				Avg Comp %	

Note: For Physical Progress, overall % of actual progress vis-à-vis quantified L2 schedule in Col (B) shall be arrived in the following manner (Unit of measurement shall be as per approved BBU for respective activities):

- (i) Let there be n category of works identified in L-2/Quantified L2 schedule i.e. W1, W2, W3Wn.**
- (ii) Let % progress for each category of work vis-à-vis L2 schedule be %W1, %W2, %W3.....%Wn.**
- (iii) Overall %in Col (B) = (%W1+ %W2+ %W3.....+%Wn)/n**

Note:

- All incidences shall be relevant to the current performance evaluation cycle.
- In case of delay in front (including construction drawings for civil packages and other inputs, if any) release by NTPC, measurement of delay in execution by the contractor shall be normalized proportionally.
- Contractor will have to submit monthly progress report capturing actual physical progress viv-a-vis L2 schedule and delay in hand over of front by NTPC, if any. In case of front delay the same has to be jointly signed by NTPC engineer & Vendor.

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FORMAT FOR QUALITY SCORE

(TO BE FILLED IN BY NTPC SITE)

S. no	Parameters	Max Score (A)	% Rating (B)	Marks Obtained (C)=(A) *(B)
(i)	Availability of Testing facilities (Available as per contractual requirement – 100% Not available – 0%)	25		
(ii)	Preventing recurrence of defects/complaints (up to 5 cases – 100%, Up to 10 cases – 40%, more than 10 cases – 0%)	25		
(iii)	Proper Storage & Preservation of Equipment/Material (Nil violation – 100%, Up to 1 case of violation – 40%, more than 1 cases of violation – 0%)	25		
(iv)	Deployment of Qualified Quality Officers/Manpower as per Contract (% deployment w.r.t. contractual requirement)	25		
	TOTAL	100		

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FORMAT FOR SAFETY SCORE

(TO BE FILLED IN BY NTPC SITE)

S. no	Parameters	Max Score (A)	% Rating (B)	Marks Obtained (C)=(A) *(B)
(i)	Having safety policy and approved Safety Assurance Plan (available as per requirement – 100%, Not-available – 0%)	10		
(ii)	Violation of safety requirement as per Safety Assurance Plan. (0 violation = 100% Upto 3 violations = 50% more than 3 = 0%)	20		
(iii)	No. of incidence of Fatal accidents due to contractor's negligence (0 incidence = 100% 1 incidence = 50% more than 1 cases, or multiple fatalities in one instance = 0%)	50		
(iv)	No. of incidence of Non-Fatal accidents due to contractor's negligence (0 incidence = 100% Up to 5 incidence = 50% more than 5 = 0%)	10		
(v)	Deployment of Qualified Safety Officers as per contract (% deployment w.r.t. contractual requirement)	10		
	TOTAL	100		

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FORMAT FOR CLAIMS & DISPUTE SCORE

(TO BE FILLED IN BY NTPC SITE)

S. no	Parameters	Max Score (A)	% Rating (B)	Marks Obtained (C)=(A) *(B)
(i)	No. of cases where Contractor stopped work on account of non-admittance/non settlement of claims (No case = 100% Upto 3 cases = 50% more than 3 cases = 0%)	70		
(ii)	No. of arbitration/legal cases resorted to by the Contractor (No case – 100%, otherwise 0%)	30		
	TOTAL	100		

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Overall Performance Evaluation

S.No.	Parameters	Max Score (A)	Score Obtained (B)	Weightage (C)	Max Weighted Score (D) = (A)*(C)	Weighted Score obtained (E) = (B)*(C)
(i)	Engineering & QA	100		0.20	20	
(ii)	Finance	100		0.20	20	
(iii)	Supply	100		0.20	20	
(iv)	Construction/Installation	100		0.20	20	
(v)	Quality	100		0.05	05	
(vi)	Safety	100		0.10	10	
	Claims & Disputes	100		0.05	05	
	Total			1.00	100	

Note: In case of Civil Contracts, score of Engineering & QA and Supply shall be NIL and weightage of Construction/Installation shall be 0.60.

Performance Rating

Total Weighted Score obtained	Performance Grade
Upto 50	Unsatisfactory
>50 to 70	Satisfactory
>70 to 80	Good
>80	Excellent

Annexure-B

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NTPC SAFETY RULES

FOR CONSTRUCTION AND ERECTION OF POWER PLANTS

INTRODUCTION:

NTPC Limited is a Maharatna organization taking lead in realizing the power dreams of the Nation with a vision “To be one of the World’s largest and best power utilities, Powering India’s growth”. Safety is one of the prime concerns of NTPC and it always strives towards accident free construction, erection, commissioning, operation and maintenance of its power projects. In this process, NTPC has already formulated Safety policy and guidelines for smooth execution of all its project activities.

In order to strengthen the existing Safety Rules for Construction and Erection and thereby curbing the chances of accidents in Construction & Erection works at various projects of NTPC, the existing safety rules have been revised for strict implementation. These Safety Rules lay down the safety requirements for safe execution of project activities, responsibilities of the contracting agencies, and all concerned involved in Construction and Erection.

A. RESPONSIBILITIES OF CONTRACTORS FOR IMPLEMENTATION OF SAFETY RULES:

The Safety Rules for Construction & Erection as outlined hereunder, while setting out a broad parameter of safety norms, are not exhaustive. The contractor and his agencies are advised to refer to the following statutory provisions as amended from time to time for details and strict compliance therewith.

FOR GREENFIELD PROJECTS:

- (a) Building and Other Construction Workers (regulation of employment and conditions of service) Act, 1996 (briefly referred to as BOCW Act),
- (b) Building and other construction workers (regulation of employment and conditions of service) Central Rules, 1998 (briefly referred to as BOCW Rules) as adopted by the various State Governments,

FOR EXPANSION, MODIFICATION, ALTERATION AND, OR CONSTRUCTION ACTIVITY WITHIN AN EXISTING PLANT OPERATING AS PER APPROVED SITE PLAN UNDER THE FACTORIES ACT;

- (a) Factories Act, 1948,
- (b) Factories Rules, as adopted by the various State Governments
- (c) BOCW Act
- (d) BOCW Rules

The contractor is also required to ensure compliance with all the relevant Acts/Rules in addition to above.

It shall be incumbent on the contractor to ensure that the requirements of safety, statutory or otherwise specified, are fully met. Thus the onus of implementation of the norms so prescribed shall squarely rest with the contractor concerned or, on his behalf, his sub-contractor or any other agency deployed by him, indemnifying NTPC from all the liabilities that may arise out of any failure to comply with the above mentioned Acts/Rules or any contravention thereof by the contractor or any other sub-agency on his behalf.

Safety cannot be ensured solely through Rules and Regulations or Codes. It is the responsibility of the Contracting Agency to ensure that basic safety principles are incorporated in the planning stage of their mobilization, execution, installation of machines, equipment, storage, etc., and initiate and maintain *safety programs*. It is desirable to have a planned programme and secure adequate cooperation of senior management, EICs, sub-contracting agencies, supervisory personnel and workers involved to ensure the implementation of the provisions of these Rules in true spirit so as to achieve the ultimate goal of *accident prevention*.

It shall also be the responsibility of the contracting agency to provide amenities and safety requirements on each construction job in order to reduce or to eliminate hazards of construction activities and also to provide necessary *first aid* facilities as well as Ambulance van (in case of major agencies) for prompt transportation of injured persons to a physician or hospital.

It is also mandated that the authorized representative of NTPC, namely, the Engineer-in-charge, may, at his convenience, exercise such superintendence, supervision and, or control as may be deemed necessary, but this shall not absolve the contractor of his basic responsibility for strict compliance with the norms, standards and, or legal provisions as applicable under the Factories Act/Rules and the Building and other construction (regulation of employment and conditions of service) Act/Rules.

Section wise checklist of provisions of BOCW Act/Rules is given hereunder for ready reference of the contractor. (This list has been prepared in chronological order with primary importance to Section of Act and secondary importance to Rules)

S - Refers relevant Sections in BOCWA

R - Refers relevant Rules in BOCWR

Sl. No.	ITEMS	RELEVANT SECTIONS / RULES IN BOCWA AND BOCWR AND RBOCWR
1	Registration of establishment	S – 7, R – 23 to 27
2.	Display of registration certification at workplace	R – 26 (5)
3.	Hours of work	S – 28 R – 234 to 237
4.	Register of overtime	S – 28; S – 29 R – 241(1) Form XXII
5.	Weekly rest and payment at rest	R – 235
6.	Night shift	R – 236
7.	Maintenance of workers registers and records	S – 30 R – 238
8.	Notice of commencement and completion	S – 46 R – 239
9.	Register of persons employed as building workers	R – 240
10.	Muster roll and wages register	R – 241(1) (a); Form XVI and XVII
11.	Payment of wages	R – 248
12.	Display of notice of wages regarding	R – 249
13.	Register of damage or loss	R – 241(1)(a); Form XIX, XX, XXI
14.	Issue of wages book	R – 241(2)(a); Form XXIII
15.	Service certificate for each workers	R – 241(2)(b); Form XXIV
16.	Display an abstract of BOCWA and BOCWR	R – 241(5)
17.	Annual return	R – 242; Form XXV
18.	Drinking water	S – 32
19.	Latrines and Urinals	S – 33 R - 243
20.	Accommodation	S – 34
21.	Creches	S – 35
22.	First-aid boxes	S – 36 R – 231 and Schedule III
23.	Canteens	S – 37 R – 244
24.	Food stuff and other items served in the canteens	R – 245
25.	Supply of tea and snacks in work place	R – 246
26.	Food charges on no loss no profit basis	R - 247
27.	Delhi BOCW welfare Board Rules	R – 250 to 296
28.	Safety committee	S – 38 R – 208

29.	Safety officer	S – 38 R – 209 and Schedule VII
30.	Reporting of accidents and dangerous occurrences	S – 39,R – 210
31.	Procedure for inquiry in to the causes of accidents	R – 211
32.	Responsibility of employer	S - 44 R – 5
33.	Responsibility of Architects, Project engineer and Designers	R – 6
34.	Responsibility of workmen	R – 8
35.	Responsibility for payment of wages and compensation	S – 45
36.	Penalties and Procedures	S – 47; S – 55
37.	Excessive noise, vibration etc.	R – 34
38.	Fire Protection	R – 35
39.	Emergency action plan	R – 36
40.	Fencing of motors	R – 37
41.	Lifting of carrying of excessive weight	R – 38
42.	Health, Safety and Environmental Policy	R – 39
43.	Dangerous and Harmful Environment	R – 40
44.	Overhead protection	R – 41
45.	Slipping, Tripping, Cutting, Drowning and Falling Hazards	R – 42
46.	Dust, Gases, Fumes, etc.	R – 43
47.	Corrosive substance	R – 49
48.	Eye Protection	R – 45
49.	Head Protection and other protection apparel	R – 46; R – 54
50.	Electrical Hazards	R – 47
51.	Vehicular traffic	R – 48
52.	Stability of structure	R – 49
53.	Illumination	R – 50; R – 124
54.	Stacking of materials	R – 51
55.	Disposal of debris	R – 52
56.	Numbering and marking of floors	R – 53
57.	Lifting appliances and gears	R – 55 to 81
58.	Runways and Ramps	R – 82 to 85
59.	Working on or adjacent to water	R – 86 & 87

60.	Transport and earthmoving equipment's	R – 88 to 95
61.	Concrete work	R – 96 to 107
62.	Demolition	R – 108 to 118
63.	Excavation and Tunneling works	R – 119 to 168
64.	Ventilation	R – 153
65.	Construction, repair and maintenance of step roof	R – 169 to 171
66.	Ladders and Step ladders	R – 172 to 174
67.	Catch platform and hoardings, chutes, safety belts and nets	R – 175 to 180
68.	Structural frame and formworks	R – 181 to 185
69.	Stacking and unstacking	R – 186 & 187
70.	Scaffold	R – 188 to 205
71.	Cofferdams and Caissons	R – 206 to 211
72.	Explosives	R – 212 & 213
73.	Piling	R – 214 to 222
74.	Medical Examination for building and other construction worker, Crane operator an Transport vehicle drivers	R – 81; R – 223(a)(iii) and Schedule
75.	Medical examination for occupational health hazards	R – 233(a)(iv)
76.	Charging of workers for Medical Examination	R – 223(b)
77.	Occupational health centres and Medical officers	R – 225 and Schedule X & XI
78.	Ambulance van & room	R – 226 & 227 and Schedule IV & V
79.	Stretchers	R – 228
80.	Occupational health service for building workers	R – 229
81.	Medical examination for occupational health hazards	R – 223(a)(iv)
82.	Emergency care services and emergency treatment	R – 232
83.	Panel of experts and agencies	Central Rule 250
84.	Power of inspectors	Central rule 251

B. RESPONSIBILITIES AND DUTIES OF WORKERS

- (a) It shall be the responsibility of the worker to comply with the requirements of safety as laid down for him and the group of workers to which he belongs and fully cooperate in the discharge of the responsibility that has been assigned to the contractor.
- (b) If he discovers any defects in the lifting appliance, lifting gear, lifting device or those concerning any transport equipment or other construction equipment or tools as well as the physical work conditions, he will report such defects promptly to his employer or NTPC Engineer or other person in authority;
- (c) No building worker shall, unless duly authorized or in case of absolute necessity, remove or interfere with any fencing, guards, gangways, gear, ladder, hatch covering, life saving appliances, lighting or other things whatsoever required and provided for safety and health. If any of the aforesaid things is removed, the persons engaged in the work shall restore such thing at the end of the period during which its removal was necessary;
- (d) Every worker shall use only means of access provided in accordance with the approved norms and no person shall authorize or order another to use such means of access or method other than those approved;
- (e) Workers shall use such means of access and egress for going to and exiting from the workplace as provided.

SECTION - I

SAFETY MANAGEMENT

1.0 SAFETY MANUAL AND SAFETY POLICY:

- 1.1** The Safety policy of the contracting agency should reflect the commitment of the concerned agency towards safety and health of the workers specified for the particular site.
- 1.2** The Contractor shall have Safety Plan detailing the safety norms evolved through Safety Policy and Job Safety Analysis (JSA) or Hazard Identification & Risk Assessment (HIRA) of all package activities and constitute a Safety management program. Contracts shall also ensure POWRA (point of work risk assessment) before start of any activity.
- 1.3** The safety management programme in the form of Safety Manual shall give details of provisions proposed by the agency w.r.t. Job Safety Analysis (JSA) or Hazard Identification and Risk Assessment (HIRA) to ensure safety of the employees and elimination of health hazards. The Safety Manual including safety policy duly signed by the head/senior executive of the agency shall be submitted to the concerned Engineer-Incharge(EIC), NTPC before start of their project activities at site.
- 1.4** Each contracting agency shall have facilities for conducting the above safety management programme, commensurate with magnitude of the work under contract.

2.0 APPOINTMENT OF SAFETY OFFICER/SAFETY SUPERVISOR:

- 2.1** Each contracting Agency shall provide a sufficient number of qualified, suitable and experienced persons to manage all safety related matter on Site relating to the works. Irrespective of manpower employed by the agency whether temporary, casual, probationer, regular or permanent or on contract, Agency shall deploy a qualified Safety Officer/executive, responsible for carrying out the safety management programme before start of the work.
- 2.2** The safety officer shall create an organization, commensurate with the project activities, consisting of other staff as required for suitable deployment.
- 2.3** The schedule of requirement of safety personnel is given below.

No. of Workers	No. of Safety Supervisors	No. of Safety Officers
Up to 100	1	1
101 to 250	2	1
251 to 500	4	1
501 to 1000	6	2
1000 to 2000	6+ One additional supervisor up to every additional 250 workers	3
2000-3000	10+ One additional supervisor up to every additional 250 workers	4
3000-4000	14+ One additional supervisor up to every additional 250 workers	5
Above 4000	18 + One additional supervisor up to every additional 250 workers	5 + one safety officer up to addition 1000 workers

2.4 The qualification and experience of the safety personnel should meet the following criteria.

- a) Safety Supervisor: (i) Possesses recognized degree in any branch of Engineering. OR
(ii) Diploma in any branch of Engineering with at least one year construction experience.
- b) Safety Officer/Safety Executive: Qualification as given under BOCW Act/rules and minimum experience of three years.

2.5 In case contractor fails to employ the required safety professionals, the department may at the cost and risk of the contractor deploy additional/required safety professionals. The cost incurred towards this shall be deducted from contractor's bill at following the rates or actual whichever is higher.

- 1. Safety Engineer Rs. 1500/day.
- 2. Safety Supervisor Rs. 1000/day.

3.0 MEETING FOR SAFETY AFTER AWARD OF THE CONTRACT:

Representatives of contracting agency along with safety Officer/executive shall meet the concerned EIC of the particular activity prior to start of construction activities for the purpose of discussing safety standards and requirements applicable to the work under contract. The person representing the agency should be a responsible person for all their site activities.

4.0 PERSONAL PROTECTIVE EQUIPMENT:

4.1 The contracting agency should ensure sufficient inventory of personal protective equipment (PPEs) prior to initial mobilization as specified in the Bidding Documents. After identifying the need of the required PPEs for various activities performed at the site, an additional inventory of approx. 20% of required PPEs should be maintain during the execution of the work. A PPE plan shall be prepared which gives fair idea regarding issue of PPEs to various personnel as per the following 'PPE Selection Matrix'.

4.2 Mandatory PPEs: Wearing of Safety Helmet, Safety Shoes and reflective jacket is mandatory for all work at site and it should be ensured that all employees and project visiting personnel shall invariably wear safety helmet, safety shoes & reflective jacket.

PPE Matrix (apart from mandatory PPEs, i.e., Safety Helmet & Safety Shoes)

Activity	Type of Protection						Remarks, if any
	Hand	Eye	Ear	Body	Respiratory	Others	
Gas Welding & Cutting	LG	WG	-	LA	*SCBA/ OLBA	-	* for confined space
Electric Arc Welding	LG	HMWS	-	LA	*SCBA/ OLBA	-	* for confined space

Rigging	CG	SG	-				--
Working at Height	-	SG	-	DLFBH	-	*FAS	* for vertical columns
Grinding & Chipping	CG	FS / SG	-	LA	-	-	--
Working in High Noise	-	-	EP / EM	-	-	-	--
Handling of Cement Concrete	RG	SG	-	-	DM	-	
Blasting	CG	SG	EP*	-	-	-	* at noise area
Excavation	CG	SG	-	-	DM	-	*Gum boot in place of Safety shoe for foot
Chemical Handling	PVCG	CSG	-	PVCA	-	-	*Full body rubber suit with hood
Electrical and C&I	ERG*	SG	-	-	-	-	*For high voltages
Sand/shot blasting	CG	-	EP/EM	CA	SAMH	-	

ABBREVIATIONS: FS: Face Shield, CSG: Chemical splash goggles, HMWS: Helmet mounted welder's shield, GB: gum boot, DLFBH: Double lanyard full body harness, SG: Safety goggles, DM: Dust mask, SAMH L Supplied air mask/hood, EP/EM: Ear plug/Ear Muff, CG: Cotton hand gloves, LG: Leather hand gloves, LA: Leather apron, RG: Rubber gloves, PVCG: PVC Gloves, PVCA: PVC Apron, SCBA: Self-contained breathing apparatus, WG: Welding goggles, ERG: Electrical Rubber Gloves. OLBA : Online breathing apparatus

4.3 The above-mentioned PPEs should be made available with contractor at site and issued to the concerned workers on the day of employment. All PPEs shall comply with ISI standards with valid test certificates.

4.4 At least two breathing apparatus sets (complying requirement as per IS: 10245) shall be provided at each site where excavation/tunneling works and Welding/ Cutting operations in confined areas are being carried out, to rescue the victims under exposure to harmful gases/vapors, if any.

5.0 SAFETY COMMITTEE:

- 5.1** *Safety committee* shall be formed within each contracting agency comprising of worker representatives with equal no. of management representatives as per the provisions of BOCW Act/rules. This committee in each agency shall meet at least once in every month. The safety officer of the concerned agency shall coordinate these meetings. NTPC Safety officer shall be special invitee for Safety Committee meetings. The safety committee functioning shall be in line with the provisions of BOCW Act/Rules.
- 5.2** Apart from the above, each agency shall organize safety meetings every day before start of day's work to educate & motivate the workers about the necessity of safety. Case study of accident/ incident can be shared in these meetings.
- 5.3** The contractor shall also regularly organize safety meetings for all job supervisors/foremen.
- 5.4** Weekly meeting with agencies' Safety Officers to be organized by safety department of NTPC and minutes to be recorded, circulated and compliance status to be checked on regular basis.

6.0 SAFETY MESSAGE PROPAGATION:

- 6.1** Contracting agencies shall arrange for display of safety hoardings depicting suitable safety cartoons/messages/ cautionary notices at appropriate places of project site to remind the workers to perform their duties safely. Minimum one safety message board/hoarding of appropriate size for every 10 workers to be provided and maintained by the concerned agency.
- 6.2** Apart from safety hoardings, each agency should maintain a safety bulletin board at all their work locations. Such safety bulletin boards should depict the activities being planned for the day, good practices, permit details etc.
- 6.3** Safety suggestion boxes shall be kept at each contractor's office at site for obtaining safety suggestions from the workers. Best suggestions should be implemented and may be rewarded suitably to encourage the workers for safety.

7. COMPETENCY OF EMPLOYEES:

- 7.1** Throughout the course of the contract, persons employed by agency shall be physically fit, qualified/experienced to perform their assigned duties/ jobs.
- 7.2** Employees shall not, knowingly be permitted to work in a manner that their ability or alertness is so impaired because of fatigue, illness or any other reason, that it may expose them and or others to injury.
- 7.3** No worker, vehicle operator shall be less than 18 years of age. And the vehicle operator shall have a valid license as per requirements of Motor Vehicle Act.
- 7.4** Contractor shall comply with all applicable state/central laws and codes related to employment of operators for Hoist, Shovel, Crane, Tractor, Bull-dozer, any other howling heavy equipment/vehicle.

8.0 SAFETY INDUCTION AND TRAINING :

- 8.1** Each worker deployed by the agency shall be given 2-days induction training which shall include the medical examination and instructions related to particular job, fire fighting, first-aid and reporting of accidents. All employees shall be given safety training as per BOCW Act/Rules.
- 8.2** The contracting agency shall also impart job specific skill based safety training to all its employees (Minimum one day) on various related safety topics using internal/external safety professionals/consultants as per the matrix given below. Record of such trainings and attendance particulars shall be maintained in a register for ready reference to statutory authorities/engineer-in charge.

TRAINING MATRIX:

Name of topic	Executives	Super visors	Skilled Workmen	Other Workers
Safety Induction	Y	Y	Y	Y
Accident_ Causes, factors, cost	Y	Y	Y	-
Industrial hazards & Accident Prevention	Y	Y	Y	-
Investigating, reporting, records	Y	Y	-	-
Personal Protective Equipment	-	Y	Y	Y
Construction Safety & Role of Supervisory personnel	-	Y	-	-
Permit to Work (PTW)	-	Y	Y	y
Statutory Provisions (BOCW Act/Rules, Factories Act 1948 etc.)	Y	Y	y	y
Material handling	-	y	Y	Y
Emergency Management	Y	Y	Y	-
Electrical Safety	-	Y	Y	-
Fire safety	Y	Y	Y	Y
First Aid & CPR (cardio pulmonary resuscitation)	-	Y	Y	Y (Selected)
Safety in Welding & Cutting	-	-	Y	-
Safety Audit	Y	Y	-	-
Safety in Lifting Tools & Tackles	-	Y	Y	y
Safety in Working at height	-	Y	Y	Y
Safety in Confined space work	-	Y	Y	Y
Defensive Driving	-	Y*	Y*	Y*

*for construction vehicle operators, helpers & crane operators

Y=Yes

9.0 ID PASS

- 9.1** CLIMS (Contract Labor Information Management System) will be the criterion for entering or gate pass system if implemented at site.
- 9.2** The contractor shall ensure that all personnel working at site having a photo Identity card before they are engaged for any work and properly mentioned details like validity, Category/designation and work area etc. This ID card should be issued only after ensuring their screening test, medical fitness and safety induction training. Id card gate pass shall be indicated with 3 nos. of offence marks. With each offence the gate pass of concerned workmen/ supervisor will be punched giving on the spot indication of persons indulging in unsafe actions.
- 9.3** Drinking of Alcoholic beverages is strictly prohibited. Employees under the influence of any intoxicants, even to the slightest degree, shall not be permitted to remain at work. Each contractor should maintain 'breath analyzer' to determine the intoxicated workers at site.

10 SAFETY AUDIT

- 10.1** Internal Safety Audit once in every six months by the contracting agency and external safety audit as once in a year by third party shall be conducted, with prior intimation to EIC and NTPC Safety Deptt. The external auditing agency should be reputed safety institution or a certified Safety Auditor under any statutory legislation. The audit report along with time bound action plan should be submitted to Engineer-in-charge and NTPC Safety Dept.
- 10.2** Apart from above, Electrical Safety Audit shall be conducted quarterly by a team comprising of Electrical engineer, Safety representative of contractor and NTPC Electrical Erection representative covering the following and submit the report to EIC.
- i) Electrical incidents investigation findings and remedial measures implemented.
 - ii) Adequacy of power supply requirements
 - iii) Power distribution system in place
 - iv) Updated electrical single line diagram including the IP44 DBs arrangement.
 - v) Electrical protection devices – ELCBs, O/L protections etc.
 - vi) Earth or ground connection and earth pit maintenance details
 - vii) Education and training of electrical personnel undertaken
 - viii) Any other point appropriate to the site conditions.

11. SAFETY BUDGET

Every contracting agency should clearly estimate and allocate a separate budget head for safety requirements every year and make the safety activity plan for the year and submit to NTPC EIC & Head of Safety. Budget allocations should be practically adequate to the site safety requirements and the details shall be intimated to the concerned EIC and safety deptt. before start of the work under the contract and subsequently, every year by 15th of April. Engineer-in Charge in consultation with Head of Safety shall review and monitor the effective utilization of allocated budget for safety related activities by the Contractor.

12. REPORTING AND INVESTIGATION OF ACCIDENTS AND DANGEROUS OCCURRENCES:

12.1 Reporting of accidents: Notice of any accident (the prescribed format is annexed to the manual) to a worker at the building or construction site that

- (a) Causes loss of life; or
- (b) Disables a worker from working for a period of **48 hours** or more immediately following the accident;

Shall forthwith be sent by Telegram, Telephone, Fax, Email or similar other means including special Messenger within **four hours** in case of **fatal accidents** and **72 hours** in case of **other accidents**, besides the Engineer-in-charge, to:

- I. The Regional Labour Commissioner (Central);
- II. The Board with which the worker involved was registered as a beneficiary;
- III. Director General of Building and other construction (regulation of employment and conditions of service) Act/Rules; and
- IV. The next of kin or other relative of the worker involved in the accident;

12.2 Further, notice of accident shall be sent in respect of an accident which

- (a) Causes loss of life; or
- (b) Disables the injured worker from work for more than 10 days to
 - (1) The Officer-in-charge of the nearest Police Station;
 - (2) The District Magistrate or, if the District Magistrate by order so desires, to
 - (3) The Sub-Divisional Magistrate;

12.3 Where any accident causing **disablement that subsequently results in death**, notice thereof in writing of such death, shall be sent the Authorities mentioned above within **72 hours** of such death.

12.4 In case of an accident causing minor injury, first-aid shall be administered and that resulting in disability of **48 hours or more**, the injured worker shall be given first-aid and immediately transferred to a Hospital or other place for medical treatment.

12.5 All near-miss accidents shall be reported to NTPC Engineer In-charge and Safety Officer as per prescribed format.

12.6 Reporting of dangerous occurrences: The following classes of dangerous occurrences shall be reported to the Inspector having jurisdiction, whether or not any disablement or death caused to the worker, namely:

- (a) Collapse or failure of lifting appliances, or hoist, or conveyors, or similar equipment for handling of building or construction material or breakage or failure of rope, chain or loose gears; or overturning of cranes used in construction work;
- (b) Falling of objects from height;
- (c) Collapse or subsidence of soil, any wall, floor, gallery, roof or any other part of any structure, platform, staging, scaffolding or means of access including formwork;
- (d) Contract work, excavation, collapse of transmission;
- (e) Explosion of receiver or vessel used for storage at a pressure than atmospheric pressure, of any gases or any liquid or solid used as building material;

- (f) Fire and explosion causing damage to any place on construction site where building workers are employed;
- (g) Spillage or leakage of any hazardous substance and damage to their container;
- (h) Collapse, capsizing, toppling or collision of transport equipment;
- (i) Leakage or release of harmful toxic gases at the construction site;
- (j) In case of failure of a lifting appliance, loose gear, hoist or building and other construction work, machinery and transport equipment at a construction site, such appliances, gear, hoist, machinery or equipment and the site of such occurrence shall, as far as practicable, be kept undisturbed until inspected by the Authorities;

12.7 Every notice given for fatal accidents shall be followed by a written report to the concerned Statutory Authorities and the Engineer In-charge in the specified Form annexed as Schedule, under acknowledgement.

12.8 Incident / injury statistics shall be maintained by all agencies cause wise.

12.9 Investigation of accidents and dangerous occurrences

Besides reporting, it shall be the responsibility of the contractor to constitute a team (members as per the gravity of the incident) of responsible person to thoroughly investigate all incidents involving near-miss accidents, lost-time and reportable accidents and dangerous occurrences with a view to finding out the causative factor, taking remedial measures and fixing responsibility, and make a copy of the investigation report along with action-plan, specifying a definite time-frame for implementation of the findings, available to the Engineer in-charge forthwith.

13. MEDICAL AND FIRST AID AMENITIES:

13.1 It is the responsibility of each contracting agency to ensure the availability of suitable arrangements at their work site for rendering prompt and efficient First aid to injured persons.

13.2 Arrange one trained and certified first aid for every twenty workers in each shift.

13.3 Ambulance with proper equipment for prompt transportation of the injured persons to a physician or a hospital shall be provided before start of the work in cases where 500 or more than 500 workers are employed. For smaller contracts, where less than 500 workers are employed, Contractor shall have a tie-up with suitable Agency for providing Ambulance with proper equipment for prompt transportation of the injured persons to a physician or a hospital in case of an Accident / Emergency. Further, Contractor shall submit a proof of the same to EIC/Safety Officer of NTPC.

13.4 Deploy one full time construction medical officer (qualification as per Schedule XI of BOCW Central Rules -1998) for cases where 500 or more workers are employed (upto one thousand workers) and one additional construction medical officer for additional one thousand workers or part thereof. For smaller contracts, where less than 500 workers are employed, Contractor shall have a tie-up with suitable Hospital / Nursing home in the vicinity of the

Project/Site where work is being executed, for providing adequate medical treatment by qualified medical officers and nursing staff, as and when required. Further, Contractor shall submit a proof of the same to EIC/Safety Officer of NTPC.

Notwithstanding anything stated above, Contractor/Agency shall strictly comply with the requirements of relevant BOCW Act/ BOCW Rules/ Factory Act/Factory Rules/ any other statutory Act/Rules/Law with regards to providing suitable medical facilities to the workers.

In case contractor fails to employ the required construction medical officer alongwith Additional staff, corresponding payment for the same shall not be made and/or necessary action as per provisions of the Bidding documents shall be taken by NTPC.

- 13.5** Additional staff including one nurse, one dresser-cum compounder, one sweeper-cum-ward boy with each construction medical officer for full working hours
- 13.6** The Telephone nos. of Medical officer, Hospital(s) or ambulance shall also be conspicuously displayed at each work site.
- 13.7** First-aid kits as approved by medical officer shall be provided at accessible points in the ratio of at least one kit for every 50 employees.
- 13.8 Health Management:** The site manager shall implement health examinations for the working personnel on a regular basis.

Types of health examination	Target	Frequency
General health examination	All workers	Annual
Occupational health examination (Audiometric, PFT, Vision etc.)	Worker engaging in noise, dust, vibration, harmful light generating work	Annual
Occupational health examination (Vision)	Personnel involved in operation of Cranes, heavy vehicles	Annual
Occupational health examination (Vertigo/Height pass)	Workers engaged at Height Works	At the time of induction training and every year

14. TESTING & EXAMINATION OF LIFTING, TOOLS, TACKLES, PRESSURE VESSELS AND OTHER EQUIPMENT:

- 14.1** All the lifting equipment, tools, tackles, pressure vessels etc. shall be tested & examined as per BOCW or Factories Act and rules made there under.

- 14.2** The records & certificates of such testing & examination shall be maintained and readily available for reference to statutory authorities/engineer-in-charge.
- 14.3** Proper color coding system should be maintained and marking should be done accordingly on all lifting tackles.
- 14.4** Regular testing of ELCBs and RCCBs by competent electrician must be ensured by agencies and record should be maintained.

15. EMERGENCY MANAGEMENT PLAN

- 15.1** The contractor shall ensure that an Emergency Management Plan is prepared to deal with emergencies arising out of:
 - a. Fire and explosion;
 - b. Collapse of lifting appliances and transport equipment;
 - c. Collapse of building, sheds or structure etc.;
 - d. Gas leakage or spillage of dangerous goods or chemicals;
 - e. Drowning of workers, sinking vessels, and
 - f. Landslides getting workers buried; floods, storms and other natural calamities.
- 15.2** While arrangements shall be made for emergency medical treatment and evacuation of the victim in the event of an accident or dangerous incident occurring, the chain of command and the responsible persons of the contractor with their telephone numbers and addresses for quick communication shall be adequately publicized and conspicuously displayed in the workplace.
- 15.3** It is also required that there is a tie-up with the hospitals and fire stations located in the neighborhood for attending to the casualties promptly and emergency vehicle kept on standby duty during the working hours for the purpose.
- 15.4** It shall be the responsibility of the contractor to keep the Local Law & Order Authorities informed and seek urgent help, as the case may be, so as to mitigate the consequences of an emergency. Prompt communication to NTPC, telephonically initially and followed by a written report, shall be made by the contractor.

16. ENFORCEMENT OF SAFETY CODE, SAFETY RULES & REGULATIONS:

The Engineer-In charge shall ensure that the contractor is exercising at all times, reasonable and proper precautions for the safety of people at works and complying with the provisions of current safety rules and laws according to safety code and relevant statutes of state/central governments. In case of negligence or default, the agency shall be penalized suitably as per penal provisions of NTPC Safety Rules.

17. WORK PERMIT SYSTEM

- 17.1** The Contractor shall implement Work Permit system, which is a formal written system used to control certain types of work that are potentially hazardous. A work permit is a document, which specifies the work to be done, and the precautions to be taken. Work Permits form an essential part of safe systems of work for many construction activities. They start the work

only after safe procedures have been defined and clearance taken from respective NTPC EICs. Permits to Work are usually required in high-risk areas as identified by the Risk Assessments.

17.2 Examples of high-risk activities include but are not limited to:

- i) Entry into confined spaces
- ii) Cutting & welding
- iii) Working at Height along with checklist
- iv) Working on electrical equipment
- v) Heavy lifting operations
- vi) Removal of grating/ Handrail / floor opening
- vii) Material Shifting

The copies of recommended formats for reference is given in annexure-IV.

17.3 The permit-to-work system should be fully documented, laying down:

- i) How the system works
- ii) The jobs it is to be used for;
- iii) The responsibilities and training of those involved; and
- iv) How to check its operation;

17.4 A Work Permit authorization form shall be completed with the maximum duration period not exceeding 12 hours.

17.5 A copy of each Permit to Work (PTW) shall be displayed near to work area (on PTW Display board) in close proximity to the actual works location to which it applies.

18. ACCESS TO AND FROM THE WORKPLACE

18.1 Safe, clean, well lit, unencumbered access and egress to and from work areas shall be maintained at all times in normal operating conditions.

18.2 The number and location of accesses and egresses from and to the workplace shall be adapted to the number of people likely to be present at any time, and therefore to evacuate from the workplace in case of emergency.

18.3 If access and egress to work areas are restricted due to operational conditions (e.g. access restricted due to pressure testing, etc.), alternative access and egress ways must be implemented, so far as is reasonably practicable. If this is not reasonably practicable, all concerned organizations and persons must be informed of the access restrictions, and work scheduling must be adapted in consequence.

18.4 Temporary access to height or into ground openings shall be of purpose made material such as scaffolds, stair cases/towers and ramps, which incorporate guardrails .

19. INTERFERENCE WITH MOVING VEHICLES AND PEDESTRIANS

- 19.1** The circulation of vehicles and pedestrians must be segregated by establishing restricted areas, one way routes where possible, pedestrian crossing zones and designated parking areas.
- 19.2** The appropriate measures must be implemented in order to prevent collision between pedestrians and vehicles at pedestrian crossings. This may include, but shall not be limited to:
 - Mirrors;
 - Lighting;
 - Speed bumps before the crossing point.
- 19.3** Vehicle and pedestrian ways shall be physically separated with Hard-barriers, so far as is reasonably practicable, and be indicated with signs.



- 19.4** When it is not reasonably practical to implement a physical segregation, pedestrians must maintain safety distance of at least 2 meters from moving/operating vehicles at all times.
- 19.5** Traffic rules must be made visible through signage and traffic stops, consistent with those used on public
- 19.6** Roads as per road safety requirement.
- 19.7** All pedestrians on Project sites must wear high-visibility garments.
- 19.8** Pedestrians (including banksmen) must wear high-visibility garments in all areas where trucks and other vehicles (forklifts, cranes, etc.) maneuver. These areas must be clearly signaled / marked (floor painting, Hard-barriers, signs, etc.).Additional points:
- 19.9** Competent banksmen must be used for operations involving reversing or maneuvering where space or view is restricted.
- 19.10** Drivers must only operate vehicles they are competent to drive and must follow the established traffic routes and comply with all site rules.
- 19.11** The maximum driving speed on site is 15 km per hour.
- 19.12** Drivers and passengers must not get on or off moving vehicles.
- 19.13** When driving a forklift, forks must be lowered, the mast tilted back.
- 19.14** Smoking, eating, drinking, using a mobile phone or using earbuds or headphones when driving a vehicle is strictly prohibited.
- 19.15** When the vehicle is not in use, it must be ensured that:
 - The engine is stopped and prevented from unauthorized use (e.g.: starter key removed), brake applied (and with wheels chocked for heavy vehicles);
 - All raised parts are lowered to the ground or put in a safe position (cranes);
 - It does not obstruct emergency exits, other routes, fire equipment or electricity panels.

20. HOUSEKEEPING

The contractor shall ensure that their work area is kept clean, tidy and free from debris generated by their activities. All debris/scrap should be stored in separate bins. The work areas must be cleaned on a daily basis and a full cleaning session of each area shall be conducted on a weekly basis. All equipment, materials and vehicles shall be stored in an orderly manner. Access to emergency equipment, exits, telephones, safety showers, eye wash stations, fire extinguishers, pull boxes, fire hoses, etc. shall not be blocked or otherwise disturbed, restricted or delayed.

21. STACKING AND STORAGE PRACTICE

Contractor Agency shall ensure stacked material is bonded on a stable and level footing capable of carrying the mass of the stack. Adequate clearances shall be provided between the sides of the stack and top to facilitate unimpeded access to service equipment like overhead wiring, cranes, forklifts and firefighting equipment, and hoses. Circular items shall be sufficiently choked with wedges not with odd bits of materials. Free-standing stacks of gunny bags and sacks such as Cement bags shall be stacked to prescribe safe stacking heights with layers formed for stable bonding, preventing slippage causing accidents. Stacking against walls shall not be permissible.

Contractor shall maintain the premises and surrounding areas in clean and clear manner with safe access and egress. There shall be sufficient and adequate storage racks, shelving, bins and pallets and material handling equipment to stack his construction materials such as Pipes, Structural and his construction enabling materials. Unwanted materials shall be promptly moved away for efficient material movement.

Any temporary store shed will be built in conformity with fire safety requirements. The stores must be provided with adequate lighting arrangement (Flame proof / intrinsically safe depending upon the Zone category) and must be equipped with sufficient fire extinguishing arrangement. "No Smoking" and other relevant signage must be displayed conspicuously at strategic locations and safety precautions must be strictly enforced.

All material should be kept at least 150mm above from the ground by providing wooden packing below. Maximum height of material stacking should not be greater than 3 meter. All loose material must be kept in wooden box or in sharp edge protected drum and material identification details to be displayed. Materials inside store room should be kept on scaffold rack.

Gas cylinder storage area must be 30m away from the hot work zone and separate storage facility must be available for empty and full cylinder with proper shed. Storage area must be design in a way that 6 meter distance between LPG/DA and oxygen maintained

22. CONFINED SPACES

All Confined Spaces belonging to Subcontractor shall be identified and clearly signed posted as a confined space forbidden to unauthorized Personnel at every entrance. A method for preventing entry must be established and maintained for all Confined Spaces. Physical prevention system (such as locks) is preferred.

Before commencing work in a Confined Space, the Subcontractor must obtain a Permit to Work from the relevant authority.

The following requirements shall be met at any time:

- Only competent and trained workers can participate to work in confined spaces (as a minimum as per local Law). A Confined Space Entry Log (or equivalent) must be used to identify the person inside the Confined Space at any time;
- Air Analysis tests must be carried out to determine if the Confined Space is oxygen deficient and/or contains flammable substances, toxic agents, carbon monoxide and/or harmful physical agents. The air shall be analyzed before starting work, during work and after work. Adequate ventilation must be provided;
- Working in the confined space without a watcher is strictly forbidden. An adequate means of communication is required and shall enable easy and clear communication:
 - Between those inside the space,
 - Between those inside the space and those outside,
 - To summon help in case of emergency;
 - Adequate emergency provisions must be in place. In particular, necessary rescue equipment must be ready, pre inspected and available. The arrangements need to be suitable and sufficient for the rescue of persons in the event of an emergency.

23. FIRE PROTECTION AND PREVENTION

Routine hot works should be described in the contractor Risk Control Plan .Non-routine hot works are submitted to daily hot works permits given by the relevant authority.

Full and unrestricted access to emergency exits, fire-fighting equipment, fire control and emergency vehicles shall be maintained at all times. The Subcontractor shall provide, install and maintain their own temporary fire protection against hazards they introduce to the Site (work areas, storage areas, and temporary facilities under their responsibilities).

Fire extinguishers shall be inspected at least annually by a certified person and visually inspected monthly and documented by the Contractor.

24. ELECTRICAL SAFETY

Personal authorization must be issued by Contractor Management (or formally designed delegates) likely to perform or supervise electrical works.

Without such an authorization validated by EIC, no Contractor's employee shall undertake electrical works.

No live work on high voltage or medium voltage is allowed. All high voltage and medium voltage electrical works must be performed on isolated equipment and only after verification of absence of voltage with suitable equipment. Low voltage and very low voltage live work is only allowed for measurement tests and checks of equipment. The below measures will be taken:

- Work practices must protect against direct or indirect body contact by means of tools or materials and be suitable for work conditions and the exposed voltage level
- A Lockout and Tagout procedure must be applied prior to commencing any electrical work. Prior to commencing works on isolated equipment, a verification of absence of voltage with suitable safety test equipment must be performed.
- Energized panels will remain locked with a specific key or tool whenever they are unattended and tagged with the signs and warnings indicating the presence of danger. If not reasonably practicable, a restricted area delimited with physical barriers and supported by warning signs must be implemented around the opened equipment.
- Only qualified electrical Contractor Personnel may enter substations and/or transformer vaults and only after being specifically authorized by NTPC EIC.
- All joints (Both terminal and intermediate) in cable should be made using lugs and joint area should be crimped using crimping tools.
- All temporary connection should be provided through 30mA ELCB/RCCB using 3 core double insulated cable and only 3 pin industrial plug top will be used for connection.
- Zero energy verification needs to be ensured before any electrical operation using only VAV before working on a live circuit which has been isolated
- Only industrial type DB to be used for connection and weather protection shed needs to be provided for every DB and shed height should not be less than man height.
- Double earthing protection must be provided for every electrical equipment and earthing value should be less than 1 Ohm
- Deployment of trained, experienced & licensed electrician as well as licensed electrical supervisor must be ensured at site as per Rule-45 of the Indian Electricity Rules, 1956 ;
- EIC May perform screening/ competency test for all contractor electrical professions i.e. electrical engineers and helpers. Selection/ rejection of the personnel who appear for the screening is sole discretion of EIC
- Electrical helper who will be engaged in helping the electrician/ engineer must have minimum ITI certificate to be eligible for working with him
- All PPE' s used while being involved in electrical work must be as per IS Standards available for electrical work

25. COMPRESSED GAS CYLINDERS

Gas cylinders shall be securely stored and transported, and identified and used in line with the safety Requirements as per Gas Cylinder Rules -2106.

Hose lines shall be adequately protected, inspected and tested for leaks in line with the safety Requirements. Flash back arrestor /NRV must be used at both ends of the hoses and all hose should be free from damage and fixed properly preferably using crimping clamps. Leakage test must be done before every use by soap solution and physical inspection of hose must be carried out regularly. Only trolley attached with wheel will be used for cylinder transportation in which cylinders must be kept secured with chain. Only Industrial type regulator fitted with two stage double dial pressure gauge is allowed to be used.

26. LIFTING OPERATIONS

The Contractor shall prepare a lifting plan, checked and submit for authorization by contractor's competent authorized persons prior to any lifting operation and formally communicated to all persons undertaking the work.

All persons preparing, issuing lifting plans and all persons involved in lifting operations must be subject to formal competence checks by the contractor to ensure necessary training, experience and qualification prior to commencing work. The Subcontractor must ensure that their nominated Lifting Leader has appropriate qualifications.

Contractor lifting plans include:

The lifting methodology, step by step

The risk analysis of the operation including consideration for weather conditions and work environments (e.g.: proximity of hazards and obstructions to the load, consideration for overturning, load integrity) where appropriate and consideration for simultaneous operations and the measures taken to avoid conflicting tasks in the lifting area

The identification of the designated lifting area, the fall zone and the control measures to prevent access such as barriers, signs, etc.

The description of the type, weight, size, shape and center of gravity of the load and the method used for slinging, attaching and detaching the load with the availability of approved lifting points on load when necessary

The list of the certified and inspected equipment and lifting accessories to be used

The composition of the team required to perform the task (crane driver, rigger, etc.) with the needed qualifications and description of their roles and responsibilities including the intended communication method

Any Heavy equipment (crane, winch machine, etc.) manufactured less than 15 years from the current year shall be only allowed to be used at our project Site's. Pre-safety Inspection of the equipment by safety deptt. shall be done before mobilizing the equipment at our project site.

The contractor must ensure that a competent operational leader is formally appointed to supervise each lifting operation. All lifting plans must clearly define the specific roles and responsibilities for each person involved (e.g.: crane drivers, lifting coordinators and riggers) and must be checked and issued prior to lifting operation. Clear communication channels must be formally established and maintained between everyone involved in a lift with only authorized person giving instruction to the operator.

Special permission needs to be taken from NTPC EIC for tandem lifting and for any non-routine lifting operations must strictly adhere to the guidelines described in corresponding Standard / Procedures / Directive.

No employee of the contractor shall be positioned under a suspended load or between a suspended load and fixed objects.

All lifting equipment and accessories must have valid manufacturers certificates or thorough examination records and be uniquely identified, marked with the safe working load, listed in a register and subject to formal regular inspection as per EHS requirements and shall have valid certificates from a competent authority. Inspection before use by the operator is mandatory. All lifting hooks must have latch. All cranes shall be fitted with Automatic Safe Load Indicator (ASLI) and Anemo Meter.

The contractor shall operate and maintain cranes and hoisting equipment in accordance with manufacturers' specifications and limitations and the safety Requirements. All defective, non-inspected or unidentified (safe working load / identification number) lifting equipment or accessories must be either removed from site or physically prevented from use.

27. LOCKOUT TAGOUT (“LOTO”)

Prior to performing work on Machines or Equipment, the Subcontractor shall ensure that all energy sources are isolated and verify the absence of residual energy (e.g.: by using specific voltage detecting device for electricity).

At any time, the contractor shall follow the Site-specific LOTO and Permit to Work rules. The contractor must ensure that all of their affected Subcontractor Personnel receive the necessary training. Lockout/ Tagout must be implemented before servicing and maintenance is performed on Machines and Equipment, which could unexpectedly start-up, become energized, or release stored energy exposing persons to a risk of injury, unless the works undertaken are performed using alternative measures that provide effective protection.

Absence of residual energy must be verified using the suitable equipment or process adapted to the machine and the kind of energy to be checked before start of work. *The contractor must procure suitable VAV instrument for verification of absence of voltage before implementing LOTO all by themselves.*

When the contractor is in charge of LOTO, each authorized person must be issued with an individual lock with a unique key. The contractor shall secure areas where energy sources have been de energized, so as to prevent the access of unauthorized personnel and erect suitable signs. All affected Personnel shall be notified.

Once an item of electrical equipment has been energized, an item of mechanical plant and/or System has been erected and released for Commissioning, no work will be allowed on such item of Equipment or System unless a valid Permit to Work (PTW) has been obtained from the relevant authority.

28. MONTHLY SAFETY REPORT

Agency has to submit the monthly safety activity report in the form of Lead-Lag indicator to NTPC Safety Deptt. Sample format attached as annexure –IV.

29. In case the Contractor doesn't adhere to any of the provisions of the NTPC Safety Rules for Construction and Erection of Power Plants, corresponding payment for the provisions not adhered, shall not be made and/or necessary action as per provisions of the Bidding documents shall be taken by NTPC.

SECTION-II

1. Safety at workplace and equipment

1.0 GENERAL PROVISIONS:

1.1. Housekeeping:

- a. The contractor shall be primarily responsible for maintaining Good housekeeping and safety standards in the workplace;
- b. Loose materials that are not required for use shall not be placed or left behind so dangerously as to obstruct workplaces or passageways;
- c. All projecting nails shall be removed or bent to prevent injury;
- d. Equipment, tools and small objects shall not be left lying unattended or unsecured from where they could fall or cause a person to trip;
- e. Scrap, waste or rubbish shall not be allowed to accumulate in the site as these combustibles can create serious fire hazards and affect safe working;
- f. Workplaces and passageways that become slippery owing to spillage of oil or other causes shall be cleaned up or strewn with sand, ash or the like;
- g. Portable equipment shall be returned after use to their designated storage place.

1.2. Means of access and egress shall consist of

- a. Adequate and safe means of access and egress shall be provided in all workplaces;
- b. The means of access and egress shall be maintained in a safe condition;

1.3 Lighting and ventilation

- a. All practical measures shall be taken to prevent smoke, fumes etc. from obscuring any workplace or equipment at which any worker is engaged;
- b. Adequate and suitable artificial lighting shall be provided where natural lighting is not sufficient as per IS 3646 (Part II). The artificial lighting so provided shall not cause any incidental any danger, including that of producing glare or disturbing shadows;
- c. To prevent danger to health from air contamination by dust generated during grinding, cleaning, spraying or manipulation of materials as also to provide protection against dangerous gases, fumes, vapours, mist, etc. effective arrangements shall be made for ventilation;
- d. Workers shall be provided with suitable respiratory protective equipment, if it is not technically possible to have uncontaminated air. To this end, a study by a competent person shall be made to decide on the due protection. Sufficient illumination at all times for maintaining safe working conditions shall be provided where building workers are required to work or pass, and for passageways, stairways and landings such illuminations shall not be less a than 0.5 foot candles at the floor level;
- e. Where natural lighting is not adequate to prevent danger, adequate and suitable lighting shall be provided as per IS: 3646 – Part II;
- f. Artificial lighting shall not cause any danger due to a brightness greater than 10 foot candles per square inch, except where the angle of inclination from the eye to the source or the part pf the fitting as the case may be exceeds 20⁰, including that of producing glare or disturbing shadows;
- g. Where necessary to prevent danger to health from air contamination by dust from the grinding, cleaning, spraying, or manipulating of materials or objects, arrangements shall be made to limit the concentration of the pollutants by thorough ventilation, and dust generated due to movement of earthmoving machinery and other construction equipment, by spray of water in the area from time to time;
- h. Adequate ventilation by the circulation of fresh air shall be maintained in such places where the concentration of pollutants is likely to affect the health of the workers;

- i. Special care shall be taken to ventilate the workplace where gas cutting, welding or other operations involving generation of dangerous fumes, vapours, mists, gases etc is likely;
- j. Where it is technically not possible to eliminate dust or noxious or harmful fumes or gases sufficiently to prevent injury to the health of the workers, the contractor shall provide suitable respiratory equipment like dust mask or gas/fume mask or breathing apparatus or other suitable respiratory equipment.

1.4. Dangerous and harmful environment:

- a. When an internal combustion engine exhausts into confined space or excavation or tunnel or any other workplace where neither natural ventilation nor artificial ventilation system is adequate to keep the carbon monoxide content of the atmosphere below fifty parts per million, adequate and suitable measures shall be taken at such workplace in order to avoid exposure of building workers to health hazards;
- b. No building worker shall be allowed to enter any confined space or tank or trench or excavation wherein there is given off any dust fumes or other impurities of such nature and to such extent as is likely to be injurious or offensive to the building worker or in which explosives, poisonous, noxious or gaseous material or other harmful articles have been carried or stored or in which dry ice has been used as a refrigerant, or which has been fumigated or in which there is a possibility of oxygen deficiency, unless all practical steps have been taken to remove such dust, fumes or other impurities and dangers which may be present and to prevent any further ingress thereof, from such workplace or tank or trench or excavation;
- c. No worker shall be allowed to enter any such space unless a responsible person has certified it safe and fit for the entry of such building workers.

1.5. Fumes/gases due to Welding and gas-cutting operations: When welding or cutting operations are carried out in a confined space:

- a. Adequate ventilation, by means of exhaust fans or forced draught, as the condition may require, shall be constantly provided; otherwise enough quantity of air shall be circulated by means of air compressors to dilute the contaminant within permissible limits;
- b. Workers shall take necessary precautions to prevent unburned combustible gas or oxygen from escaping inside a tank or vessel or other confined space;
- c. Welding or cutting operations on any container that has held explosives or where inflammable gases may have been generated, shall be undertaken after the container has been thoroughly cleaned by steam or other effective means; and
- d. Gas-test shall be carried out ensure that the confined space is completely free from combustible gases and vapours.

1.6. Dust, gases, fumes

- a. Concentration of dust, gases or fumes shall be prevented by providing suitable means to control their concentration within the permissible limit so that they may not cause injury or create health hazard to a building worker;

- b. For protection against such hazardous substances, besides efficient and effective means of control, personal protective equipment like dust masks, breathing apparatus, other respiratory appliances, goggles, as the case may be, shall be provided.

1.7. Excessive noise:

- a. Adequate measures shall be taken against the harmful effects of an excessive noise;
- b. Use of earplugs/muffs and anti-vibration gloves shall be ensured to protect the workers from the impact of exposure to such dangers;
- c. The noise level in no case shall exceed as prescribed in the concerned Rules and exposure in excess of 115 dBA over the period of a quarter of an hour cannot be permitted:

1.8. Corrosive substances:

- a. All corrosive substances, including alkalis and acids, shall be stored and used by a person dealing with such substances at a building or other construction work in such a manner that it does not endanger the building worker and suitable protective equipment shall be provided by the employer to a building worker during handling or use of such substances at a building or other construction work and in case of spillage of such substances on the building worker, immediate remedial measures shall be taken;
- b. While protection of the body could be ensured by use of corrosion resistant apparel/overalls, suitable goggles, gloves, apron, gum boots etc. shall be made available to all concerned personnel;
- c. To deal with an accidental spillage of a corrosive substance on the body of a worker, the facility of eyewash fountain or water shower, as the case may be, shall be installed, within the easy reach of the workplace.

1.9. Eye protection:

- a. Suitable personal protective equipment for the protection of eyes shall be provided and used by the building worker engaged in operations like welding, cutting, chipping, grinding or similar operations which may cause hazard to his eyes;
- b. Goggles or face shield or welding screen with suitable shade of glass/filters etc shall be provided for the protection of the eyes.

1.10. Overhead protection:

- a. It shall be ensured that at the building or other construction site, overhead protection is erected along the periphery of every building under construction that shall be of fifteen meters or more in height when completed;
- b. Overhead protection shall not be less than two meters wide and shall be erected at a height not more than five meters above the base of the building and the outer edge of such overhead protection shall be one hundred fifty millimeters higher than the inner edge thereof or shall be erected at an angle of not more than twenty degrees to its horizontal sloping into the building;

- c. It shall be also ensured that at the building and other construction work that any area exposed to risk of falling material, articles or objects is roped or cordoned off or otherwise suitably guarded from inadvertent entry of persons other than building workers at work in such area.

1.11. Lifting and carrying of excessive weight:

- a. No building worker lifts by hand or carries overhead or over his back or shoulders any materials, articles, tools or appliances exceeding in weight the maximum limits as set out in the following table unless aided by any other building worker or a mechanical device;
- b. No worker aided by other workers, lift by hand or carry overhead or over their back or shoulders any materials, articles, tools or other appliances exceeding in weight the sum total of the maximum limits as prescribed in the concerned Rules, unless aided by a mechanical devices:

1.12. Protections against fall of persons –

- a. All scaffolds/working platforms at height of two metres or more shall be fenced;
- b. All guard-rails for the fencing of floor openings, gangways, elevated workplaces shall be made of sound material, good construction and possess adequate strength and be between 1 m and 1.5 m above platform level, consist of two rails (two ropes or chains may be used if they are sufficiently taut) and supporting stanchions;
- c. Intermediate rails, ropes or chains shall be midway between the top and lower of edges of the top rail;
- d. Sufficient number of stanchions or standard poles or uprights shall be maintained to ensure the required stability and resistance;
- e. Guard-rails shall be free from sharp edges and be maintained in good repair;
- f. Floor openings through which persons could fall, shall be guarded by covering or fencing;
- g. If the means of protection is removed to allow the passage of persons or goods or other purpose, the same shall be replaced as soon as possible, while making temporary arrangements for reasonable degree of safety in the meanwhile;
- h. Covers for floor opening shall be safe to walk on and if vehicles operate thereon it shall be safe for the same. This will require the contractor to have prior assessment of expected loads;
- i. Cover for floor opening shall be secured by hinges, grooves, stops or other effective means against sliding, falling down or lifting out or any other inadvertent displacement;
- j. Covers for any openings shall not constitute any hindrance to traffic and, as far as practicable, be flush with the floor;
- k. If covers constitute as grids, the bars shall be spread not more than 5 cm apart;
- l. Elevated workplaces at more than 2 m above the floor or ground shall be protected on all open sides by guardrails. It is commonly observed that fragile barricade tapes are used as a substitute of a strong and dependable fencing. This practice is prohibited. The barricade tapes can be used as markers/route guide only;
- m. Elevated workplaces shall be provided with safe means of access and egress such as stairs, ramps or ladders according to suitability;
- n. Persons employed at elevated workplaces or other situations at more than 2m from which they may fall, shall be protected by means of adequate safety nets, or platforms, or be secured by

safety belts with the lanyard properly anchored above the head level of the user. All possible effort shall be made to have strong and dependable mechanical arrangement.

1.13. Protection against fall of objects and materials:

- a. Materials and objects such as scaffolding materials, waste materials or tools shall not be thrown up or down from heights, as they are liable to cause injury;
- b. If materials and other objects cannot be safely lowered from heights, adequate precautions such as the provision of fencing, lookout men or barriers shall be provided to protect any person from injury.

1.14. Protection against entry of unauthorized persons:

- a. Construction zones in the site and built up areas alongside main traffic routes shall be barricaded;
- b. Unauthorized persons shall not be allowed access to construction sites and visitors shall be provided with the required protective equipment and it be ensured that they use them effectively.

1.15. Head protection and other protection apparel:

Every building worker who is required to –

- a. Pass through or working within the areas where there is hazard of his being struck by falling objects or materials, shall be provided with safety helmets of the type approved and tested in accordance with the national standards;
- b. Work in water or in wet concrete or in other similar work, shall be provided with suitable waterproof;
- c. Work in rain or in similar wet condition, shall be provided with waterproof coat with hat;
- d. Workers using or handling of alkalis, acid or other similar corrosive substances shall be provided with appropriate protective equipment in accordance with the approved standards;
- e. Every building worker engaged in handling sharp objects or materials at a building or other construction work, which may cause hand injury, shall be provided with suitable hand gloves in accordance with the approved standards.

1.16. Stability of structures:

- a. No wall, chimney or other structure or part of a structure shall be left unsupported in such condition that it may fall, collapse or weaken due to wind pressure, vibration or due to any other reason. Entry of persons into such locations where tall structures are being built shall be regulated without a let up.

1.17. Safety of Structures and equipment and other safety concerns

- a. Safety of structures like scaffoldings, platforms, gangways/walkways, towers, stairs, ladders, ramps, safety in excavation, formwork, falsework, demolition work, storage, handling and use of explosives, inflammable substances and hazardous materials, gas cutting and welding, use of electricity etc.; and equipment viz. construction machinery, crushers and batching plant, boiler and other pressure vessels, transport and material handling equipment, lifting appliances, vehicles etc., shall be operated and maintained as per approved norms and –
 - i. They shall be made of sound material and of good construction, free from patent defects, provided with adequate safe guards, properly maintained, periodically inspected and strong enough to withstand safely the loads and stresses to which they may be subjected;
 - ii. They shall carry enough factor of safety bearing in mind that the possibility of their abuse, which otherwise shall be prevented by constant and adequate supervision, cannot be ruled out altogether;
 - iii. It is incumbent on the contractor to ensure that only competent and authorized persons operate the equipment or attend to electrical and mechanical systems and repair of faults or breakdowns etc.
- b. Working in the confined space may involve certain serious hazards. Strict adherence to the conditions of Permit-to-work issued for the purpose is required;
- c. Control of energy sources shall be ensured through Log-out/Tag-out practices.

1.18. Slipping, tripping, cutting, drowning and falling hazards:

- a. The contractor shall keep all passageways, platforms and other places free from accumulations of dust, debris or similar material and from other obstructions that may cause tripping;
- b. Any sharp projections or protruding nails or similar projections which may cause any cutting hazard to a building workers shall be removed or otherwise made safe by taking suitable measures;
- c. No contractor shall allow any building worker at construction work to use the passageway, or a scaffold, platform or any other elevated working surface which is in slippery and dangerous condition and shall ensure that water, grease, oil or other similar substances which may cause the surface slippery, be removed or sanded/saw-dusted or covered with suitable material to make it safe from slipping hazard;
- d. Wherever building workers are exposed to the hazarded of falling into water, they shall be provided with rescuing arrangement from such hazard and if it is considered necessary, well equipped boat or launch manned with trained personnel shall be provided by the contractor at the site of such work;
- e. Every open side or opening into or through which a building worker, vehicle or lifting appliance or other equipments may fall at a building or other construction work shall be covered or guarded suitably to prevent such fall except where free access is necessary by reasons of their nature of the work;
- f. Wherever building workers are exposed to the hazards of falling from height while employed on such work they shall be provided by the employer with adequate equipment or means for

saving them from such hazards, Such equipments or means shall be in accordance with the standards as laid down;

- g. Whenever there is a possibility of falling of any martial, equipment or building worker at a construction site relating to a building or other construction work, adequate and suitable safety net shall be provided in accordance with the above stipulation;

2.0 SAFETY IN MATERIAL HANDLING AND WASTE DISPOSAL

2.1. GENERAL PROVISIONS:

- a. All building materials stored in tiers shall be stacked, racked, blocked, interlocked or otherwise secured safely to prevent sliding, falling or collapse and in an orderly manner to avoid obstruction of any passageway at the place of work. Piles of materials shall be stored or stacked in such a manner as to ensure their stability;
- b. Maximum safe load limits of floors within buildings and structures in kg/cm² shall be conspicuously posted in all storage areas, except for floor or slab on gradient. Maximum safe load shall not be exceeded. Material or equipment shall not be stored upon any floor or platform in such quantity as to exceed its safe carrying capacity;
- c. Ailes and passageways shall be kept clear to provide for the free and safe movement of material handling equipment or persons. Such areas shall be kept in good repair;
- d. When a difference in road or working levels exist, means such as ramps, blocking or grading shall be used to ensure the safe movement of vehicles between two levels;
- e. Material stored inside buildings under construction shall not be placed within 2 m of any hoist way or inside floor openings nor within 3.2 m of exterior wall which does not extend above the top of material stored;
- f. Persons employed required to work on stored material in silos, hoppers and similar storage areas shall be equipped with lifelines and safety belts;
- g. Non-compatible materials shall be segregated in storage;
- h. Bagged materials shall be stacked by stepping back the layers and cross-keeping the bags at least every 10 bags high;
- i. Materials shall not be stored on scaffolds or runways in excess of supplies needed for immediate operations;
- j. Bricks stacks shall not be more than 2.2 m in height. When a loose brick stack reaches a height of 1.3 m it shall be tapered back 5 cm in every foot of height above the 1.25 m level;
- k. When masonry blocks are stacked higher than 2 m, the stack shall be tapered back on half block per tier above the 2 m level;
- l. Material or equipment shall not be stored or placed so close to any edge of a floor or platform as to endanger the safety of persons below or working in the vicinity. Where stacking, unshackling, stowing or unstarving of construction material or article, or handling in connection therewith cannot be safely carried out unaided, reasonable measures to guard against accident or dangerous occurrences shall be taken by shoring or otherwise to prevent any danger likely to be caused by such handling;
- m. Stacking of material or article shall be made on firm foundation not liable to settle and such material or article and shall not overload the floor on which such stacking is made;

- n. The material or articles shall not be stacked against partition or walls of a warehouse or stores unless it is known that such partition or the wall is of sufficient strength to withstand the pressure of such materials or articles;
- o. The materials or articles shall not be stacked to such a height and in such a manner as would render the pile of such stack unstable and cause hazards to the building workers or the public in general;
- p. Where the building workers are on stack exceeding one point five meters in height, safe means of access to the stack shall be provided;
- q. All stacking or unshackling operations shall be performed under the supervision of a responsible person for such stacking or unstacking;
- r. The stacking of construction materials or articles shall not be made near the site of excavation, shaft, pit or any other such opening;
- s. Stacks that may lean heavily or become unstable or collapse are barricaded shall be avoided;
- t. Structural steel, poles, pipe, bar stock and other cylindrical materials, unless racked, shall be stacked and blocked so as to prevent sliding, spreading or tilting.

2.2. LUMBER:

- a. Used lumber shall have all nails withdrawn before stacking;
- b. Lumber shall be stacked on level and solidly supported sills;
- c. Lumber piles shall not exceed 6 m in height provided that lumber is handled manually, shall not be stacked more than 5 m height;
- d. Lumber shall be so stacked as to be stable and self-supporting.

2.3. STACKING OF CEMENT AND BAGS CONTAINING OTHER MATERIALS:

- a. The cement or other material in bags shall be stacked in a header and stature-wise in rows alternately in not more than 10 numbers and there will be circulation of space of at least 600 mm in between two such rows;
- b. While removing bags from the stack pile the stability of such stack pile shall be ensured;
- c. Bags containing cement or lime shall be stored on a firm ground;
- d. The materials like bricks, tiles or blocks shall also be stored on a firm ground;
- e. Reinforcing steel shall be stored according to its shape, size and length and stack of reinforcing steel kept as low as possible;
- f. No pipe shall be stored on rack or in stack where such pipe is likely to fall by rolling;
- g. The angle of repose shall be maintained where loose materials are stacked;
- h. When dust laden material is to be stored or handled, measures shall be taken to suppress the dust produced by such storing or handling and suitable personal protective equipment supplied to and used by the building workers working for such storing or handling.

2.4. DISPOSAL OF DEBRIS AND WASTE MATERIAL:

- a. It shall be ensured that debris is
 - i. Handled and disposed of by a method, which does not cause danger to the safety of a person and not allowed to accumulate so as to constitute a hazard;
 - ii. Kept sufficiently moist to bring down the dust under control;
 - iii. Not thrown inside or outside from any height of such building or other construction work;
- b. Brought down by suitable means/chutes provided for the purpose and on completion of work, leftover building material, article or other substance or debris shall be disposed off as soon as possible to avoid any hazard to any traffic or person;
- c. Whenever materials are dropped more than 6 m to any point lying outside the exterior walls of the building an enclosed chute of wood, or equivalent material shall be used;
- d. When debris is dropped through holes in the floor without the use of chutes, the area where the material is dropped shall be completely enclosed with barricades not less than 1.1 m high and not less than 1.9 m back from the edge of the opening above. Signs warning of the hazard of falling material shall be posted at each level;
- e. All scrap lumber, waste material and rubbish shall be removed from the immediate work area as the work progresses;
- f. Disposal of waste material or debris as per the guideline issued by CPCB in compliance of Rule 10 sub-rule 1(a) of C & D Waste Management Rules, 2016).
- g. All bio-degradable material shall be disposed off in the pit for making compost. Pellets can also be made from bio-degradable material
- h. All solvent wastes, oil rags and flammable liquids shall be kept in fire resistant covered containers until removed from the work site.

2.5. HANDLING GAS CYLINDERS:

- a. Gas cylinders shall not be lifted on bare slings. For lifting the cylinders, cage of suitable size shall be used and all cylinders shall be horizontally positioned in it. Such cage shall have fencing in such a way that there is no possibility of fall of cylinders from this cage.

2.6. RIGGING EQUIPMENT FOR MATERIAL HANDLING:

- a. Rigging equipment for material handling shall be inspected prior to use in each shift as necessary during its use to ensure that it is safe. Defective rigging equipment shall be removed from service;
- b. Rigging equipment shall not be loaded in excess of its recommended safe working load, as prescribed in the Indian standards;
- c. Rigging equipment, when not in use, shall be removed from the immediate work area so as not to present a hazard to persons engaged in the area;

- d. Special custom designed grabs, hooks, clamps, or other lifting accessories, for such units as modular panels, prefabricated structures and similar materials, shall be marked to indicate the safe working loads shall be proof tested prior to use 125% of their rated load;
- e. Welded alloy steel chain slings shall have permanently affixed-durable identification standing size, grade, rated capacity and manufacturer.

2.7. FENCING OF MOTORS ETC

- a. All motors, cogwheels, chains and friction gearings, flywheels, shafting and the other dangerous and moving parts of machinery (whether or not driven by mechanical power) and steam pipes shall be securely fenced and the fencing of dangerous parts of machinery not removed while such machinery is in motion or in use;
- b. No part of any machinery which is in motion and which is not securely fenced, shall be examined, lubricated, adjusted or repaired except by a person skilled and trained for such examination, lubrication, adjustment or repairs and machine parts cleaned only when such machine is stopped;
- c. When a machine is stopped for servicing or repairs, adequate measures shall be taken to ensure that such machine does not restart inadvertently and not only tag-out sign is required; it is also essential that an active system of isolating the power be applied.

2.8. PROTECTION AGAINST LIGHTNING

- a. Where necessary, installations shall be protected against lightning, provided further that;
- b. No bare conductors or bare current-carrying parts of equipment be permitted to be installed unless adequate precautions are taken to prevent direct or indirect contact;
- c. Only flame-proof equipment and conductors shall be installed at places where explosives or inflammable substances are stored, handled or used or where explosive atmosphere exists;
- d. Persons competent and authorized only shall attend to electrical breakdowns and other operational faults and give or restore power to an equipment and such persons shall be easily identifiable by their dress or special helmet worn;
- e. It will constitute a standard practice to switch off portable tools while shifting from one place to another or while leaving them behind unattended;
- f. The contractor shall ensure that a system is in place to always keep tools well maintained.

2.9. VEHICULAR TRAFFIC

- a. Whenever any building or other construction work is being carried on, or is located in close proximity to a road or any other place where any vehicular traffic may cause danger to building workers, it shall be ensured that such building or other construction work is barricaded and suitable warning signs and lights displayed or erected to prevent such danger and if necessary, a request in writing made to the concerned authorities to control such traffic;

- b. All vehicles used at construction site shall comply with the requirements of the Motor Vehicles Act, 1988 (59 of 1988) and the Rules made hereunder;
- c. The driver of a vehicle of any class or description operating at a construction site shall hold a valid driving license under the Motor Vehicles Act. 1988 (59 of 1988).

2.10. USE OF SAFETY BELT OR OTHER FALL ARREST SYSTEMS:

Wherever any work at a height of 3 m or more is carried out, use of a suitable fall arrest system is mandatory if the workplace has already not been provided with an otherwise reliable means of protection for preventing the fall of persons from that height, provided further that:

- a. Safety belt, lanyard, life lines and devices for the attachment of such life lines shall conform to the approved standards;
- b. Every building worker shall be supplied with safety belt and safety life lines for his protection and such building worker shall use such belts and life lines during the performance of his work;
- c. All building workers using safety belt and safety life lines shall have the knowledge of safe use and maintenance of such belts and life lines and shall be supplied with necessary instructions for its use;
- d. The responsible person for supervising the use of safety belts and safety lifelines shall inspect and ensure that such safety belts and lifelines are fit for use before taking them into use.

2.11. SAFETY NET AND ITS USE

- a. Every safety net shall be of adequate strength, made of sound material and suitable for use and conform to the approved standards;
- b. The responsible person for maintenance of safety nets and their use shall ensure safe fixing of such safety nets and provide such safety nets with suitable and sufficient anchorage so that the purposes for which such safety net is intended for use is served;
- c. Use of multi-layer safety net to be ensured to avoid fall of material/objects.

2.12. STORAGE OF SAFETY BELTS AND NETS, ETC:

- a. Proper arrangement shall be made for the safe storage of safety belts, safety lifelines and safety nets when they are not in use and are protected against mechanical damage, damages from chemicals and damages from biological agents.

2.13. SAFETY HELMETS AND SAFETY FOOTWEAR

- a. The Engineer in-charge may declare whole or part of a site as the hardhat area and in such an eventuality it shall be the responsibility of the contractor to provide safety helmet of the approved quality to all personnel engaged in construction and erection work, including the visitors to the site;
- b. Accordingly, wherever safety footwear is required for the safety of the personnel, the contractor shall provide the same of the approved type free of charge.

3.0 WELDING AND GAS CUTTING OPERATIONS

3.1 GAS WELDING:

3.1.1 GENERAL PROVISIONS:

- a. All welders shall be provided with fire resistant protective clothing and equipment, such as fire resistant gauntlets and aprons, helmets and goggles with suitable filter lenses and its usage shall be ensured;
- b. The welders shall not be allowed to wear clothing that is not free from grease, oil and other flammable material;
- c. Adequate precautions shall be taken to protect persons working or passing near welding operations from dangerous sparks and radiation;
- d. When welding or cutting is being done on materials containing toxic or harmful substances or liable to produce toxic or harmful fumes, adequate precautions shall be taken to protect workers from the fumes, either by
 - i) Exhaust ventilation, or
 - ii) Respiratory protective equipment;
 - iii) Arrangement shall be made so that welding sparks do not fall down on the persons working below or material, which are combustible in nature and may be damaged with such sparks.
- e. The oxygen pressure for welding shall always be high enough to prevent acetylene flowing back into the oxygen cylinder;
- f. Acetylene shall not be used for welding at a pressure exceeding 1 atmosphere gauge;
- g. Adequate precautions shall be taken to prevent:
 - i) Fire being started by sparks,
 - ii) Slag or hot metal; and
 - iii) Damage to fibre ropes from heat, sparks, slag or hot metal;
- h. Precautions shall be taken to prevent flammable vapours and substances from entering the working area;

3.2. WELDING AT PLACES WITH FIRE RISKS:

- a. Unless adequate precautions are taken, no welding or cutting operations shall be allowed near the place where combustible materials are stored, or near materials or plant where explosive or flammable dusts, gases or vapours are likely to be present or given off. If hot work permit system exists at the site, the same shall be followed;
- b. Combustible materials and structures that cannot be removed from the vicinity of welding operations shall be shielded by asbestos or protected by other suitable means.

3.3. WELDING IN CONFINED SPACE:

When welding or cutting operations are being carried out in a confined space;

- a. Adequate ventilation, by means of exhaust fans or forced draught as the condition may require, shall be constantly provided; otherwise enough quantity of air shall be blown in by means of compressors to dilute the pollutants;

- b. No blow pipe shall be left unattended inside a tank or vessel or other confined space during meal break or other interruption of the work;
- c. The worker shall take all necessary precautions to prevent unburned combustible gas or oxygen from escaping inside a tank or vessel or other confined space; and
- d. When necessary to prevent danger, an attendant shall watch the welders from outside.

3.4. WELDING ON CONTAINERS FOR EXPLOSIVE OR FLAMMABLE SUBSTANCES:

Welding or cutting operations on containers in which they are explosives or flammable substances shall not be allowed;

- i) Welding or cutting operations on any container that has held explosive or where flammable gases may have been generated, shall only be undertaken,
- ii) After the container has been thoroughly cleansed by steam or other effective means; and
- iii) Found by air tests to be completely free from combustible gases and vapours; or
- iv) After the combustible gas in the container has been completely replaced by an inert gas or by water;
- v) If an inert gas is used as laid down in clause 4.2.3, after the vessel has been filled with gas, the gas shall continue to flow slowly into it thorough out the welding or cutting operations;
- vi) Before starting any welding operations on, or otherwise applying heat to, closed or jacketed containers or other hollow parts, such containers or parts shall be adequately vented in suitable manner.

3.5. GAS CYLINDERS

- a. Gas cylinders shall be inspected, stored, handled and transported in conformity with the requirements of Gas Cylinders Rules, 1981;
- b. When in use, cylinders shall be held in upright positions by straps, collars or chains;
- c. Devices referred to in clause 6.2 shall be such that the cylinders can be rapidly removed in an emergency;
- d. Welders shall not temper with or attempt to repair safety devices and valves on gas cylinders;
- e. When acetylene cylinders are coupled, flash back arrestor shall be inserted between the cylinder and the coupler block, or between the coupler block and the regulator;
- f. Only acetylene cylinders or approximately equal pressure shall be coupled;
- g. No gas shall be taken from a cylinder unless a pressure reducing regulator has been attached to the valve;
- h. Only the right pressure reducing regulator shall be used for the gas in the cylinder;
- i. Cylinder valves shall be kept free from gases, grease, oil, dusts and dirt;
- j. Leaky cylinders charged with acetylene or liquefied fuel gas shall be taken into the open air at a safe distance from any open flame or sparks.

3.6 HOSE

- a. Only hose especially designed for welding and cutting operations shall be used to connect an oxy-acetylene torch to gas outlet;
- b. Hose lines for oxygen and for oxy-acetylene shall be of different colours and preferably of different size;
- c. Hose connections shall be sufficiently light to withstand without leakage a pressure twice the maximum delivery pressure of the pressure regulators in the system;

- d. Care shall be taken that hose does not become kinked or tangled, stepped on or run-over or otherwise damaged;
- e. Any length of hose in which a flashback has burned, shall be discarded;
- f. No hose with more than one gas passage shall be used;
- g. Only soapy water shall be used for testing hose for leaks.

3.7. TROCHES

- a. When torches are being changed, the gases shall be shut off at the pressure reducing regulators and not by crimping hose;
- b. Torches shall be lit with friction lighters or other safe source but not with matches.
- c. Electric welding equipment:
- d. Welding machines shall be controlled by a switch mounted on or near the machine framework that, when opened, immediately cuts off the power from all conductors supplying the machine;
- e. Welding circuit shall be so designed as to prevent the transmission of high potential from the source of supply to the welding electrodes;
- f. The maximum open circuit voltage shall be in accordance with Indian Standards;
- g. Electrode conductors or cables shall not be excessive in length and shall not be longer than necessary to perform the work;
- h. Return conductors shall be taken directly to work and securely connected mechanically and electrically to it or to the work bench, floor etc. and to an adjacent metallic object;
- i. Cable shall be supported so as not to create dangerous obstruction;
- j. Motors, generators, rectifiers and transformers in arc welding or cutting machines, and all current carrying parts, shall be protected against accidental contact with uninsulated live parts;
- k. Ventilating slots in transformer enclosures shall be so designed that no live part is accessible through any slot;
- l. Frames of arc welding machines shall be effectively earthed;
- m. In hand-operated arc welding machines, cables and cable connectors used in arc welding circuits shall be effectively insulated on the supply side;
- n. The outer surface electrode holders of hand-operated arc welding machines, including the jaw so far as practicable, shall be effectively insulated;
- o. Electrode holders of hand-operated arc-welding machines shall, if practicable, be provided with discs or shields to protect the operator's hands from the heat of the arcs;
- p. Only heavy-duty cable with unbroken insulation shall be used;
- q. Circuit connections shall be waterproof;
- r. When lengths of cable have to be joined, only insulated connectors shall be used on the earth line and the electrode holder line;
- s. Connections to welding terminals shall be made at distribution boxes, socket outlets, etc. by bolted joints;
- t. Welding terminals shall be adequately protected against accidental contact by enclosures, covers or other effective means;
- u. Electrode holder shall
 - i. Have adequate current capacity;
 - ii. Be adequately insulated to prevent shock, short-circuiting or flashovers.

3.8. OPERATIONS

- a. Arc welding and cutting operations that are carried on at places where persons other than the welders are working or passing shall be enclosed by means of suitable stationary or mobile screens;
- b. Walls and screens of both permanent and temporary protective enclosures shall be provided to absorb harmful rays from the welding equipment and prevent reflection, and if necessary, be painted or otherwise treated for the purpose;
- c. When arc welding is done in damp confined spaces;
 - i) Electrode holders shall be completely insulated; and
 - ii) The welding machines shall be outside the confined space;
- d. Welders shall take adequate precautions
 - i) To prevent any part of their body from completing an electric circuit
 - ii) To prevent contact between any part of the body and the exposed part of the electrode, or electrode when in contact with metal; and
 - iii) To prevent wet or damaged clothing, gloves and boots from touching any live part;
- e. Welding circuits shall be switched off when not in use;
- f. Electrodes shall only be inserted in the holder with insulating means such as insulating gloves;
- g. Electrode and return leads shall be adequately protected against damage;
- h. Live parts of electrode holders shall be inaccessible when they are not in use;
- i. Electric arc-welding equipment shall not be left unattended with current switched on.

4.0 SAFETY IN THE USE OF ELECTRICITY

4.1. GENERAL PROVISIONS

- a. Before commencement of any building or other construction work, adequate measures shall be taken to prevent any worker from coming into physical contact with any electrical equipment or apparatus, machines or live electrical circuit which may cause electrical hazard during the course of his employment and suitable warning signs shall be displayed and maintained at conspicuous places in Hindi and in local language understood by the majority of the building workers;
- b. In workplaces where the exact location of underground electric power line is not known, the building workers using jack hammers, crow bars or other hand tools which may come in contact with a live electrical line shall be provided with approved insulated protective gloves and footwear;
- c. As far as practicable, no wiring or cable, which may come in contact with water or which may be mechanically damaged or which may result in electric shock shall be left on ground or;
- d. All electrical appliances and current carrying equipment used shall be made of sound material and adequately earthed;
- e. All temporary electrical installations shall be provided with earth leakage circuit breakers;
- f. It is required that all portable power-driven hand tools are provided with double insulation to secure a high degree of protection from electrical hazards;
- g. Electrical installations shall comply with the requirements of any law for the time being in force, especially the Indian Electricity Act/Rules in particular with specific reference to the following:
 - i) All parts of installations shall be of standard construction not lower, from the safety point of view, than the national standards, as applicable. All parts of electrical installations shall be so constructed, installed and maintained so as to prevent electrical fires, explosion and shock;
 - ii) Earthing of metal work of electrical equipment, other than the parts which carry current, shall be provided and will conform to Electricity Act and IS: 3042 – 1966 (code of practice for earthing);
- h. All parts of electrical installation shall be adequate size and characteristics for the work they may be called upon to do and in particular they shall:
 - i) Be of adequate mechanical strength to withstand working conditions in construction operations; and
 - ii) Be not liable to damage by water, dust or electrical, thermal or chemical action to which they are subjected to in construction operations;
- i. All parts of electrical installations shall be so constructed, installed and maintained as to prevent the danger of electric shock; fire and external explosion;
- j. It shall be made impossible for circuit breakers to be opened or closed inadvertently, by gravity or by mechanical impact;

- k. Before operation of OCBs, oil level must be checked and the event of short, extra quantity must be filled;
- l. Use of rubber gloves and rubber gum boots of tested quality where electric shock is likely to occur shall be provided, but these shall not be considered as providing adequate protection against the risk of electric shock in lieu of inbuilt safety arrangement in the system;
- m. First-aid boxes, instruction for restoration of persons affected by electric shock shall be made;
- n. Arrangement shall be made for sufficient number of CO₂/chemical powder type fire extinguishers/sand buckets etc.;
- o. No electrical circuits shall ever be overloaded to the dangerous extent or beyond the rated capacity;
- p. In confined areas, only 24 volt supply shall be used for every equipment, including hand-held portable tools and hand lamps;
- q. All electrical appliances and outlets shall be clearly marked to indicate their purpose and voltage.

4.2. FUSES

- a. Fuses shall bear markings indicating their rated current, whether they are of the fast or slow-breaking type and, as far as practicable, and their rated breaking capacity. Fuses as per need and of correct rating shall be used in the circuit;
- b. Effective measures shall be taken to ensure that persons removing or inserting fuses will not be endangered, in particular by any adjacent live parts;
- c. In case of blow of fuses only after finding out and correcting of the fault, new fuses shall be provided in the circuit.

4.3. SWITCHES

- a. All switches shall be of enclosed type and so installed and earthed as to prevent danger in their operation;
- b. Use of switches, which may connect or disconnect circuit through gravity, shall not be used.

4.4. MOTORS

- a. All motors shall be equipped with a switch;
- b. When a motor can be cut off from more than one place, where practicable, a stopping device shall be installed in the immediate vicinity of the motor;
- c. Motors shall be so installed as to ensure that they can be adequately cooled;
- d. Motors shall be effectively protected against over current;
- e. Whenever the motors installed are in the open area where there is the possibility of fall of liquid corrosives or otherwise, it shall be suitably protected with covering;
- f. Earthing shall be connected to all motors, generators etc. as prescribed in the Indian Electricity Rules, amended from time to time.

4.5. CONNECTIONS

- a. At points where conductors are joined, branched or led into apparatus, they shall be:
 - i. Mechanically protected, and
 - ii. Properly maintained;

- b. Conductors shall be joined, branched or led into an apparatus through junction boxes, bushings, glands or equivalent connecting devices;
- c. Junction boxes or plug-out-socket couplings shall be used for joining cables wherever practicable;
- d. When parts of conductors are joined together, or conductors are joined to one another or to an apparatus, the attachment shall be made by screwing, clamping, soldering, riveting, brazing, crimping, or equivalent means. Loose connections shall not be provided in any case;
- e. Cable joints, junction boxes and connectors shall be protected as far as practicable, against traffic, fall of ground, water and other sources of damage;
- f. Whenever armoured cables are joined, the junction boxes shall be bridged by a suitably conductive bond between the armoring of the cables.

4.6. TRANSPORTABLE AND PORTABLE ELECTRICAL EQUIPMENT:

- a. The supply of electricity to portable apparatus shall not exceed 250v;
- b. Hand-held and portable machines shall be equipped with a built-in switch to switch off power in case of emergency;
- c. Hand-held electrically operated tools shall be provided with built-in switch to disconnect the circuit when the tool is not being used;
- d. Portable electrical tools, unless flameproof, shall not be used in flammable or explosive atmosphere;
- e. Only three-core cable shall be used for single-phase operated tools with the third core connected to earth

4.7. HAND LAMPS

- a. Hand lamps shall be equipped with strong cover of glass or other transparent material;
- b. Portable lamp holders shall have:
 - i) All current –carrying parts enclosed;
 - ii) Insulated handle; and
 - iii) They shall operate at 24 v;

4.8. INSPECTION, MAINTENANCE

- a. All electrical equipment shall be inspected before it is taken into use to ensure that it is suitable for its purpose of use;
- b. At the beginning of every shift every person using electrical equipment shall make a careful external examination of the equipment and conductors for which he is responsible, especially flexible cables;

- c. Periodic inspections, testing, maintenance of all electrical equipment is to be made and record of test of transformer oil and pit earthing shall be maintained;
- d. Electrical conductors and equipment shall be repaired by the electrician only as far as practicable, no work shall be done live conductors or equipment;
- e. Before any work is begun on conductors or equipment that does not have to remain live;
 - i) The current shall be switched off;
 - ii) Adequate precautions shall be taken to prevent the current from being switched on again;
 - iii) The conductors or the equipment shall be tested to ascertain that they are dead;
 - iv) The conductor and equipment shall be earthed and short-circuited; and
 - v) Neighbouring live parts shall be adequately protected against accidental contact;
- f. After work on conductors and equipment, the current shall only be switched on again on the orders of a competent person;
- g. Electricians shall be provided with adequate tools, and person protective equipment, such as rubber gloves, mats etc.;
- h. All conductors and equipment shall be considered to live unless there is certain proof to the contrary.

4.9. WORK IN THE VICINITY OF ELECTRICAL INSTALLATION

- a. When work is to be done in the neighborhood of electrical conductors or installations, the contractor shall ascertain the voltage carried and the works shall not be allowed to reach to unsafe distance from them;
- b. When any excavation is to be made or any bore-holed sunk, the contractor shall ascertain whether there are any underground conductors, in or in dangerous proximity to, the zone of operations;
- c. No work shall be done in dangerous proximity to a conductor or an installation until it has been made dead;
- d. Before work begins, work permit shall be obtained from the Engineer in-charge if live electricity lines/circuit are passing in close vicinity;
- e. Before the current is restored, the contractor shall ensure that no work remain on the work site;
- f. If conductor or an installation in the neighbourhood of which work is to be done can not be made dead, special precautions shall be taken and special instructions given to the workers so as to prevent danger by adequately enclosing or fencing;
- g. If mobile equipment has to be employed in the neighbourhood of conductors or installations that cannot be made dead, its movement shall be so controlled as to keep it at a safe distance from them.

5.0 SAFETY IN THE USE OF HAND TOOLS AND POWER-OPERATED TOOLS

5.1 GENERAL PROVISIONS

- a. All hands and power tools and similar equipment, shall be maintained in safe condition.
- b. When power operated tools are designed to accommodate guards, they shall be equipped with such guards, when in use;
- c. Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains and other reciprocating, rotating or moving parts of the equipment shall be similarly guarded;
- d. Personnel using hand and power tools and exposed to the hazard of falling, flying, abrasive, and splashing objects, or exposed to harmful dusts, fumes, mists, vapours, or gases shall be provided with the particular personal protective equipment necessary to protect them from the hazards;
- e. All hand-held powered platen sanders, grinders, grinders with wheels of 5 cm or less, routers, planers, laminate trimmers, nibblers, shears, scroll saws and jigsaws with blade shanks of 0.5 cm wide or less shall be equipped with only a positive **on-off control**.
- f. All hand-held powered drills, tappers, fastener drivers, horizontal, vertical or angle grinders with wheels greater than 5 cm in diameter, disc sanders, belt sanders, reciprocating saws, saber saws and other operating powered tools shall be equipped with a momentary contact on control provided that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on.

5.2. HAND TOOLS

- a. The contractor shall not issue or permit the use of unsafe hand tools;
- b. Wrenches including adjustable pipe end and socket wrenches shall not be used when saws are sprung to the point that slippage occurs;
- c. Impact tools such as drift pins, wedges and chisels shall be kept free of mushroomed heads;
- d. The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight on the tools.

5.3. POWER OPERATED TOOLS

- a. Electric power operated tools shall be either of the approved double-insulated type or shall be grounded;
- b. The use of electric cords for hoisting or lowering loads shall not be permitted;
- c. Pneumatic power tools shall be secured to the hose or whip by some positive means to prevent the tool from becoming accidentally disconnected;
- d. Safety clips or retainers shall be securely installed or maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled;
- e. All pneumatically riveting machine staplers and other similar equipment provided with automatic fastener feed, which operate at more than 7 kg/cm² pressure at the tool a safety device on the

muzzle to prevent the tool from ejecting the fasteners unless the muzzle is in contact with the work surface;

- f. Compressed air shall not be used for cleaning purposes except when the pressure is reduced to less than 2 kg/cm² and that too with effective chip guarding. The 2 kg/cm² pressure requirement does not apply to concrete form, mill scale and similar cleaning purposes;
- g. The manufacturer's safe operating for hoses, pipes, valves, filters and other fittings shall not be exceeded;
- h. Only personnel who has been trained in the operation of the particular tool shall be allowed to operate power-actuated tools;
- i. The tool shall be tested each day before loading to see that the safety devices are in proper working condition. The method of testing shall be accordance with the manufacturer's recommended procedure;
- j. Any tool found not in proper working order, or that which develops a defect during use, shall be immediately removed from service and not used until properly repaired;
- k. Tools shall not be loaded until just prior to the intended firing time. Neither loaded nor empty tools are to be pointed at any other person. Hands shall be kept clear of the open barrel end;
- l. Loaded tools shall not be left unattended;
- m. Fasteners shall not be driven into very hard or brittle materials including, but not limited to, cast iron, glazed tiles, surface hardened steel, glass block, live rock, face brick or hollow tiles;
- n. Driving into materials that can be easily penetrated shall be avoided unless backed by a substance that will prevent the pin or fastener from passing completely through and creating a flying missile hazard on the other side;
- o. No fastener shall be driven into a palled area caused by an unsatisfactory fastening;
- p. Only non-sparking tools shall be used in an explosive or flammable atmosphere;
- q. All tools shall be used with the correct shield, guard or attachment as recommended by the manufacturer.

5.4. ABRASIVE WHEELS AND TOOLS

- a. All grinding machines shall be supplied with sufficient power to maintain the spindle speed at safe levels under all conditions of normal operation;
- b. Grinding machines shall be equipped with suitable safety guards;
- c. The maximum angular exposure of the grinding wheel periphery and sides shall not be more than 90⁰, except that when the work requires contact with the wheel below the horizontal plane of the spindle, the angular exposure shall not exceed 120⁰. In either case, the exposure shall begin not more than 65⁰ above the horizontal plane of the spindle. Safety guards shall be strong enough to withstand the bursting of the wheel;
- d. Floor and bench-mounted grinders shall be work-rests, which shall be rigidly supported and readily adjustable. Such work-rests shall be kept at a distance not to exceed 5 mm from the surface of the wheel;

- e. Cup type wheels used for external grinding shall be protected by either revolving cup guard or a band type guard;
- f. When safety guards are required, they shall be mounted as to maintain proper alignment with the wheel and the guard and the guard and its fastening shall be adequate strength to retain the fragments of the wheel in case of accidental breakage. The maximum angular exposure of the grinding wheel periphery and sides shall not exceed 180°;
- g. Portable abrasive wheel used for internal grinding shall be provided with suitable safety flanges;
- h. When safety flanges are required, they shall be used only with wheels designed to fit the flanges. Only safety flanges, of a type and design and properly assembled so as to ensure that the pieces of the wheel will be retained in case of accidental breakage, shall be used;
- i. All abrasive wheels shall be closely inspected and ring tested before mounting to ensure that they are free from cracks or defects;
- j. Grinding wheels shall fit freely on the spindle and shall not be forced on. The spindle nut shall be tightened only enough to hold the wheel in place;
- k. All employees using abrasive wheels shall be protected by suitable eye protection equipment.

5.5. WOODWORKING TOOLS

- a. All fixed power driven woodworking tools shall be provided with a disconnect switch that can either be locked or tagged in the **off-position**;
- b. The operating speed shall be attached or otherwise permanently marked on all circular saws over 0.5 m in diameter or operating at over 3000 peripheral rpm. Any saw so marked shall not be operated at a speed other than that marked on the blade. When a marked saw is retensioned for a different speed, the marking shall be corrected to show the new speed;
- c. Automatic feeding devices shall be installed on machines wherever the nature of the work will permit. Feeder attachments shall have the feed rolls or other moving parts covered or guarded so as to protect the operator from hazardous points;
- d. All portable power driven circular saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to the covering position.

6.0 SAFETY IN THE USE OF LADDERS AND STAIRS

6.1. GENERAL ASPECTS OF SAFETY RELATED TO USE OF LADDERS

- a. Every ladder or step-ladder used in building or other construction work shall be of good construction, made of sound material and of adequate strength for the purpose for which such ladder or step-ladder is used;
- b. When a ladder is used as a means of communication, such ladder shall be lashed to a fixed structure so that while working on such ladder it does not slip;
- c. A ladder or step ladder shall not stand on loose bricks or other loose packing and have a level and firm footing;
- d. No ladder shall be used which has a missing or defective rungs or rungs, which depend for support solely on nails, spikes or other similar fixing.

