



NAYA RAIPUR DEVELOPMENT AUTHORITY

**Tender Document for Design, Supply, Installation, Testing, Commissioning & Maintenance of Elevator and Escalator for office complex building ,retail complex building and Commercial building at Sector -21& 24 of Naya Raipur
(Following Three-Envelope Tender Procedure)**

TENDER DOCUMENT (PART ONE)

NIT No. : 103/ELE&ECS/VB /ELECT /CE(E)/NRDA/2016-17,Naya Raipur Dated: 21. 09.2016

Issued by: Chief Executive Officer,
Naya Raipur Development Authority (NRDA)
4th Floor, Paryavas bhawan, North block, Sector- 19,
Naya Raipur- 492 002, Chhattisgarh
Tel No: + 91 771 2512500; Fax No.: +91 771 2512400.
Website: www.nayaraiipur.gov.in

Tender Document Contains

- (a) Only schedule "A" and Section-I of schedule "D" are to be filled & signed by the tenderer
- (b) All the certificates as per pre qualification criteria shall be appended with relevant forms of schedule "D"

1. PART ONE (NRDA F-1)-(Attached herewith, to be submit along the tender)

Part (A)

- a) Press Notice
- b) Detailed NIT

Part (B)

- a) Schedule-A
 - (i) Cost Abstract
 - (ii) Bill of Quantities

- b) Schedule-B –NIL
- c) Schedule-C –NIL
- d) Schedule-D

Section-I..... Technical tender forms

- (i) Letter of Technical Tender
- (ii) Tenderer's Information Sheet
- (iii) Annual Turnover
- (iv) Specific Construction Experience
- (v) Declaration
- (vi) Check list for Technical tender evaluation

Section –IIScope of work

Section –III..... Technical specifications of work

Section –IV..... Special Conditions of Contract

Section –V..... List of approved makes.

Section –VI..... Drawings


- e) Schedule-E
- f) Schedule-F

2. PART TWO (NRDA F-2/3)-Standard form (Not Attached herewith, and not to be submitted along the tender)

Important note: - Link site [http:// nayaraipur.gov.in/documents/gcc.pdf](http://nayaraipur.gov.in/documents/gcc.pdf)

- 1. General Guidelines
- 2. Tender
- 3. General rules and directions
- 4. Conditions of contract
- 5. Clauses of contract
- 6. Model rules relating to labour, water supply and sanitation in labour camps safety code
- 7. Sketch of cement Godown
- 8. Contract forms
 - (a) Draft Format for Performance Security
 - (b) Earnest Money Deposit Form (Bank Guarantee)
 - (c) Format of Contract Agreement
 - (d) Draft Format for Performance Guarantee for Water Proofing and Anti-termite Works
 - (e) Indemnity Bond
 - (f) Indenture Bond
 - (g) Notice for Appointment of Arbitrator
- 9. Proforma of schedules (Schedule 'A' to Schedule 'F')

Press Note

	NAYA RAIPUR DEVELOPMENT AUTHORITY 4 th Floor,Paryavasbhawan , North block, Sector- 19, Naya Raipur- 492 002, Chhattisgarh Tel No: + 91 771 2512500; Fax No.: +91 771 2512400., Website: www.nayaraipur.gov.in
NIT No. :103/ELE&ECS/VB /ELECT /CE(E)/NRDA/2016-17,Naya Raipur Dated: 21. 09.2016	
Sealed tenders are invited from original equipment manufacturers or authorized channel partner or contractor ,who fulfill the Pre-Qualification criteria for the work of “Design, Supply, Installation, Testing, Commissioning & Maintenance of Elevator and Escalator for office complex building ,retail complex building and Commercial building at Sector -21& 24 of Naya Raipur” Estimated cost of tender is INR 2023.64 lacs with EMD of 21.00 lakhs for a time period of 5 months. Eligibility and qualification criteria are available in the detailed NIT. Tender documents can be downloaded from the website www.nayaraipur.gov.in . Last Date and Time of bid submission is by 15.00hrs on 17.10.2016. Amendment in tender, if any, will only be uploaded on the website and shall not be published in any newspaper.	
नयारायपुर—नेरारायपुर	Chief Executive Officer

Signature of Contractor.....

Signature of NRDA.....