6.2. MATERIALS FOR LADDERS

- a. Shall be constructed with upright of adequate strength and are made of straight-grained wood, free from defects and having the grain of such wood running length wise;
- b. Shall have rungs made of straight-grained wood free for defects and mortised or securely notched into the upright, reinforcing metal ties, if wedges shall not secure the tenors of such ladders;
- c. Where it is required, in case of use of fixed ladders, sufficient foot-hold and hand-hold shall be provided for use by the building worker;
- d. Every ladder shall be -
 - i. Secured so as to prevent undue swaying;
 - ii. Equally and properly supported on each of its upright;
 - iii. So used as not to cause undue sagging; and
 - iv. Placed as nearly as possible at an inclination of four in one;
- e. The use of all ladders and stepladders shall conform to the approved standards;
- f. Wooden ladders shall be constructed with uprights of adequate strength as well as rungs made of wood free from visible defects and having the grains of the wood in the ladders running lengthwise and rungs mortised or rebuted into the uprights;
- g. Uprights and rungs of metal ladders shall have a cross-section adequate to prevent dangerous deflection, shall be equal and not less than 25 cm or more than 35 cm;
- h. Rungs of metal ladders shall be kept clean so as to prevent them from becoming slippery;
- i. Portable ladders shall not exceed 9 m in length;
- j. Every ladder or run of ladders rising to a height exceeding 9 m shall be provided with an intermediate landing, providing further that the intervals between landings shall not exceed 9 m. The landings shall be of suitable size and protected by railings;
- k. Defective ladders that cannot be satisfactorily repaired shall be tagged Not Fit For Use and destroyed;
- l. Wooden ladders shall not be painted, but oiled or covered with clean varnish or other transparent preservatives;
- m. Metal ladders shall be protected against corrosion by being coated with rust-proof paint or by other means unless they are made of non-corrosive metals;

- n. Every ladder shall rise at least 1 m above the highest point to be reached and have one of the uprights continued to that height to serve as a hand-rail at the top;
- o. Ladders shall not stand on loose bricks or other loose packing but have a level and firm footing so that they are equally supported on each upright;
- p. Every ladder shall be securely fixed so that it cannot move from its top and bottom points of rest and if it cannot be secured at the top, it shall be securely fastened at the base and if fastening at the top is also impracticable, it shall have a man stationed at the foot holding the end to prevent it from slipping;
- q. Where a run of two or more ladders connects different floors, the ladders shall be staggered and a protective landing with the smallest practicable opening shall be provided at each floor;
- r. A ladder having only one upright or a missing or dangerously defective rung shall not be used;
- s. When a ladder is placed in position, the distance between the foot of a ladder and the base of the structure against which it rests shall be about one-quarter of its length;
- t. Workers using ladders shall leave at least one hand free for climbing up and down, face the ladder, avoid wearing slippery footwear and avoid carrying heavy or bulky loads;
- u. A ladder shall not be placed in front of a door that opens towards it unless the door is fastened or locked or guarded;
- v. A ladder shall not be placed against a window frame unless the ladder is fitted with a board at the top so that the applied load is safely distributed over the frame;
- w. Metal ladders shall not be used in the vicinity of live electrical equipment;
- x. Adequate means shall be provided to prevent displacement of the ladder set up in public thoroughfare or where persons, vehicles etc. may accidentally collide with it.

6.3. PORTABLE STEPLADDERS

- a. The length of portable stepladders shall not exceed 6 m and their back legs shall be adequately braced;
- b. Stepladders exceeding 1.5 m in length shall have two or more cross-ties;
- c. The spread between the front and back legs shall be restricted by means of hinged metal flat bars or high-grade fibre or other effective means;
- d. When in the open position, treads of stepladders shall be horizontal.

6.4. PORTABLE TRESTLE LADDERS

- a. The height of the trestle ladders shall not exceed 5.5 m;
- b. The spread between the front and back legs shall be restricted by means of hinged metal flat bars or high-grade fibre or other effective means;
- c. The front and back legs shall be joined at the top by bolted steel hinges of adequate dimensions or other effective means;
- d. Both legs of trestle ladders shall be equipped with sufficient number of steel crossties.

6.5. EXTENSION LADDERS

- a. The length of extension ladders shall not exceed 15 m;
- b. Extension ladders shall be equipped with an effective lock and guide brackets by which the ladder can be extended, retracted or locked in any position;

- c. The rungs of overlapping sections shall coincide so as to form double treads and shall be equipped with one or more extension ropes;
- d. Extension ropes shall be securely anchored and run over suitable pulleys.

6.6 MECHANICAL LADDERS

- a. Mechanical ladder is that ladder, which is a mechanically extendable ladder, mounted on a wheeled frame;
- b. Mechanical ladder shall be equipped with guard-rails and toe-boards and a cage of heavy-gauge steel mesh;
- c. If mechanical ladder has no railed platform or cage, workers using it shall be secured by suitable safety belt;
- d. Mechanical ladders shall not be moved, while a person is on them, unless they have specially designed to ensure that perfect stability is maintained during movement.

6.7. FIXED LADDERS

- a. Uprights of fixed ladders shall be at least 40 cm and shall be set an angle of 15° to the vertical;
- b. Clearance at the back of the rungs shall be at least 15 cm and no obstruction within 75 cm of the face of the ladder;
- c. There shall be at least 7.5 cm clearance between the ladder and the nearest fixed object;
- d. When it is necessary for a ladder to pass closely through a hole in a platform or a floor, the edges of the hole shall be padded so as to prevent injury to the users;
- e. The length of the runs of fixed ladder shall not exceed 9 m;
- f. Landing platform shall be provided for each 9 m or fraction thereof;
- g. As far as practicable, runs shall be staggered;
- h. Runs from which a person could fall from more than 6 m shall be enclosed in a cage of heavy-gauge mesh or hoops;
- i. Fixed ladders shall be firmly bolted or welded in position.

6.8. STAIRS

- a. Stairs shall be of adequate strength to withstand safely the loads that they will have to carry;
- b. Stairs used for the purpose of construction work shall have a clear width of at least 60 cm;
- c. Stairs made of perforated material shall not have openings exceeding 1.2 cm in width;
- d. No step of a stairway shall depend for its support solely on nails, spikes, screws or other similar fixing;
- e. No stairway with missing or dangerously defective steps shall be used;
- f. Every stairway that is at an angle of less than 30° from the vertical shall be provided with a secure handhold at the top landing place, either by extending one upright for at least 1 m or by other effective means;
- g. Movable and removable stairs shall be adequately secured in the position of use;
- h. In all building structures permanent stairs shall be constructed as soon as practicable;
- i. When work on a building has progressed to a height of more than 18 m above the ground and it has not been practical to construct the permanent stairs, sufficient number of stairs shall be provided to ensure safe access to the working levels.

7.0 SAFETY IN THE USE OF LIFTING APPLIANCES & GEARS

7.1. CONSTRUCTION AND MAINTENANCE OF LIFTING APPLIANCES:

All lifting appliances, including their parts and working gear, whether fixed or movable, and any plant or gear used in anchoring or fixing of such appliances -

- a. Shall be of sound construction, sound material, and of adequate strength to serve the purpose for which these are to be used and all such appliances shall be free from patent defects, and
- b. Maintained in good repair and working condition;
- c. Every drum or pulley around which the rope of any lifting appliance is carried, shall be of adequate diameter and sound construction in relation to such rope;
 - i. Any rope that terminates at the winding drum of lifting appliance shall be securely attached to such drum and at least three dead turns of such rope remain on such drum in every operating position of such lifting appliance;
 - ii. The flange of a drum projects twice the rope diameter beyond the last layer of such rope and if such rope and if such projection is not available, other measures like anti-slackness guards shall be provided to prevent such rope from coming off such drum;
- d. Every lifting appliance shall be provided with adequate and efficient brakes which shall be:
 - i) Capable of preventing fall of suspended load (including any test load),
 - ii) Effectively controlling such load while it is being lowered, acting without shock and shall be attached with shoes that can be easily removed for running and which shall be simple and have easily accessible means of adjustment;
- e. Provided that nothing contained above shall apply to **steam-winch** that can be operated as safely as with brakes.

7.2. CONTROLS OF EVERY LIFTING APPLIANCE SHALL BE SO;

- a. Situated that the driver of such appliance at his stand or seat has ample room for operating and has an unrestricted view of building or other construction work, as far as practicable, and that he remains clear of the load and the ropes, and that no load passes over him;
- b. Positioned with due regard to ergonomic considerations for proper operation of such appliance;
- c. Located that the driver of such appliance remains above the appliance and shall have upon them or adjacent to them clear markings to indicate their purpose and mode of operations;
- d. Provided, where necessary, with a suitable locking device to prevent accidental movement or displacement and shall move, as far as practicable, in the direction of the resultant load movement;
- e. Wherever automatic brakes are provided, they shall automatically come to the neutral position in case of power failure.

7.3. TEST AND PERIODICAL EXAMINATION

7.3.1 Test: all lifting appliances including all parts and gears thereof, whether fixed or movable, shall be tested and examined by a competent person before being taken into use for the first time or after it

has undergone any alteration or repairs liable to affect its strength or stability or after erection on a site and also once at least in every five years, in the manner as specified;

7.3.2. Examination: all lifting appliances shall be thoroughly examined by a competent person at least in every twelve months and where the competent person making such examination forms the opinion that the lifting appliance cannot continue to function safely, he shall forthwith give notice in writing of his opinion to the contractor.

7.4. AUTOMATIC LOAD INDICATOR

- a. Cut-out shall be provided which automatically arrests the movement of the lifting parts of every crane if the load exceeds the safe working load, wherever possible;
- b. Wherever the above provisions cannot be applied and if it is not possible to install an automatic safe load indicator, in that case, provision of a table showing the safe working loads at the corresponding inclinations or radii of the jib on the crane shall be considered sufficient.

7.5. INSTALLATION:

Fixed lifting appliances shall be installed by a competent person in a manner that

- a. Such appliances cannot be displaced by the load, vibration or other influences;
- b. The operator of such appliance is not exposed to danger from loads, ropes or drums;
- c. The operator can either see over the zone of operation or communicate with all loading and unloading points by signal, or other communication system;
- d. Adequate clearance is provided between parts or loads of lifting appliances and between the fixed objects such as walls and posts, or electrical conductors;
- e. The lifting appliances; when exposed to wind loading, are given sufficient additional strength, stability and rigidity to withstand such loading safely;
- f. No structural alterations or repairs are made on any part of the lifting appliances that affect the safety of such appliances without obtaining the opinion of the competent person to this effect.

7.6. WINCHES

- a. Winches shall not be used if their control levers operate with excessive friction or play;
- b. Double gear winches shall not be used unless a positive means of locking the gearshift is provided;
- c. There shall be no load other than the fall and the hook assembly on the winch while changing gears on a two-gear winch;
- d. Adequate protection shall be provided to the winch operator against abnormal weather;

- e. Temporary seats or shelters for winch operators that may pose hazard to the winch operator or any other building workers shall not be allowed to be used;
- f. Control levers shall be secured in the neutral position and, whenever possible, the power shall shut off if the winch is left unattended.

7.7. IN USE OF EVERY STEAM-WINCH

- a. Measures shall be taken to prevent escaping steam from obscuring any part of the construction site or other workplace or from otherwise hindering or injuring any building worker;
- b. Extension control levers which tend to fall off their own weight shall be counter-balanced;
- c. Winch operators shall not be permitted to use the which control extension levers except for short handles on wheel type controls and that such levers shall be of adequate strength, secure and fastened with metal connections at the fulcrum and at the permanent control lever;
- d. In use of every electric winch, no building worker shall be permitted to transfer, alter or adjust electric control circuits in case of any defect in such winch;

7.8. ELECTRIC WINCHES SHALL NOT BE USED FOR BUILDING WORK WHERE

- a. The electromagnetic brake is unable to hold the load; or
- b. One or more control points either hoisting or lowering are not operating properly.

7.9. BUCKETS:

It shall be ensured that tip-up buckets are equipped with a device that effectively prevents accidental tipping.

7.10. IDENTIFICATION AND MARKING OF SAFE WORKING LOAD:

- a. Every lifting appliance and loose gear shall be clearly marked for its safe working load and identification by stamping or other suitable means;
- b. Every derrick (**other than derrick crane**) shall be clearly marked for its safe working load when such derrick is used either in single purchase with lower block or in union purchases in all possible block positions;
- c. The lowest angle to the horizontal, to which the derrick may be used, shall be legibly marked;
- d. Every lifting appliance having more than one working load shall be fitted with effective means to enable the operator to determine safe working load at each point under all conditions of use;
- e. Means to ascertain the safe working load for lifting gears under such conditions in which such gears may be used shall be provided to enable a worker using such gears and such means safely, which shall comprise:
 - i) Marking of the safe working load in plain figures or letters upon the sling or upon a tablet or ring of durable material attached securely thereto in case of chain slings; and

- ii) The means specified or notices so exhibited as can be easily read by any concerned building worker stating the safe working load for the various sizes of the wire rope slings used.

7.11 LOADING OF LIFTING APPLIANCES AND LIFTING GEARS

- a. No lifting appliance, lifting gear or wire rope shall be used in an unsafe way and in such a manner as to involve risk to life of building workers and they are not loaded beyond their safe working load except for testing purposes under the direction of a **competent person** in the manner as specified in schedule;
- b. No lifting appliance and lifting gear, or any other material-handling appliance shall be used if the Inspector having jurisdiction under the Building and Other construction (regulation of employment and conditions of service) Act/Rules is not satisfied with reference to a certificate of test or examination or to an authenticated record maintained as provided under the Rules or if in his view the lifting appliance, lifting gear or any other material handling appliance is not safe for use in building or other construction work;
- c. No pulley block shall be used unless the safe working load and its identification are clearly marked on such block.

7.12. OPERATOR'S CAB OR CABIN SHALL

- a. Be made of fire resistant material;
- b. Have a suitable seat, a foot rest and protection from vibration;
- c. Afford the operator an adequate view of the area of operation;
- d. Afford the necessary access to working parts in the cab;
- e. Afford the operator adequate protection against the weather;
- f. Be adequately ventilated; and
- g. Be provided with a suitable fire extinguisher.

7.13. OPERATION OF LIFTING APPLIANCES:

Operator of every crane or lifting appliance shall possess adequate skill and training in the operation of the particular lifting appliances, provided further that

- a. No person under eighteen years of age shall be in control of any lifting machine, scaffold winch, or give signals to the operator;
- b. Precaution shall be taken by the trained operator to prevent lifting appliance from being set in motion inadvertently;
- c. The operation of lifting appliances shall be governed by signals in conformity with the approved standards;
- d. The operator's attention shall not be distracted while he is working;
- e. No crane, hoist, winch or other lifting appliance or any part of such crane, hoist, winch or other lifting appliance shall, except for testing purposes, be loaded beyond the safe working load;
- f. During the hoisting operation, effective precaution shall be taken to prevent any person from standing or passing under the load in such operation;

- g. Operator shall not leave lifting appliance unattended while power is on or the load is suspended to such appliance;
- h. No person shall ride on a suspended load of any lifting appliance;
- i. Every part of a load in course of being hoisted or lowered shall be adequately suspended and supported to prevent danger;
- j. Every receptacle used for hoisting bricks, tiles, slates or other material shall be suitably enclosed as to prevent the fall of any such material;
- k. The hoisting platform shall be enclosed when loose material or loaded wheel barrows are placed directly on such platform or lowering such materials or wheel barrows;
- l. No material shall be raised, lowered or slewed with any lifting appliance in such a way as to cause sudden jerks to such appliance;
- m. In hoisting a barrow, any wheel of such barrow shall not be used as a means of support unless adequate steps have been taken to prevent the axle of such wheel from slipping out of its bearing;
- n. Long objects like planks or girders shall be provided with tag line to prevent any possibility of danger while raising or lowering such objects;
- o. During the process of landing or material, a building worker shall not be permitted to lean out into empty space for finding out the loading and unloading of such material;
- p. When hoisting of load is done in an enclosed space, neither the lifting material nor the boom shall project outside the enclosed space;
- q. Adequate steps shall be taken to prevent a load, in the course of being hoisted or lowered from coming into contact with any object to avoid any displacement of such load and appropriate appliances provided and used for guiding heavy loads when raising or lowering heavy loads to avoid crushing of hands of building workers during such raising or lowering of loads.

7.14. HOISTS

- a. Hoist towers shall be designed according to the relevant national standards;
- b. Hoist shafts shall be provided with rigid panels or other adequate fencing at the ground level on all sides of such shafts and at all other levels on all sides of the access to such shafts while the walls of hoist shafts, except at approaches, extend at least two meters above the floor or platform of access to such shafts;
- c. Approaches to hoist shall be adequately lit and provided with gates that shall be guarded to maintain visibility at least of two meters height; and equipped with a device, which requires such gate to be closed before the platform of such hoist can leave the landing, and prevents the gate from being opened unless such platform is at the landing;
- d. The guides of hoist platforms shall offer sufficient resistance to bending and to bucking in the case of jamming, by providing a safety catch;
- e. Overhead beams and their supports are capable of holding the total maximum live and dead loads that such beams and supports will be required to carry, with a safety factor of at least five;

- f. A clear space shall be provided –
- i. Above the highest stopping place of a cage or platform to allow sufficient unobstructed travel of such cage or platform in case of over-winding and
 - ii. Below the lowest stopping place of such cage or platform;
- g. Adequate covering shall be provided above the top of hoist shafts to prevent materials from falling into such shafts;
- h. Outdoor hoist towers shall be erected on adequately firm foundations and securely braced, guyed and anchored;
- i. A ladder way shall extend from the bottom to the top of every outdoor hoist tower in case no other ladder way exists within easy reach and such ladder way shall comply with the relevant national standards;
- j. The rated capacity of a hoisting engine shall at least be one and a half times the maximum load that such engine will be required to move;
- k. All gearing on a hoisting engine shall be securely enclosed;
- l. Steam piping of hoisting engine shall be adequately protected against accidental contact of such piping with a building worker;
- m. Electrical equipment of a hoisting engine shall be effectively earthed;
- n. A hoist shall be provided with suitable devices to stop a hoisting engine as soon as the platform of such hoist reaches its highest stopping place;
- o. A hoisting engine shall be protected by suitable cover against weather and falling objects;
- p. A hoisting engine set up in a public thoroughfare shall be completely enclosed;
- q. All exhaust steam pipes shall discharge steam in such a manner that the steam so discharged does not scald any person or obstruct the operator's view;
- r. The motion of a hoist shall not be reversed without first bringing it to rest to avoid any harm from such reverse motion;
- s. A hoist not designed for the conveyance of persons shall not be set in motion from the platform of such hoist;
- t. Pawls and ratchet wheels of a hoist, requiring disengagement of such pawls from such ratchet wheels, before the platform of such hoist is lowered, shall not be used;
- u. A platform of a hoist shall be capable of supporting such maximum load that such platform may carry with a safety factor of at least three;
- v. A platform of a hoist shall be equipped with suitable safety gear which can hold such platform with its maximum load in case its hoisting rope breaks;
- w. On platform of a hoist, the wheel barrows or truck shall be efficiently blocked in safe positions;

- x. A cage of a hoist or platform where the building workers are required to enter into such cage or to go on such platform at landing levels, shall be provided with a locking arrangement to prevent such cage or platform from moving during the time a worker enters or leaves such cage or platform;
- y. The sides of platform of a hoist which are not used for loading or unloading, shall be provided with toe-board and enclosures of a wire mesh or any other suitable means to prevent the fall of any part of a load from such platform, further provided that
 - i. The platform of a hoist, which has any probability of falling of any part of a load from it, shall be provided with an adequate covering to prevent such fall;
 - ii. The counter weights of a hoist consisting of an assemblage of several parts shall be so constructed that such parts shall be rigidly connected together;
 - iii. The counter weights of a hoist shall run between guides;
 - iv. At every level of work the building workers shall be provided with adequate platforms for performing such work;
 - v. A legible notice in Hindi as well as in a local language shall be displayed in a conspicuous place of the platform of a hoist and that such notice shall state the maximum carrying capacity of such hoist in kilograms on the hoisting engine;
 - vi. On a hoist authorized and certified for the conveyance of the persons on the platform or in the cage and such notice shall state the maximum number of persons to be carried on such hoist at one time;
 - vii. On a hoist carrying goods and other materials such notice shall state that such hoist is not meant for carriage of persons.

7.15. FENCING AND MEANS OF ACCESS TO LIFTING APPLIANCES

- a. Safe means of access shall be provided to every part of lifting appliances;
- b. The operator's platform on every crane or tip driven by mechanical power shall be securely fenced and provided with safe means of access and where access to such platform is by a ladder, the sides of such ladder shall extend to a height reasonable beyond such platform or some other suitable handhold shall be provided in the platform;
- c. The handling place on such platform shall be maintained free from obstruction and slipping; and
- d. In case the height of such ladder exceeds six meters, the resting platforms shall be provided on such ladder at every six meters of its height and where the distance between last platform so provided and the top end of such ladder is more than two meters then on such top end.

7.16. RIGGING OF DERRICKS:

Every derrick shall have current and relevant rigging plans and any other information necessary for the safe rigging of such derrick and its gear.

7.17. SECURING OF DERRICK FOOT:

Appropriate measures shall be taken to prevent the foot of a derrick from being lifted out of its socket or supports.

7.18. CONSTRUCTION AND MAINTENANCE OF LIFTING GEAR

- a. Every lifting gear shall be –
 - i. of good design and construction, sound material and adequate strength to perform the work for which it is used;
 - ii. free from patent defects; and
 - iii. properly maintained in good repair and working order;
- b. Components of the loose gear, at the time of its use, shall be renewed if one of its dimensions at any point has decreased by ten per cent or more;
- c. A chain shall be withdrawn from use when it is stretched and increased in length which exceeds five per cent of its length or when a link of such chain is deformed or is otherwise damaged or defects in the welds have appeared on it;
- d. Rings, hooks, swivels and end links attached to a chain shall be of the same materials as that of such chain;
- e. The voltage of electric supply to any magnetic lifting device shall not fluctuate by more than **plus** or **minus** 10%.

7.19. TEST AND PERIODICAL EXAMINATION OF LIFTING GEARS

- a. A lifting gear shall be initially tested for the manufacturer by a competent person in a manner specified as per schedule annexed before taking into use or after undergoing any substantive alterations which renders its any part liable to affect its safety and such gear after such test shall subsequently be retested for the use of its owner at least once in every five years;
- b. A lifting gear in use shall thoroughly examined once at least in every twelve months by a competent person;
- c. A chain in use shall be thoroughly examined at least once every month by a responsible person for its use;
- d. Certificates of initial and periodical test and examinations of loose gears shall be obtained in the form annexed.

7.20. ROPES

- a. No rope shall be used for building or other construction work unless -
 - i) It is of good quality and free from patent defects; and
 - ii) In the case of wire rope, it shall be tested and examined by a competent person in the manner annexed;
 - iii) Every wire rope of lifting appliance or lifting gear used for building or other construction work shall be inspected by a responsible person for such use, once at least in every three month;

- b. Provided that after if any such wire is broken in such rope, the responsible person shall thereafter inspect it once at least in every month and ensure that;
- c. No wire rope shall be used for building or other constructing work if in any length of eight diameters of such wires, the total number of visible broken wires exceed ten per cent of the total number of wires in such rope, or such rope shows signs of excessive wear, corrosion or other defects which in the opinion of the person who inspects it, is unfit for use;
- d. Eye splices and loops of ropes for the attachment of hooks, rings and other such parts to wire rope shall be made with suitable thimble;
- e. A thimble or loop splice made in any wire rope sling shall conform to the following standards, namely:
 - i) Wire rope sling shall have at least three tucks with full strand of rope and two tucks with one-half of the wires cut out of each of such strand in all cases, such strands shall be tucked against the lay of the rope;
 - ii) Protruding ends of such strands in any splice of wire rope slings shall be covered or treated so as to leave no sharp points;
 - iii) A fiber rope or a rope sling shall have at least four tucks, tail of such tuck being whipped in a suitable manner; and
 - iv) A synthetic fiber rope or rope sling shall have at least four tucks with full strands followed by further tuck with one-half filaments cut out of each of such strand and final tuck with one-half of the remaining filaments cut out from such strands. Any portion of the splices containing such tucks, with reduced number of filaments, shall be securely covered with suitable tape or other materials;
 - v) Provided further that nothing contained above shall apply where any other form of splice, which may be shown to be as efficient as the splice with above standards, shall be used.

7.21. HEAT TREATMENT OF LIFTING GEARS

- a. All chains other than bridle chains attached to derricks and all rings, hooks, shackles and swivels used in hoisting or lowering of such derricks shall be effectively annealed under supervision of a competent person and at the following intervals, namely:
 - i) Such chains, rings, hoods, shackles and swivels which are not more than twelve and a half millimeter of length annealed at least once in every six months; and
 - ii) All other such chains rings hooks shackles and swivels shall be so annealed at least once in every twelve months;
- b. Provided that the clause (a) above shall not apply to -
 - i) Pitched chins, working on sprocket or sprocket wheels;
 - ii) Rings, hooks and swivels permanently attached to pitched chains, pulley blocks or weighing machines, and
 - iii) Hooks and swivels having ball bearings or other case hardened parts;

- c. A chain or a loose gear made of high tensile steel or alloy steel shall be plainly marked with a mark indicating that it is so made;
- d. No chain or loose gear made of high tensile steel or alloy steel shall be subjected to any form of heat treatment except where such treatment is necessary for the purpose of repair of such chain or loose gear and that such repair shall be made under the direction of the competent person;
- e. That the wrought iron gear, the past history of which is not traceable, shall be suspected of being heat treated at incorrect temperature shall be normalized before using it on any building or other construction work.

7.22. CERTIFICATE TO BE ISSUED AFTER ACTUAL TESTING AND EXAMINATION ETC:

A competent person shall issue a certificate after actual testing or examination of the apparatus specified and record of such test or examination shall be maintained for inspection.

7.23. REGISTER OF PERIODICAL TEST, EXAMINATION AND CERTIFICATION THEREOF

- a. A register in the form annexed shall be maintained and particulars of such test and examination of lifting appliances, lifting gears and heat treatment as required shall be entered in such register;
- b. Certificate in respect of each of the following shall be obtained from a competent person:
 - i) In cases of initial and periodical test and examination of the lifting appliances such as Winches, Derricks and their accessory gears, Cranes or Hoists and their accessory gears;
 - (ii) In case of test, examination and re-examination of loose gears;
 - (iii) In case of test and examination of wire ropes;
 - (iv) In case of heat treatment and examination of loose gears;
 - (v) In case of annual thorough examination of the loose gears, except where required particulars of such exemption have been enclosed in the register referred to in Form annexed and such certificates are attached to the register referred to as above and certificates kept at such construction site in case such register and certificate relate to lifting appliances, loose gear and wire ropes and
- c. Produced on demand and retained for at least five years after the date of the last entry made in such register;
- d. No lifting appliance or lifting gear in respect of which an entry is required to be made in register referred to above and certificate of test and examination are required to be attached in such register in the manner as specified, shall be used for building or other construction work unless the required entries have been made in such register and certificates.

7.24. VACUUM AND MAGNETIC LIFTING GEAR

- a. No vacuum lifting gear, magnetic lifting gear or any other lifting gear where the load on it is held by adhesive power, shall be used while workers are performing operations beneath such gear;
- b. A magnetic lifting gear used in connection with building or other construction work shall be provided with an alternative supply of power, such as batteries, which may come into operation immediately in the event of failure of the main power supply;

- c. No building worker shall work within the swinging zone of the lifting gear or load or building or other construction material suspended to such lifting gear.

7.25. KNOTTING OF CHAINS AND WIRE ROPES:

No chain or wire rope with a knot in it shall be used in building or other construction work.

7.26. CARRYING OF PERSONS BY MEANS OF LIFTING APPLIANCES ETC.

- a. No building worker shall be raised, lowered or carried by a power driven lifting appliance, except
 - i. On the drive's platform in the cage of a crane; or
 - ii. On as hoist; or
 - iii. On an approved suspended scaffold;
- b. Provided that a building worker may be raised, lowered or carried by a power driven lifting appliance:
 - i. In circumstances where the use of a hoist or of a suspended scaffold shall not reasonably be practicable, or
 - ii. On an aerial cableway or aerial ropeway, provided further that the following requirements are met:
 - iii. That the appliance referred to above can be operated from one position only and that
 - iv. Any winch used in connection with the appliance shall also comply with the requirements as laid down above.
- c. The appliance referred to above shall not carry any person except:
 - i. In a chair or cage,
 - ii. In a skip or other receptacle at least three feet deep which shall be suitable for safe carriage of a person and any such chair, cage, skip or other receptacle shall be made of good construction, sound material, and adequate strength and properly maintained with suitable means to prevent any occupant therein from falling out of it and shall be free from any material or tools which may interfere with the handhold or foothold of such occupant or otherwise endanger him; and
 - iii. Those suitable measures shall be taken to prevent the chair, cage skip or other receptacle from spinning or tipping in a manner dangerous to any occupant therein.

7.27. HOISTS CARRYING PERSONS

- a. No building worker shall be carried with the help of a hoist unless it is provided with a cage which:
 - i) Is so constructed as to prevent, when its gates are shut, any building worker carried by such hoist from falling out of it or from being trapped between any part of such cage and any fixed structure or other moving part of such hoist or from being struck by articles or materials falling down the hoist way on which such hoist is moving; and
 - ii) Is fitted on each of its side from which access is provided to a landing place with a gate which has efficient interlocking or other devices to secure so that such gate cannot be opened except when such cage is at a landing place and that such cage cannot be moved away from any such place until such gate is closed;

- b. Every gate in the hoist way enclosure of such hoist used for carrying persons shall be fitted with efficient interlocking or other devices to secure so that such gate cannot be opened except when the cage of such gate is at the landing place and that such cage cannot be moved away from the landing place until such gate is closed;
- c. In every hoist used for carrying building workers there are provided with suitable and efficient automatic devices to ensure that the cage of such hoist comes to rest at a point above the lowest point to which such gave may travel.

7.28. ATTACHMENT OF LOADS

- a. When a sling is used to hoist long materials, a lifting beam shall be used to space the sling legs for proper balance and when a load is suspended at two or more points with slings, the eyes of the lifting legs of such slings shall be shackled together and such shackled or eyes of the shackled slings shall be placed on the hook or the eyes of such lifting legs shall be shackled directly to the hoisting block, ball or balance beam, as the case may be;
- b. Every container or receptacle used for raising or lowering stone, bricks tiles, slates or other similar objects shall be so enclosed with the hoist as to prevent the fall of such objects;
- c. A loaded wheel barrows placed directly on a platform of a hoist for raising or lowering of such wheel barrows shall be so secured that such wheel barrows cannot move and such platform shall be enclosed to prevent the fall of the contents kept in such wheel barrows;
- d. Landings of hoists shall be so designed and arranged that building workers on such hoist be not required to lean out into empty space for loading and unloading on any material from such hoist

7.29. TOWER CRANES

- a. No person other than the operator trained and capable to work at heights shall be employed to operate tower cranes;
- b. The ground on which a tower crane stands shall have adequate bearing capacity;
- c. Bases for tower cranes and trucks for rail mounted tower cranes shall be firm and leveled and such cranes erected at a reasonably safe distance from excavations and operated within gradient limits as specified by the manufacturer of such cranes;
- d. Tower cranes shall be sited where there is a clear space available for erection, operation and dismantling of such cranes;
- e. Tower cranes shall be sited in such a way that the loads on such cranes shall not be handled over any occupied premises, public thoroughfares, railways or near power cables, other than construction works for which such cranes are used;
- f. Where two or more tower cranes are sited and operated, every care shall be taken to ensure positive and proper communication between operators of such cranes to avoid any dagger or dangerous occurrences;
- g. Tower cranes shall not be used for loading magnet, or demolition ball service, piling operation or other similar operations which could impose excessive load stresses on the crane structure of such cranes;

- h. The instruction of the manufacturer of a tower crane and standard safe practices regarding such cranes shall be followed while operating or using such cranes.

7.30. QUALIFICATION OF OPERATOR OF LIFTING WINCHES AND OF SIGNALER ETC.

- a. No person shall be employed to drive or operate a lifting appliance whether driven by mechanical power or otherwise or to give signals to driver of operator of such lifting appliance or to work as an operator of a rigger or derricks unless he is
 - i) Sufficiently competent and reliable;
 - ii) Possesses the knowledge of the inherent risks involved in the operation of lifting appliance;
 - iii) Medically examined periodically as specified and
 - iv) Is above eighteen years of age.

8.0 SAFETY IN THE USE OF TRANSPORT, EARTHMOVING EQUIPMENT & OTHER CONSTRUCTION MACHINERY

8.1 EARTHMOVING EQUIPMENT AND VEHICLES

- a. All vehicles and earthmoving equipment shall be made of good material, proper design and sound construction and be sufficiently strong for the purpose for which such equipment are properly used in accordance with standard safe operating practices;
- b. Provided that the truck or trailer employed for transporting freight containers shall be of the size sufficient to carry the containers, without over hanging and provided with twist locks conforming to approved standards, at all the four corners of each of such use by an authority under the relevant law for the time being in force and is inspected by a responsible person, at least once in a month and record of such inspection shall be maintained:
- c. All transport or earth moving equipment and vehicles shall be inspected at least once a week by a responsible person and in case any defect is noticed in such equipment or vehicle it shall be immediately taken out of use;
- d. Power trucks and tractors shall be equipped with effective brakes, headlights and tail lamps and maintained in good repair and working order;
- e. Side stanchions on power trucks and trailers for carrying heavy and long objects shall be
 - i. Of sound construction and free from defects;
 - ii. Provided with tie chains attached to the top across the loads for preventing such stanchions from spreading out; and
 - iii. Kept in position while loading and unloading;
 - iv. Safe gangways provided for to and fro movement of building workers engaged in loading and unloading of lorries, trucks, trailers and wagons;
 - v. Trucks and other equipment shall not be loaded beyond their safe capacity and carry workers engaged in loading and unloading of lorries, trucks trailers and wagons in an unsafe condition;
 - vi. Handles of trucks shall be so designed as to protect the hands of the building workers working on such trucks, or such handles provided with knuckle guards;
 - vii. No unauthorized person shall ride the transport equipment employed in such work;
 - viii. A driver of a transport equipment shall maneuver such equipment under the direction of a signaler;
 - ix. Adequate precaution such as isolating the electric supply or erecting overhead barriers of a safe height shall be taken when earth moving equipment or vehicles are required to operate in dangerous proximity to any live electric conductor;
 - x. Vehicles and earth moving equipment shall not be left on a slope with the engine of such vehicles or equipment running;

- xi. All earth moving equipment, vehicles or other transport equipment shall be operated only by such person who are adequately trained and possess such skills as required for safe operation of such equipment, vehicle or other transport equipment.

8.2. POWER SHOVELS AND EXCAVATOR

- a. A shovel or an excavator whether operated by steam or electric or by internal combustion, shall be constructed, installed, operated, tested and examined as per approved standards;
- b. Excavator equipped for use as a mobile crane shall be examined and tested in accordance with the requirements for such mobile cranes as laid down by the manufacturer; and
- c. Fitted with an automatic safe working load indicator;
- d. Buckets or grabs of power shovels shall be propped to restrict the movement of such buckets or grabs while being repaired or while the teeth of such buckets or grabs are being changed.

8.3. BULLDOZER

- a. Operator of every such bulldozer before leaving the dozer shall take the following steps:
 - i) Apply the brakes;
 - ii) Lower the blade and sipper and
 - iii) Put the shift lever into neutral;
 - iv) Dozer left on level ground at the close of the work for which such bulldozer is used;
 - v) The blade of a bulldozer kept low when such bulldozer is moving uphill;
 - vi) The bulldozer blades not used as brakes except in an emergency.

8.4. SCRAPERS

- a. A tractor and scraper shall be joined by safety line at the time of its operation;
- b. The scraper bowls shall be propped while blades of such scraper are being replaced;
- c. A scraper moving downhill shall not be left in gear.

8.5. MOBILE ASPHALT LAYERS & FINISHERS

- a. A mixture elevator shall be located within a wooden or sheet metal enclosure with a window for observation, lubrication and maintenance;
- b. Bitumen scoops shall have adequate covers;
- c. When asphalt plants are working on public road, adequate traffic control shall be established on such road and the building workers working with such plant provided with reflective jackets;
- d. A sufficient number of fire extinguishers shall be kept in readiness at such workplace where fire hazards may exist;
- e. The materials shall be loaded on the elevator after the drying drain has warmed up of such elevator;
- f. No open light shall be used for ascertaining the level of asphalt;

- g. Inspection opening shall not be opened till there is a pressure in the boiler, which may cause injury to building workers.

8.6. PAVERS:

Pavers shall be equipped with guards suitable to prevent building workers from walking under the skip of such pavers.

- 8.7. Road rollers:** Before a road roller is used on the ground, such ground shall be examined for its bearing capacity and general safety, especially at the edges of slopes such as embankment on such grounds and shall not be moved downhill with the engine out of gear.

8.8. GENERAL SAFETY IN RESPECT OF POWERED CONSTRUCTION MACHINERY

- a. Every vehicle or earthmoving equipment shall be equipped with -
 - i) Silencers;
 - ii) Tail lights
 - iii) Power and hand brakes;
 - iv) Reversing alarm; and
 - v) Search light for forward and backward movement, which are required for safe operation of such vehicle or earthmoving equipment;
- b. The cab of vehicle or earthmoving equipment shall be kept at least one meter from the adjacent face of a ground being excavated;
- c. When cranes or shovel are traveling, the boom of such crane or shovel shall be in the direction of such travel and the bucket or scoop attached to such crane or shovel raised and without load except when such traveling is downhill.

9.0 SAFETY IN THE PROVISION OF RUNWAYS AND RAMP

9.1. USE OF RUNWAYS AND RAMPS:

- a. Runway or ramps shall not be less than 430 mm in width and constructed of not less than 25 mm thick planking or any other material of adequate strength to withstand the required load, supported substantially in relation to the span and braced with such runway or ramp, and design and construction of such runway or ramp shall be in accordance with the approved standards;
- b. Every runway or ramp located more than 3 m above the floor or ground shall be on open sides and provided with a guardrail of adequate strength and height of not less than 1 m.
- c. Use of runways and ramps by vehicles:
 - i. All runways and ramps shall be of sound construction, strength and securely braced and supported;
 - ii. Every runway or ramp for the use of transport equipment like trailers, trucks or heavier vehicles shall have a width of not less than 3.7 m and provide with timber curbs or any other material of adequate strength with not less than 200 mm by 200 mm in width placed parallel to, and secured to, the sided of such runway or ramp and such runways or ramps or ramps shall be designed in accordance with the approved standards.

9.2. SLOPE OF RAMPS:

Every ramp shall have a slope not exceeding one in four and the total rise of a continuous ramp used by building workers carrying material or using wheelbarrows shall not exceed 3.7 m, unless broken by horizontal landing of at least 1.2 m in length.

9.3. USE OF RUNWAYS OR RAMPS BY WHEELBARROWS, ETC.

- a. Every runway or ramp used for wheelbarrows and carts or hand trucks shall not be less than 1 m width and constructed of not less than 50 mm thick planking, and supported and braced suitably for such use;
- b. Every runway or ramp located more than 3 m above the floor or ground shall be provided on the open sides with suitable guardrails of adequate strength.

10. SAFETY IN HANDLING AND USE OF EXPLOSIVES

10.1 GENERAL PROVISIONS:

- a. The use of explosives shall be carried out in a safe manner to avoid injury to any person and under the direct supervision of a responsible person;
- b. No person other than authorized and competent one shall be allowed to handle and use explosives;
- c. Before using any explosive, necessary warning and danger signals shall be erected, at conspicuous places of such use to warn the building workers and the general public of the danger involved in such use.
- d. No person other than authorized and competent one shall be allowed to handle and use explosives.
- e. Smoke, open lamps, other type of hot or heat producing items and sparks shall be prohibited in or near explosives magazines or while explosives are being handled, transported or used.
- f. No person shall be allowed to handle or use explosives while under the influence of intoxicating liquors or dangerous drugs.
- g. The explosives shall be accounted for at all times. No explosives or blasting agents shall be abandoned.
- h. No fire shall be fought where the fire is in the imminent danger of contact with explosives. All employees shall be removed to a safe area and the fire area shall be guarded against intruders.
- i. Employees authorized to prepare explosive charges or conduct blasting operations shall use every reasonable precaution including but not limited to visual and audible warning signals, flags, or barricades to ensure employee safety.
- j. Due precautions shall be taken to prevent accidental discharge of electric blasting caps from current induced by induced voltage, lightning, adjacent power lines, dust storms, or other sources of extraneous electricity or otherwise. These precautions shall include:
- k. Short-circuiting of detonators in holes, which have been primed and shunted until wired into the blasting circuit.
- l. The suspension of all blasting operations and removal of persons from the blasting area during the approach and progress of an electric storm.
- m. The prominent display of adequate signs, warning against the use of radio transmitters, on all roads within 1000 ft of blasting operations. Whenever adherence to the 1000 ft distance would create an operational handicap, a competent and expert person shall be consulted to evaluate the particular situation, and an alternative provided, which are adequately designed to prevent any premature firing of electric blasting of caps. A description of any such blasting shall be reduced to writing and shall be certified as meeting the purposes of this subdivision by the competent person consulted. The description shall be maintained at the construction site during the duration of the work, and shall be available for inspection.

- n. Empty boxes and paper and fiber packing materials, which have previously contained high explosives, shall not be used again for any purpose, but shall be destroyed by burning at an approved location.
- o. Explosives, blasting agents and blasting supplies that are obviously deteriorated or damaged shall not be used.
- p. Delivery and issue of explosives shall only be made authorized persons into authorized magazines or approved temporary storage or handling areas.
- q. Blasting operations in the proximity of overhead power lines, communication lines, utility services, or other services and structures shall not be carried on until the operators and/or owners have been notified and measures for safe control have been taken. In such situations controlled blasting shall be restored to.
- r. All loading and firing shall be directed and supervised by competent persons thoroughly experienced in this field.
- s. Loaded boreholes shall not be left unattended after the end of the shift.
- t. Suitable and sufficient means of egress to ground level shall be provided in all cases of excavations, trenches, all other places where explosives are handled above or below ground level.
- u. At an appropriate time before the final blasting warnings, workers in the area shall be removed to a designated safe place.
- v. An unmistakable, audible, final warning shall be sounded one minute prior to the detonation of explosives; after completion, when the person in charge has established that safe conditions prevail, an "all clear" shall be sounded.
- w. To prevent persons entering any danger zone during blasting operations notices shall be given to all concerned.
- x. Notices referred above shall indicate:
 - i. that explosives are in use;
 - ii. the audible warning sound and the "all clear" and state when they will be sounded; and
 - iii. the warning flags in use, including an "all clear" flag.
- y. Precautions against lightning shall be provided in accordance with the Indian Electricity Act and Indian Explosives Act and Rules and regulations framed there under.
- z. Package containing explosives shall not be dragged, dropped or handled roughly.
 - aa. Non-sparking tools shall be used to open keys.
 - bb. The explosives shall not be carried in the box or otherwise on any individual.
 - cc. Nothing shall be inserted in the open end of the blasting cap except fuses.

- dd. Deteriorated or damaged explosives shall not be used but shall be disposed or destroyed strictly in accordance with the approved methods and in the doing so the manufacturers or the appropriate authority's instructions shall be followed.
- ee. lightning shall be in accordance with Indian Electricity Act/Rules

10.2. TRANSPORTATION OF EXPLOSIVES

- a. Keep safe distance and to use non-sparking tools while opening packages containing explosives;
- b. Stop the use of explosives and handling thereof while the weather conditions are not suitable for such use or handling;
- c. Due precautions shall be taken to prevent accidental discharge of electric blasting caps from current induced by induced voltage, lightning, adjacent power-lines, dust storms or other sources of extraneous electricity or otherwise. These precautions shall include –
 - i. Suspension of all blasting operations and evacuation of persons;
 - ii. All warning signs shall be displayed within 200 m of blasting operations and in case putting up a sign at 200 m is impractical, the contractor shall consult the Engineer-in-charge for alternatives;
 - iii. All loading and firing shall be directed and supervised by competent persons thoroughly experienced in the field;
 - iv. To prevent persons entering any danger zone during blasting operations, notices shall be given to all concerned;
- d. In addition to these provisions, all measures and precautions that are required to be observed for use, handling, storing or transportation of explosives under the Rules framed under the Explosives Act, 1884 (4 of 1884) shall be observed;
- e. All the relevant statutory provisions, local laws and rules and regulations shall be complied with.
- f. Where the magazine is located near the construction site and blasting operation continues daily, actual requirement of explosives shall be drawn from the magazine and transported to the site. Any leftovers shall be returned to the magazine each time after the blast. In case of work at scattered places and for a small duration, portable magazines shall be used and kept within a fence in safe place and properly guarded.
- g. For carrying higher quantity (more than 5 kg of explosives) specially designed insulated containers shall be used. These containers shall be constructed of finished wood not less than 5cm thick or plastic not less than 6mm thick or pressed fibre not less than 10mm thick. There shall be no metal parts (not even nails, bolts, screws etc.) and the containers shall be provided with suitable non-conductive carrying device, such as rubber, leather or canvas handle or strap.
- h. Vehicles to be used for transportation explosives shall be in good working condition and shall have a tight wooded or non-sparking metal (copper, brass and the like) floor with sides and

ends high enough to prevent the explosives from falling off the vehicle. In open bodied vehicles, the explosives shall be covered with a waterproof and fibre tarpaulin.

- i. Electrical wiring in vehicle shall be fully insulated so as to prevent the danger of short-circuiting and at least two fire extinguishers of carbon dioxide type shall be carried. The vehicle shall be properly marked indicating adequate warning to the public in regard to the nature of cargo.
- j. No metals except approved metal truck shall be allowed to come in contact with cases of explosives, metal, flammable, or corrosive substance shall not be transported with explosives. As far as possible, transportation of any material along with explosives shall be prohibited.
- k. Smoking shall be prohibited in the vehicle carrying explosives.
- l. No unauthorized person shall be allowed in the vehicle, carrying explosives.
- m. Loading and unloading of explosives shall be done carefully.
- n. Explosives and detonators or blasting caps shall not be permitted to be transported in the same vehicle.
- o. Detonators and other explosives for blasting shall be transported to the site of work in the original containers or in securely locked separate non-metallic containers and shall not be carried loose or mixed with other materials.

10.3. STORAGE OF EXPLOSIVES AND BLASTING AGENTS

- a. Explosives and related materials shall be stored in approved facilities.
- b. Blasting caps, electric blasting caps, detonating primers, and primed cartridges shall not be stored in the same magazine with other explosives or blasting agents.
- c. Smoking and open flames shall not be permitted within 50 feet of explosives and detonators storage magazine.
- d. No Explosives or blasting agents shall be permanently stored in any underground area until the area has been developed to the point where at least two modes of exit have been provided.
- e. Permanent underground storage magazine shall be at least 300 feet from any shaft or other active under ground working area.
- f. Permanent underground magazines containing detonators shall not be located closer than 50 feet to any magazine containing other explosives or blasting agents.

10.4. DRILLING AND LOADING

- a. Before planning out the drilling operations for blasting purposes, nature of stratum and the over burden shall necessarily be examined to avoid possibilities of landslides after blasting.
- b. The face or rock shall be carefully examined before drilling to determine the presence of unfired explosives. No attempt shall be made to drill at a site if un-detonated explosives are suspected. In such case the boreholes shall be thoroughly cleaned before a cartridge is

inserted. Wooden tamping rods (not pointed, but cylindrical throughout) shall be used in the charging the holes. The cartridge will be on the top.

- c. The borehole shall be carefully checked for length, presence of water dust, etc. with a wooden temping pole or a measuring tape before loading.
- d. Surplus explosives shall not be stacked near working areas during loading/unloading.
- e. The line of detonating fuse extending into a borehole shall be cut from the spool before loading the remainder of the charge.
- f. A bore shall not be loaded with explosives after springing (enlarging the hole with explosives) or upon completion of drilling without making sure it is cool and it does not contain any hot smoldering material. Temperatures in excess of 65° C are dangerous.
- g. A bore near another hole loaded with explosives shall not be sprung.
- h. No force shall be used for inserting cartridges or any explosives into a bore hold or pass any obstruction in a borehole.
- i. No force shall be used for inserting a blasting cap or an electric blasting cap into explosive. The cap shall be inserted into a hole made with a pickers designed for the purpose. A hitch of the electric blasting cap leading wire shall be made on the primer cartridge so as to prevent pulling out the electric blasting cap from the explosive charge. In case of fuse, the fuse shall be tied to the explosive cartridge so that the blasting cap is not pulled out. Care shall be taken so that the blasting cap is not pulled out. Care shall be taken so that the electric blasting cap, leading wire or the length of the fuse does not get damaged during loading of the charge.
- j. No attempt shall be made to slit, drop, deform or abuse the primer.
- k. Blasting caps or electric blasting caps shall not be connected to detonating fuse except by methods recommended by the manufacturers of caps.
- l. Explosive cartridge shall not be cut, nor explosive removed from the cartridge for use.
- m. Metallic devices of any kind shall not be used in tamping. Wooden tamping tools with not exposed metal parts except non-sparking metal connectors for jointed poled shall be used. Violent tamping shall be avoided. Primer shall not be tamped.
- n. Care shall be taken to confine the explosives in the bore hold with sand, earth clay or other suitable combustible stemming material.
- o. Kinking or injuring of fuse or electric blasting cap wires shall be avoided when tamping.

10.5. ELECTRICAL SHOT-FIRING CIRCUIT

- a. In deciding the sizes of wires, fuses, circuits, blasting switches, etc., instructions issued by the manufacturers of these articles shall be followed, if they do not contradict with Indian Explosives Act or framed under it.
- b. No person shall attempt to uncoil the wires and open out the short-circuited bare leading wires of the electric blasting cap during approach of dust storm or near any source of large

charge of static electricity or near a radio transmitter. The manufacturer of the cap or the Inspectorate of Explosives shall be consulted regarding the distance from the transmitter beyond which electric short firing shall be conducted.

- c. Firing circuit shall be kept completely insulated from the ground of the other conductors, such as wires, rails, pipes or other paths or stray current.
- d. There shall not be any electric live wires or cables of any kind near electric blasting caps or other explosives except at the time and for the purpose of firing the blast.
- e. All electric blasting caps shall be tested singly and also when connected in a circuit in series using only an approved type of circuit continuity tester or ohmmeter.
- f. No attempt shall be made to use in the same circuit either electrical blasting caps made by more than one manufacturer or electric blasting caps of different design or function even if made by the same manufacturers unless such use is approved by the manufacturers.
- g. No attempt shall be made to fire a circuit of electric blasting caps with less than the minimum current specified by the manufacturer of that electric blasting cap.
- h. Care shall be taken to ensure that all wire ends to be connected are bright and clean.
- i. The electric cap wires or leading wires shall be kept short circuited until ready to fire.
- j. When energy for blasting is taken from power circuits the voltage shall not exceed 220v. The wiring controlling arrangements shall conform to the following:
- k. The blasting switch shall be strictly according to the specifications, externally operated double-throw switch, which when locked in the open position will short circuit and ground the leading wires. The switch shall be installed at the location where the firing is to be controlled.
- l. A 'safety' switch of the same type as the blasting switch shall be installed between the blasting switch and the firing circuit and lead lines, at a distance not to exceed 180cm from the blasting switch.
- m. Both the safety switch and the blasting switch shall be locked in the open position immediately after the shot and before any person is permitted to return to the blasting area. Key to the switches shall remain in the possession of the blaster at all times.
- n. Rubber covered or other adequately insulated copper wires in good condition shall be used for firing lines and shall have solid cores of appropriate gauge. Sufficient firing line shall be provided to permit the blaster to be located at a safe distance from the blast. Single conductor lead lines shall be used.
- o. Blasting operations in the proximity of overhead power lines, communication lines, utility lines, or other structures shall not be carried on until the operator or the owner, or both of such lines as been notified and precautionary measures deemed necessary, have been taken.
- p. All holes loaded on a shift shall be fired on the same shift.
- q. As far as possible, blasting shall be carried out using suitable exploder with 25 per cent excess capacity. Electric power from the mains shall be used only when it is absolutely necessary.

10.6. SHOT-FIRING WITH SAFETY FUSE

- a. The fuse shall be carefully handled to avoid damaging the covering. In very cold weather the fuse shall be slightly warmed before using so as to avoid cracking the waterproofing.
- b. Short fuse shall not be used. The length of a fuse shall not be less than 120cm. The rate of burning of the fuse shall be known and it would be necessary to make sure that it will take sufficient time in burning so as to enable all persons to reach a place of safety. The burning rate of the fuse shall not be more than 60 cm/min.
- c. The fuse shall not be cut until the operation to insert the fuse into a blasting cap is ready. The fuse shall be cut off about 2.5 to 5 cm to ensure a dry end. It shall be cut squarely across with a clean and sharp blade. The fuse shall be seated lightly against the cap charge and care shall be taken to avoid twisting after it has been placed in position.
- d. Blasting caps shall not be crimped by any means except by a cap crimper designed for the purpose. It shall be necessary to make sure that the cap is squarely crimped to the face.
- e. The fuse shall be lighted with a fuse lighter designed for the purpose. If a match is used, the fuse shall be slit at the end and the match head held in then slit against the power core and then the match head rubbed against an abrasive surface to light the fuse.
- f. The fuse shall not be lighted until sufficient stemming has been placed over the explosives to prevent sparks of live match heads from coming into contact with the explosives.
- g. The explosives shall not be held in hands when lighting the fuse.

10.7. UNDERGROUND WORK

- a. Only permissible explosives and in the manner as specified by the appropriate authority shall be used.
- b. Excessive quantities of explosives shall not be taken underground at any time. Black blasting powder or pellet powder shall not be used with any other explosive in the same borehole.

10.8. BEFORE AND AFTER FIRING

- a. Before firing, sufficient warning shall be given to enable the people working in the area to get off the danger zone. The danger zone shall be suitable cordoned off and flag men posted at important points.
- b. No loose materials, such as tools, drilling implements etc. Shall be left on the rock surfaces to be blasted.
- c. Blasting in the open shall be carried out during the fixed hours every day or on fixed days in the week. This information shall be amply publicized and the following precautions observed:
- d. On the project sites, where blasting operations are carried out, daily blasting hours shall be clearly printed on the sign-boards on all the roads approaching that area.
 - i. Road closing barriers should be provided to close the traffic on these roads, at least 400 meters away when the firing is to take place.

- ii. The beginning of the firing shall follow loud sirens and similarly loud sirens shall succeed the completion of the firing.
- e. The shot-firer shall not be allowed to return to the blasting site after firing, until at least 5 min have elapsed. In case of electric shot firing, the shot holes shall be examined after firing and in case of misfire no person shall be allowed to approach the blasting site for at least 5 min. In case of shot firing with safety fuse, utmost care shall be taken to count the number to ensure that all the shots have fired and in the event of misfire, no person shall be allowed to approach the blasting site for at least 30 min. In any case, a careful inspection for the remaining un-detonated explosive shall be made after firing the shots. All misfired shot holes shall be cross-marked. No other person than those duly authorized shall approach the holes until one of the following operations has been performed in respect of each of the misfired holes:
 - f. If the misfire is due to a faulty cable or faulty electrical connection the defect shall be remedied and the shot fired.
 - g. The stemming shall be floated out by use of water or air jet from hose until the hole has been opened to within 60 cm of the charge, whereupon water will be siphoned or pumped out, then a fresh new charge placed and duly detonated. Or
 - i. A careful search shall be made of unexploded material in the debris of the charge.
 - ii. If a shift charge is unavoidable, the person in-charge of one shift before leaving the work shall inform the person relieving him for the next shift of any cases misfired and shall point out their position duly cross marked and also state clearly what action has to be taken in the matter.

Note: The rules are made considering statutory provisions and other National/International standards. However, if any statutory provision overruling these laws is made, the statutory provisions shall overrule the NTPC Rules.

11.0 SAFETY IN EXCAVATION & TUNNELING WORK

SAFETY IN EXCAVATION

11.1 GENERAL PROVISIONS

- a. Before undertaking any activity, the soil shall be tested and in case of availability of any explosive gas, necessary arrangements must be made to remove/dilute such gases and in case they are found to be toxic or poisonous, the workplace must be purged and continuous ventilation maintaining the contamination below the permissible level ensured;
- b. The position of underground installations such as sewers, water pipes and electrical cables shall be verified and in case of their existence, they must be isolated;
- c. If they cannot be isolated or removed or shutdown, they shall be fenced, hung up or otherwise protected. On every part likely to be visited by persons or where transport vehicles ply, the area shall be suitably fenced, guarded or barricaded to prevent fall of persons, vehicles or livestock into the excavated area;
- d. Warning signs shall be erected and the in the night hours the area shall be illuminated to warn pedestrians and vehicular traffic;
- e. Arrangements shall be made to prevent external vibrations due to rail/road traffic;
- f. Blasting shall be carried out in accordance with the norms applicable in this regard. Special care shall be taken to control the impact of vibrations/tremor caused by blasting to protect excavations from cave-ins;
- g. Arrangements shall be made to save other buildings/structures in the affected zone or in the vicinity of the area of excavation, from collapse;

11.2 SHORING AND TIMBERING

- a. Site of excavations, where workers are exposed to danger from moving ground, shall be made safe by maintaining due slope not exceeding the angle of repose of different types of soil or otherwise by shoring, portable shields or other effective means;
- b. All trenches in the soil, other than rock or hard compact soil more than 1.5 m deep into which men enter, shall be securely shored and timbered under the supervision of a competent person and only the trained workers shall be allowed to substantially alter or dismantle the shoring or timbering;
- c. All struts, braces and walls in excavation shall be adequately secured so as to prevent their accidental displacement;
- d. In all excavations in soft or fissured rock or hard soil exceeding 2 m in depth, except those which are sloped to within 1.5 m of the bottom into which men enter, shall be securely shored and timbered;
- e. Where the sides of the excavations are sloped as outlined above, but not within the 1.5 m of the bottom, vertical sides shall be shored and the shoring shall extend at least 30 cm above the vertical sides. When open spaced sheathing is used, a toe-board shall be provided to prevent material rolling down the slope and falling into the excavated.

11.3. SHEATHING

- a. The sheathing should be placed against the side of the trench so that length of each piece of sheathing is vertical. It should be held securely in place against the wales by ensuring that sheathing is kept firmly pressed against the wall of the trench. Where the trench excavated is loose, sandy or soft soil or soil which has been previously excavated or soil which is under hydrostatic pressure, each piece of sheathing shall be driven into the bottom of the trench so as to firmly hold it in place;
- b. Where two or more pieces of sheathing are used one above another, the sheathing shall be so arranged that the lower pieces of sheathing shall overlap the lowest wales supporting the piece of sheathing next above it. These pieces of sheathing shall be firmly driven into the soil and securely supported by wales and struts, as the trench is made deeper.

11.4. WALES

- a. The wales shall be parallel to the bottom or the proposed bottom of the trench. Each wale shall be supported on cleats spiked to the sheathing or by posts set on the wales next below it and in the case of the lowest wale on the bottom of the trench itself. Where necessary, wedges may be provided between a wale and the sheathing it supports so that roughly uniformity is given to all individual pieces of sheathing.

11.5. STRUTS

- a. Struts shall be horizontal and at right angles to the wales or sheathing supported thereby. Struts shall be cut to the proper length required to fit in tightly between the wales. Where necessary, the struts shall be held securely in place by wedges, driven between the struts and the wales;
- b. Struts shall be placed on cleats spiked or bolted to the posts supporting the Wales.

11.6. LOOSE SITE MATERIALS:

No loose material shall be kept very close to the excavation creating possibility of its fall into the excavated area. A safe distance of at least 1 m shall be maintained.

11.7. PLANT & MACHINERY:

Movement of vehicles and heavy equipment shall be kept at a distance least equal to the depth of the excavation or at least 6 m for excavation deeper than 6 m and the workers shall be provided with proper tools.

11.8. MEANS OF ACCESS

- a. For trenches deeper than 1.5 m, safe means of access and egress shall be provided at intervals of every 15 m. Where it is not possible to provide safe means of access and egress as above, ladders shall extend from the bottom of the trench to at least 90 cm above the ground;
- b. Walkways, runways and sidewalks shall be kept clear of excavated materials or other obstructions and no side walls shall be undermined-undercut unless it is capable of carrying a minimum live load of 125 lbs per square feet;

- c. If planks are used for raising walkways, runways or sidewalks, they should be parallel to the length of the walk and fastened together against displacement;
- d. Lone worker shall not be allowed to work in the excavated area.

11.9. INSPECTIONS:

A competent person shall make inspections every day and necessary measures shall be taken to safeguard against possible cave-ins or slide or collapse of the excavations.

11.10. NOTIFICATION OF INTENTION TO CARRY OUT EXCAVATION AND TUNNELING WORK

- a. Within thirty days, prior to the commencement of such excavation or tunneling work, the contractor shall inform in writing the detailed layout plans, method of construction and schedule of such excavation or tunneling work to the Engineer in-charge of NTPC;
- b. In case compressed air is used in such excavation or tunneling work or any work incidental to or required for such excavation or tunneling work, the technical details and drawings of all man-locks and medical-locks together with names and addresses of all construction medical officers duly qualified and so appointed by such contractor for the purpose of such excavation or tunneling work shall be sent to the Engineer in-charge.

11.11. PROJECT ENGINEER

- a. The contractor undertaking any excavation or tunneling work shall appoint a Project Engineer for safe operation of such projects;
- b. Such Project Engineer shall exercise overall control of the operations and the activities at such project and be responsible for carrying out the activities safely.

11.12. RESPONSIBLE PERSON

- a. The contractor undertaking excavation or tunneling work at construction site of a building or other construction work shall appoint a responsible person for safe operation of such excavation or tunneling work;
- b. The name and addresses of such responsible persons shall be forwarded to the Engineer in-charge;
- c. Duties and responsibilities of the responsible person referred to above person shall include
 - i. To carry out smoothly such excavation or tunneling work;
 - ii. To inspect and rectify any hazardous situation relating to such excavation or tunneling work;
 - iii. To take remedial measures to avoid any unsafe practice or conditions relating to such excavation or tunneling work.

11.13. WARNING SIGNS AND NOTICES

- a. Suitable warning signs or notices, required for the safety of building workers carrying out the work of an excavation or tunneling, shall be displayed or erected at conspicuous places in Hindi

and in language understood by the majority of such building workers at such excavation or tunneling work;

- b. Such warning signs and notices with regard to compressed air working shall include:
 - i) The danger involved in such compressed air work;
 - ii) Fire and explosion hazards;
 - iii) The emergency procedures for rescue from such danger or hazards.

11.14. REGISTER OF EMPLOYMENT

- a. The contractor shall ensure that at a construction site of a building or other construction work where an excavation or tunneling work is being carried on, a register of employment of building workers carrying out such excavation or tunneling work is maintained and produced on demand;
- b. Periods of work of such excavation or tunneling work shall be maintained in a register on day-to-day basis and such register shall be produced on demand

11.15. ILLUMINATION

- a. All contractors carrying out excavation or tunneling work at a construction site of a building or other construction work shall provide for emergency generators on such construction site to ensure adequate illumination at all work places where such excavation or tunneling work is being carried out;
- b. In case of power failure, all workplaces where excavation or tunneling works are carried out shall be adequately illuminated

11.16. PNEUMATIC TOOLS:

Supply lines to pneumatic tools used within a tunnel are fitted with water trap or safety chain or safety wire, as the case may be.

11.17. STABILITY OF STRUCTURE DURING GENERAL EXCAVATION & TUNNELING:

The contractor shall ensure that where there is any doubt as to the stability of any structure adjoining the workplace or other areas to be excavated or where tunneling work is to be carried out –

- a. The Project Engineer shall arrange for measures like underpinning, sheet piling, shoring, bracing or other similar means to support such structure and to prevent injury to any building worker working adjacent to such structure or damage to property or equipment adjacent to such structure;
- b. Where any building worker engaged in excavation is exposed to hazard of falling or sliding material or article from any bank or side of such excavation which is more than 1.5 m above his footing, such worker shall be protected by adequate piling and bracing against such bank or side;

- c. The excavation and its vicinity shall be checked by a responsible person after every rain, storm or other occurrences carrying hazards and in case a hazard is noticed at such checking, adequate protection against slides and cave-in to prevent such hazard shall be provided;
- d. Temporary sheet piling installed for the construction of a retaining wall after excavation shall not be removed, except on the advice of the responsible person after an inspection carried out by such responsible person;
- e. Where banks of an excavation are undercut, adequate shoring shall be provided to support the material or article overhanging such bank;
- f. Excavated material shall not be stored at least 0.5 m from the edge of an open excavation or trench and the banks of such excavation or trench shall be stripped of loose rocks and other materials which may slide, roll or fall upon a building worker working below such bank;
- g. Adequate and suitable warning signs shall be put-up at conspicuous places at the excavation work to avoid any person falling into the excavations or trenches;
- h. The responsible person shall ensure at the excavation that no building worker is permitted to work where such building worker may be struck or endangered by the excavation machinery or material or article used in such excavation.

11.18. SAFE ACCESS AND EGRESS:

Ladders, staircases or ramps are provided, as the case may be, for safe access to and egress from excavation where the depth of such excavation exceeds one point 1.5 m and such ladders, staircases or ramps comply with the relevant national standards.

11.19. TRENCHES

- a. A trench or excavation shall be protected against falling of a person by suitable measures if the depth of such trench or excavation exceeds 1.5 m and such protection shall be an improved protection in accordance with the design and drawing of a Professional Engineer, where such depth exceeds 4 m;
- b. Where the depth of a trench requires two lengths of sheet piling, one above the other, the lower piling shall be set inside the bottom strings or wales of the upper piling and such sheet piling shall be driven down and braced as the excavation continues;
- c. All metal sheet piles used in excavation or a trench shall be welded end-to-end and secured by other similar means.

11.20. POSITIONING AND USE OF MACHINERY:

Any machinery used in excavation and tunneling work shall be positioned and operated in such a way that such machinery will not endanger the operator of such machinery or any other person in the vicinity.

11.21. BREATHING APPARATUS:

Suitable breathing apparatus shall be provided to a building worker while working in compressed air environment for his use at excavation or tunneling work and such breathing apparatus shall be maintained in good working condition at all times.

11.22. SAFETY MEASURES FOR TUNNELING OPERATIONS

- a. Where there is a danger of falling or sliding of material from the roof face or wall of a tunnel, adequate measures such as shoring, supporting by means of rock bolts, segments or steel sets shall be taken for the safety of building workers;
- b. The excavated areas shall be made safe by use of suitably designed and installed steel sets, rock bolts or similar other safe means;
- c. The responsible person shall examine and inspect the workplaces in a tunnel before the commencement of work in such tunnel and at regular intervals thereafter to ensure safety of the building workers in such tunnel;
- d. The portal areas of a tunnel with loose soil or rock, likely to cause injury to a person shall be adequately protected with supports.

11.23. SURROUNDINGS OF A SHAFT

- a. Surroundings of a shaft used in excavation or tunnel work shall be protected from being washed away by construction of sufficient height;
- b. Where a building worker is required to enter a shaft at an excavation or tunneling work, safe means of access shall be provided for such entry;
- c. Every shaft at excavation or tunneling work shall be provided with a steel casing, concrete piping, timber shoring or other materials of adequate strength for the safety of building workers working in such shaft;
- d. Such casing and bracing shall be provided to shafts at an excavation or tunneling work according to the appropriate design for such casing and bracing;
- e. A reinforced concrete raft and beam shall be provided around the opening of a shaft at an excavation or tunneling work if the ground surrounding such opening is unstable or unsafe.

11.24. LIFT FOR SHAFT:

Lift shall be provided for transport of building workers and materials or articles at an excavation or tunneling work required to descend more than 50 m in a shaft.

11.25. MEANS OF COMMUNICATION

Reliable and effective means of communication such as telephone or walkie-talkie shall be provided and maintained in working order for arranging better and effective communication at an excavation or tunneling work at the following locations, namely:

- i. Working chamber of an excavation;
- ii. Intervals of hundred meters along the tunnel;
- iii. Working chamber side of a man lock near the door of such man lock;
- iv. Interior or each chamber of a man lock;
- v. Location conspicuous lock attendant's situation;
- vi. A compressor plant;

- vii. A first-aid station, and
- viii. Outside the portal or the top of a shaft;
- ix. Such number of bells and whistles shall be made available at all times at the locations as are necessary for the safety of persons at such locations.

11.26. SIGNALS:

The standard audio or video signals shall be used in excavation or tunneling work and conspicuously located or displayed near entrance to the workplace and in such other locations as may be necessary to bring such signals to notice of all building workers employed in such excavation or tunneling work.

11.27. CLEARANCES

- a. The minimum lateral clearances of 0.5 m shall be maintained between any part of a vehicle and any fixture or any equipment used in an excavation or tunneling work after allowing the throw or swing of such fixture or equipment;
- b. The overhead clearance for a locomotive drive at excavation or tunneling work shall not be less than 1.20 m above the seat of such driver and not less than 2 m above the platform where such driver stands or of any other dimension in accordance with the approved standard.

11.28. SHELTERS:

The adequate number of shelters for the safeguard of the building workers are provided where, in the course of working, they are liable to be struck by a moving vehicle or other material handling equipment in a tunnel.

11.29. USE OF INTERNAL COMBUSTION ENGINE:

No internal combustion engine shall be used underground in excavation or tunneling work unless such engine is so constructed that the air entering the engine gets cleared before entry and the engine emits no fumes or sparks.

11.30. INFLAMMABLE OILS:

Inflammable oils with the flash point below the working temperature that is likely to be encountered in a tunnel shall not be used in excavation or tunneling work.

11.31. COUPLING AND HOSES:

All high-pressure hydraulic hoses and couplings shall be adequately protected against any possible damage in excavation or tunneling work.

11.32. HOSE INSTALLATION:

All hydraulic lines and plants working at a temperature exceeding 750 c shall be protected by adequate insulation or otherwise against accidental human contact in excavation or tunneling work.

11.33. FIRE RESISTANT HOSES:

No fire hydraulic hoses other than fire resistant hydraulic hoses are used when hydraulically activated machinery and equipment are employed in tunnels.

11.34. FLAMEPROOF EQUIPMENT:

Only flameproof equipment of appropriate type as per approved standards shall be used where there is a danger of flammable or explosive atmosphere being prevalent inside the tunnel.

11.35. STORING OF OIL AND FUEL UNDERGROUND:

All oils, greases or fuels stored underground in excavation or tunneling work shall be kept in tightly sealed containers and in fire resistant areas at safe distances away from explosive and other flammable chemical and appropriate flameproof installation shall be used in such storage areas.

11.36. USE OF GASES UNDERGROUND

- a. Petrol or liquefied petroleum gas or any other flammable substances shall not be used or stored inside the tunnel except with the prior approval of the Project Engineer;
- b. After the use of the petroleum or liquefied petroleum gas, or highly inflammable substances, all remaining petroleum or liquefied petroleum gas or highly inflammable substances shall be removed immediately from such tunnel;
- c. No oxy-acetylene gas shall be used in a compressed air environment in excavation or tunneling work.

11.37. WATER FOR FIRE FIGHTING

- a. Adequate number of water outlets shall be provided on excavation or tunneling work and readily made accessible throughout the tunnel for fire fighting purposes and such water outlets shall be maintained for effective fire lighting;
- b. All air locks shall be equipped with fire fighting facilities at excavation or tunneling work;
- c. An audible fire alarm shall be provided to warn the building workers whenever a fire breaks out on an excavation or tunneling work;
- d. Adequate number and types of fire extinguishers, in accordance with relevant national standards, shall be provided and made readily available to fight any outbreak of fire at an excavation or tunneling work;
- e. Fire extinguishers with vaporizing liquids and high pressure carbon dioxide shall not be used in tunnels or other confined spaces;
- f. The instructions regarding steps to be followed to fight outbreak of fire, at an excavation or tunneling work, written in Hindi or local language understood by the majority of the building workers employed on such excavation or tunneling work, shall be displayed at conspicuous and vulnerable places of such excavation or tunneling work.

11.38. FLOODING

- a. Water tight bulkhead doors shall be installed at the entrance of a tunnel to prevent flooding during a tunneling work where more than one tunnel is driven from a shaft;
- b. All necessary measures shall be taken to ensure that no building worker is trapped in any isolated section of a tunnel when any bulkhead door of such tunnel is closed;
- c. Where there is likelihood of flooding or water rushing into a tunnel during a tunneling work, arrangements shall be made for immediate starting of water pumps to take out water of such flooding or water rushing and for giving alert signals to the building workers and other persons to keep them away from danger.
- d. Airtight steel curtains shall be provided in areas liable to flooding at tunneling work and in case of descending tunnels, such curtains shall be provided in the top half of such tunnels to ensure the retention of pockets of air for rescue purpose.

11.39. REST SHELTERS

- a. Where building workers employed in a compressed air environment in a tunneling work are required to remain at the work site for one hour or more after de-compression from pressure exceeding one bar, adequate and suitable facilities shall be provided for such building workers to rest;
 - a. Every man-lock, medical-lock and any other facility inside these locks in a tunneling work shall be maintained in a clean state and in good repairs;
 - b. A first-aid room shall be provided and readily available at a construction site of a tunneling work;
 - c. Each man-lock attendant at the station shall be provided with a first-aid box.

11.40. PERMISSIBLE LIMIT OF EXPOSURE OF CHEMICALS

- a. The working environment in a tunnel or a shaft in which building workers are employed shall not contain any of the hazardous substances in concentrations beyond the permissible limits;
- b. The responsible person referred to shall conduct necessary test before the commencement of a tunneling work for the day and at suitable intervals as fixed by the Engineer in-charge, to ensure that the permissible limits of exposure are not exceeded and a record of such test shall be maintained and made available for inspection.

11.41. VENTILATION:

All working areas in a free air tunnel shall be provided with the approved ventilation system and the fresh air supplied in such tunnel shall not be less than 6 m³ per minute for each building worker employed underground in such tunnel and the free air-flow movement inside such tunnel not less than 9 m³ per minute.

11.42. AIR SUPPLY INTAKE POINT:

The air intake points for all air compression shall be located at places where such intake air does not get contaminated with dust, fumes, vapor and exhaust gases or other contaminants.

11.43. EMERGENCY GENERATORS

- a. Every compressed air system in a tunnel shall be provided with emergency power supply system for maintaining continued supply of compressed air in such compressed air system, which shall be capable of operating air compressor and ancillary systems of such compressed air system;
- b. The emergency power supply system shall be maintained and made readily available at all times.

11.45. AIR MAINS:

Every air-main supplying air to the working chamber, man-lock or medical-lock used at an excavation or tunneling work shall be protected against accidental damage and where it is not practicable to provide such protection, a stand-by air-main shall be provided.

11.46. BULKHEAD AND AIR LOCKS

- a. A bulk head or air tight diaphragms retaining compressed air, when used within a tunnel or a shaft, shall be constructed to withstand the maximum pressure at 1.25 the maximum working pressure of such bulk head or diaphragm and such bulk head or diaphragm shall be tested before its each use by a responsible person to ensure that such bulk head or diaphragm is in proper working order;
- b. Such responsible person shall keep the record of each test and such record shall be produced for inspection.
- c. The bulk head or diaphragm shall be made of sound material of adequate strength, which shall be able to withstand the maximum pressure on which they are subjected to at any time of their use;
- d. A bulkhead anchorage and air lock shall be tested at its work place at an excavation or tunneling work immediately after their installation at such place.

11.47. DIAPHRAGM:

All diaphragms, which are in the form of horizontal decks across a shaft used at excavation or tunneling work, shall be securely anchored

11.48. PORTABLE ELECTRICAL HAND TOOLS:

All portable electrical hand tools and inspection lamps used underground or in a confined space shall be operated at a voltage not exceeding 24 V.

11.49. CIRCUIT BREAKER

- a. Adequate numbers of differential ground fault circuit breakers shall be installed for every electrical distribution system and its sub-systems used at an excavation or tunneling;
- b. Work and the sensitivity of each of circuit breaker shall be adjusted in accordance with the requirement set out in accordance with the approved standards;
- c. No semi-enclosed fuse unit shall be used in underground place.

11.50. TRANSFORMER:

The contractor shall ensure no transformer is used in any section of a tunnel under compressed air unless such transformer is of the dry type and conforms to the approved standards.

11.51. LIVE WIRES:

There shall be no exposed live wire in working areas at an excavation or tunneling work which are accessible to building workers other than those authorized to work on such live lines.

11.52. WELDING SETS:

All welding sets used in a tunnel shall be of adequate capacity and of suitable type, duly approved.

11.53. QUALITY AND QUANTITY

- a. Every working chamber at an excavation or tunneling work where compressed air is used, the supply of such air shall be maintained at not less than 0.3 m³ per minute per person working therein;
- b. A reserve supply of compressed air shall be made available at all times for man-locks and medical locks used at a tunneling work;
- c. The air supplied in a compressed air environment at a tunneling work shall be, as far as practicable, free from contaminants, namely, dust, fumes and other toxic substances.

11.54. WORKING TEMPERATURE:

The temperature in any working chamber at an excavation or tunneling work where building workers are employed shall not exceed 29^o c and the arrangement shall be maintained for kipping records in which the temperatures measured by dry bulb and wet bulb inside such working chamber once in every hour and for producing such records for inspection on demand.

11.55. MAN-LOCKS AND WORKING IN COMPRESSED AIR ENVIRONMENT

- a. Man-locks used at a tunneling work shall be of adequate strength, made of sound material and designed to withstand any pressure, internal or external, to which it may be subjected in the normal use or in an emergency;
- b. Doors of man-locks at an excavation or tunneling work shall be made of steel and used at a tunneling work for keeping the work airtight and devices shall be provided for sealing the doors when such locks are under pressure. The anchorage of a man-lock used at tunneling work shall have adequate strength to withstand the pressure exerted by air on the man-lock. There shall be adequate room available for the workers for working in the man-locks;
- c. Where work is carried out in any compressed air tunnel, a Man-lock in accordance with the approved standards shall be used;
- d. Where a man-lock is used, safety Instructions in Hindi and in local language understood by majority of building workers employed there, shall be displaced at conspicuous places;
- e. Except in an emergency, compression and de-compression operations shall be carried out in a man-lock and in an emergency any material-lock may be used;
- f. A record of compression and de-compression shall be kept in writing and produced for inspection on demand;
- g. Material lock shall be used with the permission of the Engineer in-charge where it is impracticable to install both the man-lock and the material-lock at;
- h. The man-lock at tunneling work shall not be used for any purpose

- i. other than compression or de-compression of building workers;
- j. No de-canting of building workers at tunneling work shall be carried
- k. out without prior approval of the Engineer in-charge except in an emergency;
- l. In case a building worker collapses or is taken ill during his de-compression in a man-lock, the lock attendant of such man-lock shall raise the pressure to a level equal to the maximum pressure which that building worker was exposed to in the working chamber prior to such de-compression and such lock attendant shall immediately report the matter relating to such collapse to the medical lock attendant and medical officer on duty;
- m. A building worker who had previously received training with a trained building worker to work in a compressed air environment at tunneling work shall be employed to work independently in such a compressed air environment;
- n. A building worker who had undergone three de-compressions from a pressure exceeding one bar in a period of eight hours at tunneling work shall not be allowed to enter a compressed air environment except for the purpose of carrying out rescue work;
- o. A building worker employed in a compressed air environment for a period of eight hours in a day at tunneling work shall not be employed again in such environment unless he has spent not less than twelve consecutive hours of rest at atmospheric pressure;
- p. No building worker shall be engaged in a compressed air environment at a pressure, which exceeds three bars at a tunneling work unless prior permission, in writing, has been obtained from the Engineer in-charge;
- q. No building worker shall be employed in a compressed air environment for more than fourteen consecutive days in a month;
- r. A register of employment of all building workers in compressed air environment shall be maintained;
- s. An identification badge shall be supplied to a building worker employed in compressed air environment;
- t. The badge of a building worker shall contain particulars of his name, location of the medical-lock allotted to him for work, the telephone number of the Construction Medical Officer concerned for his treatment and the instructions in case of his illness of unknown and doubtful causes;
- u. Record of all identification badges supplied to building shall be kept in a register;
- v. Every building worker whose name appears in the register shall wear the badge supplied to him at all times during his duty hours;
- w. Suitable warning signs shall be displayed in the compressed air for the prohibition of the following, namely:
 - i) Use of alcoholic drinks;
 - ii) Use and carrying of lighters, matches or other sources of ignition;
 - iii) Smoking; and

iv) No entry to person who has consumed alcoholic drink

11.56.SAFETY INSTRUCTION:

All building workers employed in compressed air environment at tunneling work shall follow the instructions issued for their safety in the course of such employment.

11.57.MEDICAL-LOCK

- a. A suitably constructed medical lock shall be maintained at tunneling work where building workers are employed in a working chamber at a pressure exceeding one bar;
- b. Where more than one hundred building workers are employed in a compressed air working environment exceeding one bar at tunneling work, one medical-lock is provided for every one hundred building workers or part thereof and such medical lock shall be situated as near as possible to the main-lock used at such tunneling work.

12.0. SAFETY IN PILING WORK

12.1. GENERAL PROVISIONS

- a. All pile driving equipment shall be of good design and sound construction, taking into account the ergonomic principles and properly maintained;
- b. A pile driver shall be firmly supported on a heavy timber sill, concrete bed or other secured foundation;
- c. In case a pile driver is required to be erected in dangerous proximity to an electrical conductor, all necessary precautions shall be taken to ensure safety;
- d. The hoses of steam and air hammer shall be securely lashed to such hammer so as to prevent them from whipping in case of connection or break;
- e. Adequate precaution shall be taken to prevent the pile driver from over turning and hammer from missing the pile;
- f. A responsible person for inspecting pile-driving equipment shall inspect such equipment before taking it into use and takes all appropriate measures as required for the safety of building workers before commencing piling work by such equipment;
- g. Where there is any question of stability of a structure for its adjoining areas to be piled, such structure shall be supported, where necessary, by underpinning, sheet piling, shoring, and bracing or by other means to ensure safety and stability of such structure and to prevent injury to any person.

12.2. PROTECTION OF OPERATOR:

The operator of every pile driving equipment shall be protected from falling objects, steam, cinders or water by substantially covering or otherwise or by other means.

12.3. INSTRUCTION TO AND SUPERVISION OF BUILDING WORKERS WORKING ON PILE-DRIVING EQUIPMENT:

Every building worker working on a pile driving equipment shall be given instructions regarding safe work procedure to be followed in piling operation and shall be supervised by a responsible person throughout such work.

12.4. ENTRY OF UNAUTHORIZED PERSON:

The contractor shall ensure at a construction site of a buildings or other construction work that all piling areas where pile-driving equipment is in use are effectively cordoned off to prevent entry of unauthorized persons.

12.5. INSPECTION AND MAINTENANCE OF PILE DRIVING EQUIPMENT

- a. Pile-driving equipment shall not be taken into use until it has been inspected by a responsible person and found to be safe for such use;
- b. A responsible person for such inspection at suitable intervals to ensure safety to the building worker working on such equipment shall inspect pile driving equipment in use;

- c. All pile lines and pulley blocks shall be inspected by a responsible person before the beginning of each shift of piling operations.

12.6. OPERATION OF PILE-DRIVING EQUIPMENT

- a. Only experienced and trained building worker shall operate pile driving so as to avoid any probable danger from such operation;
- b. Pile-driving operations shall be governed generally prevalent and accepted signals so as to prevent any probable danger from such operations;
- c. Every building worker employed in pile driving operation or in the vicinity of such pile driving operation shall wear ear protection and safety helmet or hardhat and safety shoes;
- d. Piles shall be prepared at a distance, at least equal to twice the length of the longest pile, from the place of pile-driving operations;
- e. When a pile driver is not in use, the hammer of such pile driver shall be blocked at the bottom of the heads of such pile driver.

12.7. WORKING PLATFORM ON PILING FRAMES:

Where a structural tower supports the lead of a pile driver, leads at which it is necessary for the building workers to work and such platforms except on the hammer of such pile driver or lead sides of such platform and where such platforms cannot be provided with such railing and toe boards, a safety belt shall be provided to each such building worker.

12.8. PILE TESTING

- a. The testing of pile shall be conducted under the supervision of a responsible person for such testing;
- b. All practicable measures like displaying of warning notices, barricading the area and other similar measures shall be taken to protect the area where the pile testing is carried out;
- c. Entry to a pile testing area shall be prohibited to general public to ensure safety.

12.9. PILING, SHORING AND BRACING

- a. Planks used for sheet piling in excavation or tunneling work shall be of sound material with adequate strength;
- b. Shores and braces used in excavation or tunneling work shall be of adequate dimensions and so placed as to be effective for their intended purposes;
- c. Earth supported shores or braces used in excavation or tunneling work shall bear against a footing of sufficient area and stability to prevent the shifting of such shores or braces.

13.0. SAFETY IN THE ERECTION, USE AND DISMANTLING OF SCAFFOLDS

13.1. SCAFFOLD CONSTRUCTION

- a. Every scaffold and every component thereof shall be of adequate construction, made of sound material and free from defects and safe for the purposes for which it is intended for use;
- b. In case bamboo is used for scaffolding, such bamboo shall be of suitable quality, good condition, free from protruding knots and stripped off to avoid any injury to building workers during handling such bamboo;
- c. All metal scaffolds used in building or other construction work shall conform to the approved standards;

13.2. SUPERVISION BY A RESPONSIBLE PERSON: No scaffold shall be erected, added, altered or dismantled except under the supervision of a responsible person.

13.3. Maintenance

- a. The scaffold used in building or other construction work shall be maintained in good repairs and the measures taken against its accidental displacement or any other hazard;
- b. No scaffold or part thereof shall be partly dismantled and allowed to remain in such a condition unless –
 - i) The stability or safety of the remaining portion of such scaffold has been ensured by a responsible person for the safety of such scaffolds;
 - ii) In case the remaining part of such scaffold cannot be used by the building workers, necessary warning notice written in Hindi and in a language understood by the majority of the building workers that such scaffold is unfit for use, shall be displayed at the place where such scaffold is erected.

13.4. STANDARDS, LEDGERS, PUTLOGS

- a. Standards of a scaffold shall be plumb, where practicable, fixed sufficiently close together to secure the stability of such scaffold having regard to all the possible working situations and conditions for the intended use of such scaffold, spaced, as close as practicable, to ensure safety and stability of such scaffold;
- b. Adequate measures are taken to, prevent displacement of a standard of a scaffold either by providing sole plate or a base plate, as necessary;
- c. Ledgers of metal scaffold are placed at vertical intervals with due regard to safety and stability of such scaffold;
- d. Bamboo ledgers are kept as nearly as possible and are placed and fastened to the standards of a scaffold with due regard to the stability of such scaffold.

13.5. WORKING PLATFORM

- a. Working platform shall be provided around the face or edge of a building adjoining at every upper most permanent floor of such building under construction and at any level where construction work of such building is carried out;
- b. A platform shall be designed to suit the number of building workers to be employed on each bay of a scaffold work on such platform and the materials or articles and tools to be carried with them in such bay;
- c. The safe working load and the number of building workers to be employed in each bay of a scaffold shall be displayed for the information of all the building workers employed at such construction site.

13.6. BOARD, PLANK AND DECKING

- a. Board, plank and decking used in the construction of a working platform shall be of uniform size and strength and shall be capable of supporting the load and number of building workers keeping in view the safety of such building workers;
- b. Metal decking, which forms part of a working platform, shall be provided with non-skid surface;
- c. No board or plank which forms the working platform shall be projected beyond its end support unless it is effectively prevented from tripping or lifting and board, plank or decking shall be fastened and secured;
- d. At any one time, not more than two working platforms per bay, shall be used to support building workers or materials or articles at such bay;
- e. Adequate measures shall be taken to prevent injury which may be caused by falling material and objects by using safety nets or other suitable means;
- f. Concrete, other debris or materials shall not be allowed to accumulate at any platform on a scaffold;
- g. Where a work is to be done at the end of a wall, working platform at such workplace shall be faced or, wherever practicable, at least 0.6 m beyond the end of such wall.

13.7. REPAIR OF DAMAGED SCAFFOLD

- a. No building worker shall be permitted to work on a scaffold that has been damaged or weakened unless adequate safety measures have been taken to ensure the safety of such building worker;
- b. Necessary warning signs shall be displayed at such places where repairs of scaffold are undertaken.

13.8. OPENING

- a. There shall be no opening in any working platform except for allowing access to such working platform;
- b. Wherever opening on a platform is unavoidable, necessary measures for protection against falling of objects or building workers from such platform shall be taken by providing suitable safety nets, belts or any other similar means;
- c. Access from one working platform to another platform on a scaffold, if required, shall be provided with suitable and safe ladder for the use of building workers working on such platforms;

- d. Every opening or shaft in the floor shall be provided with suitable means to protect the fall of a person or material by providing suitable fencing or railing of height not less than 900 mm.

13.9. GUARDRAILS: Every side of a working platform from which a person is liable to fall shall be provided with suitable and safe guardrails and toe board of adequate strength to prevent fall of any building worker, material or tools from such platform.

13.10. SCAFFOLD USED BY BUILDING WORKERS OF DIFFERENT EMPLOYERS

- a. Where a scaffold or a part of a scaffold is used, which has previously been used by another employer for his building workers, such scaffold or part thereof shall be used only after its inspection and examination by a responsible person for ensuring that such scaffold or part thereof is safe and fit for such use;
- b. If any rectification, alteration or modification in a scaffold or part thereof, needed to suit its use, shall be made in consultation with the responsible person.

13.11. PROTECTION AGAINST ELECTRIC POWER LINE:

The contractor shall ensure that all necessary and practical measures for protection are taken to prevent any building worker, working on a scaffold, from coming into contact with the electric wires or dangerous equipment.

13.12. SCREENING NET AND WIRE NETS:

Where a scaffold is erected in an area where the construction activities may pose hazards to pedestrians or vehicular traffic nearby from the falling of objects, wire nets or screening nets shall be used to envelope such scaffold.

13.13. TOWER SCAFFOLD

- a. The height of every tower scaffold used in building or other construction work shall not be more than eight times the lesser to the base dimension of such scaffold;
- b. A tower scaffold shall be lashed to a building or a fixed structure before being used by the building workers;
- c. Any tower scaffold which can be moved or castered shall be –
 - i) Constructed with due regard to the stability and, if necessary, adequately weighted at the base;
 - ii) Used only on plain and even surface; and
 - iii) Has casters provided with positive locking devices to hold such scaffold in position;
- d. No building worker shall remain on board scaffold or leave behind tools and material when it is being shifted from one position to another position.

13.14. GEAR FOR SUSPENSION OF SCAFFOLD

- a. Chains, ropes or lifting gears used for suspension of a scaffold shall be of adequate strength, made of sound material and suitable for the purpose of their use and maintained in good repairs;
- b. Chains, wires, ropes or metal tubes used for the suspension of a scaffold shall be:

- i) Properly and securely fastened to every anchorage point and to the scaffold ledgers of other main supporting members used for the support of such scaffold; and
- ii) So positioned as to ensure stability of the scaffold.

13.15. TRESTLE SCAFFOLD AND CANTILEVER SCAFFOLD

- a. No trestle scaffold shall be constructed with more than three tiers or if its working platform is more than 4.5 m above the ground or floor or other surface upon which such scaffold is erected;
- b. Trestle scaffold shall be designed by professional engineer and shall have the approval of the Engineer in-charge before being taken into use.
- c. No trestle scaffold shall be erected on a suspended scaffold;
- d. No cantilever or jib scaffold shall be used unless it is adequately supported, fixed and anchored on opposite side of its support and have out triggers of adequate length and, where necessary sufficiently, supported and braced to ensure safety and stability of such scaffold;
- e. No working platform resting on bearers let into a wall at one end and without other support shall be used unless such bearers are of adequate strength, braced through the wall and securely fastened on the other side.

13.16. SCAFFOLD SUPPORTED BY BUILDING

- a. No part of a building shall be used as support or part of a scaffold unless such part of the building is made of sufficient strength and made of sound material to afford safe support;
- b. Overhanging eaves gutters shall not be used for supporting scaffold;
- c. Suspended scaffold shall be made of in accordance with the approved standards before being used by the building workers.

13.17. USE OF WINCHES AND CLIMBERS FOR SUSPENDED SCAFFOLD

- a. No scaffold shall be raised or lowered by winches or climbers unless such scaffold is made of sound material, adequate strength and has been tested and certified safe for use of winches or climber by a competent person before being taken into use;
- b. All suspended scaffolds counter-balanced by counter weights shall be of approved types before being taken into use for building or other construction work;
- c. The working platform of a suspended scaffold shall be securely fastened to the building or structure as to be safe and to prevent such platform from swing;
- d. The safe working load that a suspended scaffold can carry, shall be displayed where such scaffold is being used

13.18. SAFETY DEVICES FOR SUSPENDED SCAFFOLD

- a. Every suspended scaffold, raised or lowered by the winches or climbers, shall be provided at each of its suspension point with a safety rope with automatic safety device mounted on each of such rope so that such safety rope with such automatic safety device support the platform of such

scaffold in the event of failure of the primary suspension wire ropes, winches, climbers or any part of the mechanism used for raising or lowering such suspended scaffold;

b. Provided that the clause (a) shall not apply -

- i) Where the platform of such scaffold is supported at two independent suspension wire rope at or near each end of such platform so that in the event of failure of one of such suspension wire rope, the other wire rope is capable of sustaining the weights of such platform and its load and prevent it from tilting; or
- ii) Where a system is incorporated which operates automatically to support the platform of such scaffold and its load in the event of failure of the primary suspension wire rope of such scaffold.

14.0. SAFETY IN THE ERECTION OF STRUCTURAL FRAME & FORMWORK

14.1. GENERAL PROVISION

- a. The trained building worker under the direct supervision of a person, responsible for structural frame and formwork, shall be employed for erection of such structural frame or formwork, dismantling of building and structure and performance of and engineering work formwork, false work and shoring work;
- b. Adequate measures shall be taken to guard against hazards arising from any temporary state of weakness or unsuitability of a structure.

14.2. FORMWORK, FALSE WORK AND SHORING

- a. Formwork and false work shall be so designed, constructed and maintained that such formwork and false work are able to support the load that may be imposed on them;
- b. Such formwork shall be so erected that working platform, means of access, bracings, means of handling and stabilizing could easily be fixed with such formwork.

14.3. ERECTION OR DISMANTLING OF STEEL AND PREFABRICATED

- a. Erection or dismantling of any pre-fabricated structure shall be made safe against danger by using appropriate means such as ladders, gangways or fixed platforms, buckets, boatswains chair or other appropriate means suspended from lifting appliances, safety harness, life lines, catch nets or catch platforms, power-operated mobile working platforms etc.;
- b. The work of erection or dismantling of buildings or structures or formwork or false work or shoring or any other civil engineering work shall be carried out by trained building workers under the supervision of a person responsible for such work;
- c. Steel or prefabricated structures shall be so designed and made that such structures can be safely transported or erected; and weight of each unit of such structures shall be clearly marked on such unit;
- d. The design of each such part shall maintain stability of each part of the structures referred to in clauses above when erected, and to prevent danger, the design shall explicitly take into account –
 - i) The relevant conditions and methods of attachment in the operations of stripping, transport, storing and temporary support during erection of such parts;
 - ii) Safeguards, such as provision of railings with working platforms, and for mounting such railings and platforms easily on the structural steel or prefabricated parts;
- e. The hooks and softer devices built in or provided on the structural steel or prefabricate parts that are required for lifting and transporting such parts shall be so shaped, dimensioned and positioned to withstand the stresses to which such hooks or other devices are subjected;

- f. Prefabricated parts made of concrete shall not be stripped or erected before such concrete has set and hardened sufficiently to the extent provided for in the plans, and such parts are examined by the responsible person for any sign of damage before their use;
- g. Store-places shall be so constructed that –
 - i) There shall be no risk of structural steel or prefabricated parts falling or overturning;
 - ii) Storage conditions shall generally ensure stability and avoid damage having regard to the method of storage and atmospheric conditions; and
 - iii) Racks shall be set on firm ground and designed so that units cannot move accidentally in such store-places;
- h. Structural steel or pre-fabricated parts shall not be subjected to stresses prejudicial to their stability while they are stored or transported or raised or set down;
- i. Tongs, clamps and other appliances for lifting structural steel and prefabricated part shall be:
 - i) In such shape and dimensions as to ensure a secure grip without damaging and marked with the maximum permissible load in the most unfavourable lifting conditions; and
 - ii) Structural steel or pre-fabricated parts shall be lifted by such methods and appliances that prevent them from spinning accidentally;
- j. Structural steel or pre-fabricated parts shall be provided with railings and working platforms before raising such parts to prevent any danger of falling of building workers, materials or articles at the time of any work with such parts;
- k. All reasonably practical measures shall be taken to avoid injury to building workers, building structure or equipment while structural steel or pre-fabricated parts are handled or stored or transported or raised or lowered;
- l. Structures shall not be worked on during violent storms or high winds or any other such hazardous situation;
- m. The risk of falling to which building workers, moving on high or sloping girders, may be exposed is limited by all means of adequate collective protection or by the use of a safety harness which shall be well secured to a sufficiently strong supports;
- n. Structural steel parts, which are to be erected at a great height, shall, as far as practicable, be assembled on the ground;
- o. When structural steel or pre-fabricated parts are being erected, a sufficiently extended area underneath the workplace shall be barricaded or guarded;
- p. Steel trusses, which are being erected, shall be adequately shored, braced or guyed until they are permanently secured in position;
- q. Structural members shall not be forced into place by the hoisting machine while any building worker is in such a position that he is likely to be injured by such operation.

14.4. FORMWORK

- a. All formwork shall be properly designed keeping in view the safety of building workers, buildings or structures;
- b. A responsible person for structural frame and formwork shall –
 - i. Inspect and examine the material, timber, structural steel and scaffolding for its strength and suitability before being taken into use;
 - ii. Lay-down procedures to cover all stages of such structural frame and formwork;
 - iii. Supervise such structural frame and formwork;
 - iv. Take all necessary steps or measure to correct any situation with a view to prevent accident or dangerous occurrence during performances of such structural frame and formwork.

14.5. DE-SHORING

- a. When shoring is removed, sufficient props shall be left in place of such shoring to prevent any possible hazard; and
- b. Deshoring shall be adequately braced and tied together with support to prevent any hazard.

15.0. SAFETY IN CONCRETE WORK

15.1. GENERAL PROVISIONS REGARDING USE OF CONCRETE

- a. All construction with the use of concrete or reinforced concrete shall be based on plans including specification of steel and concrete and other material to be used in such construction –
 - i. Giving technical details regarding methods for safe placing and handing of such materials and indicating the type, quality and arrangement of each part of a structure of such construction; and
 - ii. Explaining the sequence of steps to be taken for completion of such construction;
- b. Formwork and shores used for concrete work shall be structurally safe and properly braced or tied together so as to maintain position and shape of formwork or shores;
- c. Formwork structure used shall have sufficient catwalks and other secure access for inspection of such structure if such structure is in two or more tiers;
- d. No machinery or any object should fall below by using wire nets, screen nets etc.

15.2. PREPARATION AND POURING OF CONCRETE AND ERECTION OF CONCRETE STRUCTURE

- a. A building worker handling cement or concrete shall –
 - i) Wear close-fitting clothing, gloves, helmet or hardhat, safety goggles, proper footwear and respirator or mask to protect himself from danger in such handling;
 - ii) Keep as much of his body covered as is required to protect himself from danger in such handling;
 - iii) Take all necessary precautions to keep cement and concrete away from his skin in such handling;
- b. Lime pits shall be fenced or enclosed and filled and emptied by such devices, which do not require workers to go into the pit;
- c. Moving parts of the elevators, hoists screens bunkers, chutes, grouting equipment used for concrete work and of other equipment used for storing, transport and other handling ingredients of concrete shall be securely fenced to avoid contact of building workers with such moving parts;
- d. Screw conveyors used for cement, lime and other dusty materials shall be completely enclosed.

15.3. BUCKETS

- a. Concrete buckets used with cranes or aerial cableways shall be free from projections from which accumulations of concrete could fall;
- b. Movements of concrete buckets shall be governed by signals necessary to avoid any danger by such movements.

15.4. PIPES AND PUMPS

- a. A scaffolding carrying a pipe for pumped concrete shall be strong enough to support such pipe at a time when such pipe is filled with concrete or water or any other liquid and carry the combined load of the all the building workers who may be on such scaffold at such time, safely;
- b. Every pipe for carrying pumped concrete shall be –
 - i) Securely anchored at its end point and at each curve on it;
 - ii) Provided near the top of such pipe with an air release valve;
 - iii) Securely attached to a pump nozzle by a bolted collar or other adequate means;
- c. The operation of concrete pumps shall be governed by standard signals;
- d. Building workers employed around a concrete pump shall wear safety goggles;

15.5. MIXING AND POURING OF CONCRETE

- a. The concrete mixture shall not contain any material, which may unduly affect the setting of such concrete, weaken such concrete or corrode steel used with such concrete;
- b. When dry ingredients of concrete are being mixed in confined spaces such as silos –
 - i) The dust shall be exhausted at the time of such mixing and
 - ii) In case the dust the dust cannot be exhausted, as specified, the workers shall wear respirators at the time of such mixing;
- c. When concrete is being tipped from buckets, building workers shall be kept out of the range of any kickbacks of such buckets;
- d. Loads shall not be dumped or placed on settling concrete.

15.6. CONCRETE PANELS AND SLABS

- a. All parts of a concrete panel or concrete slab shall be hoisted uniformly;
- b. Concrete panels shall be adequately braced in their final positions and such bracings shall remain in such positions until such panels are adequately supported by other parts of the construction for which such panels are used;
- c. Temporary bracings of concrete panels shall be securely fastened to prevent any part of such panels from falling when such panels are being moved.

15.7. STRESSED AND TENSIONED ELEMENTS

- a. Building workers shall not stand directly over jacking equipment while stressing of concrete girders and beams is being done;
- b. A pre – stressed concrete unit shall not be handled except at points on such unit and by the devices specified for such work by the manufacture of such devices;
- c. During transport, pre-stressed concrete girders or concrete beams shall be kept upright by bracing or other effective means;

- d. Anchor fittings for pre-tensioned strands of pre-stressed concrete girders of concert beams are kept in a safe condition in accordance with the instruction of manufacturer of such anchor fittings;
- e. Building workers shall not stand behind jacks or in line with tensioning elements and jacking equipment during tensioning operations of pre-stressed concrete girders of concrete beams;
- f. Building workers do not cut wires of pre – stressed concrete girders or concrete beams under tension before such concrete used of such girder or beams is sufficiently hardened.

15.8. VIBRATORS

- a. A building worker, who is in good physical condition, shall operate vibrators used in concreting work;
- b. All practical measures shall be taken to reduce the amount of vibration transmitted to the operators working in concreting work and
- c. When electric vibrators are used in concreting work
 - i) Such vibrators shall be earthed;
 - ii) The leads of such vibrators shall be heavily insulated; and
 - iii) The current shall be switched off when such vibrators are not in use.

15.9. INSPECTION AND SUPERVISION

- a. A person responsible for a concreting work shall supervise the erection of the formwork, shores, braces and other supports used for such concreting work, make a through inspection of every formwork to ensure that such formwork is safe, regularly inspect the formwork, shores, braces, reshores and other supports during the placing of concrete, keep all records of inspections referred to above at the workplace relating to such inspection and produce them for inspection upon the demand.
- b. Any unsafe condition, which is discovered during the inspections, shall be remedied immediately.

15.10. BEAMS, FLOORS AND ROOFS

- a. Horizontal and diagonal bracings shall be provided in both longitudinal and transverse direction as may be necessary to provide structural stability to formwork used in concreting work and shores used in such concreting work shall be properly seated on top and bottom and secured in their places;
- b. Where shores used in concreting work rest upon the ground, base plates shall be provided for keeping such shores firm and in level;
- c. Where the floor to ceiling height of a concreting work exceeds 9 m or where the formwork deck used in such concreting work is supported by shores constructed in two or more tiers, or where the dead, live and impact loads on the formwork used in such concreting work exceed 700 kilogram per m², the structure of such formwork shall be designed by a professional engineer in the relevant field and the specifications and drawings of such formwork kept at such construction site and produced on demand.

- d. Where a professional engineer designs the structure of the formwork used in concreting work, such engineer shall be responsible for the supervision of construction and the stability of such structure.

15.11. STRIPPING

- a. Stripping of formwork used in concreting work shall not commence until the concrete on such formwork is fully set, examined and certified to this effect by the responsible person and record of such examination and certification is maintained;
- b. Stripped forms in concreting work shall be removed or stock piled promptly after stripping from all areas in which building workers are required to work or pass;
- c. Protruding nail, wire ties and other formwork accessories not required for subsequent concreting work shall be pulled, cut or otherwise made safe.

15.12. RE-SHORING

- a. Re-shoring used in concreting work shall be provided to a slab or beam for its safe support after its stripping or where such slab or beam is subjected to superimposed loads due to construction above such slab or beam;
- b. The provisions applicable to shoring in a concreting work shall also be applicable to reshoring in such work or pass.

16.0. SAFETY IN CONSTRUCTION, REPAIR & MAINTENANCE OF STEEP ROOFS

16.1. WORK ON STEEP ROOFS:

All practicable measures shall be provided to protect the building workers against sliding when carrying outwork on steep roofs.

16.2. CONSTRUCTION AND INSTALLATION OF ROOFING BRACKETS

- a. Roofing brackets shall be constructed to fit the pitch of steep roof and such brackets shall be used to provide level working platform;
- b. Roofing bracket shall be secured in its place by nailing pointed metal projections attached to the underside of such bracket and securely driven into a steep roof on which it is used or secured by a rope passed over the ridgepole and tie of such roof.

16.3. CRAWLING BOARDS

- a. All crawling boards used for work on steep roofs shall be of adequate strength, made of sound material and of the type approved for the purpose of their use;
- b. Crawling boards shall be kept in good repairs and inspected by a responsible person before being taken into use;
- c. Crawling boards shall be secured to a steep roof on which it is used by ridge hooks or other effective means;
- d. A firmly fastened lifeline of adequate strength shall be strung beside each crawling board throughout its length while using such crawling boards.

17.0. SAFETY IN CATCHES PLATFORMS, HOARDINGS & CHUTES

17.1. CATCH PLATFORM

- a. Catch platform shall not be used for storage of material or as a working platform;
- b. Catch platform shall at least be of 2 m wide and inclined so that the position of outer edge of such platform is 1500 mm higher than the inner edge;
- c. The open end of catch platform shall be properly fenced to the height not less than 1 m.

17.2. HOARDINGS:

Hoardings shall be constructed when the Registering Authority / Assistant Labour Commissioner considers it necessary for protection of building workers and directs such employer to construct such hoardings.

17.3. CHUTES, ITS CONSTRUCTION AND USE

- a. Wooden or metal chutes which are at an angle of more than 45⁰ to the horizontal and used for the removal of materials shall be closed on all sides except at their openings used for receiving or discharging of materials or articles;
- b. All openings of chutes except their top openings shall be closed when not in use;
- c. Every chute –
 - i. Shall be constructed of sound material, adequate strength and suitable for the purpose it is intended for use;
 - ii. Exceeding 12 m in height shall be constructed in accordance with the design and drawings of professional engineer for such;
 - iii. A suitable warning notice shall be displayed at conspicuous locations, written in Hindi and in a local language, at the discharge end of every chute;
 - iv. Shall be cleared when debris has accumulated to a height, which can pose danger to building worker, but such clearance shall be done in no case less frequently than once a day.

18.0. SAFETY IN WORK ON OR ADJACENT TO WATER

18.1. TRANSPORT OF WORKERS BY WATER

- a. When any building worker has to proceed to or from any workplace by water for purposes of carrying on a building or other construction work, proper measures shall be taken to provide for his safe transportation and vessels used for such purpose shall be in charge of a responsible person, properly equipped for safe navigation and maintained in good condition;
- b. Maximum number of persons which can be safely carried in a vessel shall be marked plainly and conspicuously on such vessel and such number shall not be exceeded during use of such vessel for carrying persons;
- c. Adequate protecting shall be provided to the building workers in such vessel from inclement weather;
- d. Such vessel shall be manned by adequate and experienced crew;
- e. In case the bulwarks of such vessel are lower than 60 cm from the level of the deck of such vessel, the open edge of such bulwarks shall be fitted with suitable fencing to a height of at least 1 m above such deck and the post and stanchions and similar parts used in such fencing shall not be spaced more than 2 m;
- f. The number of life buoys on deck of such vessel shall at least be equal to the number of crew members of such vessel and shall not be less than two;
- g. All life buoys on deck of such vessel shall be kept in good state of maintenance and so placed that if such vessel sinks then they will remain afloat and one of such buoys shall be within the immediate reach of the Steersman of such vessel and another is situated after part of such vessel; and
- h. The position of the steersman of the vessel shall be such that he has a reasonably free view of all sides.

18.2. PREVENTION FROM DROWNING

- a. Where, on or adjacent to the workplace of any contraction site, there is water into which a building worker employed for work on such site, in the course of his employment, may fall and has the risk of drowning, suitable rescue equipment shall be provided and kept in an efficient state of ready use and measures shall be taken to arrange for the prompt rescue of such building worker from the danger of drowning and where there is a special risk of such fall from the edge of adjacent land or from a structure adjacent to or above the water, or from floating stage on such water, secure fencing shall be provided near the edge of such land, structure or floating stage, as the case may be, to prevent such fall, and such fencing may be removed or allowed to remain unerected for the time and to the extent necessary for the access of building workers to such work or the movement of material for such work;
- b. For handling rescue equipment, at least two persons knowing diving should be available at such sites.

19.0 SAFETY IN COFFERDAMS & CAISSONS

19.1 EVERY COFFERDAM AND CAISSON SHALL BE

- 19.1.1 Of good construction, sound material and of adequate strength, provided with adequate means for workers to reach safely at the top of such cofferdam or caisson in the event of an inrush of water and safe means of access to every place where workers shall be employed;
- 19.1.2 Work relating to construction, positioning, modification, dismantling of cofferdams or caissons shall be carried out under the supervision of a responsible person and inspected by the responsible person at the specified intervals;
- 19.1.3 A worker shall be allowed to work in a cofferdam or caisson after such cofferdam or caisson has been inspected and found safe by responsible person within such preceding period as approved and a record of such inspection maintained.

19.2 WORK IN COMPRESSED AIR IN A COFFERDAM OR CAISSON SHALL BE

- 19.2.1 Carried out in accordance with the procedure laid down;
- 19.2.2 Carried out by such building workers who have completed eighteen years of age and are medically examined and found fit for the work;
- 19.2.3 Carried out under the supervision of a responsible person;
- 19.2.4 If the work in cofferdam or caisson is carried out in shifts, a record of the time spent by each worker in each such shift for carrying out the work shall be maintained in a register with particulars or time taken for the compression of such building worker, if any;
- 19.2.5 At every work site or project in a cofferdam or caisson, where workers are employed to work in compressed air environment, a construction medical officer assisted by a nurse or trained first-aid attendant, shall be available at all times and there shall be one standby reserve compressor to meet the emergency.

19.3 PRESSURE PLANT AND EQUIPMENT

- 19.3.1 Pressure plant and equipment for which it is used shall be –
- 19.3.2 Properly maintained in good repairs and working condition and fitted with a suitable safety valve or other effective device to provide maximum safe discharge pressure from being exceeded at any time; a suitable pressure gauge with a dial range not less than 1.5 times and not exceeding twice the maximum working pressure, easily visible and designed to show at all times, the internal pressure in kilogram per square centimeter and marked with the maximum safe working pressure, a suitable stop valve or valves by which the pressure plant or the system of the pressure plant may be isolated from the source supply of pressure or otherwise;
- 19.3.3 Every pressure plant or equipment shall be thoroughly examined by the competent person, externally, once in every period of six months; internally, once in every period of twelve months; and by hydraulic test, once in a period of four years.

20. SAFETY IN DEMOLITION WORK

20.1 PREPARATION

- 20.1.1 All glass or similar material or article in exterior openings shall be removed before commencing any demolition work and all water, steam, electric, gas and other similar supply lines put off and suitably capped and the concerned department of the appropriate authority informed and permission obtained wherever required before commencing;
- 20.1.2 Wherever it is necessary to maintain water, gas or electric line or power during such demolition, such line shall be so located or protected with substantial coverings so as to protect it from damage and to afford safety to the building workers and the general public.

20.2 PROTECTION OF ADJACENT STRUCTURES

20.2.1 Examination of walls etc. of adjacent structures –

- i) During demolition process, the contractor shall examine the walls of all structures adjacent to the structure to be demolished to determine the thickness, method of support to such adjacent structures and;
- ii) In case, such employer has reason to believe that any of such adjacent structure is unsafe or may become unsafe during such demolition process, he shall not perform demolition activity unless stability to such unsafe adjacent structure from collapsing has been taken. All roads and open spaces adjacent to the site of demolition work shall be closed or suitably protected by bracketing.

20.3 DEMOLITION OF WALLS, PARTITIONS, ETC.

- 20.3.1 Any demolition of walls or partitions shall be proceeded in a systematic manner as per the standard safe operating practices approved and all work above each tier of any floor beams shall be completed before the safety of the supports of such beam is impaired;
- 20.3.2 Masonry shall be neither loosened nor permitted to fall in such masses or volume or weight as to endanger the structural stability of any floor or structural supports;
- 20.3.3 No wall chimney or other structure or part of a structure shall be left unguarded in such a condition that it may fall, collapse or weaken due to wind pressure or vibration;
- 20.3.4 In the case of demolition of exterior walls by hand, safe footing shall be provided for the workers employed in, such walls or partitions, which are to be demolished by hand shall be not left standing more than one storey high above the uppermost floor on which persons are working.

20.4 **METHOD OF OPERATION:** The contractor shall ensure that debris, bricks and other materials or articles are removed by means of chutes, buckets or hoists and through openings in the floors.

20.5 ACCESS TO FLOOR

- 20.5.1 Safe access to and egress from every building shall be provided at all times in the course of demolition by means of entrances hallways, stairways or ladder runs which shall be so protected as to safeguard the workers using such means from falling material or articles;

- 20.5.2 Demolition of structural steel etc. shall be demolished column by column and tier by tier and every structural member, which is being demolished, shall not be under any stress, and such structural member shall be suitably lashed to prevent it from any uncontrolled swinging, dropping or falling or falling;
- 20.5.3 Large structural members shall not be thrown or dropped from the building, but carefully lowered by adopting suitable safe method;
- 20.5.4 Where a lifting appliance like a derrick is used for demolition, the floor on which such lifting appliance rests shall be completely planked over or supported and such floor shall be of adequate strength to sustain bearing load for such lifting appliance and its operation.

20.6 STORAGE OF MATERIAL OR ARTICLE

- 20.6.1 No materials or articles shall be not stored or kept on platform, floor or stairways of a building being demolished, provided that this clause shall not apply to the floor of a building when such floor is of such strength as to support safely the load to be superimposed by storing such material or articles;
- 20.6.2 No access to any stairway or passageway shall be affected or blocked by storing any material or article;
- 20.6.3 Suitable barricades shall be provided so as to prevent materials or articles from sliding or rebounding into any space used by the workers.

20.7 FLOOR OPENINGS:

Every opening used for the removal of debris from every floor which is not closed to access, except the top or working floor, shall be provided with an enclosure from such floor to its ceiling, or such opening is so barricaded that no building worker shall access to within a horizontal distance of 6.0 m from such opening through which debris is being dropped.

20.8 INSPECTION:

A person responsible for demolition work shall make continuous inspections during demolition process so as to detect any hazard resulting from weakened or deteriorated floors or walls or loosened materials or articles, and that no building worker shall be permitted to work where such hazard exist unless remedial measured like shoring or bracing shall be taken to prevent such hazards.

20.9 WARNING SIGNS, BARRICADES, ETC.

- 20.9.1 Barricades and warning sign shall be erected along every side throughout the length and breadth of a building or other construction work to be demolished to prevent unauthorized persons from entering into the during demolition operations;
- 20.9.2 During the demolition of an exterior masonry wall or a roof from a point more than 12 m above the adjoining ground level of such wall or roof, if persons below such wall or roof are exposed to falling objects, suitable and safe catch platform shall be provided and maintained at a level not more than 6 m below the working level except where an exterior built-up scaffold is provided for safe and adequate protection of such persons;
- 20.9.3 Suitable and standard warning signs shall be displayed or erected at conspicuous places or position at the workplace;

20.10 MECHANICAL METHOD OF DEMOLITION

20.10.1 The following requirements shall be fulfilled in case the mechanical method of demolition like use of swinging weight, clamshell bucket, power shovel, bulldozer or other similar mechanical methods are used for the purpose of demolition namely –

- i) The building or structure or structure or remaining portion thereof shall be not more than 12 m in height;
- ii) Where a swinging weight is used for demolition, a zone of such demolition having a radius of at least 1.5 times the height of the structure of portion thereof being demolished shall be maintained around the points of impact of such swinging weight;
- iii) Where a clamshell bucket is being used for demolition, a zone of demolition shall be maintained within eight metres of the liner of travel of such bucket;
- iv) Where other mechanical methods are being used to affect total or partial collapse of a building or other construction work, there shall be maintained, in the area into which the affected portion of such building or other construction work may fall, a zone of demolition at least 1.5 times the height of such affected portion thereof; and
- v) No person other than building workers or other persons essential to the operation of demolition work shall be permitted to enter a zone of demolition, which shall be provided with substantial barricades.

21. FIRE EXTINGUISHERS & OTHER APPLIANCES OF FIRE FIGHTING

21.1 FIRE EXTINGUISHERS & OTHER MEANS OF PREVENTION AND PROTECTION

21.1.1 Every contractor shall have a fire protection and prevention plan developed and implemented keeping in view the following:

- i) The specific work practices requiring fire control measures;
- ii) Response measures to be taken in case of fire;
- iii) Equipment required;
- iv) Personnel requirements and responsibilities;
- v) Schedules of daily and weekly inspection;
- vi) Open flames and fires are prohibited in all underground construction;
- vii) Readily visible signs to be posted in the fire prone/inflammable/explosive areas prohibiting smoking use of open flames and other hot work.
- viii) A system of Permit-to-Work.

27.1.2 For the protection of the workers from the outbreak of fire, the contractor shall Provide, maintain and regularly inspect the Fire extinguishing equipment, which shall be sufficiently provided to extinguish any probable fire;

Suitability of portable fire extinguishers			
Class of fire	Type of extinguisher		
	Water	DCP	CO₂
A	Yes	Yes	Yes
B	No	Yes	Yes
C	No	Yes	Yes
D	No	Yes	Yes
Electrical	No	Yes	Yes

27.1.3 Ensure availability of an adequate supply of water at ample pressure;

27.1.4 Make available

- i. Adequate number of trained persons required to operate the fire extinguishing equipment;

- ii. Properly maintain Fire extinguishing equipment and inspect them at regular intervals of not less than once in a year by the responsible person and a record of such inspections maintained;
- 27.1.5 Portable fire extinguishers provided in the operator's cabin of earthmoving machinery, material handling systems, construction equipment etc. shall be regularly inspected, maintained and replenished/refilled;
- 27.1.6 The operators and the helpers of such equipment shall be trained in the methods operating the equipment and fighting the fire effectively;
- 27.1.7 All combustion engine power equipment shall be so located that the exhausts are well away from combustible material;
- 27.1.8 No smoking shall be allowed at or in the vicinity of operations, which constitute fire hazards and shall be conspicuously posted with No smoking or open flame **signs**;
- 27.1.9 In the flammable environment as described in IS: 9570, the electrical fittings and equipment shall be of flame proof type conforming to IS: 2206 & IS; 2148;
- 27.1.10 Arrangements shall be made to contain sparks generated during welding, cutting or other operations and spark shall not be allowed to fall down on combustible material kept below; All means of exit shall be kept free of obstruction at all times;
- 27.1.11 Appropriate type of fire extinguishers according to IS: 5698 shall be kept in fully charged condition at the places which have potential risk of fire;
- 27.1.12 The contractor shall educate his or his sub-contractors' men working in the vicinity of fire risk, on how to operate these equipment and know in particular circumstances which type of extinguishers is to be used;
- 27.1.13 The contractor shall take full responsibility for the upkeep and replenishment/refilling of the fixed and portable fire extinguishers.

APPENDIX

Annexure I

IMPORTANT INDIAN STANDARDS RELATED TO SAFETY

Personal Protection

- IS: 1179-1967 Equipment for eye and face protection during welding
- IS: 4770-1991 Rubber gloves for electrical purposes
- IS: 8519-1977 Guide for selection of industrial safety equipment for body protection
- IS: 8520-1977 Guide for selection of industrial safety equipment for eye, face & ear protection
- IS: 8807-1978 Guide for selection of safety equipment for protection of arms and hands
- IS: 1224-1985 Safety shoes
- IS: 2925-1984 Safety helmets
- IS: 8940-1978 Code of practice for maintenance and care of industrial safety equipment eye and face protection
- IS: 8990-1978 Code of practice for maintenance and care of industrial safety clothing
- IS: 10667-1983 Guide for selection of industrial safety for protection of foot and leg
- IS: 816-1969 Code of practice for safety and health requirements in electric and gas welding and cutting operations
- IS: 818-1968 Code of practice for safety and health requirements in electric and gas welding and cutting operations
- IS: 7194-1994 Assessment of noise exposure during work for hearing conservation purposes

Civil Engineering Construction

- IS: 2750- 1967(Part II) Steel scaffolds
- IS: 875-1987 Structural safety of building: loading standards
- IS: 4014-1967 Code of practice for steel tubular scaffolding
- IS: 3696 Safety code of scaffolds and ladders
- IS: 4138-1977 Safety code for working in compressed air
- IS: 4912-1978 Safety requirements for floor and wall openings, railings and toe boards
- IS: 7293-1974 Safety code for working with construction machinery
- IS: 9944-1992 Recommendations on safe working load for natural and man-made rope slings
- BS: 1129 Portable timber ladders, steps, Trestles & lightweight staging
- BS: 1139 Metal scaffolds
- BS: 5973 Code of practice for access & working scaffolds
- BS: 5974 Code of practice for temporary installed scaffolds and access equipment
- BS: 5975 Code of practice for falsework

Fire Protection

- IS: 2190-1992 Code of practice for selection, installation and maintenance of portable first-aid fire extinguishers
- IS: 5896 Code of practice for selection, operation and maintenance of fire-fighting appliances

IS: 8433-1984 Code of practice for dissolved acetylene cylinders

Electrical

IS: 3043-1987 Code of practice for earthing

IS: 5424-1969 Rubber mats for electrical purposes

IS: 3646 (Part II) Artificial lightings

IS: 2148 & IS: 2206 Flame proof electrical fittings

Machinery

IS: 1860-1980 Code of practice for installation, operation and maintenance of electric passenger and goods lifts

IS: 1991-1987 Safety requirements for the use, care and protection of abrasive grinding wheels

IS: 5903-1970 Safety devices for gas cylinders

IS: 8216-1976 Guide for inspection of lift wire ropes

IS: 8964-978 Recommendations for safety conditions for woodworking machines

IS: 9474-1980 Principles of mechanical guarding of machinery

IS: 11461-1985 Code of practice for compressors safety

IS: 13367-1992 Code of practice for safe use of cranes

BASIC STRUCTURE OF SAFETY PLAN

- 01- Safety Policy
- 02- When was the Safety Policy last reviewed
- 03- Details of implementation procedure / methods to implement Safety Policy / Safety Rules
- 04- Qualification & Experience of Safety Officers
- 05- Review of Accidents analysis - Methods to ensure safety & health and steps identified for prevention of accidents
- 06- Unit/site Executive responsible for ensuring safety at various levels in the workplace
- 07- List of Employees trained in safety at the commencement of execution of the job; details of training – its module and contents
- 08- Safety Training Targets, Schedules, Methods to be adopted for providing safety training to all employees
- 09- Details of checklists for different jobs/ work & responsible persons to ensure Compliance
- 10- Regular Safety Inspection Methods and Periodicity and the list of members authorized
- 11- Risk Assessment, Safety Audit by professional agencies, their Periodicity
- 12- Implementation of recommendations of Audit / Inspections. - Procedures for implementation & follow-up
- 13- Provision for treatment of Injured persons at work site
- 14- Review of overall safety by top Management and Periodicity
- 15- System for implementation of statutory provisions.
- 16- Issue of PPE to employees, Periodicity / stock on hand, etc.

Signature
Head of Organization
With Date & Stamp

Annexure - III

CONFINED SPACE WORK PERMIT

Date of Work :	Initiator:	Permit No.:
Description of work :		
Name of person supervising:		Dept./Function:
Names of workmen involved in the job :		
1	2	
3	4	
Exact Location of Work:		
JSA Referance No.		
Job Instruction & Confirmation Sheet Ref. No		
Valid From : Time Date: To Time: Date:		
Other relevant information (if any)		
Initiated by Engineer / Supervisor of Agency		Checked by Agency Safety Representative
Name		Name
Signature		Signature
Date		Date
Check list for Authorization of Work Permit		
Minimum and Mandatory Precautions		Y/ N / NA
1	Permit form filled in completely?	
2	Have wind, atmospheric, and work area conditions (e.g. cold, hot, snow, poor lighting & Ventilation etc.) been considered throughout the job so that work can be done safely?	
3	All necessary Personnel Protective Equipment like Breathing Set, Waist Rope, Light Mounted Helmet etc. is put on by all the workmen?	
4	A lifeline, a rope tied on the safety belt of the person entering the confined space is provided?	
5	All practicable measures are taken to ensure that the atmosphere inside is not deficient in oxygen and does not contain flammable vapors and no hazardous gases like H2S. (Open at least 2 manholes & keep for 2 hours)?	
6	One fully trained person is stationed at ground level/outside to assist the inside workers and emergency contact No's available?	
7	All the workers trained for emergency?	

8	Safe means of access and egress provided?	
9	Is the suitable fire extinguisher available at work location?	
10	Are they Using only 24V lamps & working tools inside the confined space?	
Following additional precautions need to be taken before the start of the work		
Permit Issued By:		
	Approved by Principal Agency work in charge	Endorsed by Principal Agency HSE Dept
Name		
Signature		
Date		
Permit Close Out by: Name & Signature (Principal Agency)		
Date :		Time :
Note: All extra information on preparation and precautions to be provided on the reverse side of this PTW.		

HOT WORK PERMIT

Date of Work :	Initiator:	Permit No.:
Description of work :		
Name of person supervising:	Dept./Function:	
Names of workmen involved in the job :		
1	2	
3	4	
Exact Location of Work:		
JSA Referance No.		
Job Instruction & Confirmation Sheet Ref. No		
Valid From : Time Date: To Time: Date:		
Other relevant information (if any)		
Initiated by Engineer / Supervisor of Agency		Checked by Agency Safety Representative
Name		Name
Signature		Signature
Date		Date
Exact location of work		
Relevant information		
Check list for Authorization of Work Permit		
Minimum and Mandatory Precautions		Y/ N / NA
1	Permit form filled in completely?	
2	Form filled in correctly and in full.	
3	Has the work area been inspected for any abnormalities - specify on wind, atmosphere, surroundings, etc.	
4	Are the necessary PPE provided and do the workmen know their use?	
5	Is the fitter, experienced and knowledgeable enough to carry out the job?	
6	Area has to be cleared of any flammables and combustible material.	
7	Electrical equipment to be protected and grounded.	
8	Are fire-fighting equipment - extinguishers, water, sand buckets etc, located nearby for ready in case of any mishap?	
9	Gas cylinders in upright state/ trolleys/ flash-back arrestors/ hose condition/ NRVs, etc.	
10	Is the area easily accessible?	

Additional precautions to be taken:		
This permit is valid only for one week. A fresh hot work permit has to be taken for continued works for the next week.		
Permit Issued By:		
	Approved by Principal Agency work in charge	Endorsed by Principal Agency HSE Dept
Name		
Signature		
Date		
Permit Close Out by: Name & Signature (Principal Agency)		
Date :		Time :
Note: All extra information on preparation and precautions to be provided on the reverse side of this PTW.		

PERMIT FOR LIFTING OF MATERIAL

Date of Work :		Initiator:		Permit No.:	
Description of work:					
Name of person supervising:			Dept./Function:		
Names of workmen involved in the job :					
Exact Location of Work:					
JSA Reference No.					
Job Instruction & Confirmation Sheet Ref. No					
Valid From : Time Date: To Time: Date:					
Other relevant information: (If any)					
Initiated by Engineer / Supervisor of agency			Checked by Agency Safety Representative		
Name				Name	
Signature				Signature	
Date				Date	
Check list for Authorization of Work Permit					
1	Details of type of crane(s) to be used?				
2	Name of Lift Co-ordinator, Rigger/Crane Operator?				
3	Adequate and suitable lifting gears available and in good condition				
4	Have soil, wind, atmospheric, and work area conditions (e.g. cold, hot , snow, poor lighting & Ventilation etc.) been considered throughout the job so that work can be done safely?				
5	Lifting Equipments, Lifting gears and Slings are tested and certified?				
6	Are all operators trained, competent and healthy (Having Licenses / Experience Certificate)?				
7	Are all the examinations and tests carried out on the equipment (Crane) and certified by competent persons?				
8	Is the safe working load (SWL) marked on all lifting tools & tackles?				
9	Lifting area cordoned off?				
10	Tag lines provided to control the swing of load?				
11	Load tied properly and secured against toppling and falling?				
12	Signalman/Rigger is provided and competent?				
13	Proper communication available between operator and rigger?				
14	Is the vehicle for transportation adequate for the load?				

Following additional precautions need to be taken before the start of the work:			
Permit Issue b By:			
Approved by Principal agency work incharge		Endorsed by main agency HSE Dept	
Name		Name	
Signature		Signature	
Date		Date	
Permit Close Out by: Name & Signature (Main agency)			
Date :		Time :	
Note: All extra information on preparation and precautions to be provided on the reverse side of this PTW.			

WORKING AT HEIGHT PERMIT

Date of Work :	Initiator:	Permit No.:
Description of work :		
Name of person supervising:		Dept./Function:
Names of workmen involved in the job :		
1	2	
3	4	
Exact Location of Work:		
JSA Referance No.		
Job Instruction & Confirmation Sheet Ref. No		
Valid From : Time Date: To Time: Date:		
Other relevant information		
Initiated by Engineer / Supervisor		Checked by Agency Safety Representative
Name		Name
Signature		Signature
Date		Date
Check list for Authorization of Work Permit		
Minimum and Mandatory Precautions		Y/ N / NA
1	Permit form filled in completely?	
2	Work area below is temporarily cordoned/barricaded	
3	The scaffold erected has pipes and clamps in good condition.	
4	Diagonal / lateral bracings pipes are provided to ensure stability	
5	Access ladder is provided to reach the work location	
6	Planks / sheet used in temporary platform are in good condition	
7	Planks / sheets are tied properly using binding wire	
8	Temporary platform is having temporary side railing	
9	Workers are wearing Helmet, Shoes & Safety belt in good condition.	
10	For Anchoring of safety belt at height rigid support / life rope line is provided	
11	Experienced workers are engaged for work	
12	Portable elect equip/fibre body checked for its healthiness including earthing	
13	The sling / pulley blocks / ropes are tested for fitness	

14	Workers are briefed on Safety Precautions to be taken	
	Power hand tools used at eight are connected through 30mA ELCB.	
Following additional precautions need to be taken before the start of the work		
Permit Issued By:		
	Approved by Principal Agency work in charge	Endorsed by Principal Agency HSE Dept
Name		
Signature		
Date		
Permit Close Out by: Name & Signature (Principal Agency)		
Date :		Time :
Note: All extra information on preparation and precautions to be provided on the reverse side of this PTW.		

DEFINITIONS

1. **Building or other construction work:** means the construction, alteration, repairs, maintenance or demolition, of or, in relation to, buildings, streets, roads, railways, tramways, airfields, generation, transmission and distribution of power, water works, oil and gas installations, electric lines, tunnels, bridges, viaducts, pipelines, towers, cooling towers and such other work as may be specified.
2. **Building worker:** means a person who is employed by a contractor to do any skilled, semi-skilled or manual, supervisory, technical or clerical work for hire or reward, whether the terms of employment be expressed or implied, in connection with any building or other construction work;
3. **Establishment:** means an establishment who or which employs building workers in any building or other construction work, and includes an establishment belonging to a contractor;
4. **Contractor:** means a person who undertakes to produce a given result for any establishment, other than a mere supply of goods or articles of manufacture by the employment of building workers or who supplies building workers for any work of the establishment, and includes a sub-contractor or any other agency engaged on his behalf;
5. **Employer:** in relation to an establishment, means the owner thereof that is the contractor himself.
6. **Competent Person:** means a person so approved by the Central Government who belongs to a testing establishment in India possessing adequate qualification, experience and skill for the purpose of testing, examination or annealing and certification of lifting appliances, lifting gears, wire ropes or pressure plant or equipment;
7. **Responsible Person:** means a person appointed by the employer to be responsible for the performance of specific duty or duties and who has sufficient knowledge and experience and the requisite authority for the proper performance of such duties;
8. **Danger:** means danger of accident or of injury or danger to health;
9. **Hazard:** means danger or potential danger;
10. **Hazardous substance:** means any substance, which due to its explosiveness, inflammability, radioactivity, toxic or corrosive properties and similar hazardous characteristics may Cause injury; or Affect adversely the human system; or Cause loss of life or damage to property or environment;
11. **Hazardous Process:** comprises roof work, steel erection, and work under and over water, demolition and work in confined space;

12. **National Standard:** means standards as approved by the Bureau of Indian Standards (BIS) and in the absence of such standards, the standards approved by the Central Government for a specific purpose;
13. **Lifting Appliance:** means a crane, hoist, derrick, winch, jack, pulley block or other equipment used for lifting materials, objects or building workers;
14. **Lifting gear:** means ropes, chains, hooks, slings and other accessories of a lifting appliance;
15. **Safe Operating Practice:** Means the practice followed in building and construction activities for the safety of workers and for safe operation of machinery and equipment used in such activities. Such practices shall conform to all or any of the following:
 - Relevant Standards approved by BIS;
 - National Building Codes;
 - Manufacturer's instruction on safe use of equipment and machinery;
 - Code of practice on safety in construction industry published by International Labour Organization .
16. **Safe working load:** in relation to an article of lifting gear or lifting appliance, means the load which is the maximum load that may be imposed on such article or appliance with safety in the normal conditions as assessed and certified by a competent person;
17. **Workplace:** means all places where building workers are required to be present or to go for work and which are under the control of an employer;
18. **Personal Protective Equipment (PPE):** are the protective devices made available for individual or collective use of the workers likely to be affected by the hazards of the workplace or process;
19. **Construction & Erection Manual (E&C) Rules:** all references to E&C Manual shall mean the Construction & Erection Rules that are detailed hereunder;
20. **Engineer in-charge:** All references to the Engineer in-charge shall mean the person in-charge of a building and construction of the NTPC.
21. **Interpretation of words not defined: words and expressions not defined or used in this Manual shall have the same meaning as generally assigned in common engineering practices**

SECTION - V

SPECIAL CONDITIONS OF CONTRACT

The following Special Conditions of Contract (SCC), Section-V, shall supplement / amend the General Conditions of Contract (GCC), Section-IV. Wherever there is a conflict, the provisions in SCC shall prevail over those in the GCC. The corresponding clause number of the GCC is indicated in parentheses.

SCC Cl. No.	Clause Ref, in any	Special Conditions
1.	Definitions (GCC Clause 1)	NAME OF PACKAGE: ANDAMAN & NICOBAR GAS POWER PROJECT (50 MW) CIVIL WORKS PACKAGE BIDDING DOCUMENT NO.: NVVN / C&M / RE-342 / 2024-25
1.1	Definitions (GCC Clause 1 (a))	Name of Employer/Owner - NVVN Limited Address of Employer: NTPC Vidyut Vyapar Nigam Limited, 5th floor, Engineering Office Complex, NTPC Limited, A-8A, Sector-24 Noida – 201301, India. Telephone No. (+91) - (120) - 4947239 Registered Office Address: NTPC VIDYUT VYAPAR NIGAM LIMITED, NTPC Bhawan, Core-7, SCOPE Complex, 7, Institutional Area, Lodhi Road, New Delhi – 110003 Corporate Identification Number: U40108DL2002GOI117584. Website: www.nvvn.co.in
1.2	Definitions (GCC Clause 1 (l))	Engineer in charge: CEO NVVN or designated representative
1.3	Definitions (GCC Clause 4.2)	Description in schedule of quantities and SCC/Additional Special Condition of Contract to be read together
2.	Laws Governing the Contract (GCC Clause 6.1)	Provisions of GCC shall be applicable in this regard. The courts of New Delhi shall have exclusive jurisdiction in all matters arising under the Contract
2.1	Settlement of Disputes (GCC Sub- Clause 7.3.5)	Place of arbitration will be New Delhi .
3.	Human Resources (GCC Clause 10)	The number and other relevant details of key personnel required to be engaged/ employed by the Contractor in all areas shall be as finalized with the successful bidder during post bid discussions.

4.	GCC Clause 23.3	Rate of interest for mobilization advance and equipment advance shall be (SBI 1year MCLR + 150 bps per annum)
5.	GCC Clause 24.11 (IV)	In case 'Amount linked to Safety Aspects / compliance to Safety Rules' is less than 2% of the total Contract value, the amount by which it is lower shall be retained proportionately from the other components of the Contract price while releasing payments of each RA bill. No interest shall be payable on the amounts linked to Safety Aspects / Compliance to Safety Rules including aforesaid retained amount. The amounts linked to Safety Aspects / Compliance to Safety Rules including aforesaid retained amount shall be payable in part or full based on safety compliance duly certified by EIC and Safety-in-charge on quarterly basis.
6.	Contract Price Adjustment GCC Clause 25.0	Fixed Component of the Base Contract Price = 0.2 Variable components of the Base Contract Price: 1. Labor, l= 0.15 2. H.S. diesel oil, D = 0.02 3. Material(s), m1= 0.23 (except steel & cement) m2= 0.40 (steel & cement)
7.	GCC Clause 25.0	<p>The price adjustment formulae for the various components of the Contract price, shall be construed as stipulated hereinafter. The formulae designed for governing and calculating the price adjustment to be applied to contract price shall be as follows:</p> <p>(A) FOR SCHEDULE-I CIVIL WORKS CPA = ACP - BCP Where, CPA = Price Adjustment BCP = Base Contract Price ACP = Adjusted Contract Price ACP shall be computed as under: $ACP = BCP [F + m \cdot M1/M0 + d \cdot D1/D0 + 0.5 \cdot lb \cdot L1/L0 + 0.5 \cdot lb \cdot W1/W0]$ F = Fixed component portion of Base Contract Price which will not be subject to any adjustment under this formula or otherwise = 0.20 lb = Labour component of the Base Contract Price which will be subject to adjustment = 0.15 m = Material component of the Base Contract Price which will be subject to adjustment = 0.63 d = High Speed Diesel/P.O. L component of the Base Contract Price which will be subject to adjustment = 0.02 L = Labor Index, which shall be the "Index Number" of "Consumer Price Index" for Industrial Workers : (All India) (General)" as published by Labor Bureau, Simla in their monthly bulletin entitled "Indian Labor Journal" unless otherwise stipulated in SCC W = Arithmetical average of Minimum Wages for Unskilled, Skilled, Semi-skilled and highly skilled workers notified by the Central Government for the particular classified Area in which the project site is located or notified by the State Government of the state in which the project site is located, whichever is higher M = Material Index, which will be the "Index Number" of "Index Numbers of</p>

		<p>Wholesale Prices" under Group "All Commodities" as published by Ministry of Industry in their monthly bulletin entitled "Index Number of Wholesale Prices", unless otherwise stipulated in SCC.</p> <p>D = H.S. diesel oil Index, which will be the price of high-speed diesel oil per litre inclusive of taxes and duties, if any, at the retail outlet of Indian Oil Corpn. or any other publicized or fuel marketing company, nearest to the project.</p> <p>SUBSCRIPT</p> <p>'0' = refers to the values of the above mentioned minimum wages, labour / material indices or H.S. diesel price as on seven (7) days prior to the deadline set for submission of the bids.</p> <p>'1' = refers to the values of corresponding minimum wages, labour / material indices or H.S. diesel price as applicable for the month in which the Work is executed for which adjustment is applicable, respectively</p>
8.	Time for Completion (GCC Clause 29.2)	<p>Time for Completion:</p> <p>The entire scope of work covered under this Contract shall be completed within 24 months from the date of Letter of Award.</p>
9.	Liquidated Damages for Delay (GCC Clause 29.6.1)	<p>The Contractor shall ensure adequate progress during the execution of the work according to the bar chart/work schedule incorporated in the Contract so that following activities are completed in the period allowed in the bar chart/work schedule and as further shown below. The value of these items to be completed in identified periods is shown as a percentage of the total contract value for the purpose of calculation of Liquidated damages for Delay in case the Contractor fails to complete the work on or before scheduled or extended date of completion as per clause 29.2 & 29.5 of GCC.</p> <p>COMPENSATION FOR DELAY CLAUSE (LD PARAMETERS)</p> <p>The liquidated damages shall be charged at the rate of 0.5% per week of delay of the value of the work shown above if there is delay for a particular stage or the entire value of Contract if the whole of the work is delayed.</p> <p>The total amount of liquidated damages payable by the Contractor for delay in stage-wise completion or completion of the whole work shall not exceed 7.5% of the contract value as awarded.</p>
10.	Material to be issued by the employer (GCC Clause 34 (b) (i))	PLEASE REFER SCOPE OF WORK & SPECIAL TERMS & CONDITIONS (SECTION-VI) OF TENDER DOCUMENT-
11.	Construction Power and Construction Water Supply and Staff/ Labor Colony (GCC	PLEASE REFER SCOPE OF WORK & SPECIAL TERMS & CONDITIONS (SECTION-VI) OF TENDER DOCUMENT

	Clause 41.1.1, 41.1.3 & 41.2.1)	
12.	Site Laboratory (GCC clause no. 42.0)	Applicability/provisions of Site Laboratory may be decided in consultation with Engg.
13.	Defect Liability (GCC Clause 45)	PLEASE REFERSCOPE OF WORK & SPECIAL TERMS & CONDITIONS (SECTION-VI) OF TENDER DOCUMENT
14.	GCC Clause No.59.0	Last milestone to be executed/Completed: 24 months
15.	Payment (GCC Clause 24.7)	Progressive payment as per RA bill, preferably month wise
16.	Payment to workers	Contractor has to pay their workers as per Central Minimum wages applicable in Centre/Andaman & Nicobar whichever is higher.
17.	Limitation of Liability	<p>60.1 Except in cases of criminal negligence or willful misconduct,</p> <p>(a) neither Party shall be liable to the other Party, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, which may be suffered by the other Party in connection with the Contract, provided that this exclusion shall not apply to any obligation of the Contractor to pay liquidated damages to the Employer and</p> <p>(b) the aggregate liability of the Contractor to the Employer, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to any obligation of the Contractor to indemnify the Employer with respect to patent infringement.</p> <p>the aggregate liability of the Employer to the Contractor, whether under the Contract, in tort or otherwise, at any point of time during the execution/ performance of the Contract, shall not exceed the 'total Contract Price less payments already released to the Contractor'.</p>
18.	No Claim for interest or damage	<p>61.1 Interest on money due to the contractor: Contractor shall not be entitled to any interest or damage in case of any delay on the part of the Employer to pay the amount due upon measurement or as per Contract or otherwise. Contractor shall also not be entitled to interest upon any guarantee/ security/ retention money or payments in arrears or upon any balance which may on the final settlement of his account be due to him.</p> <p>61.2 No claim for interest or damage: No claim for interest or damage will be entertained or be payable by the Employer in respect of any amount or balance which may be lying with the Employer or may become due upon settlement/adjudication of any dispute, difference or misunderstanding between the parties by way of arbitration or court proceedings or otherwise or in respect of any delay or omission on the part of the Employer in making intermediate or final payment or in respect of any amount/damage which may be claimed through arbitration or court</p>

		proceedings or in any other respect whatsoever.
19.	Maintenance of Records for Weekly Review Meetings at Site GCC(Sub-Clause no. 29.3.3*)	<p>The Contractor shall be required to attend all weekly site progress review meetings organized by the 'Project Manager' or his authorized representative. The deliberations in the meetings shall inter alia include the weekly program, progress of work (including details of manpower, tools and plants deployed by the contractor vis-a-vis agreed schedule), inputs to be provided by Employer, delays, if any, and recovery program, specific hindrances to work and work instructions by Employer. Record of Hindrances / events that lead to slow / stoppage of smooth execution of work shall be maintained in "Hindrance Register". The minutes of the weekly meetings shall be recorded in triplicate in a numbered register available with the 'Project Manager', or his authorized representative.</p> <p>These recordings shall be jointly signed by the Project Manager or his authorized representative and the Contractor and one copy of the signed records shall be handed over to the Contractor.</p> <p>The following documents shall form the principal basis for consideration of Time Extension pursuant to GCC Clause 29.5 with or without LD, determining the compensation amount pursuant to GCC Clause 29.6 and settlement of extra claims during the execution of contract:</p> <ol style="list-style-type: none"> 1. The joint recordings in "Hindrance Register" and "Weekly Review Register". 2. Records of Technical Coordination Meetings. 3. Records of Contract Review Meetings. 4. Written notices issued by the "Engineer-in-charge" or his authorized representative to contractor in the relevant period. <p>Written requests/ notices by the Contractor to Employer/ Engineer-in- Charge in the relevant period.</p>
20.	Replace existing Sub Clause 10.4.9: Safety of Section- General Conditions of Contract (GCC):	<p>The Employer has formulated Safety Rules for Construction & Erection of Power Plants and is enclosed at Annexure-B to GCC. These Safety Rules lay down the safety requirements for safe execution of project activities, responsibilities of the Contractor, and all concerned involved in Construction and Erection. The Contractor, including his sub- contractors, while executing the Works, shall strictly comply with these Safety rules and statutory requirements (including amendments thereof), as applicable, in respect of safety of personnel, equipment and materials at site area under execution of the Contractor.</p>
21.	Clause no. 10.4.9* Safety	<p>In addition to other clauses specified in 'NTPC Safety Rules for Construction and Erection of Power Plants' [as enclosed with GCC/SCC], Contractor shall adhere to the following provisions for payment linked to Safety Compliances as specified in Payment Terms:</p> <ol style="list-style-type: none"> i) Safety Personnel Contractor shall adhere to the requirements of Clause 2.3 (requirement of Safety personnel) of 'NTPC Safety Rules for Construction and Erection of Power Plants'. ii) Personal Protective Equipment & Safety Equipment Contractor shall adhere to the requirements of Clause 4 (Personal Protective Equipment) of 'NTPC Safety Rules for Construction and Erection of Power Plants' and the provisions of the Bidding Documents with regards to number

		<p>of Safety Equipment/PPEs to be provided by the Contractor.</p> <p>In case Contractor fails to comply with aforesaid requirement, EIC/Safety Officer shall issue a warning letter/Non-compliance Memo to the Contractor regarding the same advising him to take corrective action.</p> <p>EIC/NTPC Safety Officer shall maintain written record of all such incidents when Warning letter/Non-compliance Memo is issued to the Contractor for not meeting the requirements of Clause 4.0 (Personal Protective Equipment) and the provisions of the Bidding Documents.</p> <p>iii) Safety Induction and Training</p> <p>Contractor shall adhere to the requirements of imparting Safety training as per Clause 8.0 (Safety Induction and Training) of 'NTPC Safety Rules for Construction and Erection of Power Plants.</p> <p>Contractor shall maintain written record of Safety trainings imparted to its Employees/ workmen for purpose of aforesaid payment. These records shall be available for review of EIC/NTPC Safety Officer all the time.</p> <p>iv) Medical and First Aid Amenities</p> <p>Contractor shall adhere to the requirements of Clause 13 (Medical and First Aid Amenities) of 'NTPC Safety Rules for Construction and Erection of Power Plants.</p> <p>NTPC Safety Officer/EIC shall maintain written record of incidences when requisite Medical and first aid amenities as per Clause 13 of Safety Rules were not available for purpose of aforesaid payment.</p> <p>v) Compliance to Work Permit System</p> <p>Contractor shall adhere to the requirements of Clause 17 (Work Permit System) of 'NTPC Safety Rules for Construction and Erection of Power Plants'.</p> <p>In case Contractor fails to obtain work, permit or fails to comply to any requirements of aforesaid Work permit system, he will be issued a warning letter/Non-compliance Memo by EIC/Safety Officer of NTPC regarding the same advising him to take corrective action.</p> <p>NTPC/NVVN Safety Officer / EIC shall maintain written record of all such incidents when Warning letter / Non-compliance Memo is issued to Contractor for not complying with the requirements of Work Permit System as per Clause 17 of Safety Rules for purpose of aforesaid payment</p>
22.	Add a new clause under GCC clause "Definitions"	<p>(v) "Sub-contractor from a country which shares a land border with India" means;</p> <p>a) An entity incorporated, established or registered in such a country; or</p> <p>b) A subsidiary of an entity incorporated, established or registered in such a country; or</p> <p>c) An entity substantially controlled through entities incorporated, established or registered in such a country; or</p> <p>d) An entity whose beneficial owner is situated in such a country; or</p> <p>e) An Indian (or other) agent of such an entity; or</p> <p>f) A natural person who is a citizen of such a country; or</p> <p>g) A consortium or joint venture where any member of the consortium or joint venture falls under any of the above.</p> <p>(v1) The beneficial owner for the purpose of clause "v" above will be as under;</p>

		<p>a) In case of company of Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.</p> <p>Explanation</p> <p>i. "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent of shares or capital or profits of the company;</p> <p>ii. "Control" shall include the right to appoint a majority of the directors or to control the management or policy decisions including by virtue of their shareholdings or management rights or shareholders agreements or voting agreements.</p> <p>b) In case of a partnership firms, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more judicial person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership.</p> <p>c) In case of an unincorporated associations or body of individuals, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;</p> <p>d) Where no natural person is identified under (a) or (b) or (c) above, the beneficial owner is the relevant natural person who holds the position of senior managing officials;</p> <p>e) In case of a trust, the identifications of beneficial owner(s) shall include identification of the author of trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.</p> <p>(v2) An Agent is a person employed to do any act for another, or to represent another in dealings with third person.</p>
23.	Add a new Clause 30.3 under GCC regarding "Sub Contracts"	<p>30.3 The Contractor shall not be allowed to sub-contract works to any sub-contractor/sub-vendor from a country which shares a land border with India unless such sub-contractor is registered with the competent Authority.</p> <p>The Competent Authority for the purpose of registration shall be as mentioned in the relevant Annexure of SCC.</p> <p>However, the said requirement of registration will not apply to sub-contractors from those countries (even if sharing a land border with India) to which the Government of India has extended lines of credit or in which the Government of India is engaged in development projects. The Contractor may apprise itself of</p> <p>(vi) the updated lists of such countries available in the website of the Ministry of External Affairs.</p>
24.	Add a new Clause 51.3.1 (j) to GCC clause "Termination for Contractor's Default"	<p>51.3.1 (j) If the Contractor, sub-contracts any part of the works in violation of the provision of GCC Clause 30.3.</p>

25.	<p>Alternate Mode of Payment for Micro Small & Medium Enterprises (MSMEs)</p>	<p>Trade Receivables e-Discounting System (TReDS) is a regulatory framework put in place by the Reserve Bank of India under the Payment and Settlement Systems Act 2007 (PSS Act) to facilitate the financing of trade receivables (invoices) of MSMEs through invoice financing by multiple financiers.</p> <p>The Reserve Bank of India has granted approval to (i) Mynd Solutions Pvt Limited, (ii) A.TReDS Ltd. and (iii) Receivables Exchange of India Ltd to set up and operate TReDS platform. The name of respective TReDS platform of the above-mentioned entities are M1xchange, Invoicemart and RXIL.</p> <p>Presently, NTPC Limited is transacting with M1xchange and RXIL TReDS platforms. MSME Vendors may choose from the aforesaid TReDS platforms as an alternate payment mechanism.</p> <p>For queries/ details, the vendor may directly contact M1xchange or RXIL at:-</p> <p>(i) M1XCHANGE: - URL: https://m1xchange.com Toll free No.: 1800-103-7261</p> <p>(ii) RXIL:- URL: https://www.rxil.in/Home/Index Phone: 022-40771424, 40771426 Toll free No.: 1800 1038 311”</p> <p>The aforesaid provision may not be applicable for payments envisaged through “Letter of Credit (LC)” or “Escrow Account” or “A separate account with a Scheduled Bank at Site”.</p>
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**LIST OF BANKS ACCEPTABLE FOR SUBMISSION
OF BANK GUARANTEE FOR ADVANCE PAYMENTS & PERFORMANCE SECURITIES**

SCHEDULED COMMERCIAL BANKS

A STATE BANK OF INDIA

B NATIONALISED BANKS

1. Allahabad Bank
2. Andhra Bank
3. Bank of India
4. Bank of Maharashtra
5. Canara Bank
6. Central Bank of India
7. Corporation Bank
8. Dena Bank
9. Indian Bank
10. Indian Overseas Bank
11. Oriental Bank of Commerce
12. Punjab National Bank
13. Punjab & Sind Bank
14. Syndicate Bank
15. Union Bank of India
16. United Bank of India
17. UCO Bank
18. Vijaya Bank
19. Bank of Baroda

C SCHEDULED PRIVATE BANKS (INDIAN BANKS)

1. Catholic Syrian Bank
2. City Union Bank
3. Dhanlaxmi Bank Ltd.
4. Federal Bank Ltd
5. Jammu & Kashmir Bank Ltd
6. Karnataka Bank Ltd
7. Karur Vysya Bank Ltd
8. Lakshmi Vilas Bank Ltd
9. Nainital Bank Ltd
10. Kotak Mahindra Bank
11. RBL Bank Limited
12. South Indian Bank Ltd
13. Tamilnad Mercantile Bank Ltd
14. ING Vysya Bank Ltd
15. Axis Bank Ltd.
16. IndusInd Bank Ltd
17. ICICI Bank
18. HDFC Bank Ltd.
19. DCB Bank Ltd
20. Yes Bank Ltd
21. IDFC Bank Limited
22. Bandhan Bank Limited

ANNEXURE-I TO SPECIAL CONDITIONS OF CONTRACT

D SCHEDULED PRIVATE BANKS (FOREIGN BANKS)

1. Abu Dhabi Commercial Bank PJSC
2. Bank of America NA
3. Bank of Bahrain & Kuwait B.S.C.
4. Mashreq Bank p.s.c.
5. Bank of Nova Scotia
6. Crédit Agricole Corporate and Investment Bank
7. BNP Paribas
8. Barclays Bank
9. Citi Bank N.A.
10. Deutsche Bank A.G.
11. The HongKong Shanghai Banking Corporation Ltd
12. Societe Generale
13. Sonali Bank Ltd.
14. Standard Chartered Bank
15. J.P. Morgan Chase Bank, National Association
16. State Bank of Mauritius Ltd.
17. DBS Bank Ltd.
18. Bank of Ceylon
19. PT Bank Maybank Indonesia TBK
20. A B Bank
21. Shinhan Bank.
22. CTBC Bank Co. Ltd.
23. Mizuho Bank Ltd
24. Krung Thai Bank Public Company Ltd.

ANNEXURE-I TO SPECIAL CONDITIONS OF CONTRACT

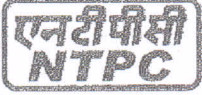
25. The Bank of Tokyo-Mitsubishi UFJ Limited.
26. Austalia & Newzealand Banking Group Limited
27. Sumitomo Mitsui Banking Corporation
28. American Express Banking Corporation
29. Qatar National Bank SAQ
30. Credit Suisse A.G.
31. FirstRand Bank Ltd.
32. Industrial & Commercial Bank of China Ltd.
33. JSC VTB Bank
34. National Australia Bank
35. Cooperatieve Rabobank U.A.
36. Sberbank
37. United Overseas Bank Ltd.
38. Westpac Banking Corporation
39. Woori Bank
40. The Royal Bank of Scotland plc
41. Doha Bank Qsc
42. Industrial Bank of Korea
43. KEB Hana Bank
44. First Abu Dhabi Bank PJSC
45. Emirates NBD Bank (P.J.S.C)

E OTHER PUBLIC SECTOR BANKS

1. IDBI Bank Ltd

*In case, Bank Guarantee is getting issued from State Bank of India, Bidder to take note of NTPC letter ref. NTPC/FC/CS/BG/01 dated 03.09.2014 and SBI letter ref. CAG-I/AMT-1/2014-15/370 dated 04.09.2014 attached herewith.

*Note - Any Addition/ Deletion/ Modification in Bank list shall be as per changes in Second Schedule List by RBI from time to time.



एन टी पी सी लिमिटेड
(भारत सरकार का उद्यम)

NTPC Limited
(A Govt. of India Enterprise)

केन्द्रीय कार्यालय/Corporate Centre

Date : 03rd September 2014

Ref. No.: NTPC/FC/CS/BG/01
Deputy General Manager,
State Bank of India,
CAG Branch,
12 th floor, Jawahar Vyapar Bhavan, 1, Tolstoy Marg,
New Delhi 110 001

Kind Atten: Sh. Sandeep Mishra

Sub: Format of the Bank Guarantee (BG) issued by State Bank of India – reg.

Dear Sir,

NTPC Limited is India's largest Power Company and a 'Maharatna PSU' with a significant presence in the entire value chain of power generation business. The procurement process of NTPC requires its participating Bidders to submit Bank Guarantees (BGs) as Bid security/other securities in a fixed format provided by NTPC.

It has been observed recently that BGs issued by various branches of State Bank of India are inserting the following additional clause.

QUOTE

Notwithstanding anything contrary contained in any law for the time being in force or banking practice, this guarantee shall not be assignable or transferable by the beneficiary. Notice or invocation by any person such as assignee, transferee of agent of beneficiary shall not be entertained by the bank. Any invocation of guarantee can be made only by the beneficiary directly.

UNQUOTE

The inclusion of the aforesaid clause in the BGs restricts the rights of NTPC under the BG and it may not be possible for NTPC to accept the aforesaid clause in the BGs submitted to us by our Bidders. It may also be mentioned that incorporation of the above additional clause in the BG results in the BG being returned by NTPC and consequently rejection of the bids of parties that have submitted such BGs.

In view of the above, it is requested that please take up at appropriate levels so that suitable instructions are issued to all your branches not to incorporate any such additional clause and henceforth BGs may be issued strictly as per NTPC format only.

Kindly acknowledge the receipt of this letter

Yours faithfully,

(K.P.Gupta)
General Manager (Finance)

Copy for Kind information: ED(CC&M) for kind info of u.s

एन टी पी सी भवन स्कोप कॉम्प्लेक्स, 7, इंस्टीट्यूशनल एरिया, लोधी रोड, नई दिल्ली-110003 टेल/Tel.: 24360100, फैक्स/Fax: 011-24361018
NTPC Bhawan, SCOPE Complex, 7, Institutional Area, Lodhi Road, New Delhi-110003, वेबसाइट/Website: www.ntpc.co.in



भारतीय स्टेट बैंक
State Bank of India

कॉरपोरेट लेखा समूह शाखा, जवाहर व्यापार भवन,
11-12 वां तल, 1, टॉलस्टाय मार्ग, नई दिल्ली-110 001
Corporate Accounts Group Branch, Jawahar Vyapar Bhawan,
11th & 12th Floor, 1, Tolstoy Marg, New Delhi-110 001

Tel. : 23374525, 23374505, 23374541 (AMT-1), 23353022 (DGM & COO), 23701043, 23359506 (A & A), 23352995 (CS), 23352968 (IB)
Fax : 23353101 (Sectt.), 23352793 (CS), 23353029 (IB)

Shri K.P. Gupta,
General Manager (Finance),
NTPC Limited
Scope Complex, 7, Institutional Area,
Lodhi Road,
New Delhi: 110 003.

CAG-I/AMT-1/2014-15/370

04.09.2014

Dear Sir,

Format of the Bank Guarantee (BG) issued by State Bank of India

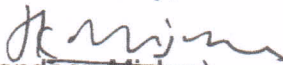
We refer to your letter dated 3rd September 2014 wherein you have requested for excluding bidders/vendors of NTPC from insertion of additional Clause restraining assignment/transferability of BG.

Looking at our relationship with NTPC, as a very special case, we have since obtained waiver from our Authorities for excluding NTPC from insertion of the referred clause for BGs issued in your favour.

We are taking steps to issue suitable instructions to our offices for exclusion of this clause for BGs issued in favour of NTPC. In case any bidder or vendor submits to you a Bank Guarantee issued by any of our Branches containing the additional clause as mentioned above, request you to please bring it to our notice and advise us so that we can take-up with the concerned Branch for excluding it.

This is for your information and necessary action please.

Yours faithfully,


(Sandeep Mishra)

Deputy General Manager &
Relationship Manager, AMT-1

CONTRACT CLOSING CERTIFICATES

CERTIFICATE NO.	CERTIFICATE DESCRIPTION	RESPONSIBILITY	LIMITING DATES FOR ISSUANCE OF CERTIFICATE
CCP-01	Certificate of Final Amendment to the Contract	Corporate Contract Services	7 Months from Completion of Facilities
CCP-02	Drawing Receipt Certificate	Corporate Engineering	2 Months from Completion of Facilities
CCP-03	QA Documents Receipt Certificate	CQA&I	2 Months from Completion of Facilities
CCP-04	O&M Manual Receipt Certificate	Corporate Engineering	4 Months from Completion of Facilities
CCP-05	Scope Completion Certificate	Site Erection	8 Months from Completion of Facilities
CCP-06	Liquidated Damages for Delay Certificate		
(a)	For cases where LD for delay is settled by Corporate Contracts	Corporate Contract Services	7 Months from Completion of Facilities
(b)	For cases where LD for delay is settled by the Regions/ Site	Concerned Site/ Regional offices	7 Months from Completion of Facilities
CCP-07	Shortfall in Equipment Performance Certificate	<ul style="list-style-type: none"> • Corporate OS : Site Performance Test-Cat-I • Regional OS: Site Performance Test-Cat-II • Site : Site Performance Test-Cat-III • CQA&I : Shop Test 	5 Months from Performance and Guarantee (PG) Tests
CCP-08	"Material Reconciliation" Certificate	Site Erection & Site Materials Mgmt.	6 Months from Completion of Facilities
CCP-09	"Payment Reconciliation" Certificate : Indian Contractor	Site Finance	6 Months from Completion of Facilities
CCP-10	Certificate regarding Labour Payments and Statutory Requirements to be furnished by Contractor.	Contractor	9 Months from Completion of Facilities
CCP-11	"No Demand Certificate" by Contractor	Contractor	6 Months from PG Tests
CCP-12	Certificate for Completion of Warranty Period	Site Erection	14 Months from Trial Operation/ Completion of Facilities

CONTRACT CLOSING CERTIFICATES

CERTIFICATE NO.	CERTIFICATE DESCRIPTION	RESPONSIBILITY	LIMITING DATES FOR ISSUANCE OF CERTIFICATE
CCP-13	Certificate for Return of BGs/ Insurance Surety Bonds/Indemnity Bonds etc.	Site Finance/ Corporate Finance	All BGs except CPG: 5 Month from Trial Operation / Completion of Facilities CPG: 15Months from Trial Operation/ Completion of Facilities

ANNEXURE-IV to SCC

F. No. DPE/7(4)/2017-Fin.
Government of India
Ministry of Finance
Department of Public Enterprises

Block No. 14, CGO Complex,
Lodi Road, New Delhi-110003
Dated the 24th February, 2023

To,

Chief Executives of all CPSEs

Subject:- Restrictions under Rule 144(xi) of the General Financial Rules
(GFRs), 2017 - regarding

Sir/Madam,

The undersigned is directed to reiterate the instructions as contained in
Department of Expenditure O.M. No. 7/10/2021-PPD(1) dated 23rd February, 2023
(copy enclosed) to all CPSEs for their information and strict compliance.

Encl : As stated


(Kailash Bhandari)
Deputy Director
Tel : 2436-6247

Copy to :- Shri Kanwalpreet, Director (PPD), Department of Expenditure, Room No.
264-C, North Block, New Delhi.

No.F.7/10/2021-PPD (1)
Government of India
Ministry of Finance
Department of Expenditure
Procurement Policy Division

264-C, North Block, New Delhi.
23.02.2023.

Order (Public Procurement No. 4)

Subject: Restrictions under Rule 144(xi) of the General Financial Rules (GFRs), 2017.

Attention is invited to Order (Public Procurement No. 1) issued vide F.6/18/2019-PPD dated 23.07.2020, Order (Public Procurement No. 2) issued vide F.6/18/2019-PPD dated 23.07.2020, Order (Public Procurement No. 3) issued vide F.6/18/2019-PPD dated 24.07.2020, Office Memorandum (OM) No. F.18/37/2020-PPD dated 08.02.2021, OM No. F.12/1/2021-PPD(Pt.) dated 02.03.2021 and OM No. F.7/10/2021-PPD dated 08.06.2021. In this regard, the following is hereby ordered under Rule 144(xi) (as amended vide OM No. F.7/10/2021-PPD dated 23.02.2023) on the grounds stated therein, in supersession to all of the above mentioned Orders/ clarifications:

Requirement of registration:

2. Any bidder from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turnkey projects) only if the bidder is registered with the Competent Authority, specified in **Annexure I**.

3. Any bidder (including an Indian bidder) who has a Specified Transfer of Technology (ToT) arrangement with an entity from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turnkey projects) only if the bidder is registered with the Competent Authority, specified in **Annexure I**.

4. The requirement of registration for cases covered by paragraph 2 above has been applicable since 23.07.2020. The requirement of registration for bidders covered by paragraph 3 above will be applicable for all procurements where tenders are issued/ published after 01.04.2023.

5. In tenders issued after 23.07.2020 or 01.04.2023, as the case may be, the provisions of requirement of registration of bidders and of other relevant provisions of this Order shall be incorporated in the tender conditions.

Applicability:

6. Apart from Ministries/ Departments, attached and subordinate bodies, notwithstanding anything contained in Rule 1 of the GFRs 2017, the Order shall also be applicable

- a) to all Autonomous Bodies;
- b) to all public sector banks and public sector financial institutions;
- c) to all Central Public Sector Enterprises;
- d) to all procurement in Public Private Partnership projects receiving financial support from the Government or public sector enterprises/ undertakings; and
- e) Union Territories, National Capital Territory of Delhi and all agencies/ undertakings thereof.

7. This order will not be applicable for cases falling under **Annexure II**.

Definitions:

8. "*Bidder*" for the purpose of the Order (including the term 'tenderer', 'consultant' 'vendor' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency, branch or office controlled by such person, participating in a procurement process.

9. "*Tender*" for the purpose of the Order will include other forms of procurement, except where the context requires otherwise.

10. "*Transfer of Technology*" means dissemination and transfer of all forms of commercially usable knowledge such as transfer of know-how, skills, technical expertise, designs, processes and procedures, trade secrets, which enables the acquirer of such technology to perform activities using the transferred technology independently. (Matters of interpretation of this term shall be referred to the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade, and the interpretation of the Committee shall be final.)

11. "*Specified Transfer of Technology*" means a transfer of technology in the sectors and/ or technologies, specified in paragraph 15, occurring on or after 23.07.2020.

12. "*Bidder (or entity) from a country which shares a land border with India*" for the purpose of the Order means

- (a) An entity incorporated, established or registered in such a country; or
- (b) A subsidiary of an entity incorporated, established or registered in such a country; or
- (c) An entity substantially controlled through entities incorporated, established or registered in such a country; or
- (d) An entity whose beneficial owner is situated in such a country; or
- (e) An Indian (or other) agent of such an entity; or
- (f) A natural person who is a citizen of such a country; or

(g) A consortium or joint venture where any member of the consortium or joint venture falls under any of the above

13. *Beneficial owner* for the purposes of Para 12 (d) will be as under:

(i) In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person(s), has a controlling ownership interest or who exercises control through other means.

Explanation:-

a. "Controlling ownership interest" means ownership of, or entitlement to, more than twenty-five per cent of shares or capital or profits of the company;

b. "Control" shall include the right to appoint the majority of the directors or to control the management or policy decisions, including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;

(ii) In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;

(iii) In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;

(iv) Where no natural person is identified under (i) or (ii) or (iii) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;

(v) In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

14. "*Agent*" for the purpose of the Order is a person employed to do any act for another, or to represent another in dealings with third persons.

[Note:

i. A person who procures and supplies finished goods from an entity from a country which shares a land border with India will, regardless of the nature of his legal or commercial relationship with the producer of the goods, be deemed to be an Agent for the purpose of this Order.

ii. However, a bidder who only procures raw material, components etc. from an entity from a country which shares a land border with India and then manufactures or converts them into other goods will not be treated as an Agent.]

Sensitive Sectors/ Technologies (relevant only for the provisions on ToT arrangements):

15. (i) Certain sectors and technologies have been identified as sensitive from the national security point of view. The sectors listed in Schedule I to this Order are considered Category-I sensitive sectors. The sectors listed in Schedule II to this Order are considered Category-II sensitive sectors. The technologies listed in Schedule III are considered sensitive technologies.

(ii) For Category-I sensitive sectors, bidders with ToT arrangement in any technology with an entity from a country which shares a land border with India shall require registration.

(iii) For Category-II sensitive sectors, bidders with ToT arrangement in the sensitive technologies listed in Schedule III, with an entity from a country which shares a land border with India shall require registration.

(iv) In Category-II sensitive sectors, the Secretary (or an officer not below the rank of Joint Secretary to Government of India, so authorized by the Secretary) of the Ministry/ Department of the Government of India is empowered, after due consideration, to waive the requirement of registration for a particular item/ application or a class of items/ applications from the requirement of registration, even if included in Schedule III. The Ministry/ Department concerned shall intimate the Department for Promotion of Industry and Internal Trade (DPIIT) and National Security Council Secretariat (NSCS) of their decision to waive the requirement of registration. Ministries/ Departments of the Government of India are not required to consult the DPIIT/ NSCS before deciding and are only required to intimate the decision to DPIIT/ NSCS. If any point is raised by DPIIT/ NSCS, it should be considered in future procurements; ongoing procurement for which the waiver was granted need not be interrupted or altered.

16. Based on security considerations, a Ministry/ Department in a Category II sensitive sector or other Ministries/ Departments may recommend to DPIIT inclusion of any other technology in the list of sensitive technologies, either generally or for their Ministry/ Department.

Sub-contracting in works contracts

17. In works contracts, including turnkey contracts, contractors shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority. The definition of "contractor from a country which shares a land border with India" shall be as in paragraph 12 above. This shall not apply to sub-contracts already awarded on or before 23.07.2020.

[Note: Procurement of raw material, components, etc. does not constitute sub-contracting.]

Certificate regarding compliance

18. An undertaking shall be taken from bidders in the tender documents (**Annexure III**) that the extant guidelines for participation in the tenders (which should include conditions for implementation of this Order) have been complied with. If such certificate given by a bidder whose bid is accepted is found to be false, this would be a ground for debarment and further legal action in accordance with law.

Validity of registration

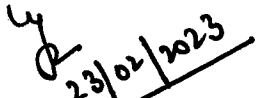
19. In respect of tenders, registration should be valid at the time of submission of bids and at the time of acceptance of bids. In respect of supply otherwise than by tender, registration should be valid at the time of placement of order. If the bidder was validly registered at the time of acceptance / placement of order, registration shall not be a relevant consideration during contract execution.

Government e-Marketplace (GeM)

20. GeM shall remove non-compliant entities from GeM unless/ until they are registered in accordance with this Order.

Model Clauses/ Certificates

21. Model Clauses and Model Certificates which may be inserted in tenders/ obtained from Bidders are given at Annexure-III. While adhering to the substance of the Order, procuring entities are free to appropriately modify the wording of these clauses based on their past experience, local needs etc.


23/02/2023
(Kanwalpreet)
Director(PPD)

Tel.No. 2309 3811; email: kanwal.irss@gov.in

To

1. Secretaries of all Ministries/ Departments of Government of India for information and necessary action. They are also requested to inform these provisions to all procuring entities.
2. Secretary, Department of Public Enterprises with a request to immediately reiterate these orders in respect to public enterprises.
3. Secretary, Department of Financial Services with a request to immediately reiterate these orders in respect to public sector and public sector financial institutions.
4. Secretary DPIIT with a request to take action as provided under Annexure I.
5. Chief Secretaries/ Administrators of Union Territories/ National Capital Territory of Delhi.
6. CEO/ GeM with a request to ensure implementation of this order on GeM.

List of Category-I Sensitive sectors:

Sr.No.	Sector
(i)	Atomic Energy
(ii)	Broadcasting/ Print and Digital Media
(iii)	Defence
(iv)	Space
(v)	Telecommunications

List of Category-II Sensitive sectors:

Sr.No.	Sector
(i)	Power and Energy (including exploration/ generation/ transmission/ distribution/ pipeline)
(ii)	Banking and Finance including Insurance
(iii)	Civil Aviation
(iv)	Construction of ports and dams & river valley projects
(v)	Electronics and Microelectronics
(vi)	Meteorology and Ocean Observation
(vii)	Mining and extraction (including deep sea projects)
(viii)	Railways
(ix)	Pharmaceuticals & Medical Devices
(x)	Agriculture
(xi)	Health
(xii)	Urban Transportation

List of Sensitive Technologies:

Sr.No.	Sensitive Technologies
(i)	Additive Manufacturing (e.g. 3D Printing)
(ii)	Any equipment having electronic programmable components or autonomous systems (e.g. SCADA systems)
(iii)	Any technology used for uploading and streaming of data including broadcasting, satellite communication etc.
(iv)	Chemical Technologies
(v)	Biotechnologies including Genetic Engineering and Biological Technologies
(vi)	Information and Communication Technologies
(vii)	Software

Competent Authority and Procedure for Registration

- A. The Competent Authority for the purpose of registration under this order shall be/ continue to be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT)*. [This Committee was already constituted under Order (Public Procurement) No.1].
- B. The Registration Committee shall have the following members*:
- i. An officer, not below the rank of Joint Secretary, designated for this purpose by DPIIT, who shall be the Chairman;
 - ii. Officers (ordinarily not below the rank of Joint Secretary) representing the Ministry of Home Affairs, Ministry of External Affairs, and of those Departments whose sectors are covered by applications under consideration;
 - iii. Any other officer whose presence is deemed necessary by the Chairman of the Committee.
 - iv. With effect from 01.04.2023, an officer (ordinarily not below the rank of Joint Secretary) representing the National Security Council Secretariat.
- C. DPIIT shall lay down the method of application, format etc. for such bidders as covered by the Order.
- D. On receipt of an application seeking registration from a bidder covered by Para 2 and 3 of this order, the Competent Authority shall first seek political and security clearances from the Ministry of External Affairs and Ministry of Home Affairs, as per guidelines issued from time to time. Registration shall not be given unless political and security clearance have both been received.
- E. The Ministry of External Affairs and Ministry of Home Affairs may issue guidelines for internal use regarding the procedure for scrutiny of such applications by them.
- F. The decision of the Competent Authority, to register such bidder may be for all kinds of tenders or for a specified type(s) of goods or services, and may be for a specified or unspecified duration of time, as deemed fit. The decision of the Competent Authority shall be final.
- G. Registration granted by the Competent Authority of the Government of India shall be valid not only for procurement by the Central Government and its bodies specified in para 6 of this order, but also for procurement by State Governments and their agencies/ public enterprises etc. No fresh registration at the State level shall be required.
- H. The Competent Authority is empowered to cancel the registration already granted if it determines that there is sufficient cause. Such cancellation by itself, however, will

not affect the execution of contracts already awarded. Pending cancellation, it may also suspend the registration of a bidder, and the bidder shall not be eligible to bid in any further tenders during the period of suspension.

- I. For national security reasons, the Competent Authority shall not be required to give reasons for rejection/cancellation of registration of a bidder.

[*Note:

(i) In respect of application of the Order to procurement by/ under State Governments, all functions assigned to DPIIT shall be carried out by the State Government concerned through a specific department or authority designated by it. The composition of the Registration Committee shall be as decided by the State Government. However, the requirement of political and security clearance as per para D shall remain and no registration shall be granted without such clearance.

(ii) Registration granted by State Governments shall be valid only for procurement by the State Government and its agencies/ public enterprises etc. and shall not be valid for procurement in other states or by the Government of India and their agencies/ public enterprises etc.]

Special Cases

- A. In projects which receive international funding with the approval of the Department of Economic Affairs (DEA), Ministry of Finance, the procurement guidelines applicable to the project shall normally be followed, notwithstanding anything contained in this order and without reference to the Competent Authority. Exceptions to this shall be decided in consultation with DEA.
- B. This order shall not apply to procurement by Indian missions and by offices of government agencies/ undertakings located outside India.
- C. This order will not apply to bidders (or entities) from those countries (even if sharing a land border with India) to which the Government of India has extended lines of credit or in which the Government of India is engaged in development projects. Updated lists of countries to which lines of credit have been extended or in which development projects are undertaken are given on the website of the Ministry of External Affairs.
- D. Procurement of spare parts and other essential service support like Annual Maintenance Contract (AMC)/ Comprehensive Maintenance Contract (CMC), including consumables for closed systems, from Original Equipment Manufacturers (OEMs) or their authorized agents, shall be exempted from the requirement of registration.

Model Clause/ Certificate/ Undertaking to be inserted in tenders etc.

[While adhering to the substance of the Order, procuring entities and GeM are free to appropriately modify the wording of the clause/ certificate based on their past experience, local needs etc.

The conditions relating to specified ToT (as shown in italics) should be incorporated only in the tenders which attract the restrictions due to specified ToT.]

A. Model Clauses for Tenders (including tenders issued manually or any electronic portal including GeM):

I. Any bidder from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turnkey projects) only if the bidder is registered with the Competent Authority. *Further, any bidder (including bidder from India) having specified Transfer of Technology (ToT) arrangement with an entity from a country which shares a land border with India, shall also require to be registered with the same competent authority.*

II. "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.

III. "Bidder (or entity) from a country which shares a land border with India" for the purpose of this Order means: -

- (a) An entity incorporated, established or registered in such a country; or
- (b) A subsidiary of an entity incorporated, established or registered in such a country; or
- (c) An entity substantially controlled through entities incorporated, established or registered in such a country; or
- (d) An entity whose beneficial owner is situated in such a country; or
- (e) An Indian (or other) agent of such an entity; or
- (f) A natural person who is a citizen of such a country; or
- (g) A consortium or joint venture where any member of the consortium or joint venture falls under any of the above

IV. The beneficial owner for the purpose of (iii) above will be as under:

1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.

Explanation—

a. "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent. of shares or capital or profits of the company;

b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;

2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;

3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;

4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;

5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

V. An Agent is a person employed to do any act for another, or to represent another in dealings with third person.

VI. [To be inserted in tenders for Works contracts, including Turnkey contracts] The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority.

VII. The registration shall be valid at the time of submission of bid and at the time of acceptance of bid.

VIII. If the bidder was validly registered at the time of acceptance / placement of order, registration shall not be a relevant consideration during contract execution

Model Certificate for Tenders:

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that this bidder fulfills all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

Model Certificate for Tenders for Works involving possibility of sub-contracting:

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority and will not sub-contract any

work to a contractor from such countries unless such contractor is registered with the Competent Authority. I hereby certify that this bidder fulfills all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

Model additional certificate by Bidders in the cases of specified ToT:

"I have read the clause regarding restrictions on procurement from a bidder having Transfer of Technology (ToT) arrangement. I certify that this bidder does not have any ToT arrangement requiring registration with the competent authority."

OR

"I have read the clause regarding restrictions on procurement from a bidder having Transfer of Technology (ToT) arrangement. I certify that this bidder has valid registration to participate in this procurement."

B. Model Certificate for GeM (to be taken by the GeM from seller during registration on GeM. GeM should also obtain this certificate from all existing bidders as soon as possible):

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this vendor/ bidder is not from such a country and does not have any specified Transfer of Technology (ToT) from such a country or, if from such a country or if having specified ToT from such a country has been registered with the Competent Authority. I hereby certify that this vendor/ bidder fulfills all requirements in this regard and is eligible to be considered for procurement on GeM. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

ANNEXURE-V TO SCC

NOT USED

F. No. 11/22/2021-Th.II
 Government of India
 (Bharat Sarkar)
 Ministry of Power
 (Vidyut Mantralay)

Shram Shakti Bhawan, Rafi Marg
 New Delhi, the 22nd March, 2022

OFFICE MEMORANDUM

Subject: Constitution of Conciliation Committee of Independent Experts for resolution of contractual disputes in respect of the projects implemented by CPSUs / Statutory Bodies under administrative control of Ministry of Power – regarding.

With the approval of Hon'ble Minister of Power and New & Renewable Energy, Ministry of Power, vide OM of even number dated 29.12.2021 (**Annex-I**), introduced a conciliation mechanism for settlement of contractual disputes in contracts of CPSUs / Statutory Bodies under Ministry of Power executing power projects. For this purpose, it was decided to constitute three numbers of Conciliation Committees of Independent Experts (CCIEs).

2. Accordingly, a Notification of even number was issued on 07.01.2022 inviting Expression of Interest from the eligible candidates for empanelment as Independent Expert for constitution of the CCIEs. Consequently, with the approval of Hon'ble Minister of Power, a Search-cum-Selection Committee was also constituted for scrutiny of the EoIs as well as screening of the candidates.

3. Based on the recommendations of the Search-cum-Selection Committee, following three nos. of Conciliation Committee of Independent Experts are hereby constituted for settlement of contractual disputes in contracts of CPSUs / Statutory Bodies under Ministry of Power executing power projects:-

CCIE	Members of CCIE
CCIE-1	Shri Anup Wadhawan, Ex-Secretary (Commerce), GoI
	*Shri Ravinder Kumar Sharma, Ex-MD, HBSEBL
	Shri Mrinal Kanti Bhattacharya, Ex-Executive Director, Indian Bank
CCIE-2	Ms. Rashmi Verma, Ex-Secretary (Tourism), GoI
	*Shri Dharendra Veer Singh, Ex-CMD, THDC (India) Ltd.
	Shri Naveen Bhushan Gupta, Ex-Director (Finance), PFC Ltd.
CCIE-3	Shri P. S. Kharola, Ex-Secretary (Civil Aviation), GoI
	*Shri Anil Kumar Jha, Ex-Director (Technical), NTPC Ltd.
	Shri Chinmaya Gangopadhyaya, Ex-Director (Projects), PFC Ltd.

4. The aforementioned CCIEs shall function as per the Standard Operating Procedure enumerated in this Ministry's Office Memorandum of even number dated 29.12.2021. Moreover, the tenure, remuneration and other terms and conditions of the engagement of above Members of CCIEs shall also be governed by the aforesaid OM.

This issues with the approval of Hon'ble Minister of Power and New & Renewable Energy.

Encl: as above.

Vikrant S. Dhillon

(Vikrant S. Dhillon)
 Deputy Director

Email: hydro2-mop@gov.in

***Second member in the CCIE(s) shall stand substituted by coal-mining expert Member (presently, Shri Tapas Kumar Nag, Ex-CMD, NCL), as notified by Ministry of Power from time to time, in case of disputes relating to captive coal mines**

To

1. Chairperson, CEA
2. CMDs – PGCIL, REC, PFC, NTPC, NHPC, SJVN, THDC, NEEPCO, POSOCO
3. Chairman - BBMB, DVC
4. Director General – BEE, NPTI, CPRI

Copy to:


1. PS to Hon'ble Minister of Power & NRE
2. APS to Hon'ble MoS for Power
3. Sr. PPS to Secretary (Power)
4. Sr. PPS to AS(SKG) / Sr. PPS to AS&FA / Sr. PPS to AS(VKD)
5. All Joint Secretaries of Ministry of Power
6. All Directors / Deputy Secretaries of Ministry of Power.
7. Members of the CCIEs


Copy also to:


In-charge, NIC Cell, MoP with request to publish the OM on the website of Ministry of Power.