NAYA RAIPUR DEVELOPMENT AUTHORITY (NRDA) RAIPUR, CHHATTISGARH

DETAILED NIT

NIT No.:103/ELE&ECS/VB/ELECT /CE(E)/NRDA/2016-17,Naya Raipur Dated: 21.09.2016

Last date and time for submission of tenders:1500 hrs on 17.10.2016

1. Item Rate Tenders are invited in the prescribed tender documents by the Chief Executive Officer, Naya Raipur Development Authority (NRDA), Raipur Chhattisgarh from Sealed tenders are invited from **original equipment manufacturer or authorized channel partner or contractor** who fulfill the Pre-Qualification criteria for the work.
2. The detailed NIT is as under:-

Name of work	Design, Supply, Installation, Testing, Commissioning & Maintenance of Elevator and Escalator for office complex building ,retail complex building and Commercial building at Sector -21 & 24 of Naya Raipur
Estimated Cost (INR in Lacs)	2023.64
EMD (INR in Lacs)	21.00
Time allowed including rainy season	5.0 Months
Cost of Tender (In INR)	5,000.00
Tender to be uploaded on NRDA website to enable download	23.09.2016
Last Date and time of submission of Tender	17.10.2016& 15.00Hrs
Date and time of opening of Tender	17.10.2016& 16.00Hrs

3. **Pre Qualification Criteria** -To be eligible under the contract, the intending tenderer should meet the mandatory criteria mentioned in **4.1 and 4.2 below:-**

4. Tender Criteria

4.1 Financial Criteria

Average Annual Turnover:The intending tenderer's average annual turnover during last three (3) years ending 31st March (i.e 20012-13, 2013-2014 & 2014-15) should be equal to INR2023.00 lacs or more. Annual turnover is total certified payments received from contracts in progress and completed during the financial year.

For above, the Tenderer has to submit audited balance sheets of their financial turn over/ accounts along with profit and loss account for the last three(3) years, duly certified by the Chartered Accountant. Where necessary, the Authority can make enquiries with the Tenderer's Bankers.

Signature of Contractor.....

Signature of NRDA.....

4.2 Technical Criteria

A	Intending tenderer shall be an original equipment manufacturer or an authorized channel partner or contractor. The OEM or the Manufacturer proposed by contractor shall have service set-up /service engineer located at Raipur /Chhattisgarh state or Nagpur
AND	
B	If the tenderer is a Channel Partner of OEM ,the said Channel Partner shall be associated with company for min. 2 years and should have completed supply,Installation, Testing & Commissioning of at least 20 no's of passenger Elevator/goods Elevator / Escalator &above during last seven years i.e. after 31/08/2009, in any Government / PSUs/Local bodies.
OR	
C	If the tenderer is a contractor he should have completed satisfactorily supply ,installation,Testing & Commissioning of 40 no's of 10 passenger Elevator / goods Elevator / Escalator& above during last seven years i.e. after 31/08/2009, in any Government / PSUs/Local bodies.

Note: -

- a) For the purpose **value of executed works and financial turnover shall be bought to current costing level by enhancing the actual value of work at the rate of 7% per annum (compounded annually), calculated from the date of completion to last date of receipt of applications for tenders.**
- b) In case authorized channel partner of original equipment manufacturer is bidding then his own work experience shall only be considered rather than work experience of the original equipment manufacturer.
- c) Ongoing project / part project experience shall not be considered for evaluation.
- d) For the benefit of the intending tenderers a checklist is enclosed at Schedule-D (vi), for the documents to be submitted along with tender.

For these, the certificate of satisfactory completion from Employer shall be submitted along with the application incorporating clearly the name of Contractor, name of the work, Contract value, billing amount, date of commencement of works, scheduled date of completion, actual date of completion, satisfactory performance of the Contractor, Quality of works executed (Very Good/Good/Fair/Poor), Time overrun if any(whether with or without levy of compensation or levy of compensation).

The works executed by the Applicant as a member of joint venture or as sub-contractor shall not be considered.

In case the similar work, as described above, is only a part of a composite/bigger project, the certificate from Employer should also indicate the cost of similar work out of the total project cost of composite/bigger project .In such case the work experience as an authorized sub venderby the client shall be considered as experience.

Signature of Contractor.....

Signature of NRDA.....

Certificates:

- a) All tenderers should submit the valid registration certificate. Commercial tax certificate, balance sheet with profit and loss statement for the 3 year (i.e 20012-13, 2013-2014 & 2014-15) duly certified by Chartered Accountant.
- b) The tenderers shall also submit satisfactory completion certificates in support of each quoted experience along with work order. The satisfactory completion certificate should be signed by an officer not below the rank of Executive Engineer concerned in case of Government **department or officer not below the rank of General Manager in case of public/ private sectors** as the case may be.
- c) In case of channel partner of the OEM ,a certificate from the OEM of being channel partner along with assurance of technical support shall be submitted.
- d) **All the documents to be submitted shall be duly notarized.**
5. The tender document for the above work is available on NRDA's websites: www.nayaraipur.gov.in and www.cg.gov.in Tenderer will have to download the tender document, and shall submit the tender along with the tender cost as mentioned in the Para 1 above. For tender cost, DD drawn in favor of "**CHIEF EXECUTIVE OFFICER, NRDA**" should be enclosed. The tenderers shall attach the cost of tender document along with EMD as mentioned in the Para 1 above.
6. **Three** envelope Tender procedures shall be followed. Tenderer has to submit three sealed envelopes containing the documents as detailed below simultaneously, enclosed in a **Fourth Envelope**.

ENVELOPE-1	EMD & Cost of tender in the prescribed format
ENVELOPE-2	Technical Tender consisting of the documents/certificate in proof of prequalification criteria PART ONE, Design, Supply, Installation, Testing, Commissioning & Maintenance of Elevator and Escalator for office complex building ,retail complex building and Commercial building at Sector -21& 24 of Naya Raipur and tender specification in soft & hard copy and (NRDA F-1) excluding schedule-A
ENVELOPE-3	Financial Tender PART ONE (Schedule-A) (Price Bid should also be submitted as soft copy in MS Excel 2007,in CD)

All the three tenders shall be put in a fourth envelope which shall be dully sealed. All the 4 envelopes shall be super-scribed with the Name of Work and Name of intending tenderer. Respective envelopes shall also be marked as envelope 1, envelope 2, and envelope 3 as detailed above. Tenders who do not conform to the specified requirements will be held non-responsive.

Initially, only the **envelope -1** shall be opened, if found responsive then the **envelope-2** (Technical tender) shall be opened at the date and time given in the Tender Document. The Price tender shall remain sealed and unopened in the custody of NRDA.

7. All Tenders must **be** accompanied with the
- a) **Earnest money** as mentioned in the Para 2 above. The Earnest money shall be payable in favor of *Chief Executive Officer NRDA*, in the form of a **Bank Draft payable at Raipur/ Bank Guarantee Operatable/Encashable at Raipur with their local branch address, drawn from a nationalized bank/ Scheduled Bank. Bank Draft and Bank Guarantee shall be valid for a period of 3 (three) months and 6 (Six) months respectively from the date of submission of tender**
- b) **Cost of tender** as mentioned in the Para 2 above. The Cost of tender money shall be payable in favor of *Chief Executive Officer NRDA*, in the form of a **Bank Draft payable at Raipur drawn from a nationalized bank/ Scheduled Bank** which shall be valid for a period of **3 (Three) months** from the date of submission of tender.

Signature of Contractor.....

Signature of NRDA.....

8. Tenders shall be submitted at the address below on or before due date. Tenders received after the due date or time for tender submission (Late tenders) will either not be accepted or if inadvertently accepted, will not be opened and shall be rejected and returned back to the tenderer subsequently.
9. (a) NRDA reserves full rights to reject any or all the tenders without assigning any reason, and to seek any further information from the tenderers. The selection shall be at the entire discretion of NRDA and the NRDA's decision in this respect shall be final and binding. Further NRDA reserves right to split the contract in two or more parts. This shall be at the entire discretion of NRDA and NRDA's decision in this matter shall be final and without appeal.
(b) The competent authority on behalf of NRDA does not bind himself to accept the lowest or any other tender, and reserves to himself the authority to reject any or all of the tenders received without the assignment of a reason. All tenders in which any of the prescribed conditions is not fulfilled or any condition including that of conditional rebate is put forth by the tenderer, shall be summarily rejected.
10. (a) Tenders shall be valid for 90 (Ninety) days from the last date of submission of the tender. NRDA will not be responsible for any costs or expenses incurred by Tenderers in connection with the preparation or delivery of Tenders. If any tenderer withdraws his tender before the said period or issue of letter of acceptance/intent, whichever is earlier, or makes any modifications in the terms and conditions of the tender which are not acceptable to the NRDA, then the NRDA shall, without prejudice to any other right or remedy, be at liberty to forfeit entire amount of Earnest Money as aforesaid.
(b) Any bidder, who has withdrawn his proposal or have been disqualified on the basis of the above clause, shall not be eligible to submit the tender in the recall of such tender.
(c) Subletting of the contract or Joint Venture in any case shall not be allowed. In case subletting is done or proved during the contract, the work shall be closed at the stage as it is and the SD / Retention money/any other deposits available with department shall be forfeited.
11. **The intending tenderers are advised to send their queries to NRDA either by post or by email to ceo@nayarapur.com and cee@nayarapur.com upto the date mentioned in the Para 2 as above.**
12. **Clarification/ amendments, if any shall be uploaded on website only.**
13. **Period for completion of work as mentioned above at Para 2 is inclusive of rainy season.**
14. Approved hard copy of the standard document is available in the office of the employer and could be seen on any working day during office hours at the following address:-
Chief Engineer (Engg), NRDA
First Floor, Paryawasbawan , North block, Naya Raipur-492002
15. The intending tenderers are advised to cross check the downloaded version of the tender document with the hard copy available with NRDA.
16. In case of any discrepancy between the downloaded tender and the approved hard copy, the approved hard copy shall hold good for contractual as well as legal purposes.
17. Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders, as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general, shall themselves at their own cost obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect the execution of work and shall incorporate the cost of such effects while quoting the tender, A tenderer shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charges consequent on any misunderstanding or otherwise shall be allowed, The tenderer shall be responsible for arranging and maintaining at his own cost all materials tools & plants, water, electricity, access facilities for workers and on all other services required for executing the work unless otherwise specifically provided in the contract documents. Submission of tender by a tenderer implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and local conditions and other factors having a bearing on the execution of the work.
18. Canvassing whether directly or indirectly, in connection with tenders is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to rejection.