(Vikrant S. Dhillon)
Deputy Director


CLAUSE NO.	TECHNICAL REQUIREMENTS				
<p>1.0.0</p> <p>1.1.0</p> <p>1.1.1</p> <p>1.1.2</p> <p>1.1.3</p>	<p>GENERAL REQUIREMENTS/ SPECIFICATIONS</p> <p>In addition to the above specific items of work, the Contractor must fulfill the under-mentioned obligations of general nature for the successful completion of work.</p> <p>Before tendering, the Bidder is advised to visit site and its surroundings to assess and satisfy himself about the local conditions such as access roads to the site, adequacy of the existing culverts / bridges / roads / tunnels/ports/ jetties for the expected traffic, water and power supply, applicable taxes, duties, royalties and levies, nature of ground and subsoil conditions, underground water table, availability of accommodation, weather characteristics of Port Blair, local terrain, availability of construction materials, minimum wages, labour and other related laws, environmental and safety laws, acts and regulations and any other relevant information, as required by him. The Bidder may obtain all necessary information as to risk, contingencies, and other circumstances, which may influence or affect their tender. Bidder shall be deemed to have considered local conditions and information and to have satisfied himself in all respects before quoting his rates and terms and no claim whatsoever in this regard shall be entertained by the Owner at a later date.</p> <p>There will be limitations of space during the construction stage. Simultaneously, other mechanical, electrical, C&I agencies are required to work in the area, where the successful Bidder for this work will also have to work. The Contractor for the work must plan and coordinate to meet the requirements of other agencies and reorganize/re-schedule his work activities, if required. Rescheduling from time to time may be done after ascertaining the progress achieved.</p> <p>The Bidder's unit rates shall be inclusive of all such contingencies and no payments whatsoever in this regard (any compensation for working under difficult circumstances or for rescheduling of the work but without altering the overall completion schedule of the Contract) shall be entertained by the Owner, at a later date.</p> <p>The Contractor shall take all necessary precautions to protect his own and or other agencies existing buildings/ structures/ equipment facilities etc. from damage. In case any damage occurs due to the activities of the contractor on account of negligence, ignorance, accidental or any other reason whatsoever, the damage shall be immediately made good by the Contractor at his own cost to the satisfaction of the Owner. The Contractor shall also take all necessary safety measures with specific reference to deep excavation and excavation of rock to avoid any harm or injury to his workers and staff from the equipment and facilities of the power station.</p> <p>Contractor shall make all necessary arrangements, whatsoever required including all weather truckable / haulage roads, transportation from sea route for transportation of:</p>				
<p>A&N GAS PROJECT 50MW CIVIL WORKS PACKAGE</p>	<p>Bid Doc. No. : NVVN/C&M/RE- 342/2024-25</p>	<p>TECHNICAL SPECIFICATIONS</p>	<p>SECTION - II PART A</p>	<p>Page 1 of 33</p>	


CLAUSE NO.	TECHNICAL REQUIREMENTS				
	<ul style="list-style-type: none"> i) Concrete from batching plant to the place of construction. ii) Steel and cement to be sourced from mainland. iii) Factory Fabricated structures from mainland iv) Assembled / fabricated structures from pre-assembly yard to the erection site. v) Construction materials (coarse and fine aggregate for Reinforced cement concrete works to be sourced from mainland). v) Materials from borrow area (to be identified and arranged by bidder). vi) Materials / Earth (soil/rock) to disposal area (to be identified and arranged by bidder). 				
1.1.4	Temporary/Cross drains, whatsoever required to drain out the water from working areas to avoid the water logging, shall be constructed by the Contractor at his own cost.				
1.1.5	All applicable standards, specification etc., and codes of practice shall be the latest editions, including all applicable official amendments and revisions issued up to thirty (30) days prior to the date of opening of this tender. A complete set of all these documents shall generally be available at Site, with the contractor and shall be made available to Engineer whenever he desires.				
1.1.6	The work to be performed under this specification shall include providing all labour, supervision, materials, construction equipment, tools and plant, instruments, testing, scaffolding, power, fuel, water supplies, transportation, handling, storage, insurance, duties, taxes, incidental items and all operations (not shown or specified but reasonably implied) necessary for successful completion of work in strict accordance with the drawings and these specifications.				
1.1.7	The technical specification covers the technical requirements for the supply / construction / fabrication and erection / installation of complete civil, structural and architectural works. The works shall have to be carried out both below and above ground level. The work shall be carried out within the plant boundary limits unless otherwise specified. Broad scope of work is specified herein in subsequent clauses.				
1.1.8	These specifications are intended for the general description of the work, quality and workmanship. These specifications are, however, not intended to cover the minutest details and the work shall be executed according to the relevant latest/best prevailing public works department practices/recommendations and to the instructions of the Engineer.				
1.1.9	The technical specification shall be read in conjunction with the 'General Conditions of Contract', 'Special Conditions of Contract', 'Tender Drawings' and 'Schedule of Items'.				
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1.1.10	<p>The survey details/contours of the existing ground indicated in the tender drawings are based on the survey carried out by the Owner and have been indicated solely for the guidance of the bidder. The Owner does not take any responsibility about the accuracy of these details/ contours and any variation of the said details/levels shall not constitute a valid reason for changing the terms and conditions of the contract.</p>				
1.1.11	<p>The Bidder shall obtain written clarifications from the Owner for any doubt about the tender documents etc. and in respect of interpretation of any portion of these documents, before tendering.</p>				
1.1.12	<p>All materials arising out of cutting/excavation including antiques, treasures, etc. shall be the property of the Owner. They shall be dealt with in the manner specified by the Engineer.</p>				
1.1.13	<p>The Contractor shall ensure dry working conditions by suitable de-watering as directed by the Engineer.</p>				
1.1.14	<p>It shall be the responsibility of the Contractor to construct and maintain proper approaches required for his use. Further, he shall also provide and maintain proper approaches to the working areas for the use of Owner's staff for inspection and supervision till the completion of works. Before submitting his bid, the Bidder shall inspect and satisfy himself of the adequacy of the existing approaches, bridges and culverts for his use and shall include for any strengthening/modification of the same, if required, in his quoted rates.</p>				
1.1.15	<p>After the completion of the work, the Contractor shall remove all the temporary structures put up by him like marking pillars, pegs, strings, sheds, construction equipment, testing equipment, etc. to the satisfaction of the Engineer.</p>				
1.2.0	<p>Drawings</p>				
1.2.1	<p>The tender drawing(s) (ANNEXURE-III) enclosed with the tender documents provide a general idea about the work to be performed under the scope of this contract. These are preliminary drawing(s) and are by no means the final drawing(s) or show the full range of the work under the scope. Work has to be executed according to "Released for Construction" drawings with additions, alterations and modifications made from time to time as required or approved by the Engineer and also according to any other drawing(s) that would be supplied to the Contractor progressively during the execution of the contract.</p>				
1.2.2	<p>The levels indicated in the tender drawings are tentative and work has to be carried out as per final levels to be furnished in "Released for Construction" drawings.</p>				
1.2.3	<p>All drawings and documents which are to be furnished by Contractor, shall be submitted in soft copy. One copy of the 'drawings and document' duly stamped by the Owner shall be returned to contractor. All such drawings and documents shall</p>				
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	<p>generally be stamped for Category-IV i.e. for information purpose only, unless noted otherwise. After receiving the stamped drawings, the contractor shall further make copies and furnish the requisite number of copies, as desired by Engineer, of these drawings and document, along with one soft copy.</p>				
1.2.4	<p>Approval of contractor's drawings & documents whatsoever by the Engineer, shall not relieve the contractor of his responsibility and obligation regarding adequacy, correctness, completeness, safety, strength, quality, workmanship, etc. of his design / drawings.</p>				
1.2.5	<p>All fabrication drawings, bar bending schedules, cutting plans, staging drawings and other working drawings shall be prepared on AutoCAD. For preparing such drawings, contractor shall keep a dedicated engineering team, comprising of well-experienced engineer, architect and AutoCAD operator, as a part of his establishment. All documents other than working drawings submitted by the contractor to the engineer shall be prepared in MS office. All computations shall be done on MS Excel.</p>				
1.2.6	<p>The data sheet for bought out items shall include technical parameters as mentioned in the technical specification and/or in the relevant codes/ standards along with their reference and the applicable tolerance limit. The working/fabrication drawings shall include all details required for construction along with the applicable construction schedule and the bill of material including all fittings/fixtures/hardware, etc.</p>				
1.2.7	<p>The contractor shall submit the working / fabrication drawings related to following work / activities to Engineer. The list is indicative only (not exhaustive) and drawings for any other work / activities as directly by Engineer shall also be submitted.</p> <ul style="list-style-type: none"> i) Bar bending schedule for reinforcement. ii) Floor finishes iii) Door windows and partitions iv) Glass and glazing v) False ceiling vi) Data sheet for cladding and roofing system 				
1.2.8	<p>The Contractor shall submit backup design calculations and documents for works as listed below and or as required by Engineer. The list is Indicative only (not exhaustive) and any other calculations and documents required by the Engineer shall also be submitted.</p> <ul style="list-style-type: none"> i) Joint calculations for fabrication drawings. ii) Calculations for suitability of sheeting and allied works, as per the criteria specified. iii) Drawing wise quantities for all major items. 				
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1.2.9	iv) Painting scheme of steel structures. v) Construction and erection methodology. The Contractor shall submit the following records of construction. The list is indicative only (not exhaustive) and any other record required by the Engineer shall also be submitted. i) As built construction/ working drawings. ii) As built fabrication drawings. iii) All records for concreting and reinforcement as indicated in this document. iv) Sampling, testing and quality records. v) Ground levels. vi) Data sheet for procurement of bought out items.				
1.3.0	Plant/Levelling Boundary The plant/levelling boundary unless otherwise noted, shall mean the 'Land Acquisition Line' for the entire project area as indicated in the 'General Layout Plan' drawing. The area within the plant/levelling boundary shall be referred as 'Site'.				
1.4.0	Girth Girth of a tree wherever mentioned in the specifications shall mean, perimeter of trunk of the tree at a height of 1 metre from the existing ground level.				
1.5.0	Geotechnical Data for the Plant Geotechnical investigation (borelogs) have been carried out and bore log details are enclosed in Part-B of Technical Specification. Detailed results of these investigations are available with the Owner. The same can be referred to by the bidder if required by him. However, these are solely for the guidance of the Bidder and the Owner does not take any responsibility about the accuracy of these results and any variation of the said details shall not constitute a valid reason for changing the terms and conditions of the contract. The Contractor shall satisfy himself about the actual nature of soil/rock present at site.				
1.6.0	Protection and Establishment of Reference Pillars				
1.6.1	A grid system of co-ordinates has been established at site by the Owner. Permanent reference pillars have been established and under no circumstances the Contractor shall remove or disturb any permanent reference pillar/mark without the written approval of the Engineer.				
1.6.2	After cutting/filling in a block/area has been completed all the reference pillars that are disturbed or lost in the cutting/filling shall be re-established by the Contractor as				
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	<p>directed by the Engineer. The Contractor shall supply all labour, materials, tools, equipment, safeguards and incidentals for establishing these permanent pillars at his own cost. The Contractor shall provide all assistance, instruments, materials and men to the Engineer for checking the layout and levels at his own cost. However, the Contractor shall be fully responsible for correctness of layout and levels.</p>				
1.6.3	<p>It shall be the responsibility of the Contractor to protect the reference pillars at respective locations and levels until the site is finally handed over to the Owner. Any reference pillar disturbed or lost during this period for any reason whatsoever shall be replaced and re-established by the Contractor at his own cost at the original location and level unless otherwise directed by the Engineer.</p>				
1.7.0	<p>For DSR-2018 Items, CPWD specifications- 2019 with all correction slips/ modifications/ amendments shall be applicable and Non-DSR items Technical Specification given in Part-B shall be applicable.</p>				
2.0.0	<p>CONTRACTOR'S OBLIGATIONS</p> <p>The bidder / contractor shall be deemed to have full knowledge of the site and site limitations, whether he visits site or not and no extra charges consequent on any misunderstanding or otherwise shall be allowed.</p>				
2.1.0	<p>Site Visit</p>				
2.1.1	<p>Before tendering, bidder is advised to visit site and its surroundings to assess and satisfy themselves about the local conditions such as access roads to the site, ports, jetties, approach road available within project site, adequacy of the existing culverts / bridges / roads for the expected traffic, water and power supply, application / details of taxes, duties, royalties and levies, nature of ground and subsoil condition, underground water table, availability of accommodation, weather characteristics, local terrain, availability of construction materials, minimum wages, labour and other related laws, environmental and safety laws, acts and regulations and any other relevant information, as required by them. The bidder may obtain all necessary information as to risk, contingencies and other circumstances, which may influence or affect their tender. Bidder shall be deemed to have considered local conditions and information and to have satisfied himself in all respects before quoting his rates and terms and no claim whatsoever in this regard shall be entertained by the Owner at a later date.</p>				
2.2.0	<p>Site Limitations</p>				
2.2.1	<p>A close look at the Master plan enclosed with the tender documents indicates that there will be limitations of space during the construction stage.</p>				
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2.2.2	<p>The contractor shall make his own arrangement for approach (access road) to work site including borrow/ disposal area and for movement of men, machinery and other equipment. The access road near to the work site and drainage will not be available at the time of mobilisation. The contractor shall plan his work within plant area. All drainage of works area work site and all weather truckable / haulage roads / access road to facilitate the movement of men, material and heavy equipment like cranes, tractor, trailer, transit mixer, dumpers, water tanker, etc., what so ever are required by the contractor shall be constructed and maintained by the contractor.</p>				
2.2.3	<p>The Master plan enclosed with the tender, shows the area earmarked for various buildings and facilities including roads, bridges etc. Cross drains, whatsoever required to drain out the water from working areas to avoid the water logging, shall be constructed by the contractor.</p>				
2.2.4	<p>Hard crusting for pre-assembly shall be developed by the contractor as a part of this contract, under the item of filling. Further development of the pre-assembly work site like pre-assembly bed, power distribution points, cable laying, drains etc., shall be done by the contractor.</p>				
3.0.0	<p>CONTRACTOR'S OFFICE & STORE BUILDINGS</p>				
3.1.0	<p>Contractor's Office & Store Buildings: The plot of land for the project is limited. For his site office, the contractor shall adopt readymade 'Portacabin' or similar construction. For storage of construction materials, the Contractor shall make their own arrangement for construction of covered store buildings / sheds and land for the same shall also be arranged by the Contractor including payment of land lease rent, obtaining necessary clearances/approvals of the concerned local authorities.</p>				
3.2.0	<p>Contractor shall make arrangements/tie up with equipment manufacturers / suppliers for periodic overhaul/maintenance and repair for major breakdown, of construction plant, equipment and machinery (like dumpers, excavators, cranes, batching plant, dewatering pumps etc.)</p>				
4.0.0	<p>WORKING HOURS</p>				
4.1.0	<p>The contractor shall normally work in one shift every day. Erection work, however, shall be done during the day shifts only, as far as possible. The contractor shall, however, intimate the engineer well in advance in case he desires to carryout the work in the two shifts also. The contractor shall provide adequate illumination during the night shift.</p>				
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<p>5.0.0</p> <p>5.1.0</p> <p>5.2.0</p> <p>6.0.0</p> <p>6.1.0</p>	<p>PRICE BASIS</p> <p>The total contract price quoted by the bidder in schedule of Items, shall be based on the Scope of Work included in Part - A read in conjunction with various Technical Requirements specified in Sections in Part - B and Tender Drawings of this Technical Specification and other requirements as per provisions of the bidding documents.</p> <p>The price basis for quoting shall be governed as follows: The bidder shall quote Discount or Premium in percentage (%) over the total value in the respective sections in Schedule of Quantities for DSR Items and Non DSR Items.:</p> <p>For all the Schedules (DSR and Non Schedule Items, the bidder has to quote Discount of Premium in Percentage (%age) rates as indicated in the following table:</p> <table border="1"> <thead> <tr> <th>S. No</th> <th>SCHEDULE</th> <th>SCHEDULE & BRIEF DESCRIPTION</th> <th>BASIS OF RATES TO BE QUOTED</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Schedule I.A</td> <td>DSR ITEMS</td> <td>Discount or Premium in Percentage (%) to be quoted For individual section separately.</td> </tr> <tr> <td>2</td> <td>Schedule I.B</td> <td>NON DSR ITEMS</td> <td>Discount or Premium in Percentage (%) to be quoted For individual section separately.</td> </tr> </tbody> </table> <p>DSR= Delhi Schedule of Rates</p> <p>All the works though not specifically mentioned in the Technical Specification but are required to complete the work in all respects as per bidding documents shall be deemed to be included in the "Item/Lump Sum Rate Portion" of work and the same shall be executed within the price quoted by the bidder.</p> <p>SAFETY MEASURES</p> <p>General</p>				S. No	SCHEDULE	SCHEDULE & BRIEF DESCRIPTION	BASIS OF RATES TO BE QUOTED	1	Schedule I.A	DSR ITEMS	Discount or Premium in Percentage (%) to be quoted For individual section separately.	2	Schedule I.B	NON DSR ITEMS	Discount or Premium in Percentage (%) to be quoted For individual section separately.
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	<p>i) The contractor shall comply with all the requirements of "The Building and Other Construction Workers (Regulation of Employment & Conditions of Service) Act", 1996 and its Central Rule 1998 / State Rules and any other statutory requirements as applicable.</p> <p>ii) The Contractor shall follow Owner Safety Rules as issued from time to time with respect to safety in construction & erection.</p> <p>iii) The contractor shall have the approved Safety, Health and Environment (SHE), Policy in respect of Safety and health of Building Workers and it shall be circulated widely and displayed at conspicuous place in Hindi and local language understood by the majority of the workers. A copy of the safety policy should be submitted to Engineer in charge.</p> <p>iv) The contractor shall prepare the safety plan comprising of methods to implement the Safety Policy / Rules, Risk assessment and ensuring Safety at work areas, Safety audits, inspections and its compliance, Supervision and responsibility to ensure Safety at various levels, Safety training to employees, review of Safety and accident analysis, ensure Health and Safety Procedures to prevent accidents and submit to Engineer for approval as per the format of Safety plan as given in Annexure-I.</p> <p>v) The Contractors shall ensure proper safety of all the workmen, materials, plant and equipment belonging to him or to the Employer or to others, working at the site.</p> <p>vi) All equipments used in construction and erection by the contractor shall meet BIS / International Standards and where such standards to not exist, the Contractor shall ensure these to be absolutely safe. All equipments shall be strictly operated and maintained by the contractor in accordance with manufacturer's operation manual. The contractor should also follow Guidelines / Rules of the Employer in this regard.</p> <p>vii) The Contractor shall provide suitable latest Personal Protective Equipments of prescribed standard to all his employees and workmen according to the need. The Engineer shall have the right to examine these safety equipments to determine their suitability, reliability, acceptability and adaptability. The contractor should also ensure availability of these before their use at worksite.</p> <p>viii) The Contractor shall provide safe working conditions to all workmen and employees at his workplace including safe means of access, railings, stairs and ladders, scaffolding, work platforms, toe boards etc. The scaffoldings shall be erected under the control and supervision of an experienced and competent person. For erection of scaffolds, access, work platforms etc. the</p>				
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	<p>material shall be good and the contractor shall use standard quality of material.</p> <p>ix) The Contractor shall follow and comply with all the Safety Rules, standards, code of practices of Owner and relevant provisions of applicable laws pertaining to the safety of workmen, employees, plant and equipment as may be prescribed from time to time without any protest or contest or reservation. In case of any unconformity between statutory requirement and the Safety Rules of the Employer referred above, the latter shall be binding on the Contractor unless the statutory provisions are more stringent. As and when required he can refer / obtain copy of Owner safety documents as stated above.</p> <p>x) The contractor shall have his own arrangements with nearby hospitals for shifting and treatment of sick and injured. The medical examination of the workers employed in hazardous areas shall be conducted as per Rule 223 of The Building and Other Construction Worker (Regulation of Employment and Condition of Service) Central Rule 1998. Their health records shall be maintained accordingly and to be submitted to Engineer when asked for. If any worker is found suffering from occupational health hazard, the worker should be shifted to suitable place of working and properly treated under intimation to Engineer. The medical fitness certificate is to be submitted to Engineer.</p> <p>xi) First Aid boxes equipped with requisite articles as specified in the Rule 231 of The Building and Other Construction Worker (Regulation of Employment and Condition of Service) Central Rule 12998 shall be provided at construction sites for the use of workers. Training has to be provided on first aid to workmen and office bearers working at site.</p> <p>a) Emergency Action Plan</p> <p>The contractor shall prepare and emergency action plan approved by his competent authority to handle any emergency occurred during construction work. Regular mock drills shall be organized to practice this emergency plan. The Emergency Action Plan should be widely circulated to all the employees and suitable infrastructure shall be provided to handle the emergencies.</p> <p>b) Scaffolding</p> <p>The contractor shall take all precautions to prevent any accidental collapse of scaffolding or fall of persons from scaffolding. The contractor should ensure that scaffolding is designed by a competent person and its erection and repairs should be done under the expert supervision.</p>				
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6.2.0	<p>The scaffolding shall meet the required strength and other requirements for the purpose for which the scaffold is erected. The material used for scaffold should conform to the BIS / International standards.</p> <p>c) Opening</p> <p>The contractor shall ensure that there is no opening in any working platform / any floor of the building, which may cause fall of workers or material. Whenever an opening on a platform / any floor of the building is unavoidable, the opening should be suitably fenced and necessary measures for protection against falling objects or building workers from such platform shall be taken by providing suitable safety nets, safety belts or other similar means.</p> <p>d) Explosives</p> <p>The contractor shall take all precautions while handling, using, storing or transporting of all explosives. Before usage of any explosive necessary warning / danger signals should be erected at conspicuous places to warn the workers and general public. The contractor should strictly ensure that all measures and precautions required for use, handling, storing or transportation of explosives under the rules framed under the Explosives Act, 1884 are complied with.</p> <p>Coffer Dam and Caissons</p> <p>The contractor shall ensure that the cofferdam and caissons are of good construction and adequate strength. The cofferdam and caissons should be provided with adequate means for workers to reach safely at the top of such dams in the event of an in-rush of water. The workers should be allowed to work in a cofferdam or caisson only after inspection and found safe by Engineer. Such inspection report is to be maintained in a Register.</p> <p>Where the workers are employed to work in a compressed air environment at the work site of coffer dam or caissons, a construction Medical Officer assisted by a Nurse or trained first aid attendant should be available at all the times during such work.</p>				
6.3.0	<p>Fencing of Machinery</p> <p>The contractor shall provide suitable fencing or guard to all dangerous and moving parts of machinery. The contractor shall not allow any of the employees to clean, lubricate, repair, adjust or examine when the machinery is in motion, which may cause injury to the person.</p>				
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6.4.0	<p>Dangerous and Harmful Gases / Equipment</p> <p>The contractor shall ensure that the workers are not exposed to any harmful gases during any construction activity including excavation, tunneling, confined spaces etc. The contractor should not allow any worker to go into the confined space unless it is certified by Engineer to be safe and fit for the entry to such work place. Proper record and work permits should be followed to carry out such works.</p>				
6.5.0	<p>Carrying of Excessive Weight by a Worker</p> <p>The worker shall not be allowed to lift by hand or carry over his head, back or shoulder weight/load more than the maximum limit set by the prescribed rules for the person.</p>				
6.6.0	<p>Overhead Protection</p> <p>The contractor shall ensure that any area exposed to risk of falling materials, articles or objects is roped off or cordoned off or otherwise suitably guarded from inadvertent entry of any person.</p> <p>Wherever there is a possibility of falling of any material, equipment or construction workers while working at heights, a suitable and adequate safety net should be provided. The safety net should be in accordance with BIS Standards.</p>				
6.7.0	<p>Working at Heights</p> <p>All working platforms, ways and other places of construction work shall be free from accumulation of debris or any other material causing obstructions and tripping. Wherever workers are exposed to the hazard of falling into water, the contractor shall provide adequate equipment for saving the employees from drowning and rescuing from such hazards. The contractor shall provide boat or launch equipped with sufficient number of life buoys, life jackets, etc. and manned with trained personnel at the site of such work.</p> <p>Every opening at elevation from ground level through which a building worker, vehicle, material equipment etc. may fall at a construction work shall be covered and / or guarded suitably by the contractor to prevent such falls.</p> <p>Wherever the workers are exposed to the hazards of falling from height, the contractor shall provide full harness safety belts fitted with fall arresting systems to all the employees working at higher elevations and life line of 8 mm diameter wire rope with turn buckles for anchoring the safety belts while working or moving at higher elevations. Safety nets shall also be provided for saving them from fall from heights and such equipment should be in accordance with BIS standards. Wherever there is a possibility of falling of any material, equipment of construction workers</p>				
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6.8.0	<p>while working at heights, a suitable and adequate safety net should be provided. The safety net should be in accordance with BIS Standards.</p> <p>The contractor shall provide standard prefabricated ladders on the columns where the workers are required to use them as an access for higher elevations till permanent staircase is provided. The workers shall be provided with safety belts fitted with suitable fall arresting system (Fall arrestors) for climbing / getting down through ladders to prevent fall from height.</p> <p>Handling of Hazardous Chemicals</p> <p>The contractor will notify well in advance to the Engineer of his intention to bring to the Site any container filled with liquid or gaseous fuel or explosive or petroleum substance or such chemicals which may involve hazards. Owner shall have the right to prescribe the conditions under which such container is to be stored, handles and used during, the performance of the works and the Contractor shall strictly adhere to and comply with such instructions. The Engineer shall have the right at his sole discretion to inspect any such container or such construction plant / equipment for which material in the container is required to be used and if in his opinion, its use is not safe, he may forbid its use. No claim due to such prohibition shall be entertained by Owner and Owner shall not entertain any claim of the Contractor towards additional safety provisions / conditions to be provided for / constructed.</p> <p>Further, any such decision of the Engineer shall not, in any way, absolve the Contractor of his responsibilities. In case, use of such a container or entry thereof into the Site area is forbidden by Owner, the Contractor shall use alternative methods with the approval of the Owner without any cost implication to the Owner to extension of work schedule.</p> <p>Where it is necessary to provide and / or store petroleum products or petroleum mixtures and explosives, the Contractor shall be responsible for carrying out such provisions and / or storage in accordance with the rules and regulations laid down in Petroleum Act 1934, Explosives Act 1948, and petroleum and Carbide of Calcium Manual published by the Chief Inspector of Explosives of India. All such storage shall have prior approval of the Engineer. In case any approvals are necessary from the chief Inspector (Explosives) or any statutory authorities, the Contractor shall be responsible for obtaining the same.</p> <p>The Contractor shall be fully responsible for the safe storage of his and his Sub-Contractor's radio-active sources in accordance with BARC/DAE (Bhabha Atomic Research Centre / Department of Atomic Energy, Govt. of India) Rules and other applicable provisions. The Contractor would take all precautionary measures stipulated by BARC/DAE in connection with use for storage and handling of such material.</p>				
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6.9.0	<p>The contractor shall provide suitable personal protective equipments to the workers who are handling the hazardous and corrosive substances including alkalis and acids.</p> <p>As a precautionary measure the contractor should keep the bottles filled with distilled water in cupboard / Boxes near workplace for emergency eye wash by worker exposed to such hazardous chemicals.</p> <p>Eye Protection</p> <p>The contractor shall provide suitable personal protective equipment to his workmen depending upon the nature of hazards and ensure their usage by the workers engaged in operation like welding, cutting, chipping, grinding or similar operations which may cause injuries to his eyes.</p>				
6.10.0	<p>Excavation</p> <p>The contractor shall take all necessary measures during excavation to prevent the hazards of falling or sliding of material or article from any bank or side of such excavation which is more than one and a half metre above his footing by providing adequate piling, shoring, bracing etc. against such bank or sides. Adequate and suitable warning signs shall be put up at conspicuous places at the excavation work to prevent any persons or vehicles falling into the excavation trench. No worker should be allowed to work where he may be stuck or endangered by excavation machinery or collapse of excavations or trenches.</p>				
6.11.0	<p>Electrical Hazards</p> <p>The contractor should ensure that all electrical installations at the construction work comply with the requirements of latest electricity acts / rules. The contractor shall take all adequate measures to prevent any worker from coming into physical contact with any electrical equipment or apparatus, machines or live electrical circuits which may cause electrical hazards during the construction work. The contractor shall provide sufficient ELCBs / RCCBs for all the portable equipments, electrical switchboards, distribution panels etc. to prevent electrical shocks. The contractor should ensure use of single / double insulated hand tools or low voltage i.e. 110 volts hand tools. The contractor should also ensure that all temporary electrical installations at the construction works are provided with earth leakage circuit breakers.</p>				
6.12.0	<p>Vehicular Traffic</p> <p>The contractor should employ vehicle drivers who hold a valid driving license under the Motor Vehicles Act, 1988.</p>				
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6.13.0	<p>Lifting Appliances, Tools & Tackles, Lifting Gear and Pressure Plant and Equipment etc.</p> <p>The contractor shall ensure all the lifting appliances, tools and tackles including cranes, etc. lifting gear including fixed or movable and any plant or gear, hoists, Pressure Plant and equipment etc. are in good condition and shall be examined by competent person and only those certified fit for use shall be used at site. Periodical Examination and the tests for all lifting / hoisting equipment & tackles shall be carried out. A register of such examinations and tests shall be properly maintained by the Contractor and will be promptly produced as and when desired by the Engineer or by the person authorized by him.</p>				
6.14.0	<p>Excessive Noise, Vibration</p> <p>The contractor shall take adequate measures to protect the workers against the harmful effect of excessive noise or vibration. The noise should not exceed the limits prescribed under the concerned rules, Noise Pollution (Regulation and Control) Rules, 2000.</p>				
6.15.0	<p>Electrical Installations</p> <p>The contractor shall not interfere or disturb electric fuses, wiring and other electrical equipment belonging to the Employer or other contractors under any circumstances, whatsoever, unless expressly permitted in writing by the engineer to handle such fuses, wiring or electrical equipment.</p> <ul style="list-style-type: none"> i) Before the Contractor connects any electrical appliances to any plug or socket belonging to the other contractor or the Owner he shall <ul style="list-style-type: none"> a) Satisfy the Engineer that the appliance is in good working condition; b) Inform the Engineer of the maximum current rating voltage and phases of the appliances; c) Obtain permission of the Engineer detailing the sockets to which the appliances may be connected ii) The Engineer will not grant permission to connect until he is satisfied that <ul style="list-style-type: none"> a) The appliance is in good condition and is fitted with suitable plug, having earth connection with the body. b) Wherever armored / metallic sheathed multi core cable is used, the same should be connected to earth. 				
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6.16.0	<p>iii) No repair work shall be carried out on any live equipment. The Engineer must declare the equipment safe and a permit to work shall be issued by the Owner / contractor as the case may be to carry out any repair / maintenance work. While working on electric lines / equipments whether live or dead, suitable type and sufficient quantity of tools will have to be provided by the contractor to electricians / workmen / Officers.</p> <p>iv) The contractor shall employ necessary number of qualified, full time Electricians / Electrical Supervisors to maintain his temporary electrical installation. The installations shall be provided with suitable ELCBs and RCCBs wherever required.</p> <p>Safety Organization</p> <p>i) The contractor employing more than 250 workmen whether temporary, casual, probationary, regular or permanent shall employ at least one full time safety officer exclusively to supervise safety aspects of the equipments and workmen, who will coordinate with the Owner Safety Officer. Further requirement of safety officers, if any, shall be guided by Rule 209 of The Building and Other Construction Worker (Regulation of Employment and Conditions of service) central rule 1998. In case the work is being carried out through sub-contractor, the employees / workmen of the sub-contractor shall also be considered as the contractor's employees / workmen for the above purpose.</p> <p>In case of contractor deploying less than 250 workmen he should designate one of his Engineer/supervisor or the contractor himself (if he is directly supervising the work) as safety officer in addition to his existing responsibilities. The Engineer / supervisor should get at least 2 days safety training from any reputed organization or from Owner before resuming the work. If already trained in past, the declaration along the training certificate to be furnished to Owner safety officer.</p> <p>ii) The name and address of such Safety Officer of the Contractor will be promptly informed in writing to the Engineer with a copy to the Project Safety Officer before he starts work or immediately after any change of the incumbent is made during the Contract Period.</p>				
6.17.0	<p>Reporting of Accident and Investigation</p> <p>In case any accident occurs during the construction / erection or other associated activities undertaken by the Contractor thereby causing any near miss, minor or major or fatal injury to his employees due to any reason, whatsoever, it shall be the responsibility of the Contractor to promptly inform the same to the Engineer,</p>				
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6.18.0	<p>Owner Safety Officer with a copy to Owner Head of Project in the prescribed form and also to all the authorities envisaged under the applicable laws.</p> <p>Right to stop Work</p> <p>(i) The Engineer shall have the right at his sole discretion to stop the work, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and / or property, and / or equipments. In such cases, the contractor shall be informed in writing about the nature of hazards and possible injury / accident and he shall comply to remove shortcomings promptly. The contractor after stopping the specific work can, if felt necessary, appeal against the order of stoppage of work to the Engineer within 3 days of such stoppage of work and decision of the Engineer in this respect shall be conclusive and binding on the Contractor.</p> <p>(ii) The Contractor shall not be entitled for any damages / compensation for stoppage of work, {Sub-Clause 6.18.0(i)} due to safety reasons and the period of such stoppage of work shall not be taken as an extension of time for Completion of the Facilities and will not be the ground for waiver of levy of liquidated damages.</p>				
6.19.0	<p>Fire Protection</p> <p>The contractor shall provide sufficient fire extinguishers at place(s) of work. The fire extinguishers shall be properly maintained as per relevant BIS Standards. The employees shall be trained to operate the first extinguishers / equipment.</p>				
6.20.0	<p>Penalties</p> <p>i) If the Contractor fails in providing safe working environment as per the Safety Rules of Owner or continues the work even after being instructed to stop the work by the engineer as provided in Clause 6.18.0(i) above, the Contractor shall be penalised at the rate of Rs.25,000/- per day or part thereof till the instructions are complied with and so certified by the Engineer.</p> <p>However, in case of accident, the provisions contained in Sub-Clause 6.20.0 (ii) below shall also apply in addition to the penalties mentioned in this sub-clause.</p> <p>ii) If the Contractor does not take all safety precautions and / or fails to comply with the Safety Rules as prescribed by the Employer or under the applicable law for the safety of the plant and equipment and for the safety of personnel and the contractor does not prevent hazardous conditions which cause injury to this own employees or employees of other contractors, or Owner's</p>				
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	<p>employees or any other person who are at the Site or adjacent thereto, the Contractor shall be responsible for payment of penalty to Owner as per the following schedule:</p> <p>a) Fatal injury of accident causing death: Penalty @10% of of contract value or Rs.5,00,000/- per person, whichever is less.</p> <p>b) Major injuries or accident causing 25% or more permanent disablement to workmen or employees: Penalty @ 2.5% of contract value or Rs.1,00,000/- per person whichever is less.</p> <p>Permanent disablement shall have the same meaning as indicated in The Workmen's Compensation Act' 1923. The penalty mentioned above shall be in addition to the compensation payable to the workmen / employees under the relevant provisions of the Workmen's Compensation Act' 1923. The penalty mentioned above shall be in addition to the compensation payable to the workmen / employees under the relevant provisions of the Workmen's Compensation Act' 1923 and rules framed there under or any other applicable laws as applicable from time to time.</p> <p>iii) If any contractor worker found working without using the safety equipment like safety helmet, safety shoes, safety belts, etc. or without anchoring the safety belts while working at height the Engineer / Safety Officer of Owner shall have the right to penalise the contractor for Rs.200/- per person per day as such worker shall be sent out of the workplace immediately and shall not be allowed to work on that day. Engineer / Safety Officer of Owner will also issue a notice in this regard to the contractor.</p> <p>iv) If two or more fatal accidents occur at same Owner's site under the control of contractor during the period of contract and he has</p> <ol style="list-style-type: none"> 1. not complied with keeping adequate PPEs in stock 2. defaulted in providing PPEs to his workmen 3. not followed statutory requirements / Owner safety rules. 4. been issued warning notice/s by Owner's head of the project on non-observance of safety norms. 5. not provided safety training to all his workmen, <p>the contractor can be debarred from getting tender documents from Owner for two years from the date of last accident.</p>				
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6.21.0	<p>The safety performance will also be one of the overriding criteria for evaluation of overall performance of the contractors by Owner. The contractor shall submit the accident data including fatal / non-fatal accidents for the last 3 years where he has undertaken the construction activities Project-wise along with the bid documents. This will also be considered for evaluation of tender documents. If the information given by the contractor found incorrect, his contract will be liable to the terminated.</p>				
6.22.0	<p>Award</p> <p>If the contractor's performance on safety front is found satisfactory i.e. without any fatal / reportable accident in the year of consideration; he may be considered for suitable award "ACCIDENT FREE SAFETY MERITORIOUS AWARD" as per scheme of the employer.</p>				
6.23.0	<p>Some of the relevant safety codes are given hereunder:</p> <p>IS : 3696 (Parts 1 & 2): Safety code for scaffolding and ladders.</p> <p>IS : 3764 : Excavation work – code of safety.</p> <p>IS : 4081 : Safety code for blasting and related drilling operations.</p> <p>IS : 4130 : Demolition of buildings – code of safety.</p> <p>IS : 5121 : Safety code for piling and other deep foundations.</p> <p>IS : 5916 : Safety code for construction involving use of hot bituminous materials.</p> <p>IS : 7205 : Safety code for erection of structural steel work.</p> <p>IS : 7293 : Safety code for working with construction machinery.</p> <p>IS : 7969 : Safety code for handling and storage of building materials.</p> <p>Indian Explosives Act 1940 : As updated</p>				
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	Annexure - I				
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Safety Plan


01. Safety Policy of the Contractor to be enclosed
02. When was the Safety Policy last reviewed.
03. Details of implementation procedure / methods to implement Safety Policy / Safety Rules.
04. Name, Qualification, experience of Safety Officer
05. Review of Accidents Analysis Method, Methods to ensure Safety and Health.
06. Unit executive responsible to ensure Safety at various levels in work area.
07. List of employees trained in safety employed before execution of the job. Give the details of training.
08. Safety Training Targets, Schedules, methods Adopting to providing safety training to all employees.
09. Details of checklist for different jobs / work and responsible person to ensure compliance (copy of checklist to be enclosed).
10. Regular Safety Inspection Methods and Periodicity and list of members to be enclosed.
11. Risk Assessment, Safety Audit by Professional Agencies, Periodicity.
12. Implementation of Recommendations of Audit / Inspections. Procedures for implementation and follow up.
13. Provision for treatment of injured persons at work site.
14. Review of overall safety by top Management and Periodicity.
15. System for Implementation of Statutory legislations.
16. Issue of PPEs to employees, Periodicity / stock on hand etc.


Signature
Head of the Organisation
with date & stamp


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7.0.0	<p>PREVENTION OF POLLUTION</p> <p>It shall be the responsibility of the contractor that no air borne and water borne pollution should occur during all stages of his operations such as in cutting areas, during transportation of excavated materials, during placement of fill materials, etc. It shall be the responsibility of the contractor to undertake all measures such as water sprinkling, covering the fill/disposable materials in open trucks with tarpaulins etc. to take care of the above, if necessary.</p>				
8.0.0	<p>PRESERVATION OF PROPERTY</p> <p>The contractor shall undertake all precautions for the protection and preservation of all existing structures, buildings, roadside trees, drains, sewers or other subsurface drains, pipes, conduits and any other structures under or above ground which may be damaged by his operations and which in the opinion of the Engineer shall be continued in use without any change. Safeguards taken by the Contractor in this respect, shall be got approved by him from the Engineer. However, if any of these objects is damaged by reasons arising out of contractor's action, it shall be replaced or restored to the original condition by him at his own expense.</p>				
9.0.0	<p>CONSTRUCTION WATER AND CONSTRUCTION POWER</p>				
9.1.0	<p>Construction Water</p> <p>The Contractor shall arrange for construction water from approved sources. The Contractor shall obtain all necessary clearances/approval from the local/statutory authorities for drawing the and shall make all the payments towards water charges, levies, taxes etc. All pipe lines, pumps, water tankers, underground storage tank, overground storage tank, etc., whatsoever required for taking the water from source to the site of work shall be provided / erected / constructed / maintained by the contractor at his own cost.</p> <p>The Contractor shall not be entitled to any compensation on account of the expenditure incurred in arranging the construction water.</p>				
9.2.0	<p>Construction Power</p> <p>To meet the construction power requirement of the project, DG sets shall be employed. The Bidder shall extend supply from these to meet the construction power requirements at the various locations through suitably rated isolation transformers along with LT distribution boards as per requirement. LT packaged substation along with isolation transformers may also be used for the purpose. Supply, erection, testing and commissioning of overhead lines ring mains, single pole /double pole/ four pole structures with switches, fuse, lightening arrestors, LT transformers, 415V switchboards, power and control cables, DC Systems etc. as</p>				
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	<p>required for meeting the construction power requirements, shall be in the bidder's scope. All necessary statutory requirements for charging construction power bidder's network shall be in the bidder's scope. The bidder shall also provide power for meeting the Employer's office/miscellaneous power requirements. Construction power supply network, within the plant, is a temporary arrangement which shall be used during the project construction phase. To meet this requirement, the equipment may be arranged by Bidder either by shifting their existing equipment at other installation or by fresh procurement, which may be taken back after commissioning of the project. All temporary wiring must comply with local regulations and will be subject to Employer's inspection and approval before connection to supply. All necessary spares, consumables, Fuel etc. shall be under Bidder's scope.</p>				
10.0.0	<p>GENERAL ENVIRONMENTAL REQUIREMENTS</p>				
	<p>The contractor shall execute all work at site as per the general environmental requirement and following the applicable codal provisions and local regulations in this respect. The contractor shall provide and install suitable safeguards and facilities as approved by the Engineer for meeting general environment requirements given herein under.</p>				
10.1.0	<p>Protect damage and disturbance of the existing trees, shrubs, any other plants, pole lines, fences, signs, monuments, buildings, pipe lines, drains, sewers, or other surface or sub-surface systems / facilities within or adjacent to the works being carried out given herein below.</p>				
10.2.0	<p>Take all necessary precautions against soil erosion, water and environmental pollution and safe disposal of waste material.</p>				
10.3.0	<p>Control the ground in the vicinity of all excavations, so that the surface of the ground is properly sloped or dyked to prevent surface water from running into the excavated areas, during construction.</p>				
10.4.0	<p>All materials obtained from excavation shall remain Owner's property. All salvaged materials of archaeological importance or of value (in the opinion of the Engineer) shall be segregated from the other materials and stacked separately at locations as indicated by the Engineer.</p>				
10.5.0	<p>The method and arrangement of blast cleaning shall conform to factory act, local laws, stipulations of pollution control board, if any.</p>				
10.6.0	<p>a) Excavated earth/rock should be stockpiled properly at designated areas so as not to spread and cause air pollution (fugitive dust emission) and water pollution (suspended solids in run-off). Top soil (top 150mm layer of the</p>				
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11.0.0	<p>fertile soil) may be stored separately for future use in landscaping / revegetation / horticulture.</p> <p>b) Solid wastes generated during construction such as construction debris, excess cement / concrete, wrapping materials (e.g. plastic packets and wrappers), timber, tins, cans and drums, wire, nails, glass etc., chemical wastes and hazardous wastes, food and domestic wastes etc., should be properly disposed off so as not to cause any air / water pollution.</p> <p>c) Potential pollutants (such as oils, chemicals) shall be kept, stored, and used in such a manner that any escape can be contained and the surface, ground and sea water resources are not contaminated.</p> <p>d) Water containing pollutants such as cements, concrete, lime, chemicals and oils shall be discharged through a temporary sedimentation and equalisation tank.</p> <p>e) The necessary precautions shall be taken to control emission of fugitive dust and suspended solids in effluents leading to sedimentation of receiving water bodies.</p> <p>f) Provide necessary sanitation facilities to the labour camps.</p> <p>g) All vehicles and equipment shall be kept in good working order and serviced regularly to maintain the exhaust emissions and noise levels within reasonable limits.</p> <p>h) Control the movement of all vehicles so as to minimize disruption to regular users of the routes.</p> <p>i) The speed of the vehicles on gravel or earth roads in and around site may be restricted to minimize the emission of fugitive dust. Further, the road surface of gravel or earth roads may be provided with suitable cover to reduce the emission of fugitive dust.</p> <p>CONSTRUCTION AND ERECTION METHODOLOGY /REQUIREMENTS</p> <p>The contractor shall execute all works at site as per the construction and erection methodology given herein. Construction and erection activities shall be fully mechanised from the start of the work.</p> <p>The contractor shall prepare detailed construction and erection methodology scheme, which shall be compatible to the requirements given herein. The construction and erection methodology scheme shall be got approved by the Engineer.</p>				
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	<p>All excavation and backfilling works shall be done using excavators, loaders, dumpers, dozers, poclains, jcb's excavator, rock breakers, vibro compactors, vibratory rollers, vibro rollers, sprinklers, water tankers, etc. Manual excavation can be done only on isolated places, with specific prior approval of the Engineer.</p> <p>For controlled rock blasting specialist agency, equipped with sensors to assess the impact of the blast on the adjoining existing structures, shall be employed. Pneumatic wagon drills with compressors shall be deployed for controlled blasting.</p> <p>De-watering wherever required shall be done using the combination of electrical and standby diesel pumps. Wherever necessary, well-point de-watering system shall be deployed. Sludge pumps and high head pumps, wherever required, shall be deployed.</p> <p>Bored pile installation shall be done using rotary hydraulic rig capable of socketing into rock and suitable for flushing with air lift technique.</p> <p>All concreting shall be done using centralised batching plant/Ready mix concrete plant, transit mixers, concrete pumps and electrical hoists. Individual mixers for localised concreting can only be used for PCC works.</p> <p>All structural steel shall be fabricated in factory, transported and erected at site. All factory fabricated structures shall have bolted field connections. For testing of structural steel works, ultrasonic testing machines, radiographic testing machines, dye penetration test equipment, etc, shall be deployed at factory. Help of specialist agencies shall be taken for ultra sonic / radiographic and other specialised testing. Fabricated structure shall preferably be transported from the preassembly / fabrication yard to the erection site by trolley moving on rails. All fabrication and erection activities of structural steel shall be carried out using pug cutting machines, cutting torches, pillar drill machines, gantry cranes, crawler mounted heavy cranes and other equipment like heavy plate bending machines, shearing machines, lathe, milling machines, grinders, etc.</p> <p>Erection of all structural steel works shall be done with the help of cranes only. Use of derricks shall not be permitted. Gantry cranes / truck mounted / cranes / crawler cranes shall be used in preassembly yard / fabrication yard. Heavy crane having lifting capacity and boom length matching with the heaviest part to be lifted shall be used for the erection work, in combinations of other cranes. For erection of heavy members simultaneous use of two cranes may be required. Columns and roof trusses shall be erected in single piece, unless specified otherwise. If required temporary strengthening of members during erection shall be made</p> <p>Modular units of scaffolding and shuttering shall be used.</p>			
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	<p>All finishing items including roofing / cladding / sheeting, etc, shall be installed / fixed in position, using appropriate modern mechanical tools and deploying expert technicians. Manual punching, etc, shall not be permitted.</p> <p>Electrical power winches, electrically operated heavy duty hoists and tyre mounted mobile tower crane, for lifting of construction materials shall be deployed.</p> <p>Cleaning of foundations and other surfaces shall be done by compressed air using heavy duty compressors.</p> <p>Stone / tile / marble / granite cutting and polishing machines shall be deployed for flooring works.</p> <p>Breaking of concrete, wherever required, shall be done by using jack hammers.</p> <p>Field laboratory shall be provided with all latest equipment for survey, testing of soil, aggregates, concrete, etc.</p> <p>Other materials like cables, slings, heating ovens, pre-heating arrangement, materials for making platforms and platform supports, etc, shall be mobilised as per the requirement.</p> <p>All persons working at site shall be provided with necessary safety equipment such as gloves, goggles, safety belts, safety helmets, etc.</p> <p>All safety aspects shall be duly considered for each construction / erection activity.</p> <p>Only the persons who are trained in the respective trade shall be employed for executing that particular type of work.</p> <p>Construction of machine foundation, pump house substructure foundation and other main foundations shall be done after the approval of the scheme for staging and concreting.</p> <p>All layouts and levels shall be taken using digitized theodolite and level i.e. Total workstation.</p> <p>Concrete core cutting machine and concrete sawing machine shall be used respectively for making circular and slit type opening in the concrete. Rebar/detector shall be used to identify the location of reinforcement, before making opening in the concrete.</p> <p>Sheet piling shall be done for deep excavations if directed by the Engineer from the consideration of safety.</p>			
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12.0.0	<p>The contractor shall mobilise all plant equipment / machinery required for successful completion of the work. A list of the plant equipment / machinery required to be deployed by the bidder to match with the agreed work schedule and the construction and erection methodology is appended to this document (ANNEXURE-IV). This list, however, is not an exhaustive list but specifies the suggested minimum requirements of equipment and machinery to be deployed for the execution. Any additional equipment and machinery required for the timely completion of the works but not listed in the List of Plant Equipment/Machinery shall also be deployed by the contractor, as directed by the Engineer.</p> <p>SAMPLING, TESTING AND QUALITY ASSURANCE</p> <p>Sampling, testing and quality assurance requirements are given in “Quality Assurance Program” chapter of this specification. Indicative (not exhaustive) field quality plan (FQP), QA & QC organisational set up, typical QA & QC laboratory equipment are also given in this specification. Customer hold points have been identified in the FQP beyond which the work shall not proceed without prior written approval from the Engineer. Acceptance criteria and construction tolerance have also been specified.</p>			
13.0.0	<p>RATES AND MEASUREMENTS</p>			
13.1.0	<p>Rates</p>			
13.1.1	<p>The various Items of the Schedule of Items shall be read in conjunction with the Technical Specification, Special Conditions of Contract, tender drawings, General conditions of contract, including amendments and additions thereon.</p>			
13.1.2	<p>Unit Rates for different Items of the schedule of items shall include the cost for:</p> <ul style="list-style-type: none"> a) all the activities covered in the description in the schedule of items read in conjunction with the notes/instructions/undertaking mentioned therein, as well as for all necessary operations described in the technical specifications, special conditions of contract, general conditions of contract, etc. b) the provision of the item in totality and completeness, unless some item / items of work though required for completion of the items but are explicitly excluded from that item of work, in the schedule of items. c) minor works, which may not have been mentioned in the description of item in the schedule of items read in conjunction with technical specification and other bid document, but are essential for the satisfactory completion of the work. 			
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	<p>d) all works associated with site visit, site limitation and working hours, etc, as mentioned under Contractor’s obligation elsewhere in this part of specification.</p> <p>e) preparation, submission and approval of working / fabrication drawing, design calculations, data sheets other documents and records of construction ,etc, mentioned under “Drawings and Documents”, elsewhere in this part of technical specification.</p> <p>f) all safety measures as required by codal provisions, local regulations and as specified under ‘Safety Measures’ elsewhere in this part of technical specification.</p> <p>g) arranging for construction water and construction power as specified under ‘Construction water and Construction power’ elsewhere in this part of technical specification.</p> <p>h) providing for suitable safeguard and facilities whatsoever required to meet the general environment requirement as specified under 'General Environmental Requirement' elsewhere in this part of technical specification.</p> <p>i) all works activities, equipment, instrument, personnel, material etc. to comply with sampling and testing and quality assurance requirement including construction tolerances and acceptance criteria as given elsewhere in this part of technical specification.</p> <p>j) providing for construction and erection methodology / requirement as specified elsewhere in this specification under ‘Construction and Erection Methodology/Requirements’. This shall include provision of all plant, equipment, labour, supervision, technical personnel, materials, transportation, staging, all temporary works, skilled and trained manpower whatsoever required etc., for carrying out the work in a mechanised way, right from the start of work.</p> <p>k) establishing layout and levels of all structures as mentioned elsewhere in this part of the specification under ‘Layout and Levels’. This shall also include the layout / level / coordination at each location of building, foundations, underground facilities (like drains, sewers, tanks etc.) etc. from one established bench mark and set of grid lines furnished by Owner.</p> <p>l) all subsoil conditions.</p> <p>m) All construction materials including cement, reinforcement steel and structural steel.</p>				
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	<p>n) deployment of minimum Plant and Equipment Machinery, as specified elsewhere this part of technical specifications.</p> <p>o) all working conditions including under water / mud, extreme weather conditions etc.</p> <p>p) movement / shifting of plant and machinery from one location to another location as per the requirement of works and as directed by Engineer.</p> <p>q) Construction and subsequent demolition/ removal from site of all temporary and enabling works, such as site offices, construction water, construction power, temporary structures, access roads, etc.</p> <p>r) procurement of bought out item from approved vendor.</p> <p>s) execution of work under supervision of specialised agency.</p> <p>t) recording ground / grade levels at the grid of 10m x 10m before taking over the site / starting the work and obtaining the specific approval of the engineer wherever the level are different from the level indicated in the general layout plan.</p> <p>u) recording level at the grid of 10m x 10m before handing over the site to the Engineer.</p> <p>v) all packing, crating, boxing, coating, covering, protecting whatsoever required to prevent damage or deterioration during transit, handling and erection, covered storage at site for all bought out items, till their use in work/ fixing in position/ installation/erection, etc.</p>				
13.2.0	Measurements				
13.2.1	All measurements shall be done in SI units.				
13.2.2	The Contractor and the Engineer shall jointly record all Measurements				
13.2.3	Linear Measurements shall be done in metre (m) (unless noted otherwise) and rounded off to second place of decimal. Areas and volumes shall be calculated from the linear measurements and shall generally be in Sq. metre (Sq. m. or M2) and Cubic metre (Cu. m. or M3) respectively (unless noted otherwise), rounded off to Two place of Decimals. For rounding off, values in the third place of decimal, which are below '5' shall be ignored and those above '5' shall be considered as 10.				
13.2.4	Weight measurement shall be done in Metric Tonne, (unless noted otherwise), rounded off to third place of decimal.				
A&N GAS PROJECT 50MW CIVIL WORKS PACKAGE	Bid Doc. No. : NVVN/C&M/RE- 342/2024-25	TECHNICAL SPECIFICATIONS	SECTION - II PART A	Page 28 of 33	

CLAUSE NO.	<p style="text-align: center;">TECHNICAL REQUIREMENTS</p> 			
13.2.5	<p>For each item of work, the quantity to be considered for payment shall be lesser of the actual quantity executed and the quantity calculated on the basis of mode of measurements, given elsewhere in the technical specification.</p>			
14.0.0	<p>BOUGHT OUT ITEMS</p> <p>All bought out items shall be procured on the basis of approval of samples and as per approved data sheet and working drawings.</p> <p>All materials shall be ordered, procured and stored well in advance to avoid use of sub standard items under compulsion to maintain the construction schedule.</p> <p>All materials shall be accompanied with relevant test certificates establishing the quality and genuineness of materials being supplied.</p> <p>All bought out items/ composite items shall be from the approved vendors. For this purpose, bidders shall furnish the list of manufactures/suppliers of each of the bought out items/ composite items in their bids, which shall be reviewed and finalised during the post bid discussions with the successful bidder.</p> <p>Wherever the manufacturers / sub-vendors are placed in "Details Required" (DR) category, during the post bid discussions, the details of such manufacturers / sub-vendors shall be submitted in the Owner's prescribed format, within two months from the date of award, for review/ approval of Owner.</p>			
15.0.0 15.1.0	<p>SPECIAL REQUIREMENTS</p> <p>Details of minimum treatment for foundations / underground structures required to counteract soil / water chemical environment shall be as given below.</p> <ol style="list-style-type: none"> a) Minimum grade of concrete shall be M35. b) Cement shall be Ordinary Portland Cement with C₃A content from 5 to 8 percent / Portland slag cement confirming to IS 455 having more than 50% slag. c) Minimum cement content shall be 370 kg/m³ and maximum free water-cement ratio shall be 0.45 for foundation works. d) Reinforcement steel (High Strength Deformed steel bars) shall be Corrosion Resistance thermo-mechanically treated (CRS-TMT) bars and shall confirm to grade Fe-500 of IS:1786 (with minimum percentage of elongation of 14.5%). e) For foundations, the minimum cover to reinforcement shall be 50mm. f) "Very Severe" exposure condition as per IS 456 to be considered for mix design. g) All foundations and surfaces of substructures coming in contact with earth shall be applied with Minimum two coats of hot bitumen of Industrial grade 85/25, conforming to IS: 702 (latest), mixed with 1% anti-stripping compound at the rate 1.7 Kg/Sq.m (for sum of all coats). 			
<p style="text-align: center;">A&N GAS PROJECT 50MW CIVIL WORKS PACKAGE</p>	<p style="text-align: center;">Bid Doc. No. : NVVN/C&M/RE- 342/2024-25</p>	<p style="text-align: center;">TECHNICAL SPECIFICATIONS</p>	<p style="text-align: center;">SECTION - II PART A</p>	<p style="text-align: center;">Page 29 of 33</p>

CLAUSE NO.	TECHNICAL REQUIREMENTS				 एनटीपीसी NTPC विद्युत व्यापार Vidyut Vyapar
16.0.0	<p>Vulnerability Atlas Of India (VAI)</p> <p>Vulnerability Atlas of India (VAI), prepared by Building Materials, Training and Promotion Council (BMTPC) under Ministry of Housing and Urban Affairs, is a comprehensive document which provides existing hazard scenario for the entire country and presents the digitized State/UT-wise hazard, maps with respect to earthquakes, winds and floods for district-wise identification of vulnerable areas. It also includes additional digitized maps for thunderstorms, cyclones and landslides. The main purpose of this Atlas is its use for disaster preparedness and mitigation at policy planning and project formulation and construction stage. The VAI provides necessary information for risk analysis and hazard assessment and is available at website www.bmtpc.org.</p> <p>As per Government’s directive, it is mandatory for the bidders to refer VAI for multi-hazard risk assessment and include the relevant hazard proneness specific to project location while planning, designing and execution of the project in terms of following details:</p> <ol style="list-style-type: none"> i. Seismic zone (II to V) for earthquakes ii. Wind velocity iii. Area liable to floods and Probable max. surge height iv. Thunderstorms history v. Number of cyclone storms/sever cyclone storms and max sustained wind specific to coastal region vi. Landslides incidences with Annual rainfall normal vii. District wise Probable Max. Precipitation <p>Accordingly, bidder should refer VAI while planning, designing and execution of the project.</p> <p>However, for design of structures/facilities and equipment, the criteria for earthquake resistant design of structures and equipment, the criteria for Wind Resistant Design of Structures and Equipment and design parameters for drainage facilities, stipulated in the Technical Specification shall be followed.</p> <p>For other information like area liable to floods, probable max. surge height, landslide, thunderstorm, cyclone etc. agencies are required to refer the VAI.</p>				
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TECHNICAL REQUIREMENTS





ANNEXURE-III


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LIST OF TENDER DRAWINGS


S. NO.	DRAWING NO.	TITLE
1	6400-999-POC-F-001	GENERAL LAYOU PLAN
2	6400-301-POC-F-001A	VICINITY PLAN
3	6400-301-POC-A-002	SITE LEVELLING WORKS- PLAN
4	6400-999-POC-F-002	TOPOGRAPHICAL SURVEY


CLAUSE NO.	TECHNICAL REQUIREMENTS																																																									
	<p style="text-align: right;">ANNEXURE-IV</p> <p style="text-align: center;">LIST OF EQUIPMENT</p> <p>In order to ensure timely completion of the work, in accordance with the time schedule indicated in the work programme, the tenderer should deploy adequate number of equipment & machinery. A suggested list of equipment and machinery to be deployed but not limited to these, is indicated below:</p> <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: center;">1.</td> <td style="width: 75%;">Mobile Crane 10T</td> <td style="width: 20%; text-align: right;">As per requirement</td> </tr> <tr> <td style="text-align: center;">2.</td> <td>Trailors 10-15 T capacity</td> <td style="text-align: right;">As per requirement</td> </tr> <tr> <td style="text-align: center;">3.</td> <td>DG set</td> <td style="text-align: right;">As per requirement</td> </tr> <tr> <td style="text-align: center;">4.</td> <td>Chain pulley block</td> <td style="text-align: right;">As per requirement</td> </tr> <tr> <td style="text-align: center;">5.</td> <td>Destructive testing equipment</td> <td style="text-align: right;">As per requirement</td> </tr> <tr> <td style="text-align: center;">6.</td> <td>Batching Plant</td> <td style="text-align: right;">1 set</td> </tr> <tr> <td style="text-align: center;">7.</td> <td>Concrete Mixer</td> <td style="text-align: right;">4 nos.</td> </tr> <tr> <td style="text-align: center;">8.</td> <td>Transit Mixer</td> <td style="text-align: right;">As per requirement.</td> </tr> <tr> <td style="text-align: center;">9.</td> <td>Vibrators (Needle type)</td> <td style="text-align: right;">4 nos</td> </tr> <tr> <td style="text-align: center;">10.</td> <td>Vibrator (Float, Plate etc.)</td> <td style="text-align: right;">2 nos</td> </tr> <tr> <td style="text-align: center;">11.</td> <td>Scaffolding units including shuttering plates</td> <td style="text-align: right;">As per requirement</td> </tr> <tr> <td style="text-align: center;">12.</td> <td>Jack Hammers</td> <td style="text-align: right;">2 nos</td> </tr> <tr> <td style="text-align: center;">13.</td> <td>Scaffolding pipe staging including clamps</td> <td style="text-align: right;">As per requirement</td> </tr> <tr> <td style="text-align: center;">14.</td> <td>Bull Dozer (Heavy Duty)</td> <td style="text-align: right;">3 nos.</td> </tr> <tr> <td style="text-align: center;">15.</td> <td>Excavators</td> <td style="text-align: right;">As per requirement</td> </tr> <tr> <td style="text-align: center;">16.</td> <td>Rock Blasting Equipment/rock breaker</td> <td style="text-align: right;">As per requirement</td> </tr> <tr> <td style="text-align: center;">17.</td> <td>Dumpers</td> <td style="text-align: right;">As per requirement</td> </tr> <tr> <td style="text-align: center;">18.</td> <td>Rollers (10T capacity)</td> <td style="text-align: right;">As per</td> </tr> </table>				1.	Mobile Crane 10T	As per requirement	2.	Trailors 10-15 T capacity	As per requirement	3.	DG set	As per requirement	4.	Chain pulley block	As per requirement	5.	Destructive testing equipment	As per requirement	6.	Batching Plant	1 set	7.	Concrete Mixer	4 nos.	8.	Transit Mixer	As per requirement.	9.	Vibrators (Needle type)	4 nos	10.	Vibrator (Float, Plate etc.)	2 nos	11.	Scaffolding units including shuttering plates	As per requirement	12.	Jack Hammers	2 nos	13.	Scaffolding pipe staging including clamps	As per requirement	14.	Bull Dozer (Heavy Duty)	3 nos.	15.	Excavators	As per requirement	16.	Rock Blasting Equipment/rock breaker	As per requirement	17.	Dumpers	As per requirement	18.	Rollers (10T capacity)	As per
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A&N GAS PROJECT 50MW CIVIL WORKS PACKAGE	Bid Doc. No. : NVVN/C&M/RE- 342/2024-25	TECHNICAL SPECIFICATIONS	SECTION - II PART A	Page 32 of 33																																																						


CLAUSE NO.	TECHNICAL REQUIREMENTS			
		<p>19. Vibro Compactor</p> <p>20. Water Tankers</p> <p>21. Dewatering Pumps</p> <p>22. Total Station</p> <p>23. Levelling Instruments</p> <p>24. Laboratory Equipment for the following tests:</p> <ul style="list-style-type: none"> - Moisture content - Dry density by Standard Proctor test - In-situ Proctor Needle Penetration test - Testing facilities for chemical analysis & Expansive characteristics of soil - Core cutter - Set of sieves - Compression Testing Machine (for concrete) <p>Notes:</p> <p>1) These requirements and capacity of the equipment are indicative only and not exhaustive and deployment of the equipment; machinery and labour shall be suitably augmented to achieve the timely completion of the work, as per the program and directions of the Engineer, without any additional cost to the Owner.</p> <p>2) Other equipment though required for the timely completion of the job but not listed above shall be deployed by the contractor, as per the job requirements and as directed by the Engineer.</p> <p>3) The contractor shall make suitable on site arrangement for repairs and maintenance of the equipment mobilized and always keep them in good working conditions, as the repair facilities for such equipment are not available at the project site.</p>	<p>requirement</p> <p>As per requirement</p> <p>As per requirement</p> <p>as required</p> <p>1 nos.</p> <p>1 nos.</p> <p>as required</p>	
A&N GAS PROJECT 50MW CIVIL WORKS PACKAGE	Bid Doc. No. : NVVN/C&M/RE- 342/2024-25	TECHNICAL SPECIFICATIONS	SECTION - II PART A	Page 33 of 33


CLAUSE NO.	<p style="text-align: center;">SCOPE OF SUPPLY & SERVICES</p> 		
<p>1.00.00</p>	<p>SCOPE OF CIVIL, STRUCTURAL & ARCHITECTURAL WORKS OF EPC GAS GENERATOR PACKAGE</p> <p>The scope of civil, structural and architectural works shall include topographical survey, geotechnical investigation, site clearance, site levelling, preparation of design documents and drawings and getting approval of the same from the Employer and construction of all civil, structural and architectural works including supply of all construction materials for all buildings, equipment and facilities for the project. The nature of work generally involves geotechnical investigation if required, earthwork in excavation in all types of soil and rock including controlled blasting/ mechanical means, de-watering, backfilling around completed structures, plinth filling, disposal of surplus earth/rock/excavated material/dismantled material, concreting including reinforcement and form work, plastering, corrosion protection measures including painting, wall cladding, roofing and flooring including permanent steel decking, false ceiling, fabrication of structures, pre assembly of fabricated structures, transportation of pre-fabricated structures and erection of steel structures and miscellaneous steel works (i.e., steel staircase, cable supports, pipe supports, ladders, walkways, railing, chequered plate/grating floors, inserts etc.), painting of structures, paving, gravel filling, providing pre-cast covers, damp proofing, roof water proofing, roads, drainage, sewerage, rain water harvesting, final grading and site clearance before handing over and any other item of work required for completion of all systems under the scope of work complete.</p> <p>The scope of Bidder for civil, structural and architectural works as defined above shall include but not be limited to the following buildings/ areas/ systems along with their foundations, super structures and finishes complete.</p> <ol style="list-style-type: none"> 1. Site clearance including cutting of trees of girth less than 30 centimeters 2. Infrastructure Works <ol style="list-style-type: none"> a. Site levelling of entire Plant area as shown in tender drawings b. Plant roads/grid road and storm water drains (as shown in tender drawings) including approach roads to buildings/facilities. c. Plant boundary wall as shown in tender drawing. d. Retaining wall/Sea wall as shown in tender drawing. e. Separate RCC drainage network with GI grating cover and sump pit for plant effluents for all buildings and facilities in Bidder's scope including floor wash water from Engine Hall area, Plant area. f. Sewerage system including Sewage Treatment Plant for plant facilities of the entire plant. g. Hard crusting of Pre-assembly yard. h. Hard crusting of Plant area, passageways in plant area, preassembly yard to facilitate movement of vehicles and erection of equipment. 		
<p style="text-align: center;">A&N GAS PROJECT 50MW EPC CIVIL WORKS PACKAGE</p>	<p style="text-align: center;">TECHNICAL SPECIFICATION Bid Doc. No. : NVVN/C&MRE- 342/2024-25</p>	<p style="text-align: center;">SUB-SECTION-IID CIVIL WORKS</p>	<p style="text-align: center;">PAGE 1 OF 6</p>


CLAUSE NO.	<p style="text-align: center;">SCOPE OF SUPPLY & SERVICES</p> 		
	<p>3. Foundations for all buildings/ area/ systems including machine foundations.</p> <p>4. All Civil, Structural, Architectural works including underground facilities like drainage, sewerage, trenches, earthing mat/ grounding for the Plant area covering the following:</p> <ol style="list-style-type: none"> a. Engine foundations. b. Engine building - foundations, structures, floors, roof & side cladding, Gantry Girder with rails for EOT crane. c. Elevator pit & Civil Works for Control Room Building. d. Control room buildings including toilets, conference hall. e. Utility Building including pantry, toilets above control room. f. Compressor house. g. Transformer yard area foundations including rail track, fire barrier wall and oil-water separation pit etc. h. 33kv Switchgear building i. Area Paving and miscellaneous foundations in entire area enclosed within the peripheral roads of the Plant. j. Foundation of steel Chimney. <p>5. All Civil, Structural and Architectural Works associated with Service Water System, Potable water System, Desalination Plant, Effluent Treatment System including sheds and foundations for pumps & associated piping etc.</p> <p>6. Civil Works associated with Engine lube oil storage room</p> <p>7. Civil Works associated with Intake gas filtration skid</p> <p>8. Civil Works associated with Engine cooling system radiator</p> <p>9. Civil Works associated with Fire water storage tank foundations</p> <p>10. Civil Works associated with Fire water pump house</p> <p>11. Civil Works associated with fire detection and fire protection pipes.</p> <p>12. Civil works associated with air conditioning & ventilation system.</p> <p>13. Civil, Structural works for pipe /cable /duct supporting structures, trestles and foundations, trenches, culverts, duct banks, pedestals, hume pipe & culverts, buried pipes, racks, culverts across road for pipes/ drains/ cables and any other facility and thrust blocks etc.</p> <p>14. Civil, Structural works for Pipe/Cable supports/trestle in Plant areas.</p> <p>15. Outdoor transformer foundations.</p> <p>16. Earth mats and risers for Plant area.</p> <p>17. LT Switchgear building.</p> <p>18. Fire Station Building including offices, toilet, pantry</p> <p>19. O&M Stores</p> <p>20. Gate Complex with Time office.</p>		
<p style="text-align: center;">A&N GAS PROJECT 50MW EPC CIVIL WORKS PACKAGE</p>	<p style="text-align: center;">TECHNICAL SPECIFICATION Bid Doc. No. : NVVN/C&MRE- 342/2024-25</p>	<p style="text-align: center;">SUB-SECTION-IID CIVIL WORKS</p>	<p style="text-align: center;">PAGE 2 OF 6</p>


CLAUSE NO.	<p style="text-align: center;">SCOPE OF SUPPLY & SERVICES</p> 			
<p>1.00.01</p> <p>1.00.02</p> <p>1.00.03</p> <p>1.00.04</p>	<p>21. Watch Towers 22. Rain water harvesting pit 23. Facilities for Rain water harvesting in all buildings in the bidder's scope. 24. Any other miscellaneous building or facility.</p> <p>All steel structures can be site fabricated and erected at site or fabricated in factory, transported and erected at site. All factory-fabricated structures can have bolted or welded field connections.</p> <p>Note: Steel structures shall mean plant and non-plant building structures, support structures, pipe and cable support structures.</p> <p>Civil, structural and architectural works though not explicitly mentioned in the above list but required for the completion of the various systems of the package shall also be in the scope of the bidder.</p> <p>Corrosion Protection</p> <p>The plant lies in the corrosive category C5 as per ISO 12944-2. Protection measures shall be provided for the mentioned corrosivity category with very high durability as specified in Part-B of Technical Specifications.</p> <p>Supply of earth for filling & disposal of surplus earth/ debris including arranging the borrow pit/ disposal site and making payment of Seigniorage, royalty, levies, taxes and any other applicable charges etc. shall be in bidder's scope.</p> <p>PROOF CHECKING</p> <p>THE SCOPE OF WORK OF THE SUCCESSFUL BIDDER INCLUDES: -</p> <p>(a) To interact, discuss with Owner / Proof Checking (PC) agency for the modalities, schedule, and design parameters, loading to be considered in line with the Owner's specifications.</p> <p>(b) To submit the drawings and design calculations as per the project schedule sequentially as per the sequence below.</p> <p>(c) Incorporate all the comments/observations/suggestions furnished by the PC on the drawings and design documents.</p> <p>(d) After review of the drawings and design documents by PC the same shall be submitted to the Owner for consent. In case of further observation by Owner the same is also to be incorporated.</p> <p>Sequence of submission of documents: -</p> <p>1) Design basis which will include all design philosophy, seismic and wind criteria as per specification, foundation type along with bearing capacity as per Geotechnical Report, materials of construction, loading details, finishing schedule etc.</p> <p>2) Architectural details/General Arrangement drawings for buildings, facilities, equipment including the elevations and cross sections.</p> <p>3) Design calculation along with the STAAD/ANSYS/SAP 2000 models and/or computer work sheets or any other software model as mutually agreed with Owner.</p> <p>4) Foundation drawings.</p>	<p style="text-align: center;">TECHNICAL SPECIFICATION Bid Doc. No. : NVVN/C&MRE- 342/2024-25</p>	<p style="text-align: center;">SUB-SECTION-IID CIVIL WORKS</p>	<p style="text-align: center;">PAGE 3 OF 6</p>
<p style="text-align: center;">A&N GAS PROJECT 50MW EPC CIVIL WORKS PACKAGE</p>				


CLAUSE NO.	SCOPE OF SUPPLY & SERVICES			
<p>2.00.00</p> <p>2.01.00</p> <p>2.02.00</p>	<div style="text-align: right;">  </div> <p>5) Superstructure drawings sequentially as per construction sequence or material projection, as applicable.</p> <p>WORKER & STAFF COLONY AND CONSTRUCTION FACILITIES</p> <p>WORKER & STAFF COLONY</p> <p>The following are in the Bidder’s scope of work for Worker & staff colony: -</p> <ul style="list-style-type: none"> <li>a) Development of Bidders temporary staff colony and worker colony along with toilets & fencing etc. For safety of Worker, bidder to provide separate approach road for their movement, as per site conditions, which shall be completely isolated from material movement road/path. No material movement shall be allowed on approach road meant for worker colony. <li>b) Adequate no. of Rest rooms with toilet for bidder’s worker & staff. <li>c) All Civil and Structural work associated with drinking and service water for Bidder’s worker and other personnel at the work site/colony/offices including pump houses, pipes, overhead tank, tube wells etc. <li>d) The EPC Contractor shall have total responsibility for providing and maintaining facilities for safety, welfare, drinking water and sanitation, hygiene, biennial health checkup etc. for construction workers at their workplaces as well as at worker & staff colonies. The facilities for occupational safety, healthy environment, first aid, drinking water, resting place & toilets, canteen, crèche, etc. shall be provided at the workplace for construction workers by the contractor. <li>e) Accommodation for Workers & staff colony in adequate numbers as required for the project peak demand shall be made in the form of temporary structures which shall be removed after completion of the project. It shall have facilities for drinking water & sanitation, approach road, dust suppression, drainage, sewage treatment plant, solid waste collection & disposal, fuel for cooking, medical healthcare, creches, etc. <li>f) Responsibility of development and maintenance of above facilities for construction workers hired by the Contractor or his sub-contractors shall rest solely with the Contractor. Land, water, electricity for the worker & staff colony shall be arranged by the Contractor as stipulated elsewhere in Technical Specification. <p>CONSTRUCTION FACILITIES</p> <p>The following are in the Bidder’s scope of work pertaining to construction facilities in this package.</p> <ol style="list-style-type: none"> <li>1. Construction Water <p>Construction water shall be the responsibility of Bidder during all stages of construction.</p> <li>2. Construction Power <p>Construction Power shall be the responsibility of Bidder during all stages of construction.</p> 	<p>TECHNICAL SPECIFICATION</p> <p>Bid Doc. No. : NVVN/C&M/RE- 342/2024-25</p>	<p>SUB-SECTION-IID CIVIL WORKS</p>	<p>PAGE 4 OF 6</p>
<p>A&N GAS PROJECT 50MW EPC CIVIL WORKS PACKAGE</p>	<p>TECHNICAL SPECIFICATION</p> <p>Bid Doc. No. : NVVN/C&M/RE- 342/2024-25</p>	<p>SUB-SECTION-IID CIVIL WORKS</p>	<p>PAGE 4 OF 6</p>	


CLAUSE NO.	<p style="text-align: center;">SCOPE OF SUPPLY & SERVICES</p> 		
	<p>3. Construction of following temporary facilities of bidder</p> <ol style="list-style-type: none"> a) Construction office, b) Construction stores (covered) & open stores as per his requirement. c) Workshops for maintenance of construction plant and equipment. d) Material/field testing laboratory facilities and any other temporary building. <p>4. Providing all necessary fire-fighting devices/equipment/fire tender etc. required during the project execution stage in project areas including laydown/pre-assembly yard area.</p> <p>5. Providing all tools and tackles required for the work.</p> <p>6. The Bidder shall arrange skilled/semiskilled/unskilled labour (from local source(s) as far as available) and supervisory staff for quality execution of all civil, structural and architectural works.</p> <p>7. Development of hard crusted / paved fabrication yard for onsite structural steel fabrication work where permitted.</p> <p>8. Area lighting at the construction / erection site, fabrication, pre-assembly and storage yard, office areas, labour and staff colony etc.</p> <p>9. Providing first aid facilities at the construction / erection sites, workshops, laboratories, fabrication, pre-assembly & storage yard, Offices and other places of work as per the requirement.</p> <p>10. Use of ash and ash based products.</p> <p style="padding-left: 40px;">In line with Gazette Notification on Ash Utilization issued by Ministry of Environment & Forest and its amendments, Bidder shall use ash and ash based products in all construction. He shall furnish a compliance report along with all details of use of ash and ash based products along with each bill. The above requirements shall be applicable to his sub-vendors also and Contractor shall be responsible for enforcing the same on his sub-vendors.</p> <p>11. Repair & Maintenance Facilities by the Bidder:</p> <p style="padding-left: 40px;">Bidder shall establish/set up at site suitable repair facilities for construction equipment and machinery (like cranes, hydra, forklifts, welding equipment, dumpers, rollers, etc.) Bidder shall also make arrangements /tie-up with manufacturers / suppliers of such construction plant, equipment & machinery, for periodic overhaul/ maintenance and for repair of major breakdown, if any. Bidder shall also keep adequate stock of spares at site for various construction plant, equipment and machinery to meet day to day requirements as recommended by the manufacturer / suppliers or as instructed by the Engineer. Bidder shall deploy dedicated qualified, full time mechanical / electrical foreman & supervisors for manning the repair facilities as specified above.</p>		
<p>A&N GAS PROJECT 50MW EPC CIVIL WORKS PACKAGE</p>	<p>TECHNICAL SPECIFICATION Bid Doc. No. : NVVN/C&MRE- 342/2024-25</p>	<p>SUB-SECTION-IID CIVIL WORKS</p>	<p>PAGE 5 OF 6</p>


CLAUSE NO.	<p style="text-align: center;">SCOPE OF SUPPLY & SERVICES</p> 			
<p>2.03.00</p> <p>2.03.01</p>	<p>12. Water sprinkling in construction area and roads, as per requirement/directions of Engineer-in-Charge, to arrest fugitive construction dust.</p> <p>13. Dewatering in construction area during construction period for any seepage water as well as accumulated rainwater.</p> <p>14. Housekeeping of all construction area and disposal of construction/demolition waste. This also includes cutting and removal of vegetation including dry vegetation to avoid fire hazard in the entire project construction area.</p> <p>DEVELOPMENT OF LAYDOWN AREA</p> <p>Area totalling 300 SQM (approx.) marked in GLP is identified as laydown/preassembly area. Fencing of the laydown area is in bidder's scope. Any additional laydown area requirement shall be in the Bidder's scope including its development, fencing/boundary wall, security, etc.</p> <p>The contractor shall develop the following facilities before using the allocated laydown area.</p> <ol style="list-style-type: none"> a. Site clearance including cutting of trees as specified elsewhere in the specifications. b. Bidder shall construct and maintain approach road from plant area to laydown area as shown in Tender General layout Plan and road network in the interior of laydown area. Further bidder to ensure measures to avoid noise and dust pollution to habitants during the contract period. c. Security of material shall be responsibility of the EPC Contractor, including gate control. d. RCC/Brick drains in the entire laydown area and along roads shall be planned so as to ensure proper disposal of rainwater. RCC drain with culvert to be mandatorily provided at crossings wherever vehicular /material movement is envisaged. e. Levelling, compaction backfilling, for purpose of laydown area surface preparation <p>Hard crusting of Laydown area, fabrication, and pre-assembly yard area has to be carried out as per specifications mentioned elsewhere. The extent of hard crusting shall be decided by the contractor based on their requirement. Material and equipment storage shall be as per guidelines covered elsewhere.</p>	<p style="text-align: center;">TECHNICAL SPECIFICATION</p> <p style="text-align: center;">Bid Doc. No. : NVVN/C&M/RE- 342/2024-25</p>	<p style="text-align: center;">SUB-SECTION-IID CIVIL WORKS</p>	<p style="text-align: center;">PAGE 6 OF 6</p>
<p style="text-align: center;">A&N GAS PROJECT 50MW EPC CIVIL WORKS PACKAGE</p>				


CLAUSE NO.	TECHNICAL SPECIFICATIONS FOR DSR ITEMS				
1.00.00	<p style="text-align: center;">DELHI SCHEDULE OF RATES BASED ITEMS</p> <p>DELHI SCHEDULE OF RATES BASED ITEMS</p> <p>Technical specifications for DSR 2018 based items shall be as per 'CPWD Specification' - 2019 with all correction slips/modifications/amendments.</p>				
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CLAUSE NO.	TECHNICAL SPECIFICATION FOR SITE CLEARANCE				
1.0.0	TECHNICAL SPECIFICATION FOR SITE CLEARANCE				
1.1.0	<p>This work involves the following operations:</p> <ul style="list-style-type: none"> i) Cutting and removal of trees of girth 30 cm or less. ii) Removal of all organic and vegetable matters including their roots. iii) Disposal of the serviceable and unserviceable materials. iv) Removal of stumps and roots of trees already cut. v) Filling and making good the pits caused due to the removal of roots, potholes, etc. 				
1.2.0	DETAILED DESCRIPTION OF ABOVE OPERATIONS ARE GIVEN BELOW:				
1.2.1	<p>Cutting of trees of girth 30 cm or less</p> <p>Unless otherwise instructed by the Engineer, all trees having a girth of 30 cm or less shall be cut and useful portion of trees so cut shall be stacked at a suitable place as directed by the Engineer.</p>				
1.2.2	<p>Removal of vegetation including roots</p> <p>All organic and vegetable matters like grass, plants, shrubs, bushes, weeds, stumps of trees, rank vegetation etc. shall be completely removed including their roots. The roots of all vegetation including the trees shall be completely removed to the satisfaction of the engineer. Removal of vegetation may be achieved by use of dozer. However, use of dozer for removal of vegetation shall not be paid separately.</p>				
1.2.3	<p>Disposal of serviceable and unserviceable materials</p> <p>As mentioned above serviceable materials (useful portion) of trees cut shall be stacked at suitable place(s)/location(s) within the plant boundary in a manner as directed by the Engineer. Woods, branches, trunks of trees shall be termed as serviceable material and shall be the property of the Owner. Trunks and branches of trees shall be cleared of limbs and tops, cut into pieces of suitable lengths and stacked neatly at suitable place(s)/location(s) within the plant boundary in a manner as directed by the Engineer.</p> <p>All other materials like twigs, leaves, roots, vegetable & organic matter and unusable earth obtained in site clearance etc. shall be termed as unserviceable material and shall be separated from the serviceable material before disposal. They shall be cleared from the area and disposed off at place(s)/location(s) within the plant boundary in a manner as directed by the Engineer.</p>				
1.2.4	<p>Making good root pits, potholes, etc.</p> <p>Pot holes, hollows, pits, voids, etc. existing at site or created due to removal of roots, etc. shall be filled up with suitable earth in layers of 20cm each, well compacted and dressed smooth to match with surrounding earth.</p>				
A&N GAS BASED POWER PROJECT (50 MW) CIVIL WORKS		Bid Doc. No.: NVVN/C&M/RE- 342/2024-25	TECHNICAL SPECIFICATIO NS PART-B	SITE CLEARANCE SECTION-II	Page 1 of 1


CLAUSE NO.	FINISHING AND ALLIED WORKS				
FINISHING AND ALLIED WORKS					
1.00.00	GENERAL REQUIREMENT				
1.01.00	Content				
1.01.01	This section of the specification covers the technical requirements for floor finish and allied works, doors, windows, partitions, glass and glazing, water proofing, false ceiling, fencing, gates and other similar works at all levels, for all types of works and for all kinds of working conditions.				
1.01.02	The plastering and painting on masonry & concrete surfaces and painting of structural steel have been covered elsewhere in this specification.				
1.02.00	Codes and Standards				
1.02.01	Some of the relevant applicable Indian Standards and codes, etc, applicable to this section of the specification are listed below :				
	IS: 158	Ready mixed paint, brushing, bituminous, black, lead-free, acid, alkali and heat resisting			
	IS: 419	Putty, for use on window frames			
	IS 513	Cold rolled carbon steel sheets			
	IS: 702	Specification for industrial bitumen			
	IS: 733	Specification for wrought aluminium and aluminium alloy bars, rods and sections (for general engineering purposes)			
	IS 1079	Hot rolled carbon steel sheets and strips			
	IS: 3043	Code of practice for earthing			
	IS: 1081	Code of practice for fixing and glazing of metal (Steel and aluminium) doors, windows and ventilators			
	IS 1161	Steel tubes for structural purposes			
	IS: 1237	Cement concrete flooring tiles			
	IS: 1285	Wrought aluminium and aluminium alloy extruded round and hollow section (for general engineering purposes)			
	IS: 1443	Code of practice for laying and finishing of cement concrete flooring tiles			
	IS: 1580	Specification for bituminous compound for water-proofing and caulking purposes			
	IS: 1948	Specification for aluminium doors, windows and ventilators			
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CLAUSE NO.	FINISHING AND ALLIED WORKS			
	IS: 1949	Specification for aluminium windows for Industrial buildings		
	IS 2062	Steel for general structural purposes		
	IS: 2095 (part I)	Specification for gypsum plaster boards: plain gypsum plaster boards		
	IS: 2095(part III)	Specification for gypsum plaster boards: reinforced gypsum plaster boards		
	IS: 2202	Wooden flush door shutters (solid core type) particle board face panels and hard (part-2) board face panels		
	IS: 2395	Code of practice for painting concrete, masonry and plaster surfaces		
	(Part-1)	Operations and workmanship		
	(Part-2)	Schedule		
	IS: 2571	Code of practice for laying in-situ cement concrete flooring		
	IS: 3067	Code of practice for general design details and preparatory work for damp proofing and water proofing of buildings		
	IS: 3548	Code of practice for glazing in buildings		
	IS: 3614	Specification for fire check doors:		
	(part-1)	Plate metal covered and rolling type		
	(part-2)	Resistance test and performance criteria		
	IS: 4351	Specifications for steel door frames		
	IS: 4441	Code of practice for use of silicate type chemical resistant mortars		
	IS: 4443	Code of practice for use of resin type chemical resistant mortars		
	IS: 4457	Specification for ceramic unglazed vitreous acid resisting tile		
	IS: 4832(part I)	Specification for chemical resistant mortars: silicon type		
	IS: 4832(part II)	Specification for chemical resistant mortars: resin type		
	IS: 4832(part III)	Specification for chemical resistant mortars: sulphur type		
	IS: 5437	Figured, rolled and wired glass		
	IS: 6248	Specifications for metal rolling shutters and rolling grills		
	IS: 8042	White portland cement		
A&N GAS BASED POWER PROJECT (50 MW) CIVIL WORKS	Bid Doc. No.: NVVN/C&M/RE-342/2024-25	TECHNICAL SPECIFICATIO NS PART-B	FINISHING AND ALLIED WORKS SECTION-III	Page 2 of 27


CLAUSE NO.	FINISHING AND ALLIED WORKS			
1.03.00	IS: 13753	Specification for dust pressed ceramic tiles with water absorption of E>10%		
	IS: 13755	Dust pressed ceramic tiles with water absorption of 3%, E6% (Group B11a)		
	IS: 13801	Chequered cement concrete tiles-Specification		
	IS:14900	Transparent Float glass – Specification		
	ASTM	Standard specifications for high solid content cold liquid applied elastomeric water C836-89a proofing membrane for use with separate wearing course		
	ASTM898-89	Standard guide for use of high solid content, cold liquid-applied elastomeric water proofing membrane for use with separate wearing course.		
1.04.00	IS : 15658	Precast Concrete Blocks for Paving - Specification.		
1.03.00	Sequence			
	Commencement, scheduling and sequence of the finishing works, shall be planned in detail keeping in view the activities of other agencies working in that area and must be specifically approved by the Engineer. However, the Contractor shall remain fully responsible for all normal precautions and vigilance to prevent any damage to finishing items whatsoever till handing over. Size and thickness of the topping/ tile shall be as specified as the schedules of items.			
1.04.00	Materials			
	A)	All materials shall be of 1 st quality.		
	B)	For colour and shade, RAL nomenclature and the classification shall be followed.		
	C)	Wherever working drawings are involved, the procurement of the material shall be done only after the preparation of working drawings including data sheets and approval of same by Engineer. All bought out items shall be procured from approved sub vendor as mentioned in part of this specification.		
1.05.00	Workmanship			
	Workmanship shall be as recommended by manufacturer (supplier of material) and approved by Engineer. Workers specially experienced in particular items of work shall only be engaged under the supervision of experienced supervisors recommended / appointed by the manufacturer.			
1.06.00	Handling & Transportation			
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CLAUSE NO.	FINISHING AND ALLIED WORKS				 विद्युत व्यापार Vidyut Vyapar
1.07.00	<p>All bought out items shall be protected, covered, boxed and crated properly before dispatch so that there will be no damage / deterioration during transportation, handling and storage at site till such time they are fixed in position. All materials shall be stored, dry in the covered shed / place over wooden sleeper with a stacking height not to exceed 2m.</p> <p>Working Drawings</p> <p>Contractor shall prepare the detailed working drawings / data sheets for all bought out items, etc based on the scheme drawing/dimensions given by the Engineer. Working drawing / data sheets shall indicate the schedule of all hardware (fittings and fixture), fabrication details along with the section sizes, fixing details, bill of materials along with sectional weight and total weight, net area, numbers required, dimensions, material specification along with quantity for each type of material, reference to the applicable codes and standards, method of installing, workmanship, tolerance, acceptance criteria, etc. Contractor shall prepare shop drawings of AI. Sections for doors, windows, partitions, and ventilators and get it approved by Engineer-in Charge before fabrication. Contractor shall prepare detail working drawings of toilet showing plumbing layout as per site conditions, fixtures and finishes as per scope drawing approved by the owner.</p>				
2.00.00	FLOOR FINISH AND ALLIED WORKS				
2.01.00	General Requirement				
2.01.01	<p>This part of the specification covers the requirements for providing, laying, installation, preparation of working drawings, finishing, curing, testing, protection, maintenance till handing over various types of floor finishes including skirting / dado and allied items of work.</p>				
2.01.02	<p>Generally following type of finishes shall be provided over the required under bed / compacted earth sub base / hard stone aggregate sub base.</p> <ol style="list-style-type: none"> i) Vitrified ceramic tiles (mirror and polished) ii) Metallic hardener topping iii) Heavy duty cement concrete tiles iv) Interlocking concrete blocks v) Neat cement slurry finish vi) Non-metallic hard granular (ready mix) aggregate finish. vii) Glass mosaic tiles viii) Natural stone (polished) like marble and granite ix) Pre-polished, high wearing resistance concrete tiles x) Acid / alkali and oil resistant epoxy based finish. 				
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CLAUSE NO.	FINISHING AND ALLIED WORKS				
xi) xii)	Tac tiles Acid Resistant Tile				
2.01.03	Pigment Good quality pigment having durable colour shall only be used. Organic colour and lead pigments shall not be used. The colour pigment as selected shall be pure mineral pigments, lime proof and non-fading. Matching of colour between different batches shall be ensured				
2.02.00	Materials				
2.02.01	Material shall be from approved manufacturer / agency and installed by specialist agency.				
2.01.02	All cements used for laying and jointing the floor topping /tiles shall be white portland cement in accordance with IS:8042 unless specified otherwise. For jointing and joint filling, the white cement suitably colour pigmented with the colour matching the colour shade of topping/tiles, shall be used.				
2.02.03	Vitrified ceramic tile shall be as per DSR Item No. 11.49.2 & 11.49.3 Tiles shall be doubly charged mirror polished or matt finished as specified in the construction drawings.				
2.02.04	Metallic hardener compound shall be of approved quality consisting of uniformly graded, properly treated, iron particle, free from non-ferrous metal particle, oil, grease, sand, soluble alkaline compound or other injurious materials. Wherever desired by the Engineer, the sample shall be tested for abrasion value. (Metallic hardener topping -with ordinary grey cement - 12 mm thick (in situ))Cement Concrete flooring below metallic hardener shall be as per DSR Item No. 11.3.1.				
2.02.05	IS:1237 shall be followed as general guidance for the specification of heavy duty cement concrete tiles . Top wearing shall be with white cement with pigment. Aggregate shall be of hard stone chips of different colours. Carborandum, granite, quartzite chips shall be used. Properly graded aggregate upto 10 mm size shall be used. Physical properties and dimensional tolerance of the tile shall be as per IS: 1237. However, surface hair cracks shall not be acceptable. Tile shall be initially grind (preferably twice) before laying.				
2.02.06 2.02.07	Interlocking blocks shall generally meet the requirements of DSR Item No 16.69 For finishing the concrete/mortar surface topping with ordinary gray neat cement , IS:2571 shall be followed as general guidance.				
2.02.08	Readymix non-metallic hard granular aggregate finish shall be made from hard natural stone like quartz, carborandum etc.				
2.02.09	Glass mosaic tile shall be in decorative murals and pattern and shall meet the requirements of DSR Item No. 11.53.				
2.02.10	Natural Polished Stone Slab (Marble, Granite) shall be used as finishing material for both horizontal and vertical surfaces shall meet the requirements of DSR Item No. 11.56.1 for granite and DSR Item No. 11.23.2, 11.24 & 11.25 for marble.				
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CLAUSE NO.	FINISHING AND ALLIED WORKS					
<p>Granite stone</p> <p>2.02.11</p> <p>2.02.12</p> <p>2.02.13</p> <p>2.02.14</p> <p>2.02.15</p> <p>2.02.16</p> <p>2.03.00</p> <p>2..04.00</p> <p>2.05.00</p>	<div style="text-align: right; margin-bottom: 10px;">  </div> <p>work for kitchen platforms, vanity counters window sills, facias and similar locations & edge moulding etc shall be as per DSR Item No. 8.2.2.1, 8.3.2 & 8.5</p> <p>Decorative / designer pre polished, pigmented, high wearing resistance, concrete tiles shall meet the requirements of DSR Item No. 11.20.4</p> <p>Acid / Alkali and oil resistant high built seamless epoxy based resin shall be two component system consisting of high build solid epoxy with pigments of different colours and hardener. It shall be a solvent free coating. It shall be resistant to acids, alkalis, and oils. It shall provide a self smoothing and seamless finish and shall be applicable to both horizontal and vertical surfaces.</p> <p>Ceramic Glazed wall tiles dado shall be as per DSR Item No. 8.31</p> <p>Ceramic Glazed Floor tiles shall be as per DSR Item No. 11.37 & 11.38</p> <p>Cement concrete flooring with concrete hardener topping shall be as per DSR Item No. 11.4</p> <p>Tactile tile (for vision impaired persons as per standards) shall be as per DSR Item No. 16.90</p> <p>Painting Premium Acrylic Smooth exterior paint with Silicone additives of required shade shall be as per DSR Item No. 13.47.1</p> <p>Synthetic enamel paint of approved brand and manufacture of required colour to give an even shade shall be as per DSR Item No. 13.62.1</p> <p>White cement based putty of average thickness 2 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth shall be as per DSR Item No. 13.80 (Generally Similar).</p> <p>Acrylic Distemper shall be as per DSR Item No. 13.81.2</p> <p>Acrylic Emulsion Paint shall be as per DSR Item No. 13.82.2</p> <p>Chemical resistant paint (chlorinated rubber based) without provision of Plaster of Paris as per manufacture's guidelines shall be provided.</p> <p>Sanitary Installation Sanitary fixtures shall be as per following DSR Items: A) Orissa pattern W.C.- DSR Item No. 17.1.2 B) European type W.C.- DSR Item No. 17.3.1 C) Single half urinal- DSR Item No. 17.5.1 & 17.5.2 D) Wash basin- DSR Item No. 17.7.4 E) Kitchen Sink- DSR Item No. 17.10.1.1 F) PVC Waste - DSR Item No. 17.28.2.2 G) Mirror- DSR Item No. 17.31 H) Glass Shelf- DSR Item No. 17.33 I) Toilet Paper Holder- DSR Item No. 17.34.1 J) Waste Coupling- DSR Item No. 17.69.1 K) Bottle trap- DSR Item No. 17.70.1 L) Liquid Soap Container- DSR Item No. 17.71 M) Towel rail - DSR Item No. 17.72</p> <p>Water Supply</p>	<p>A&N GAS BASED POWER PROJECT (50 MW) CIVIL WORKS</p>	<p>Bid Doc. No.: NVVN/C&M/R E-342/2024-25</p>	<p>TECHNICAL SPECIFICATIONS PART-B</p>	<p>FINISHING AND ALLIED WORKS SECTION-III</p>	<p>Page 6 of 27</p>