Signature of Contractor.....

Signature of NRDA.....

19. The successful tenderer shall be required to execute an agreement on a non judicial stamp paper of appropriate value with the **Chief Engineer (Engineering), NRDA** in the Proformas annexed to the tender document, within 7 days of the issue of letter of acceptance/ award by the NRDA. The cost of non judicial stamp paper shall be borne by contractor. In the event of failure on the part of the successful tender to sign the agreement within 7 days, the entire earnest money will be forfeited and tender shall be cancelled.
20. The successful tenderer, upon issue of letter of acceptance, in addition to execution of an agreement on a non judicial stamp paper of appropriate value, shall also be required to furnish an irrevocable Performance Bank Guarantee of requisite amount to the Chief Engineer (Engineering), NRDA in the Performa annexed to the tender document, within 7 days of the issue of the letter of acceptance /award of Tender by the NRDA. In the event of failure on the part of the successful tenderer to furnish the Performance Bank Guarantee within 7 days, the earnest money will be forfeited and tender shall be cancelled.
21. This Notice Inviting Tender shall form a part of the contract document. In accordance with clause 1 of the contract, the letter of acceptance/ award shall be issued in favour of the successful tenderer/ contractor. After submission of the performance guarantee, by the contractor, the General arrangement drawings and other details for commencement of work shall be issued. The contract shall be deemed to have come into effect on issue of communication of letter of acceptance of the tender. On such communication of acceptance, the successful Tenderer/ Contractor shall, within 7 days from such date, formally sign the agreement consisting of:-
- PART ONE of the Tender documents along with detailed NIT as issued to the contractor at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto and
 - PART TWO of the Tender document i.e. "General conditions of contract duly modified / corrected to the extent as specified under PART ONE (though not issued to the contractor but always available for inspection on written demand at the office of the officer inviting tenders specified under Schedule F of PART ONE of the Tender Document) and deemed to have been consulted, inspected, understood and considered by the tenderer before quoting and submitting his tender.
 - Agreement signed on non-judicial stamp paper of appropriate value as per prescribed proforma of tender documents.
22. GCC is available as a standard NRDA Publication and can also be downloaded free of cost from the NRDA web site under title "General conditions of contract" for Contractors in construction Contracts" However contractors are advised to refer to PART ONE of the tender document carefully and thoroughly for corrections/ modifications in the "General conditions of contract" Standard form NRDA F-2/3 is also available for inspection in the office of the Engineer in charge on written demand from contractors. Link site <http://nayaraipur.gov.in/documents/gcc.pdf>
23. While submitting the tender the contractor shall clearly and legibly write his full mailing address including PIN code, Telephone/ mobile no./ Fax Numbers/ e-mail address etc for communication purposes and shall inform the Engineer in Charge about any change from time to time in his postal/ mailing address. The communication shall be dispatched only at the contractor's such latest informed address and NRDA shall in no way be responsible for non-receipt of correspondence by the contractor.
24. It is found that the contractor has misrepresented that facts or has attempted to secure or has secured the work by misrepresenting the facts or by submitting false or forged documents then the Entire Earnest Money submitted by the contractor and or the Performance Guarantee and/ or the Security Deposit as the case may be, shall be liable to be absolutely forfeited and such contractor/ individuals shall also be liable to be prosecuted for cheating/ forgery/ fraud etc as per law.
25. Bill of quantities is enclosed with tender document, the rate shall be quoted against each item separately **in figures as well as in words**
- During price Tender evaluation, the Employer will correct arithmetical errors on the following basis:
- if there is a discrepancy between words and figures, following procedure shall be followed:
 - the unit price which correspond to the total price for the item worked out by the Tenderer shall be followed;
 - If the total price of an item is not worked out by the Tenderer or it does not correspond with the rates written either in words or figures then the rate quoted by the Tenderer in words shall be taken as correct.