CLAUSE NO.	FINISHING AND ALLIED WORKS				
2.06.00	<p>Suitable items from Sub Head : 18.0 Titled Water Supply of DSR-2023 shall be provided for water supply.</p> <p>Drainage ISI mark PVC-U pipe of 110 & 160 dia for sewerage systems as per IS 15328:2003 with nominal ring stiffness of SN8 tees, junction at site including bedding conforming to relevant I. S. Code and CPHEEO Specification jointing with Elastomeric sealing rings, including all necessary specials and fittings i.e. bend, tees, junction (with or without door), reducer, coupler, clamp etc, including the cost of centering and shuttering required for completion of the work as per drawings, specifications and as per the directions of Engineer-in-charge shall be provided. Fixing, jointing, laying and testing of pipe shall be done.</p> <p>75 mm dia (wall thickness- 3.2-3.8mm) & 110mm dia pipe (wall thickness- 3.2-3.8mm) ISI marked UV stabilized UPVC pipes for soil, waste and vent, Type-B as per IS : 13592 suitable for rubber ring joints, including all necessary specials and fittings (confirming to IS : 14735) i.e. bends, tees, junctions (with or without doors), reducers, WC connectors, couplers, cowels, clamps, rubber rings, cleanouts, MS holder bat clamp, Y sections, Connections in trap/ manholes etc. fixing at wall/ceiling/floor level supported by clamp & hangers etc. in concealed / inside duct / under floor & basement ceiling / external work etc. including chase cutting as required, excavation and back filling in all kind of soils, suspended from floor under false ceiling or embedding the pipes laid under floors / building in 75 mm. around 1:2:4 cement concrete (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) including cost of shuttering for proper completion of the work, breaking and making good the walls and floors etc. after pipes have been duly laid and tested. The rubber ring shall confirm to IS : 5382 shall be provided. Fixing, jointing, laying and testing of pipe shall be done.</p> <p>The pipes will be supported with threaded GI rods & clamps on 50x50x5 mm slotted angle. The cost will include all support arrangements. The work includes commissioning of all pipes lines as per drawings and specifications and as directed by engg-in-charge at site.</p>				
2.03.00	<p>Under bed</p> <p>The under bed for flooring (horizontal surface) shall generally be with PCC of grade M-20 using 12.5 mm nominal size graded aggregates. Similarly for vertical surface, the mix shall consist of 1:3 cement sand mortar (1 part cement and 3 parts coarse sand by volume). The under bed shall be cast in panels. For some type of flooring compacted earth sub base / hard stone aggregate sub base shall be used as under bed. For laying of tiles suitable adhesive as per IS:15477 shall be used.</p>				
2.04.00	<p>Topping</p> <p>Different types of topping shall be provided over under bed and/or laid directly over the base surface. Before laying the topping the white cement slurry, shall be spread at an average rate of 2.5 kg per Sq.M. unless specified other wise.</p>				
2.05.00	<p>Pattern</p> <p>a) Flooring shall be laid in the pattern as given in the working drawings. Border panel shall not exceed 500 mm in width and joints in the border shall be in</p>				
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	<p>line with panel joints. The panels shall be of uniform size and no dimension of a panel shall exceed 2 m and the area of the panel shall generally be not more than 2 Sq.M.</p> <p>b) Generally, the flooring shall be cast in alternate panels for which flooring / dividing strip need not be provided. Panels shall be bound by angle sections or flats. These shall have the same depth as the flooring. The flooring shall be completed in one operation to ensure uniformity of colour of all the panels. This shall be cured for a minimum period of 7 days.</p>				
2.06.00 -2.06.05	Deleted				
2.06.06	a)	The metallic hardener finish shall be 12 mm thick layer laid over under bedding.			
2.06.07	b)	1 Part of metallic hardener compound shall be mixed dry with 4 parts of grey cement by weight. To this mixture, 6 mm nominal size stone aggregates shall be mixed in the ratio of 1:2 (1 cement hardener mixture : 2 stone aggregate) by volume, and well turned over. Just enough water shall then be added to this dry mix as required for floor concrete.			
2.06.08	c)	The above mixture so obtained shall be laid in 12 mm thickness on the under bed concrete within 2 to 4 hours of its laying. The topping shall be laid true to provide a uniform and even surface. After the initial set has started, the surface shall be finished smooth true to slope with steel floats.			
2.06.09	a)	For laying of heavy duty concrete tile, IS: 1443 shall be followed for general guidance. A thick layer of white cement slurry @ 2.5 kg. /Sq.M. shall be spread over the under bed before laying of tiles.			
2.06.09	b)	The Joints between the tiles shall be filled with epoxy grout as per DSR Item No. 11.48.2 & 11.48.3			
2.06.08	The blocks shall be laid on firm and prepared sub-base. The slope shall be provided in the sub-base to maintain the required slope. The sub-base can be of compacted earth or hard stone aggregate depending upon the intensity of load and type of application. The periphery of the paved area shall be suitably edge restrained. The sub-base shall be sand sprayed keeping a thickness of 20 mm. The laying of paving shall be carried out according to the required pattern. The paved blocks shall then be vibrated with a vibrator to their final level. The sand shall be sprayed over the joints and with the help of vibrator the sand shall get into the joints.				
	Ordinary gray neat cement finish shall be applied over green concrete or green plaster. The top surface of RCC / PCC / plaster shall be cleaned and the laitance shall be removed and a coat of grey cement slurry at the rate of 2.5 Kg. / Sq.M. shall be applied and finished smooth.				
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2.06.10	The readymix non metallic hard granules shall be laid by spreading directly over concrete base when it is still green and finished smooth with steel trowel. Nominal rate of application of granules shall be 5 kg per Sq.M. or as specified.				
2.06.11	Deleted				
2.06.12	Deleted				
2.06.13	Deleted				
2.06.14	<p>Acid / Alkali and oil resistant high built seamless epoxy based resin shall be laid after the concrete surfaces have been cured for 28 days. The surface shall be leveled and free from dust, loose dirt, oil, grease, etc. All pot holes, uneven surface, cracks, crevices shall be repaired.</p> <p>The prepared surface shall be given a coat of epoxy based tack / primer coat as per recommendations of the manufacturer using brush or conventional spray equipment. The primer shall be allowed to dry for about two hours and then first coat of epoxy coating shall be applied. Subsequent coats shall be applied within an interval of four hours or as recommended by manufacturer. Total dry film thickness (DFT) of the coating (excluding primer) shall be minimum 300 microns, which shall be achieved in not more than three coats.</p>				
2.06.15	<p>Acid Resistant tile shall conform to IS: 4457-2007 and shall be executed on horizontal surface with 20mm thick tile and on vertical surface with 12mm thick tile 6 mm thick under-bed by potassium silicate mortar conforming to IS : 4832 (Part-I), pointing of joints of tiles with acid/alkali resistant epoxy/furane mortar up to a depth of 20 mm and bitumastic end sealing including one coat of bitumen primer followed by 12mm thick bituminastic layer conforming to IS:9510</p>				
2.06.16	<p>Rubber Flooring Rubber flooring shall conform to IS:809. The minimum thickness shall be 4 mm with sheet size of 602mm x 602mm.</p> <p>Rubber flooring shall consist of 100% virgin elastomer reinforcing agents, resins, curing agents, anti oxidants and pigments. It shall have excellent abrasion resistance and shall have class-I fire rating. It shall be acid & alkali resistant and shall be of anti static grade. In general, BS code shall apply for their technical characteristics.</p>				
2.06.17	<p>Acid / Alkali Resistant Treatment for Desalination Plant: Acid / alkali resistant lining treatment shall be provided in different areas as follows:</p> <p>Neutralization Pit: The walls shall be provided with one coat of bitumen primer, followed by 18 mm thick bitumastic layer, 115 mm thick A.R. bricks, 6 mm thick under bed of potassium silicate mortar, pointing the joints of bricks with acid / alkali resistant epoxy / furane mortar upto a depth of 20 mm and bitumastic end sealing. Suitable pilasters shall be provided with A.R. bricks at regular intervals depending upon the height of lining, as per the specification.</p> <p>The floor of neutralization pit shall be provided with acid / alkali resistant lining treatment as given in the above para, except that the 115 mm thick A.R.bricks layer shall be replaced by 75 mm thick A.R. tile layer and pilasters shall be omitted.</p>				
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2.06.18	<p>The ceiling of neutralization pit shall be provided with one coat of epoxy primer followed by 2 coats of epoxy paint (150 micron).</p> <p>Acid / Alkali storage area / projections above the floor, pedestals projecting from the floor / saddles. The floor shall be provided with one coat of bitumen primer followed by 12 mm thick bitumastic layer, 20 mm thick A.R. tiles, 6 mm thick under - bed by potassium silicate mortar, 6mm thick pointing of joints of tiles with acid / alkali resistant epoxy / furane mortar up to a depth of 20 mm and bitumastic end sealing. Dado of 1.0M high with above treatment shall also be provided if applicable in case of walls nearby.</p> <p>Alum/Lime Storage area: One coat of bitumen primer followed by 12mm thick bitumastic layer, 20 mm thick A.R. tiles, 6 mm thick underbed of potassium silicate mortar, 6mm thick pointing of joints of tiles with acid /alkali resistant epoxy /furane mortar up to a depth of 20 mm and bitumastic end sealing.</p> <p>Alum solution preparation tank: The wall shall be provided with one coat of bitumen primer followed by 12 mm thick bitumastic layer, 75 mm thick A.R. tiles, 6 mm thick underbed by potassium silicate mortar, pointing of joints of tiles with acid / alkali resistant epoxy / furane mortar upto a depth of 20 mm and bitumastic end sealing.</p> <p>The floor shall be provided with acid / alkali resistant lining treatment as given in the above para except that the 75 mm thick A.R. tile layer shall be replaced by 12 mm thick A.R. tile layer.</p> <p>Basket of Alum Solution Preparation tank: 5mm thick epoxy lining over a coat of epoxy primer.</p> <p>Curved surfaces of saddles shall have minimum 12 MM thick bitumastic layer to support the vessel / tanks.</p> <p>Effluent Drains: Acid Resistant lining treatment indicated for the storage area shall be provided on the bed as well as walls of the drains with 38 MM AR tiles. The underside of the pre-cast slab cover shall be applied with one coat of epoxy primer and two coats of epoxy coating, total DFT 150 microns.</p> <p>Lime tank: Two coats of bitumen paint conforming to IS : 9862, with total DFT 150 microns.</p> <p>Guarantee</p> <p>The Contractor shall give a guarantee for satisfactory functioning of the lining for a period of 36 months from the date of completion of the work or date of handing over the site to the Engineer, whichever is later.</p> <p>The Contractor shall replace / rectify defects is any, observed in the lining to the satisfaction of the Engineer without any extra cost during this period.</p> <p>Foundation of Over Ground Steel Circular Water Storage Tanks</p> <p>General Requirements</p>				
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5.02.11.07	<p>The tank foundation shall be as per IS 803 and as specified in relevant clause of foundation chapter.</p> <p>Sub Grade Preparation</p> <p>The surface of natural soil shall be thoroughly compacted by rolling or other means, as directed by Engineer, to obtain 95% of max. laboratory dry density for the soil, as per IS:2720 (Part-VII).</p> <p>Anti Corrosive Layer</p> <p>Anti-corrosive layer shall consist of screened coarse sand, mixed with VG-30 grade bitumen or equivalent 8% to 10% by volume.</p> <p>Bitumen shall be heated to a temperature 175°C to 190° C, with 3% kerosene, if required. Sand shall be thoroughly mixed with it in a mixing drum to obtain uniform mixture and shall be laid over the compacted surface, laid in line, grade and levels and as directed by the Engineer. Bitumen shall not be heated beyond the temperature limits given above.</p> <p>The premix carpet shall be laid in two layers of 3 cm and 2 cm respectively. After compacting and laying the first layer of 3cm, a tack coat of hot bitumen at the rate of 1 Kg. per Sq.m. shall be uniformly applied to the surface, by means of Sprayer and the Second layer of 2cm thick shall be laid, tamped and compacted to the satisfaction of the Engineer.</p> <p>Sand shall be spread on the final surface at the rate of 0.5 Cu. m per 100Sq.m.</p> <p>Premix</p> <p>Materials</p> <p>Sand</p> <p>Sand shall be clean, dry, coarse, hard angular, free from coatings of clay, dust and mix of vegetable and organic matters and shall conform to IS 383 (Grade -III).</p> <p>Stone Chippings</p> <p>Stone chippings shall be hard black trap or granite or locally available stone and shall conform to IS 383. The grading shall be of normally 12mm down size and 6mm down size, in the ratio of 3:2 respectively.</p> <p>Bitumen</p> <p>Bitumen required for the work shall be VG-30 grade or its equivalent quality.</p> <p>Laying</p> <p>Areas on which the premix is to be laid shall be thoroughly cleaned of all dust and loose materials. On the cleaned surface, a tack coat at the rate of 1.0 Kg. per Sq.M. of hot Bitumen shall be uniformly applied by Sprayers. The applied Binder shall be evenly brushed.</p>				
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	<p>The Binder bitumen VG-30 grade shall be heated to the temperature of about 190° C with 3% kerosene, if required and mixed with stone chippings of size, as mentioned above, at the rate of 400 KG, with Six (6) Cu. M. of stone chips, for 100 Sq.M. of surface. The total mixed quantity, as mentioned above, is the quantity required for the total 50mm thick for 100 Sq. m. of area. Mixing shall continue until the aggregate is well coated.</p>				
3.00.00	DOORS, WINDOWS, PARTITION, ETC.				
3.01.00	General Requirement				
3.01.01	<p>This part of the specification covers the requirement of steel door frame, solid core flush door shutters, decorative veneer panels, hollow metal steel doors, fire proof doors, aluminium works for door, windows, ventilators, partition, aluminium grills, rolling shutters, sliding shutters, etc.</p>				
3.02.00	Materials				
3.02.01	<p>Cold rolled steel shall conform to grade 'O' of IS:513. All steel upto 1.6 mm thickness shall be cold rolled.</p>				
3.02.02	<p>Hardware and fixtures like hinges, jam, beed, screws, bolts, handles, stoppers, door closers, lockers, hold fasts, mastic caulking, fasteners, neoprene gaskets etc shall be able to withstand repeated use. Door closers shall conform to IS:3564. Heavy duty double acting floor springs where specified shall conform to IS:6315. These shall be suitable for door shutters weighing upto 125 kg and shall be hydraulically regulated. These shall be constructed of cast brass casting cover and shoe, gun metal piston player and all other parts of mild steel. All hardware shall be as per relevant IS codes.</p>				
3.02.03	<p>Aluminium sections for fabrication of doors windows, ventilators, partitions cover strips, floor dividing strips etc be as per DSR Item No. 21.1.1.1, 21.1.2.1. The gap in between aluminium frame & adjacent RCC/ Brick/ Stone work shall be filled as per DSR Item No. 21.8.1. The wall thickness of Al. Sections shall be minimum 2mm.</p>				
3.02.04	<p>The mastic for caulking (if required) shall be of best quality.</p>				
3.02.05	<p>Blades of steel louvers shall be made of mild steel plates. Frame for louvers shall be made with steel.</p>				
3.02.06	<p>All material including doors, windows, ventilators, partitions etc. shall be stored under cover in a way to prevent damage or distortion. Special care shall be taken to prevent staining of aluminium products by rust, mortar etc.</p>				
3.02.07	<p>The Contractor shall bring to the site the mastic cement in original sealed container of manufacturer and shall apply it as per the instructions, for all frames supplied by the Contractor and caulking done properly.</p>				
3.02.08	<p>Suitable steel accessories all complete for fixing doors , windows and ventilators as per DSR-2023 shall be used.</p>				
3.03.00	Steel door frames				
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3.03.01	<p>The steel door frames for wooden or other non-metallic door shutters shall be pressed or cold rolled. The pressed steel frames shall conform to IS:4351. Mild steel sheet of 1.25 mm (minimum) thickness shall be used for manufacturing of the frame. The profile of the frame shall be type-A unless otherwise specified. The frame shall be fitted with hold fasts and/or expansion fasteners. Steel surfaces shall be blast cleaned to near white metal surface (Sa 2 1/2) and zinc silicate primer (minimum DFT 75 microns) shall be applied. For blast cleaning of steel surfaces and application of the primer, reference may be made to the specification for the fabrication and erection of structural steel elsewhere in the document. Zinc silicate primer shall be followed by intermediate coat of minimum 75 micron (DFT) epoxy based titanium dioxide / micaceous iron oxide pigmented and finish coat of minimum 75 microns (DFT) of epoxy based coloured pigmented finish polyamide cured paint and final finish coat with minimum 25 micron DFT polyurethane colour pigmented paint.</p>				
3.03.02	<p>The door frames shall be fixed to the wall with the help of hold fasts, embedded in the concrete block. However, for RCC surfaces, expansion fasteners shall be used. The gap between masonry and doorframe shall be caulked with mastic.</p>				
3.03.03	<p>Fitting and fixing in position shall be similar to aluminum work of doors, windows etc. After installation of steel door, etc., all abrasions to shop-coat of paint shall be retouched and made good with the same quality of paint used in shop coat. All coupling mullions, transoms, frames, etc., in contact with adjacent steel and other members, shall be well bedded in mastic. The painting scheme shall of be painting of steel surfaces (other than those embedded in concrete) described elsewhere in the specifications.</p>				
3.04.00	<p>Solid core flush door shutter</p>				
3.04.01	<p>Solid core flush door shutters shall be as per DSR Item no. 9.21.1 ,9.22.1 and 9.23.</p>				
3.04.02	<p>Door shall be fitted with hardware like holdfast, butt hinges, wood screws, handles, sliding and tower bolts, door stoppers and door closers, lock (6 lever Godrej or equivalent) etc.</p>				
3.05.00	<p>BWP particle board (Pre laminated)</p> <p>The boards shall be 12 mm thick with decorative prelaminated veneer on both sides bonded with BWP type phenol formaldehyde synthetic resin conforming to IS : 12823. These boards shall be fixed wherever indicated as panels in the aluminium frame work as door shutters and/or partition.</p>				
3.06.00	<p>Hollow metal double sheet steel doors</p>				
3.06.01	<p>Frames for hollow metal double plate flush doors shall be fabricated from 1.6 mm thick sheets. They shall be mortised, reinforced, drilled and tapped for hinges and lock and bolt strikes. Where necessary, frames shall be reinforced for door closers. Welded construction with mitred corners shall be used. Rubber door silencers shall be furnished for striking jamb. Loose "T" masonry anchors shall be provided. Frames shall finish flush with floor and adjustable floor anchors shall be supplied. Frames shall be brought to site with floor ties/weather bars installed in place.</p>				
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3.06.02	<p>Door shutters shall be double plate flush door construction. This shall be 45 mm thick completely flush design and shall comprise of two outer sheets of minimum 1.2 mm thick steel sheets, rigidly connected and reinforced inside with continuous vertical 1 mm stiffeners, spot welded in position at not more than 150 mm on centers. Horizontal stiffeners shall also be provided. Both edges of doors shall be joined and reinforced full height by steel channels placed immediately inside and welded to the door faces. Top and bottom of doors shall be reinforced horizontally by steel channels placed immediately inside and welded to the door faces. Doors shall not have more than 2.5 mm clearance at jambs and head, shall have proper bevel on lock stiles and rails to operate without bending, and shall be reinforced at corners to prevent sagging or twisting. Pairs or double doors shall have meeting stile edges beveled or rebated. Where shown on drawing or called for in the schedule of items, the doors shall be sound deadened by filling with insulating material.</p> <p>Doors shall be morticed, reinforced, drilled and tapped in shop for hinges, locks and bolts. They shall also be reinforced for closers, push plates and other surface hardware where necessary. Any drilling and tapping required for surface hardware shall be done at site.</p>				
3.06.03	<p>Steel surfaces shall be blast cleaned to near white metal surface (Sa 2 1/2) and zinc silicate primer (minimum DFT 75 microns) shall be applied. For blast cleaning of steel surfaces and application of the primer, reference may be made to the specification for the fabrication and erection of structural steel else where in the document. Zinc silicate primer shall be followed by intermediate coat of minimum 75 micron (DFT) epoxy based titanium dioxide / micaceous iron oxide pigmented and finish coat of minimum 75 microns (DFT) of epoxy based coloured pigmented finish polyamide cured paint and final finish coat with minimum 25 micron DFT polyurethane colour pigmented paint</p>				
3.06.04	<p>Fitting and fixing in position shall be similar to aluminum work of doors, windows etc. After installation of steel door, etc., all abrasions to shop-coat of paint shall be retouched and made good with the same quality of paint used in shop coat. All coupling mullions, transoms, frames, etc., in contact with adjacent steel and other members, shall be well bedded in mastic.</p>				
3.07.00	<p>Fire Proof Door</p>				
3.07.01	<p>Fire proof doors shall be provided at all fire exit points and also to restrict the spread of fire within buildings whether from internal fire or from external fire. Doors shall comply with the testing requirement mentioned in IS:3614 (Part-II) & BS 476 Part 22. The doors shall have minimum 2 hours fire rating.</p> <p>Doorframe shall be of minimum 1.6mm thick galvanized steel sheet pressed form to double rebate profile so as to accommodate minimum 45 mm thick shutter. The shutter panel shall be fabricated with 2 numbers, minimum 1.25mm thick galvanized steel sheet pressed formed having lock seam joints and reinforcements at top, sides and bottom of edges. The shutter shall have infill of insulation for fire rating. Integrated Vision panel shall be provided in shutter as per drawing. The doorframe and door shutter shall be blast cleaned to near white metal surface. Frame and shutter shall be primed and finished with suitable fire retardant paint of approved shade & colour. Prototype of Door shall be got tested at CBRI, Roorkee & certificate to this effect shall be submitted along with Manufacturer's test certificate. The work shall be complete as per specification and instruction of Engineer-in charge</p>				
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	<p>Metal covered (on both sides) Doors having insulating core filled – up with mineral wool shall be used at all fire exit points and shall open out side. Vision panel of size 300x 600 mm of clear size with 6mm thick 2 hours fire rated toughened glass at required location on door shutter shall be provided.</p>				
3.07.02	<p>All necessary accessories and hardware shall also be supplied along with doors. Fireproof door shall be provided with zinc silicate primer (minimum DFT 75 microns) after blast cleaning the surface to near white metal surface (Sa 2 ½). The doors shall be finish with suitable fire retardant painting system.</p>				
3.07.03	<p>Fitting and fixing in position shall be similar to aluminum work of doors, windows etc. After installation of steel door, etc., all abrasions to shop-coat of paint shall be retouched and made good with the same quality of paint used in shop coat. All coupling mullions, transoms, frames, etc., in contact with adjacent steel and other members, shall be well bedded in mastic</p>				
3.08.00	<p>DELETED</p>				
3.09.00	<p>Windows Grills</p>				
	<p>Anodised aluminium grills shall be of approved design patterns. These shall be fixed on to the aluminium framework of windows / Ventilators by using anodised aluminium screws. Necessary openings shall be provided in the grill to facilitate the operation of the windows/ ventilators.</p>				
3.10.00	<p>Rolling Steel Shutters/Grills</p>				
3.10.01	<p>Rolling Shutters / grills shall be with motor drives, gear arrangement and / or manual operation as specified in schedule of items including all accessories and shall conform to IS:6248. All Electrical work shall be in strict accordance with the relevant Indian Electricity Rules.</p>				
3.10.02	<p>Shutters shall be painted with one coat of zinc silicate primer (minimum DFT 75 microns) after blast cleaning the surface to near white metal surface (Sa 2 ½). Zinc silicate primer shall be followed by intermediate coat of minimum 75 micron (DFT) epoxy based titanium dioxide / micaceous iron oxide pigmented and finish coat of minimum 75 microns (DFT) of epoxy based coloured pigmented finish polyamide cured paint and final finish coat with minimum 25 micron DFT polyurethane colour pigmented paint</p>				
3.10.03	<p>After installing the shutters, the Contractor shall test the performance of the shutter in the presence of the Engineer. The shutters shall be smoothly operable under all ambient conditions. All control and locking devices shall give fault free performance.</p>				
3.11.00	<p>Sliding Door</p>				
3.11.01	<p>This shall be provided as described in the schedule of items.</p>				
3.12.00	<p>Automatic Operation System for Door</p>				
3.12.01	<p>This shall be provided as described in the schedule of items.</p>				
4.00.00	<p>GLASS AND GLAZING</p>				
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<p>4.01.00</p> <p>4.01.01</p> <p>4.01.02</p>	<p>General Requirement</p> <p>This part of the specification covers the requirement of providing fitting and fixing in position of glazing of different thickness comprising of clear float glass, wired glass, tinted glass, including curtain glass and hermetically sealed composite double glazing complete with all clips, putty, mastic, etc., including glass block masonry. IS:1081 and IS:3548 shall be followed as guidance for glazing work.</p> <p>Materials</p> <p>a) All glass and glazing shall have uniform refractive index and free from flaws, specks, and bubbles.</p> <p>b) The glass shall be brought to site in the original packing from the manufacturer and cut to size at site. The cut edges shall be straight and free from hips, spells or any other damages.</p> <p>c) Glass shall be toughened glass and shall be of thickness as specified in construction drawings. Properties of float glass shall generally meet the requirements of IS:14900.</p> <p>d) Minimum 6mm thick toughened glass shall be used in windows and ventilators. For Al. Glazed doors minimum 8mm thick toughened glass shall be used.</p> <p>e) The putty shall conform to IS:419 and shall be of best quality and shall be brought to site in manufacturer's original packing. Quick setting putty shall be used for windows and sashes except when glare reducing glass is used where it shall be of non-setting type.</p> <p>f) Material for glass block masonry work shall be as per the best industry practice.</p> <p>g) Composite double glazing shall be made of double glazing of two 6 mm thick with one side clear float glass and other side tinted glass. Both the glasses shall be separated by an air gap of 12 mm. The trapped air shall be kept dry by means of suitable desiccant. The glass shall be hermetically sealed. The sealing shall be under strict quality control. The composite glazing shall be procured as finished product</p> <p>h) Composite double glazing, 24mm thick shall consist of 6mm thick clear float glass on inner side and 6mm thick reflective toughened glass on outer side. The two glasses shall be separated by 12mm air gap and hermetically sealed by beading of anodized Aluminium with outer edge sealed with silicon sealant. Composite double glazing shall have technical characteristics as mentioned below.</p> <p>Solar factor : 25% or less</p> <p>U -value : less than 1.6 W/m².K</p>				
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4.02.00 4.02.01 4.02.02 4.02.03 4.02.04 4.02.05 4.02.06 4.02.07	<p style="text-align: center;">VLT : Minimum 40%</p> <p>Fitting and Fixing</p> <p>All glazing clips, putty, mastic, etc. as required shall be provided.</p> <p>All glasses shall be thoroughly cleaned before setting in position. Wherever required, glass pane shall be held in place by special glazing clips of approved type. Four glazing clips shall be provided per glass pane except for large panes where six or more clips shall be used. All holes that may be necessary on the anodised aluminium doors, windows etc for holding the clips, glazing beads and all other attachments shall be drilled in position. Glass panes shall be set without springing, and shall be bedded in putty and back puttied, except where moulding or gaskets are provided. Putty, mastic etc. shall be smoothly finished to a true even line.</p> <p>After completing the glazing work, the Contractor shall remove all dirt, stains, excess putty and clean the glass panes and leave the work in perfectly acceptable condition. All broken, cracked or damaged glass shall be replaced by new ones.</p> <p>Structural shall be fixed on external face of building along with the aluminum frame as per manufacturer's recommendations and joint shall be filled with high quality butyl/structural silicon sealant.</p> <p>Double glazing shall be hermetically sealed.</p> <p>The glass must be protected during installation period so that they will not be damaged by splashed of cement, welding, grinding etc.</p> <p>The stains caused by welding and grinding will permanently damage the glass and shall require replacement immediately.</p> <p>Labels, tapes, adhesives, writing with chalk or any other tool shall never be done on the coating of glazing.</p> <p>After the completion of installation, the glazing shall be immediately washed with clean water.</p> <p>When assembling and installing the glazing, the position of coating is of crucial importance and the same be positioned as indicated in the drawings.</p> <p>Glazing shall be carefully done to avoid direct contact with metal frames.</p> <p>Glass block masonry shall be laid by using the adhesive as per the best industry practice.</p> <p>No separate measurement shall be made for</p> <ol style="list-style-type: none"> a) Glazing clips, mastic cement, putty, screws, nails etc. nor for drilling holes, in frames for inserting glazing clips. However, aluminum beading shall be paid alongwith anodised aluminum works. b) Cutting of glass to required size, wastage, edge finishing, etc. 				
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4.02.08	<p>c) Cleaning the glass after installation.</p> <p>Reflective Toughened Glass</p> <p>The glass to be used as reflective toughened glass shall have the technical characteristics as described in bill of quantities. Any cutting, grinding, drilling or working upon the glass shall be completed prior to the toughening process. The glass shall have the following characteristics:</p> <p style="text-align: center;">VLT : Minimum 40%</p> <p style="text-align: center;">Solar Factor : 45% or less</p> <p style="text-align: center;">U-Value : less than 5.7 W/m².K</p>			
5.00.00	FALSE CEILING			
5.00.01	General Requirement			
5.01.01	<p>This part of the specification covers the requirement of the false ceiling of Glass Reinforced Gypsum (GRG) ceiling system and pre-painted coil coated steel ceiling system all complete with supporting grid system galvanized wires, height adjustment clips, providing openings for ac ducts, return air duct, light fixtures, grills etc</p>			
5.01.02	<p>Materials</p> <p>a) Gypsum board shall meet the requirement of IS: 2095. In addition, the board shall be reinforced with a layer of glass fiber membrane conforming to IS:8183. Nominal thickness of the board shall be 12 mm. Fine textured finish shall be provided.. Nominal size of the board shall be 600x600 mm. Bigger size panels shall be used for flat construction.</p> <p>b) Mineral fibre board false ceiling DSR Item No.26.27.1</p> <p>Calcium Silicate board false ceiling DSR Item No.26.25</p> <p>c) Tile type pre-coated steel false ceiling panel shall be of square type. Size of the tile shall be 600 x 600 mm and thickness of the sheet (bare metal) shall be minimum 0.5 mm. Coating shall be applied by coil coating process. Rate of galvanisation shall be 180 gm / Sq.M. (grade 180 as per IS : 277) and thickness of regular modified polyester/super polyester paint over primer shall be 20 microns. The thickness of primer coat shall be 5 micron.</p> <p>d) Aluminium False Ceiling: Aluminium false ceiling shall be in 600 mm x 600 mm tile or plank type of 0.6 mm thickness (minimum)with perforation of 2.5 mm dia in combination with built in nonwoven tissue for providing good acoustic properties. False ceiling shall have coil coating of thickness 25micron (minimum)and it shall be installed with T-Grid (of profile 24 mm) in same or contrasting colours or with 6 mm recess joints. The whole system shall be level adjusting arrangement and shall be suspended as per manufacturer guidelines.</p>			
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5.02.00	Deleted				
5.02.01	<p>Pre Painted coil coated steel false ceiling system.</p> <p>A) Tile type false ceiling shall be supported on T-frame as specified for laying GRG in tile of 600 mm x 600 mm above Lineal type false shall be supported/clipped into the galvanised carriers suspending from the soffit/structural members.</p> <p>B) Wherever required under deck insulation shall be laid above the steel ceiling system as specified elsewhere in this specification.</p>				
6.00.00	WATER PROOFING TREATMENT				
6.01.00	General Requirement				
6.01.01	This part of the specification covers the requirement of providing water proofing treatment of roof or any other RCC surface under water pressure using high solids content Polyurethane based cold liquid applied coating.				
6.02.00	Materials				
6.02.01	High solids content Polyurethane based cold liquid applied coatings shall be as per ASTM C836-89 and shall comprise of urethane pre-polymers extended with flexible material, which cure by reaction with atmospheric moisture to give a continuous film which is rubbery and elastic. Any other equivalent material formulation permitted as per ASTM can also be considered for use. The material shall consist of high solids coating designed to give a high-build film. The material shall not be diluted. The coating shall have physical features like high viscosity, min. 80% solids, high resistance to impact, abrasion and cracking, superior tensile strength, 300% elongation and forming a perfectly smooth permanently flexible seamless membrane which should have good adhesion to roof substrates. It should also be resistant to acid (mild concentrated), alkalis and have a very low water absorption rate (0.5% max.) at ambient temperature after 7 days. The material shall not be older than 9 months after the date of manufacture and packing.				
6.02.02	Reinforcing layer for the membrane shall be non-woven polyester scrim cloth. This shall be made of 100% polyester. Weight of cloth shall be 40 g/Sq.M. (min)				
6.02.03	Extruded high density dimpled polyurethane shall have minimum weight of 500 gms. / Sq.M., minimum thickness 0.5 mm and mechanical resistance to compression not less than 230 KN / Sq.M. The stud height shall be 8 mm and minimum numbers of stud shall be 1800 / Sq.M.				
6.02.04	Materials for cement mortar under bedding, cement-sand plaster over concrete roof and cement concrete under bedding shall be as specified elsewhere in this specification.				
6.02.00	Fixing and laying				
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6.03.00	ASTM C898 – 89 shall be followed as general guidance.				
6.03.01	Water Proofing Treatment for Roof				
6.03.01	Different layers required for water proofing treatment for roof shall be as shown on the working drawings. Different layers shall consist of the following <ol style="list-style-type: none"> a) Grading under bed. b) Elastomeric membrane. c) Wearing course 				
6.03.02	Grading Underbed The underbed shall be laid to provide an ultimate run - off gradient not less than 1 in 100 or as specified in the drawing. However no underbed is required where the slope has been provided in the structural frame work/ concrete. Upto an average thickness of 25 mm the underbed shall usually be composed of cement and sand plaster. For higher thickness the underbed shall be made with cement concrete. The surface of roof and that part of the parapet, gutters, drain channels, drain mouths, or any other RCC surfaces etc., over which the underbed is to be applied shall be roughened and thoroughly cleaned of all foreign matter namely fungus, moss and dust, with wire brushing and dusting. Oil patches if any shall be removed with detergent. The surface shall be soaked with water and all excess water removed just before laying of the underbed. The plaster shall be provided as specified elsewhere in this specification and this shall be laid to proper grade in continuous operation and fully compacted. The concrete shall be used where the underbed is more than 25 mm (average) thick. It shall consist of cement concrete of grade M-20 with 12.5 mm nominal size graded aggregate. The mix shall be laid to proper grade in continuous operation and fully consolidated. The surface shall be even and smooth. Concrete work wherever required shall be done as specified elsewhere in this specification.				
6.03.03	Elastomeric membrane <ol style="list-style-type: none"> a) For preparatory work, IS: 3067 shall be followed as a general guidance for laying the roof waterproofing treatment .The roof surface shall be thoroughly cleaned with a wire brush and all foreign matter, etc. shall be removed. Well defined cracks on the surface shall be cut to 'V' section, cleaned and filled up flush with a paste of polyurethane based crack filling compound and white cement in a ratio of 1:2 or polymerised mastic (Bitumen mixed with inert fillers or Elastomeric membrane). Water proofing treatment shall be carried out into the drain pipe or out-lets by at least 100 mm. For rain water pipe out-lets, a groove shall be cut all round to tuck the treatment. When a pipe passes through a roof on which water proofing treatment is to be laid, a cement concrete angle-fillet shall be built round it and the water proofing treatment taken over the fillet. In case of parapet walls, for tucking in the water proofing treatment, a horizontal groove shall be left in the vertical face at the time of construction. At the junction between the roof and the vertical face of the parapet wall, a cement concrete fillet 75 mm (min) in radius shall be constructed. At the drain mouths, the fillet shall be suitably cut back and rounded off for easy application of the water proofing treatment and easy flow of water. 				
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6.03.04	<p>b) Application</p> <p>i) Primer Coat</p> <p>It shall consist of polyurethane (P.U.) or any other equivalent material. Primer coat shall be a special blend of moisture curing urethane pre-polymers in solvent. A single coat of this primer shall be applied by brush over the prepared bed as an adhesion coat of an application rate of not more than 6 Sq.M. per liter.</p> <p>The primer shall be allowed to dry for a minimum of 2 hours but not more than 24 hours time before the successive finishing coats of P.U. liquid membrane are applied.</p> <p>ii) Finishing Coats</p> <p>The finishing coats shall consist of minimum two successive liquid coatings of high solids content urethane pre-polymers or equivalent material to form an elastomeric membrane. Application shall be with brush or spray to form a uniform jointless elastomeric membrane. The overall dry film thickness excluding primer coat shall be 1.5 mm. However, nominal rate of total liquid coating application shall not be less than 1.6 kg. /Sq.M. excluding primer coat. Each coat shall be allowed to dry for minimum 12 hours before applying the next coat. The surface shall be dry and smooth before application. The coating shall be continued upto parapets / walls for a minimum of 150 mm over the finished roof surface. It shall be continued into rain water pipes by at least 100 mm into inner surface of pipe. Reinforcing layer of polyester scrim cloth shall be placed over the 1st coat when the coat is tacky. The surface shall be dry and smooth before application. The coating shall be continued up the parapets/walls for a minimum of 150 mm over the finished roof surface.</p> <p>Fine silica sand shall be spread over the final coat when coat is tacky to obtain a rough surface.</p> <p>Water proofing of membrane shall be tested by pounding of water.</p> <p>Wearing Course</p> <p>a) Finishing coat of elastomeric membrane shall generally be provided with wearing course consisting of minimum 25 mm thick PCC of Grade M20 (using 12.5 mm size aggregate) cast in panel of maximum size of 1.5 m x 1.5m and reinforced with galvanised chicken wire mesh. Sealing of Joints at the panel junctions shall be done using non bitumastic sealant/ elastomeric compound. Wearing course shall not be provided for vertical surfaces and inaccessible areas provided with elastomeric membrane. PCC wearing course and chicken wire mesh shall be provided as mentioned elsewhere in this specification.</p> <p>b) The area of the roof surface which is subjected to foot traffic or used as a working area, shall be suitably protected, as mentioned elsewhere in the specification, in such a way so to keep the top of the protective coating matching with top surface of the wearing course.</p>				
6.04.00	<p>Water Proofing Treatment for basement type structure</p>				
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6.04.01	The electrometric membrane for the raft shall be provided over the lean concrete / PCC. The membrane shall be applied in the similar manner as mentioned for water proofing treatment for roof. The top surface of elastomeric membrane shall be protected by providing 20 mm thick PCC of grade M20 (using 12.5 mm size aggregate) cast in panel of maximum size 1.5 m x 1.5m.			
6.04.02	The electrometric membrane for the vertical wall shall be provided on the outer face exposed to water pressure. The membrane shall be applied in the similar manner as mentioned for water proofing treatment for roof. The exposed surface of elastomeric membrane shall be protected by providing extruded high density dimpled polyurethane membrane.			
7.00.00	FENCING AND GATES			
7.01.00	General Requirement			
7.01.01	This part of the specification covers the requirement of providing PVC coated chain link fencing, welded wire mesh, reinforced barbed tape and MS Gates.			
7.01.02	<p>Materials</p> <p>a) PVC coated chain link fencing shall be of mesh size 75 mm and of minimum 4 mm diameter (including PVC coating) and diameter of bare galvanized wire shall not be less than 2.5 mm as per IS 272.</p> <p>b) Welded wire mesh shall conform to IS:1566. Mesh size shall be as indicated in the drawing.</p> <p>c) Reinforced barbed tape shall consist of flattened and cold drawn, galvanised to 230 g./Sq.M. (as per IS:2629), unalloyed wire as per Grade-II of IS:4454 Part-I having a nominal bare metal diameter of 2.60mm and minimum tensile strength of 1600 N / Sq.mm. and a low carbon steel strip 19 mm wide and 0.5 mm thick and conforming to IS: 513 with hardness between 137 to 180 VPN, having series of sharp barbs punched all along the length on both sides of strip at regular intervals (24 mm approx.) and electro galvanised with 12 to 18 microns of zinc coating as per requirement of IS:1573.</p> <p>d) MS gates shall be made of structural steel conforming to IS 2062, pipe conforming to IS 1161, steel sheet conforming to IS 513 and IS 1079. All guide track, tempered steel pivot, castor, bronze aluminium ball and bearing etc. shall also be of best and heavy quality and shall provide smooth operation.</p>			
7.02.00	Fencing			
7.02.01	Supporting vertical steel post and toe wall wherever required for fencing shall be provided as part of structural steel and masonry work, as specified elsewhere in this specification. The chain link will be stretched and attached by 'C' clips at 0.5 m intervals to 3 strands of high tensile spring steel wire (HTSSW) of 2.5 mm interwoven in chain link wire mesh and kept under tension which in turn are attached to the fence post with security nuts and bolts. On every fourth post, a clamping strip			
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7.02.02	<p>will be threaded through the links of chain link and bolted to the fence post with the help of security nuts and bolts.</p> <p>The mild steel frame work for fixing of the welded wire mesh shall be provided as part of structural steel and masonry work, as specified elsewhere in this specification. The welded wire mesh shall be fixed to the steel frame work by using mild steel beading, screwing and welding Welded wire mesh shall be finished by blast cleaning of steel surfaces to near white metal surface (Sa 2 ½ Swedish standard), applying inorganic zinc silicate primer of minimum 75 microns (DFT), application of intermediate (under) coat of minimum 75 micron (DFT) epoxy based titanium dioxide / micaceous iron oxide, followed by finish painting with Epoxy based colour pigmented finish Poly Amide cured paint.</p>			
7.02.03	<p>The reinforced barbed tape shall be stretched and fixed in specified number of rows and two verticals strands. The bottom row shall be 10.0 cm above ground and the rest at 15.0 cm center to center. The reinforced barbed tape shall be held to the RCC / steel posts by means of G.I. hair pins and washers. Turn buckles and straining bolts shall be used for fixing of the barbed tape.</p>			
7.03.00	<p>Gates</p>			
7.03.01	<p>Finished material shall be free from imperfect edges and other defects. It shall have a smooth, uniform finish, and shall be straightened. It shall also be free from loose mill scale, rust, pits or other defects affecting its strength and durability.</p>			
7.03.02	<p>The fabrication and erection of gate shall be carried out as per the working drawing developed by Contractor and approved by Engineer. All fabrication and erection work shall be done as per IS : 800.</p>			
7.03.03	<p>All Structural Steel works shall be painted with shop coat of approved zinc silicate primer (minimum DFT 75 micron) over blast cleaned surface to near white metal surface (Sa 2-1/2) and final painting shall be with epoxy based finish poly amide cured painting system consisting of three coats as specified for structural steel works. Blast cleaning of steel surfaces shall be done as specified in the technical specification for the fabrication and erection of structural steel work.</p>			
7.03.04	<p>The gate shall be complete with guide track, castor wheel, ball and bearing, all fitting and fixtures like hinges, aldrops, locking arrangement, stubs, posts, tempered steel pivots, tempered steel templates, etc.</p>			
8.00.00	<p>ALUMINIUM COMPOSITE PANEL CLADDING</p> <p>Designing, fabricating, testing, installing and fixing in position Aluminium Composite Panel Cladding, with open grooves for linear as well as curvilinear portions of the building, for all heights and all levels etc. including:</p> <p>(a) Structural analysis & design and preparation of shop drawings for pressure equalisation or rain screen principle as required, proper drainage of water to make it watertight including checking of all the structural and functional design.</p> <p>(b) Providing, fabricating, supplying and fixing panels of aluminium composite panel cladding in pan shape in metallic/ solid colour of approved shades made out of 4mm thick aluminium composite panel having 7.5kg/sqmt weight. ACP consisting of 3mm thick Fire Retardant mineral filled Core comprising of around 70% Inorganic compound which is 100% non-combustible mineral and balance 30% is food grade virgin polymer sandwiched between two Aluminium sheets (each 0.5mm thick). The Aluminium composite panel top and bottom skin should conform to Aluminium Alloy</p>			
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	 <p>5005 (AIMg 1) marine grade series. The ACP sheet shall be coil coated with Kynar 500 based (70:30 ratio) PVDF / Lumiflon based fluoropolymer resin coating of approved colour and shade on face # 1 the “specification for coated coil for the exterior building application” issued by ECCA (European Coil Coating Association). The coating shall confirm to AMMA-2605 for superior performing of exterior grade finish and polymer (Service) coating on face # 2 as specified using stainless steel screws, nuts, bolts, washers, cleats, weather silicone sealant, backer rods etc.</p> <p>(c) The fastening brackets of Aluminium alloy 6005 T5 / MS with Hot Dip Galvanised with serrations and serrated washers to arrest the wind load movement, fasteners, SS 316 Pins and anchor bolts of approved make in SS 316, Nylon separators to prevent bi-metallic contacts all complete required to perform as per specification and drawing The item includes cost of all material & labour component including aluminium base work for ACP cladding, the cost of all mock ups at site, cost of all samples of the individual components for testing in an approved laboratory, field tests on the assembled working curtain wall with aluminium composite panel cladding, cleaning and protection of the curtain wall with aluminium composite panel cladding till the handing over of the building for occupation. The Contractor shall provide curtain wall with aluminium composite panel cladding, having all the performance characteristics all complete , as per the Architectural drawings, as per item description, as specified, as per the approved shop drawings and as directed by the Engineer-in-Charge. However, for the purpose of payment, only the actual area on the external face of the curtain wall with Aluminium Composite Panel Cladding (including width of groove) shall be measured in sqm. up to two decimal places.</p> <p>d) ACP for External use in buildings – Engine Hall, Utility Building, Gate complex</p> <p>d) ACP for internal encasement with Class II B fire rated LDPE core mixed with mineral fibre in Utility Building/ Engine hall Gate complex (Generally Similar to DSR Item No. 8.32)</p> <p>9.00.00 Autoclaved Aerated Concrete Blocks Autoclaved Aerated Concrete (AAC) blocks shall be as per DSR Item No. 6.38 & 6.47</p> <p>10.00.0 Insulation Insulation of mineral wool upto 50 mm etc., all complete, as per drawings and instructions of the Engineer. nominal thickness conforming to IS : 8183, having a density of 32 kg / Cu.M. for glass wool or 48 kg/ Cu.M. for rock wool, for cladding insulation, under-deck insulation, insulation for hollow doors, insulation over false ceiling, at all levels, for all kinds of work, handling, transportation, etc., including all labour, material, scaffolding, equipment, with or without framed strips 25x3 mm (min) at maximum 300 mm c/c spacing, to hold the insulation between the horizontal sheeting runners, keeping in position with galvanised hexagonal wire netting of 0.3mm wire diameters and 19mm mesh size, for glass / rock wool, as per manufacturer's recommendation shall be provided. Insulation may be Wrapped in polyethylene sheet bags but without framed strips or wrapped in polyethylene sheet bags but with framed strips. Minimum 0.05 mm thick aluminium foil (instead of wrapping in polythelene sheet) for under deck insulation work on exposed faces, followed by 0.56 mm dia and 25 mm mesh GI wire netting and fixed with metal expansion fasteners shall be provided.</p> <p>11.00.0 Automatic Sliding Doors Automatic Sliding/ Swing operating system for Glass doors comprising of Advanced DC brushless motor, Automatic Reversing / swinging Safety Device, Suitable for door weight 100 kg, Opening speed : 90-110cm /sec (adjustable), Closing Speed :</p>			
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12.00.0	<p>40-110cm/sec (adjustable), opening time : within 1-9 seconds after door stopped in opening, controller : 8 Bit micro computer, Motor (Dortexor equivalent) : DC12V, 35W brushless motor, Power Voltage : AC 110V - 240V. 50Hz - 60Hz, Power Consumption : 45W including Infra Red Sensors 2No both sides, make of best and approved quality with toughened glass of 12mm thickness shall be provided Engine Hall/ Utility Building and any other locations as instructed by the owner</p> <p>Stainless Steel Railing 1200 High Stainless Steel (SS) Railing shall be provided as specified in construction drawings (Engine Hall Building, Utility Building, Gate Complex and Time Office per DSR Item No. 10.28</p>			
8.00.00	<p>SAMPLING, TESTING, ACCEPTANCE CRITERIA INCLUDING CONSTRUCTION TOLERANCES</p>			
8.01.00	<p>Frequency of sampling, testing and quality assurance including the method of conducting the tests, acceptance criteria and construction tolerances shall be as given in Part-C of this specification.</p>			
9.00.00	<p>RATES AND MEASUREMENTS</p>			
9.01.00	<p>Rates</p>			
	<p>This clause shall be read in conjunction with the clause for the rates given in Part-A of this specification</p>			
9.01.01	<p>Unit rates for providing and laying floor-finishing materials shall also include for provision of side shuttering (if required) for casting of floor in alternate panels</p>			
9.01.02	<p>Unit rate for anodized aluminum works shall be applicable for all type aluminium work except aluminium grills and shall also include for provisions for all hardware, fitting and fixtures for fixed as well as operable type of unit.</p>			
9.01.03	<p>Unit rate for rolling / sliding shutter shall also include for</p> <ol style="list-style-type: none"> a) Provision of locks, guide channels, and drive as specified. b) In case of electrically operated rolling shutter, the mounting of controls, wire and wiring from the nearest junction box, conduit and other electrical connections and cost of electric motor. 			
9.01.04	<p>Unit rate for aluminium grills shall also include the fixing the grills in aluminium windows, ventilators, etc at all elevations.</p>			
9.01.05	<p>Unit rate for glazing including composite double glazing shall also include for provisions of glazing clips, mastic cement, putty, screws, nails etc., for drilling holes, in frames for inserting glazing clips. cutting of glass to required size, edge finishing, for cleaning the glass after fitting and fixing.</p>			
9.01.06	<p>The unit rate for providing, fabrication, transportation and erection of structural steel work in gate shall also include the provision of all materials, wastage, labour, tools and plant required for fabrication, including welding, supply & fitting of all accessories, erection, surface preparation by blast cleaning and epoxy painting.</p>			
9.02.00	<p>Measurements</p> <p>This clause shall be read in conjunction with the clause for the measurement given in Part-A of this specification.</p>			
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9.02.01	<p>The item of providing and laying floor-finishing materials shall be measured in Sq.M. for net area except interlocking concrete blocks and ready mix non-metallic granules. Any opening less than 0.1 Sq.M. shall neither be taken into account nor shall any extra be paid for it. Measurement for interlocking concrete blocks of various sizes and thickness shall be made in Cu.M. based on the theoretical volume or the net volume of the concrete block, whichever is less. Ready mix non-metallic granules shall be measured by weight in MT of the net granules spread.</p>				
9.02.02	<p>The item of providing and laying acid/alkali resistant tiles shall be measured in Sq.M. for net area. Any opening upto 0.1 Sq.M. shall be neglected as non existent for the purpose of measurement however if the opening area is more than 0.1 Sq.M. then same shall be considered for deduction in calculating the net area.</p>				
9.02.03	<p>The item of providing, fitting and fixing of steel door frames, shall be measured in running meter along the center line of frames provided.</p>				
9.02.04	<p>The item of providing, fitting and fixing of solid core flush door shutters, shall be measured in Sq.M. for the net area of shutters provided. Any opening upto 0.1 Sq.M. shall be neglected as nonexistent for the purpose of measurement however if the opening area is more than 0.1 Sq.M. then same shall be considered for deduction in calculating the net area.</p>				
9.02.05	<p>The item of providing, fitting and fixing of BWP particle board decorative veneered, shall be measured in Sq.M. for the net area provided. Any opening upto 0.1 Sq.M. shall be neglected as non existent for the purpose of measurement however if the opening area is more than 0.1 Sq.M. then same shall be considered for deduction in calculating the net area.</p>				
9.02.06	<p>The item of providing, fitting and fixing of hollow metal double sheet steel door shall be measured in Sq.M. for the net outer-to-outer area of door provided.</p>				
9.02.07	<p>The item of providing, fitting and fixing of fire proof doors shall be measured in Sq.M. for the net outer-to-outer area of door provided.</p>				
9.02.08	<p>The item of providing, fitting and fixing of anodised aluminum works for doors, windows, ventilators etc including aluminium beadings, aluminium fittings and fixtures etc. shall be measured by weight in kg based on the calculations made for the fabricated sections using standard unit weight of the sections and/or actual weight whichever is less.</p>				
9.02.09	<p>The item of providing, fitting and fixing of anodised aluminium grills shall be measured by weight in kg based on the actual weight of the grill.</p>				
9.02.10	<p>The item of providing, fitting and fixing of rolling shutters and sliding doors shall be measured as the area of openings in Sq.M. over which rolling shutters / sliding doors have been provided.</p>				
9.02.11	<p>The item of automatic operation system for doors shall be measured as 'Each' for every door opening for which the said system is provided.</p>				
9.02.12	<p>Steel louvers wherever provided shall be measured under the item of fabrication and erection of structural steel as specified in structural steel section module.</p>				
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9.02.13	The item of providing, fitting and fixing of glazing (float glass, wired glass, tinted glass) shall be measured as the actual area of the glass provided in Sq.M. (including the portion of glass covered behind support).			
9.02.14	The item of providing, fitting and fixing of composite double glazing and curtain glazing shall be measured as actual area provided in Sq.M. as composite unit (separate measurement shall not be made for each of the two layers).			
9.02.15	The item of glass block masonry shall be measured as actual area provided in Sq.M.			
9.02.16	The item of providing and fixing GRG false ceiling system and pre coated steel false ceiling system shall be measured as actual surface area laid in square meters. However, no deduction shall be made for opening up to 0.25 Sq.M. each in area.			
9.02.17	The item of providing, laying and fixing in position of water proofing shall be measured as net surface area in Sq.M. Grading under bed, grading course, fillet, plaster, etc., when provided, shall be measured under relevant item of work.			
9.02.18	The item of providing and laying extruded high density dimpled polyethylene membrane shall be measured as net surface area in Sq.M.			
9.02.19	The item of providing and installing PVC coated chain link fencing shall be measured for the net surface area provided in Sq.M. Steel post / toe wall / concrete shall be measured separately under relevant item of work.			
9.02.20	The item of providing and installation of welded wire mesh shall be measured by weight in M.T. based on the theoretical weight and or actual weight whichever is less.			
9.02.21	The item of providing and installation of reinforced barbed tape shall be measured by weight in M.T. based on the theoretical weight and or actual weight whichever is less.			
9.02.22	The item of providing, fabrication, transportation and erection of structural steel work in gates shall be measured in kg. of the net weight of metal including accessories in the fabricated structure.			
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	SHEETING AND ALLIED WORKS			
1.00.00	GENERAL REQUIREMENT			
1.01.00	Contents			
	<p>This section covers the technical requirement for painting, resin bonded granular coating, colour coated metal sheeting for decking, roofing & cladding, pre-engineered buildings and other similar works</p>			
1.02.00	Codes and Standards			
1.02.01	<p>Some of the relevant Indian Standards, Codes, etc. applicable to this section of the specification are listed below:</p>			
	IS:277	Galvanised steel sheets (Plain or corrugated).		
	IS:428	Distemper, oil emulsion, colour as required.		
	IS:513	Cold rolled carbon steel sheets.		
	IS:737	Specification for wrought aluminium and aluminium alloy sheet and strips for general engineering purpose.		
	IS:801	Code of practice for use of cold formed light gauge steel structural members in general building construction.		
	IS:1254	Specification for use of corrugated aluminium sheet.		
	IS:2395	Code of practice for painting concrete, masonry and plaster surfaces.		
	IS: 2402	Code of practice for external rendered finishes.		
	IS:3414	Design and installation of joints in buildings.		
	IS:4326	Code of practice for earthquake resistant design and construction of buildings.		
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1.03.00	IS:5411	Plastic emulsion paint.			
	IS:7178	Technical supply conditions for tapping screw.			
	IS:8147	Code of practice for use of aluminium alloy in structures			
	IS:8183	Bonded mineral wool.			
	IS:12118	Two parts polysulphide based sealants.			
	IS:12436	Specification for preformed rigid polyurethane (Pur) and polyisocyanurate (Pir) foams for thermal insulation.			
	IS:13204	Rigid phenolic foams for thermal insulation.			
	IS:14246	Continuously pre-painted galvanised steel sheets and coils			
	SP: 20	Explanatory hand book on masonry code.			
	Australian Standards				
	AS1365	Standards for Steel Manufacturing			
	AS1397	A steel sheet & strip – Hot –dipped-zinc-coated or Aluminium-Zinc coated			
	AS /NZS 2728	Pre finished / pre painted sheet metal product for interior/exterior building applications–Performance requirements			
	AS 3566	Self drilling screws for building and construction industry.			
Sequence					
<p>Commencement, scheduling and sequence of works, shall be planned in detail keeping in view the activities of other agencies working in that area and must be specifically approved by the Engineer. However, the Contractor shall remain fully responsible for all normal precautions and vigilance to prevent any damage to works whatsoever till handing over. Size and thickness of the topping/ tile shall be as specified as the schedules of items.</p>					
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1.04.00	<p>Materials</p> <p>A) All materials shall be of first quality.</p> <p>B) For colour and shade, RAL nomenclature and the classification shall be followed.</p> <p>C) Wherever working drawings are involved, the procurement of the material shall be done only after the preparation of working drawings including data sheets and approval of same by Engineer. All bought out items shall be procured from approved sub vendor as mentioned in part of this specification.</p>			
1.05.00	<p>Workmanship</p> <p>Workmanship shall be as recommended by manufacturer (supplier of material) and approved by Engineer. Workers specially experienced in particular items of work shall only be engaged under the supervision of experienced supervisors recommended / appointed by the manufacturer.</p>			
1.06.00	<p>Handling & Transportation</p> <p>All bought out items shall be protected, covered, boxed and crated properly before dispatch so that there will be no damage / deterioration during transportation, handling and storage at site till such time they are fixed in position. All materials shall be stored, dry in the covered shed / place over wooden sleeper with a stacking height not to exceed 2m.</p>			
1.07.00	<p>Working Drawings</p> <p>Contractor shall prepare the detailed working drawings / data sheets for all bought out items, etc based on the scheme drawing/dimensions given by the Engineer. Working drawing / data sheets shall indicate the schedule of all hardware (fittings and fixture), fabrication details along with the section sizes, fixing details, bill of materials along with sectional weight and total weight, net area, numbers required, dimensions, material specification along with quantity for each type of material, reference to the applicable codes and standards, method of installing, workmanship, tolerance, acceptance criteria, etc.</p>			
2.00.00	<p>FINISH PAINT</p>			
2.01.00	<p>General Requirements</p>			
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2.01.01	This covers the finish painting of all types of concrete surfaces and / or plastered masonry /concrete surfaces in all kinds of work.			
2.01.02	Before commencing painting / finishing, the Contractor shall undertake normal precautions to prevent damage, disfiguration or staining of the painting / finishing by other trades and also damage, disfiguration or staining to work of other trades / activities or other installations.			
2.01.03	Paints shall be kept covered at all times and mixing shall be done in suitable containers. All necessary precautions shall be taken against fire hazards.			
2.02.00	<p>Materials</p> <p>All prime coats shall be compatible to the material of the surface to be finished as well as to the finishing coats to be applied. All colours shall be as per painting/finish schedule and tinting and matching shall be done to the satisfaction of the Engineer. In such cases, where samples are required, these shall be executed in advance with the specified materials for the approval of the Engineer. Paint in general shall have eco-friendly low VOC contents, complying with Green Building/ GRIHA norms.</p>			
2.02.01	<p>Acrylic Distemper</p> <p>Acrylic Distemper shall be applied (wherever specified) on the plastered surface. The paint shall be applied on the dry surface as per guidelines & recommendations of the manufacturer of the paint. Minimum three coats shall be applied to obtain even shade.</p>			
2.02.02	<p>Acrylic Emulsion Paint</p> <p>Acrylic emulsion paint shall be water based acrylic copolymer emulsion with rutile titanium dioxide and other selected pigment and fungicide conforming to IS: 5411 (Part - 1). It shall exhibit excellent adhesion to plaster and cement surface and shall resist deterioration by alkali salts. The paint film shall allow the moisture in wall to escape without peeling or blistering the paint. After it is dried, the paint should be able to withstand washing with mild soap and water without any deterioration in colour or without showing flaking, blistering or peeling.</p>			
2.02.03	<p>Chemical Resistant Paint (Chlorinated Rubber Paint)</p> <p>Chlorinated Rubber Paint shall be made from natural rubber and chlorine. For finishing coat, suitable colour pigment shall be added. The material shall be hard</p>			
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2.02.04	<p>resin and shall be plasticised to make elastic paint films. Stabilisers shall be added for exterior use to prevent deterioration by ultra-violet light. For primer, chlorinated rubber zinc phosphate shall be used. Titanium dioxide/ micaceous iron oxide shall be used for intermediate coat.</p> <p>Oil Resistant Paint</p> <p>Oil resistant paint shall be epoxy based. Primer coat shall be as per manufacturer's specifications.</p>			
2.02.05	<p>Resin / Polymer Bonded Granular Textured Decorative Coating</p> <p>Resin/Polymer bonded granular texture coating, 2.5 mm thickness, for external finish, shall consist of adhesive synthetic resins and properly graded, washed natural stone chips, of approved quality 0.5 mm to 2.5 mm size.</p> <p>The coating shall be of approved colour, shade & make. The material shall be supplied in one pack, Ready-Mix, Ready to use form in air tight sealed drums, and shall be stored in cool, dry place under cover. The average thickness of applied coat should be 2.5 mm, on base plaster and to be in perfect line, level, plumb with sharp edge at corners, niches etc. The item shall cover all labour, material, surface preparation and required scaffolding.</p> <p>Resin/polymer bonded granular texture coating, 1.2 mm thick for interior finish shall consist of adhesive synthetic resins and properly graded natural stone or synthetic granules / flakes of approved quality, 0.5 mm to 1.2 mm size. The coating shall be of approved colour, shade make and shall be supplied in one pack, Ready-Mix, Ready to use form in air tight sealed drums, and shall be stored in cool, dry place under cover. The average thickness of applied coat should be 1.2 mm, on base plaster and to be in perfect line, level, plumb with sharp edge at corners, niches etc. The item shall cover all labour material, surface preparation and required scaffolding.</p>			
2.03.00	<p>Preparation of Surface</p>			
2.03.01	<p>Before starting the work the Contractor shall obtain the approval of the Engineer regarding the soundness and readiness of the surface to be painted on.</p>			
2.03.02	<p>Surface shall be free from all oil, grease, efflorescence, mildew, loose paint or other foreign and loose materials. Masonry / plaster cracks shall be cleared out and patch filled with mortar similar to the original surface and uniformly textured. Where this type of resurfacing may lead to the finishing paint being different in</p>			
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<p>2.03.03</p> <p>2.04.00</p> <p>2.04.01</p> <p>2.04.02</p> <p>2.04.03</p> <p>2.04.04</p> <p>2.04.05</p> <p>2.04.06</p>	<p>shade from the original surfaces, the resurfaced area shall be treated with minimum one coat of cement primer which should be continued to the surrounding area for a distance of minimum 100 mm.</p> <p>Wherever specified, the concrete / plastered surface shall be finished with 2 mm thick wall putty finish to give an even and smooth surface, before the application of finishing paint/ coat. Acrylic emulsion paint shall be applied over the surfaces finished with wall putty, as required. Acrylic distemper shall also be generally applied (wherever possible) over the surfaces finished with wall putty, if required.</p> <p>Application</p> <p>Application shall generally be by brush. In case of selection of special shades and colour (not available in standard shades) the Contractor shall mix different shades and prepare test panels of minimum size 1 metre square as per instruction of the Engineer and obtain his approval prior to application of finishing paints.</p> <p>Proper tools and implements shall be used. Scaffoldings if used shall be independent of the surface to be painted to avoid shade differences of the freshly repaired anchor holes.</p> <p>Painting shall be done by skilled labour in a workmanlike manner. All materials shall be evenly applied, so as to be free of sags, runs, crawls or other defects. All coats shall be of proper consistency.</p> <p>All coats shall be thoroughly dry before being sand papered or before the succeeding coat is applied. Coats of painting as specified are intended to cover surfaces perfectly. In case the surface is not covered properly by applying the specified number of coats, further coats shall be applied by the Contractor when so directed by the Engineer.</p> <p>All undercoats shall be tinted to approximate the colour of the finishing coats. Finishing coats shall be of exact colour and shade as per approved samples and all finish shall be uniform in colour and texture. All parts of mouldings and ornaments shall be left clean and true to finish. One coat shall consist of horizontal strokes immediately followed by vertical ones.</p> <p>EXTERIOR PAINTING ON WALL</p> <p>The paint shall be (premium acrylic smooth exterior paint) of approved brand and manufacture. This paint shall be brought to the site of work by the contractor in its</p>		
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	<div style="float: right;">  </div> <p>original containers in sealed condition. The material shall be brought in at a time in adequate quantities to suffice for the whole work or at least a fortnight's work. The materials shall be kept in the joint custody of the contractor and the Engineer-in-Charge. The empty containers shall not be removed from the site of work till the relevant item of work has been completed and permission obtained from the Engineer-in-Charge.</p> <p>Preparation of Surface</p> <p>For new work, the surface shall be thoroughly cleaned off all mortar dropping, dirt dust, algae, fungus or moth, grease and other foreign matter of brushing and washing, pitting in plaster shall make good, surface imperfections such as cracks, holes etc. should be repaired using white cement. The prepared surface shall have received the approval of the Engineer in charge after inspection before painting is commenced.</p> <p>Application of Base Coat</p> <p>Base coat shall be of water proofing cement paint.</p> <p>Preparation of Mix for Base Coat</p> <p>Cement Paint shall be mixed in such quantities as can be used up within an hour of its mixing as otherwise the mixture will set and thicken, affecting flow and finish. Cement Paint shall be mixed with water in two stages. The first stage shall comprise of 2 parts of cement Paint and one part of water stirred thoroughly and allowed to stand for 5 minutes. Care shall be taken to add the cement Paint gradually to the water and not vice versa. The second stage shall comprise of adding further one part of water to the mix and stirring thoroughly to obtain a liquid of workable and uniform consistency. In all cases the manufacturer's instructions shall be followed meticulously.</p> <p>The lids of cement Paint drums shall be kept tightly closed when not in use, as by exposure to atmosphere the cement Paint rapidly becomes air set due to its hygroscopic qualities. In case of cement Paint brought in gunny bags, once the bag is opened, the contents should be consumed in full on the day of its opening. If the same is not likely to be consumed in full, the balance quantity should be transferred and preserved in an airtight container to avoid its exposure to atmosphere.</p>		
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	<p>Application of Base Coat</p> <p>The solution shall be applied on the clean and wetted surface with brushes or spraying machine. The solution shall be kept well stirred during the period of application. It shall be applied on the surface which is on the shady side of the building so that the direct heat of the sun on the surface is avoided. The method of application of cement Paint shall be as per manufacturer's specification. The completed surface shall be watered after the day's work. The second coat shall be applied after the first coat has been set for at least 24 hours. Before application of the second or subsequent coats, the surface of the previous coat shall not be wetted.</p> <p>For new work, the surface shall be treated with three or more coats of water proof cement Paint as found necessary to get a uniform shade.</p> <p>Precaution</p> <p>Water proof cement Paint shall not be applied on surfaces already treated with white wash, colour wash, distemper dry or oil bound, varnishes, Paints etc. It shall not be applied on gypsums, wood and metal surfaces. If water proofing cement is required to be applied on existing surface, previously treated with white wash, colour wash etc., the surface shall be thoroughly cleaned by scrapping off all the white wash, colour wash etc. completely. Thereafter, a coat of cement primer shall be applied followed by two or more coat of water proof cement.</p> <p>Application of exterior paint</p> <p>Before pouring into smaller containers for use, the paint shall be stirred thoroughly in its container, when applying also the paint shall be continuously stirred in the smaller containers so that its consistency is kept uniform. Dilution ratio of paint with potable water can be altered taking into consideration the nature of surface climate and as per recommended dilution given by manufacturer. In all cases, the manufacturer's instructions & directions of the Engineer-in-charge shall be followed meticulously.</p> <p>The lids of paint drums shall be kept tightly closed when not in use as by exposure to atmosphere the paint may thicken and also be kept safe from dust. Paint shall be applied with a brush on the cleaned and smooth surface. Horizontal strokes shall be given, First and vertical strokes shall be applied immediately afterwards. This entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving no brush marks.</p>			
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3.00.00	SHEETING WORKS			
3.01.00	General Requirement			
	<p>This part of the specification covers the technical requirements of colour-coated sheet and allied works for roofing, decking and cladding, with or without thermal insulation. Supply and installation of the profiled sheeting shall be done by same agency. During handling / stacking, if any damage is done to sheets like distortion of edges, formation of dents, scratches on sheet etc., then such damaged sheet shall stand rejected and shall be immediately replaced by the contractor.</p>			
3.02.00	Material			
3.02.01	<p>(a) Troughed permanently colour coated metal decking sheet of steel for floor/roof decking shall conform to the requirements of Table-1:</p> <p>(b) Alternatively aluminium feed material of minimum 0.9 mm (bare metal thickness) thick colour coated aluminium alloy of series 31,000 and above as per IS 737 and IS 1254 can also be used for metal decking.</p> <p>(c) Steel/ aluminium alloy shall be colour coated with total coating thickness of 35 microns (nominal) dry film thickness (DFT) comprising of silicon modified polyester (SMP with silicon content 30% to 50%) paint or polyester paint, of 20 microns (nominal) SMP or polyester paint on one side (exposed side) on 5 micron (nominal) primer coat and 5 microns (nominal) SMP or polyester paint over 5 micron (nominal) primer coat on the other side. SMP and polyester paint systems shall conform to Product type 4 as per AS/ANZ 2728.</p> <p>(d) Sheet shall be of approved profile, sectional properties, colour and shade.</p> <p>(e) Chemical composition of troughed permanently colour coated metal decking sheets shall conform to the provisions of the same reference code to which the mechanical properties conform to.</p> <p>(f) Mechanical properties shall be confirmed by relevant tests</p>			
3.02.02	<p>(a) Troughed permanently colour coated metal sheets of steel for roofing and side cladding (internal and external) shall conform to the requirements of Table-2:</p>			
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- b) Alternatively aluminium feed material of minimum 0.7 mm (bare metal thickness) thick colour coated aluminium alloy of series 31,000 and above as per IS 737 and IS 1254 can also be used.
- c) Steel/ aluminium alloy shall be colour coated with total coating thickness of 35 microns (nominal) dry film thickness (DFT) comprising of silicon modified polyester (SMP with silicon content of 30 % to 50%) paint or Polyester paint, of 20 microns (nominal) SMP or polyester paint on one side (exposed face) on 5 micron (nominal) primer coat and 5 microns (nominal) SMP or polyester paint over 5 micron (nominal) primer coat on other side. SMP and polyester paint systems shall conform to Product type 4 as per AS/ANZ 2728.
- d) Sheet shall be of approved profile, sectional properties, colour and shade.
- e) Chemical composition of Troughed permanently colour coated metal sheet for roofing and side cladding shall conform to the provisions of same reference code to which the mechanical properties conform to.
- f) Mechanical properties shall be confirmed by relevant tests.


TABLE – 1 (METAL DECKING)


Group	Grade /Reference Code	Yeild strength (minimum) MPa	Tensile strength (minimum) MPa	Elongation% (minimum)		Coating Class Designation	BMT mm	(+ve) Tolerance mm	Upper limit of BMT mm	(-)ve Tolerance mm	Lower Limit of BMT mm
				L0=50 mm	L0=80 mm						
1a	G250/ AS 1397	250	320	25	22	Z275	0.8	0.04	0.84	-0.04	0.76
1b	SS255/ASTM A653M	255	360	18	--						
1c	S250GD / EN 10326	250	330	19	--						
2a	G350 / AS1397	350	420	15	14	Z275	0.60	0.04	0.64	-0.04	0.56
2b	SS340 Class 4 / ASTM A653M	340	410	12	--						
2c	S350GD / EN 10326	350	420	16	--						
3a	G550 /AS1397	550	550	2	2	Z275	0.60	0.04	0.64	-0.04	0.56
3b	SS550 / class1 ASTM A653M	550	570	--	--						
3c	S550GD / EN 10326	550	560	---	--						


TABLE – 2 (METAL CLADDING)


Group	Grade /Reference Code	Yeild strength (minimum) MPa	Tensile strength (minimum) MPa	Elongation% (minimum)		Coating Class Designation	BMT mm	(+ve) Tolerance mm	Upper limit of BMT mm	(-)ve Tolerance mm	Lower Limit of BMT mm
				L0=50 mm	L0=80 mm						


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	1a	G250/AS1397	250	320	25	22						
	1b	SS255/ASTM A653M	255	360	18	--	Z275	0.6	0.04	0.64	-0.04	0.56
	1c	S250GD / EN 10326	250	330	19	--						
	2a	G350/AS 1397	350	420	15	14						
	2b	SS340 Class 4/ ASTM A792M	340	410	12	--	AZ150	0.5	0.04	0.54	-0.04	0.46
	2c	S350GD / EN 10326	350	420	16	--						
	3a	G550/AS 1397	550	550	2	2						
	3b	SS550 / ASTM A792M	550	570	--	--	AZ150	0.4	0.04	0.44	-0.04	0.36
	3c	S550GD / EN 10326	550	560	--	--						
3.02.03	Plain permanently colour coated steel metal sheet for ridge and hips, flashings, trimmings, closure for vertical and horizontal joints, capping etc shall confirm to the same requirements as those of troughed permanently colour coated metal sheet for roofing and side cladding.											
3.02.04	<p>a) For metal decking the sectional modulus and moment of inertia of troughed profile per meter width shall be so as to limit the deflection of sheets to span/250 over a span of 1.7 m under total super imposed loading (DL +LL) of 450 kg per Sq.M. for two span condition. The sectional modulus and moment of inertia of troughed profile shall be computed as per the provisions of IS: 801 for satisfying the deflection and strength requirements. All structural calculations for checking the adequacy of the profiled sheet for strength & deflection criteria is to be done taking into consideration the maximum permissible negative tolerance over the specified BMT i.e. the lower limit of BMT is to be considered as per last column in Table -1.</p> <p>b) For metal roofing and side cladding, the sectional modulus and moment of inertia of troughed profile per metre width shall be such that the deflection of sheets is limited to span/250 over a span of 1.5 m under design wind pressure of 160 kg/sq.m. for two span condition. The sectional modulus and moment of inertia of troughed profile shall be computed as per the provisions of IS:801 for satisfying the deflection and strength requirements. No increase in allowable stress is permissible under wind load condition. All necessary structural calculations for checking the adequacy of the profiled sheet for strength & deflection criteria is to be done taking into consideration the maximum permissible negative tolerance over the BMT i.e. the lower limit of BMT is to be considered as per last column in Table - 2.</p>											
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	<p>c) In case, during the inspection, if it is observed that the BMT of sheet / coil is having (-)ve tolerance beyond 0.04mm i.e. if minimum BMT of sheet is found to be less than the "Lower Limit of BMT" as specified in last column of Table 1 or Table 2 as applicable, it will be rejected.</p>			
3.02.05	<p>The maximum spacing of the fasteners shall be 390 mm c/c along the length of purlins / runners. However exact spacing shall be as per the design done by the bidder for the fasteners considering the wind load, self load and other associated loads. Minimum diameter of the fastener shall be 5.5 mm and at least 3 nos. of fasteners shall be used per sheet.</p>			
3.02.06	<p>Sealant used for cladding shall be butyl based, two parts poly sulphide or equivalent approved, non-staining material and be flexible enough not to interface with fit of the sheets</p>			
3.02.07	<p>Filler blocks as a trough filler shall be used to seal cavities formed between the profiled sheet and the support or flashing. The filler blocks shall be manufactured from black synthetic rubber or any other material approved by the Engineer.</p>			
3.02.08	<p>For insulation of cladding and other areas, mineral wool conforming to IS: 8183 shall be used. The density shall be 32 or 48 kg. /Cu.M. for glass or rock wool respectively. The nominal thickness of insulation shall be 50mm.</p>			
3.02.09	<p>Special coated fasteners shall be used conforming to class 3 as per AS3566 and shall be tested to 1000 hours salt spray test.</p>			
3.02.10	<p>Data Sheet for Metal Decking and Metal Cladding shall be submitted as per the formats given in the Annexure-1 & 2.</p>			
3.03.00	<p>Installation and Fixing</p>			
3.03.01	<p>Metal Decking</p> <p>a) The sheeting shall be fixed as per the working drawings. Sheets shall be supplied in required sizes (based on purlin spacing) according to the cutting schedule. Generally cutting of sheets to length shall not be permitted at site. Specific approval under exceptional circumstances shall be obtained before cutting of any sheet at site. Power tools shall be used for cutting. Cutting and trimming of small openings which were not finalised at the time of working drawings can be allowed at site. Wherever possible, site cut edges shall be concealed at laps or with flashings. Suitable steel members for stiffening shall be provided at the cut edges.</p>			
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3.03.02	<p>No gas cutting shall be done on the sheet. If any sheet is found with gas cut mark, same shall stand rejected and shall be immediately replaced.</p> <p>b) Distorted, blemished or water stained sheets shall not be used.</p> <p>c) Before installing decking sheet, it shall be ensured that the purlins are in true planes, correctly placed and securely fixed.</p> <p>d) Side and end laps of the sheets shall be made weather proof by securing them with the fasteners not less than 4.0mm diameter with 2.0 mm thick neoprene washer. Maximum spacing of the fasteners should not exceed 500 mm.</p> <p>e) Precautions shall be taken during the erection of the sheets to ensure that partially erected decking sheets are protected during inclement weather and damage at all times.</p> <p>f) Side and end of decking sheet shall be located and positioned in such a manner as to provide the maximum weather protection taking into account the direction of the prevailing wind.</p> <p>g) Length of the sheet shall be such as to cover minimum 3 span purlin spacings.</p> <p>h) The roof decking sheets shall be fixed to the purlins with the help of self drilling and tapping type fasteners and neoprene washers</p> <p>i) Sheets shall be laid over the supporting purlins with a minimum bearing of 50 mm and end projection of 75 mm at lap joints.</p> <p>j) End and side laps between the sheets shall be sufficiently large to ensure the weather tightness. In no case, the end laps shall be less than 150 mm and side laps less than one trough length with proper weather tight arrangement.</p> <p>Roofing and cladding</p> <p>a) The sheeting shall be fixed as per the working drawings. Sheets shall be supplied in required sizes (based on purlin spacing) according to the cutting schedule. Generally cutting of sheets shall not be permitted at site. Specific approval under exceptional circumstances shall be obtained before cutting of any sheet at site. Power tools shall be used for cutting. Cutting and trimming of small openings which were not finalised at the</p>			
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	<p>time of working drawings can be allowed at site. Wherever possible, site cut edges shall be concealed at laps or with flashing. Suitable steel members for stiffening shall be provided at the cut edges. No gas cutting shall be done on the sheet. If any sheet is found with gas cut mark, same shall stand rejected and shall be immediately replaced.</p> <p>b) Distorted, blemished or water stained sheets shall not be used.</p> <p>c) Before installing roofing/cladding, it shall be ensured that the supporting structure i.e. purlins/runners are in true planes, correctly placed and securely fixed.</p> <p>d) Side and end laps of the sheets shall be made weather proof by securing them with the fasteners not less than 4.0mm diameter with 2.0 mm thick neoprene washer and cap of matching colour. Maximum spacing of the fasteners should not to exceed 500 mm.</p> <p>e) Precautions shall be taken during the erection of roofing/ cladding to ensure that partially erected roofing/cladding and insulation (pending placing of external cladding sheet) are protected during inclement weather to prevent the ingress of water and damage at all times.</p> <p>f) During erection of roofing/cladding, ladders shall not be leaned on any cladding without precautions being taken against damage.</p> <p>g) The fasteners shall be installed by means of power tools and provided with neoprene seal.</p> <p>h) Length of the sheet shall be such as to cover minimum 3 span purlin spacings.</p> <p>i) Expansion joints shall be provided to take care of movements due to temperature variations.</p> <p>j) The sheets shall be laid on the steel purlins/runner or scantlings to a true plane with the lines of profiles truly parallel to or normal to other sides of the area to be covered, unless otherwise required as in special shape.</p> <p>k) Cladding erection for each elevation shall commence at the bottom and proceed towards the top, in order to ensure tight fitting laps.</p>			
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<p>3.03.03</p> <p>3.04.00</p>	<p>l) The sheets shall be laid with a minimum overlap of 15 cm at the ends and side laps shall be of one trough length subject to a minimum of 50 mm, having a proper water tight arrangement. The minimum lap of sheets with ridges, hips and valleys shall be 15 cm measured at right angles to the line of the ridge, hip and valley respectively.</p> <p>m) In case of insulated sheeting works, the insulation shall be provided.</p> <p>n) In case double skin cladding, inner sheet and outer sheet can be directly fixed to the opposite faces of the sheeting runner totally concealing the supporting steel structure.</p> <p>o) Crimping and curving wherever specified shall be provided over the profile sheet.</p> <p>Flashing, trimming etc.</p> <p>Flashings, cappings, trimming, closure for vertical/horizontal joints, ridge and hips etc. shall be provided with a minimum lap of 15 cm. The lapping of sheets shall provide the dust free, airtight enclosure. If required this may be achieved by using 2-parts polysulphide sealing compound or butyl tape.</p> <p>Aprons, closures, flashings and other similar fittings shall be formed at works before delivery to site. Site forming or dressing of these items will be approved only in special locations.</p> <p>The black synthetic rubber external trough fillers are to be secured by the mechanical fixings to the flashings or parapet capping.</p> <p>Measurements</p> <p>This clause shall be read in conjunction with the clause for the measurements given in Part-A of the specifications.</p> <p>a) Light gauge troughed permanently colour coated metal decking shall be measured net as laid in Sq.M. without any allowance for laps and troughs. However no deductions shall be made for openings upto 0.4 Sq.M. each in area.</p> <p>b) Troughed permanently colour coated sheet on roof, sides etc. shall be measured net as laid in Sq.M. without any allowance for laps and troughs. However no deductions shall be made for openings upto 0.4 Sq.M. each in area.</p>			
<p>A&N GAS BASED POWER PROJECT (50 MW) CIVIL WORKS</p>	<p>TECHNICAL SPECIFICATIONS PART-B</p>	<p>SHEETING AND ALLIED WORKS SECTION-IV</p>	<p>PAGE 15 OF 28</p>	


CLAUSE NO.	SHEETING AND ALLIED WORKS			 एनटीपीसी NTPC विद्युत व्यापार Vidyut Vyapar
<p>4.00.00</p> <p>4.01.00</p> <p>4.02.00</p> <p>4.03.00</p>	<p>c) Crimping and curving shall be measured net as laid in Sq.M. without any allowance for laps and troughs. However no deductions shall be made for openings upto 0.4 Sq.M each in area.</p> <p>d) Plain permanently colour coated sheet for ridge and hips, flashing/trimming/closure for vertical/horizontal joints etc. shall be measured net as laid in Sq.M. without any allowance for laps and troughs. However no deductions shall be made for openings up to 0.4 Sq.M. each in area.</p> <p>HEADED SHEAR STUDS</p> <p>General</p> <p>This part of specification covers the technical requirement of Headed shear studs. The studs shall be welded to steel beams either directly or through metal deck sheet whichever is applicable. In case metal deck sheet is used as permanent shuttering, it shall not be considered as structural element for slab design.</p> <p>Material</p> <p>(a) Studs shall be manufactured from cold drawn round bars conforming to the requirement of ASTM A 29 of grade designation 1010 through 1020 or equivalent, inclusive either semi-killed or killed (aluminium or silicon deoxidation).</p> <p>(b) Mechanical properties and other requirements of studs shall conform to requirement of Type-B studs specified in AWS D1.1/D1.1M or equivalent.</p> <p>(c) The diameter of stud shall be 16mm (5/8 inch.) for roof slab and 19 mm (3/4 inch.) for other slabs.</p> <p>(d) Before weld, length of 16mm (5/8 inch.) diameter stud shall be 65mm and that of 19mm (3/4 inch.) stud shall be 100mm.</p> <p>Installation and fixing</p> <p>(a) Headed shear studs shall be welded to top flange of floor beams either directly or through metal deck by Drawn Arc Stud Welding by stud gun with arc shields/ferrules. After welding, arc shields/ferrules shall be broken free from studs.</p> <p>(b) The distance between the edge of a stud and edge of steel beam flange shall not be less than 25mm.</p>			
A&N GAS BASED POWER PROJECT (50 MW) CIVIL WORKS	TECHNICAL SPECIFICATIONS PART-B	SHEETING AND ALLIED WORKS SECTION-IV	PAGE 16 OF 28	


CLAUSE NO.	SHEETING AND ALLIED WORKS			 एनटीपीसी NTPC विद्युत व्यापार Vidyut Vyapar
<p>4.04.00</p> <p>4.05.00</p> <p>4.06.00</p> <p>5.00.00</p>	<p>(c) In no case studs shall be welded through more than two plies of metal decking.</p> <p>(d) Stud welding procedure specification, procedure qualification record, operator/welder's qualification and acceptance norms shall conform to ASME IX.</p> <p>Workman ship</p> <p>(a) At the time of welding, the studs shall be free from rust, oil, moisture or other deleterious matter that would adversely affect the welding operation.</p> <p>(b) The studs shall not be painted, galvanized or cadmium-plated prior to welding.</p> <p>(c) The areas to which the studs to be welded shall be made free of scales, rust, moisture or other injurious material to the extent necessary to obtain satisfactory welds and prevent objectionable fumes.</p> <p>(d) The arc shields/ferrules shall be dry. Any shields/ferrule which shows signs of surface moisture from dew or rain shall be oven dried at 1200 C for two hours before use.</p> <p>(e) If there is any damage to the painting of steel members or metal deck sheet, same shall be repainted by the Bidder.</p> <p>Measurement</p> <p>Headed shear studs shall be measured in Numbers. This clause shall be read in conjunction with the clause for measurements given elsewhere in the specifications.</p> <p>Field Test</p> <p>Test on production welds, production welding and repair of studs shall be as per AWS D1.1/1.1M.</p> <p>INSULATION</p>			
<p>A&N GAS BASED POWER PROJECT (50 MW) CIVIL WORKS</p>	<p>TECHNICAL SPECIFICATIONS PART-B</p>	<p>SHEETING AND ALLIED WORKS SECTION-IV</p>	<p>PAGE 17 OF 28</p>	


CLAUSE NO.	SHEETING AND ALLIED WORKS			 एनटीपीसी NTPC विद्युत व्यापार Vidut Vyapar
5.01.00	General Requirements			
5.01.01	This part of the specification covers the technical requirements for providing, laying, installation and preparation of working drawings for under deck thermal insulation.			
5.02.00	Material			
5.02.01	Mineral Wool			
5.02.02	<p>This shall be upto 50mm nominal thickness having a density of 32 kg/m³ for glass wool and 48 kg/m³ for rock wool conforming to IS:8183.</p> <p>Polyisocyanurate / rigid phenolic foam</p> <p>This shall be preformed rigid polyisocyanurate (PIR) foam conforming to IS:12436 or rigid phenolic foam, conforming to IS:13204. These shall be in the form of boards, slabs, etc. The material shall be fire retardant and non toxic, having negligible smoke generation property. The density of the material shall be 32 kg/Cu.M. Nominal thickness of the slab shall be 30mm. The nominal size of the slab shall not be less than 1m x 0.5m.</p>			
5.02.03	Over deck insulation			
5.02.04	<p>This shall be minimum 40 mm thick impervious sprayed close cell free rigid Polyurethane foam confirming to IS: 12432–III, with density of foam 40 to 45 Kg/Cu.M.</p> <p>Wall insulation</p> <p>This shall be upto 50 mm nominal thick expanded polystyrene board conforming to IS:4671 having density of 35 kg/cum on the inner surface of exposed brick wall. This shall be in the form of boards, slabs, etc. This material shall be fire retardant, non-toxic and having negligible smoke generation property.</p>			
15.03.00	Installation and fixing			
15.04.00	<p>Mineral wool insulation</p> <p>The method used for securing insulation slabs prior to the erection of the cladding sheets, shall be to the approval of the Engineer. For insulated metal cladding, cold applied adhesive shall be applied as per manufacturer’s recommendations. In addition, for securing the insulation in position galvanised hexagonal wire</p>			
A&N GAS BASED POWER PROJECT (50 MW) CIVIL WORKS	TECHNICAL SPECIFICATIONS PART-B	SHEETING AND ALLIED WORKS SECTION-IV	PAGE 18 OF 28	


CLAUSE NO.	SHEETING AND ALLIED WORKS			 एनटीपीसी NTPC विद्युत व्यापार Vidyut Vyapar
15.04.01	<p>netting of not less than 0.3 mm diameter and 19 mm mesh size shall be used. Wherever specified (e.g. metal false ceiling) insulation shall be wrapped in polythene sheet bags. The insulation shall be provided with or without framed strips as specified. Framed strips shall be of mild steel and made of flat of size 25 x 3mm minimum and placed at maximum spacing of 300mm c/c to hold the insulation between the horizontal sheeting runners. The under deck insulation wherever specified shall be provided with 0.05mm thick aluminium foil and 0.56 mm dia and 25mm mesh size GI wire netting. The under deck insulation shall be fixed below RCC slab by using metal expansion fasteners.</p> <p>Polyisocyanurate phenolic foam</p> <p>Before application of the insulation slab, the bottom surface shall be cleaned of dust and loose particles with the help of brush. The adhesive glue shall be applied both on the underside of the slab as well as on the top of the insulation slab as per manufacturer's recommendations and the slab shall then be pressed in position when the glue is still tacky. The ends of the slab shall be glued and butted together. The exposed face of the slab shall be laminated with 0.05mm thick aluminium foil. Further these slabs shall be secured by providing galvanised mild steel fasteners. The maximum spacing of the fasteners shall be 450 mm c/c.</p>			
15.04.02	<p>Over deck insulation</p> <p>Overdeck insulation with 40 mm thick polyurethane foam with density of 40 to 45 kg/cum shall be fixed over a coat of polyurethane primer applied @ 6 to 8 litre/ sqm, laid over cement screed, laid in slope above the cleaned roof top. 400g polythene sheet shall be laid over polyurethane spray and provided with a wearing course of 40 mm thick. Cement screed with welded mesh over which water proofing elastomeric membrane shall be provided under the relevant water proofing item.</p>			
15.04.03	<p>Wall Insulation</p> <p>Wall insulation 50 mm nominal thick expanded polystyrene board conforming to IS:4671 having density of 35 kg/cum on the inner surface of exposed brick wall along with providing and fixing G.I.Z channel of 25x50x25x1.2 mm to the brick walls with dash fasteners forming the grid of 610x1220 mm for holding expanded polystyrene board along with providing and fixing 12.5 mm thick. Gypsum board confirming to IS:2095(part-3) with dry wall screws at 300 mm c/c and ensuring proper joints and finish to have flush look which includes filling and finishing the tapered and square edges of boards with jointing compound and joint paper tape as per manufacturer's recommendation.</p>			
A&N GAS BASED POWER PROJECT (50 MW) CIVIL WORKS	TECHNICAL SPECIFICATIONS PART-B	SHEETING AND ALLIED WORKS SECTION-IV	PAGE 19 OF 28	

CLAUSE NO.	SHEETING AND ALLIED WORKS			 एनटीपीसी NTPC विद्युत व्यापार Vidyut Vyapar
6.00.00	SAMPLING, TESTING, ACCEPTANCE CRITERIA INCLUDING CONSTRUCTION TOLERANCES			
6.01.00	Frequency of sampling, testing and quality assurance including the method of conducting the tests, acceptance criteria and construction tolerances shall be as given in Part-C of this specification.			
7.00.00	RATES AND MEASUREMENTS			
7.01.00	Rates			
	This clause shall be read in conjunction with the clause for the unit rate given in Part-A of this specification.			
	a) There shall not be separate unit rates for DPC, plinth protection as these are covered under different item of the schedule of item.			
	b) There shall not be a separate unit rate for drip course, lath plaster, plaster for grading underbed as these are included in the item of plastering.			
	c) The rate for dismantling of brick masonry shall also provide for removing mortar from and cleaning bricks, cutting of reinforcement bars, stacking, cleaning and straightening of reinforcement bars from reinforced masonry work.			
	d) The rate for metal sheeting work (deckng, roofing, cladding, flashings etc.) also provides for provision of metal sheet of thickness higher than the minimum specified value in order to meet the required sectional properties			
7.02.00	Measurements			
	This clause shall be read in conjunction with the clause for the measurements given in Part-A of this specification.			
7.02.01	a) All cement : sand plaster shall be measured net (on the surface area on which it is applied) in square meters except for mortar used for grading underbed over floors/roofs and lath plaster which shall be measured in Cu.M. Plastering of different proportion and thickness shall be measured separately.			
A&N GAS BASED POWER PROJECT (50 MW) CIVIL WORKS	TECHNICAL SPECIFICATIONS PART-B	SHEETING AND ALLIED WORKS SECTION-IV	PAGE 20 OF 28	


CLAUSE NO.	SHEETING AND ALLIED WORKS			 एनटीपीसी NTPC विद्युत व्यापार Vidut Vyapar
	<p>b) Galvanised hexagonal wire netting shall be measured net (on the surface area on which it is applied) in Sq.M.</p> <p>c) Wall putty shall be part of the finish items and separate measurement shall be taken for the same.</p> <p>d) Finish paint over concrete / masonry surfaces shall be measured net (on the surface area on which it is applied) in Sq.M.</p> <p>e) (i) Ready mix two component, resin and polymer bonded granular textured coating finish shall be measured net (on the surface area on which it is applied) in Sq.M.</p> <p>(ii) Wash stone grit plaster shall be measured net (on the surface area on which it is applied) in Sq.M.</p> <p>f) Factory made composite modular aerated concrete panels shall be measured net in Sq.M. However, no deduction shall be made for openings upto 0.2 sq.m. each in area. Separate measurements shall be taken for each thickness.</p> <p>g) Light gauge troughed permanently colour coated metal decking shall be measured net as laid in Sq.M. without any allowance for laps and troughs. However no deductions shall be made for openings upto 0.4 m² each in area.</p> <p>h) Troughed permanently colour coated sheet on roof, sides etc. shall be measured net as laid in Sq.M. without any allowance for laps and troughs. However no deductions shall be made for openings upto 0.4 Sq.M. each in area.</p> <p>i) Crimping and curving shall be measured net as laid in Sq.M. without any allowance for laps and troughs However no</p> <p>j) Plain permanently colour coated sheet for ridge and hips, flashing/trimming/closure for vertical/horizontal joints etc. shall be measured net as laid in Sq.M. without any allowance for laps and troughs. However no deductions shall be made for openings upto 0.4 Sq.M. each in area.</p> <p>k) Insulation shall be measured in Cu.M. Area of insulation actually provided shall be measured and shall be multiplied by measured thickness for computing the volume.</p>			
A&N GAS BASED POWER PROJECT (50 MW) CIVIL WORKS	TECHNICAL SPECIFICATIONS PART-B	SHEETING AND ALLIED WORKS SECTION-IV	PAGE 21 OF 28	


CLAUSE NO.	SHEETING AND ALLIED WORKS			 एनटीपीसी NTPC विद्युत व्यापार Vidyut Vyapar
	<p>l) Aluminium foil including galvanised wire netting for covering of under deck insulation shall be measured net as laid in Sq.M. without any allowance for laps.</p> <p>m) Polyisocynurate, or rigid phenolic foam, underdeck insulation and wall insulation shall be measured net as laid in Sq.M. without any allowance for laps and troughs. However no deductions shall be made for openings upto 0.4 m² each in area.</p>			
A&N GAS BASED POWER PROJECT (50 MW) CIVIL WORKS	TECHNICAL SPECIFICATIONS PART-B	SHEETING AND ALLIED WORKS SECTION-IV	PAGE 22 OF 28	

CLAUSE NO.	SHEETING AND ALLIED WORKS																																													
	<p style="text-align: right;">ANNEXURE-I</p> <p><u>STANDARD DATA SHEET FOR METAL DECKING SHEET</u></p> <p>Project Name: _____ Package Name: _____ Document No. _____ Rev No. _____ Rev Date: _____</p> <p>1. Brief Description: Color coated metal deck as per Schedule of Item No. 45 2. Source/ Manufacturer of sheet : As per MQP 3. Name of profiler : As per MQP 4. Material Specification : Refer Decking Requirements as per Table-1.</p> <table border="1"> <tr> <td>(a) Material Group (Select any one and strike others)</td> <td>Group 1a</td> <td>Group 1b</td> <td>Group 1c</td> <td>Group 2a</td> <td>Group 2b</td> <td>Group 2c</td> <td>Group 3a</td> <td>Group 3b</td> <td>Group 3c</td> </tr> <tr> <td>(b) Grade/ Reference code</td> <td colspan="9" rowspan="8">As per Decking Requirements Table-1 for the corresponding selected Material Group.</td> </tr> <tr> <td>(c) Yield strength (minimum)</td> </tr> <tr> <td>(d) Tensile strength (minimum)</td> </tr> <tr> <td>(e) Elongation %</td> </tr> <tr> <td>(f) Coating Class</td> </tr> <tr> <td>(g) Bare Minimum Thickness (BMT) in mm</td> </tr> <tr> <td>(h) Tolerance on BMT</td> </tr> <tr> <td></td> <td colspan="9">(Signature of Contractor)</td> </tr> </table>										(a) Material Group (Select any one and strike others)	Group 1a	Group 1b	Group 1c	Group 2a	Group 2b	Group 2c	Group 3a	Group 3b	Group 3c	(b) Grade/ Reference code	As per Decking Requirements Table-1 for the corresponding selected Material Group.									(c) Yield strength (minimum)	(d) Tensile strength (minimum)	(e) Elongation %	(f) Coating Class	(g) Bare Minimum Thickness (BMT) in mm	(h) Tolerance on BMT		(Signature of Contractor)								
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A&N GAS BASED POWER PROJECT (50 MW) CIVIL WORKS	TECHNICAL SPECIFICATIONS PART-B				SHEETING AND ALLIED WORKS SECTION-IV			PAGE 23 OF 28																																						


CLAUSE NO.	SHEETING AND ALLIED WORKS																	
	<p>5. Painting System: Select SMP or Polyester Paint conforming to Product type 4 as per AS/NZS 2728: 1997</p> <table border="1"> <thead> <tr> <th>Coat DFT (Dry film thickness)</th> <th>Exposed Side</th> <th>Unexposed side</th> </tr> </thead> <tbody> <tr> <td>Primer</td> <td>5 microns (Nominal)</td> <td>5 microns (Nominal)</td> </tr> <tr> <td>Main</td> <td>20 microns (Nominal)</td> <td>5 microns (Nominal)</td> </tr> <tr> <td>Sub-total</td> <td>25 microns (Nominal)</td> <td>10 microns (Nominal)</td> </tr> <tr> <td>Total</td> <td colspan="2">35 microns (Nominal)</td> </tr> </tbody> </table> <p>6. Test Requirements: As per MQP</p> <p>7. Profile: Refer Drg No. _____ Rev No.____Titled _____(Attach approved drawing).</p> <p>8. Colour Shade: RAL 9002 on exposed surface.</p> <p>9. Organic Film : Transparent Organic film of thickness 40 microns on outer surface.</p> <p>10. Storage Requirement: on wooden sleepers and covered.</p> <p>(Signature of Contractor)</p>			Coat DFT (Dry film thickness)	Exposed Side	Unexposed side	Primer	5 microns (Nominal)	5 microns (Nominal)	Main	20 microns (Nominal)	5 microns (Nominal)	Sub-total	25 microns (Nominal)	10 microns (Nominal)	Total	35 microns (Nominal)	
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Group	Grade / Reference Code	Yield strength (min.)	Tensile strength (min.)	Elongation % (minimum)		Coating Class Designation	BMT	(+ve) Tolerance	Upper Limit of BMT	(-ve) Tolerance	Lower Limit of BMT
		Mpa	Mpa	Lo= 50mm	Lo= 80mm		mm	mm	mm	mm	mm
1a	G250 / AS 1397	250	320	25	22	Z275	0.8	0.04	0.84	-0.04	0.76
1b	SS255 / ASTM A653M	255	360	18		Z275	0.8		0.84		0.76
1c	S250GD / EN 10326	250	330	19		Z275	0.8		0.84		0.76
2a	G350 / AS 1397	350	420	15	14	Z275	0.6	0.04	0.64	-0.04	0.56
2b	SS340 Class 4 / ASTM A653M	340	410	12		Z275	0.6		0.64		0.56
2c	S350GD / EN 10326	350	420	16		Z275	0.6		0.64		0.56
3a	G550 / AS 1397	550	550	2	2	Z275	0.6	0.04	0.64	-0.04	0.56
3b	SS550 / class1 ASTM A653M	550	570	----		Z275	0.6		0.64		0.56
3c	S550GD / EN 10326	550	560	----		Z275	0.6		0.64		0.56
<p>Note: Payment for the metal deck sheeting work will be as per actual BMT supplied at site. Minimum acceptable BMT shall be equal to "Lower Limit of BMT" as per last column of above table.</p> <p>(Signature of Contractor)</p>											
A&N GAS BASED POWER PROJECT (50 MW) CIVIL WORKS				TECHNICAL SPECIFICATIONS PART-B				SHEETING AND ALLIED WORKS SECTION-IV		PAGE 25 OF 28	

CLAUSE NO.	SHEETING AND ALLIED WORKS																																																
	<p style="text-align: right;">ANNEXURE-II</p> <p><u>STANDARD DATA SHEET FOR METAL CLADDING SHEET</u></p> <p>Project Name: _____ Package Name: _____ Document No. _____ Rev No. _____ Rev Date: _____</p> <p>1. Brief Description: Color coated metal deck as per Schedule of Item No. 46 2. Source/ Manufacturer of sheet : As per MQP 3. Name of profiler : As per MQP 4. Material Specification : Refer Metal Cladding Requirements as per Table- 2.</p> <table border="1"> <thead> <tr> <th>(a) Material Group (Select any one and strike others)</th> <th>Group</th> <th>Group</th> <th>Group</th> <th>Group</th> <th>Group</th> <th>Group</th> <th>Group</th> <th>Group</th> <th>Group</th> <th>Group</th> </tr> <tr> <td></td> <td style="text-align: center;">1a</td> <td style="text-align: center;">1b</td> <td style="text-align: center;">1c</td> <td style="text-align: center;">2a</td> <td style="text-align: center;">2b</td> <td style="text-align: center;">2c</td> <td style="text-align: center;">3a</td> <td style="text-align: center;">3b</td> <td style="text-align: center;">3c</td> <td></td> </tr> </thead> <tbody> <tr> <td>(b) Grade/ Reference code</td> <td colspan="10" rowspan="7" style="text-align: center; vertical-align: middle;">As per Decking Requirements Table-2 for the corresponding selected Material Group.</td> </tr> <tr> <td>(c) Yield strength (minimum)</td> </tr> <tr> <td>(d) Tensile strength (minimum)</td> </tr> <tr> <td>(e) Elongation %</td> </tr> <tr> <td>(f) Coating Class</td> </tr> <tr> <td>(g) Bare Minimum Thickness (BMT) in mm</td> </tr> <tr> <td>(h) Tolerance on BMT</td> </tr> </tbody> </table> <p style="text-align: center; margin-top: 20px;">(Signature of Contractor)</p>										(a) Material Group (Select any one and strike others)	Group	Group	Group	Group	Group	Group	Group	Group	Group	Group		1a	1b	1c	2a	2b	2c	3a	3b	3c		(b) Grade/ Reference code	As per Decking Requirements Table-2 for the corresponding selected Material Group.										(c) Yield strength (minimum)	(d) Tensile strength (minimum)	(e) Elongation %	(f) Coating Class	(g) Bare Minimum Thickness (BMT) in mm	(h) Tolerance on BMT
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	1a	1b	1c	2a	2b	2c	3a	3b	3c																																								
(b) Grade/ Reference code	As per Decking Requirements Table-2 for the corresponding selected Material Group.																																																
(c) Yield strength (minimum)																																																	
(d) Tensile strength (minimum)																																																	
(e) Elongation %																																																	
(f) Coating Class																																																	
(g) Bare Minimum Thickness (BMT) in mm																																																	
(h) Tolerance on BMT																																																	
A&N GAS BASED POWER PROJECT (50 MW) CIVIL WORKS	TECHNICAL SPECIFICATIONS PART-B				SHEETING AND ALLIED WORKS SECTION-IV			PAGE 26 OF 28																																									

CLAUSE NO.	SHEETING AND ALLIED WORKS																		
	<p>5. Painting System: Select SMP or Polyester Paint conforming to Product type 4 as per AS/NZS 2728: 1997</p> <table border="1"> <thead> <tr> <th>Coat DFT (Dry film thickness)</th> <th>Exposed Side</th> <th>Unexposed side</th> </tr> </thead> <tbody> <tr> <td>Primer</td> <td>5 microns (Nominal)</td> <td>5 microns (Nominal)</td> </tr> <tr> <td>Main</td> <td>20 microns (Nominal)</td> <td>5 microns (Nominal)</td> </tr> <tr> <td>Sub-total</td> <td>25 microns (Nominal)</td> <td>10 microns (Nominal)</td> </tr> <tr> <td>Total</td> <td colspan="2">35 microns (Nominal)</td> </tr> </tbody> </table> <p>6. Test Requirements: As per MQP</p> <p>7. Profile: Refer Drg No. _____ Rev No. ___ Titled _____ (Attach approved drawing).</p> <p>8. Colour Shade: RAL 5012, 5005, 9002, etc. (on exposed surface) as per relevant approved Architectural Drawings.</p> <p>9. Organic Film : Transparent Organic film of thickness 40 microns on outer surface.</p> <p>10. Storage Requirement: on wooden sleepers and covered.</p> <p>(Signature of Contractor)</p>			Coat DFT (Dry film thickness)	Exposed Side	Unexposed side	Primer	5 microns (Nominal)	5 microns (Nominal)	Main	20 microns (Nominal)	5 microns (Nominal)	Sub-total	25 microns (Nominal)	10 microns (Nominal)	Total	35 microns (Nominal)		
Coat DFT (Dry film thickness)	Exposed Side	Unexposed side																	
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<p>A&N GAS BASED POWER PROJECT (50 MW) CIVIL WORKS</p>	<p>TECHNICAL SPECIFICATIONS PART-B</p>	<p>SHEETING AND ALLIED WORKS SECTION-IV</p>	<p>PAGE 27 OF 28</p>																

Group	Grade / Reference Code	Yield strength (min.)	Tensile strength (min.)	Elongation % (minimum)		Coating Class Designation	BMT	(+)ve Tolerance	Upper Limit of BMT	(-)ve Tolerance	Lower Limit of BMT
		Mpa	Mpa	Lo= 50mm	Lo= 80mm		mm	mm	mm	mm	mm
1a	G250 / AS 1397	250	320	25	22	Z275	0.6	0.04	0.64	-0.04	0.56
1b	SS255 / ASTM A653M	255	360	18		Z275	0.6		0.64		0.56
1c	S250GD / EN 10326	250	330	19		Z275	0.6		0.64		0.56
2a	G350 / AS 1397	350	420	15	14	AZ150	0.5	0.04	0.54	-0.04	0.46
2b	SS340 Class 4 / ASTM A792M	340	410	12		AZ150	0.5		0.54		0.46
2c	S350GD / EN 10326	350	420	16		AZ150	0.5		0.54		0.46
3a	G550 / AS 1397	550	550	2	2	AZ150	0.4	0.04	0.44	-0.04	0.36
3b	SS550 / class1 ASTM A792M	550	570	----		AZ150	0.4		0.44		0.36
3c	S550GD / EN 10326	550	560	----		AZ150	0.4		0.44		0.36
<p>Note: Payment for the side sheeting work will be as per actual BMT supplied at site. Minimum acceptable BMT shall be equal to "Lower Limit of BMT" as per last column of above table. (Signature of Contractor)</p>											
A&N GAS BASED POWER PROJECT (50 MW) CIVIL WORKS				TECHNICAL SPECIFICATIONS PART-B				SHEETING AND ALLIED WORKS SECTION-IV		PAGE 28 OF 28	

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1.00.00	GENERAL REQUIREMENT				
1.01.01	<p>Contents</p> <p>This section covers the technical requirement for welded wire mesh fabric, shotcrete, cement grouted rock bolts/anchors, Geo Grid mesh, mesh anchors and other similar works</p>				
1.02.00	Codes and Standards				
1.02.01	<p>Some of the relevant Indian Standards, Codes, etc. applicable to this section of the specification are listed below:</p> <p>IS 1566 Hard-Drawn Steel Wire Fabric for Concrete Reinforcement</p> <p>IS 1786 High Strength Deformed Bars and Wires for Concrete Reinforcement</p> <p>ASTM D 6637 Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method</p> <p>ACI 506 R -90 Guide to Shotcrete</p>				
2.00.00	Welded Wiremesh				
2.01.00	<p>Welded wiremesh shall be installed in surface and underground excavation as reinforcement for shotcrete, usually in combination with rock bolts. It may also be used with steel ribs, when it shall be laid over the outer flange of the rib and pinned or fixed to the excavated surface between the ribs where necessary.</p> <p>Welded wiremesh shall conform to the requirement of is: 1566. The fabric shall have a square mesh of 100 to 200 mm spacing, made of wires having a yield strength not less than 275 N per sq.mm, and diameter shall be as shown on the drawings.</p> <p>Where possible, the welded wiremesh shall be placed at the same time as rock bolts are installed. It shall not be placed between the rock surfaces and bearing plates of rock bolts, but shall be placed over the heads of rock bolts and fastened to them by separate plates and nuts. Sufficient intermediate mesh anchors, or if directed by the Engineer-in-Charge, additional rock bolts, shall be placed to ensure that the mesh is drawn close to the excavated surface so that when shotcrete is applied subsequently, the mesh neither sags nor vibrates excessively and impairs the effectiveness of the shotcrete.</p> <p>In case the welded wiremesh is placed at such locations where rock bolts have not been provided, wiremesh anchors of a type acceptable to the Engineer-in-Charge shall be used .to secure the edges of wire mesh tight to the rock surface to provide 'anchorage at overlaps and to provide intermediate support. The wiremesh anchors shall have a minimum length of 450 mm and threaded length 100mm.</p> <p>The use of wooden pegs on pins for fastening the wiremesh to the rock surface will not be permitted.</p>				
A&N GAS BASED POWER PROJECT (50 MW) CIVIL WORKS	Bid Doc. No.: NVVN/C&M/R E-342/2024-25	TECHNICAL SPECIFICATIONS PART-B	SLOPE STABILISATION SECTION-V	Page 1 of 4	

CLAUSE NO.	TECHNICAL SPECIFICATIONS FOR SLOPE STABILISATION				
	<p>Welded wiremesh shall be' firmly stretched between the rock bolts. Care shall be taken to ensure that air pockets are not formed behind the wiremesh, when used as reinforcement for shotcrete.</p> <p>Overlaps in the wiremesh shall not be less than 300 mm.</p> <p>3.00.00 SHOTCRETE</p> <p>3.01.00 Definitions</p> <p>3.01.01 Shotcrete</p> <p>Shotcrete for the purpose of this work, is defined as wet mix of cement concrete (plain) or steel fibre reinforced (SFRS) applied from a spray nozzle by mean of compressed air. The Engineer-in-Charge may, in exceptional cases, allow use of dry mix for plain shotcreting. Shotcrete shall contain an approved admixture suitable to attain quick set and high early strengths as specified herein.</p> <p>3.01.02 Rebound</p> <p>Rebound is defined as the aggregates and cement or wet shotcrete which bounces away from a surface against which shotcrete is being projected.</p> <p>3.02.00 Materials</p> <ul style="list-style-type: none"> i. Material for shotcrete shall comprise cement, aggregates, water and approved admixtures, micro-silica as specified herein ii. Cement shall be ordinary Portland cement conforming 43 grade or as specified in the drawings. iii. Aggregates shall conform to the requirements of relevant Indian Standards. The aggregates size for plain shotcrete shall not exceed 10 mm. The contents of the crushed and non-cubical material shall not exceed 10%. Aggregates shall be furnished by the Contractor from a source accepted by the Engineer-in-Charge, but acceptance of source, by the Engineer-in-Charge shall not be construed as constituting the acceptance of all aggregates to be taken from that source or grading of aggregates to be in conformance with Contract. iv. Air used for sparying shotcrete and water used for mixing shall be clean and free of oil. v. Admixtures <ul style="list-style-type: none"> Admixtures shall be used to develop quick set and high early strength, to ensure good workability, low pumping pressure. adequate slump retention and low rebound as approved by the Engineer-in-Charge, conforming to the requirements of the relevant Standards. a) Super plasticizers / water reducing agents shall be added at the batching plant to keep the shotcrete mix workable during transportation and to ensure good pumpability to an acceptable low water cement ratio. The super plasticizers shall be free of chlorides b) Accelerators <ul style="list-style-type: none"> A proven accelerator shall be added for providing a quick setting time. It shall be alkali free and shall be environment friendly. Only liquid accelerators shall be used to achieve low rebound. The accelerator shall have a pH value less than 12. The accelerators shall be added at the nozzle and doses shall be minimum but not to exceed 5% of the weight of cement and microsilica. The chemical composition and technical details of the accelerators along with performance report I certificate from the manufacture I supplier shall be submitted for prior approval of the Engineer-in-charge. vi. Micro -Silica or silica fume <ul style="list-style-type: none"> Micro silica shall be added in the mix at the batching plant for facilitating the mixing and distribution of fibres to reduce fibre rebound and improve bond between cement matrix and fibres. The dose of silica fumes shall be 5-7% (of cement weight) 'subject to site trials. Silica fume shall have a bulk density between 500 -700 kg I cum. Test certificates from approved and reputed testing laboratory shall be produced to satisfy that the silica fume complies with IS-15388. 				
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3.3.0
3.3.1

**Mix Design and Proportioning
Plain Shotcrete**

- i. The type / grade of shotcrete to be used in a particular location shall be as per drawings and as directed by the Engineer-in-Charge.
- ii. The mix proportions of cement, aggregates, and permitted admixtures in each class shall be determined by the Contractor satisfying the requirements given below and shall be subject to the approval of the Engineer-in-Charge. The mixes shall be such as to permit placement without excessive rebound and segregation.

Grade of Shotcrete	Aggregate Size, mm	Cement Content	Water Cement Ratio
M-25	Sizegrading: Dmax ≤10 mm, unless $\Phi \geq 50$ mm (where Φ is the pipe diameter). In this case ($\Phi > 50$ mm), we can use Dmax ≤ $\Phi / 3$, but maximum of 25 mm in all cases. Aggregate flattening coefficient ≤ 20.	≥400 kg/m ³	≤ 0.45

- iii. The admixtures shall have proven compatibility with the cement make and type so as to ensure initial and final setting time as 3 and 12 minutes respectively. The Contractor shall supply, to the Engineer-in-charge, all the necessary test results and reports to confirm compatibility.
- iv. The water content of the mixes shall be limited to prevent sloughing. The water- cement ratio of fresh shotcrete in place shall be between 0.32 and 0.45.
- v. The mixes shall be such that aggregate gradation and cement content after placing are as those obtained from samples taken from test panels produced from approved trial mixes. All constituents shall be uniformly dispersed throughout the mix.
- vi. The proportion of admixtures shall vary between 2% to 7% of the weight of cement or as determined by testing prior to any shotcrete work.
- vii. Proportioning of aggregates and cement shall be only by weigh Batching.
- viii. The shotcrete shall meet the following compressive strength requirements or as shown on the drawings
 - (a) 4.5 N/mm² at 8 hours
 - (b) 12.5 N/mm² at 72 hours
 - (c) 25 N/mm² at 28 days
- ix. The price quoted for shotcrete shall include the cost of all materials, labour, machinery, all leads and lifts etc. complete. The above quoted rate shall include payment towards variation in the quantities, if any, of all materials during mix design1 execution stage.
- x. Mixed material shall be used within 90 minutes after adding cement.
- xi. The super -plasticizer admixtures shall be added at batching plant and shall be accurately proportioned and thoughtly mixed with other ingredients. The accelerating admixture shall be accurately proportioned and added at the application nozzle
- xii. Approved mix proportions may have to be varied, during execution stage, to obtain required strength of shotcrete, to maintain rebound to the minimum and to meet other requirements of the Contract. The Contractor shall notify to the Engineer-in-Charge of all variations to the mixes.


4.00.00


RESIN GROUTED TYPE & CEMENT GROUTED TYPE ROCK BOLT


4.01.00


Rock bolts shall consist of deformed steel 32mm diameter conforming to IS 1786 with a yield stress of 415N per Sq. mm or as shown on the drawings. Each bolt shall have one end chamfered and the other end threaded with a coarse thread over a length of 200 mm.


After the hole is drilled and cleaned, fast setting resin cartridges shall be placed in the hole and tamped with the bolt to the bottom of the hole. Bolt shall be stressed to the level as indicated in drawing or directed by Engineer-in-Charge-The annular space in hole around the


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<p>4.02.00</p> <p>5.00.00</p> <p>6.00.00</p>	<p>bolt shall then be filled with slow setting resin cartridges for resin grouted type bolts and with mortar for cement grouted type bolts. The Contractor shall demonstrate the resin cartridges used satisfy the specified strength requirements of the bolts to the satisfaction of Engineer-in-Charge, before use.</p> <p>Cement Grouted Anchors Bars/Anchor Bolts</p> <p>(i) Grouted anchor bars/anchor bolts shall be fabricated from a deformed reinforcing bar 20mm 125 mm 132 mm diameter with a yield stress of 415 N per Sq. mm or as shown on the drawings conforming to IS1786.</p> <p>(ii) Anchor bars / anchor bolts shall be thoroughly cleaned before being placed in the drill hole. The hole shall be filled with grout constituting 1:1 cement / sand mix with low water cement ratio. Admixtures for fast setting and low shrinkage may also be required.</p> <p>(iii) The anchor bars / anchor bolts shall be protected against disturbance for a minimum time of 48 hrs after installation or as required by the Engineer-in-Charge.</p> <p>(iv) Each anchor bolt shall be threaded over a length of at least 100 mm and provided with a nut.</p> <p>GEO-GRID MESH</p> <p>Plastic Geo-Grid mesh shall be manufactured from polypropylene or High-Density polyethylene and shall be extruded into sheet and punched into regular mesh pattern and stretched into biaxial plastic geo-grid. It shall be UV stabilised using carbon black content not less than 2%. The Tensile Strength of material when tested as per ASTM D6637 – Method-A, in both Machine Direction and Cross Machine Direction shall not be less 30 kN/m.</p> <p>MEASUREMENT</p> <p>a) Welded wiremesh fabric shall be measured and paid by actual weight of the installed fabric measured in Metric Tonne nearest to third place of decimal.</p> <p>b) Rock bolts/anchors shall be measured in Running metre nearest to second decimal place. Only the embedded length of rock bolts/anchors shall be measured. Cost of anchor plates, nuts etc shall not be measured and paid separately and shall be included in the rate of rock bolts/anchors.</p> <p>c) Shotcrete shall be measured and paid by volume of concrete applied over the rock surface arrived at by measuring the surface area by surveying and the minimum thickness of shotcrete given in the construction drawings. Even if, at some places thickness of shotcrete is more than the minimum stipulated thickness, volume of shotcrete shall be arrived at in Cubic metre to nearest third decimal place by multiplying the measured area in Square metre nearest to second decimal place by the minimum thickness in metre nearest to second decimal place.</p> <p>d) Mesh Anchors shall be measured in numbers</p>			
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CLAUSE NO.	WATER SUPPLY, DRAINAGE AND SANITATION			
	DRAINAGE AND SANITATION			
8.1.00.00	GENERAL REQUIREMENTS			
8.1.01.00	Content This section covers the technical requirements for medium grade galvanised mild steel water pipes, stop cocks, toilet block, pantry block, cast iron soil pipes, non - pressure RCC pipes, RCC manholes and connection of drains / sewer lines and similar works.			
8.1.02.00	Codes and Standards			
8.1.02.01	Some of the relevant applicable Indian Codes, Standards and Acts are referred to herein below : IS : 458 : Specification for Concrete Pipes. IS : 554 : Dimensions for Pipe Threads, where Pressure Tight Joints are made on Thread. IS : 771 : Glazed Fire Clay Sanitary Appliances. (Part I to VIII) IS : 774 : Flushing Cisterns for Water Closets and Urinals. IS : 775 : Cast Iron Brackets and Supports for Wash Basins and Sinks. IS : 778 : Copper Alloy Gate, Globe and Check Valves for Water Works Purposes IS : 781 : Cast Copper Alloy Screw Down Bib Taps and Stop Valves for Water Services IS : 782 : Caulking Lead. IS : 783 : Code of Practice for Laying of Concrete Pipes. IS : 1172 : Basic Requirements for Water Supply, Drainage and Sanitation. IS : 1239 : Mild Steel Tubes, Tubular and Other Wrought Steel Fittings. IS : 1536 : Centrifugal Cast (Spun) Iron Pressure Pipes for Water, Gas and Sewage. IS : 1538 : Cast Iron Fittings for Pressure Pipe for Water, Gas and Sewage.			
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	IS : 1703	: Ball Valves (Horizontal Plunger Type) including Float for Water Supply Purposes.	
	IS : 1726	: Cast Iron Manhole Covers and Frames.	
	IS : 1729	: Sand Cast Iron Spigot and Socket, Soil, Water and Ventilating Pipes, Fittings and Accessories.	
	IS : 1742	: Code of Practice for Building Drainage.	
	IS : 2064	: Code of Practice for Selection Installation and Maintenance of Sanitary Appliances.	
	IS : 2065	: Code of Practice for Water Supply in Building.	
	IS : 2501	: Copper Tubes for General Engineering Purposes.	
	IS : 2548	: Plastic Seat and Cover for Water - Closets.	
	IS : 2556	: Vitreous Sanitary Appliances - (Vitreous China).	
	(Parts 1 to 15)		
	IS : 2633	: Method for Testing uniformity of Coating on Zinc Coated Articles.	
	IS : 2629	: Recommended Practice for Hot Dip Galvanising on Iron and Steel.	
	IS : 2963	: Non Ferrous Waste Fittings for Wash Basins and Sinks.	
	IS : 3114	: Code of Practice for Laying of Cast Iron Pipes.	
	IS : 3311	: Waste Plug and its Accessories for Sinks and Wash Basins.	
	IS : 3438	: Silvered Glass Mirrors for General Purposes.	
	IS : 4111	: Code of Practice for Ancillary Structure in Sewerage System.	
	(Part I to IV)		
	IS : 4827	: Electro Plated Coating of Nickel and Chromium on Copper and Copper Alloys.	
	IS : 5219	: Cast Copper Alloys Traps.	
	IS : 5329	: Code of Practice for Sanitary Pipe Work above Ground for Buildings.	
	IS : 5382	: Rubber Sealing Rings for Gas Mains, Water Mains and Sewers.	


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	IS : 5822 : Code of Practice for Laying of Welded Steel Pipes for Water Supply IS : 8931 : Cast Copper Alloy Fancy Bib Taps and Stop Valves for Water Services IS : 8934 : Cast Copper Alloy Fancy Pillar Taps for Water Services IS : 10446 : Glossary of Terms for Water Supply and Sanitation. IS : 12701 : Rotational Moulded Polyethylene Water Storage Tanks. IS : 13983 : Stainless Steel Sinks. SP : 35 : Hand Book on Water Supply and Drainage.	
8.2.00.00	TOILET BLOCK AND PANTRY BLOCK	
8.2.01.00	General Requirement This part of the specification covers the requirement for provision of the toilet block and pantry block in totality and completeness with respect to sanitary and toiletries items, including all fittings and fixtures whatsoever required, for the commissioning and efficient working. This shall include but not limited to the supply and installation of water supply / sanitary fixtures and accessories like water closets, urinals, wash basins, sinks, mirrors, shelves, towel rail, soap containers, geyser, water cooler, etc., water supply / sanitation pipes, water storage tank (overhead / loft type) in various toilet / pantry blocks. All fittings and fixtures shall generally conform to relevant Indian standards.	
8.2.02.00	Material	
8.2.02.01	All pipes, fittings, fixtures, appliances and accessories shall conform to the relevant Indian Standards and shall be of 1st class quality.	
8.2.02.02	All material, fittings, fixtures, appliances, accessories shall be from reputed brands (manufacturer) as approved by the Engineer. The contractor shall submit samples of materials, as directed by the Engineer, which may be retained by him for subsequent comparison with the bulk supplies made in future at site. However, ultimate choice of the type shall lie completely with the Engineer.	
8.2.02.03	Chromium plating on fittings and appliances shall be of Grade - 2, (10 micron thickness). Powder coating shall be of approved colour and shall have a minimum Dry Film Thickness (DFT) of 20 Microns.	
8.2.02.04	All sanitary fittings shall be of heavy duty brass finish with powder coating, unless specified otherwise.	
8.2.02.05	Stainless steel used for accessories shall be of Grade SS - 304 and from reputed manufacturer (such as SALEM Steel) and shall have polished bright finish.	


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8.2.02.06	<p>Flushing Valve / System</p> <p>Powder coated brass flush valve of minimum 32 mm size shall be fitted with the water closet. For urinals, flushing system fitted with photo voltaic control system shall be provided.</p>	
8.2.02.07	<p>Pillar Taps</p> <p>Pillar taps shall be heavy duty fancy type. The nominal size of pillar taps shall be 15mm.</p>	
8.2.02.08	<p>Bib / Stop Cock</p> <p>All bibcocks and stopcocks used in sanitary appliances shall be of heavy duty fancy type. Nominal size of bibcocks shall be 15mm. Stopcocks (for installation on main supply line) shall be heavy duty and oxidised.</p>	
8.2.02.09	<p>Gate Valves</p> <p>All gate valves shall be heavy duty and of brass.</p>	
8.2.02.10	<p>Shower Rose</p> <p>The shower rose shall be of fancy type adjustable multi - spread spray with rotating / adjustable type arm. It shall have uniform perforations. The inlet size shall be 15mm.</p>	
8.2.02.11	<p>Shower Tray</p> <p>The shower tray shall be made of stainless steel of Grade SS - 304 polished with bright finish having minimum thickness of 1.2 mm.</p>	
8.2.02.12	<p>Mirror</p> <p>Mirror shall be of superior float glass, edge mounted with teak beading and 6 mm (BWR) plywood backing. The size of the mirror shall be 600 mm x 900 mm. It shall be uniformly silver plated at the back and shall be free from any silvering defects. Silvering shall have a protective uniform covering of lead paint.</p>	
8.2.02.13	<p>Water Closet</p> <p>i) Orissa pattern squatting pan with integral foot rest shall be provided.</p> <p>ii) Wall mounted European type water closet complete with seat and cover made of bakelite shall be provided and shall be of approved shade and colour.</p>	
8.2.02.14	<p>Towel Rail</p> <p>Towel rail (minimum 20mm diameter) and supporting brackets (Stainless steel) shall be fixed in position by means of steel expansion fasteners.</p>	


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8.2.02.15	<p>Toilet Paper Holder</p> <p>The toilet paper holder shall be of vitreous china and of size and design as approved by the Engineer. It shall be fixed in position by means of oxidised screws and expansion steel fasteners embedded in the wall.</p>	
8.2.02.16	<p>Liquid Soap Dispenser</p> <p>Push type metallic liquid soap dispenser shall be provided.</p>	
8.2.02.17	<p>Urinal</p> <p>The urinal and partition shall be in white glazed vitreous china.</p>	
8.2.02.18	<p>Wash Basin</p> <p>Each wash basin shall be provided with photo voltaic system for water control.</p>	
8.2.02.19	<p>Sinks</p> <p>Stainless steel sink with in-built drain board shall be provided for pantry block.</p>	
8.2.02.20	<p>Waste Fittings</p> <p>The waste fittings shall be provided for wash basin and sinks.</p>	
8.2.02.21	<p>Geyser</p> <p>Geyser shall be of vertical type and shall have minimum capacity of 25 liters and of approved make. It shall be provided with stopcocks, both at inlet and outlet connections.</p>	
8.2.02.22	<p>Inlet Pipes</p> <p>For inlet connecting pipes to appliances / fittings, powder coated brass pipe of 15mm nominal bore, with union of approved make shall be used.</p> <p>For building sanitary works above ground level, sand cast iron / pipe fittings and accessories shall be used. Pipes shall be coated with two coats of ready mixed black bituminous paint.</p>	
8.2.02.23	<p>Water Cooler</p> <p>Water cooler shall be of minimum 30 liters capacity and of approved make. It shall be provided with stopcocks at the inlet pipe. The water cooler shall have waste water tray with disposal pipe of suitable length.</p>	
8.2.03.00	<p>Working Drawings</p>	
8.2.03.01	<p>The working drawings shall be prepared by the contractor and approved by the Engineer. The drawings shall contain list of all fixtures and fittings along with colour, make, size, dimensions, levels, plumbing details, etc.</p>	


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8.2.03.02	Working drawings shall also give the bill of material with appropriate unit i.e. Quintal, Kgs., Nos. (each), Running Meters, etc., as relevant for all fixtures and fittings.	
8.2.04.00	<p>Fixing (Installation) of Sanitary Fixtures and Fittings</p> <p>All sanitary fittings and fixtures shall be installed in best workman like manner by skilled workers. These shall be perfect in level, plumb, plane, location and symmetry. All items shall be securely anchored to wall and floors. All cuttings in walls and floors shall be made good by the contractor. No sunken slab shall be provided in the floor except for local sinking for Indian water closet (wc) of toilet block. Sanitary pipe shall be routed below the slab. All photo - voltaic systems for water flushing shall be installed by expert agencies.</p>	
8.3.00.00	GALVANISED PIPES	
8.3.01.00	Material	
8.3.01.01	For water supply and roof drainage, galvanised mild steel pipe of medium grade conforming to IS : 1239 shall be used. Galvanising shall be as per IS : 4736. The minimum mass of zinc coating shall not be less than 400 gms. / sq. m. as per IS : 6745. The zinc coating shall be smooth and shall be subjected to testing as per IS : 2633, for uniformity of coating. The zinc coating shall be free from all defects, as per IS : 2629.	
8.3.02.00	Laying Installation and Jointing of Pipes and Fittings	
8.3.02.01	Relevant Indian standard code of practices shall be followed as general guidance for laying, installation and jointing of different types of pipes and fittings.	
8.3.02.02	For entry of the pipe lines into any building or structure, suitable conduits under the structure or sleeves shall be used to facilitate installation and maintenance of the services.	
8.3.02.03	Galvanised mild steel pipes shall be used for water supply and rain water down comers. The galvanised mild steel pipes and fittings shall run on the surface of the walls, ceiling or in chase as specified or shown on the drawing. All pipes shall be well secured and supported by adequately strong brackets anchors. Suitable spacer blocks shall be provided against the vertical surface on which the pipe is fixed. Fixing shall be done by means of standard pattern holder bat clamps. To conceal pipes, chasing may be adopted or pipes fixed in the ducts or recess etc., provided there is sufficient space to work on the pipes with the common tools. Union joints shall be provided for all required locations to facilitate maintenance.	
8.3.02.04	Where directed by the Engineer, a M. S. tube sleeve shall be fixed at a place the pipe is passing through. All pipes and fittings shall be properly jointed and made completely water tight. Burr from the joint shall be removed after screwing.	
8.3.02.05	For water pipe lines, meticulous care shall be taken to avoid chances of airlock and water hammer. The layout of pipe work shall be such that there is no possibility of backflow towards the source of supply, from any cistern / appliance, whether by syphonage or otherwise. The pipe inside the building shall be concealed in masonry or concrete of the structure. Chases, openings, conduits, as necessary shall be cut	


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	<p>or left in the masonry or concrete. Clamps and fittings shall be as per standard practice and as approved by the Engineer.</p>	
8.3.02.06	<p>The pipes and fittings shall be checked under working pressure. Any joints found leaking, shall be rectified and all leaking pipes removed and replaced. The pipes and fittings shall be tested for a hydraulic pressure of 6 Kgf / Sq. cm.</p>	
8.3.02.07	<p>All pipes used for water supply should be thoroughly and efficiently disinfected before being taken into use. The method of disinfection shall be subject to the approval of the Engineer.</p>	
8.3.02.08	<p>The storage tanks and downtake distribution pipes shall be disinfected together as specified in IS : 2065, using disinfecting chemical. All rain water down comers shall be provided with cowl dome type drain head.</p> <p>Galvanised M. S. Pipes shall be jointed by using standard sockets and / or by welding. For welding of pipes, IS : 11906 shall be followed. After welding, the welded area shall be coated with zinc rich paint, after proper cleaning and preparation of the surface. Joints between successive lengths of pipe can be jointed by collars according to provisions of IS : 1742.</p>	
8.3.03.00	<p>Working Drawings</p>	
8.3.03.01	<p>The working drawings shall be prepared by the contractor and approved by the engineer. The drawings shall contain list of all fixtures and fittings along with colour, make, size, dimensions, levels, plumbing details, etc.</p>	
8.3.03.02	<p>Working drawings shall also give the bill of material with appropriate unit i.e. Quintal, Kgs., Nos. (each), Running Meters, etc., as relevant for all fixtures and fittings.</p>	
8.4.00.00	<p>CAST IRON PIPE AND RCC PIPE</p>	
8.4.01.00	<p>Material</p>	
8.4.01.01	<p>Cement concrete pipe used for sewer and drain shall conform to IS : 458 and shall be of specified Class.</p>	
8.4.01.02	<p>Centrifugally cast (spun) iron pressure pipes of class Ia conforming to IS : 1536 shall be used for under ground applications. The pipe shall have spigot and socket ends. pipes shall be coated with coal - tar by hot dipping process for both inner and outer surfaces. C. I. fittings shall conform to IS: 1538.</p>	
8.4. 02.00	<p>Laying, Installation and Jointing of Pipes and Filling</p>	
8.4.02.01	<p>In no case, pipes shall be rolled and dropped into trenches. After lowering, pipes shall be arranged so that the spigot of one pipe is carefully centered into the socket of the next pipe and pushed to the distance that it can go.</p> <p>The pipe shall be laid with socket facing the direction of flow of water. The connection to an existing sewer as far as possible shall be done at the manhole.</p>	
8.4.02.02	<p>Some important aspects pertaining to a few commonly used (Type) pipes are described in the following clauses.</p>	


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8.4.02.03	Unless otherwise shown on the drawing, following minimum gradients of soil and drainage pipes shall be followed for maintaining minimum self cleansing velocity of 0.75 M / Sec.		
	Diameter (in mm)	Gradient	
	100	1 in 57	
	150	1 in 100	
	200	1 in 175	
	Diameter (in mm)	Gradient	
	250	1 in 195	
	300	1 in 250	
8.4.02.04	The pipes and specials shall be handled with sufficient care to avoid damage to them. These shall be lined up on one side of the alignment of the trench socket facing upgrade.		
8.4.02.05	Cutting of pipes may be necessary when pipes are to be laid in lengths shorter than the lengths supplied. The pipe shall be so marked that the cut is truly at right angle to the longitudinal axis of the pipe.		
8.4.02.06	Drainage and soil pipes shall not be allowed to come close to water supply pipe lines.		
8.4.02.07	Where soil, waste and ventilating pipes are accommodated in ducts, access to cleaning eyes shall be provided. Connection to drain shall be through a gully with seal cover to guard against ingress of sewer gas, vermin or back flow.		
8.4.02.08	<p>Cast iron pipes shall be used for above ground sanitary works</p> Proper ventilation shall be provided in the piping system. The single stack system shall not generally be provided. Pipes shall be provided with floor trap (nahni type), slotted vent cowl, gully trap with cast iron grating as applicable.		
8.4.02.09	All work for earthwork shall be done as specified elsewhere in this document under relevant items of the schedule of items. Trenches shall be so dug that pipes could be laid to the required alignment and at required depths. Filling of the trench shall not be commenced till the length of pipes therein have been tested and passed. Special care shall be taken to pack under and sides of the pipes thoroughly with selected material. At least 300 mm over the pipe shall be filled with selected earth.		
8.4.02.10	All soil pipes, waste pipes, ventilating pipes and all other pipes, when above ground shall be gas tight. All sewer and drains laid below ground shall be water tight.		
8.4.02.11	Over ground cast iron pipes shall be provided with lead joint. The spigot shall be centered in the adjoining socket by tightly caulking in, sufficient turns of tarred		


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	<p>gasket or hemp yarn to leave unfilled half the depth of socket for lead. When gasket or hemp yarn has been caulked tightly home, a jointing ring shall be placed round the barrel and against the faces of the socket. Molten pig lead shall then be poured into for filling remainder of the socket. Lead shall then be solidly caulked with suitable tools and hammers of not less than 3 Kgs. weight, right round the joint, to make up for the shrinkage of the molten metal on cooling, and shall preferably be finished 3 mm behind the socket face. Lead for caulking shall conform to IS : 782. It is essential that pipes shall be maintained perfectly dry, before lead run joints are made.</p>				
8.4.02.12	<p>Under ground cast iron pipes shall be provided with Tyton's joints. The C. I. Pipe manufacturer's instructions shall be strictly followed in making such joints. Tyton joints shall be made by push on type 'Tyton' rubber gasket shall conform to the specifications as stipulated by the pipe manufacturer. Tools specified by the pipe manufacturer shall be used to secure joints fully.</p>				
8.4.02.13	<p>Jointing of concrete pipes shall be generally of rigid type. Collar type joints shall be provided. For collar jointing two adjoining pipes shall be butted against each other and adjusted in correct position and alignment. Collar shall then be slipped over the joint, covering equally both the pipes. The annular space shall be filled with stiff mixture of cement mortar 1 : 2 (1 cement : 2 sand) rammed completely with caulking tools. Any extraneous material shall be removed from the inside of the pipe and the newly made joints shall be cured.</p>				
8.4.03.00	<p>Working Drawings</p>				
8.4.03.01	<p>The working drawings shall be prepared by the contractor and approved by the Engineer. The drawings shall contain list of all fixtures and fittings along with colour, make, size, dimensions, levels, plumbing details, etc.</p>				
8.4.03.02	<p>Working drawings shall also give the bill of material with appropriate unit i.e. Quintal, Kgs., Nos. (each), Running Meters, etc., as relevant for all fixtures and fittings.</p>				
8.5.00.00	<p>MANHOLES</p>				
8.5.01.00	<p>At every change of alignment, gradient or diameter of drain / sewer line, a manhole or inspection chamber shall be provided. The maximum distance between manholes shall be 30 M except for trunk route (for pipes above 900 mm diameter) where the distance shall be 45 M. Provisions of IS : 4111 (Part - i) shall be followed for construction of manholes.</p>				
8.5.02.00	<p>Manhole structure shall generally be constructed with RCC. The manhole shall be built on a foundation concrete (1 : 4 : 8) having a base thickness / wall thickness of 100 mm up to 900 mm depth and a base thickness / wall thickness of 150 mm for depths ranging between 900 mm to 2300 mm. RCC slab shall be provided as shown on the drawings. Grade of concrete shall be as specified in the schedule of items. Shape of RCC manholes shall generally be of rectangular or circular in section as specified in the schedule of items.</p>				
8.5.03.00	<p>20 mm diameter M. S. Rungs shall be provided in all manholes. Rungs shall be fixed 300 mm apart vertically as well as horizontally and staggered laterally and shall project 100 mm beyond the surface of the wall. The top rung shall be 450 mm below the manhole cover. Projected portion of rungs shall be coated with coal tar and finish</p>				
<p>A&N GAS BASED POWER PROJECT (50 MW) CIVIL WORKS</p>	<p>Bid Doc. No.: NVVN/C&MR E-342/2024-25</p>	<p>TECHNICAL SPECIFICATIONS PART-B</p>	<p>DRAINAGE & SANITATION SECTION-VI</p>	<p>Page 9 of 11</p>	

CLAUSE NO.	WATER SUPPLY, DRAINAGE AND SANITATION			
	<p>Painted with two coats of ready mixed black bituminous paint. The portion embedded shall be painted with thick cement slurry before fixing.</p>			
8.5.04.00	<p>For the portion of manhole below water table, water proofing admixture shall be added in the concrete. Inside concrete surface shall be finished with floating coat of neat cement slurry.</p>			
8.5.05.00	<p>Unless otherwise specified, 560 mm diameter circular cast iron manhole cover and frame, heavy duty shall be provided. Manhole cover and frame shall be coated with a smooth and tenacious black bituminous base material. The frame of manhole shall be finally embedded to correct alignment and levels in RCC or plain concrete slab. After completion of the work, manhole covers shall be sealed by means of thick grease.</p>			
8.5.06.00	<p>The channels and benching shall be done in cement concrete M - 20 neatly finished. These shall be semi - circular in the bottom half and of diameter equal to the pipe. Above the horizontal diameter, sides shall be extended vertically 50 mm above the crown of the pipe and top edge suitably rounded off.</p>			
8.6.00.00	<p>OVER HEAD / LOFT TYPE WATER STORAGE TANK</p>			
8.6.01.00	<p>Overhead / loft type water storage tank shall be made of polyethylene. These tanks shall be provided for each toilet block and placed on the roof / loft of the buildings with proper supporting arrangements. Bearing contact shall be so as to distribute the load evenly. These tanks shall be leak proof and water tight.</p> <p>The outlet pipe shall be 50mm above the bottom of the tank and provided preferably with copper gauge strainers. Wash out or draining pipe shall be made flush at the bottom of the tank at its lowest point. Floor of the tank shall be given a slight fall to the wash out pipe.</p>			
8.6.02.00	<p>Polyethylene Water Tanks</p>			
8.6.02.01	<p>The polyethylene water tanks shall meet the requirements of IS : 12701. Virgin HDPE granules of approved grade, suitable for drinking water shall be used for making the tank. Carbon black shall be added with the granules. Tank shall have closed top provided with lid. However, for storage inside the building, rectangular loft tank of approved colour shall be provided. Minimum capacity of the tank shall be 500 litres.</p>			
8.6.02.02	<p>Tank shall be provided with all fittings for inlet, overflow, outlet pipes and ball valves including mosquito proof coupling.</p>			
8.6.02.03	<p>Tank shall be installed with proper support and anchorage, for applicable wind and seismic conditions. Installation of tanks shall be carried out according to the recommendation of IS : 12701.</p>			
8.7.00.00	<p>MAKING CONNECTION OF DRAIN AND SEWER LINE WITH EXISTING MANHOLE</p> <p>This shall include the breaking into and making good the walls, floor with cement concrete of specified grade, providing of cement : sand plaster, finishing the same with neat cement, including making of necessary channels.</p>			
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8.8.00.00	SAMPLING, TESTING, ACCEPTANCE CRITERIA AND TOLERANCES	
8.8.01.01	Frequency of sampling, testing and quality assurance including the method of conducting the tests, acceptance criteria and construction tolerances shall be as given in Part-C of this specification.	
8.9.00.00	RATES AND MEASUREMENTS	
8.9.01.00	Rates	
8.9.01.01	This clause shall be read in conjunction with the clause for the unit rate given in Chapter-A of this specifications.	
8.9.02.00	Measurements	
	This clause shall be read in conjunction with the clause for the measurements given in Chapter-A of this specifications.	
8.9.02.01	The measurement for the item of galvanised mild steel pipes shall be based on the weight in quintals. Pipes shall be measured separately, according to range of diameter of pipes.	
8.9.02.02	The measurement for the item of oxidised brass stopcocks shall be based on the weight in kgs.	
8.9.02.03	The measurement for the item of toilet block and pantry block shall be based on numbers of respective items and types.	
8.9.02.04	The measurement for the item of sand cast iron / cast iron (pressure) pipe / non pressure RCC pipes shall be based on linear measurement in meters, as laid or fixed from inside of one manhole to the inside of the other manhole / chamber. The length shall be taken along center line of pipes over all fittings, such as bends, junctions, etc. Cement concrete bedding / concrete for haunching or encasement for R. C. C. and C. I. Pipes shall be measured separately, under respective P. C. C. / RCC Work.	
8.9.02.05	The measurement for the item of manhole shall be based on numbers of respective items and type and shall be enumerated depending upon the type, size and depth. The depth of manhole shall be reckoned from the top level of C. I. cover to the invert level of channel and shall be measured in Cm. All reinforcement work, M. S. rungs shall be paid separately under relevant respective Items of work.	
8.9.02.06	No separate measurement shall be done for making connection of drain or sewer line with existing manhole, as the same is included under the item of manhole.	

CLAUSE NO.	TECHNICAL SPECIFICATIONS FOR PAINTING				 एनटीपीसी NTPC विद्युत व्यापार Vidyut Vyapar
1.00.00	CORROSION PROTECTION				
1.01.00	GENERAL				
	<p>(a) All Steel structures shall be provided with painting as given in the specification. Further, painting system shall also meet the requirements of Corrosivity category C5 (durability very High) as per ISO 12944.</p> <p>Painting system for steel surfaces embedded in Concrete is given separately.</p> <p>(b) All Painting shall be done as per technical specification. Painting scheme shall be submitted by the bidder for approval of employer.</p> <p>(c) Painting scheme shall be resubmitted by the Bidder for approval of employer.</p>				
1..02.00	PAINTING OF STEEL SURFACES EMBEDDED IN CONCRETE: <p>a) For the portion of Steel surfaces embedded in Concrete, the surface shall be prepared by Manual Cleaning and provided with primer coat of chlorinated rubber based zinc phosphate primer of minimum 50 micron dry film thickness (DFT).</p> <p>b) All threaded and other surfaces of foundation bolts and its materials, insulation pins, Anchor channels, sleeves, etc. shall be coated with temporary rust preventive fluid and during execution of civil works, the dried film of coating shall be removed using organic solvents.</p>				
1..03.00	PAINTING OF STEEL SURFACES (OTHER THAN THOSE EMBEDDED IN CONCRETE) <p>a) All steel surfaces shall be provided with two component moisture curing zinc (ethyl) silicate primer coat (having minimum 80% of metallic Zinc content in dry film, solid by volume minimum 60% \pm2%) of minimum 70 micron DFT to be applied over blast cleaned surface with Sa 2 ½ finish conforming to ISO 8501-1 with surface profile 40-60 micron. The primer coat shall be applied in shop immediately after blast cleaning by airless spray technique. Zinc dust composition and properties shall be Type-II as per ASTM D520-00.</p> <p>b) Primer coat shall be followed with the application of Intermediate coat of two component polyamide cured epoxy with MIO Content (containing lamellar MIO minimum 30% on pigment, solid by volume minimum 80% \pm2%) of minimum 180 micron DFT. This coat shall be applied in shop after an interval of minimum 24 hours from the application of primer coat by airless spray technique.</p> <p>c) Intermediate coat shall be followed with the application of finish coat of two-pack aliphatic Isocyanate cured acrylic finish paint (solid by volume minimum 55% \pm2%) with Gloss retention (SSPC Paint Spec No 36, ASTM D 4587, D 2244, D 523) of Level 2 (after minimum 1000 hours exposure, Gloss loss less than 30 and colour change less than 2.0 ΔE) and minimum 70 micron DFT. This coat shall be applied in shop after an interval of minimum 10 hours and within six (6) months from the completion of Intermediate coat. Colour and shade of the coat shall be as mentioned in the colour coding scheme attached at appendix- I.</p> <p>Notes:</p> <ol style="list-style-type: none"> For Primer, high quality surface preparation is necessary and good amount of moisture is required for proper curing. Below 70 % relative humidity, curing time may go up to 7 days or more. In such a case additional water sprinkling may be ensured for completion of curing. Additionally Inorganic zinc silicate cannot be recoated; even with itself. Typically it should be used when coating bare steel surface for first time. The most frequent problem associated when top coating Primer is bubbling/pin holing especially with non-weathered zinc silicate coatings. To a great extent, this bubbling of finish paint can be eliminated by applying a mist coat of intermediate/topcoat as the 				
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1..04.00	<p>first pass of the product, allow the bubbles to subside and then apply a full coat, as required.</p> <p>3. In case top coating of zinc silicate with epoxy/polyurethane coatings, is expected to be delayed, it is advisable to use a suitable tie coat to avoid formation of white rust. However, if white rust forms then clean the surface with high pressure water, dry and apply the subsequent coats as required.</p> <p>4. Touch up paintings on damaged areas: Surface preparation by manual tools, wire brush/ emery paper etc. Minimum 6 inches peripheral area, adjoining to damaged area to be covered. If metal surface is exposed, it is to be painted with Zinc rich epoxy (70 micron) or suitable primer with existing paint scheme. If primer is intact, intermediate & top coat to be done with specified DFT in scheme.</p> <p>COATING FOR MILD STEEL PARTS IN CONTACT WITH WATER.</p> <p>a) All mild Steel parts coming in contact with water or water vapour shall be hot dip galvanised. The Minimum Coating of Zinc shall be 900 Gms / Sq. M. for galvanised Structures and shall comply with IS: 4759 and other relevant Codes. Galvanising shall be checked and tested in accordance with IS: 2629.</p> <p>b) The galvanising shall be followed by the application of an etching Primer and dipping in black bitumen in accordance with BS: 3416, unless otherwise specified.</p>				
1..05.00	<p>Gratings</p> <p>All gratings shall be blast cleaned to Sa 2 ½ finish or cleaned by acid pickling as per ISO 8501-1 and shall be hot dip galvanized at the rate of 900 Gms / Sq. M.</p>				
1..06.00	<p>Hand Railings and Ladders</p> <p>All Mild steel handrails and ladders shall be galvanised at the rate of 900 Gms / Sq.m. as per IS: 4736.</p>				
1..07.00	<p>Sea Worthiness</p> <p>All Steel Sections and fabricated Structures, which are required to be transported on sea, shall be provided with anti corrosive Paint before shipment to take care of sea worthiness.</p>				
1..08.00	<p>For Reinforced Concrete Work.</p> <p>i) The protection for concrete sub-structure shall be provided based on aggressiveness of the soil, chemical analysis of soil/sub-soil water and presence of harmful chemicals/salts.</p> <p>ii) The protection to super structure shall depend on exposure condition and degree of atmospheric corrosion.</p> <p>This shall require use of dense and durable concrete, control of water cement ratio, increase in clear cover, use of special type of cement and reinforcement, etc., coating of concrete surface, etc.,</p> <p>Bidder shall furnish the details of corrosion protection measures</p>				
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CLAUSE NO.	TECHNICAL SPECIFICATIONS FOR SEWERAGE SYSTEM				
<p>1.0.0</p> <p>1.1.0</p> <p>1.2.0</p> <p>1.3.0</p> <p>1.4.0</p>	<p>SEWERAGE SYSTEM</p> <p>Cement concrete pipes of class NP-3 as per IS:458 shall be used below ground level for sewage disposal in all areas other than main plant area. However, for pressure pipes and in main plant areas, spun C.I. pipes conforming to IS:1536 of required class shall be used.</p> <p>RCC manholes with CI cover shall be provided at every 30m along the length, at connection points, and at every change of alignment, gradient or diameter of a sewer pipeline. This shall be as per IS:4111.</p> <p>Sewage pump house shall be provided as per IS:4111.</p> <p>Sewers shall be designed for a minimum self-cleansing velocity of 0.75m/sec and the maximum velocity shall not exceed 2.4m/sec. and shall be connected by gravity or by pumping, to the sewage treatment plant. De-centralized Treatment Units of Sintex (PWTS-STBF or NBF) or Ion-exchange (NGPSTP) make or equivalent of minimum 10 Cum/day capacity shall be provided for sewage treatment.</p> <p>Manual on Sewerage and Sewage treatment (published by Central Public Health Environment Engineering Organisation, Government of India) shall be followed for design purpose.</p>				
<p>A&N GAS PROJECT 50MW CIVIL WORKS PACKAGE</p>	<p>Bid Doc. No. : NVVN/C&M/RE- 342/2024-25</p>	<p>TECHNICAL SPECIFICATIONS PART-B</p>	<p>SEWERAGE WORK SECTION-VIII</p>	<p>Page 1 of 1</p>	



Clause No.

Quality Assurance

QA CIVIL CHAPTER

1.0

SAMPLING AND TESTING OF CONSTRUCTION MATERIALS

- a) Before execution of any civil work the contractor shall conduct full-scale suitability tests on various construction and building material such as soil, fine and coarse aggregates, cement, construction chemicals, supplementary cementitious materials, and construction water to ascertain their suitability for use and the concrete mix designs conducted from Owner/NTPC Acceptable labs. (Attached as annexure 1A). The test samples for such full-scale testing shall be jointly sampled and sealed by the Owner/NTPC and contractor, thereafter these shall be sent to the concerned laboratory through the covering letter signed by field quality assurance department (FQA) representative of the Owner/NTPC. Format for sampling and testing of cement, coarse aggregate, fine aggregate, chemical admixture, fly ash, water, concrete mix design is enclosed at **Annexure-I**. Design mix will be carried out at the starting of the work with all tests as per Annexure I.
- b) The contractor shall timely initiate the action with regard to the evaluation of aggregates and other building material including concrete mix design, so as to ensure completion of these tests before start of civil works at site, thereby not affecting any project work. The test reports and recommendations for suitability of the materials including concrete mix design shall be promptly submitted by the contractor to the Engineer-in-charge (EIC)/Head of Field Quality Assurance (FQA) Department of Owner/NTPC.

2.0

LABORATORY AND FIELD TESTING

- a) The field laboratory for QA and QC activities shall be established and installed with the adequate facilities to meet the requirement of envisaged day to day tests during execution of the work. Temperature and humidity controls shall be available wherever necessary during testing of samples. The contractor shall furnish a comprehensive list of testing equipment/ instrument required to meet the planned/scheduled tests for the execution of works for EIC acceptance/ approval. The contractor shall establish the requisite laboratory equipment/set up and skilled QA&QC manpower within 30 days from the mobilization date of Main contractor at site. The tests which cannot be carried out/do not have facilities for testing in the field laboratory shall be done at Owner/NTPC acceptable third-party testing laboratory.
- b) All equipment and instruments in the field shall be calibrated before the commencement of tests and then at regular intervals, as per the manufacturer's recommendation and as directed by the EIC. The calibration certificates shall specify the fitness of the equipment and instruments within the limit of tolerance for use. Contractor shall arrange for calibration of equipment and instruments by NABL or such accrediting agency complying with ISO/IEC-17025 accreditation and the calibration reports shall be submitted to EIC for their review and acceptance.
- c) The QA and QC activities (include all works, activities, equipment, instrument, personnel, material etc. whatsoever associated to comply with sampling, testing and quality assurance requirements) in all respects as specified in the technical specifications/ drawings / data sheets / quality plans / relevant standard codes / contract documents shall be carried out at no extra cost to the Owner/NTPC.
- d) The contractor shall carry out testing in accordance with the relevant IS/standards /codes and in line with the requirements of the technical specifications / quality plans. Where no specific testing procedure is mentioned, the tests shall be carried out as per the best prevalent engineering practices and to the directions of the EIC.

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Quality Assurance

3.0

FIELD QUALITY PLAN

- a) Well before the start of the work, the contractor shall prepare and submit the Field Quality Plans (FQP) and obtain approval of Owner/NTPC, which shall detail out for all the works, equipment, services, quality practices and procedures etc. in line with the requirement of the technical specifications to be followed by the contractor at site. This FQP shall cover for all the items / activities covered in the contract / schedule of items required, right from material procurement to completion of the work at site. An Indicative Field Quality Plan for civil works is enclosed at **Annexure II** for reference purpose.

4.0

PURCHASE AND SERVICE

- a) To facilitate advance planning of material testing/ approval of bought out items (BOI), well before the start of activity as per L-2 network, representative samples shall be procured by the contractor from approved sub-vendors and submitted to the EIC for his approval before bulk procurement. In case of manufacturers test certificate (MTC) is submitted for acceptance, it shall be clearly traceable and correlated with the consignment received at site. MTC of all bought out items (BOI) shall essentially contain all the test parameters / characteristics specified in the technical specifications / standards / codes. In case the manufacturer's test certificate does not mention these details, sample from each lot shall be tested at the Owner/NTPC acceptable third-party lab. Approval of material / sample by the Owner/NTPC shall not relieve the contractor of his responsibility, for their conformance to the specification, as well as the requisite performance and quality of material.
- b) Structural steel (plates and rolled sections i.e. channels, beams & angles) conforming to IS 2062 and Reinforcement steel conforming to IS 1786 supply if in the scope of the contractor shall be procured from the Steel Producers (Refer NOTE below). Currently, Steel Producers acceptable are:
1. SAIL,
 2. JSW Steel Ltd,
 3. Jindal Steel & Power,
 4. RINL (for long products/Rolled sections and Reinforcement steel/TMT bars),
 5. JSW Ispat Special Products Ltd. (for long products/Rolled sections and Reinforcement steel/TMT bars).
 6. Arcelormittal Nippon Steel India Ltd. (for Flat products/ Steel Plates),
 7. Tata steel Ltd. (for Reinforcement steel/TMT bars), and
 8. ESL Steel Ltd. (for Reinforcement steel/TMT bars)

Subsequently, if any new Steel Producer/s are proposed by the main contractor during execution of contract, the same may be considered for acceptance subject to meeting the following qualifying requirements:

- i) The proposed supplier should be a Steel Producer, having a minimum production capacity of one million tons per annum (MTPA).
- ii) The proposed supplier should be a regular manufacturer of Steel Plates and / or Rolled Sections and / or Reinforcement Steel for the last two years as on date of submission of proposal.
- iii) The proposed supplier should also be a registered licensee with Bureau of Indian Standards for BIS: 1786/2062 at the time of submission of proposal.

NOTE: "The "Steel Producer" shall mean Steel Producer of any capacity, irrespective of process route, starting their operations from iron making using iron ore, virgin or processed, with necessary refining facilities and rolling/processing facilities, at a single location or else in multiple locations provided that the entire gamut of iron &



steel production, from iron making to finished steel production, is owned by the same company or its subsidiary company(ies). Provided that the iron making capacity is sufficiently matching the steelmaking capacity. Further, downstream units should use material from the upstream units of the same company or its subsidiaries.”

A) Approval conditions for procurement of structural steel sections through SAIL Conversion/Wet Leasing agent:

In case of non-availability of certain steel sections such as angel 100X100X10 mm or smaller size, MS flats, rounds bars, square bars and chequered plate from NTPC acceptable steel producers (non-availability to be established by supporting documents), an option is given to the Main contractor to source these sections directly from SAIL approved Conversion/Wet Leasing agent subject to the conditions given below:

1. The validity of BIS License of the finished sections shall be ensured by the Main contractor.
2. Billets shall be procured from Owner acceptable Steel Producers. Proper records for traceability from raw material to final product shall be maintained.
3. Testing of one sample per 40 MT for each type of section/size or part thereof shall be carried out as per IS: 2062 on finished product for physical and chemical properties. The sampling and testing for physical and chemical tests on finished product at Conversion/Wet Leasing agent shall be mandatorily witnessed by main contractor with prior consent of Owner.
4. Each lot of delivery of finished product shall be accompanied with co-relatable Manufacturer’s Test Certificate (MTC). MTC of finished sections shall be correlated with original MTC for Billets received from NTPC acceptable Steel Producers.
5. Owner will have access to carry out the surveillance checks for in-process stage.
6. In case of any defects are seen in the material, Main Contractor will replace the material without any cost implication to Owner.

B) Approval conditions for procurement of Steel tubes conforming to IS: 1161 and Hollow (square and rectangular) steel sections conforming to IS: 4923 from BIS approved sources:

Steel tubes conforming to IS:1161 and Hollow (square and rectangular) steel sections conforming to IS: 4923 shall be sourced from BIS approved sources having valid BIS license subject to complying and ensuring the following conditions by Main contractor:

1. The validity of BIS License of the finished sections shall be ensured by the Main contractor.
2. Raw materials shall be procured from Owner acceptable Steel Producers.
3. Testing of samples of steel tubes and hollow sections from each lot shall be carried out as per IS: 1161 & IS: 4923 respectively on finished product.
4. Each lot of delivery of finished product shall be accompanied with co-relatable Manufacturer’s Test Certificate (MTC).
5. Owner will have access to carry out the surveillance checks for in-process stage.
6. In case of any defects are seen in the material, Main Contractor will replace the material without any cost implication to Owner.

The specific methodology to be followed for Procurement of Structural Steel and Reinforcement Steel through Conversion route/BIS approved sources shall be subject to approval by NTPC in advance.

5.0

CW LINER/DUCT

The following tests / checks shall be carried out for CW Liner works:

A. Fabrication Works

SL. NO.	TESTS / CHECKS	QUANTUM / STANDARD
(I) CW Liner/ Pipes Fabricated using Steel Plates with Longitudinal & Circumferential Weld Joints at		
i) Site (Field Shop) or		
ii) Factory		
Option-1		
1.	WPS, PQR& welder's Qualification	100%
2.	DPT on root run	100% for pipes up to 1200mm diameter
3.	DPT after back gouging	100% for pipes above 1200 mm diameter
4.	UT	Not recommended.
5.	RT	5%
6.	DPT on finished butt welds	10%
7.	Hydro test	1.5 times the design pressure or 2 times the working pressure whichever is higher.
Option-2		
1.	WPS, PQR& welder's Qualification	100%
2.	DPT on root run	100% for pipes up to 1200mm diameter
3.	DPT after back gouging	100% for pipes above 1200mm diameter
4.	UT	Not recommended
5.	RT	- 100 % RT on circumferential joints in the bottom 1/3 portion of CW liner for weld length as per Fig 1 - 5% RT on top 2/3 portion of circumferential joints and - 5% RT on longitudinal joints
6.	DPT on finished butt welds	10%
7.	Hydro test	No Hydro test
(II) CW Liner/ Pipes Fabricated using H.R. coils with spiral weld joints at		
i) Factory		
1.	WPS, PQR& welder's Qualification	100%
2.	DPT on root run	Not applicable
3.	UT	Not recommended.
4.	RT	5% RT (mandatory and can't be replaced by other NDT mechanism i.e.

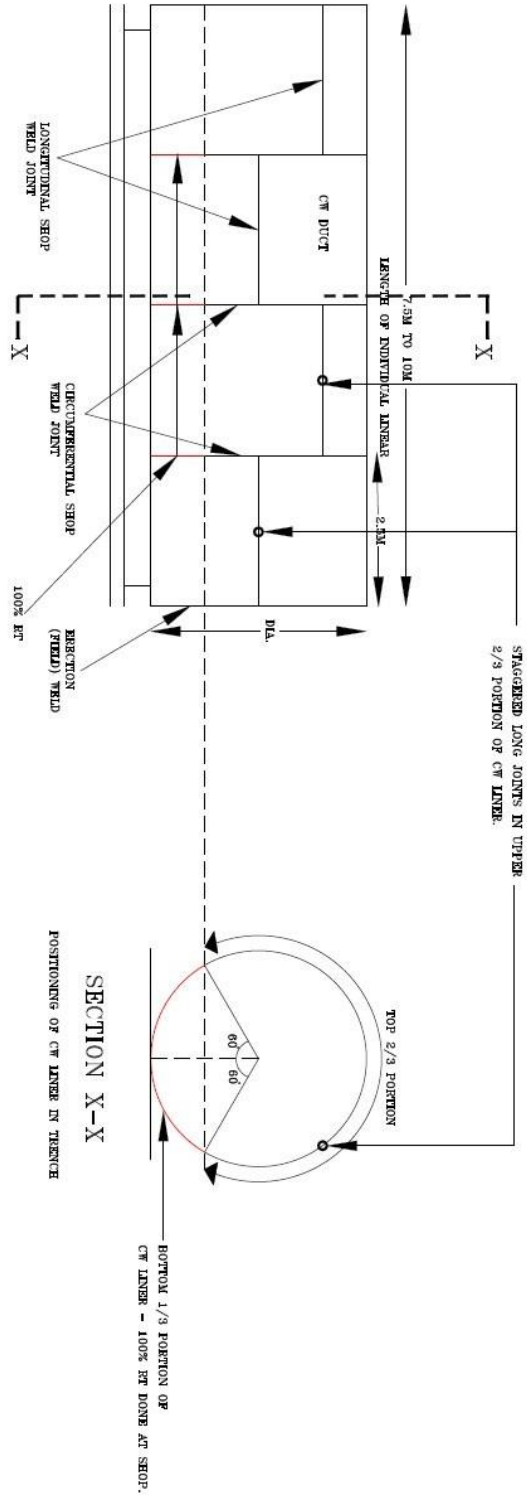
Clause No.

Quality Assurance



SL. NO.	TESTS / CHECKS	QUANTUM / STANDARD
		UT/PAUT/TOFD)
5.	DPT on finished butt welds	10% DPT
6.	Hydro test	Hydro test at 1.5 times the design pressure or 2 times the working pressure whichever is higher.
B. Erection Works at site		
Tests for CW Liner erection at site		
1.	WPS, PQR& welder's Qualification	100%
2.	DPT on root run	100% for pipes upto 1200mm diameter
3.	DPT after back gouging	100% for pipes above 1200mm diameter
4.	UT	Not recommended.
5.	RT	5% (mandatory and can't be replaced by other NDT mechanism i.e. UT/PAUT/TOFD)
6.	DPT on finished butt welds	10%
7.	Hydro test	1.5 times the design pressure or 2 times the working pressure whichever is higher. In exceptional cases where hydraulic test is not possible the same may be substituted with 100% RT as per the instruction/discretion of EIC.

FIG.1 INDIVIDUAL PIECE OF CW LINER - RADIOGRAPHY TEST
 NOTE : RADIOGRAPHED PORTIONS OF THE JOINTS TO BE SIMILARLY COLORED FOR IDENTIFICATION DURING LAYING.



Format of Request Letter for Evaluation of Materials

Ref: _____

Date: _____

To,

Sub.: Evaluation of materials and concrete mix design

Dear Sir,

We have awarded the work of on M/s.....vide our LOA No. dated.....for execution of Civil Works. Based on provisions of contract, M/s are expected to get the following tests/ evaluation done through your laboratory and accordingly the tests have been described below.

M/s have been advised to deposit the requisite evaluation/ testing charges and to deliver the test samples of quantities, specified below.

1. Evaluation of Cement:

- a) To carry out different physical tests on cement samples i.e. Blaine's fineness, initial and final setting time, soundness and compressive strength at 3, 7 and 28 days as per IS: 4031 and drying shrinkage and specific gravity in case of PPC.
- b) To carry out chemical analysis of the cement samples as per IS: 4032, including the total alkali content of the cement (Na₂O equivalent).
- c) To advise the suitability of cement based on the test results of a) and b) above.

2. Evaluation of Aggregates:

- a) To carry out different tests on coarse aggregate sample i.e. specific gravity, water absorption, sieve analysis, deleterious material content (coal & lignite, clay lumps, material finer than 75 micron sieve, soft fragment, shale, Total of % of all deleterious materials), soundness, crushing value, impact value, abrasion value, elongation index and flakiness index, as per IS: 383 & IS: 2386.
- b) To carry out different tests on fine aggregate sample i.e. specific gravity, water absorption, sieve analysis, soundness, deleterious material content (coal & lignite, clay lumps, material finer than 75-micron sieve, soft fragment, shale, Total of % of all deleterious materials), silt content, organic impurities and mica content as per IS: 383 & IS: 2386.
- c) To prepare evaluation report based on test results of a) and b) above and to advise regarding suitability of fine and coarse aggregates to be used with the cement of 1) above.

3. Evaluation of Aggregates for Potential Alkali-Aggregate Reactivity:

- a) To carry out petrographic analysis and Alkali-Aggregate Reactivity as per IS 2386 (PART VIII & VII).
- b) If rock type is limestone, X-Ray diffraction test (XRD) shall be carried out to determine clay mineral in the rock for preliminary conclusions and to carry out repeated temperature cycle test to determine residual expansion of aggregate for concrete to be used in dynamic foundations like TG, Fans, mills, crushers etc. Additionally, Alkali carbonate reactivity test may be carried out wherein the parameters shall be reported in conjunction with the petrographic analysis.
- c) To prepare a report based on test results of a) and b) above and to advise regarding suitability of aggregates to be used with the cement of 1) above and further testing required if any.

- 4. Evaluation of Flyash Sample (if applicable):**
- a) To carry out various physical and chemical tests on fly ash sample i.e. Blaine's fineness, lime reactivity, specific gravity, loss on ignition and other chemical tests as per IS: 3812, conforming to grade-I.
- b) To advise the suitability of fly ash sample based on the test results of a) above.
- 5. Evaluation of water:** To carry out various physical and chemical tests as per IS: 456 and IS:3025.
- 6. Evaluation of admixtures:** To carry out various physical and chemical tests as per IS: 9103.
- Note:** Test certificate shall be obtained from the supplier to compare the values given in Table 2 of IS: 9103 i.e. uniformity tests and requirements.
- 7. Concrete Mix Design:** Based on the provisions of technical specification, the Following may be specified by site Construction department/Quality department **
- a) For RCC Work
- i. Grade of concrete :
 - ii. Slump required, mm :
 - iii. Cement- Type and grade :
 - iv. Max Size of Aggregates, mm:
 - v. Exposure conditions :
 - vi. Maximum water-cement ratio:
 - vii. Minimum cement content :
 - viii. Concrete admixture to be used or not (If yes, specify the brand/ type/batch no. of admixture) :
 - ix. Fly ash to be used or not (If yes, indicate % of fly ash to be used):
- b) For PCC work: Same as i) to ix) of a) above
- c) For piling work (if required): Same as i) to ix) of a) above
- 8. Details of material sampled:** In order to facilitate the above mentioned tests, specified quantities of samples have been collected and sealed jointly (by Owner – Quality department, Execution department and contractors' representative) is being sent for testing. The impression of seal has also been punched below.

a) Quantity of material required for each mix-design:

Sl. No.	Material Description	Quantity Required
i)	Cement	2 bags (sealed in double polythene bags)
ii)	Coarse Aggregates	100 Kg of each fraction as explained below: e.g.; If Maximum size of aggregates (MSA) is 20mm, then 100 Kg each of 20-10mm and 10mm down are required. If MSA is 40mm then 100Kg each of 40-20mm, 20-10mm and 10mm down are required.
iii)	Fine Aggregates	200Kg
iv)	Chemical Admixtures	2 Litres
v)	Water	100 Litres
vi)	Fly ash (If decided to be used)	100Kg

b) Quantity of material required for Alkali-Aggregate reactivity

Sl. No.	Material Description	Quantity Required
i)	Coarse aggregate	
a)	80-40mm	60Kg
b)	40-20mm	60Kg
c)	20-10mm	60Kg
d)	<10mm	60Kg
ii)	Fine aggregates	60Kg
iii)	Cement	2 samples (1 bag each), contemplated for use in construction.

c) Impression/ Punch Mark of seal:

You are requested to kindly forward us the test reports along with the recommendations regarding the suitability of materials to us at the earliest.

Thanking you,

Yours faithfully,

Name:

Designation:

Contact Number:

Email ID:

(Quality department Representative of Owner)

Note:

1. Based on provisions of technical specification, the testing charges for all the above-mentioned tests shall be borne by the contractor.
2. The content of the letter is for guidance only, and if required may be suitably modified to suit the specific requirements of the package in consultation with Construction and quality department.

** This line may be deleted in the letter sent to the institute.

INDICATIVE FIELD QUALITY PLAN

Annexure II

SUPPLIERS NAME AND ADDRESS		ITEM : Civil Work		QP NO. :		PROJECT:		A&N GAS PROJECT 50MW		
		SUB-SYSTEM : GEOTECH INVESTIGATION, FOUNDATIONS, EXCAVATION & FILL, SITE LEVELLING, CONCRETE, ROAD, BUILDING ETC.		REV. NO. :		PACKAGE:		EPC CIVIL WORKS PACKAGE		
				DATE :		CONTRACT NO. :				
				PAGE :		MAIN CONTRACTOR :				
Sl. No	Activity and operation	Characteristics / Instruments		Class of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record	Remarks
1	2	3		4	5	6	7	8	9	10
1	GENERAL REQUIREMENTS									
A	Setting up of Field QA&QC laboratory, Availability of requisite laboratory set up and equipment in good working condition & duly calibrated well before commencement of concerned activity.	As agreed / required	B	Physical	Once prior to start of work and thereof monthly	Tech Specs and Const. Drawings		SR	√	The contractor shall establish and mobilize the requisite laboratory equipment/set up and skilled QA&QC manpower within 30 days from the mobilization date of Main contractor at site. Functioning & calibration status of laboratory equipment in proper working condition to be verified on monthly basis.
B	Submission of QA & QC manpower deployment schedule and availability of manpower	As agreed / required	B	Physical	Manpower shall be deployed progressively as per the work front and discipline wise progress	Tech Specs and Const. Drawings		SR	√	
C	Sampling for testing of construction materials (Coarse aggregate, fine aggregate etc.), materials for concrete mix design etc.	As agreed / required	A	Physical	Once per each source	Tech Specs and Const. Drawings		SR/TR	√	Test report along with the recommendations from Owner acceptable laboratories to be submitted to EIC/FQA head for their review and acceptance.
D	Submission of Monthly Test/QA reports/data	As agreed / required	A	Physical	Monthly	Tech Specs and Const. Drawings		SR/TR	√	
E	Stacking and storage of construction materials and components at site	As per IS:4082	B	Physical	Random minimum 10% in each week	Tech Specs and Const. Drawings, Manufacturer's guidelines and IS 4082		SR		
F	Survey	To mark reference co-ordinate & elevation	As required / agreed	B	Physical	Each Bench Mark/ Grid Pillars	As per technical specifications/approved drawings	SR	√	Joint protocol for co-ordinate and elevation
2	EXCAVATION, FILLING/BACKFILLING AND COMPACTION WORKS									
2.1	Excavations-									
i	Nature, type of soil/rock before and during excavations	As agreed / required	B	Visual/ Measurement	Random minimum 10%	Tech Specs and Const. Drawings/IS 1892		SR	√	GTI report to be referred. In case of ambiguity localised GTI may be carried out or excavation samples to be sent to NTPC acceptable Third party lab for determination of soil/rock strata.
ii	Initial ground level before start of excavations, shape, Dimensions of excavations & Side slope of final excavation and Final excavation levels.	As agreed / required	B	Measurement	100%	Tech Specs and Const. Drawings		SR	√	
2.2	Excavation in Hard Rock- If required									
i	Receipt, Storage, accountability of Explosive	As agreed / required	B	Physical	Random minimum 10% in each week	Indian Explosive Act 1940/all statutory norms, Tech Specs and Const. Drawings		SR	√	Owner approved specialist blasting agency such as CMRI, NIRM shall be deployed at site for trial blasts, design blasts, blast vibration monitoring etc.
ii	Execution of Blasting Operation	As agreed / required	B	Physical	Random minimum 10% in each shift	IS:4081, Tech Specs and Const. Drawings/ scheme		SR		
iii	Submission of Blasting report to EIC	As agreed / required	B	Physical	Each blast	Tech Specs and Const. Drawings			√	Seismographs shall be deployed at site for monitoring of blast operation vibrations.
iv	Excavation in Hard Rock (Blasting Prohibited)	As agreed / required	B	Physical	100%	As per approved drawing/ scheme, Tech Specs and Const. Drawings		SR	√	
2.3	Filling/ Backfilling									
i	Suitability of fill material	Grain size analysis, Organic Matter, Liquid Limit, plastic limit, Shrinkage limit & Free Swell Index and chemical analysis(like Organic Matter, Calcium carbonate, pH value, Total soluble sulphate etc.) as required in TS	As per IS: 2720	B	Physical	Once per each type of source or change of source subject to a min. of 2 samples	IS:2720 (Pt.IV), IS:2720 Pt.XXII, IS:2720 (Pt.XI)/relevant part, Tech Specs and Const. Drawings	SR/TR	√	Test report along with the recommendations regarding suitability of the fill material from NTPC acceptable laboratories to be submitted to EIC for review and acceptance. Geo technical investigation report may also be considered as basis for suitability of fill material if available as per the discretion of EIC.
2.4	Standard proctor Test	Optimum moisture content (OMC) and max. dry density (MDD) of filling/backfilling materials	As per IS: 2720	A	Physical	One in every 10000 cum for each type and source of fill materials	IS 2720 (Pt.VII), Tech Specs and Const. Drawings	SR/TR	√	
2.5	Compaction of Filling / Backfilling Works									
i	Moisture content	Moisture content of fill before compaction	As per IS: 2720	B	Physical	Random minimum 10%	IS 2720 (Pt.II), Tech Specs and Const. Drawings	SR/TR	√	
ii		Dry density by core cutter method ---- OR---- Dry density in place by sand replacement method ---- OR---- any other method as per IS 2720	As per IS: 2720	A	Physical	i) For foundation back fill: one in every 10 foundations for each compacted layer. ii) For area filling: every 1000 SQM area for each compacted layer.	IS 2720 (Pt. XXIX)/ IS 2720 (Pt. XXVIII)/ IS 2720 Relevant Part/ Tech Specs and Const. Drawings	SR / TR	√	Number of readings for field density test may be decided by EIC according to the size of the soil bed which is subject to testing as the dry density of the soil varies appreciably from point to point. However, in no case, readings should be less than three as compaction result drawn out of less than three readings may give erroneous result.

iii		Relative density (Density Index)	As per IS: 2720	A	Physical	----do---- (I) & (ii) above	IS 2720 (Pt. XIV), Tech Specs and Const. Drawings	SR/TR	✓	
3	RAW MATERIALS FOR CONCRETE									
3.1	CEMENT									
i	Material	Physical and chemical properties as per relevant IS codes	As required/ agreed	A	Review of MTC/ test reports	for each manufacturing Week number	IS : 269/ IS:1489/ IS:455, Tech Specs and Const. Drawings	MTC	✓	To be procured from BIS approved source having valid BIS License. Each consignment of cement shall be duly correlated with manufacturers' TC.
ii		Testing of cement for Setting time (Initial & Final) and compressive strength	As per IS:4031	A	Physical	one for each manufacturing Week number	IS : 269/ IS:1489/ IS:455, Tech Specs and Const. Drawings	SR/Test Report	✓	Additionally, If the cement is stored more than 90 days in godown of contractor then the same shall be retested for Setting time & Comp. Strength.
3.1 b	Fly ash (if applicable)									
		Physical and chemical properties as per IS 3812 Part I (Table 1 and 2)	As per IS 3812 Part I	A	Physical	once in a week or change of source whichever is earlier	IS:3812 Part I and Tech. Spec./Design mix.	SR/Test Report	✓	Batching plant shall have facility for mixing of fly ash.
3.2	Coarse Aggregate									
i		Moisture content	IS:2386	B	Physical	To be done every day before start of work	IS : 456/IS : 383/IS: 2386 Part-III/Tech Spec	SR/LB	✓	During monsoon, frequency may be increased and accordingly water content in concrete will be adjusted.
ii		Sieve analysis, flakiness index, elongation index	IS:2386	B	Physical	One per 100 cum. or part thereof	IS: 2386 Part-I, IS:383 / Tech Spec	SR/LB/TR	✓	
iii		Specific gravity, Soundness, Water absorption, Deleterious materials (coal & lignite, clay lumps, material finer than 75 micron sieve, soft fragment, shale, Total of % of all deleterious materials),	IS:2386	A	Physical	Once for each source & for every change of source	IS: 2386 Part-III, IS: 2386 Part-II, IS: 2386 Part-V, IS:456, IS:383/Tech Spec	SR/LB/ TR	✓	
iv		Alkali aggregate reactivity and Petrographic examination	IS 2386	A	Physical	Once for each source & for every change of source.	IS: 2386 (Part-VII/VIII), IS:383 Spec/ASTM C-1260 / ASTM 1293 /Tech	SR/LB/ TR	✓	During Design mix, these tests to be carried out
v		Crushing value, Abrasion value and Impact value	IS:2386	A	Physical	Once for each source & for every change of source	IS:383, IS-2386 Part IV/Tech Spec	SR/LB/ TR	✓	
3.3	Fine Aggregate									
i		Moisture content	IS:2386	B	Physical	To be done every day before start of work	IS : 456/IS : 383/IS: 2386 Part-III/Tech Spec	SR/LB	✓	During monsoon, frequency may be increased and accordingly water content in concrete will be adjusted.
ii		Sieve analysis, Silt content	As agreed / required	B	Physical	One per 100 cum. or part thereof	Tech Spec/ IS 2386 / IS 456/ IS 383	SR/LB/ TR	✓	
iii		Specific gravity, Soundness, Water absorption, Deleterious materials (coal & lignite, clay lumps, material finer than 75 micron sieve, soft fragment, shale, Total of % of all deleterious materials (excluded mica as well as included mica content)), organic impurities	IS:2386	A	Physical	Once for each source & for every change of source	IS: 2386 Part-III, IS: 2386 Part-II, IS: 2386 Part-V, IS:456, IS:383/Tech Spec	SR/LB/ TR	✓	During Design mix, these tests to be carried out
iv		Alkali aggregate reactivity and Petrographic examination	IS 2386	A	Physical	-do-	IS: 2386 (Part-VII/VIII), IS:383 Spec/ASTM C-1260 / ASTM 1293 /Tech	SR/LB/ TR	✓	
3.4	Water									
		Complete Testing as per IS:456-2000	As per IS:456	B	Testing	Once for each source and thereafter yearly in case of borewell. If water is used from open source like river, stream, canal etc., then water testing is to be done quarterly.	IS:456-2000/ Tech. spec.	TR	✓	
3.5	Admixtures for Concrete									
		Material/Type of admixture and its suitability	As per IS:9103	A	Review of MTC/ test reports	For each lot received at site	As per Designed mix and IS:9103/ Tech. Spec.	Test Report/ MTC	✓	Random sample may be send to Owner acceptable third party testing lab. for testing requirements as per TS and IS codes. Frequency of check may be decided by EIC/Head FQA based on quantity, requirement and Relevant IS code.

4 CONCRETING (MIXING, CONVEYING, PLACEMENT, COMPACTION, CURING & TESTING)																						
4.1 Batching Plant (if installed)																						
i		Calibration of Batching Plant		A	Physical	After initial setting up of batching plant, calibration by NABL accredited agency must be done before use of batching plant for production of concrete.	Review of calibration chart/ Certificate/IS 4925	Calibration Certificate	√	Additionally, Batching Plant shall be calibrated regularly at least once in a 3 months in-house. The weights for batching plant calibration to be calibrated once in year by NPL/NABL accredited lab./Weights & Measures Dept.												
4.2 CONCRETE																						
i		Design Mix.	As per IS 456	A	Physical	Before the start of the work	Tech. Spec., IS 456	TR	√	Design mix will be carried out at the start of the work with all tests as per Annexure I.												
ii		4 Trial mixes to ascertain the workability and cube strength	After receiving the recommended design	A	Physical	4 trial mix. for each mix proportion as per IS 10262	Tech. Spec., IS 456/IS 10262	SR/LB	√	The concrete for field trials shall be produced by methods of actual concrete production. (Initially Baby/mini mixture may be used till the installation of Batching Plant at site).												
iii		Concrete Cube strength Test	IS:516	A	Physical	As per IS 456 clause 15.2.2	IS:516, IS:456, Tech. Spec.	SR/LB/ TR	√	<p>Quantity of Concrete in the Number of Samples</p> <table border="1"> <thead> <tr> <th>Work, m³</th> <th>Number of Samples</th> </tr> </thead> <tbody> <tr> <td>1 - 5</td> <td>1</td> </tr> <tr> <td>6 - 15</td> <td>2</td> </tr> <tr> <td>16 - 30</td> <td>3</td> </tr> <tr> <td>31 - 50</td> <td>4</td> </tr> <tr> <td>51 and above</td> <td>4 plus one additional sample for each additional 50 m³ or part thereof</td> </tr> </tbody> </table> <p>NOTE—At least one sample shall be taken from each shift.</p>	Work, m ³	Number of Samples	1 - 5	1	6 - 15	2	16 - 30	3	31 - 50	4	51 and above	4 plus one additional sample for each additional 50 m ³ or part thereof
Work, m ³	Number of Samples																					
1 - 5	1																					
6 - 15	2																					
16 - 30	3																					
31 - 50	4																					
51 and above	4 plus one additional sample for each additional 50 m ³ or part thereof																					
iv		Workability - slump test	IS:1199	B	Physical	At the time of concrete pouring at site every two hrs.	IS:456/Tech. Spec.	SR/LB/ TR	√													
v		Temperature Control of Concrete as per Tech. spec./IS standard	Thermometer	B	Physical	100%	Temperature as per technical specification/Relevant standard	SR	√													
vi		Water Cement Ratio		B	Physical	For each batch of concrete	As per approved Design Mix	SR/Batch slip	√													
vii		Placement of concrete, Compacting, Curing	As required	B	Physical	At Random minimum 10%	IS:456, Period of curing as per IS 456	SR														
4.3 TESTS / CHECKS ON RCC STRUCTURE IN HARDENED CONDITION																						
i		Visual inspection of concrete surface just after removal of shuttering	As agreed / required	B	Visual	100%	As per IS:456/ tech. Specification.	SR														
ii		Dimensional check on finished structures	As agreed / required	B	Measurement	100%	As per IS:456/ tech. Specification and Const. Drawings	SR/LB	√													
iii		Position and alignment of embedded parts and inserts	As agreed / required	B	Visual	100%	As per provisions and tolerances of equipment supplier, Tech Specs and Const. Drawings															
iv		Embedment of inserts in concrete shall be checked for gap if any using hammer for all dynamic foundations	As agreed / required	B	Physical	100%	As per Technical Specification	SR	√	No hollow sound												
v		Submission of grouting / repair methodology to EIC for approval if concrete surface / position and alignment of embedded parts / inserts are found defective	--	B	Review and approval	once for each type of defect	As per provisions and tolerances, Tech Specs and Const. Drawings		√													
vi		UPV Tests on top deck of TG foundation, Columns & Other Foundations as per Technical Spec.	IS : 516	A	Physical	As per Tech. Spec.	IS : 516/ As per Technical Specification	Test Report	√													
vii		Core Test	IS:516	A	Physical	As required by Owner EIC.	As per IS:456, IS 516	SR/LB/ TR	√	Compressive strength based on core test is required to be carried out in case of doubt regarding the grade of concrete used, either due to poor workmanship or based on the results of cube strength test as per 4.2 ii) above and as per discretion of EIC.												
viii		Water Tightness Test of liquid retaining structure/ tanks	As required	A	Test	100%	IS:3370/ Tech. Specification	SR/LB	√													

5	REINFORCEMENT STEEL AND ITS PLACEMENT									
i	Material	Physical and chemical properties as per relevant IS codes and Tech spec.	As agreed/required	A	Review of MTC	Each batch/lot of delivery	As per IS 1786, IS 432, IS 1566, IS 13920, Tech spec and cont. drawing	MTC	√	To be procured from Owner approved source.
	Coupler	Physical and chemical properties as per relevant IS codes and Tech spec.	As agreed/required	A	Review of MTC	Each batch/lot of delivery	IS 16172, Tech spec and cont. drawing	MTC	√	MTC shall contain all the parameters specified in the technical specifications
ii		Freedom from cracks surface flaws, Lamination & excessive rust.	As agreed / required	B	Visual	Random minimum 10% in each shift	IS: 1852, IS:432, IS:1786, Tech Specs and Const. Drawings	SR	√	To be checked at site. Steel collected from source should be free from excessive rust. To be stored as per Technical Specs.
iii		Bar bending schedule with necessary lap, Spacers & Chairs	As agreed / required	B	Physical & Measurement	Random minimum 10% in each shift	Approved Drawings, Tech Specs and Const. Drawings, IS:2502	SR	√	
iv		Acceptance - disposition of cage w.r.t. reference axes, cover, spacing of bars, spacers and chairs after the reinforcement cage is put inside the formwork	Measuring tape & as required	B	Visual & Measurement	Random minimum 10% in each shift*	IS 456, Tech Specs and Const. Drawings	SR	√	* for foundations, frequency shall be Each foundation
6	FOUNDATION SYSTEM									
i		Foundation casting - Layout, Shape, dimensions, Reinforcement, concreting, curing etc.	As required / agreed	B	Physical	Each foundation	As per technical specifications and construction drawings	SR	√	lines and levels to be checked. Concrete Grade to be checked as per Mix Design
7	STAGING AND FORMS									
i		Materials and accessories	As agreed / required	B	Visual	Once before start of work	As per relevant IS, Tech Specs and Const. Drawings	SR		
ii		Soundness of staging, shuttering and scaffolding including application of mould oil / release agent	As agreed / required	B	Visual	Once before start of work	As per manufacturer's spec. and as per 3696,4014, 4990, Tech Specs and Const. Drawings	SR		
iii		Acceptance of formwork before start of concreting : disposition w.r.t. reference axes, size, etc.	Measuring tape & as required	B	Physical / visual	Before start of each concreting	As per provisions and tolerances in IS 456, Tech Specs and Const. Drawings	SR	√	
g	EMBEDDED PARTS (INCLUDING LAYING OF RAILS & ANCHOR FASTENERS) --If Applicable.									
i		Material	As agreed / required	B	Review of MTC/ test reports	Each batch/lot of delivery	As per Tech Specs and Const. Drawings	SR/MTC	√	
i		Position / alignment / levels of embedded parts / bolt hole / pipe sleeves / rails / PVC pipes / etc. as per TS and construction Drg.	As agreed / required	B	Physical/ measurement	100%	As per Tech Specs and Const. Drawings	SR/ Protocol	√	Exposed surface of the embedded parts other than holding down bolts are to be painted with as per technical specifications.
ii		Welding / tying of embedment to reinforcement	As agreed / required	B	Physical/ measurement	Random minimum 10% in each shift	As per Tech Specs and Const. Drawings	SR		


10	JOINTS IN CONCRETE, DAMP PROOF COURSE									
i	JOINTS IN CONCRETE	Joint material - bitumen impregnated fibre board, PVC water stops, Sealing compound, Expanded polystyrene board, Hydrophilic strip, Acrylic polymer etc. (as given in technical spec)	As per manufacturer Standards	A	Review of MTC/ test reports	Each batch/lot of delivery	Tech Specs and Const. Drawings, IS 1838, IS 1834, IS12200	SR/MTC	✓	
ii	DAMP PROOF COURSE	Material - Hot bitumen and water proofing materials etc. (as given in technical spec).	As agreed / required	A	Review of MTC/ test reports	Each batch/lot of delivery	Tech Specs and Const. Drawings, IS 702	SR/MTC	✓	
iii		Acceptance of installation of Joints material & Acceptance of damp proof course.	As agreed / required	B	Acceptance	Each installation randomly	Tech Specs and Const. Drawings		✓	
11	GROUTING									
i		Material	As agreed / required	A	Review of MTC/ test reports	Each batch/lot of delivery	Tech Specs and Const. Drawings	SR/MTC	✓	
ii		Compressive strength of grouting material before its use.	As agreed / required	A	Physical	Each batch/lot of delivery	Tech Specs and Const. Drawings	SR/LB/ TR	✓	
iii		Compressive strength of cubes after grouting.	As agreed / required	A	Physical	Random minimum 10% 10 %	Tech Specs and Const. Drawings	SR/LB/ TR	✓	
iv		Acceptance of the grouts : Mixing, placement, application and grout pressure (as applicable)	As agreed / required	B	Physical	Each grout section	Tech Specs and Const. Drawings	SR	✓	
12	MASONARY WORKS									
12.1	Test on Bricks									
i		Compressive strength, water absorption, efflorescence.	As agreed / required	A	Measurement/ Physical Test	As per relevant IS Code/ One Sample for 30,000 nos. or part thereof	IS: 1077, IS:13757, IS: 12894 / Tech Specs and const. Drawings	SR/LB/ TR	✓	
ii		Dimensions , shape, warpage.	As agreed / required	B	Measurement/ Physical Test	As per relevant IS Code/ One Sample for 30,000 nos. or part thereof	IS: 1077, IS:13757, IS: 12894 / Tech Specs and const. Drawings	SR/LB	✓	Warpage test is applicable for facing bricks only as per IS:2691.
12.2	Modular aerated panel									
i	Material	As required	As agreed / required	A	Review of test report	Each batch/lot of delivery	Tech Specs and Const. Drawings	SR/LR	✓	
12.3	Autoclaved Aerated Concrete (AAC) block									
i		Material	As agreed / required	B	Review of MTC	Each batch/lot of delivery	Tech Specs /IS 2185 Part III and Const. Drawings	SR/MTC	✓	
ii		Compressive Strength and Density	As agreed / required	A	Physical	As per relevant IS Code/ One Sample for 10,000 nos. or part thereof	Tech Specs /IS 2185 Part III	TR	✓	
iii		Dimensions, shape	As agreed / required	B	Physical	As per relevant IS Code/ One	Tech Specs /IS 2185 Part III	TR/SR	✓	
12.4	Test on Mortar									
i	Sand	Grading	As agreed / required	B	Test	once per 100 Cum or part thereof	IS:2116	SR/LB	✓	
ii		Compressive strength	As agreed / required	B	Test	Random minimum 10%	IS 2250-1981, Tech Specs and Const. Drawings	SR/TR	✓	
12.5	Masonry construction									
		Workmanship, verticality and alignment	As agreed / required	B	Visual/ Physical	100%	IS 2212, IS 1905 , Tech Specs and Const. Drawings	SR/LB		
13	PLASTERING- MATERIAL AND WORKMANSHIP									
i	Sand	Deleterious Material	As agreed / required	B	Physical	Once per source	IS : 2386 (Part-I &II) & IS :2116, Tech Specs and	SR/TR	✓	
ii		Grading	As agreed / required	B	Physical	50 Cum./or part thereof	Tech Specs and Const. Drawings	SR/TR	✓	
iii		Silt content	As agreed / required	B	Physical	One per 100 cum., or part thereof	CPWD/ Tech Spec/ IS 2386/ IS 456/ IS 383	SR/LB/ TR	✓	
iv	Stone grit plaster/ granular textured coat finish (if applicable)	Material	As agreed / required	B	Review of MTC	For each lot received at site	Tech Specs and Const. Drawings	SR/MTC	✓	
v	Galvanized wire mesh (if applicable)	Galvanized hexagonal wire netting for lath plastering	As agreed / required	B	Review of MTC/ test reports	Each batch/lot of delivery at site	Tech Specs and Const. Drawings	SR/MTC	✓	
vi		Thickness, Trueness and finishing of plaster, grooves etc.	As agreed / required	B	Visual/ Measurement	Random minimum 10% in each shift	Tech Specs and Const. Drawings	SR/LB	✓	
14	PAINTING SYSTEM - CONCRETE WORKS AND PLASTERED MASONARY SURFACES									
i	Materials and accessories- Oil Bound, Acrylic Emulsion, Chemical Resistant, Oil Resistant Paint etc. as applicable (as given in technical spec).	Shade, type from brand and manufacturer as approved by EIC.	As agreed / required	A	Review of MTC/ test reports	Each batch/lot of delivery	Tech Specs and Const. Drawings	SR/MTC	✓	
ii	Surface preparation	As required	As agreed / required	B	Physical / visual	Random minimum 10% in each shift	Tech Specs and Const. Drawings	SR		
iii	Acceptance of painted surfaces	Shade, finish, WFT	As agreed / required	B	Physical/visual	Each surface at Random minimum 10%	Tech Specs and Const. Drawings	SR	✓	
14.2	PAINTING SYSTEM - STEEL WORKS (OTHER THAN STRUCTURAL STEEL WORKS)									
i		Painting Materials and accessories	-	A	Review of MTC/ test reports	Each batch of delivery	Tech Specs and Const. Drawings	SR/MTC	✓	
ii		Surface preparation	As agreed / required	B	Physical / visual	Each Erection Mark	Tech Specs and Const. Drawings, Relevant code/ standards	SR	✓	
iii		Primer Thickness	Elcometer	B	Measurement	Each Erection Mark	Tech Specs and Const. Drawings	SR	✓	
v		Acceptance of painted surfaces : DFT, Finish, Shade	Elcometer	B	Visual and measurement	Each Erection Mark	Tech Specs and Const. Drawings	SR	✓	
15	SHEETING, INSULATION & ALLIED WORK									


i		Material : Profiled Colour coated Metal Deck & Cladding sheets	As agreed / required	A	Review of CHP/ Test reports	Each lot received at site	Tech Specs and/ Const. Drawings/ profiled drawing	CHP/TR	√	Co-relation with CHP/TR (Video-jet printing or coil no. or any other means) may be verified with the lot received at site.
ii		Insulation material (other than Chimney insulation), galvanized wire net, aluminium foil, fasteners	As agreed / required	A	Review of MTC/ test reports	Each lot received at site	Tech Specs and/ Const. Drawings	SR / LB/MTC	√	All tests as per specification
iii		Insulation material (for Chimney insulation)	As agreed / required	A	Review of MTC/CHP/MDCC reports	Each lot received at site	Tech Specs and/ Const. Drawings	MTC/CHP/MDCC/Insp report	√	
iv		Installation, lap alignment & workmanship.	As agreed / required	B	Visual/ Physical	Random minimum 10% in each shift	Tech Specs and/ Const. Drawings	SR	√	No gas cutting of colour coated sheets acceptable .
v		Finishing and acceptance	As agreed / required	B	Visual/ Physical	Each installation	Tech Specs and/ Const. Drawings	SR/LB	√	
16	DOORS , WINDOWS, VENTILATORS & GRILLS									
i	Steel doors	Materials & Check for shape tolerances thickness, welding & finishing of sections as per TS	As agreed / required	B	Visual/ Physical / test report	For each lot received at site	Tech Specs and Const. Drawings	SR / LB/TR	√	Review of test report
ii	Wood/Timber	Moisture content & anatomy	As agreed / required	A	Physical	For each lot received at site	Tech Specs and Const. Drawings/ IS 287	SR/LB	√	Tests to be carried out from Owner acceptable third party lab. like Forest Research Institute Dehradun. Frequency of check may be decided by EIC based on quantity and requirement.
iii	Wood work in frames	Check for dimensions, surface finish	As agreed/ required	B	Physical	Random minimum 10% for each installation	Tech Specs and Const. Drawings	SR	√	
iv	Flush Door shutter	End emersion test, knife test, adhesion test	As agreed/ required	A	Review of MTC/test reports	For each lot received at site	IS 2202, Tech Specs and Const. Drawings	SR/MTC	√	The required tests to be carried out from Owner acceptable third party lab. like Forest Research Institute Dehradun in addition to review of MTC/TR. Frequency of check may be decided by EIC based on quantity, requirement and IS 2202.
v	Particle Door		As agreed / required	A	Review of MTC/ test reports	For each lot received at site	IS:12823, Tech Specs and Const. Drawings	SR/MTC	√	The required tests to be carried out from Owner acceptable third party lab. like Forest Research Institute Dehradun in addition to review of MTC/TR. Frequency of check may be decided by EIC based on quantity, requirement and IS 12823.
vi	Anodised aluminium works (Door & Window)	Materials- Aluminium sections, Coating	As agreed / required	A	Visual/ Physical / test report	For each lot received at site	IS: 1948, IS: 1949, IS:733, IS:1285, IS:1868, IS:11857/ Tech Specs and Const. Drawings	SR / LB	√	Randomly one sample of each type may be send to Owner acceptable third party testing lab. for testing requirements as per TS and IS codes. Anodization shall be as per Tech. Spec. Frequency of check may be decided by EIC based on quantity, requirement and relevant IS code.
vii	Fire proof doors	Material & Receipt inspection	As agreed / required	A	Review of MTC/ purchase order (unpriced copy) / drawings of suppliers / certificate of CBRI/CPRI/GOV. LAB. & Visual/ Physical/ Review of MTC	For each source & For each lot received at site	Tech Specs and Const. Drawings	SR/MTC	√	The door drawing proposed for supply should have been tested and approved by CBRI Roorkee/CPRI/GOV. LAB. for the similar dimensions for minimum fire rating as required in Tech. spec.
viii	Rolling shutters	Surface finish and thickness of plate of approved make and DFT	As agreed / required	B	Physical / visual / review of MTC	Random for each lot of delivery	Tech Specs and Const. Drawings	SR/MTC	√	
ix	Steel windows / Grills/ Louvre	Material fabrication and fixtures	As agreed / required	B	Review of MTC/ test reports	Each lot of delivery	IS: 1038 / IS:1361, IS: 7452 and Tech Specs and Const. Drawings	SR/MTC	√	
x	Doors / Windows Sections	Material - Rolled Steel, Z Sections, T-iron frames sections, Plates etc.	As agreed / required	B	Review of MTC/ test reports	Each lot of delivery	Tech Specs and Const. Drawings	SR/MTC	√	
xi	Glass and glazing, Reflective toughened glass-as per TS.	Material	As agreed / required	B	Review of MTC/ test reports	Each lot of delivery	IS: 14900, IS:1081, IS: 3548, IS:5437 Tech Specs and Const. Drawings	SR/MTC	√	
xii	Curved dome on roof/ Poly Carbonate Sheet	Materials - As per tech spec.	As agreed / required	B	Review of MTC/ test reports	Each lot of delivery	Tech Specs and Const. Drawings	SR/MTC	√	Randomly one sample of each type may be send to Owner acceptable third party testing lab. for testing requirements as per TS and IS codes. Frequency of check may be decided by EIC based on quantity, requirement and Relevant IS code.


xiii	False Ceiling	Materials - As per tech spec.	As agreed / required	A	Review of MTC/ test reports	For each lot received at site	Tech Specs and Const. Drawings	SR/MTC	√	Randomly one sample of each type may be send to Owner acceptable third party testing lab. for testing requirements as per TS and IS codes. Frequency of check may be decided by EIC based on quantity, requirement and Relevant IS code.	
xiv		Installation finishing and acceptance	As agreed / required	B	Visual / physical	Random minimum 10%	Tech Specs and Const. Drawings	SR			
17	WATER PROOFING (Roof / Basement Treatment)										
i		Methodology for the application of water proofing system	As required	B	Review	for each type of treatment	Tech Specs and Const. Drawings	SR	√		
ii	Graded under bed	Levels / slopes	As required	C	Physical	100%	Tech Specs and Const. Drawings				
iii	Elastomeric coatings	Material- Primer coat, finishing coat	As required	B	Review of MTC/ test reports	Each lot of delivery	Tech Specs and Const. Drawings	SR/MTC	√	MTC shall contain all the parameters specified in the technical specifications	
iv	Wearing course	Materials - As per tech spec.	As required	B	Review of MTC/ test reports	Each lot of delivery	Tech Specs and Const. Drawings	SR/MTC	√	MTC shall contain all the parameters specified in the technical specifications	
v		Acceptance of water proofing work	As agreed / required	B	Physical	100%	Tech Specs and Const. Drawings				
18	Fencing and Gates										
i	PVC coated chain link fencing (IS 2720), Welded wire mesh (IS 1566), Reinforced barbed tape galvanised (IS 2629) etc.	Materials	As agreed / required	A	Review of MTC/ test reports	Each lot of delivery	Tech Specs and Const. Drawings	SR/MTC	√	MTC shall contain all the parameters specified in the technical specifications	
ii	Structural steel, painting system, caster wheel, ball and bearing, fixtures and fasteners	Materials	As agreed / required	A	Review of MTC/ test reports	Each lot of delivery	Tech Specs and Const. Drawings	SR/MTC	√	MTC shall contain all the parameters specified in the technical specifications	
iii		Alignments, erection painting, DFT etc. and acceptance of the installation and working	As agreed / required	B	Physical / measurements	Each installation	Tech Specs and Const. Drawings	SR	√		
19	FLOOR FINISHES AND ALIED WORKS										
i	Cement Concrete Flooring	Glass/ PVC strips in joints	As agreed / required	B	Physical	Random minimum 10% in each shift	Tech Specs and Const. Drawings	SR			
ii	Ceramic tiles, vitrified tiles, glass mosaic, acid alkali resistant tiles, heavy duty cement concrete tiles (Materials as per TS)	Materials	As agreed / required	B	Review of MTC / test reports	Each lot of delivery	Tech Specs and Const. Drawings	SR/MTC	√	MTC shall contain all the parameters specified in the technical specifications. In case non-availability of MTC, sample to be tested as per relevant IS code.	
iii	Interlocking Blocks	Materials	As agreed / required	A	Review of MTC / test reports	Each lot of delivery	Tech Specs and Const. Drawings	SR/MTC	√	MTC shall contain all the parameters specified in the technical specifications	
iv	Kota Stone, Granite and Marble	Materials: Quality, texture, thickness, colour for each lot of delivery	As agreed / required	B	Physical	Each lot of delivery	Tech Specs/ BOQ and Const. Drawings	SR/TR	√		
v	Metallic / non-metallic hardener	Material	As agreed / required	B	Review of MTC / test reports	Each lot of delivery	Tech Specs and Const. Drawings	SR/TR/MTC	√		
vii	Acid / alkali and oil resistant high built seamless epoxy based resin and treatment	Material	As agreed / required	A	Review of MTC / test reports	Each lot of delivery	Tech Specs and Const. Drawings	TR/MTC	√	work to be done by skilled manpower	
		Surface preparation (as applicable)	As agreed / required	B	Physical	Random minimum 10% in each shift	Tech Specs and Const. Drawings, IS 2395				
viii	Rubber Flooring	Material	As agreed / required	A	Review of MTC/ test reports	Each lot of delivery	Tech Specs and Const. Drawings / IS 809	TR/MTC	√	MTC shall contain all the parameters specified in the technical specifications	
ix		Finishing and acceptance of all above BOI	As agreed / required	B	Physical	100%	Tech Specs and Const. Drawings	SR			