Signature of Contractor.....

Signature of NRDA.....

- b) if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected;
 - c) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected.
 - d) The unit wise amounts will be rounded to the nearest rupee
 - e) The tendered rates of items against which no rate or price is entered by the tenderer will be taken as zero and the price of the same shall be deemed to have been covered by the rates/amount quoted in other items.
26. The tender document shall be written legibly and free from erasure, overwriting or conversion of figure. Any correction where unavoidable shall be made by crossing out, rewriting and attestation by the tenderer.
27. All royalties be paid by the contractor as also all tolls, duties, local and other levies including sales tax, insurances & workman compensation act etc.
28. Applicable service tax shall be reimbursed separately on production of receipt of payments of Service Tax.
29. Contractor will be bound to follow CG Model rules relating to its water supply& sanitation in labour camp.
30. The contractor shall pay not less than the minimum wages to labours engaged by him on the work.
31. Department reserves the right to take up the work departmentally or to award any work on contract in the vicinity without prejudice to the terms of contract.
32. If the rate quoted by the lowest (L1) of the tenderer is considered unbalanced (in relation to the Department's estimate of cost of work to be performed under the contract) by the CEO, NRDA, then tenderer shall submit detail price/rate analysis of major items of the work within 7 days of such notice so as to demonstrate the internal consistency of these price/rate(s) with his quoted price/rate(s). After evaluation by tender sanctioning authority CEO, NRDA may require the tenderer to submit additional Security upto 5% of the estimated cost put to tender for the performance of the agreement in the shape of F.D. Or a BG receipt in favor of the CEO, NRDA before signing of the agreement, which shall be refunded along with the normal S.D. after Completion of work. If he fails to complete the work or leave the work in complete, this 5% additional SD, shall also be forfeited by the department, in addition to other provision of the contract & the agreement shall be terminated and action shall be taken in accordance of relevant contract clause of the agreement.
33. Important Instructions to Tenderers :The tenderers who have down loaded the tender documents from the web site, should read the following important instructions carefully before actually quoting the rates & submitting their tender on the tender document downloaded from the web site:
- a) The tenderer should see carefully & ensure that all the pages of PART ONE (NRDA F-1) of the tender document including schedule of quantities of items of work (NRDA F-1 Schedule-A) has been down loaded properly & completely.
 - b) The printout of the downloaded tender document shall be taken on A-4 size plain white paper only & the printer settings shall be dept to ensure that the downloaded document is printed in the same manner and pattern/ setting as appearing on the web site & there is no change in the formatting, number of paras etc.
 - c) The tenderer should ensure that no page in the down-loaded tender document is missing and all pages in the down-loaded tender document as printed are legible & clear & are printed on a good quality paper.
 - d) The tenderer should ensure that every page of the down-loaded tender document is signed by tenderer himself.
 - e) The tenderer should ensure that the down loaded tender document is properly bound and wax sealed before submitting the same in the envelope. **Loose submission** shall be liable to be rejected.
 - f) In case of any correction/ addition/ alteration/ omission in the downloaded tender document Vis a Vis that in the **Standard DRAFT Tender Document** available in the office of NRDA, it shall be liable to be rejected.

Signature of Contractor.....

Signature of NRDA.....

- g) The tenderer shall furnish a declaration to this effect that no addition/ deletion/ corrections have been made in the downloaded tender document being submitted by him and it is identical to the tender document appearing on the Web-site and with the **Standard DRAFT Tender Document** available in the office inviting the tenders.

Chief Executive Officer, NRDA
4th Floor,Paryawasbhawan , North block,
Sector- 19, Naya Raipur- 492 002, Chhattisgarh
Tel No: + 91 771 2512500;
Fax No.: +91 771 2512400.

Signature of Contractor.....

Signature of NRDA.....

SCHEDULE– D
Section-I
Technical Tender Forms

Schedule-D

Section I - Tender Forms Technical

This Section contains the forms which are to be completed by the Tenderer and submitted as part of his PART ONE (NRDA F-1).

Table of Forms

Letter of Technical Tender.....	2
Tenderer's Information Sheet.....	4
Annual Turnover	5
Specific Construction Experience.....	6
DECLARATION	7
CHECK LIST FOR TECHNICAL TENDER EVALUATION.....	8
RETURN OF EMD.....	11
INTEGRITY PACT	12

(i) Letter of Technical Tender

Date: _____

NIT No.: _____

To:

Chief Executive Officer,
4th Floor, Paryawasbhawan , North block,
Sector- 19, Naya Raipur- 492 002, Chhattisgarh
Tel No: + 91 771 2512500;
Fax No.: +91 771 2512400.

Ref for NIT no:-----

Subject: Name of the work:- -----

Dear Sir,

I/We, the undersigned, declare that:

- (a) I/We have examined and have no reservations to the Tender Document, including Addendum if any, minutes of meeting, clarification to the queries etc.
- (b) I/We offer to execute the subjected under in conformity with the Tender Documents and the addendums.
- (c) I/We have satisfied ourselves as to the location of the site and working conditions, examined the requirements of NRDA and have obtained all the information necessary for the successful and timely completion of the work.
- (d) I/We have submitted the Earnest Money Deposit as specified in the tender document which will not bear any interest and shall be subjected to forfeiture on following defaults.
 - (i) if we withdraw our Tender during the period of tender validity as specified in Detailed NIT Para 9 or
 - (ii) if we fail to:
 - furnish a Performance Security in accordance with Detailed NIT Para 19 or
 - sign the Contract in accordance with Detailed NIT Para 18; or
 - Accept the correction of its Tender Price pursuant to Detailed NIT Para 24.
 - (iii) If we have given the false documents in support of qualification with the technical tender.
- (e) My/Our Tender shall be valid for a period of 90 days from the date fixed for the tender submission deadline in accordance with the Tender Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (f) If my/our Tender is accepted, we commit to obtain a Performance Security in the amount as specified in the tender document for the due performance of the Contract and sign the agreement;
- (g) I/We are not participating, as Tenderers, in more than one Tender in this Tendering process, in accordance with the Tender Document;

- (h) My/our firm, its affiliates or subsidiaries, including any subcontractors or suppliers for any part of the Contract, has not been declared ineligible by NRDA, Raipur;
- (i) I/We understand that this Tender, together with your written acceptance thereof included in your letter of acceptance, shall constitute a binding contract between us, until a formal Contract is prepared and executed;
- (j) I/We understand that you are not bound to accept the lowest evaluated tender or any other tender that you may receive.
- (k) I/We hereby pay the Earnest Money Deposit of required amount in the form of a demand draft on a nationalized bank/ Scheduled Bank (-----Bank Name and address) and operatable at Raipur in favour of the 'Chief Executive Officer, NRDA, Raipur' for the said amount and is attached.
- (l) I/We hereby declare that, the entire work including Addendum/ Corrigendum, if any, shall be completed in all respect within the time limit specified in the NIT.
- (m) I/We here by authorize the Employer to get all bank guarantee verified and got confirmed from concerned Bank.

Signature: -----

Signed by: ----- (Name)

Designation: -----

For and on Behalf of -----(Name of Tenderer)

Date:

(ii)Tenderer’s Information Sheet

Tenderer’s Information		
Tenderer’s legal name		
Tenderer’s legal address		
Tenderer’s authorized representative <small>(name, address, telephone numbers, fax numbers, e-mail address)</small>	Name:	Address:
	Telephone : Fax :	E-Mail:
Tenderer’s details of Incorporation	Place of incorporation/ registration:	Year of incorporation:
<p>Attached are copies of the following original documents.</p> <p><input type="checkbox"/> 1. Articles of incorporation or constitution of the legal entity named above.</p> <p><input type="checkbox"/> 2. In the case of government-owned entity, documents establishing legal and financial autonomy and compliance with commercial law.</p>		

Details of the office closest to Raipur (if available)

1.	Address of Office	
2.	Telephone :	Contact :
3.	Fax :	E-Mail :

Signature of Tenderer

Date: _____

(iii) Annual Turnover

Annual Turnover Data for the Last 3 Years			
Year	Amount and Currency	Exchange Rate if any	INR Equivalent
2012-13			
2013-14			
2014-15			
2015-16			
Average Annual Turnover for any 3 years in INR			

All Tenderers are requested to complete the information in this form

The information supplied should be the Annual Turnover of the Tenderer in terms of the amounts billed to clients for each year for contract in progress or completed, converted to INR at the rate of exchange at the end of the period reported.