20	WATER SUPPLY / SANITARY INSTALLATIONS									
i	Material	Sanitary items and fixtures i.e. water closets, urinals, wash basins, sinks, mirrors, shelves, towel rail, soap containers, geyser, water cooler, etc. water supply / sanitation pipes (GI/ MS/ SCI/ CI / RCC), manhole cover and frames, Over head / loft type etc. as per TS	As agreed / required	B	Review of MTC/ test reports	Each lot of delivery	Tech Specs and Const. Drawings	SR/TR/MT C	√	
ii		leakage of pipes	As agreed / required	B	Physical	Each installation	Tech specs and const drawings	SR	√	
iii		Acceptance of installations of all sanitary items and fixtures	As agreed / required	B	Acceptance	100%	Tech Specs and Const. Drawings	SR		
20.2	RCC Pipes									
i	Material (As per TS)	RCC pipes	As agreed / required	A	Review of MTC/ test reports	Each lot of delivery	Tech Specs, IS 458 and Const. Drawings	SR/TR/MT C	√	To be procured from BIS Approved Sources having valid BIS License.
ii		Acceptance and leakage	As agreed / required	B	Physical	Random minimum 10%	Tech Specs and Const. Drawings	SR		
20.3	Water Storage Tanks									
i	Material (As per TS)	Over head / loft type	As agreed / required	A	Review of MTC/ test reports	Each lot of delivery	Tech Specs and Const. Drawings	SR/TR/MT C	√	To be procured from BIS Approved Sources having valid BIS License.
ii		Acceptance and leakage	As agreed / required	B	Acceptance	Random minimum 10%	Tech Specs and Const. Drawings	SR		
21.0	SPECIAL ITEMS									
21.1	Earthing Mat (Grounding System)									
i	Material (As per TS)	Earthing mat	As agreed / required	A	Review of MTC/ test reports	Each lot of delivery	As per relevant IS and Tech. Specs / Manufacturer's, IS 3043	SR/TR/MT C	√	
ii		Weld sizes & length	Visual/Tape	B	Visual/ Measurement	100%	Tech Specs and Const. Drawings			Owner approved electrodes shall be used
iii		D P test	DP test Kit	A	Physical	10% at random of the offered lot	Tech Specs and Const. Drawings	TR	√	
iv		Earth test	Earthing test kit	A	Physical	100%	Tech Specs and Const. Drawings,	SR/TR	√	
21.2	Bitumen layer for tank foundation									
i	Material (As per TS)	Grade of bitumen	As agreed / required	A	Review of MTC/ test reports	Each lot of delivery	As per relevant IS and Tech. Specs /MTC	SR/MTC	√	APPROVED SOURCE FOR MATERIAL PROCUREMENT SHALL BE ALL GOVERNMENT REFINARIES
ii	Acceptance and workmanship	Application / workmanship	As agreed / required	B	Physical	Random minimum 10%	Tech Specs and Const. Drawings	SR		
21.3	Composite Aluminium Panels and structural glazing									
i	Material (As per TS)	Type of aluminium panels / structural glazing / fasteners and fixtures / silicon sealant	As agreed / required	A	Review of MTC/ test reports	Each lot of delivery	Technical specifications / drawings	SR/TR/MT C	√	MTC shall cover all the properties / parameters as per technical specifications
ii	Acceptance and workmanship	Installation / workmanship	As agreed / required	B	Physical	Random minimum 10%	Technical specifications / drawings	SR		
21.4	Pressure Release Valves									
i	Material (As per TS)		As agreed / required	A	Review of MTC/ test reports	Each lot of delivery	Technical specifications / drawings	SR/TR/MT C	√	
ii	Acceptance and workmanship	Acceptance / Installation / workmanship	As agreed / required	B	Physical	Random minimum 10%	Tech Specs and Const. Drawings	SR	√	
21.5	ANTI WEED TREATMENT									
i	Material (As per TS)	Anti-weed treatment materials	As agreed / required	B	Review of MTC/ test reports	Each batch of delivery	Tech Specs and Const. Drawings	SR/TR/MT C	√	
ii		Execution of treatment	As agreed / required	B	Physical	Random minimum 10% check for each treatment	Tech Specs and Const. Drawings	SR		
23	PILING WORK (If Applicable)									
23.1	Execution									
i		Borehole diameter	As required	B	Physical	100%	As per appd. Drawings and technical specification	SR/LB	√	
ii		Pile layout	Total station	B	Measurement	100%	As per appd. Drawings and technical specification	SR/LB	√	
iii		Recording ground level and pile termination level	As required	B	Measurement	Random minimum 10%	As per appd. Drawings and technical specification	SR/LB	√	
iv		Cleaning/Flushing of pile bore	As required	B	Measurement	Each pile	IS 2911/ Tech. Specs.	SR/LB	√	
v		Size of bore and During boring of pile record commencement of SPT/ core recovery to ensure socketing length equivalent in terms of the Diameter of the pile below the socketing horizon.(if applicable)	As required	B	Measurement	100%	As per appd. Drawings and technical specification	SR/LB	√	
vi		Pouring of concrete to project above cut off level.	As required	B	Measurement	100%	As per appd. Drawings and technical specification	SR/LB	√	
23.2	Testing									


i		Bentonite	IS:2720	A	Physical / Test report	Once per lot	As per IS:2720, IS 2911/ tech. Specs.	MTC/TR	√	One sample from each source (brand/manufacturer) to be tested at Owner acceptable third party lab.
ii		Density check on sample of mud collected from pile bore bottom	IS 2911	B/A	Physical	Each pile/ Randomly 1 in 10 piles (i.e. 10%)	IS 2911/ Tech. Specs./approved PILING METHODOLOGY	SR/LB	√	Tests to be done before placing of concrete.
ii		Slump test of concrete	IS:1199	B	Physical	Every 2 hrs at pouring point of concrete	IS:2911, As per appd. Drawings and technical specification	SR/LB/TR	√	
iii		Concrete Cube strength Test	IS:456	A	Physical	One set of 6 cubes per 50 Cum or part thereof for each grade of concrete per shift whichever is earlier.	IS:2911, As per appd. Drawings and technical specification	SR/LB/TR	√	
iv		Initial pile load test, Vertical (Compression), Lateral (horizontal) and pull-out (tension).	IS:2911 / as required	A	Testing	As per Technical Specification/IS standard	IS:2911, As per appd. Drawings and technical specification	SR/LB/TR	√	
v		Routine pile tests (VERTICAL LOAD TEST (COMPRESSION) and LATERAL LOAD TEST (horizontal))	IS:2911 / as required	A	Testing	As per Technical Specification/IS standard	IS:2911, As per appd. Drawings and technical specification	SR/LB/TR	√	
vi		Pile Integrity Tests (PIT)	PEM / as required	A	Testing	100%	IS:2911, As per appd. Drawings and technical specification and suppliers manual	Test Report	√	
22.0 GEOTECHNICAL INVESTIGATION WORK										
i		Deployment of Owner approved Geotechnical Investigation Agency - Equipment, Manpower etc.	As required / agreed	B	Physical	Once before commencement of work	As per technical specifications and relevant IS Codes	SR	√	
ii		Execution of Geotechnical Investigation - locations, type etc. as per scheme	As required / agreed	B	Physical	Each Location	As per technical specifications , approved drawing and relevant IS Codes	SR	√	
iii		Collection of disturbed and undisturbed samples , their packing and storage	As required / agreed	B	Physical	each sampling	As per technical specifications , approved drawing and relevant IS Codes	SR		
iv		Conducting filed tests as per investigation scheme- such as SPT/ERT/SCTP/PLT/PMT etc. if applicable	As required / agreed	B	Physical	each field test	As per technical specifications , approved drawing and relevant IS Codes	SR	√	
v		Submission of Owner approved Final Geotechnical investigation report along with recommendations.	As required / agreed	B	Physical	After completion of investigation work	As per technical specifications and relevant IS Codes	-	√	
23 ROAD WORKS										
23.1 Tests on Embankment, Subgrade Construction and Cut Formation										
A) Suitability of Borrow Fill material										
i		Sand Content	As per IS 2720	A	Physical	Once per each type of source or change of source subject to a min. of 2 samples	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification, IS 2720 (Part IV)	SR/TR	√	
ii		Plasticity Test	As per IS 2720	A	Physical	Once per each type of source or change of source subject to a min. of 2 samples	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification, IS 2720 (Part V)	SR/TR	√	
iii		Density Test	As per IS 2720	A	Physical	Each soil type to be tested, 2 tests	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification, IS 2720 (Part VIII)	SR/TR	√	
iv		Deleterious Content Test	As per IS 2720	B	Physical	As and when required by Engineer in charge	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification, IS 2720 (Part XXVII)	SR/TR	√	
v		Moisture Content Test	As per IS 2720	A	Physical	Two Tests	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification, IS 2720 (Part II)	SR/TR	√	
vi		CBR Test	As per IS 2720	A	Physical	One CBR test (Avg. of three specimens) or closer as and when required by EIC	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification, IS 2720 (Part XVI)	SR/TR	√	
vii		Free swell Index	Measuring Cylinder	A	Physical	Once per each type of source or change of source	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification, IS 2720 (Part XI)	SR/TR	√	

B Compaction											
i		Standard proctor Test	As per IS: 2720	A	Physical	One in every 2000 cum for each type and source of fill materials	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification, IS 2720 (Pt.VII)	SR/TR	✓		
ii		Moisture content of fill before compaction	As per IS: 2720	B	Physical	Random minimum 10%	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification, IS 2720 (Pt.II)	SR/TR	✓		
iii		Dry density by core cutter method ---- OR---- Dry density in place by sand displacement method	As per IS: 2720	A	Physical	One in every 2000 SQM area for each compacted layer.	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification, IS 2720 (Pt. XXIX)/ IS 2720 (Pt. XXVIII),	SR/TR	✓		
iv		Lines, grade and cross section	As required / agreed	B	Physical	One in every 500 SQM area	As per Tech Specs and Const. Drawings	SR		Template, straight edge	
23.2 Granular Sub-Base (GSB) (if applicable)											
i		Grading of aggregate	Set of IS Sieves	B	Physical	One test per 400 cum	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification,	SR/TR	✓		
ii		Atterberg limits	Atterberg limits determination	A	Physical	One test per 400 cum	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification,	SR/TR	✓		
iii		Moisture Content prior to compaction	As required / agreed	B	Physical	One test per 400 cum	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification	SR/TR	✓		
iv		Density of compacted Layer	As required / agreed	B	Physical	one test per 1000 sqm.	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification,	SR/TR	✓		
v		Deleterious Constituents	As required / agreed	B	Physical	As required	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification,	SR/TR	✓		
vi		CBR	As required / agreed	B	Physical	As required	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification,	SR/TR	✓		
		Lines, grade and cross section	As required / agreed	B	Physical	One in every 500 SQM area	As per Tech Specs and Const. Drawings	SR		Template, straight edge	
23.3 Water Bound Macadam (WBM)											
i		Aggregate Impact Value	Aggregate Impact value Test Apparatus	A	Physical	One test per 1000 cum of aggregate	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification,	SR/TR	✓		
ii		Grading of aggregate	Set of IS Sieves	B	Physical	One test per 250 cum	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification,	SR/TR	✓		
iii		combined Flakiness and Elongation Indices	Flakiness & Elongation test gauge	B	Physical	One test per 500 cum of aggregate	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification,	SR/TR	✓		
iv		Atterberg limits of binding material	Atterberg limits determination	A	Physical	One test per 50 cum of binding material	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification,	SR/TR	✓		
v		Atterberg limits of screenings	Atterberg limits determination	A	Physical	One test per 100 cum of aggregate	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification,	SR/TR	✓		
23.9 RCC pavement/ PQC/ Geopolymer Concrete											
Quality checks for Materials used for Pavement concrete							As per Table 900-6 of MORTH Spec.				
Quality checks for concrete used for Pavement concrete							As per Table 900-6 of MORTH Spec.				
23.10 Alignment, Level, Surface regularity and rectification											
i		Horizontal alignment, Surface levels and Surface regularity	As required / agreed	B	Physical	As per section 900 of MORTH specification	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification	SR/TR			
ii		Rectification	As required / agreed	B	Physical	Each rectification	As per Tech Specs and Const. Drawings, Section 900 of MORTH specification	SR/TR	✓		
26 GEOGRID MESH											
i	Material		As agreed / required	A	Review of MTC/ test reports	Each lot of delivery	Tech Specs and/ Const. Drawings	MTC/TR	✓		
ii	Identification of Material		As agreed / required	B	Visual	Each lot of delivery	Technical Specification, const. Drawings and Manufacturer Recommendation	SR		All rolls of the geo-grid shall be identified with permanent marking on the roll or packaging, with the manufacturers name, product identification, roll number and roll dimensions.	
iii	Acceptance of Installation		As agreed / required	A	Physical	Random minimum 10%	Technical Specification, const. Drawings and Manufacturer Recommendation	SR	✓		
<p>LEGENDS :</p> <p>* Records identified with tick (✓) shall be essentially included by supplier in QA documentation.</p> <p># Class A : Critical, Class B : Major, Class C : Minor.</p> <p>Class 'A' checks shall be witnessed by Owner FQA and Execution Engineer, Class 'B' checks shall be witnessed by Owner Execution Engineer, Class 'C' checks shall be witnessed by Main contractor engineer. CLASS 'A' & 'B' CHECKS SHALL BE NTPC CHP STAGE.</p> <p>SR - Site Register, TR- Test Report, LB-Log Book, IR - Inspection Report, MTC - Manufacturer's Test Certificate.</p> <p>Surveillance of Class 'A' checks shall be perform By Owner Head (FQA), Class 'B' by Owner FQA Engineer and for class 'C' Another Executing Engineer authorised by Head (Executing Deptt).</p> <p>Note: Any non confirmity/ deviation to the Quality plan must be brought to notice of NTPC/Owner.</p> <p>Dispositioning authority shall be the authorised representative of NTPC/Owner as per NTPC FQA system manual</p>							For Owner Use		Owner DOC NO. :		
Main-supplier							 A Maharatna Company		REVIEWED BY	APPROVED BY	APPROVAL SEAL

	PROJECT: A&N GAS PROJECT 50MW	LIST OF ITEMS REQUIRING QUALITY PLAN AND SUB-SUPPLIER APPROVAL			DOC NO	
	PACKAGE: EPC CIVIL WORKS PACKAGE				REV. NO.	
	Main supplier:	SUB SYSTEM: CIVIL WORKS			DATE	
	Contract No.:					
SL. NO.	ITEM	QAP / INSP. CAT	PROPOSED SUB SUPPLIER	PLACE OF MANUFACTURING	APPROVAL STATUS / CATEGORY	REMARKS
1.	GALVANIZED STEEL STRUCTURES (LATTICE & PIPE) FOR SWITCHYARD AND TRANSMISION LINE	I	VIJAY TRANSMISSION LTD	RAIPUR	A	
			UNITECH POWER TRANSMISSION LTD	NAGPUR	A	
			ASSOCIATED POWER STRUCTURES	VADODARA	A	
			R.S. INFRAPROJECTS PVT. LTD	SURAJPUR	A	
			NEW MODERN TECHNOMECH	MAYURBHANJ (ORRISA)	A	
			GOOD LUCK STEEL TUBES	SIKANDRABAD	A	
			UNIQUE STRUCTURES & TOWERS LTD.	RAIPUR	A	
			VATCO ELEC-POWER PVT. LTD.	NAVIMUMBAI	A	GALVANISING AT SIGMA GALVANISER NAVI MUMBAI
			R.S. INFRAPROJECTS PVT. LTD	SIKANDRABAD	A	
			ADVANCE STEEL TUBE	SAHIBABAD	A	
			SANGAM STRUCTURES LTD.	ALLAHABAD	A	
			RELIABLE SPONGE PVT LTD UNIT III	KALUNGA	A	
			VSP ENTERPRISES PVT. LTD	SONEPAT	A	
			SKIPPER LIMITED	UNIT-I: JANGALPUR, Howrah. Unit-II: ULUBERIA UNIT, Howrah. UNIT- III: BCTL, Howrah.	A	Proto type inspection at Unit- Bagnan, Howrah

	PROJECT: A&N GAS PROJECT 50MW	LIST OF ITEMS REQUIRING QUALITY PLAN AND SUB-SUPPLIER APPROVAL			DOC NO	
	PACKAGE: EPC CIVIL WORKS PACKAGE				REV. NO.	
	Main supplier:	SUB SYSTEM: CIVIL WORKS			DATE	
	Contract No.:					
SL. NO.	ITEM	QAP / INSP. CAT	PROPOSED SUB SUPPLIER	PLACE OF MANUFACTURING	APPROVAL STATUS / CATEGORY	REMARKS
			RUKMANI ELECTRICAL & COMPONENT PVT. LTD ENCORP POWERTRANS PVT LTD RICHARDSON & CRUDDAS (1972) LTD	RAIPUR PALGHAR NAGPUR	A A A	
2.	COLOUR COATED METAL DECK & CLADDING/ROOFING SHEET (COIL)	I	TATA STEEL LIMITED TATA STEEL LIMITED TATA BLUESCOPE STEEL LTD ARCELORMITTAL NIPPON STEEL INDIA LIMITED NATIONAL STEEL & AGRO INDUSTRIES LTD JSW STEEL COATED PRODUCTS LTD JSW STEEL COATED PRODUCTS LTD BHUSHAN POWER & STEEL LTD	KHOPOLI, RAIGARH SAHIBABAD JAMSHEDPUR PUNE DHAR KALMESHWAR (NAGPUR) TARAPUR, BOISAR SAMBALPUR (ODISHA)	A A A A A A A	AL-ZN COIL FOR CLADDING
3.	ELECTROFORGED GRATING	II	INDIANA GRATINGS PVT. LTD KANADE ANAND UDYOG PREMIER POWER PRODUCTS LTD BHOLA RAM STEEL PVT. LTD PINAX STEEL INDUSTRIES PVT LTD	PUNE THANE HOWRAH PATNA PATNA	A A A A A	

	PROJECT: A&N GAS PROJECT 50MW	LIST OF ITEMS REQUIRING QUALITY PLAN AND SUB-SUPPLIER APPROVAL			DOC NO	
	PACKAGE: EPC CIVIL WORKS PACKAGE				REV. NO.	
	Main supplier:	SUB SYSTEM: CIVIL WORKS			DATE	
	Contract No.:					
SL. NO.	ITEM	QAP / INSP. CAT	PROPOSED SUB SUPPLIER	PLACE OF MANUFACTURING	APPROVAL STATUS / CATEGORY	REMARKS
			ANKIT ELECTROGRATING	RAIPUR	A	
			FERROTECH STRUCTURALS (INDIA) PRIVATE LIMITED.	PUNE	A	
			RATAN PROJECTS & ENGINEERING CO. PVT. LTD.	HOWRAH	A	
			VINFAB ENGINEERS INDIA PVT LTD. (For Galvanising) VINFAB GRATINGS (For Fabrication)	THANE	A	
4.	PROFILERS FOR COLOUR COATED METAL DECK & CLADDING/ROOFING SHEETS	II	MAIN CONTRACTOR APPROVED SOURCE	-	-	
5.	STOP LOG GATES, TRASH RACK AND LIFTING BEAM	II	MAIN CONTRACTOR APPROVED SOURCE	-	-	
6.	HIGH PERFORMANCE MOISTURE COMPATIBLE CORROSION RESISTANT COATING SYSTEM	III	CECRI LICENSED SOURCES	-	-	
7.	BITUMEN	III	ALL GOVERNMENT REFINERIES	-	-	
8.	PTFE BEARING / ELASTOMERIC BEARING	III	MORTH / RDSO APPROVED VENDORS	-	-	
9.	CEMENT	III	BIS APPROVED SOURCES HAVING VALID BIS LICENCE	-	-	
10.	CI PIPES	III	BIS APPROVED SOURCES HAVING VALID BIS LICENCE	-	-	
11.	RCC PIPES	III	BIS APPROVED SOURCES HAVING VALID BIS LICENCE	-	-	
12.	CPVC/UPVC PIPES	III	BIS APPROVED SOURCES HAVING VALID BIS LICENCE	-	-	
13.	PVC WATER STOP	III	BIS APPROVED SOURCES HAVING VALID BIS LICENCE	-	-	
14.	POLYTHENE WATER STORAGE TANKS	III	BIS APPROVED SOURCES HAVING VALID BIS LICENCE	-	-	

	PROJECT: A&N GAS PROJECT 50MW	LIST OF ITEMS REQUIRING QUALITY PLAN AND SUB- SUPPLIER APPROVAL			DOC NO	
	PACKAGE: EPC CIVIL WORKS PACKAGE				REV. NO.	
	Main supplier:	SUB SYSTEM: CIVIL WORKS			DATE	
	Contract No.:					
SL. NO.	ITEM	QAP / INSP. CAT	PROPOSED SUB SUPPLIER	PLACE OF MANUFACTURING	APPROVAL STATUS / CATEGORY	REMARKS
15.	CERAMIC / VITRIFIED TILES	III	BIS APPROVED SOURCES HAVING VALID BIS LICENCE	-	-	
16.	PARTICLE BOARDS, PLYWOOD, MDF	III	BIS APPROVED SOURCES HAVING VALID BIS LICENCE	-	-	
17.	FIRE PROOF DOORS	III	MAIN CONTRACTOR APPROVED SOURCES WITH VALID PROTOTYPE TEST REPORT FROM CBRI/CPRI/GOV. LAB.)	-	-	
18.	CONSTRUCTION CHEMICALS/ADMIXTURE, WATER PROOFING COMPOUNDS AND GROUTS	III	MAIN CONTRACTOR APPROVED SOURCE	-	-	
19.	PAINT AND PAINTING SYSTEM	III	MAIN CONTRACTOR APPROVED SOURCE	-	-	
20.	HIGH SOLID CONTENT LIQUID APPLIED URETHANE BASED ELASTOMERIC MEMBRANE FOR WATER PROOFING	III	MAIN CONTRACTOR APPROVED SOURCE	-	-	
21.	FOUNDATION BOLTS	III	MAIN CONTRACTOR APPROVED SOURCE	-	-	

LEGENDS:

1. SYSTEM SUPPLIER/SUB-SUPPLIER APPROVAL STATUS CATEGORY (SHALL BE FILLED BY NTPC)

A – For these items proposed vendor is acceptable to NTPC. To be indicated with letter “A” in the list along with the condition of approval, if any.

DR – For these items “Details required” for NTPC review. To be identified with letter “DR” in the list.

2. QP/INSPN CATEGORY:

CAT-I: For these items the Quality Plans are approved by NTPC and the final acceptance will be on physical inspection witness by NTPC.

CAT-II: For these items the Quality Plans approved by NTPC. However, no physical inspection shall be done by NTPC. The final acceptance by NTPC shall be on the basis review of documents as per approved quality plan.

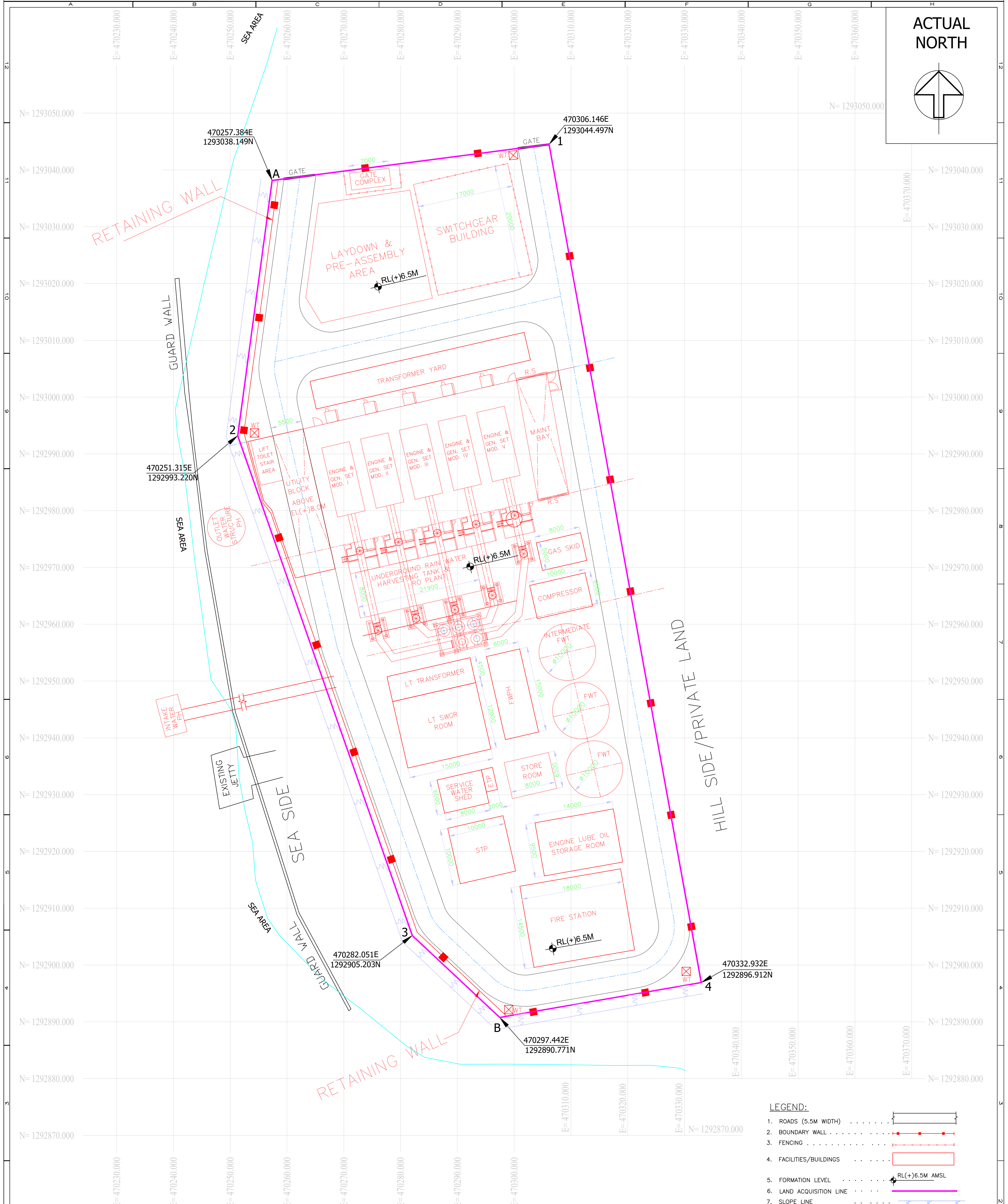
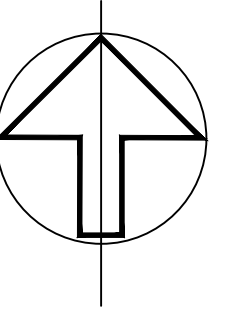
CAT-III: For these items the Quality control to be exercised as per Main Contractor Quality Assurance System. The final acceptance by NTPC shall be on the basis of Certificate of conformance (COC) by Main Contractor.

UNITS/ WORKS: Place of manufacturing Place of Main Supplier of multi units/works.

NOTE 1: For the items placed in CAT-III for Civil Works, the review and final acceptance shall be done by NTPC-EIC/ FQA on the basis of MTC / certificate of conformance in line with Technical Specifications/FQP.

NOTE 2: Items for which Sub-QR is envisaged, vendors shall be considered for assessment subject to Sub-QR clearance from NTPC Engg.

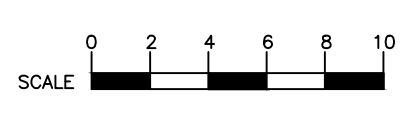
ACTUAL NORTH



- LEGEND:**
- 1. ROADS (5.5M WIDTH)
 - 2. BOUNDARY WALL
 - 3. FENCING
 - 4. FACILITIES/BUILDINGS
 - 5. FORMATION LEVEL RL(+).6.5M AMSL
 - 6. LAND ACQUISITION LINE
 - 7. SLOPE LINE
 - 8. WATCH TOWER(WT)
 - 9. RETAINING WALL

FOR TENDER PURPOSE ONLY

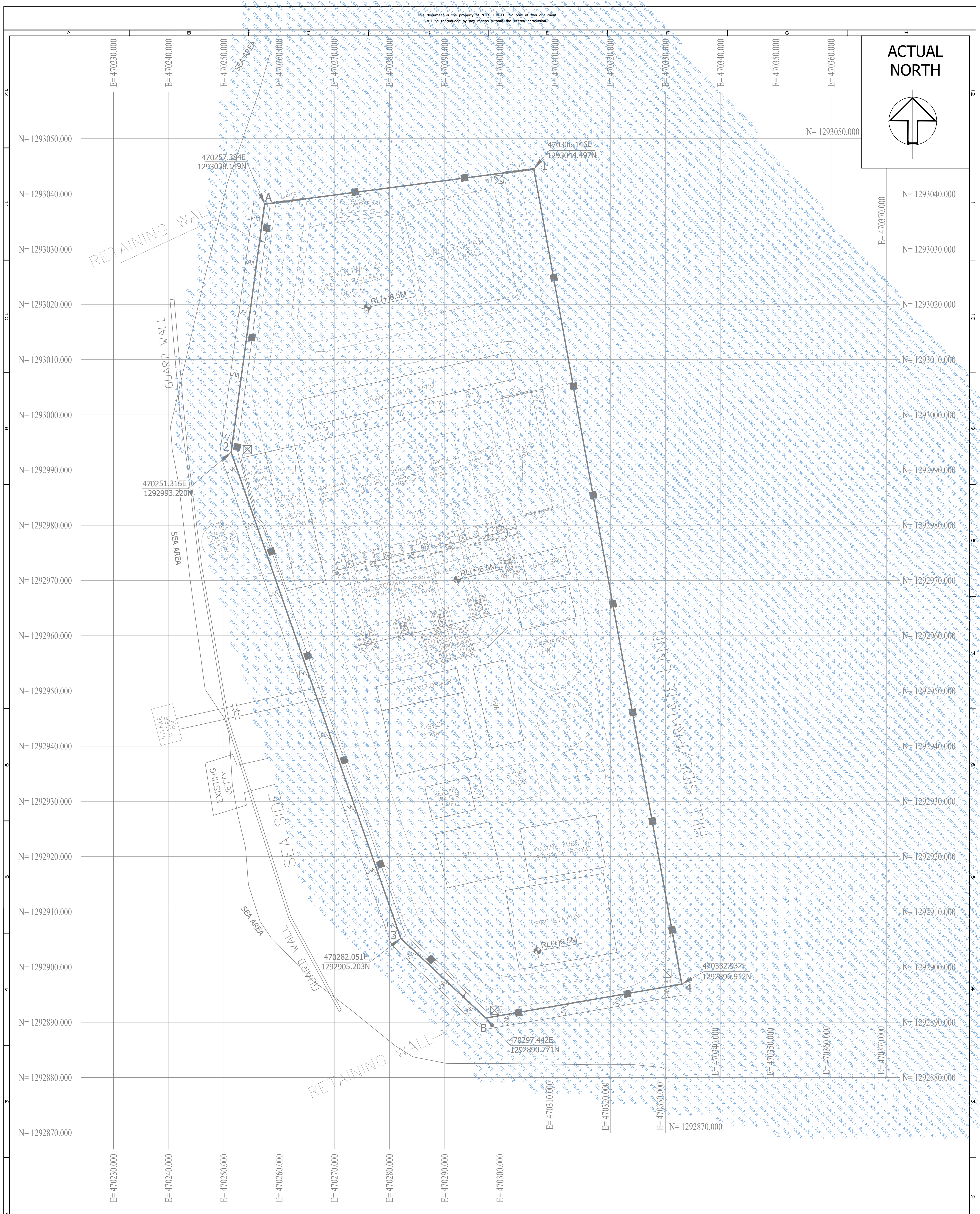
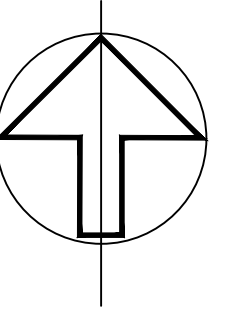
- NOTES:**
1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METRES.
 2. FOR DETAILS IN MAIN PLANT BLOCK REFER MAIN PLANT LAYOUT DRAWING NO. 6400-999-POM-A-001.
 3. FORMATION LEVELS FOR THE PROJECT IS (+)RL6.5M.
 4. TOTAL LAND AVAILABLE IS ABOUT 2 ACRES.
 5. GREEN BELT IS NOT CONSIDERED DUE TO SPACE CONSTRAINT.
 6. PROJECT IS CONSIDERED IN THE CLOSE VICINITY OF THE SEA AND IT IS PRESUMED THAT CRZ CLARENCE FOR THE SAME SHALL BE AVAILABLE IN VIEW OF THE AREA BEING UNDER PORT AUTHORITY.
 7. GRID SIZE IS 10MX10M
 8. SIZES OF BUILDINGS/FACILITIES SHOWN IN GLP ARE OF MINIMUM SIZE



		NTPC Limited (A GOVT. OF INDIA ENTERPRISE)	
		PROJECT ANDAMAN & NICOBAR GAS POWER PROJECT (50MW)	
TITLE GENERAL LAYOUT PLAN		SIZE SCALE A1 1:1000	
REV. 0		6400-999-POC-F-001	

REV.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	C	E	C&I	APPD	DATE
0	FOR TENDER PURPOSE ONLY	VENKY	KK	SP						17.10.24

ACTUAL NORTH



NOTES:

1. ALL DIMENSIONS ARE IN METRES.
2. ±0.00 OF MAIN PLANT AREA CORRESPONDS TO RL(+6.50M).
3. THIS DRAWING IS FOR TOPOGRAPHICAL SURVEY PURPOSE ONLY.

LEGEND:

1. ROADS (5.5M WIDTH)
2. BOUNDARY WALL
3. FENCING
4. FORMATION LEVEL

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NTPC Limited
(A GOVT. OF INDIA ENTERPRISE)

PROJECT ANDAMAN & NICOBAR GAS POWER PROJECT (50MW)

TITLE TOPOGRAPHICAL SURVEY

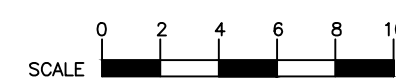
6400-999-POC-F-002

SCALE 1:1000

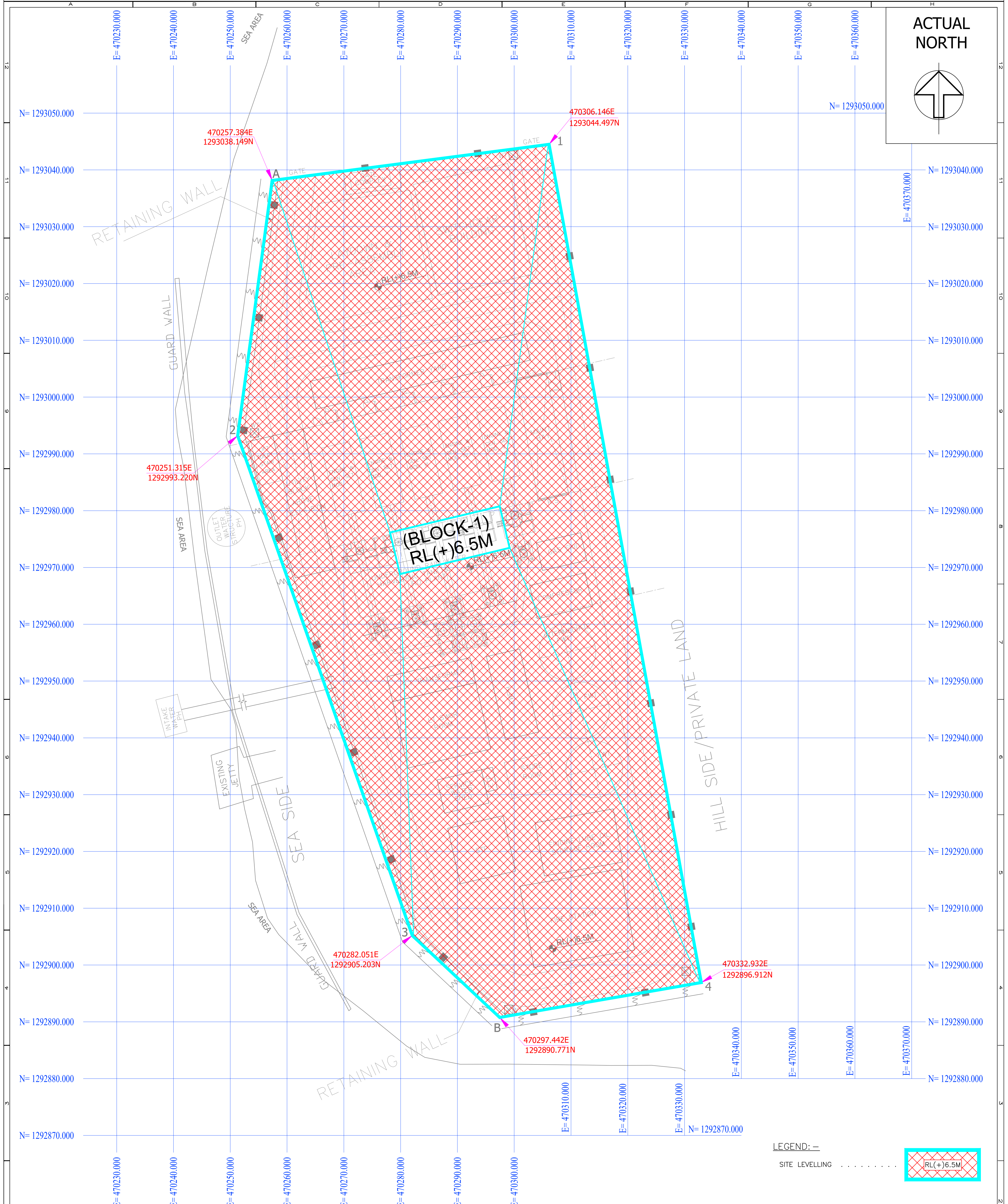
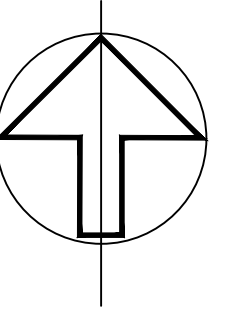
DATE 17.10.24

REV. 0

REV.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	C	E	C&I	APPD.	DATE
0	FOR TENDER PURPOSE ONLY	VENKY	KK	SP						17.10.24

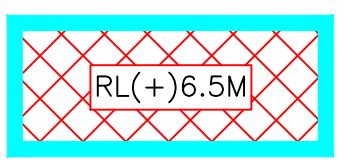


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LEGEND: -

SITE LEVELLING




NOTES:-

1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METERS.
2. GRIDS ARE MARKED AT 10M INTERVALS IN BOTH DIRECTIONS.
3. SITE CLEARANCE SHALL BE DONE AS PER TECHNICAL SPECIFICATION UPTO 2.0M BEYOND EXPECTED LINE OF FILLING/CUTTING.
4. EXISTING GROUND LEVELS SHALL BE RECORDED AS JOINTLY TAKEN BY SITE AND CONTRACTOR. AFTER THE SITE CLEARANCE AS PER SPECIFICATIONS. THE JOINT GROUND LEVEL RECORDINGS ARE TO BE TAKEN USING 'TOTAL STATION'.
5. FILLING WITH EARTH SHALL BE DONE IN LAYERS AND COMPACTED TO 95% OR MORE OF STANDARD PROCTOR'S MAXIMUM DRY DENSITY AS PER TECHNICAL SPECIFICATION.
6. SLOPES IN CUTTING/FILLING FOR CHANGE OF LEVEL SHALL BE 1(V):2.5(H) UNLESS SPECIFICALLY NOTED OTHERWISE.
7. ALL CO-ORDINATES ARE SPECIFIED FOR THE TOP EDGE OF THE SLOPE OF FILLING/CUTTING. UNLESS SPECIFICALLY NOTED OTHERWISE.

REFERENCE DRGS:

1. DRG. NO. 6400-999-POC-F-001 TITLED 'GENERAL LAYOUT PLAN'

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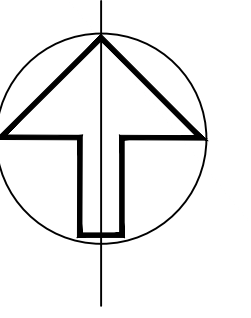
 NTPC Limited (A GOVT. OF INDIA ENTERPRISE)	
PROJECT	ANDAMAN & NICOBAR GAS POWER PROJECT (50MW)
TITLE	SITE LEVELLING LAYOUT PLAN
SIZE	A1
SCALE	1:1000
DRG.NO.	6400-301-POC-A-003
REV.	0



0	FOR TENDER PURPOSE ONLY	VENKY	KK	SP						17.10.24
REV.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	C	E	C&I	APPD	DATE

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ACTUAL NORTH



Vitala School

Mariamamma Temple



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NTPC Limited
(A GOVT. OF INDIA ENTERPRISE)

PROJECT ANDAMAN & NICOBAR GAS POWER PROJECT
(50MW)

TITLE GENERAL LAYOUT PLAN

SIZE A1 SCALE 1:1000 DRG.NO. 6400-999-POC-F-001A REV. 0

NTPC VIDYUT VYAPAR NIGAM LIMITED

(A wholly owned Subsidiary of NTPC Limited)



SECTION - VII

BOOK 1 OF 3

FORMS AND PROCEDURES

FOR

ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE

BIDDING DOCUMENT NO.: NVVN / C&M / RE-342 / 2024-25

(This document is meant for the exclusive purpose of bidding against this Bid Document No. / Specification and shall not be transferred, reproduced or otherwise used for purposes other than that for which it is specifically issued).

TABLE OF FORMS AND PROCEDURES

Sl. No.	Description
1.)	Section-VII (Part 1 of 3) Techno-Commercial Bid (Envelope-1) (Bid Form along with Attachments)
2.)	Section-VII (Part 2 of 3) Price Bid (Envelope-2) (Bid Form along with attachments and Price Schedules)
3.)	Section-VII (Part 3 of 3) 1. Proforma for Bank Guarantee for Bid Security 2. Bank Guarantee verification checklist 3. Form of Bank Guarantee for Contract Performance Guarantee 4. Proforma for extension of Bank Guarantee 5. Proforma of Bank Guarantee for Lumpsum Advance 6. Proforma of Bank Guarantee to be furnished by Associate(s)- 7. List of banks from which Bank Guarantees for Advance/ Security Deposit and Bank Guarantee to be furnished by Bidder/ Contractor can be accepted 8. Form of Bank Guarantee for removal of Plant and Equipment from the Site 9. Form of Hypothecation Deed 10. Proforma of "Contract Agreement" 11. Proforma of "Indemnity Bond" for "Employer Issue Materials" 12. Letter of Undertaking to be given by Contractor while furnishing the Indemnity Bond" to Employer for "Employer Issue Materials" 13. Proforma of Letter of Confirmation by the proposed Sub-Contractor 14. Proforma for Material Accounting & Reconciliation 15. Form of Indemnity Bond to be executed by the Contractor for the safe custody of equipment brought to site by the contractor 16. Form of Indemnity Bond to be executed by the contractor for Removal/ Disposal of surplus material 17. Proforma of Contract Closing Certificates

(BIDDER MAY TAKE NOTE OF THE FOLLOWING POINTS WHILE SUBMITTING ITS BID)

- Bidders are required to furnish requisite details in the formats specified in the bidding documents for meeting the stipulated qualifying requirements (QR) along with all supporting documents like copies of client's certificates, work order and contract agreements etc. If any of the reference works furnished by bidder pertains to the contract(s)/ works executed by bidder for NTPC/NVVN in the past then in respect of such contract(s)/ works, bidder is not required to enclose client's certificate(s) along with its bid
- In case of extension of techno-commercial bid opening date, bidder to furnish audited annual reports along with its bid as per extended date of techno-commercial bid opening to meet the stipulated financial QR criteria.
- Power of attorney duly notarized by a notary public indicating that the person(s) signing the bid has/have the authority to sign the bid and the bid is binding upon the bidder during the full period of its validity backed by a copy of board resolution/ other relevant documents to demonstrate the authority of the person issuing the power of attorney. To be furnished along with the bid.
- Power of attorney to the authorized signatory of the bidder for signing of bid, wherever applicable, to be submitted along with bid and should be dated not later than the date of signing the bid.
- Bidder to ensure that bid security/integrity pact to be submitted in original strictly as per specified formats duly signed in original by authorized signatory and stamped on each page. Scanned/ photocopy of these documents without signature in original shall not be acceptable and shall be summarily rejected.
- Date of purchase of stamp paper of instruments like bid security etc should be on or before the date of execution of such instruments.
- Bidders To Submit This Techno-Commercial Bid Form Along with All Attachments In Pdf Format And No Physical Signatures Are Required Since Bid Shall Be Digitally Signed By The Bidder.

**1A. BID FORM AND ATTACHMENTS
(TECHNO-COMMERCIAL BID)**

TECHNO-COMMERCIAL BID FORM

Ref No.:

Date:

**Name of Package : ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS
PACKAGE**

BIDDING DOCUMENT NO. NVVN / C&M / RE-342 / 2024-25

To

NTPC VIDYUT VYAPAR NIGAM LIMITED
2nd Floor, Core 5, Scope Complex,
Institutional Area, Lodi Road,
New Delhi – 110003, India

Gentlemen and/or Ladies,

1.0 Having examined the Bidding Documents No. NVVN/C&M/RE-342/2024-25, including its subsequent amendments and clarifications, if any, the receipt of which is hereby acknowledged, we the undersigned, submit our bid for the Works under the above-named Contract Package, in full conformity with the said Bidding Documents for the sum as mentioned in the output preview of Main Screen of Bid Invitation at NTPC e-tender site or such other sums as may be determined in accordance with the terms and conditions of the contract.

1.1 **Further we understand that discount letter separately uploaded online or submitted in physical form or indicated at location other than Conditions field of General Data/Item Data in Main Screen of Bid Invitation shall not be considered for the purpose of evaluation.**

1.2 We have read the ITB clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries. We certify that we/our Collaborator/JV Partner/Consortium member are/is not from such a country or, if from such a country, have/has been registered with the Competent Authority and we will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority.

*Further, we certify that we do not have any Transfer of Technology (TOT) arrangement requiring registration with the competent authority.

Or

*Further, we certify that we have valid registration for Transfer of Technology (TOT) arrangement with the competent authority to participate in this procurement.

We hereby certify that we fulfill all requirements in this regard and are eligible to be considered.

*We further confirm that evidence of valid registration by the Competent Authority for us/our Collaborator/JV Partner/Consortium member, as applicable, is enclosed as Annexure...** to Bid.

*Bidder to strike-off, if not applicable.

**Bidder to mention the Annexure no.

2.0 **COMPLIANCE TO THE PROVISIONS OF THE BIDDING DOCUMENTS**

2.1 We have read all the provisions of the Bidding Documents and confirm that notwithstanding anything stated anywhere in our bid to the contrary, the provisions of the Bidding Documents,

are acceptable to us and we further confirm that we have not taken any deviation to the provisions of the Bidding Documents anywhere in our bid.

Any deviation, variation or additional condition etc. or any mention, contrary to the provisions of Bidding Documents and its subsequent Amendment(s)/ Clarification(s)/ Addenda/ Errata (if any) found anywhere in our bid proposal, implicit or explicit shall stand unconditionally withdrawn, without any cost implication whatsoever to the Employer, failing which our bid security shall be forfeited.

- 2.2 We further declare that additional conditions, variations, deviations to the provisions of bidding documents and its subsequent Amendment(s)/ Clarification(s)/ Addenda/ Errata, if any, found in our proposal, shall not be given effect to.
- 3.0 **SCHEDULE OF QUANTITIES:**
- 3.1 In line with the requirements of the Bidding Documents, we are attaching in the Schedule of Quantities, duly filled-in in your format in E-Tender portal only.
- 3.2 We are aware that the Schedule of Quantities does not generally give a full description of the work to be performed under each item and we shall be deemed to have read the Technical Specifications, Drawings and other Sections of the Bidding Documents to ascertain the full scope of work included in each item while filling in the rates and amount/ prices. We agree that the entered rates and amount/ prices shall be deemed to include the full scope as aforesaid, including overheads and profit.
- 3.3 We declare that prices left blank in the Schedule of Quantities will be deemed to have been included in the prices of other items. The total for each Schedule and the total of grand summary shall be deemed to be the total price for executing the subject package in complete accordance with the Contract, whether or not each individual item has been priced.
- 4.0 We hereby agree that we shall furnish all necessary justification to establish the reasonableness of the rates/ prices, if required by you.
- 5.0 We undertake, if our bid is accepted, to commence work immediately upon your Letter of Award to us and to achieve Completion of Work within the time specified in the Bidding Documents.
- 6.0 If our bid is accepted, we undertake to provide Advance Payment Security, Contract Performance Securities and securities for Deed(s) of Joint Undertaking (as applicable) in the form and amounts and within the times specified in the Bidding Documents.
- 7.0 We agree to abide by this bid for a period of six (6) months from the date of opening of Techno-Commercial Bids as stipulated in the Bidding Documents, unless extended by us on your request, and it shall remain binding upon us and may be accepted by you at any time before the expiration of that period.
- 8.0 Until a formal Contract is prepared and executed between us, this bid, together with your written acceptance thereof in the form of your Letter of Award shall constitute a binding contract between us.
- 9.0 We understand that you are not bound to accept the lowest or any other bid you may receive. Further we understand that NVVN reserves the right to reject any or all bids or cancel/withdraw the Invitation for Bids without assigning any reason whatsoever and in such case no bidder/intending bidder shall have any claim arising out of such a situation.
- 10.0 We, hereby, declare that only the persons or firms interested in this proposal as principals are named here and that no other persons or firms other than those mentioned herein have any interest in this proposal or in the Contract to be entered into, if the award is made on us, and that this proposal is made without any connection with any other person, firm or party likewise submitting a proposal, is in all respects for and in good faith, without collusion or fraud.

11.0 (i)* *We confirm that we fulfill the requirements of Local content for Class-I local supplier.*

The details of the location(s) at which the local value addition are as under:

Sl. No.	Description of Goods & Services	Details of the location(s) at which the local value addition is made

(i)* *We confirm that we fulfill the requirements of Local content for Class-I local supplier*

*Strike out whichever is not applicable.

(ii) *We confirm that we fulfill the requirements of Local content for Class-I local supplier for Item(s) mentioned at clause no. 41 of GTR in Technical Specifications, as applicable. We further confirm that in case such item(s) are bought-out for us, we shall source the same from Class-I local supplier only.*

We undertake that a certificate from the statutory auditor or cost auditor (in the case the bidder is a company) or from a practicing cost accountant or practicing chartered accountant (in respect of bidders other than companies) certifying the percentage of local content shall be submitted by us prior to submission of our last bill for payment.

#We further confirm that we are presently not debarred / banned by any other procuring entity for violation of 'Public Procurement (Preference to Make in India), Order 2017' (PPP- MII Order) dated 15.06.2017 and its subsequent revisions / amendments issued by Department for Promotion of Industry and Internal trade (DPIIT)."

#In case a Bidder has been banned/debarred by any other procuring entity for violation of 'Public Procurement (Preference to Make In India), Order 2017' (PPP- MII Order) dated 15.06.2017 and its subsequent revisions / amendments issued by Department of Industrial Policy and Promotion (DIPP), the same may be declared by Bidder by striking off para above and declaring the details of banning using additional sheets.

Bidder may also enclose additional sheets in similar format (if required), for providing details pertaining to local value addition.

12.0 We have read the ITB clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries. We certify that we/our Collaborator/JV Partner/Consortium member/Assignee are/is not from such a country or, if from such a country, have/has been registered with the Competent Authority and we will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. We hereby certify that we fulfill all requirements in this regard and are eligible to be considered.

***We further confirm that evidence of valid registration by the Competent Authority for us/our Collaborator/JV Partner/ Consortium member/Assignee, as applicable, is enclosed as Annexure... **....**

***Bidder to strike-off, if not applicable.**

****Bidder to mention the Annexure no.**

Dated this _____ day of _____ 2020.

Thanking you, we remain,

Yours faithfully,

Date:

(Designation).....

Place:

(Printed Name).....

Business Address:

Fax No. :

Phone No. :

ANDAMAN AND NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE
BIDDING DOCUMENT NO. NVVN / C&M / RE-342 / 2024-25
BID SECURITY

To

[Employer's Name and Address]

Dear Sirs,

In accordance with Invitation for Bids under your Bid Document No. NVVN / C&M / RE-342 / 2024-25 M/s.....(**) having its Registered/ Head Office at (hereinafter called the "Bidder") wish to participate in the said bid for [Name of Package]

As an irrevocable Bank Guarantee against Bid Security for an amount of.....(*) valid for days from (**)... required to be submitted by the Bidder as a condition precedent for participation in the said bid which amount is liable to be forfeited on the happening of any contingencies mentioned in the Bidding Documents.

We, the[Name & address of the Bank].....having our Head Office at.....(#)... guarantee and undertake to pay immediately on demand by NTPC Vidyut Vyapar Nigam Limited (hereinafter called the 'Employer')... the amount of(*)... without any reservation, protest, demand and recourse. Any such demand made by the 'Employer' shall be conclusive and binding on us irrespective of any dispute or difference raised by the Bidder.

This guarantee shall be irrevocable and shall remain valid upto(@) i f any further extension of this guarantee is required, the same shall be extended to such required period (not exceeding one year) on receiving instructions from M/s(**)[Bidder's Name]..... on whose behalf this guarantee is issued.

In witness whereof the Bank, through its authorised officer, has set its hand and stamp on this day of 20..... at

.....
(Signature)

.....
(Name)

.....
(Designation with Bank Stamp)

Authorised vide
Power of Attorney No.....

Note :

1. (* The amount shall be as specified in the bidding documents
(**) This shall be the date of opening of Techno-Commercial bids
(#) Complete mailing address of the Head Office of the Bank to be given
(@) This date shall be forty five (45) days beyond the validity of bid.
(***) Write the name and addresses of all the Joint Venture partners, in case the Bid is submitted by a Joint Venture in terms of Qualifying Requirements.
2. The Bank Guarantee (BG) shall be from a Bank as per provisions of the Bidding Documents.
3. The BG should be on Non-Judicial Stamp paper/ e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG is executed, whichever is higher. The Stamp Paper/ e-Stamp Paper shall be purchased in the name of Bidder/ Bank issuing the guarantee.
4. While getting the Bank Guarantee issued, Bidders are required to ensure compliance to the points mentioned in Bank Guarantee Verification Check List in the Bidding Documents. Bidders are required to fill up this Check List and enclose the same along with the Bank Guarantee.

**ANDAMAN AND NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE
BIDDING DOCUMENT NO. NVVN / C&M / RE-342 / 2024-25**

**Tender Fee
(Submitted offline)**

Tender Fee @ INR 22,500 has been submitted.

**ANDAMAN AND NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE
BIDDING DOCUMENT NO. NVVN / C&M / RE-342 / 2024-25**

POWER OF ATTORNEY

Bidder to attach documents as per ITB clause 10.3(b)

(IN A SEPARATE SEALED ENVELOPE)

ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE

BIDDING DOCUMENT NO. NVVN / C&M / RE-342 / 2024-25

(Qualification Data to be filled in by bidders who are seeking qualification as per item No. 6.1.0 of Invitation for Bid)

Bidder's Name & Address:

To,

Sr. Manager (C&M)

NTPC Vidyut Vyapar Nigam Limited,
5th floor, Engineering Office Complex,
NTPC Limited, A-8A, Sector-24

Noida – 201301, India

1.0 We, M/s. the Bidder are seeking Qualification as per clause 6.1.0 of IFB.

2.0 We confirm that we meet the qualifying requirements specified in Item No. 6.1.1 of IFB Section-I of Bidding Documents. In this regard, we declare that we have executed/completed Similar Works during the last seven (7) years, as on last date of the month preceding the month of publication of NIT, having minimum contract/ order values as indicated below:

(a) One order of value not less than Rs.58.43 Crore,

OR

(b) Two orders, each of value not less than Rs.36.52 Crore,

OR

(c) Three orders, each of value not less than Rs.29.21 Crore.

Whereas, Similar Work means works comprising of “Construction of Civil, Structural & Architectural works including excavation in rock, Reinforced cement concrete works, steel structural works in a power plant or Industrial Plant or Jetty or Infrastructure project (Road & bridges).

S.No	Item Description	Details	Supporting documents for details furnished
(1)	(2)	(3)	(4)
i.	Name, address, e-mail, Tel. No. and Fax No. of the Bidder		
ii.	Name and Designation of the responsible person		

- iii. Name of the reference stations and its location
- iv. Name of the client / owner with full address, phone, fax & e-mail
- v. Details of the work performed during last seven (7) years, as on last date of the month preceding the month of publication of NIT
- vi. Value of the Contract
- vii. The date, when the work has been executed/completed

Note:

- i. The term “executed/completed” means the bidder should have achieved the criteria, even if the total contract/order is not completed / closed. In case of contract/order under execution as on last date of the month preceding the month of publication of NIT, the value of work executed against contract/order till such date shall be considered, provided the same is certified by the Owner/Project Authority.
- ii. Reference work executed by a Bidder as a sub-contractor may also be considered provided the certificate issued by main contractor is duly certified by Owner/Project Authority specifying the scope of work executed by the sub-contractor in support of Qualifying Requirements.
- iii. In case of composite work/BOQ, the bidder shall have to furnish Certificate from Owner/Project Authority certifying the value of specific nature of work, as mentioned above.
- iv. For the purpose of arriving at the executed value of order specified above, basic amount only shall be considered. In case of an order/contract inclusive of Taxes, agency has to provide the break-up of basic value and tax.
- v. The bidder can meet the requirements stipulated above either in a single order or collectively in multiple orders (not more than two or three, as applicable).

**APPENDIX A TO
ATTACHMENT-3A-1**

**Undertaking from Independent Statutory Auditor
(On letter head digitally signed by a person duly authorized to Sign on behalf of the Statutory Auditor)**

Ref.: _____

Date:

To,

NVVN Ltd.
.....

Dear Sir,

Subject: Authentication of veracity of documents submitted by M/s in support of meeting the Qualifying Requirements

Ref : IFB/Tender no.
Name of the Package/ Tender:

M/s. (hereinafter called Bidder) having Registered office at..... intend to participate in above referred tender of NVVN Ltd. We, M/s has been appointed as Statutory Auditor for the Bidder i.e. M/s (Relevant documents on our appointment attached)

The tender condition stipulates that the bidder shall submit supporting Documents pertaining to Technical Qualifying Requirement duly verified and certified by Statutory Auditor.

In this regard, it is hereby confirmed that we have examined the following documents, which are also attached with this letter. The same has been verified from the Original Documents and / or Client for authenticity.

We hereby confirm that the following documents are found to be genuine and authentic.

1. Doc ref. no. dated (name of Documents)
2. Doc ref. no. dated (name of Documents)
3.

All the aforesaid documents have been duly signed and stamped and/ or digitally signed by us as a certificate of authenticity.

*Further, we have examined the books of accounts, records, and other relevant documents, along with other necessary information and explanations furnished by M/s. (bidder) and hereby certify following:.....

This certificate is issued at the request of M/s (Bidder) for the purpose of participating in tender/s.

Thanking you,

.....

**APPENDIX B TO
ATTACHMENT-3A-1**

**Undertaking from Third Party Inspection Agency
(on letter head digitally signed by a person duly authorized to Sign on behalf of the TPIA)**

Ref.: _____

Date:

To,

NVVN Ltd.
.....

Dear Sir,

Subject: Authentication of veracity of documents submitted by M/s in support of meeting the Qualifying Requirements

Ref : IFB/Tender no.
Name of the Package/ Tender:

M/s. (hereinafter called Bidder) having Registered office at intend to participate in above referred tender of NTPC Ltd.

The tender condition stipulates that the bidder shall submit supporting Documents pertaining to Qualifying Requirement duly verified and certified by a specified independent Third-Party Inspection Agency as per the list mentioned in the bidding documents.

In this regard, it is hereby confirmed that we have examined the following documents, which are also attached with this letter. The same has been verified from the Original Documents and / or Client for authenticity.

We hereby confirm that the following documents are found to be genuine and authentic.

1. Doc ref. no. dated (name of Documents)
2. Doc ref. no. dated (name of Documents)
3.

All the aforesaid documents has been digitally signed by us as a certificate of authenticity.

We further confirm that we neither have any vested interest in aforesaid tender nor have any conflict of interest in respect of above tender. This certificate is issued at the request of M/s (Bidder) for the purpose of participating in the subject tender/s.

Thanking you,

.....

ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE

BIDDING DOCUMENT NO. NVVN / C&M / RE-342 / 2024-25

(Details pertaining to Financial Qualification of the bidder as per Item
No. 6.2.1 of the Invitation for Bid)

- (A) We confirm that our average annual turnover in the preceding three (3) financial years as on date of Techno-Commercial bid opening is not less than **INR 36.52 Crores (Indian Rupees Thirty-Six Crores & fifty-Two lakhs Only)** or in equivalent foreign currency. In support of above, we are enclosing audited financial statements, and the details are as under:

Sl. No	Financial Year	Amount in Rs.
1.	2023-2024	
2.	2022-2023	
3.	2021-2022	
4.	Average Annual Turnover for the preceding three (3) Financial Years as on date of Techno Commercial Bid Opening.	
5.	We have enclosed Audited financial statements for the last 3 financial years at	Annexure to Attachment3
6.	<p>Since we are not able to furnish our audited financial statements, on stand alone entity basis, we are submitting the following documents for substantiation of our Qualification :</p> <p>(a) Copies of unaudited unconsolidated financial statements of the bidder alongwith copies of the audited consolidated financial statements of our Holding Company for the last 3 years enclosed at Annexure to this Attachment 3.</p> <p>(b) Certificate from the CEO/CFO of the Holding company stating that the unaudited unconsolidated financial statements form part of the consolidated Financial Statements of the Holding Company, is enclosed as per the format at Appendix-A to this Attachment-3.</p>	Enclosed at Annexure
7.	Audited results for the last financial year as on the	YES <input type="checkbox"/> */NO* <input type="checkbox"/>

ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE

BIDDING DOCUMENT NO. NVVN / C&M / RE-342 / 2024-25

	<p>date of Techno-Commercial bid opening enclosed</p> <p>In case not enclosed, financial results certified by a practicing chartered accountant enclosed</p> <p>In case financial results certified by a practicing chartered accountant not enclosed, then Audited financial statements for FY also enclosed.</p> <p>Further, a Certificate from the CEO/CFO of the Bidder stating that the Financial results of company are under audit as on the date of Techno-Commercial Bid Opening and the certificate from the practicing chartered accountant certifying the financial parameters is not available, is enclosed Annexure as per the format at Appendix-C to this Attachment-3.</p>	<p>YES <input type="checkbox"/>*/NO* <input type="checkbox"/></p> <p>Enclosed at Annexure</p> <p>YES <input type="checkbox"/>*/NO* <input type="checkbox"/></p> <p>Enclosed at Annexure</p>
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ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE

BIDDING DOCUMENT NO. NVVN / C&M / RE-342 / 2024-25
(Details pertaining to Financial Qualification of the bidder as per
Item No. 6.2.2 of the Invitation for Bid)

- B) We hereby confirm that net worth of our company as on the last day of the preceding financial year is not less than 100% of its paid-up share capital.

The Details are as under:

Sl. No	Description	As on last day of the preceding financial year
1.	Paid-up Share Capital	
2.	Net Worth	
3.	%age of Net worth to Paid-up Share Capital	
4.	Documentary evidence like Annual reports/ Audited financial statements for the last 3 financial years in support of above is enclosed at Annexure. to this Attachment-3A-2	
5.	<p>Since we are not able to furnish our audited financial statements, on standalone entity basis, we are submitting the following documents for substantiation of our Qualification :</p> <p>(a) Copies of unaudited unconsolidated financial statements of the bidder alongwith copies of the audited consolidated financial statements of the Holding Company for the last 3 years enclosed at Annexure to this Attachment 3A-2.</p> <p>(b) Certificate from the CEO/CFO of the Holding company stating that the unaudited unconsolidated financial statements form part of the consolidated financial statements of the Holding Company, is enclosed as per the format at Appendix-A to this Attachment-3A-2.</p>	

For Bidders meeting requirement of Item No. 6.2.1 and/or 6.2.2 of IFB based on the strength of their *Subsidiary(ies) and/or *Holding Company and/or *Subsidiaries of the Holding companies

- (a) Since we do not satisfy the financial criteria stipulated at Clause 6.2.1 of IFB on our own, we meet the requirement of average annual turnover based on the strength of our Holding Company who meet the stipulated turnover requirements of IFB Item No. 6.2.1 and whose network as on the last day of the preceding financial year is atleast equal to or more than paid up share capital of the holding company.

Sl. No.	Description	As on last day of the preceding financial year
1.	Name and Address of the Holding Company	
2.	The annual turnover of the holding company in the preceding three financial years in Indian Rupees (INR) or in Foreign Currency (FC)\ 2023-2024 2022-2023 2021-2022	
3.	The average annual turnover of the holding company in the preceding three financial years as on the date of techno-commercial bid opening	
4.	We have enclosed Annual Reports/ Audited Financial Statements for the last 3 financial years of the Holding Company	YES <input type="checkbox"/> */NO* <input type="checkbox"/>
5.	Paid-up Share Capital of the Holding Company	
6.	Net Worth of the Holding Company	
7.	%age of Net worth to Paid-up Share Capital	
8.	A Letter of Undertaking from the holding company supported by Board Resolution of the Holding Company, pledging unconditional and irrevocable financial support for execution of the contract by the bidder in case of award, is enclosed as per the format at Appendix-B to this Attachment-3A-2. A power of attorney of the person signing on behalf of holding company is also enclosed at Annexure to this Attachment-3A-2.	
9.	Documentary evidence like Annual Report/Audited Financial Statements together with relevant schedules for the last preceding financial year/certification of financial statements from a practicing Chartered Accountant etc. in respect of Holding Company in support of above is enclosed at Annexure to this Attachment-3A-2.	

- (b) Since we do not satisfy the financial criteria stipulated at Clause 6.2.2 of IFB on our own, we meet the requirement of net worth based on the strength of our *Subsidiary(ies) and/or *Holding Company and/or *Subsidiaries of the Holding companies, and the Net worth of the Bidder and its *Subsidiary(ies) and/or* Holding Company and/or *Subsidiary(ies) of the Holding Company, in combined manner is not less than 100% of their total paid up share capital and individually, their Net worth is not less than 75% of their respective paid up share capitals.

Sl. No.	Description	As on last day of the preceding financial year
1.	Name and Address of the Subsidiary(ies) and/or* Holding Company and/or *Subsidiary(ies) of the Holding Company	
2.	Paid-up Share Capital of the Subsidiary(ies) and/or* Holding Company and/or *Subsidiary(ies) of the Holding Company	
3.	Net Worth of the Subsidiary(ies) and/or* Holding Company and/or *Subsidiary(ies) of the Holding Company	
4.	%age of Net worth to Paid-up Share Capital	
5.	Documentary evidence like Annual Report/Audited Financial Statements together with relevant schedules for the last preceding financial year/certification of financial statements from a practicing Chartered Accountant etc. in respect of Subsidiary(ies) and/or* Holding Company and/or *Subsidiary(ies) of the Holding Company in support of above is enclosed at Annexure to this Attachment-3A-2.	

* Bidder to strike-off whichever is not applicable.

We further confirm that notwithstanding anything stated above, the Employer reserves the right to verify any information/documents furnished by the Bidder and also to carry out assessment of the capabilities and capacity of the bidder/his collaborators / associates / subsidiaries / group companies to perform the contract, should the circumstances warrant such assessment in the overall interest of the Employer .

Date : (Printed Name).....

Place : (Designation).....

Notes :

- (i) In case where audited results for the last financial year as on the date of Techno commercial bid opening are not available, the financial results certified by a practicing Chartered Accountant shall be considered acceptable. In case, party is not able to submit the Certificate from a practicing Chartered Accountant certifying its financial parameters, the audited results of three consecutive financial years preceding the last financial year shall be considered for evaluating the financial parameters provided party submits a Certificate from the CEO/CFO as per the format enclosed at Appendix-C to this Attachment-3A-2.

- (i) Net worth means the sum total of the paid up share capital and free reserves. Free reserve means all reserves credited out of the profits and share premium account but does not include reserves credited out of the revaluation of the assets, write back of depreciation provision and amalgamation. Further, any debit balance of Profit and Loss account and miscellaneous expenses to the extent not adjusted or written off, if any, shall be reduced from reserves and surplus.
- (ii) Other income shall not be considered for arriving at annual turnover.
- (iii) "Holding Company" and "Subsidiary Company" shall have the meaning ascribed to them as per Companies Act of India.
- (iv) For annual Turnover indicated in foreign currency, the exchange rate as on seven (7) days prior to the date of Techno-Commercial bid opening shall be used.
- (v) For Turnover and Net worth, only standalone Financial Statement of Bidder/Associate/Collaborator/Holding/subsidiary(s) shall be considered.

ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE

BIDDING DOCUMENT NO. NVVN / C&M / RE-342 / 2024-25
PROFORMA OF CERTIFICATE FROM THE CEO/CFO OF THE HOLDING COMPANY IN
ACCORDANCE WITH ITEM NO 6.2.3 OF IFB
(To be submitted by Bidder along with the Bid)

- 1.0 I, Mr _____ (CEO/CFO of the holding company), declare
that M/s _____ (Name of the Holding Company) is the Holding
Company of M/s (Name of the Bidder).
- 2.0 I hereby confirm and undertake that the unaudited unconsolidated financial statements submitted in respect
of the Bidder as part of the bid reference no ----- dated-----
--- have been considered for the purposes of the finalization of consolidated financial statements of the
Holding Company as part of the Annual Reports.
- 3.0 I further, certify that the figures in the unaudited unconsolidated financial statements are true and correct
and same have been duly reflected in the audited consolidated financial statements and/or Annual Report
of the Holding Company.

Yours faithfully,

(Signature)

Date: _____
Place: _____
Name & Designation.....
Name of the Holding Company.....
Seal of the Holding Company.....

ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE

BIDDING DOCUMENT NO. NVVN / C&M / RE-342 / 2024-25

PROFORMA OF LETTER OF UNDERTAKING

(TO BE FURNISHED ON NON-JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)

[To be executed by the Holding Company Supported by Board Resolution and submitted by the Bidder along with the Bid, in case financial support is being extended by the Holding Company to the Bidder for meeting the stipulated Financial Qualifying Requirement as per Item No. 6.2.3 of Invitation for Bid]

Dear Sir,

1.0 We, M/s _____ declare that we are the holding company of M/s (Name of the *Bidder/*Associate/Collaborator) and have controlling interest therein.

M/s _____ (Name of the Bidder) proposes to submit the bid for the package (Name of the package) for _____ (Name of the Project) under bid reference no _____ dated _____ and M/s _____ (Name of the Bidder) have sought financial strength and support from us for meeting the stipulated Financial Qualifying Requirement as per Item No. **6.2.1/6.2.2** Invitation for Bid.

2.0 We hereby undertake that we hereby pledge our unconditional & irrevocable financial support for the execution of the said package to M/s _____ (Name of the Bidder), for the execution of the Contract, in case M/s _____ (Name of the Bidder) are awarded the Contract for the said package at the end of the bidding process.

We further agree that this undertaking shall be without prejudice to the various liabilities that M/s _____ (Name of Bidde) would be required to undertake in terms of the Contract including the Performance Security as well as other obligations of the Bidder/Contractor.

3.0 This undertaking is irrevocable and unconditional, and shall remain in force till the successful execution and performance of the entire contract and/or till it is discharged by Employer.

4.0 We are herewith enclosing a copy of the Board Resolution in support of this undertaking.

Yours faithfully,

(Signature of Authorized Signatory on behalf of the Holding Company)

Date: _____ Name & Designation.....

Place: _____ Name of the Holding Company.....

Seal of the Holding Company.....

1.

2.

ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE

BIDDING DOCUMENT NO. NVVN / C&M / RE-342 / 2024-25

**PROFORMA OF CERTIFICATE FROM THE CEO/CFO OF THE BIDDER IN
ACCORDANCE WITH ITEM NO. 62.3. OF IFB
(To be submitted by Bidder along with the Bid)**

Ref. :

Date :

To

NTPC Vidyut Vyapar Nigam Limited,
5th floor, Engineering Office Complex,
NTPC Limited, A-8A, Sector-24
Noida – 201301, India

1.0 I, Mr./Ms. (CEO / CFO* of M/s (Name of the *Bidder / *Subsidiary(ies) / *Holding Company / *Subsidiaries of the Holding companies) hereby confirm and undertake that the Financial results of the Company are under audit as on the date of Techno-commercial bid opening for the package..... (Name of the package).

2.0 I further, declare that the Certificate from the practicing Chartered Accountant certifying the financial parameters of M/s..... (Name of the *Bidder/*Subsidiary(ies) / *Holding Company / *Subsidiaries of the Holding companies) for the last financial year is not available.

***Strike whichever is not applicable**

Yours faithfully

(Signature)

Date :

(Name & Designation).....

Place:

(Name of the Company).....

(Seal of the Company).....

ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE

BIDDING DOCUMENT NO. NVVN/C&M/RE-342/2024-25
(Declaration of Available Bid Capacity)

Bidder's Name and Address:

To

NTPC VIDYUT VYAPAR NIGAM LIMITED,
5th floor, Engineering Office Complex,
NTPC Limited, A-8A, Sector-24
Noida – 201301, India

1.0 We understand that available Bid Capacity shall be calculated as per formula stipulated hereunder:

$$\text{Available Bid Capacity (Rs. Crore)} = (A \times N \times 1.5 - B)$$

$A =$ Maximum value of works performed in any Year during last seven years (Rs. Crore) $N =$
Completion time of the subject Work in years .

$B =$ Value of existing commitments and works to be completed during the next N Years (Rs. Crore)

2.0 In this regard, details of (i) Value of works performed during the last 7 (Seven) years as on the date of bid opening of Techno-Commercial bids and (ii) details of existing commitments and works to be completed during the nextmonths as on the date of bid opening of Techno-Commercial bids, duly certified by a practicing Chartered Accountant have been enclosed as per details placed at **Annexure-I to this Attachment-3A.**

Based on details as per Annexure-I to this Attachment

- $A =$ Maximum value of works performed during the last 7 years as on the date of bid opening of Techno-Commercial bids = (Rs. Crore)
- $B =$ Maximum value of existing commitments and works to be completed* during the next
Months# as on the date of bid opening of Techno-Commercial bids = (Rs. Crore)

* The same shall be based on firm Order/ Commitments in hand.

Value of existing commitments and works to be completed for Months shall be taken from the details in Annexure-I to this Attachment.

3.0 Bid Capacity

Bid Capacity as per the Formula at Para 1.0 above and details at Para 2.0 above (duly certified by a practicing Chartered Accountant as per details placed at Annexure-I to this Attachment-3A) works out to(Rs Crore)

We hereby confirm that:

(a)* Available Bid Capacity' at the expected time of Bidding is more than 110% of the estimated cost of the works, mentioned in the IFB.

OR

(b)* if the present commitments and works to be completed during the next months are such that the available Bid Capacity is less than 110% of the estimated cost of the works, mentioned in the IFB, the details of alternative arrangements to be organized by us for this purpose are also furnished and are attached as Annexure-II to this Attachment-3A. The same shall be subject to Employer's acceptance.

[*Strike out (a) or (b) whichever is not applicable]

ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE**BIDDING DOCUMENT NO. NVVN/C&M/RE-342/2024-25
(Certificate by a practicing Chartered Accountant)**

To
NTPC VIDYUT VYAPAR NIGAM LIMITED
 5th floor, Engineering Office Complex,
 NTPC Limited, A-8A, Sector-24
 Noida – 201301, India

Dear Sirs,

Name of the Bidder and address:

We hereby certified the following details of Bidder:

- (i) value of works performed during the last 7 (Seven) years as on the date of bid opening of Techno Commercial bids and
- (ii) details of existing commitments and works to be completed during the next 3 years as on the date of bid opening of Techno-Commercial bids as under.

* Maximum value of works performed during the last 7 years as on the date of bid opening of Techno-Commercial bids.

Sl. No.	Financial Year	Value of works performed in (Rs. Crores)
(i)		
(ii)		
(iii)		
(iv)		
(v)		
(vi)		
(vii)		

A * **Maximum value of works performed in a Year (out of above last preceding 7 years is
(Rs. In Crores)**

- * **Value of existing commitments and works to be completed* during the next months as on the date of bid opening of Techno-Commercial bids.**

Sl. No.	Financial Year	Value of existing commitments and works (RS. In Crores)
(i)		
(ii)		
(iii)		

- * **The same shall be based on firm Order/ Commitments in hand.**

Date : Signature of Chartered Accountant
(Printed Name)

Place : Designation

**ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE
BIDDING DOCUMENT NO. NVVN/C&M/RE-342/2024-25
(Details regarding anticipation of change in ownership)**

Bidder's Name and Address:

To

NTPC VIDYUT VYAPAR NIGAM LIMITED,
5th floor, Engineering Office Complex,
NTPC Limited, A-8A, Sector-24
Noida – 201301, India

We hereby confirm that we do not anticipate any change in ownership during proposed period of execution of work (if such a change is anticipated, the scope and effect thereof shall be defined). The relevant document for same is enclosed at Annexure to this Attachment-3C.

Date :

Name of Authorised Person

Place :

Designation

ATTACHMENT 4

ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE

BIDDING DOCUMENT NO. NVVN/C&M/RE- 342/2024-25

(LIST OF SIMILAR WORKS ON HAND & PERCENTAGE COMPLETED BY THE BIDDER)

i) Details of similar works on hand

Status as on

Sl. No.	Detailed Description of works	Name of Owner/ Client, name of person & contact details of contact person	Quantity of earth work in embankment formation	Total Value as awarded (Rs. in lacs)	Value of works as executed (Rs. In lacs)	Time Schedule				Percentage of work completed as on..... (Date)		Remarks & Highlights of work	Enclose a statement for each work regarding cash flow of work upto expected completion in terms of money (specify page/ Annex. No.)
						Date of Commencement		Date of completion		Physical	Financial		
						Sch.	Act.	Sch.	Anticipated				
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
1													
2													
3													

Note: Bidder shall enclose a statement for each work regarding cash flow of expected work upto completion in term of money (specify Page/ Annex No.)

ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE

BIDDING DOCUMENT NO. NVVN/C&M/RE- 342/2024-25

(LIST OF CONTRACTS EXECUTED)

Details of similar works executed in last ten (10) years

Sl. No	Detailed description of works*	Name of Employer/Client Name of person & address of contact person	Quantity)	Total Value as awarded (Rs. In crore)	Total Value as executed (Rs. In crore)	Date of commencement		Date of completion	
						Sch	Act	Sch	Act

Note : Bidder may enclose additional sheets, if required.

ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE

BIDDING DOCUMENT NO. NVVN/C&M/RE- 342/2024-25

(EQUIPMENT/ MACHINERY DEPLOYMENT SCHEDULE)

S I N o	Equipment Type/ Capacity	Min Nos require d	No. propos ed to be deploy ed	No. already available for immediate deployme nt	Period by which balance equipment will be deployed	Place from where balance equipment will be bought	Number intended to be purchas ed	Period by which New T&P can be deployed	Quantum of work that can be achieved during peak period/shift
1.									

NOTES

- a) These requirements and capacity of the equipment are indicative only and not exhaustive and deployment of the equipment, machinery and labour shall be suitably augmented to achieve the timely completion of the work as per the program and directions of the engineer, without any additional cost to Owner.
- b) Other materials like cables, sling, gloves goggles, safety belts, safety helmets, heating oven, preheating / post weld heat treatment arrangements, material for making platforms and platform supports etc. shall be mobilised as per requirement.
- c) Other equipment though required for the timely completion of the job and but not listed above shall be deployed by the contractor, as per the job requirements and as directed by the Engineer.
- d) The contractor shall make suitable provisions for repairs and maintenance of the equipment mobilised and always keep them in good working condition, as the repair facilities for such equipment are not available at the project site.
- e) All concreting shall be carried out using centralised batching plant, transit mixers, concrete pumps, boom placers. However individual mixers for localised concreting can be done for PCC work and small qty. of RCC work after the approval of Engineer-in-charge, if required.

ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE

BIDDING DOCUMENT NO. NVVN/C&M/RE- 342/2024-25

SAFETY EQUIPMENT & SAFETY PERSONAL PROTECTIVE EQUIPMENTS

SI No	Equipment Type/ Capacity	Min Nos required to be deployed at site	No. proposed to be deployed at site	No. already available for immediate deployment at site	Period by which balance equipment will be deployed at site	Place from where balance equipment will be bought at site	Number intended to be purchase d	Period by which New T&P can be deploye d
1	Suggested List of Safety Equipments and Safety Personal Protective Equipments to be deployed: Safety Helmet & safety Shoes: Industrial Safety Helmet (IS:2925- 1984 marked) Industrial Safety/ Electrical Shoes (IS:15298-2002 marked)	50 Nos. each 50 Nos. each						

Note:-

- 1) These quantities of the equipment are minimum only and not exhaustive and deployment of the equipment, shall be suitably augmented as per the program and directions of the Engineer, without any additional cost to Owner.
- 2) Other equipments like cables, sling, gloves, goggles, safety belt, heating oven, pre-heating arrangement, material for making platform and platform support etc. shall be mobilised as per requirement.
- 3) Other equipment though required for the execution of the job and but not listed above shall be deployed by the contractor, as per the job requirements and as directed by the Engineer.
- 4) The contractor shall make suitable provisions for repairs and maintenance of the equipment mobilised and always keep them in good working conditions, as the repair facilities for such equipment are not available at the project site.

**ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE
BIDDING DOCUMENT NO. NVVN/C&M/RE-342/2024-25
(SUB-CONTRACTORS)
(TO BE SUBMITTED AT SITE AFTER AWARD OF WORK)**

Dear Sirs,

The following details in respect of each Sub-Contractor proposed by us in our bid are annexed to this Attachment

1. Name of the Sub-Contractor and the broad scope of work proposed to be sub-contracted to him.
2. The following details of the Sub-Contractor:
 - (i) Similar work executed in Industrial/ Infrastructure projects in the last seven (7) years including achievements. Details shall clearly indicate the name & address of the client, period of execution, the nature/ scope of work, major civil/ structural/ architectural quantities in his scope and physical progress achieved on monthly/ yearly basis.
 - (ii) List of plant & equipment proposed for deployment indicating whether the plant of equipment are lying idle and/or will be diverted from other works indicating likely date of release by client.
 - (iii) Technical manpower available for deployment.
 - (iv) Financial status for last three (3) years
 - (v) Letter of confirmation from the Sub-Contractor, signifying his confirmation to execute the Work.

Further, a letter from each of our proposed sub-contractors, conveying their willingness to work with us in case of award, is also enclosed.

- Note :**
1. The Bidder shall furnish the above details for each of the agencies/sub-contractors separately as per the relevant clause of ITB.
 2. The format of the Letter of confirmation shall be as given at S. No. 13 of Forms and Procedures, Section VIII.

Date :

Name of Authorised Person

Place :

Designation

**ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE
BIDDING DOCUMENT NO. NVVN/C&M/RE-342/2024-25
(LIST OF FINANCIAL DOCUMENTS)**

The following Documents are annexed to this attachment.

1. Solvency Certificate (from Bankers) issued not earlier than fifteen (15) days prior to the scheduled date of Techno-commercial bid opening of the package.
2. Audited Annual Report of last 3 years.
3. List of IMMOVABLE Assets of Partners/Directors (In case of Proprietary / Partnership firm).
4. Declaration by Bankers or the Chartered Accountant regarding,
 - i) Bank guarantee Limit (Sanctioned and utilised).
 - ii) Overdraft Limits/Cash Credit Limit (Sanctioned and utilised).
 - iii) Deferred Payment Limits.
 - iv) Fixed Deposits.
 - v) Movable Property Hypothecation.

(Please state the present utilisation status also).

5. PAN NUMBER
6. Cash flow statement for execution of the subject package: - **TO BE SUBMITTED WITH PRICE PROPOSAL.**
7. GST Identification Number (GSTIN)

Date : Name of Authorised Person

Place : Designation

ATTACHMENT-9

**ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE
BIDDING DOCUMENT NO. NVVN/C&M/RE-342/2024-25
(GENERAL DECLARATION BY BIDDER)**

Bidder's Name and Address:

To

NTPC VIDYUT VYAPAR NIGAM LIMITED,
5th floor, Engineering Office Complex,
NTPC Limited, A-8A, Sector-24
Noida – 201301, India

Dear Sirs,

We hereby confirm that :

1. We have carefully read General Conditions of Contract, Special Conditions of Contract, Technical Specification and Bid Drawings (including amendments/ errata) and Schedule of Quantities and all other Bidding documents.
2. Our technical team/ technically competent officer visited the site to apprise our selves about availability of construction materials, unskilled labour, access to site and other infrastructure/enabling facilities (including availability of water/power) needed for the execution of the contract.

Date :

Name of Authorised Person

Place :

Designation

ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE
BIDDING DOCUMENT NO. NVVN/C&M/RE-342/2024-25
(DETAILS OF FATAL ACCIDENTS)

Dear Sirs,

We declare that the details of fatal/ non-fatal accidents that took place during the last three (3) years at various construction projects for works awarded to us are as given below :

Sl. No.	Name & Address of Project where accident took place	Nature of accident	Fatal/ Non Fatal	Reasons for accident
1				
2				
3				
4				
5				

Note : Bidder to furnish details of each accident giving the date/ period of occurrence of such accident

Date : _____ Name of Authorised Person

Place : _____ Designation

**ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE
BIDDING DOCUMENT NO. NVVN/C&M/RE-342/2024-25**

All information required for issue of relevant Certificate by you for availing Customs Duty benefits against import of equipment and materials for incorporation in the Works under this Bid and facilitating the execution of Works under this Bid. **[TO BE SUBMITTED ALONGWITH PRICE BID]**

**ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE
BIDDING DOCUMENT NO. NVVN/C&M/RE-342/2024-25**

All information required for issue of relevant Certificate by you for availing Customs Duty benefits against import of construction equipment as per the extant Customs Acts and Notifications of Govt. of India. **[TO BE SUBMITTED ALONGWITH PRICE BID]**

I/We hereby declare that the particulars given above are correct and complete. If the transaction is delayed or credit is not affected at all for reasons of incomplete or incorrect information, I/We would not hold the Employer responsible.

SIGNATURE

DATE

--	--	--	--	--	--

(AUTHORISED SIGNATORY)

Name

:

OFFICIAL STAMP

BANK CERTIFICATION:

It is certified that above mentioned beneficiary holds a bank account no.
with our branch and the Bank particulars mentioned above are correct.

NAME:

SIGNATURE:

OFFICIAL STAMP

(AUTHORISED SIGNATORY)

Authorization No. :

DATE					

ANDMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE

AT

BIDDING DOCUMENT NO. NVVN/C&M/RE-342/2024-25

(INTEGRITY PACT)

Between

NTPC VIDYUT VYAPAR NIGAM LIMITED., a wholly owned subsidiary of NTPC Ltd. (hereinafter referred

to as "The Employer") and

..... (Hereinafter referred to as "The Bidder/Contractor") and

..... (Hereinafter referred to as "JV Partner/ Consortium
Members")

(if applicable)

Preamble

The Employer invites the bids from all eligible bidders and intends to enter into contract for **ANDMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE** with the successful bidder(s), as per organizational systems and procedures. The Employer values full compliance with all relevant laws and regulations, and the principles of economical use of resources, and of fairness and transparency in its relations with its Bidder(s) and/or Contractor(s).

In order to achieve these goals, the Employer may appoint an Independent External Monitor (IEM), who will monitor the bidding process and the execution of the contract for compliance with the principles mentioned above.

Section 1 Commitments of the Employer

1. The Employer commits itself to take all measures necessary to prevent corruption and to observe the following principles in this regard:
 - a) No employee of the Employer, either in person or through family members including relatives, will in connection with the bidding for or the execution of a contract, demand or accept a promise for or accept for him/herself or for a third person, any material or immaterial benefit to which he/she is not legally entitled to.
 - b) The Employer shall, during the bidding process treat all Bidders with equity and reason. The Employer will, in particular, before and during the bidding process, provide to all Bidders the same information and will not provide to any Bidder confidential/additional information through which the Bidder(s) could obtain an advantage in relation to the bidding process or the contract execution.

- c) The Employer will exclude from the process all known prejudiced persons.
2. If the Employer obtains information on the conduct of any of its employees which is a criminal offence under the IPC/PC Act or if there be a substantive suspicion in this regard, the Employer will inform the Chief Vigilance Officer and in addition can initiate disciplinary actions.

Section 2 Commitments and Undertakings by the Bidder/Contractor

- 1 The Bidder/Contractor commits and undertakes to take all measures necessary to prevent malpractices & corruption. He commits himself to observe the following principles during his participation in the bidding process and during the execution of the contract:
- a) The Bidder/ Contractor undertakes not to, directly or through any other person or firm offer, promise or give or influence to any employee of the Employer associated with the bidding process or the execution of the contract or to any third person on their behalf any material or immaterial benefit which he/she is not legally entitled, in order to obtain in exchange any advantage of any kind whatsoever during the bidding process or during the execution of the contract.
 - b) The Bidder/ Contractor undertake not to enter into any undisclosed agreement or understanding, whether formal or informal with other Bidders. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other action to restrict competitiveness or to introduce cartelization in the bidding process.
 - c) The Bidder/Contractor undertakes not to commit any offence under the relevant Anti-corruption Laws of India; further the Bidder/Contractor will not use improperly, any information or document provided by the Employer as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically for purposes of competition or personal gain and will not pass the information so acquired on to others.
 - d) The Bidder/ Contractor will, when presenting his bid undertakes, to disclose any and all payments made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
- 2 The Bidder/ Contractor will not instigate and allure third persons/parties to commit offences outlined above or be an accessory to such offences.

Section 3 Disqualification from Bidding Process and Exclusion from Future Contracts If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of any provisions of Section 2 or in any other form so as to put his reliability or credibility as Bidder into question, the Employer shall be entitled to

disqualify the Bidder(s)/ Contractor(s) from the bidding process or to terminate the contract, if signed on that ground.

1. If the Bidder/ Contractor has committed a transgression through a violation of Section 2 such as to put his reliability or credibility into question, the Employer shall be entitled to exclude including blacklist and put on holiday the Bidder/ Contractor for any future tenders/contract award process. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the Employer taking into consideration the full facts and circumstances of each case particularly taking into account the number of transgressions, the position of the transgressors within the company hierarchy of the Bidder and the amount of the damage. The exclusion will be imposed for a minimum of 3 years.
2. A transgression is considered to have occurred if the Employer after due consideration of the available evidence concludes that no reasonable doubt is possible.
3. The Bidder with its free consent and without any influence agrees and undertakes to respect and uphold the Employer's absolute rights to resort to and impose such exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground, including the lack of any hearing before the decision to resort to such exclusion is taken. This undertaking is given freely and after obtaining independent legal advice.
4. Subject to full satisfaction of the Employer, the exclusion of Bidder/ Contractor could be revoked by the Employer if the Bidder/ Contractor can prove that he has restored/ recouped the damage caused by him and has installed a suitable corruption prevention system in his organization.

Section 4 Compensation for Damages including Forfeiture of Earnest Money Deposit/ Security Deposit/ Performance & Advance Bank Guarantees

1. If the Employer has disqualified the Bidder/ Contractor from the bidding process or has terminated the contract pursuant to Section 3, the Employer shall forfeit the Earnest Money Deposit/Bid Security, encash Contract Performance Bank Guarantees in addition to excluding the bidder from the future award process and terminating the contract.
2. In addition to 1 above, the Employer shall be entitled to take recourse to the relevant provisions of the contract related to Termination of Contract due to Contractor's Default.

Section 5 Previous Transgressions

- 1 The Bidder swears on oath that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other Company in any country conforming to TI approach or including with any Public Sector Enterprise/ Undertaking in India or any Government Department in India

that could justify bidder's exclusion from the tender process.

- 2 If the Bidder makes incorrect statement on this subject, Bidder can be disqualified from the bidding process or the contract, if already awarded, can be terminated on this ground.

Section 6 Company Code of Conduct

Bidders are also advised to have a company code of conduct (clearly rejecting the use of bribes and other unethical behaviour) and a compliance program for the implementation of the code of conduct throughout the company.

Section 7 Deleted

Section 8 Pact Duration

This Pact comes into force from the date of signing by all the parties. It shall expire for the Contractor 12 months after the last payment under the respective contract, and for all other unsuccessful bidders 6 months after the contract has been awarded.

Section 9 Miscellaneous Provisions

- 1 This Pact is subject to Indian Law. The place of performance and jurisdiction shall be New Delhi.
- 2 Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
3. The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.
4. If the Contractor is a JV partnership / Consortium / Associate, this agreement must be signed by all the partners of JV / Consortium Partners / Associate as the case may be.

The Parties hereby sign this Integrity Pact aton thisday of 2020.

Employer

Bidder/ Contractor

Joint Venture Partner(s)/
Consortium members

TO BE ACCEPTED THROUGH GTE

ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE

**BIDDING DOCUMENT NO. NVVN/C&M/RE-342/2024-25
(CHECKLIST FOR TECHNO-COMMERCIAL BID)**

Bidder's Name and Address:

To

NTPC VIDYUT VYAPAR NIGAM LIMITED,
5th floor, Engineering Office Complex,
NTPC Limited, A-8A, Sector-24
Noida – 201301, India

Dear Sirs,

Check List of documents to be submitted for Techno-Commercial Bid

Sl.	Details of Checks	Enclosed: Yes / No
1.	BID FORM (TECHNO-COMMERCIAL BID)	.....
2.	ATTACHMENT-1, 1A, & TENDER FEE <i>(IN A SEPARATELY SEALED ENVELOPE)</i>	.....
3.	ATTACHMENT-2 <i>(IN A SEPARATELY SEALED ENVELOPE)</i>	.....
4.	ATTACHMENT-3 (INCLUDING QR DETAILS)	.....
5.	ATTACHMENT-4	.....
6.	ATTACHMENT-5	.....
7.	ATTACHMENT-6 & 6A	.....
8.	ATTACHMENT-7	.....
9.	ATTACHMENT-8	.....
10.	ATTACHMENT-9	.....
11.	ATTACHMENT-10	.....
12.	ATTACHMENT-11 <i>(IN A SEPARATELY SEALED ENVELOPE)</i>	.....
13.	ATTACHMENT-12	.....
14.	ATTACHMENT-13	.....



SECTION - VII (Part 2 OF 3)

FORMS AND PROCEDURES

FOR

**ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL
WORKS PACKAGE**

IFB DOCUMENT NO.: 'NVVN/C&M/RE-342/2024-25

(This document is meant for the exclusive purpose of bidding against this Bid Document No. / Specification and shall not be transferred, reproduced or otherwise used for purposes other than that for which it is specifically issued).

TABLE OF FORMS AND PROCEDURES

SI.No.	Description
1.)	Section-VII (Part 1 of 3) Techno-Commercial Bid (Envelope-1) (Bid Form along with Attachments)
2.)	Section-VII (Part 2 of 3) Price Bid (Envelope-2) (Bid Form along with attachments and Price Schedules)
3.)	Section-VII (Part 3 of 3) 1. Proforma for Bank Guarantee for Bid Security 2. Bank Guarantee verification checklist 3. Form of Bank Guarantee for Contract Performance Guarantee 4. Proforma for extension of Bank Guarantee 5. Proforma of Bank Guarantee for Lumpsum Advance 6. Proforma of Bank Guarantee to be furnished by Associate(s)- 7. List of banks from which Bank Guarantees for Advance/ Security Deposit and Bank Guarantee to be furnished by Bidder/ Contractor can be accepted 8. Form of Bank Guarantee for removal of Plant and Equipment from the Site 9. Form of Hypothecation Deed 10. Proforma of "Contract Agreement" 11. Proforma of "Indemnity Bond" for "Employer Issue Materials" 12. Letter of Undertaking to be given by Contractor while furnishing the Indemnity Bond" to Employer for "Employer Issue Materials" 13. Proforma of Letter of Confirmation by The proposed Sub-Contractor 14. Proforma for Material Accounting & Reconciliation 15. Form of Indemnity Bond to be executed by the Contractor for the safe custody of equipment brought to site by the contractor 16. Form of Indemnity Bond to be executed by the contractor for Removal/ Disposal of surplus material 17. Proforma of Contract Closing Certificates

**1B. ATTACHMENTS FOR
ENVELOPE-II (PRICE BID)**

ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE

BIDDING DOCUMENT NO. NVVN/C&M/RE-342/2024-25

(Declaration regarding Import Content included in our Price bid)

Dear Sirs,

- 1.) We confirm the details of the Import Content included in our bid prices are as follows which essentially qualify as Goods under Chapter 98.01 of Custom Tariff Act and required for incorporation in the work under the Contract.
- 2.) These details are furnished for the purpose of issuance of the Certificate as referred at clause 10.3 of ITB.
- 3.) We further confirm that we are solely responsible for obtaining the customs duty benefits for import of Goods which we have considered in our bid and in case of failure to receive such benefits; Owner will not compensate us in any manner whatsoever.