As a proof of the above, the contractor shall submit the copies of the balance sheet for last three years along with audited profit & loss statement duly signed by the chartered accountant.

Signature of Tenderer

Date: _____

(iv) Specific work Experience

Fill up one (1) form per contract.

Details of Contract			
Contract No of	Name of work		
Award Date		Completion Date	
Role in Contract	<input type="checkbox"/> Contractor	<input type="checkbox"/> Sub-contractor	
Total Contract Amount			INR
Employer's Name Address Telephone/Fax Number E-mail			
Description of the work executed			

Note: Attach copies of work order and satisfied completion certificates in support of each quoted experience. The completion certificate should be signed by the officer not below the rank of concerned Executive Engineer in case of Government department or in the rank of General Manager in case of public sector/private sector as the cases may be.

Signature of Tenderer

Date: _____

(v)DECLARATION

(TO BE SIGNED BY THE TENDERER SUBMITTING THE TENDER ON DOWNLOADED TENDER DOCUMENT)

I/We hereby declare and certify that:

1. I/We are submitting the tender in the tender document downloaded by me /us from the website & we certify that there is no change in formatting, numbering of pages etc. In the downloaded documents.
2. I/We are submitting the tender in the tender document which is exactly similar and identical to the one available on the website and also as available with the officer inviting tenders.
3. I / We have not made any modifications / corrections / additions / omissions etc in the tender documents downloaded from web by me / us.
4. I / We have checked that no page in the downloaded tender document is missing and all the pages as per web site are available & that all the pages of tender document submitted by us are clear & legible.
5. I / We have signed (with stamp) all the pages of the tender document before submitting the same.
6. I / we have wax sealed the tender documents properly before submitting the same.
7. I / We have submitted the application for issue of tender documents on the prescribed format separately along with the cost of tender documents and also the attested Xerox copies of the eligibility documents prescribed for respective work in the NIT.
8. I / We have read carefully & understood the entire Tender document including important instructions to the tenderers submitting the downloaded tender.
9. In case at any stage whatsoever at a later date it is found/ revealed that there is a difference in our downloaded tender documents from the original **Standard DRAFT Tender Document**, NRDA shall have the absolute right to take any action as deemed fit without any prior intimation to me / us.
10. In case at any stage whatsoever at a later date it is found that there is difference in our downloaded tender document from the Standard DRAFT Tender Document, we clearly understand that our work shall be liable to be cancelled and Earnest Money/ Performance Guarantee / Security deposit etc all are liable to be forfeited by NRDA and in such an eventuality I / We shall have no right or claim for any damages / compensation from NRDA on this account. Further in such case I / We may also be debarred by NRDA for further participation in the tendering in the concerned NRDA & be removed from the approved list of contractors of NRDA.

Dated.....

(TENDERER)
(SIGNATURE WITH SEAL/ STAMP)

(vi) CHECK LIST FOR TECHNICAL TENDER EVALUATION

Name of the Agency:						
S. No	Document	Details			Enclosed at annexure	
					Page No	
			From	To		
1	Tender Document Cost	Downloaded from NRDA Website Details of DD				
		Amount				
		Name of the Bank & Branch				
		Date				
		D.D no & Photo copy attached	Yes	No		
2	Earnest Money Deposit (EMD)	Amount				
		Form of EMD				
		Issuing Bank & Branch				
		No & Date Photo copy attached	Yes	No		
	Contractor Registration Certificate	Class in which registered				
		Name of Department				
		Registration Number & Date				
		Validity				
		Notarized	Yes/No			
4	Commercial Tax Certificate	Registration Number:				
		Name of the Office				
		Notarized	Yes/No			

Name of the Agency:					
S. No	Document	Details		Enclosed at annexure	
				Page No	From
5	Average Annual Turnover in Lacs	2011-2012			
		2012-2013			
		2013-2014			
		2014-2015			
		Chartered accountant certificate in original or photo copy duly notarized can be submitted			
6	Details of the projects/works completed as pre-qualification criteria	Name of the Work			
		Work Completed	Yes/No		
		Year of completion			
		Cost of the Project			
		Certificate Enclosed	Yes/No		
		Notarized	Yes/No		
		Name of the Work			
		Work Completed	Yes/No		
		Year of completion			
		Cost of the Project			
		Certificate Enclosed	Yes/No		
		Notarized	Yes/No		

Note: The above check list only provides for those documents which are mandatory for the tender pre-qualification criteria. Tenderers are required to append, other documents also with the technical tender as required in the detailed NIT or elsewhere in the PART ONE (NRDA F-1).