Sl. No.	Description of Item	Value in Rs (CIF) (included in our bid price)
1		
2		
3		

Note: Continuation sheets of like size and format may be used as per Bidder's requirement and shall be annexed to this Attachment

ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE

BIDDING DOCUMENT NO. NVVN/C&M/RE-342/2024-25

(DECLARATION REGARDING CUSTOMS DUTY BENEFITS FOR IMPORT OF CONSTRUCTION EQUIPMENT UNDER CHAPTER 98.01 OF CUSTOMS TARIFF ACT)

Dear Sir,

1. We confirm that we are solely responsible for obtaining Customs Duty benefits for import of Construction Equipment which we have considered in our bid and in case of failure to receive such benefits, Employer will not compensate us in any manner whatsoever.
2. **We further confirm that we will not claim for adjustment in Contract Price on account of variation in or withdrawal of Customs Duty benefits for import of Construction Equipment.**
3. We are furnishing below the information required by the Employer for issue of relevant Certificates in terms of the Customs Acts & Notifications of Govt. of India:
 - (A) *CIF Value of Construction Equipment to be imported by the Bidder / Assignee (if applicable in case of foreign bidder) including its sub-contractor(s) of the Bidder/Assignee.

We further confirm that the aforesaid CIF value has not been included in Attachment-11.

* Please state the currency and fill in the amount in figures and words.

- (B). Description and quantities of the Construction Equipment to be imported by the Bidder/ sub-contractor(s) for deployment to site under the package.

Sl.No.	To be imported by	Description of Item to be imported	Quantity
(i)	Bidder		
(ii)	Sub-Contractor(s)		

- 4.0** We confirm that the Construction Equipment being imported as per 'B' above shall be deployed at the Project Site for the purpose of execution of Package as per bidding document No. **NVVN/C&M/RE-342/2024-25**.

Date : (Designation).....

Place: (Printed Name).....

Note: (i) Continuation sheets of like size and format may be used as per Bidders requirements and shall be annexed to this Attachment

ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE

BIDDING DOCUMENT NO. NVVN/C&M/RE-342/2024-25

CHECK LIST OF DOCUMENTS FOR ENVELOPE-II:

~~PRICE BID~~

<i>Sl. No.</i>	<i>Details of Checks</i>	<i>Enclosed: Yes/No.</i>
1.	Attachment 11	
2.	Attachment-12	
3.	All Price Schedules and BOQ	

Date: (Designation).....

Place: (Printed Name)

PRICE SCHEDULE & SUMMARY

(Uploaded online in Excel File in the same format as downloaded with bidding document)



SECTION – VII (Part 3 OF 3)

FORMS AND PROCEDURES

FOR

ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL WORKS PACKAGE

IFB DOCUMENT NO.: NVVN/C&M/RE-342/2024-25

(This document is meant for the exclusive purpose of bidding against this Bid Document No. / Specification and shall not be transferred, reproduced or otherwise used for purposes other than that for which it is specifically issued).

**ANDAMAN & NICOBAR GAS POWER PROJECT CIVIL
WORKS PACKAGE**

**BIDDING DOCUMENT NO. NVVN / C&M / RE-342/2024-25
SECTION - VII (Part 3 of 3)**

**TABLE OF FORMS AND PROCEDURES,
(SECTION-VIII, BOOK 3 OF 3)**

Sl. No.	Description
1.)	Section-VII (Part 1 of 3) Techno-Commercial Bid (Envelope-1) (Bid Form along with Attachments)
2.)	Section-VII (Part 2 of 3) Price Bid (Envelope-2) (Bid Form along with attachments and Price Schedules)
3.)	Section-VII (Part 3 of 3) 1. Proforma for Bank Guarantee & Insurance Surety Bond for Bid Security 2. Bank Guarantee verification checklist 3. Form of Bank Guarantee for Contract Performance Guarantee 4. Proforma for extension of Bank Guarantee 5. Proforma of Bank Guarantee for Lumpsum Advance 6. Proforma of Bank Guarantee to be furnished by Associate(s)- 7. List of banks from which Bank Guarantees for Advance/ Security Deposit and Bank Guarantee to be furnished by Bidder/ Contractor can be accepted 8. Form of Bank Guarantee for removal of Plant and Equipment from the Site 9. Form of Hypothecation Deed 10. Proforma of "Contract Agreement" 11. Proforma of "Indemnity Bond" for "Employer Issue Materials" 12. Letter of Undertaking to be given by Contractor while furnishing the Indemnity Bond" to Employer for "Employer Issue Materials" 13. Proforma of Letter of Confirmation by The proposed Sub-Contractor 14. Proforma for Material Accounting & Reconciliation 15. Form of Indemnity Bond to be executed by the Contractor for the safe custody of equipments brought to site by the contractor 16. Form of Indemnity Bond to be executed by the contractor for Removal/ Disposal of surplus material 17. Proforma of Contract Closing Certificates

**1. PROFORMA FOR BANK GUARANTEE
FOR BID SECURITY**

**1. PROFORMA FOR BANK GUARANTEE FOR BID SECURITY
(IN LIEU OF CASH DEPOSIT)**

Bank Guarantee No. :
Date :

To,

NVVN Limited
5th floor, Engineering Office Complex,
NTPC Limited, A-8A, Sector-24
Noida – 201301, India

Dear Sir,

In accordance with Invitation for Bids under your Bid Document No.....M/s
.....(***)..... having its Registered/ Head Office at
..... (hereinafter called the "Bidder") wish to participate in the
said bid for [*Name of Package*]

As an irrevocable Bank Guarantee against Bid Security for an amount of(*) valid
for days from(**).....required to be submitted by the Bidder as a condition precedent
for participation in the said bid which amount is liable to be forfeited on the happening of any
contingencies mentioned in the Bidding Documents.

We, the[*Name & address of the Bank*] having our Head
Office at.....(#)..... guarantee and undertake to pay immediately on demand
by NTPC Vidyut Vyapar Nigam Limited (hereinafter called the 'Employer') the amount of
.....(*)..... without any reservation, protest, demand and recourse. Any such demand
made by the 'Employer' shall be conclusive and binding on us irrespective of any dispute or difference
raised by the Bidder.

This guarantee shall be irrevocable and shall remain valid upto(@)..... If any further
extension of this guarantee is required, the same shall be extended to such required period (not
exceeding one year) on receiving instructions from M/s
.....(***).....[*Bidder's Name*] on whose
behalf this guarantee is issued.

In witness whereof the Bank, through its authorized officer, has set its hand and stamp on this day of 20..... at

.....
(Signature)

.....
(Name)

.....
(Designation with Bank Stamp)

Authorised vide

Power of Attorney No.....

Date.....

Note :

1. (*) The amount shall be as specified in the bidding documents
(**) This shall be the date of opening of Techno-Commercial bids
(#) Complete mailing address of the Head Office of the Bank to be given
(@) This date shall be forty five (45) days beyond the validity of bid.
(***) Write the name and addresses of all the Joint Venture partners, in case the Bid is submitted by a Joint Venture in terms of Qualifying Requirements.
2. The Bank Guarantee (BG) shall be from a Bank as per provisions of the Bidding Documents.
3. The BG should be on Non-Judicial Stamp paper/ e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG is executed, whichever is higher. The Stamp Paper/ e-Stamp Paper shall be purchased in the name of Bidder/ Bank issuing the guarantee.
4. While getting the Bank Guarantee issued, Bidders are required to ensure compliance to the points mentioned in Bank Guarantee Verification Check List in the Bidding Documents. Bidders are required to fill up this Check List and enclose the same along with the Bank Guarantee.
5. In case, Bank Guarantee is getting issued from State Bank of India, Bidder to take note of NTPC letter ref. NTPC/FC/CS/BG/01 dated 03.09.2014 and SBI letter ref. CAG-I/AMT-1/2014-15/370 dated 04.09.2014 (attached with Section-III of Bidding Documents).

**Form of Insurance Surety Bond towards Bid Security
(To be stamped in accordance with Stamp Act of India)**

Insurance Surety Bond No.
Date.....

To

NVVN Limited
5th floor, Engineering Office Complex,
NTPC Limited, A-8A, Sector-24
Noida – 201301, India

Dear Sirs,

In accordance with Invitation for Bids under your Bid Document No.,
M/s.....[Bidder's Name] having its Registered/Head Office at
..... (hereinafter called the 'Bidder') wish to participate in the said
bid for [Name of Package]

As an irrevocable Insurance Surety Bond against Bid Security for an amount of
(*) valid for..... days from
.....(**)..... required to be submitted by the Bidder
as a condition precedent for participation in the said bid which amount is liable to be forfeited on the
happening of any contingencies as mentioned under the Bidding Documents.

We, the [Name & address of the Insurer]
.....having our Head Office at (#)
..... guarantee and undertake to pay immediately on demand by NTPC
Vidyut Vyapar Nigam Limited (hereinafter called the 'Employer') the amount of
.....(*)without any reservation, protest, demand
and recourse. Any such demand made by the 'Employer' shall be conclusive and binding on us
irrespective of any dispute or difference raised by the Bidder and/or any right/remedy available to the
bidder in terms thereof.

This Insurance Surety Bond shall be unconditional as well as irrevocable and shall remain valid upto
.....(@)..... If any further extension of this Insurance Surety Bond is required, the
same shall be extended to such required period (not exceeding one year) on receiving instructions
from M/s[Bidder's Name] on whose behalf this
Insurance Surety Bond is issued.

In witness where of the Insurer, through its authorised officer, has set its hand and stamp on
this.....day of.....20.....at.....

.....
(Signature)
.....
(Name)
.....
(Designation with Insurer Stamp)
Authorised Vide
Power of Attorney No.....
Date.....

NOTE:

1. (*) The amount shall be as specified in the Bid Data Sheets.
(**) This shall be the date of opening of Techno-Commercial bids.
(#) Complete mailing address of the Head Office of the Insurer to be given.
(@) This date shall be forty five (45) days after the last date for which the bid is valid.
2. The Insurance Surety Bond shall be from an Insurer as per guidelines issued by Insurance Regulatory and Development Authority of India (IRDAI) as amended from time to time.
3. The Employer shall be the Creditor, the Bidder shall be the Principal debtor and the Insurance company/Insurer shall be the Surety in respect of the Insurance Surety Bond to be issued by the Insurer.
4. The Insurance Surety Bond should be on Non-Judicial stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the state(s) where the Insurance Surety Bond is submitted or is to be acted upon or the rate prevailing in State where the Insurance Surety Bond is executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Bidder/Insurer issuing the Insurance Surety Bond.
5. While getting the Insurance Surety Bond issued, Bidders are required to ensure compliance to the points mentioned in Form of Bank Guarantee/Insurance Surety Bond Verification Check List enclosed in this Section of Bidding Documents. Further, Bidders are required to fill up this Form and enclose the same with the Insurance Surety Bond.

**2. BANK GUARANTEE/ INSURANCE SURETY BOND
VERIFICATION CHECKLIST**

BANK GUARANTEE/INSURANCE SURETY BOND VERIFICATION CHECKLIST

1. Bank Guarantee/Insurance Surety Bond No.
2. Issuing Bank/Insurer
3. Amount of BG/Insurance Surety Bond
4. Nature of BG/Insurance Surety Bond & No. of Pages
5. Validity of BG/Insurance Surety Bond
6. Package Description
7. Party & Contracts Ref. Name, Address, Tel, Fax, e-mail,
Contract No. Package Name
8. Bank/Insurer Reference Name, Address, Tel. Fax, E-mail

Sl. No.	Details of Checks	Yes/ No
1	Is the BG/ Insurance Surety Bond on Non-judicial stamp paper/ e-stamp paper of appropriate value, as per Stamp Act ?	
2	Whether date, purpose of purchase of stamp paper and name of the purchaser are indicated on the stamp paper? (The date of purchase of stamp paper should be of any date on or before the date of execution of BG and the stamp paper should be purchased either in the name of the executing Bank or the Bidder on whose behalf the BG has been issued. The stamp paper (other than e-stamp paper) should be duly signed by the stamp vendor).	
3	Has the executing Officer of BG/Insurance Surety Bond indicated his name, designation and Power of Attorney No. / Signing Power No. etc. on the BG/Insurance Surety Bond?	
4	Is each page of BG/Insurance Surety Bond duly signed/initiated by executant and whether stamp of Bank/Insurer is affixed thereon? Whether the last page is signed with full particulars including two witnesses under seal of Bank/Insurer as required in the prescribed proforma?	
5	Does the Bank Guarantee/Insurance Surety Bond compare verbatim with the Proforma prescribed in the Bid Documents?	
6	Are the factual details such as Bid Document No., NOA / LOA / Contract No., Contract Price, Percentage of Advance, Amount of BG/Insurance Surety Bond and Validity of BG/Insurance Surety Bond correctly mentioned in the BG/ Insurance Surety Bond?	
7	Whether overwriting / cutting if any on the BG/ Insurance Surety Bond have been properly authenticated under signature & seal of executant?	
8	Whether the BG/Insurance Surety Bond has been issued by a Bank/Insurer in line with the provisions of Bid/Contract Documents?	

9	In case BG has been issued by a Bank other than those specified in Bid/Contract Document, is the BG confirmed by a Bank in India acceptable as per Bid/Contract Documents?	
---	--	--

Date :

Name of Authorized Person

Place :

Designation

Note: The Bidder is required to fill up this form and enclose along with the Bank Guarantee/Insurance Surety Bond.

Certified that the Bank Guarantee submitted has been verified and accepted in line with the prescribed procedure.

3. FORM OF BANK GUARANTEE FOR CONTRACT PERFORMANCE GUARANTEE

PERFORMANCE BANK GUARANTEE

Bank Guarantee No.....
Date.....

To

NVVN Limited
5th floor, Engineering Office Complex,
NTPC Limited, A-8A, Sector-24
Noida – 201301, India

In consideration of the [Employer's Name] (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators and assigns) having awarded to M/s..... [Contractor's Name]..... with its Registered /Head Office at (hereinafter referred to as the 'Contractor', which expression shall unless repugnant to the context or meaning thereof, include its successors administrators, executors and assigns), a Contract by issue of Employer's Notification of Award No. dated..... and the same having been unequivocally accepted by the contractor, resulting into a Contract bearing No..... dated valued at for and the Contractor having agreed to provide a Contract Performance Guarantee for the faithful performance of the entire Contract equivalent to(*).....% (..... percent) of the said value of the Contract to the Employer.

We[Name & Address of the Bank].....having its Head Office at(hereinafter referred to as the 'Bank', which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the Employer, on demand any and all monies payable by the Contractor to the extent of(*)..... as aforesaid at any time up to(@)..... [days/month/year] without any demur, reservation, contest, recourse or protest and/or without any reference to the Contractor. Any such demand made by the Employer on the Bank shall be conclusive and binding notwithstanding any difference between the Employer and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. The Bank undertakes not to revoke this guarantee during its currency without previous consent of the Employer and further agrees that the guarantee herein contained shall be enforceable till ninety (90) days after expiry of its validity.

The Employer shall have the fullest liberty, without affecting in any way the liability of the Bank under this guarantee, from time to time to extend the time for performance of the Contract by the Contractor. The Employer shall have the fullest liberty, without affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor, and to exercise the same at any time in any manner, and either to enforce or to forbear to enforce any covenants, contained or implied, in the Contract between the Employer and the Contractor or any other course or remedy or security available to the Employer. The Bank shall not be released of its obligations under these presents by any exercise by the Employer of its liberty with reference to the matters aforesaid or any of them or by reason of any other act or forbearance or other acts of omission or commission on the part of the Employer or any other indulgence shown by the Employer or by any other matter or thing whatsoever which under law would, but for this provision, have the effect of relieving the Bank.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor's liabilities.

Notwithstanding anything contained hereinabove our liability under this guarantee is restricted to(*)..... and it shall remain in force upto and including(@)..... and shall be extended from time to time for such period (not exceeding one year), as may be desired by M/s[Contractor's Name]..... on whose behalf this guarantee has been given.

Dated this day of 20..... at.....

.....

(Signature)

.....

(Name)

.....

(Designation with Bank Stamp)

Authorised Vide Power of

Attorney No.....

Date.....

Notes :1. (*) This sum shall be ten percent (10%) of the Contract Price.

(@) This date will be ninety (90) days beyond the Defect liability period as specified in the Contract.

2. The Bank Guarantee shall be from a Bank as per provisions of the Bidding Documents.

3. The BG should be on non-judicial stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the state(s) where the BG is submitted or is to be acted upon or the rate prevailing in State where the BG is executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Bidder/Bank issuing the guarantee.

4. While getting the Bank Guarantee issued, the Contractor is required to ensure compliance to the points mentioned in Form of Bank Guarantee Verification Check List. Further, the Contractor is required to fill up this Form and enclose the same with the Bank Guarantee.

5. In case, Bank Guarantee is getting issued from State Bank of India, Bidder to take note of NTPC letter ref. NTPC/FC/CS/BG/01 dated 03.09.2014 and SBI letter ref. CAG-I/AMT-1/2014-15/370 dated 04.09.2014 (attached with Section-III of Bidding Documents).

**Form of Insurance Surety Bond towards Performance Security
(To be stamped in accordance with Stamp Act of India)**

Insurance Surety Bond No.
Date.....

To,

NVVN Limited
5th floor, Engineering Office Complex,
NTPC Limited, A-8A, Sector-24
Noida – 201301, India

Dear Sirs,

In consideration of the [Employer's Name] (Hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators and assigns) having awarded to M/s..... [Contractor's Name]..... with its Registered /Head Office at (Hereinafter referred to as the 'Contractor', which expression shall unless repugnant to the context or meaning thereof, include its successors administrators, executors and assigns), a Contract by issue of Employer's Notification of Award No. dated..... and the same having been unequivocally accepted by the contractor, resulting into a Contract bearing No..... dated, valued at for and the Contractor having agreed to provide a Contract Performance Guarantee for the faithful performance of the entire Contract equivalent to(*).....% (..... percent) of the said value of the Contract to the Employer.

We[Name & Address of the Insurer].....having its Head Office at(hereinafter referred to as the 'Insurer', which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the Employer, on demand any and all amount payable by the Contractor to the extent of(*)..... as aforesaid at any time up to(@)..... [days/month/year] without any condition, demur, reservation, contest, recourse or protest and/or without any reference to the Contractor. Any such demand made by the Employer on the Insurer shall be conclusive and binding notwithstanding any difference between the Employer and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. The Insurer undertakes not to revoke this Insurance Surety Bond during its currency and or any period extended under the contract, without prior consent of the Employer and further agrees that the guarantee herein contained shall be enforceable till ninety (90) days after expiry of its validity.

The Employer shall have the fullest liberty, without affecting in any way the liability of the Insurer under this Insurance Surety Bond, from time to time to extend the performance of the Contract by the Contractor for the purpose of which, the Insurer shall be liable to extend the validity of the present Insurance Surety Bond without any demur, condition, protest and the Insurer shall at no point in time have an option of revoking the same, The Employer shall have the fullest liberty, without affecting this Insurance Surety Bond, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor, and to exercise the same at any time in any manner, and either to enforce or to forbear to enforce any covenants, contained or implied, in the Contract between the Employer and the Contractor or any other course or remedy or security available to the Employer. The Insurer shall not be released of its obligations under these presents by any exercise by the Employer of its liberty with reference to the aforesaid or any of them or by reason of any other act or forbearance or other acts of omission or commission on the part of the Employer or any other indulgence shown by the Employer or by any other matter or thing whatsoever which under law would, but for this provision, have the effect of relieving the Insurer.

The Insurer also agrees and undertakes that the Employer at its option shall be entitled to enforce this Insurance Surety Bond against the Insurer as a Surety, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor's liabilities.

Notwithstanding anything contained hereinabove our liability under this Insurance Surety Bond is restricted to(*)..... and it shall remain in force upto and including(@)..... and shall be extended from time to time for such period (not exceeding one year), as may be desired by M/s[Contractor's Name]..... on whose behalf this Insurance Surety Bond has been given.

Dated this day of 20..... at.....

WITNESS :

<p>1. (Signature)</p> <p>..... (Name)</p> <p>..... (Official Address)</p> <p>..... (Signature)</p> <p>..... (Name)</p> <p>..... (Official Address)</p>	<p>..... (Signature)</p> <p>..... (Name)</p> <p>..... (Designation with Insurer Stamp)</p> <p>Authorised Vide Power of Attorney No..... Date.....</p>
---	---

Notes :

1. (*) This sum shall be three percent (03%) of the Contract Price.
(@) This date will be ninety (90) days beyond the Defect liability period as specified in the Contract.
2. The Insurance Surety Bond shall be from an Insurer as per guidelines issued by Insurance Regulatory and Development Authority of India (IRDAI).
3. The Employer shall be the Creditor, the Contractor shall be the Principal debtor and the Insurance company/Insurer shall be the Surety in respect of the Insurance Surety Bond to be issued by the Insurer.
4. The Insurance Surety Bond should be on Non-Judicial stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the state(s) where the Insurance Surety Bond is submitted or is to be acted upon or the rate prevailing in State where the Insurance Surety Bond is executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Bidder/Insurer issuing the Insurance Surety Bond.
5. While getting the Insurance Surety Bond issued, the Contractor is required to ensure compliance to the points mentioned in Form of Bank Guarantee/ Insurance Surety Bond Verification Check List. Further, the Contractor is required to fill up this Form and enclose the same with the Insurance Surety Bond.

**4. PROFORMA FOR EXTENSION OF
BANK GUARANTEE/INSURANCE
SURETY BOND**

PROFORMA FOR EXTENSION OF BANK GUARANTEE/INSURANCE SURETY BOND

Ref. No. :

Dated :

NVVN Limited
5th floor, Engineering Office Complex,
NTPC Limited, A-8A, Sector-24
Noida – 201301, India

Dear Sirs,

**Sub. : Extension of Bank Guarantee/Insurance Surety bond No. Dated
..... for.....[indicate
value of Bank Guarantee/ Insurance Surety Bond]..... favouring yourselves,
expiring on..... on
account of M/s(Name of Bidder)..... in respect of Contract for (Insert
Package Name)..... for (Insert Project Name) Project,
Contract No. dated.....(hereinafter called original
Bank Guarantee/Insurance Surety Bond)**

At the request of M/s, we Bank branch office at
..... and having its head office at..... do hereby extend our liability
under the above-mentioned Guarantee/Surety No. dated..... for a further
period of years/months from to expire on

Except as provided above, all other terms and conditions of the original Bank Guarantee
No/Insurance Surety Bond No..... dated shall remain unaltered and binding.

Please treat this as an integral part of the original guarantee/surety bond to which it would be
deemed to have been attached.

(Signature).....
(Name).....
(Designation with
Bank Stamp)

Authorised vide
Power of Attorney No.....
Date.....

Dated

Seal of Bank/Insurance Company

- Note:** 1. The extension of the Bank Guarantee/Insurance Surety Bond should be forwarded to
the Unit/ Project/ Corporate Centre, from where the extension has been sought.
2. The extension of BG should be on Non-Judicial Stamp paper/ e-stamp paper of appropriate
value as per Stamp Act prevailing in the State(s) where the BG is submitted or is to be acted
upon or the rate prevailing in the State where the BG is executed, whichever is higher. The
Stamp Paper/ e- Stamp Paper shall be purchased in the name of Bidder/ Bank issuing the
guarantee.

**5. PROFORMA OF BANK
GUARANTEE FOR LUMP SUM
ADVANCE**

1. PROFORMA OF BANK GUARANTEE FOR LUMP SUM ADVANCE

To,

NVVN Limited
5th floor, Engineering Office Complex,
NTPC Limited, A-8A, Sector-24
Noida – 201301, India

In consideration of the NVVN Limited, _____ having its registered office at NTPC Bhawan, SCOPE Complex, 7, Institutional Area, Lodi Road, New Delhi-110 033 (hereinafter called "the Employer" which expression shall unless repugnant to the subject or context include its successors and assigns) having agreed under the terms and conditions of the Award Letter No. _____ dated _____ issued by the Employer which have been unequivocally accepted by _____* _____ in connection with the work of " _____ " Specification No. CC _____ (hereinafter called "the said Contract") to make at the request of the Contractor a lumpsum advance of Rs. _____/- (Rupees _____ only) for utilizing it for the purpose of the Contract on his furnishing a guarantee acceptable to the Employer.

We, _____ Bank incorporated under _____ and having one of our branches at

_____ (hereinafter referred to as "the said Bank") do hereby guarantee the due recovery by the Employer of this said advance with interest thereon as provided according to the terms and conditions of the Contract. If the said Contractor fails to utilize the said advance for the purpose of the Contract and/or the said advance together with Interest thereon as aforesaid is not fully recovered by the Employer, We, _____ Bank hereby unconditionally and irrevocably undertake to pay to the Employer on demand and without demur to the extent of the said sum of Rs. _____/- (Rupees _____ only), any claim made by the Employer on us for the loss or damage caused to or suffered by the Employer by reason of the Employer not being able to recover in full the said sum of Rs. _____/- (Rupees _____ only) with interest as aforesaid.

2. We, _____ Bank further agree that the Employer shall be the sole judge of and as to whether the said Contractor has not utilized the said advance or any part thereof for the purpose of the Contract and the extent of loss or damage caused to or suffered by the Employer on account of the said advance together with interest not being recovered in full and the decision of the Employer that the said Contractor has not utilized the said advance or any part thereof for the purpose of the Contract and as to the amount or amounts of loss or damage caused to or suffered by the Employer shall be final and binding on us.

3. We, the said Bank, 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 Contract and till the said advance with interest has been fully recovered and its claims satisfied or discharged and till Employer certifies that the said advance with interest has been fully recovered from the said Contractor, and accordingly shall have no claim under this Guarantee after 30 (thirty) days from the date of satisfactory completion of the said Contract (as per the mutually agreed Work schedule) i.e. upto and inclusive of _____ (date) unless a notice of the claim under this Guarantee has been served on the Bank before the expiry of the said period i.e. _____ (date) in which case the same shall be enforceable against the Bank notwithstanding the fact, that the same is enforced after the expiry of the said period.
4. The Employer shall have the fullest liberty without effecting any way the liability of the Bank under this Guarantee or Indemnity, from time to time, to vary any of the terms and conditions of the said Contract or the advance or to extend time of performance by the said Contractor or to postpone for any time and from time to time any of the powers exercise able by it against the said Contractor and either to enforce or forbear from enforcing any of the terms and conditions governing the said Contract or the advance available to the Employer and the said Bank shall not be released from its liability under these presents by any exercise by the Employer of the liberty with reference to the matters aforesaid or by reasons of time being given to the said Contractor or any other forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Contractor or of any other matter or thing whatsoever which under the law relating to sureties would, but for this provision, have the effect of so releasing the Bank from its such liability.
5. It shall not be necessary for the Employer to proceed against the Contractor before proceeding against the Bank and the Guarantee herein contained shall be enforceable against the Bank notwithstanding any security, which the Employer may have obtained or obtain from the Contractor shall at the time when proceedings are taken against the Bank hereunder, be outstanding or unrealised.
6. We, the said Bank, lastly undertake not to revoke this Guarantee during its currency except with the previous consent of the Employer in writing and agree that any change in the Constitution of the said Contractor or the said Bank shall not discharge our liability hereunder.

If any further extension of this Guarantee is required the same shall be extended to such required periods on receiving instructions from M/s. _____, on whose behalf this Guarantee is issued.

Notwithstanding anything contained herein before our liability under this Guarantee is restricted to Rs. _____/- (Rupees _____ only) together with interest. Our undertaking shall commence from the date of execution and shall remain in force upto _____

Dated this _____ day of _____ 20 _____

In presence of

For and on behalf of (the Bank)

Witness:

(Signature).....

.....
(Signature)

(Name).....

.....
(Name)

(Designation with
Bank Seal)

.....
(Official Address)

Power of Attorney No.....

Date.....

Stamp

The above guarantee is accepted by the Employer.

For an On behalf of NVVN Limited

NOTES :

***For Proprietary Concerns**

Shri _____ son of _____ resident of _____ carrying on business under the name and style of _____ at _____ (hereinafter called "the said Contractor" which expression shall unless the context requires otherwise include his heirs, executors, administrators and legal representatives).

*** For Partnership Concerns**

*M/s. _____ a partnership firm with its office _____ (hereinafter called "the said Contractor" which expression shall unless the context requires otherwise include their heirs, executors, administrators and legal representatives); the names of their partners being (i) Shri _____ S/o _____ (ii) Shri _____ S/o _____ etc.

*** For Companies**

*M/s _____ a company under the Companies Act, 1956 and having its registered office _____ in the State of _____ (hereinafter called "the said Contractor" which expression shall unless the context requires otherwise include its administrators, successors and assigns.)

1. (*) Write the name and addresses of all the Joint Venture partners, in case the bid is submitted by a Joint Venture in terms of Qualifying Requirements.
2. The Bank Guarantee shall be from a Bank as per provisions of the bidding documents.
3. The Stamp paper of appropriate value shall be purchased in the name of guarantee issuing Bank/Bidder.
4. While getting the Bank Guarantee issued, Bidders are required to ensure compliance to the points mentioned in Bank Guarantee Verification Check List in the bidding documents Bidders are required to fill up this Check List and enclose the same along with the Bank Guarantee.

**6. PROFORMA FOR BANK
GUARANTEE TO BE FURNISHED
BY ASSOCIATE(S)**

-NOT APPLICABLE-

**7. LIST OF BANKS FROM WHICH BANK
GUARANTEES FOR
ADVANCE/ SECURITY DEPOSIT TO BE
FURNISHED BY
BIDDER/ CONTRACTOR**

**7. BANKS FROM WHICH BANK GUARANTEES FOR
ADVANCE / SECURITY DEPOSIT TO BE FURNISHED BY
BIDDER/CONTRACTOR CAN BE ACCEPTED**

SCHEDULED COMMERCIAL BANKS

A STATE BANK OF INDIA

B NATIONALISED BANKS

1. Allahabad Bank
2. Andhra Bank
3. Bank of India
4. Bank of Maharashtra
5. Canara Bank
6. Central Bank of India
7. Corporation Bank
8. Dena Bank
9. Indian Bank
10. Indian Overseas Bank
11. Oriental Bank of Commerce
12. Punjab National Bank
13. Punjab & Sind Bank
14. Syndicate Bank
15. Union Bank of India
16. United Bank of India
17. UCO Bank
18. Vijaya Bank
19. Bank of Baroda

C SCHEDULED PRIVATE BANKS (INDIAN BANKS)

1. Catholic Syrian Bank
2. City Union Bank
3. Dhanlaxmi Bank Ltd.
4. Federal Bank Ltd
5. Jammu & Kashmir Bank Ltd
6. Karnataka Bank Ltd
7. Karur Vysya Bank Ltd
8. Lakshmi Vilas Bank Ltd

9. Nainital Bank Ltd
10. Kotak Mahindra Bank
11. RBL Bank Limited
12. South Indian Bank Ltd
13. Tamilnad Mercantile Bank Ltd
14. ING Vysya Bank Ltd
15. Axis Bank Ltd.
16. IndusInd Bank Ltd
17. ICICI Bank
18. HDFC Bank Ltd.
19. DCB Bank Ltd
20. Yes Bank Ltd
21. IDFC Bank Limited
22. Bandhan Bank Limited

D SCHEDULED PRIVATE BANKS (FOREIGN BANKS)

1. Abu Dhabi Commercial Bank PJSC
2. Bank of America NA
3. Bank of Bahrain & Kuwait B.S.C.
4. Mashreq Bank p.s.c.
5. Bank of Nova Scotia
6. Crédit Agricole Corporate and Investment Bank
7. BNP Paribas
8. Barclays Bank
9. Citi Bank N.A.
10. Deutsche Bank A.G.
11. The HongKong Shanghai Banking Corporation Ltd
12. Societe Generale
13. Sonali Bank Ltd.
14. Standard Chartered Bank
15. J.P. Morgan Chase Bank, National Association
16. State Bank of Mauritius Ltd.
17. DBS Bank Ltd.
18. Bank of Ceylon
19. PT Bank Maybank Indonesia TBK

20. A B Bank
21. Shinhan Bank.
22. CTBC Bank Co. Ltd.
23. Mizuho Bank Ltd
24. Krung Thai Bank Public Company Ltd.
25. The Bank of Tokyo-Mitsubishi UFJ Limited.
26. Australia & Newzealand Banking Group Limited
27. Sumitomo Mitsui Banking Corporation
28. American Express Banking Corporation
29. Commonwealth Bank of Australia
30. Credit Suisse A.G.
31. FirstRand Bank Ltd.
32. Industrial & Commercial Bank of China Ltd.
33. JSC VTB Bank
34. National Australia Bank
35. Cooperatieve Rabobank U.A.
36. Sberbank
37. United Overseas Bank Ltd.
38. Westpac Banking Corporation
39. Woori Bank
40. The Royal Bank of Scotland plc
41. Doha Bank Qsc
42. Industrial Bank of Korea
43. KEB Hana Bank
44. National Bank of Abu Dhabi PJSC

E OTHER PUBLIC SECTOR BANKS

1. IDBI Bank Ltd

***Note - Any Addition/ Deletion/ Modification in Bank list shall be as per changes in Second Schedule List by RBI from time to time.**

*In case, Bank Guarantee is getting issued from State Bank of India, Bidder to take note of NTPC letter ref. NTPC/FC/CS/BG/01 dated 03.09.2014 and SBI letter ref. CAG-I/AMT-1/2014-15/370 dated 04.09.2014 attached herewith.

8. *FORM OF BANK GUARANTEE FOR REMOVAL OF PLANT AND EQUIPMENT FROM THE SITE*

8. FORM OF BANK GUARANTEE FOR REMOVAL OF PLANT AND EQUIPMENT FROM THE SITE

To

NVVN Limited
5th floor, Engineering Office Complex,
NTPC Limited, A-8A, Sector-24
Noida – 201301, India

In consideration of the NVVN Ltd., (hereinafter called “the Employer” which expression shall unless repugnant to the subject or context include its successors and assigns) having agreed under the terms and conditions of Contract. No..... dated.....made between* and the Employer in connection with(hereinafter called “the said Contract”) to permit the Contractor to remove the plant and equipment mentioned in the Schedule hereto hypothecated to the Employer as security against a loan of Rs..... with interest as provided in the Contract granted to the Contractor by the Employer from the site to any other works of the Contractor on his furnishing an acceptable Bank guarantee, we the..... Bank. (hereinafter referred to as “the said Bank”) and having our registered office at..... do hereby undertake and that upon the Contractor failing to bring back to the site the said plant and equipment or any part thereof and to unconditionally pay the amount claimed by the Employer on demand and without demur to the extent of Rs (Rupees..... only)(to be specified by the Employer at the appropriate time).

We Bank further agree that the Owner shall be the sole judge of and as to whether the said contractor has failed to bring the said plant and equipment or any part thereof back to the site and the extent of loss, damage, costs, charges and expenses caused to or suffered by or that may be caused to or suffered by the Owner on account thereof and the decision of the Owner that the said Contractor has so failed and as to the amounts of loss, damage, costs charges and expenses caused to or suffered by or that may be caused to or suffered by the Owner from time to time shall be final and binding on us.

We, the said bank further agree that the Guarantee herein contained shall remain in full force and effect till the Employer certifies that the said plant and equipment have been brought back to the site or the said loan of Rs..... with interest has been repaid to the Employer in full, and accordingly discharges this Guarantee or till.....(to be specified by the Employer prior to the issue of this guarantee), whichever is later.

It shall not be necessary for the Employer to proceed against the Contractor before making a demand on the Bank and the guarantee herein contained shall be enforceable against the Bank, notwithstanding any security which the Employer may have obtained from the Contractor and in force at the time of making such demand on the Bank.

We, the said Bank lastly undertake not to revoke this Guarantee during its currency except with the previous consent of the Employer, in writing and agree that any change in the Constitution of the said Contractor or the said Bank shall not discharge our liability hereunder.

Dated thisday of20.....

For and on behalf of the Bank.....
Common Seal of the Bank

Signature.....

Name.....

In presence of

Designation.....

Authorisation No.

Witness :

1.

2.

The above Guarantee is accepted by
(NVVN Ltd.)

For and on behalf of the
(NVVN Ltd.)

Date
(Name and Designation)

Note :

*** For Proprietary Concerns**

Shri.....son ofresident of
carrying on business under the name and style of at.....
(hereinafter called. "the said Contractor" which expression shall unless the context requires otherwise
include his heirs, executors administrators and legal representatives).

*** For Partnership Concerns**

M/s.....a partnership firm with its office at.....
(hereinafter called "the said Contractor" which expression shall unless the context requires otherwise
include their respective heirs executors, administrators and legal representatives); the name of partners
being (i) Shri..... S/o
.....
(ii) Shri..... S/o.....etc.

*** For Companies**

M/sa company registered under the Companies Act, 1956 and having its registered office at.....in the State of (hereinafter called "the said Contractor" which expression shall unless the context requires otherwise include its administrators, successors and assigns).

1. Bidder to fill up the check list as per the proforma enclosed for submitting the Bank Guarantees.
- 0
2. BG shall be on non judicial stamp paper of appropriate value as per stamp Act prevailing in the state(s) where the BG is submitted or is to be acted upon or the rate prevailing in the state where the BG is executed, whichever is higher.

Witness: (Signature).....

..... (Name).....

(Signature)

(Designation with
Bank Seal)

.....
(Name)

Power of Attorney No.....

.....
(Official Address)

Date.....

Stamp

1. (*) Write the name and addresses of all the Joint Venture partners, in case the bid is submitted by a Joint Venture in terms of Qualifying Requirements.
2. The Bank Guarantee shall be from a Bank as per provisions of the bidding documents.
3. The Stamp paper of appropriate value shall be purchased in the name of guarantee issuing Bank/Bidder.
4. While getting the Bank Guarantee issued, Bidders are required to ensure compliance to the points mentioned in Bank Guarantee Verification Check List in the bidding documents Bidders are required to fill up this Check List and enclose the same along with the Bank Guarantee.

9. FORM OF HYPOTHECATION DEED

**9. FORM OF HYPOTHECATION DEED
(ON NON-JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)**

To,

NVVN Limited
5th floor, Engineering Office Complex,
NTPC Limited, A-8A, Sector-24
Noida – 201301, India

Dear Sir,

In consideration of[Employer's Name] (hereinafter referred to as the 'Employer', which expression shall, unless repugnant to the context or meaning thereof include its successors, administrators and assigns) having awarded to M/s.....[Contractor's Name]*..... with its Registered/Head Office at (hereinafter referred to as the 'Contractor' which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns), a Contract, by issue of Employer's Letter of Award No. dated and the same having been unequivocally accepted by the Contractor, resulting into a Contract bearing No. dated..... valued at for [Name of Contract](hereinafter called the Contract.) and the Employer having agreed to make an interest bearing advance (said 'Advance') of Rs. _____(Rupees _____ only) to the Contractor for plant and equipment described in the Schedule hereto specifically acquired by the Contractor for the Works and brought to Site against hypothecation of the said plant and equipment in the name of the Employer.

The Contractor hereby declares that he has paid in full the purchase price of each and every one of the Plant & Equipment described in the Schedule hereto and that the same are the absolute property of the Contractor and that the same have not been sold, pledged, mortgaged or transferred by him and the same is free from encumbrances.

The Contractor hereby hypothecates, assigns and transfers to the Employer, the plant and equipment described in the Schedule hereto in favour of the Employer as security for the due repayment of the said advance with interest thereof.

The Contractor hereby agrees that he shall repay to the Employer the said advance of Rs. _____(Rupees _____ only) together with interest thereon as aforesaid and agrees that the said advance be recovered by the Employer by making deductions in the manner provided in Clause of the General Conditions of Contract and other conditions of the Award letter from the claims made by the Contractor against the Employer for on account payment.'

The Contractor further agrees that so long as any amount remains payable to the Employer by the Contractor in respect of the said advance of Rs. _____ only, he shall not sell, pledge, hypothecate, transfer, part with the Plant and Equipment described in the Schedule hereto.

The Contractor also agrees that if the said advance of Rs. _____ shall not be repaid by the Contractor or recovered in the manner described above by the said _____ day of _____ due to any reason whatsoever or the said Contract has been determined earlier or cancelled or if the Contractor shall sell, pledge, mortgage, transfer, part with and equipment or any part thereof or the Contractor or any of the partners is adjudged insolvent or the Contractor is to be wound up or makes any composition or arrangement with its creditors or the Contractor shall commit breach of any of the terms and conditions or covenants as herein contained or if any of the said plant and equipment or if any other property whatsoever belonging to the Contractor has been sold or attached for a period of not less than twenty-one (21) days in execution of the decree of any court for payment of money, the whole of the said advance of Rs. _____ or such part thereof as may have remained unpaid or unrecovered together with interest thereon shall forthwith become due and payable. The Contractor also agrees that the Employer may on the happening of any of the aforesaid events or in the event of the said advance or any part thereof becoming due and payable and has not been paid or recovered or cannot be recovered as provided in the said conditions, seize and take possession of the said plant and equipment (and either remain in possession thereof without removing the same or else may remove and same) and sell the said plant and equipment or any of them either by public auction or private contract and may out of the sale proceeds retain the balance of the said advance and interest thereon remaining unpaid and unrecovered and all costs, charges and expenses and payments incurred or made in maintaining, defending or protecting the rights of the Employer hereunder and shall pay over the surplus, if any, to the Contractor.

The Contractor also agrees that he shall at all times during the continuance of the security and at the expense of the Contractor insure and keep insured the plant and equipment described in the Schedule hereto for the full value thereof in the joint names of the Contractor and the Employer with an insurance company to be approved by the Engineer-in-Charge against the risk of loss or damage from whatever cause arising other than the Excepted Risks. During the continuance of the security, the Contractor shall pay all premia and sums of money necessary for keeping such insurance on foot and the insurance policy and receipts in original for premia paid shall be deposited with the Engineer-in-Charge and the Contractor shall assign all his rights, title and interest in the policy to the Employer.

The Contractor also agrees that he shall not permit or suffer the said plant and equipment or any part thereof to be destroyed or damaged or used or to be used or to deteriorate in a greater degree than it would deteriorate by reasonable wear and tear thereof in the performance of the Contract.

In the event of any damage or loss happening to the said plant and equipment or any part thereof from whatever cause other than the Excepted Risks, the Contractor agrees that he shall forthwith have the same repaired or replaced as the case may be or arrange for payment of the entire amount recovered or to be recovered from the insurance company to the Employer towards the payment of the said advance of Rs. _____

Upon repayment or recovery in full of the amount secured on account of this hypothecation deed the said plant and equipment secured hereunder shall stand released from hypothecation but this is without prejudice to the right of the Employer under any other conditions of the Contract.

SCHEDULE ABOVE REFERRED TO

Sl. No.	Particulars of Plant and Equipment	Nos.	Purchase price/ price considered reasonable by Engineer-in-Charge	Total Price	Advance (75% of Col.5)
1	2	3	4	5	6

Dated this day of 20..... at

WITNESS

..... (Signature)

..... (Name)

.....
(Official Address) Printed Name of Authorised person
having Power of attorney.....
Designation.....

Common Seal.....

NOTE :

*** For Proprietary Concerns**

Shri _____ son of _____ resident of _____ carrying on business under the name and style of _____ at _____ (hereinafter called "the said Contractor" which expression shall unless the context requires otherwise include his heirs, executors, administrators and legal representatives).

*** For Partnership Concerns**

M/s. _____ a partnership firm having its registered office at _____ (hereinafter called "the said Contractor" which expression shall unless the context requires otherwise include and their respective heirs, executors, administrators and legal representatives) the partners of the firm being (i) Shri _____ s/o _____ (ii) and Shri _____ s/o _____
etc

*** For Companies**

M/s _____ a company under the Companies Act, 1956, and having its registered office at _____ in the State of _____ (hereinafter called "The said Contractor" which expression shall unless the context requires otherwise include its successors and assigns).

**10. PROFORMA OF
“CONTRACT AGREEMENT”**

**10. PROFORMA OF "CONTRACT AGREEMENT"
(to be executed on proper non-judicial stamp paper)**

This Contract Agreement made thisday of
(month) two thousand and year
..... between NVVN Limited, a company incorporated under the
Companies Act, 1956, having its registered Office at NTPC Bhawan, Core 7, SCOPE Complex, 7,
Institutional Area, Lodhi Road, New Delhi-110 003 (hereinafter referred to as "Employer" as "NVVN"
which expression shall include its administrators, successors, executors and assigns) or the one part
: And a company incorporated under the Companies Act 1956
having its registered office at

(OR)

M/S (Partnership Firm) registered under the Indian Partnership
Act 1932 having its Head Office atand consisting of
.....Partners namely

(OR)

M/S a proprietary concern having its Principal Place of
Business atand owned and controlled by its Sole Proprietor
namely (hereinafter referred to as the "Contractor" which
expression shall include its administrators, successors, executors and permitted assigns) of the other
part.

WHEREAS NVVN Limited desirous of setting up its Power Project at..... District
..... with an ultimate capacity of.....)*
.....MW (hereinafter called the "Project") has invited bids for
..... (briefly describe scope of work as per LOA) for the
.....*
..... stage of the Project with the capacity of
.....*
..... MW as per its Bid Specification No

AND WHEREAS the Contractor had participated in the above referred bidding vide their proposal
No.....dt.....including its amendments, if any and Employer after
examining the said proposal accepted their aforesaid proposal and awarded the Contract to the
Contractor on terms and conditions more specifically contained in its Letter of Award No.
.....dtand the documents referred to therein, which have
been unequivocally accepted by the Contractor resulting into a concluding "Contract", hereinafter called
the "Contract".

NOW THEREFORE THIS DEED WITNESSETH AS UNDER:

1.0 AWARD OF CONTRACT

1.1 The Employer has already awarded the CONTRACT to the Contractor for the work of.....on the terms and conditions contained in its Letter of Award Nodatedthe documents referred to therein and under these presents. The contract has taken effect from i.e. the date of issue of the aforesaid Letter of Award. The terms and expressions used in this Agreement shall have the same meaning as are assigned to them in the "Contract" referred to in the succeeding Article.

2.0 CONTRACT

The Contract shall be performed strictly as per the terms and conditions stipulated herein, in the Contract Documents and in the Letter of Award (hereinafter collectively referred to as "Contract").

2.1 Contract Documents shall mean:-

- A. Invitation For Bids No.dated and Bidding documents in respect of Specification No..... issued vide Letter No.dated consisting of:
- i) General Conditions of Contract for Civil Works including all amendments issued vide its letter(s) No.(s) dated(Section - IV).
 - ii) Special Conditions of Contract (Section - V).
 - iii) Technical Specifications and Drawings including amendments issued vide its Letter No.dated (Section – VI).

Sl. No.	Drawing	Title
---------	---------	-------

The above drawings are tentative and are meant for bidding purpose only and are not the final drawings nor show the full range of the work under scope of work. Work has to be executed according to the Final drawings with latest additions, alterations and modifications if any from time to time as required or approved by the Engineer-in-Charge and also according to any other relevant drawing that would be supplied to the Contractor progressively during the execution of the Contract.

- iv) Schedule of Quantities* (Section - VII).
- v) Forms & Procedures

- B. Contractor's Proposal No. datedincluding its amendments if any received and opened on
- C. Agreed Minutes of Meeting held onbetween Employer/NVVN and the Contractor.*

2.2 LETTER OF AWARD: The Letter of Award shall mean the Employers letter no..... dated together with its amendments if any.

All the aforesaid Contract Documents and Letter of Award above shall form an integral part of this Contract Agreement, in so far as the same or any part thereof is not in conflict with the Documents (Section I, II, III, IV, V, VI & VII, VIII in Para 2.1 and 2.2 above and what has been specifically agreed to by the Employer and brought out in its Letter of Award and subsequent amendment if any. Any matter in the Contractor's Proposal referred to in sub-clause B of Para 2.1 above inconsistent therewith, contrary or repugnant thereto or any deviations taken by the Contractor in its "Proposal" but not agreed to specifically by the Employer in its Letter of Award shall not be given effect to and shall be deemed to have been withdrawn by the Contractor without any cost implication to EMPLOYER., For the sake of brevity, this Contract Agreement alongwith its aforesaid Contract Documents and the Letter of Award shall be referred to as the "Contract".

3.0 CONDITIONS & COVENANTS

3.1 The scope of work under the Contract shall include

3.2 The scope of work under the Contract as specified above, consideration, terms of payment, loans and advances, price variation, security deposit, taxes wherever applicable, insurance, agreed time schedule, compensation for delay and all other terms and conditions are contained in the Contract and the Contract shall be duly performed by the Contractor strictly and faithfully in accordance with the terms of this Contract.

3.3 The scope of Works shall also include all such items which are not specifically mentioned in the Contract, but which are necessary for the satisfactory completion of the entire scope of works envisaged under this contract unless otherwise specifically excluded from the scope in the Contract.

- 3.4 The progress of work shall conform to the agreed work schedule.
- 3.5 This Contract Agreement constitutes full and complete understanding between the parties and terms of these presents. It shall supersede all prior correspondence to the extent of inconsistency or repugnancy to the terms and conditions contained in the Contract Agreement. Any modifications of the Contract Agreement shall be effected only by written instruments signed by the authorized representatives of both the parties.
- 3.6 Time is the essence of the Contract and it shall be strictly adhered to.
- **3.7** It is expressly understood and agreed by and between the Contractor and the Employer that the Employer is entering into this agreement solely on its own behalf and not on behalf of any other person or entity. In particular, it is expressly understood and agreed that the Govt. of India is not a party to this Agreement and has no liabilities, obligations or rights hereunder. It is expressly understood and agreed that the Employer is an independent legal entity with power and authority to enter into Contracts solely on its own behalf under the applicable laws of India and the general principles of Contract Law. The Contractor expressly agrees, acknowledges and understands that the Employer is not an agent, representative or delegate of the Govt. of India. It is further understood and agreed that the Govt. of India is not and shall not be liable for any acts, omissions, commissions, breaches or other wrongs arising out of the Contract. Accordingly, Contractor expressly waives, releases and foregoes any and all actions or claims, including cross claims, impediment claims, or counter claims against the Govt. of India arising out of this Contract and covenants not to sue the Govt. of India in any manner, claim, cause of Action or thing whatsoever arising out of or under this agreement.
- 4.0 The total contract price for the entire scope of this contract as detailed in Clause No. of Letter of Award is (.....)
- 5.0 The Terms of Payment is governed by Clause..... of GCC (Section - IV).
- 6.0 NO WAIVER OF RIGHTS:**
- 6.1 Neither the inspection by the Employer or the Engineer-in-Charge or any of the officials, employees or agents nor any order by the Employer or the Engineer-in-Charge for payment of money or any payment for or acceptance of, the whole or any part of the Works by the Employer or the Engineer-in-Charge nor any extension of time nor any possession taken by the Engineer-in-charge shall operate as Waiver of any provisions of the contract, or of any power herein reserved to the Employer, or any right to damages herein provided, nor shall any waiver of any breach in the contract be held to be a waiver of any other or subsequent breach.

7.0 SETTLEMENT OF DISPUTES

7.1 It is specifically agreed by and between the parties that all the differences or disputes arising out of the Contract or touching the subject matter of the Contract shall be decided by process of Settlement of Disputes as specified in Clause 7 of the General Conditions of the Contract as amended and the provisions of the Arbitration & Conciliation Act, 1996 including any statutory modifications or re-enactment thereof and the rules made thereunder shall apply and Delhi Courts alone shall have exclusive jurisdiction in all matters arising under this Contract. The arbitrator shall give reasoned/speaking award.

7.2 Governing Laws

The laws applicable to this contract shall be the laws in force in India.

7.3 Notice of Default

Notice of default given by either party to the other party under the Contract shall be in writing and shall be deemed to have been duly and properly served upon the parties hereto if delivered against acknowledgement or by telex or by registered mail with acknowledgement due addressed to the signatories at the addresses mentioned herein above.

IN WITNESS WHEREOF, the parties through their duly authorised representatives have executed these presents (execution there-of has been approved by the competent authorities of both the parties) on the day, month and year first above mentioned at..... #
.....

FOR AND ON BEHALF OF
NVVN Limited

WITNESSES :

1. :
(Signature) (Employer's Signature)

..... :
(Name) (Printed Name)

2. :
(Designation) (Designation)

.....
(Company's Stamp)

: **FOR AND ON BEHALF OF**
M/S.

.....

.....

1. ....	:	.....
(Signature)		(Contractor's Signature)
.....	:
(Name)		(Printed Name)
.....	:
(Designation)		(Designation)
	:
		(Company's Stamp)

NOTE:

- * Strike whichever is not applicable.
- # Here mention the place where contract is signed.

**11. PROFORMA OF “INDEMNITY BOND” FOR
“EMPLOYER ISSUE MATERIALS”**

11. PROFORMA OF INDEMNITY BOND” FOR “EMPLOYER ISSUE MATERIALS”

(On non-judicial paper of appropriate value and to be stamped in accordance with Stamp Act. The stamp paper to be in the name of Executing Contracting Firm/ Company)

This bond of indemnity made this day of by [Contractor's Name]* , a company registered under the Companies Act, 1956/ Partnership firm/ Proprietary concern having with its Registered/ Head Office at (hereinafter referred to as the 'Contractor' which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) in favour of[Employer's Name]. (hereinafter referred to as the 'Employer', which expression shall, unless repugnant to the context or meaning thereof include its successors, administrators and assigns)

WHEREAS [Employer's Name]... has awarded to the Contractor, a Contract by issue of Employer's Letter of Award No. dated and in terms of the said Contract, the Employer has agreed to issue from time to time to the Contractor according to the requirements for incorporation in the Works under the said Contract, the 'Employer Issue Materials' viz. 'Cement' and/or 'Reinforcement Steel' and/or 'Structural steel' '**' (hereinafter called 'Employer Issue Materials') necessarily required for performance of the aforesaid Contract.

AND WHEREAS one of the conditions for the issue of the 'Employer Issue Materials' is that the Contractor shall furnish an Indemnity Bond in favour of the Employer covering the full value for the total quantities of 'Employer Issue Materials' which shall remain in the safe custody of the Contractor during the execution of the Contract.

NOW THIS Indemnity Bond witnessh as follows:

1.0 THAT in consideration of the various Employer Issue Materials as aforesaid issued/ to be issued free of cost by Employer to the Contractor from time to time as per requirements for the purpose of the performance of the said Contract valued at Rs..... , the Contractor hereby undertakes to indemnify and keep Employer indemnified, for the full Value of the said Employer Issue Materials. The Contractor hereby acknowledges the receipt of the said Employer Issue Materials as per details given in Schedule attached hereto. Further the Contractor agrees to acknowledge the receipt of the subsequent Employer Issue Materials as will be issued by Employer in the form of schedules consecutively numbered which shall be attached to this Indemnity Bond so as to form integral part of this Bond.

2.0 That in terms of the said Contract, the maximum quantity of "Employer Issue Materials" at any point of time during the currency of the Contract shall not exceed the quantity as is identified herein below in column 'd' and its value for the purpose of Indemnity Bond as per clause of are as given below :

Sl. No.	Name of Items of Employer Issue Materials	Total Qty. in Contract (M.T.)	Max. Qty. at any point of time (M.T.)	Rate @ Rs.	Total amount (Rs. in Millions) for total Qty. in the Contract
a.	b.	c.	d.	e.	f. (c x e)
1.	Cement (in bags or silos)				
2.	Reinforcement Steel (in various sizes and lengths)				
3.	Structural steel (in various sizes & lengths)				

∑f = Total Value of this I.B. = Total Value in Rs..... Millions

3.0 Notwithstanding the above maximum quantity (Column 'd' above) of 'Employer Issue Materials' that remain in the custody of the Contractor at any point of time, the actual issuance of materials with the aforesaid total limit shall be governed by the actual programme of execution of work as may be agreed to between the Contractor and the Employer from time to time. The issuance of lesser quantities and/or the availability of balance unused quantity at site of 'Employer Issue Materials' shall not in any way dilute the obligation of the Contractor under this Indemnity Bond except that its value in such case will stand reduced to the value of such materials actually with the Contractor computed at the same unit rate as mentioned in para 2.0 above.

4.0 That the value of Indemnity Bond as brought out in para 2.0 and 3.0 above are linked with the following unit rate of these materials.

- a) Cement @ Rsi.e., Procurement Rate +25%.
- b) Reinforcement steel : @ Rs. i.e. Max. rate of nearest stockyard of SAIL for any section inclusive of Sales Tax + 25%.
- c) Structural steel : @ Rs. i.e. Average rates of nearest stockyard of SAIL for structural sections, pipes & plates inclusive of Sales Tax + 25%.

- 4.1 In the event of any upward revision of the aforesaid rate by the concerned authorities, the value of the Indemnity Bond shall be enhanced proportionately by executing fresh bond.
- 5.0 That the Contractor undertakes to keep these 'Employer Issue Materials' at the Employer's project site at a place duly notified by the Engineer-in-Charge and shall not take out these materials or allow the same to be taken out of the project site under any circumstances whatsoever.
- 6.0 That Contractor shall remain absolutely responsible for the safe custody and protection of the said 'Employer Issue Materials' against all risks whatsoever till these are duly incorporated in the Works as per terms of the contract and non utilised materials will be promptly returned to Employer in accordance with said Contract and as such the Contractor do hereby undertakes to indemnify and shall keep Employer indemnified against any loss or damage or conversion that may be caused or done to the said 'Employer Issue Materials' while in the Contractor's possession/custody. These materials shall however, at all times, be available for inspection by the Engineer-in-Charge from time to time.
- 7.0 Further, Employer shall have the absolute right at all times to take possession of the 'Employer Issue Materials' in whatever form the Employer Issue Materials may be, if in its opinion, the 'Employer Issue Materials' are likely to be endangered, misutilised or converted touses other than those specified in the Contract, by any acts of omission on the part of the Contractor or any other person or on account of any reason whatsoever and the Contractor binds itself and undertakes to comply with the directions of Employer to promptly return the 'Employer Issue Materials' without any demur or reservation, protest or contest.
- 8.0 That the Contractor shall keep the 'Employer Issue Materials' as a 'Trustee' on the Employer's behalf and the ownership of these materials shall always vest in Employer.
- 9.0 That the 'Employer Issue Materials' shall exclusively be used by the Contractor for performing the Works under the Contract and for no other work or purpose whatsoever, otherwise it willbe treated as criminal breach of trust. Should however, at any time, any loss/damage occur to the 'Employer Issue Materials' in part or in full or the same or any part thereof is misused or converted or used for any other purposes other than the contractual purpose by the Contractor or the surplus unused materials and the wastage/scrap are not returned to Employer in terms of the Contract, then Employer shall be entitled to recover from the Contractor, the compensation at the specified rates under the Contract for and in respect of such misuse, loss, damage, or conversion or any other unauthorised use not intended under the Contract, without prejudice to any other remedies which may be available to Employer including deduction from any payment/dues to or any sum which at any time hereinafter may become due to the Contractor under the Contract.

- 10.0 In the event of any misuse, loss or damage as aforesaid, the assessment for such misuse, loss or damage and the assessment of the compensation thereof would be made by Employer or its authorised representatives and the said assessment shall be final and binding on the Contractor.
- 11.0 This Indemnity Bond shall be valid till six (6) calendar months after the scheduled date of completion of work under the Contract and shall be extended from time to time till the entire work under the Contract is successfully completed or earlier upon determination of contract and all the surplus/wastage/ scrap materials are fully returned and the account for 'Employer Issue Materials' is finally settled between the Contractor and Employer, whichever event is later.
- 12.0 It is clearly understood and agreed to by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall Inter-alia constitute a criminal breach of trust on the part of the Contractor and he shall be liable for all legal/penal consequences thereof.
- 13.0 Now the condition of this Bond is that the Contractor shall duly and punctually comply with all the terms and conditions of this bond to the satisfaction of Employer, then, the above bond shall be void, but otherwise, it shall remain in full force and virtue.
- 14.0 That this bond shall not be irrevocable during its validity period and the Contractor shall not revoke this bond till it is discharged by Employer in writing.

WITNESS

.....
(Signature)
.....
(Name)
.....
Address)

(Signature)
(Name of Contractor).....
Name of the Authorised person (Official
having Power of Attorney).....
Designation
Seal.....

Notes :

*** FOR PROPRIETARY CONCERNS**

Shri son of resident of carrying on business under the name and style of at (hereinafter called "the said Contractor" which expression shall unless the context requires otherwise include his heirs, executors, administrators and legal representatives).

*** FOR PARTNERSHIP CONCERNS**

M/s. a partnership firm with its office at (hereinafter called "the said Contractor" which expression shall unless the context requires otherwise include their heirs, executors, administrators and legal representatives), the names of their partners being (i) Sh. son of Sh.

(ii) Sh. son of Sh.

*** FOR COMPANIES**

M/s. a Company registered under the Companies Act, 1956 and having its registered office at in the State of and its head office at (hereinafter called "the said Contractor" which expression shall unless the context requires otherwise include its administrators, successors and assigns.)

**12. LETTER OF UNDERTAKING TO BE GIVEN BY
CONTRACTOR WHILE FURNISHING THE
“INDEMNITY BOND” TO EMPLOYER FOR
“EMPLOYER ISSUE MATERIALS”**

**12. LETTER OF UNDERTAKING TO BE GIVEN BY CONTRACTOR
WHILE FURNISHING THE "INDEMNITY BOND" TO
EMPLOYER FOR "EMPLOYER ISSUE MATERIALS"**

To :
The Engineer-in-Charge

(_____project)

_____(State)

From :

M/s. _____

(Contractor)

(_____Project)

Name of Contract _____

Dear Sir,

Sub : Undertaking to be Submitted alongwith INDEMNITY BOND for "EMPLOYER ISSUE MATERIALS" under Contract No. _____ dated _____.

1.0 This is to inform you that as per Clause No. _____ of SCC forming integral part of the Contract No. _____ dated _____ relating to "Employer Issue Materials", we have to submit to you an irrevocable and unconditional INDEMNITY BOND equivalent to the total value of "Employer Issue Materials" required for incorporation in the Works of "-" awarded to us vide your LOA No. _____ dated _____.

2.0 The amount of the aforesaid INDEMNITY BOND is dependent upon maximum quantity of Employer Issue Materials that will remain with us at any point of time during the execution of the Contract and is based on the prevailing market value of Employer Issue Materials, as given below :

- | | | | |
|----|---------------------|---|---|
| a. | Cement | : | Procurement Rate plus 25%. |
| b. | Reinforcement Steel | : | Max. rate of nearest Stockyard of SAIL for any section inclusive of Sales Tax plus 25%. |
| c. | Structural Steel | : | Average rates of nearest stockyard of SAIL for structural sections, pipes and plates inclusive of Sales Tax plus 25%. |

3.0 We agree that in the event of the aforesaid total quantity of "Employer Issue Materials" is to be increased during the execution of the contract for performance of the work or for the market value of the "Employer Issue Materials" increase for any reasons whatsoever, the amount of aforesaid INDEMNITY BOND shall be enhanced by us without any demur correspondingly, in accordance with the various provisions in clause _____ of the aforesaid conditions of Contract.

4.0 We further confirm and undertake to increase the value of the aforesaid INDEMNITY BOND in accordance with para 3.0 above within 30 days of the receipt of notice from Employer for enhancement of the value of the said Indemnity Bond failing which Employer shall have the absolute right to invoke the said Indemnity Bond which will be honoured by us without any demur, contest or protest. Further we undertake to extend the validity of the INDEMNITY BOND as required from time to time by Employer till the entire material is incorporated in the Works and the unutilised material including wastage, scrap etc. are returned to the Employer and the reconciliation of the total Employer Issue Materials is completed in all respects.

5.0 This undertaking is irrevocable and shall remain in force till the execution and performance of the entire contract and/or till it is discharged by Employer.

Thanking you,

Yours faithfully,

(Signature of Authorised Signatory)

Name & Designation.....

Name of Contractor.....

Name of the Work

Contract No.....

Date of Award.....

Seal of the Contractor.....

Date :

Place :

13. *LETTER OF CONFIRMATION BY THE PROPOSED SUB-CONTRACTOR*

13. LETTER OF CONFIRMATION BY THE PROPOSED SUB-CONTRACTOR

Bidder's Name & Address

To,

NVVN Limited
Core – 5 ,1st & 2nd Floor,
7 Lodhi Road, institutional Area
New Delhi- 110003

Dear Sirs,

I / We M/s@..... have been proposed by M/s. @@.....
as a sub-contractor for the portion of work relating to\$...... under
Package.

We agree to work as subcontractor to M/s.@@..... for the aforesaid
portion of the work relating to\$...... under Package subject to award
of Contract to@@.....and on being approved by NVVN.

Date :
Place :
Contractor having Power

Signature.....
Printed Name of Authorised person of Sub-
of attorney.....
Designation.....
Common Seal.....

@ Write Name of the sub-contractor as proposed by the main Bidder.

@@ Write Name of the main Bidder.

\$ Write Particulars of the portion of the work for which the Sub-Contractor has been proposed.

Note : To be filled by Sub-Contractor(s) individually.

**14. PROFORMA FOR
MATERIAL ACCOUNTING &
RECONCILIATION**

14. PROFORMA FOR MATERIAL ACCOUNTING & RECONCILIATION

Name of Materials
Reconciliation

1. Name of the Contractor :
2. Name of the Project :
3. Name of the Work :
4. Contract No. & Date :
5. Location of the Contractor's Stock/godown :
6. Total Estimated Requirement in the Contract :
7. Value of the Material Security :
8. Indemnity Bond furnished towards the value of Security towards other Materials :
9. Value of security towards Materials under this Performance :

- Note :
- i. Full Separate proforma for
 - a. Cement
 - a. M.S. Reinforcement (Sectionwise/Diameterwise)
 - b. Tor-steel Reinforcement (Sectionwise/Diameterwise)
 - c. Structural Steel
 - ii. Same proforma to be used till it is filled by succeeding reconciliation. Fresh Proforma for each reconciliation is prohibited.

Sl. No.	Date of Reconciliation	Cumulative Qty. issued till last reconciliation	Cumulative Qty. incorporated in the Works as certified by the Engr.	Qty. returned	Qty. available in stock of contractor	Unaccounted C-(D+E+F) of unaccounted matl. (Col. G) effect ed. If so; amount recovered and bill/ MB No.	Whether recovery	Outstanding recoveries (cumulative till date)	Remarks
A	B	C	D	E	F	G	H	I	J

Note: 1 Reconciliation shall be done at minimum frequency of three (3) months.
(Signature of Engineer-in-Charge)

(Signature of Contractor's

Authorised Site Representative)

Name & Designation

Seal

15. Form of Indemnity Bond to be Executed
by the Contractor for The Safe Custody of
Equipments Brought to site by the Contractor

**15. FORM OF INDEMNITY BOND TO BE EXECUTED
BY THE CONTRACTOR FOR SAFE CUSTODY OF
THE EQUIPMENTS BROUGHT TO SITE BY THE CONTRACTOR
FOR PERFORMANCE OF ITS CONTRACT
AND AGAINST WHICH PAYMENT TO BE MADE ON RECEIPT
(Entire Equipment Consignment in one lot)
(On non-Judicial stamp paper of appropriate value)**

INDEMNITY BOND

THIS INDEMNITY BOND is made thisday of.....
20..... by..... (Contractor's Name) a Company registered under the Companies
Act, 1956/Partnership firm/Proprietary concern having its Registered Office at
.....(hereinafter called as 'Contractor' or "Obligor" which expression shall include
its successors and permitted assigns) in favour of..... (Name of Employer), a
Company incorporated under the Companies Act, 1956 having its Registered Office at
..... and its project at (hereinafter called
"....." {Abbreviated name of the Employer}) which expression shall include its successors
and assigns) :

WHEREAS@..... has awarded to the Contractor a Contract for
.....vide its Notification of Award/Contract No.....dated and
its Amendment No. and Amendment No..... ,
(applicable when amendments have been issued) (hereinafter called the Contract") in terms of which
.....(contractor)..... is required to keep in his safe custody various Equipments required for
execution of the Contract.

And WHEREAS by virtue of Clause No of the said Contract, the Contractor is required
to execute an Indemnity Bond in favour of.....@ for safe custody of the Equipments for the
purpose of performance of the Contract/Erection portion of the contract (hereinafter called the
"Equipments")

AND THEREFORE, This Indemnity Bond witnesseth as follows:

1. That in consideration of various Equipments as mentioned in the Contract, valued at
(Currency and amount in Figures)..... (Currency and
amount in words) for the purpose of safe
custody and performance of the Contract, the Contractor hereby undertakes to indemnify and
shall keep@ indemnified, for the twice the value of the Equipments. The
Contractor hereby acknowledges actual receipt of the Equipment etc. as detailed in the
Schedule appended hereto.

@ Fill in abbreviated name of Employer

2. That the Contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the Equipment at@..... project site against all risks whatsoever till the Equipments are duly used/erected in accordance with the terms of the Contract and the plant/package duly erected and commissioned in accordance with the terms of the Contract is taken over by@..... The Contractor undertakes to keep@ harmless against any loss or damage that may be caused to the Equipments.
3. The Contractor undertakes that the Equipments shall be used exclusively for the performance/execution of the Contract strictly in accordance with its terms and conditions and no part of the equipment shall be utilized for any other work of purpose whatsoever. It is clearly understood by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall inter-alia constitute a criminal breach of trust on the part of the Contractor for all intents and purpose including legal/penal consequences.
4. That@. is and shall remain the exclusive owner of the equipments free from all encumbrances, charges or liens of any kind, whatsoever. The Equipments shall at all times be open to inspection and checking by the Engineer-in-Charge or other employees/agents authorized by him in this regard. Further,@. shall always be free at all times to take possession of the Equipments in whatever form the Equipments may be, if in its opinion, the equipments are likely to be endangered, misutilized or converted to uses other than those specified in the Contract, by any acts of omission or commission on the part of the Contractor or any other person or on account of any reason whatsoever and the Contractor binds himself and undertakes to comply with the directions of demand of@. to return the Equipments without any demur or reservation.
5. That this Indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipments or the same or any part thereof is misutilized in any manner whatsoever, then the Contractor hereby agrees that the decision of the Project Manager of@. as to assessment of loss or damage to the Equipment shall be final and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and/or damaged Equipments at its own cost and/or shall pay the amount of loss to@. without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to@..... against the Contractor under the Contract and under this Indemnity Bond.
6. NOW THE CONDITION of this Bond is that if the Contractor shall duly and punctually comply with the terms and conditions of this Bond to the satisfaction of@. , THEN, the above Bond shall be void, but otherwise, it shall remain in full force and virtue. @
Fill in abbreviated name of Employer

IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorised representative under the common seal of the Company, the day, month and year first above mentioned.

SCHEDULE

Particulars of the Equipments	Quantity	Particulars of Despatch title Documents RR/GR/ Bill of lading Carrier No & Date	Value of the Equipments	Signature of Attorney in token of receipt
-------------------------------	----------	--	-------------------------	---

For and on behalf of

.....
(Contractor's Name)

WITNESS :

- | | | |
|----|--------------------|---|
| 1. | 1. Signature | Signature |
| | 2. Name | Name |
| | 3. Address | Designation of
Authorised representative * |
| 2. | 1. Signature | (Common Seal) |
| | 2. Name | (In case of Company) |
| | 3. Address | |

* Indemnity Bond are to be executed by the authorized person and (i) in case of contracting Company under common seal of the Company or (ii) having the Power of Attorney issued under common seal of the company with authority to execute Indemnity Bond, (iii) In case of (ii), the original Power of Attorney if it is specifically for this Contract or a photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to Indemnity Bond.

**FORM OF INDEMNITY BOND TO BE EXECUTED BY THE CONTRACTOR
FOR SAFE CUSTODY OF THE EQUIPMENTS BROUGHT TO SITE IN INSTALLMENTS BY THE
CONTRACTOR FOR
PERFORMANCE OF THE CONTRACT AND AGAINST WHICH PAYMENT
IS TO BE MADE ON RECEIPT AT SITE
(On Non-Judicial stamp paper of appropriate value)**

INDEMNITY BOND

THIS INDEMNITY BOND is made thisday of..... 20
..... by.....(Contractor's Name) a Company registered under the Companies Act,
1956/Partnership firm/Proprietary concern having its Registered Office at
..... (hereinafter called as 'Contractor' or "Obligor" which expression shall include
its successors and permitted assigns) in favour of(Name of Employer), a Company
incorporated under the Companies Act, 1956 having its Registered Office at
..... and its project at (hereinafter called
"....." {Abbreviated name of the Employer} which expression shall include its successors and
assigns) :

WHEREAS@..... has awarded to the Contractor a Contract for vide its
Notification of Award/Contract No.....dated and its
Amendment No. and Amendment No....., (applicable
when amendments have been issued) (hereinafter called the Contract") in terms of which
.....(contractor) is required to keep in his safe custody various Equipmentsfor execution of the
Contract.

And WHEREAS by virtue of Clause No..... of the said Contract, the Contractor is
required to execute an Indemnity Bond in favour in@for the safe custody of Equipments
for the purpose of performance of the Contract/Erection portion of the contract (hereinafter called the
"Equipments")

NOW THEREFORE, This Indemnity Bond witnesseth as follows :

1. That in consideration of various Equipments as mentioned in the Contract, valued at
(Currency and amount in figures)..... (Currency and amount in words)
.....brought to site by the contractor in instalments from
time to time for the purpose of safe custody and performance of the Contract, the Contractor
hereby undertakes to indemnify and shall keep@..... indemnified, forthe twice the
value of the Equipments. The Contractor hereby acknowledges actual receipt of the initial
instalment of the Equipment etc. at site as per details in the Schedule appended hereto.
Further, the Contractor agrees to acknowledge actual receipt of the subnsequent instalments
of the Equipments etc. as required by @. in the form of
Schedules consecutively numbered which shall be attached to this Indemnity Bond so as to
form integral parts of this Bond.

@ Fill in abbreviated name of Employer

2. That the Contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the Equipment at@ project site against all risks whatsoever till the Equipments are duly used/erected in accordance with the terms of the Contract and the plant/package duly erected and commissioned in accordance with the terms of the Contract, is taken over by@ The Contractor undertakes to keep@ harmless against any loss or damage that may be caused to the Equipments.
3. The Contractor undertakes that the equipments shall be used exclusively for the performance/execution of the Contract strictly in accordance with its terms and conditions and no part of the equipment shall be utilised for any other work of purpose whatsoever. It is clearly understood by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall inter-alia constitute a criminal breach of trust on the part of the Contractor for all intents and purpose including legal/penal consequences.
4. That@ is and shall remain the exclusive owner of the Equipments free from all encumbrances, charges or liens of any kind, whatsoever. The Equipments shall at all times be open to inspection and checking by the Project Manager or other employees/agents authorized by him in this regard. Further,@ shall always be free at all times to take possession of the Equipments in whatever form the Equipments may be, if in its opinion, the equipments are likely to be endangered, misutilised or converted to uses other than those specified in the Contract, by any acts of omission or commission on the part of the Contractor or any other person or on account of any reason whatsoever and the Contractor binds himself and undertakes to comply with the directions of demand of@ to return the Equipments without any demur or reservation.
5. That this Indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipments or the same or any part thereof is mis-utilised in any manner whatsoever, then the Contractor hereby agrees that the decision of the Project Manager of@ as to assessment of loss or damage to the Equipment shall be final and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and/or damaged Equipments at its own cost and/or shall pay the amount of loss to@ without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to@ against the Contractor under the Contract and under this Indemnity Bond.
6. NOW THE CONDITION of this Bond is that if the Contractor shall duly and punctually comply with the terms and conditions of this Bond to the satisfaction of@ , THEN, the above Bond shall be void, but otherwise, it shall remain in full force and virtue.

@ Fill in abbreviated name of Employer

IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorised representative under the common seal of the Company, the day, month and year first above mentioned.

SCHEDULE No.1

Particulars of the Equipments	Quantity	Particulars of Despatch title Documents RR/GR/ Bill of lading Carrier No & Date	Value of the Equipments	Signature of Attorney in token of receipt
-------------------------------	----------	--	-------------------------	---

(Please number subsequent schedules)

For and on behalf of
.....
(Contractor's Name)

WITNESS

- | | | |
|----|--------------------|---|
| 1. | 1. Signature | Signature |
| | 2. Name | Name |
| | 3. Address | Designation of
Authorised representative * |
| 2. | 1. Signature | (Common Seal)
(In case of Company) |
| | 2. Name | |
| | 3. Address | |

* Indemnity Bond are to be executed by the authorised person and (i) in case of contracting Company under common seal of the Company or (ii) having the Power of Attorney issued under common seal of the company with authority to execute Indemnity Bond, (iii) In case of (ii), the original Power of Attorney if it is specifically for this Contract or a photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to Indemnity Bond.

**16. FORM OF INDEMNITY BOND
FOR REMOVAL/ DISPOSAL
OF SURPLUS MATERIAL**

**16. FORM OF INDEMNITY BOND TO BE EXECUTED
BY THE CONTRACTOR WITH REGARD TO DISPOSAL OF
SURPLUS MATERIAL
(TO BE EXECUTED ON STAMP PAPER OF APPROPRIATE VALUE)**

INDEMNITY BOND

THIS INDEMNITY BOND executed thisday of..... 20 by
.....(Name of Company) a Company registered under the
Companie Act, 1956/Partnership Firm/Proprietary concern having its Registered Office(s) at
..... (Office Address).....hereinafter called the
Indemnifier(s)/Contractor(s) (which expression shall, unless excluded by or repugnant to the context,
be deemed to mean and include its successors, administrators, executors and permitted assigns).

IN FAVOUR OF

NVVN Limited (a Wholly owned subsidiary of NTPC Ltd.),having its registered office at NTPC Bhawan,
Scope Complex, 7, Institutional Area, Lodhi Road, New Delhi-110 003 (hereinafter referred to as
"NVVN").

1. NVVN has awarded the Contractor(s), contract for execution of work ("Scope of Work") as mentioned in the contract agreement no. dated..... , entered into between NVVN and Contractor(s), relating to.....(Name & Address of Project/Station) (hereinafter called 'the Project').
2. The Indemnifier(s) for the purpose of execution of its Scope of Work had from time to time procured and stored (Details of Material) at the Project Site.
3. After completion of the Scope of Work by Indemnifier(s), it has been identified that scrap (Details of Scrap Material & its quantity)and/or surplus (Details of Surplus Material & its Quantity) belonging to Indemnifier(s) is lying at the said Project Site.
4. Now, the scrap (Details of Scrap Material & its Quantity) and/or surplus (Details of Surplus Material & its Quantity) belonging to the Indemnifier(s), requires to be removed by Indemnifier(s) from the Project Site.

NOW THEREFORE THIS INDEMNITY BOND WITNESSETH AS UNDER:

1. That Indemnifier(s) by way of this indemnity requests NVVN to issue necessary exit gate pass(es) in favour of Indemnifier(s) for removal of scrap..... (Details of Scrap Material & its Quantity) and/or surplus..... (Details of Surplus Material & its Quantity)belonging to Indemnifier(s), from the project.
2. That as per NVVN's procedure, Indemnifier(s) shall ensure loading of trucks for clearing of its scrap (Details of Scrap Material & its Quantity) and/or surplus (Details of Surplus Material & its Quantity) by itself, as aforesaid, under the supervision of CISF personnel.
3. That Indemnifier(s) in consideration of the premises above, for itself and its respective, executors, administrators and assigns, jointly and severally agree and undertake from time to time and at all times hereafter to indemnify NVVN and keep NVVN indemnified from and against all claims, demands, actions, liabilities and expenses which may be made or taken against or incurred by NVVN by reason of the issue of necessary gate pass(es) by NVVN and permitting Indemnifier(s) to remove scrap (Details of Scrap Material & its Quantity) and/or surplus (Details of Surplus Material & its Quantity)belonging to Indemnifier(s), from the project.
4. That Indemnifier(s) undertakes to indemnify and keep NVVN harmless from any act of omission or negligence on the part of the Contractor in following the statutory requirements with regard to removal/disposal of scrap and surplus belonging to Indemnifier(s), from the Project Site aforesaid, by the Indemnifier(s). Further, in case the laws require NVVN to take prior permission of the relevant Authorities before handing over the scrap and/or surplus to the Indemnifier, the same shall be obtained by the Indemnifier on behalf of NVVN.

IN WITNESS WHEREOF, the Indemnifier(s), through its authorized representative, has executed these presents on the Day, Month and Year first mentioned above at (Name of the Place)
.....

Witness:

Indemnifier

- 1.
- 2.

.....
.....

(Authorised Signatory)

17. PROFORMA OF CONTRACTCLOSING CERTIFICATES

PROFORMA OF CERTIFICATE OF FINAL AMENDMENT TO THE CONTRACT

(To BE ISSUED BY Site C&M/SSC C&M)

CERTIFICATE NO. CCP - 01

NAME OF PACKAGE:

**LETTER OF AWARD/ NOA/
CO N T R A C T N O . :**

NAME OF CONTRACTOR

DATED:

This is to certify that amendments have been issued to the aforesaid contract as per the details mentioned below:

	Amendment No.	Date
1.		
2.		
3.		
4.		
5.		

This is to certify further that Amendment No.----- dated is the last amendment issued.

Signature

Date

Name.....

Place.....

Designation

**PROFORMA FOR DRAWING RECEIPT CERTIFICATE (TO
BE ISSUED BY ENGINEERING)**

CERTIFICATE NO.CCP- 02

NAME OF PACKAGE:

**LETTER OF AWARD/ NOA/
CONTRACT NO. :**

NAME OF CONTRACTOR

DATED:

Project:

This is to certify that we have received all the drawings which were to be submitted by the Contractor in requisite number along with the reproducibles as detailed in Annexure enclosed herewith, as per provisions stipulated in the above mentioned LOA/Contract.

Signature

Date

Name.....

Place.....

Designation

**PROFORMA FOR QA DOCUMENTS RECEIPT CERTIFICATE (TO
BE ISSUED BY CQA&I)**

CERTIFICATE NO. CCP-03

NAME OF PACKAGE:

**LETTER OF AWARD/ NOA/
CONTRACT NO. :**

NAME OF CONTRACTOR:

DATED:

Project:

This is to certify that the QA documents as per the list enclosed, in respect of the above mentioned LOA/ Contract has been received in line with the provisions of the Contract.

Signature

Date

Name.....

Place.....

Designation

**PROFORMA FOR O&M MANUAL RECEIPT CERTIFICATE (TO
BE ISSUED BY ENGINEERING)**

CERTIFICATE NO. CCP - 04

NAME OF PACKAGE:

**LETTER OF AWARD/ NOA/
CONTRACT NO. :**

NAME OF CONTRACTOR:

DATED:

Project :

This is to certify that we have received from the contractor all the necessary O&M Manuals in requisite number including the list of spare parts along with the names of vendors in respect of the above LOA/contract. The consolidated list of such manuals received is enclosed along with the distribution as marked on the list.

Signature

Date.....

Name... ..

Place.....

Designation.....

**PROFORM FOR SCOPE COMPLETION CERTIFICATE (TO
BE ISSUED BY SITE ERECTION)**

CERTIFICATE NO. CCP- 05

NAME OF PACKAGE:

**LETTER OF AWARD/
NOA/CONTRACT NO.:**

NAME OF CONTRACTOR:

DATED:

Project :

1. This is to certify that the scope of the above Contract has been completed in line with the contract read in conjunction with the following documents:

1. Final Amendment No. _____ (As per CCP -01)
2. Approved drawings including site run pipingschemes, if any. 3. Approved Bill of Materials
4. Material Dispatch Clearance Certificate (s)
5. Measurement Book
6. As Built Drawings
7. Any other documents (specify)

2. It is further certified that the following have been supplied, as per the details given in the Contract Documents and the same have been taken over by NVVN.

1. Mandatory Spares
2. Recommended Spares
3. Special Tools & Tackles

Signature

Date

Name... ..

Place.....

Designation

PROFORMA FOR LIQUIDATED DAMAGES FOR DELAY CERTIFICATE

(TO BE ISSUED BY SITE ERECTION/ REGIONAL OFFICE/ CORPORATE CONTRACTSERVICES)

CERTIFICATE NO. CCP- 06

NAME OF PACKAGE:

**LETTER OF AWARD/ NOA/
CONTRACT NO. :**

NAME OF CONTRACTOR:

DATED:

Project:

This is to certify that the issue regarding liquidated damages for delay as per the provisions of clause _____ of the above contract/ LOA has been resolved with the approval of the Competent authority vide reference _____ (copy enclosed).

Signature

Date

Name.....

Place.....

Designation

Note: In respect of cases where LD for delay is settled by Corporate Contract Services (CS), this certificate will be issued by CS and where LD for delay is settled by the Site / Region, the same will be issued by the concerned Site/Regional Offices.

PROFORMA OF SHORTFALL IN EQUIPMENT PERFORMANCE CERTIFICATE

(TO BE ISSUED BY OS/SITE, AS APPLICABLE, FOR SITE PERFORMANCE TEST AND BY CQA&I FOR SHOP TEST)

CERTIFICATE NO. CCP - 07

NAME OF PACKAGE:

**LETTER OF AWARD/ NOA/
CONTRACT NO. :**

NAME OF CONTRACTOR:

DATED:

PROJECT:

This is to certify that the following shortfall in equipment performance as compared to the guaranteed parameters have been assessed and agreed to with the contractor in respect of the above mentioned LOA/ Contract.

S.No	Guaranteed Parameter	Guaranteed	Assessed Value	Shortfall, if	liquidated damages
1	2	3	4	5	6

Further, it is also confirmed that liquidated damages for shortfall in equipment performance in respect of above Items, have been recovered fully from the contractor and no other dues are outstanding for shortfall in equipment performance.

Signature

Date
Place.....

Name.....
Designation

To be counter signed by Site Accounts.

Signature

Date.....
Place.....

Name.....
Designation

PROFORMA OF "MATERIAL RECONCILIATION" CERTIFICATE (TO BE

**ISSUED BY SITE ERECTION AND COUNTERSIGNED BY SITE
MATERIALS MANAGEMENT)**

CERTIFICATE NO. CCP- 08

NAME OF PACKAGE:

**LETTER OF AWARD/ NOA/
CONTRACT NO. :**

NAME OF CONTRACTOR:

DATED:

PROJECT:

This is to certify that the materials issued to the contractor in respect of the above mentioned LOA/Contract have been reconciled with the stipulations under the contract documents and no other recovery of material is pending with the contractor.

Signature

Date

Name.....

Place.....

Designation

To be counter signed by materials management

Signature

Date

Name.....

Place.....

Designation.....

PROPORMA OF "PAYMENT RECONCILIATION" CERTIFICATE
(TO BE ISSUED BY SITE ACCOUNTS IN CASE OF INDIAN CONTRACTORS)

CERTIFICATE NO. CCP - 09

NAME OF PACKAGE:

**LETTER OF AWARD/ NOA/
CONTRACT NO. :**

NAME OF CONTRACTOR:

DATED:

PROJECT:

This is to certify that all the payments released to the contractor in respect of the above mentioned LOA/Contract have been reconciled with the provisions of the contract documents and statement of Accounts and or other Certificates of Contractor. It is observed that there are no recoveries pending under any of the items listed overleaf.

Signature

Date.....

Name.....

Place.....

Designation.....

Enclosure to CCP-09

The list of recoveries and claims as advised by site Erection Department should include all recoveries and claims on any account whatsoever, including the following:

1. Liquidated damages for delay.
2. Liquidated damages for shortfall in Performance as observed during shop-testing (by inspection deptt.)
3. Liquidated damages for shortfall in performance as observed during performance guarantee tests conducted at site and other site tests.
4. All recoveries /claims on account of variations/deviations to scope of contract permitted or otherwise taken place during execution of the contract as listed in certificate No. CCP.05 for contract closing (Certificate by site Erection for contract closing).
5. Recoveries on account of reconciliation of payments made under the contract.
6. All the claims against the contractor regarding clearance of materials from site and vacation of the premises allotted for site office, stores.
7. All claims in respect of Training/Transportation/Accommodation/Services provided by site in respect of above LOA/Contract.
8. Recoveries on account of settlement of insurance claims
9. Recoveries on account of reconciliation of materials issued to the Contractor.
10. All recoveries on account of demurrage, transportation, insurance premiums etc. and other recoveries as informed by T&CC group on account of port clearance, transportation etc.
11. All recoveries on account of wastage and scrap.
12. All recoveries/claims (if any) on account of maintenance of equipments.
13. All recoveries/claims(if any) on account of price variation.
14. All recoveries/claims (if any) on account of statutory dues paid on behalf of the Contractor by NVVN.
15. Royalty charges.
16. All recoveries/ claims (if any) on account of hiring out of NVVN's plant and equipment.
17. All recoveries/claims (if any) on account of water and electricity charges (if applicable).
18. Any other recoveries/claims against specific instructions.

**PROFORMA OF RECONCILIATION CERTIFICATE FOR
PAYMENTS BY SITE**

**(TO BE ISSUED BY SITE ACCOUNTS/ REGIONAL OFFICE ACCOUNTS IN CASE OF
FOREIGN CONTRACTORS)**

CERTIFICATE CCP- 09A

NAME OF PACKAGE:

**LETTER OF AWARD/ NOA/
CONTRACT NO.:**

NAME OF CONTRACTOR:

DATED:

PROJECT /REGIONAL OFFICE:

This is to certify that,

- 1) All the payments against the above mentioned LOA/ Contract have been reconciled with the provisions of the Contract Documents and Statement of Accounts and/ or other certificates of the Contractor.

- 2) No recoveries are pending from the Contractor under any of the items advised by Site Erection Department as listed overleaf.

Signature

Date

Name.....

Place.....

Designation

Enclosure to CCP - 09A

The list of recoveries and claims as advised by Site Erection Department should include all recoveries and claims on any account whatsoever including the following:

1. All the claims against the Contractor regarding clearance of material from site and vacation of premises allotted for site office, stores.
2. All claims in respect of Training/ Transportation/ Accommodation/ Services provided by Site in respect of the above mentioned LOA/ Contract.
3. Recoveries on account of settlement of insurance claims.
4. Recoveries on account of reconciliation of materials issued to the Contractor.
5. All recoveries on account of wastage and scrap.
6. All recoveries/ claims (if any) on account of statutory dues paid on behalf of the Contractor by NVVN.
7. All recoveries / Claims (if any) on account of hiring out of NVVN's plant and equipment.
8. All recoveries / claims (if any) on account of water and electricity charges (if applicable)
9. Any other recoveries/ claims against specific instructions.

**PROFORMA OF RECONCILIATION CERTIFICATE
FOR PAYMENTS BY CORPORATE FINANCE**

**[TO BE ISSUED BY CORPORATE FINANCE (I.F. DEPTT.) FOR
LOA/CONTRACT ON FOREIGN CONTRACTOR]**

CERTIFICATE CCP- 09B

NAME OF PACKAGE:

**LETTER OF AWARD/ NON
CONTRACT NO. :**

NAME OF CONTRACTOR:

DATED:

PROJECT:

This is to certify that,

- 1) All the payments against the above mentioned LOA/ Contract released to the Contractor from Corporate Finance (I.F. Deptt.) have been reconciled with the provisions of the Contract Documents and Statement of Accounts and/or other certificates of the Contractor.
- 2) No recoveries are pending from the Contractor under any of the items advised by Site Erection Department as listed overleaf.

Signature

Date

Name... ..

Place.....

Designation

Enclosure to CCP- 09B

The list of recoveries and claims as advised by Site Erection Department should include all recoveries and claims on any account whatsoever, including the following:

1. Liquidated damages for delay.
2. Liquidated damages for shortfall in performance as observed during shop-testing (by Inspection Deptt.)
3. Liquidated damages for shortfall in performance as observed during performance guarantee tests conducted at site and other site tests.
4. All recoveries/claims on account of variation / deviations to scope of contract- permitted or otherwise taken place during execution of the Contract as listed in certificate No. CCP-05 for contract closing (certificate by Site Erection for Contract Closing)
5. Recoveries on account of reconciliation of payments made under the contract.
6. Reconciliation on account of settlement of insurance claims.
7. All recoveries / claims (if any) on account of price variation.
8. Royalty charges
9. Any other recoveries/ claims against specific instructions.

PROFORMA OF "CUSTOMS RECONCILIATION" CERTIFICATE
[TO BE ISSUED BY ACCOUNTS DEPTT. OF T&CC OFFICE FOR LOA/CONTRACT ON FOREIGN CONTRACTOR]

CERTIFICATE NO-CCP09C

NAME OF PACKAGE: LETTER OF AWARD/ NOA/
CONTRACT NO. :

NAME OF CONTRACTOR: DATED:

PROJECT/ REGION:

This is to certify that:

- 1) All the payments released by this**..... T&CC Office in respect of the above mentioned LOA/ Contract have been debited to the Project/ Region as per details (***) enclosed for reconciliation/ settlement/ recovery by them.
- 2) All the payments released towards the payment of Customs Duty have been completely reconciled with the Customs Authorities by the Contractor. No amount is due to the Customs Authorities and no recoveries are pending from the Contractor under any of the items noticed.

(This is applicable for vendor clearance)

- 3) All documents required from the Contractor for reconciliation of the Customs Duty Payment with the Customs Authorities have since been received and those are in order. No recoveries are pending from the Contractor under any of the items noticed.

(This is applicable where the clearance is done by NVVN)

Signature

Date
Place.....

Name... ..
Designation

** Name of T&CC Office from where payments have been released

*** The details will include amount, date when paid, reasons for payment and when debit was given to the concerned Project/Region together with reference thereof, if any.

Note : Strike out whichever is not applicable and initial.

**PROFORMA OF CERTIFICATE REGARDING LABOUR PAYMENTS AND
STATUTORY REQUIREMENTS TO BE FURNISHED BY CONTRACTOR.**

(TO BE ISSUED BY THE CONTRACTOR)

CERTIFICATE NO. CCP - 10

NAME OF PACKAGE:

**LETTER OF AWARD/ NOA/
CONTRACT NO. :**

NAME OF CONTRACTOR:

DATED:

PROJECT:

This is to certify that we have made all labour payments including PF Liabilities in respect of the above mentioned LOA/ Contract and no other payments in this regard is pending from us.

Further we confirm that all Statutory requirements have been complied with by us and in case any default is reported against us, we shall be solely responsible for the same.

Date

Signature

Place.....

Name.....

Designation

**PROFORMA OF "NO DEMAND CERTIFICATE" BY CONTRACTOR (TO
BE ISSUED BY THE CONTRACTOR)**

CERTIFICATE NO. CCP-11

NAME OF PACKAGE:

**LETTER OF AWARD/ NOA/
CONTRACT NO. :**

NAME OF CONTRACTOR:

DATED:

PROJECT:

We, M/s..... (Contractor) do hereby acknowledge and confirm that we have received the full and final payment due and payable to us from NVVN Ltd. in respect of our aforesaid LOA/Contract No..... dated.....including amendment,s if any, issued by NVVN Ltd., to our entire satisfaction and we further confirm that we have no claim whatsoever pending with NVVN Ltd. under the said Contract.

Notwithstanding any protest recorded by us in any correspondence document, measurement books, and/or final bills etc., we waive all our rights to lodge any claim or protest in future under this contract.

We are issuing this "NO DEMAND CERTIFICATE" in favour of NVVN Ltd. with full knowledge and with our free consent without any undue influence, misrepresentation, coercion etc.

Signature

Date

Name.....

Place.....

Designation

(Company CommonSeal)

(This certificate shall be accompanied by the Power of attorney of the signatory)

**PROFORMA OF CERTIFICATE FOR COMPLETION OF WARRANTY PERIOD (TO
BE ISSUED BY SITE ERECTION)**

CERTIFICATE NO. CCP-12

NAME OF PACKAGE:

**LETTER OF AWARD/ NOA/
CONTRACT NO.:**

NAME OF CONTRACTOR:

DATED:

PROJECT:

This is to certify that the warranty period for the above mentioned LOA/Contract has been completed in line with the provisions of the contract.

Signature

Date

Name... ..

Place.....

Designation

**PROFORMA OF "CERTIFICATE FOR RETURN OF BGs/ INDEMNITY BONDS ETC." (TO BE
ISSUED BY SITE ACCOUNTS)**

CERTIFICATE NO. CCP-13

NAME OF PACKAGE:

**LETTER OF AWARD/NOA/
CONTRACT NO.:**

NAME OF CONTRACTOR:

DATED:

PROJECT:

This is to certify that all the *Bank Guarantee/ Indemnity bonds/ Insurance policies/ Collaborator's or Associate's Guarantee received for the above mentioned LOA/ Contract have been returned in original to the contractor.

Signature

Date

Name... ..

Place... ..

Designation

****Delete whichever is not applicable***

Certificate from Bank regarding BG charges

TO WHOMSOEVER IT MAY CONCERN

This is to certify that we have issued/ extended/ amended Bank Guarantee (BG) Number..... amounting to (in number and words in Contract Currency) in favour of NTPC Limited on behalf of M/S (Contractor name) vide their request reference.....dated..... (DD/MM/YYYY) for the period (from)..... (to).....

We confirm that the bank commission (excluding Stamp paper, Out of Pocket Expenses (OPE) and GST on OPE) amounting to (amount and currency) for issuance/ extension/ amendment of the aforesaid BG have been recovered from M/s (Contractor name).

We further confirm that the commission charged on issuance/ extension/ amendment of the aforesaid BG is as per the prescribed rates of the Bank. Further the commission charged by the Bank as per card rates / sanctioned rates is customer/ borrower specific and is uniform for all BGs issued at the request of said customer/ borrower irrespective of beneficiary.

Chief Manager/Branch Manager
SS No: -
ABC Bank Ltd
New Delhi.
(With Seal of Bank Official)