Signature of Tenderer

Date: _____

(vii) RETURN OF EMD

Date: _____

To:

Chief Executive Officer,
4th Floor,Paryawas bhawan , North block,
Sector- 19, Naya Raipur- 492 002, Chhattisgarh
Tel No: + 91 771 2512500;
Fax No.: +91 771 2512400.

Ref for NIT no:-----

Subject: Name of the work:- -----

Dear Sir,

(a) I/We have submitted the Earnest Money Deposit of amount Rs. _____(In words _____) as specified in the tender document in the form of a demand draft/Bank Guarantee on a nationalized bank/ Scheduled Bank (-----Bank Name and address) and operatable at Raipur in favour of the 'Chief Executive Officer, NRDA, Raipur.

(b) In case, i/we am/are not found qualified bidder, our Earnest Money Deposit (EMD) may kindly be return back on the provided bank details as below:

Our bank detail (Please attaché a cancel cheque) are as follows :

(1) Beneficiary Name: _____

(2) Beneficiary's Bank: _____

(3) Branch: _____

(4) IFS Code: _____

(5) Account No _____

Signature: -----

Signed by: ----- (Name)

Designation: -----

For and on Behalf of -----(Name of Tenderer)

Date:

INTEGRITY PACT

To,

.....,
.....,
.....

Sub: NIT No. for the work

Dear Sir,

It is here by declared that Naya Raipur Development Authority(NRDA),Naya Raipur(C.G.) is committed to follow the principle of transparency, equity and competitiveness in public procurement.

The subject Notice Inviting Tender (NIT) is an invitation to offer made on the condition that the Bidder will sign the integrity Agreement, which is an integral part of tender/bid documents, failing which the tenderer/bidder will stand disqualified from the tendering process and the bid of the bidder would be summarily rejected.

This declaration shall form part and parcel of the Integrity Agreement and signing of the same shall be deemed as acceptance and signing of the Integrity Agreement on behalf of the Naya Raipur Development Authority,Naya Raipur(C.G.).

faithfully

Yours

**Executive Engineer
Naya Raipur Development Authority
Naya Raipur(C.G.)**

INTEGRITY PACT

To,

**Naya Raipur Development Authority (NRDA),
Naya Raipur (C.G.),**

.....,

Sub: Submission of Tender for the work of

Dear Sir,

I/We acknowledge that **Naya Raipur Development Authority (NRDA),Naya Raipur (C.G.)**,is committed to follow the principles thereof as enumerated in the Integrity Agreement enclosed with the tender/bid document.

I/We agree that the Notice Inviting Tender (NIT) is an invitation to offer made on the condition that I/We will sign the enclosed integrity Agreement, which is an integral part of tender documents, failing which I/We will stand disqualified from the tendering process. I/We acknowledge that **THE MAKING OF THE BID SHALL BE REGARDED AS AN UNCONDITIONAL AND ABSOLUTE ACCEPTANCE** of this condition of the NIT.

I/We confirm acceptance and compliance with the Integrity Agreement in letter and spirit and further agree that execution of the said Integrity Agreement shall be separate and distinct from the main contract, which will come into existence when tender/bid is finally accepted by **Naya Raipur Development Authority (NRDA),Naya Raipur (C.G.)**. I/We acknowledge and accept the duration of the Integrity Agreement, which shall be in the line with Article 1 of the enclosed Integrity Agreement.

I/We acknowledge that in the event of my/our failure to sign and accept the Integrity Agreement, while submitting the tender/bid, **Naya Raipur Development Authority (NRDA),Naya Raipur (C.G.)** shall have unqualified, absolute and unfettered right to disqualify the tenderer/bidder and reject the tender/bid is accordance with terms and conditions of the tender/ bid.

Yours faithfully

(Duly authorized signatory of the Bidder)

To be signed by the bidder and same signatory competent / authorized to sign the relevant contract on behalf of Naya Raipur Development Authority Naya Raipur(C.G.)

INTEGRITY AGREEMENT

This Integrity Agreement is made at on this day of20.....

BETWEEN

Naya Raipur Development Authority (NRDA),Naya Raipur (C.G.) represented through The CEO or Any Officer appointed by him,

(Name of Division)

Naya Raipur Development Authority ,

....., (Hereinafter referred as the (Address of Division)

'Principal/Owner', which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

AND

..... (Name and Address of the Individual/firm/Company) through (Hereinafter referred to as the (Details of duly authorized signatory)

"Bidder/Contractor" and which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

Preamble

WHEREAS the Principal / Owner has floated the Tender (NIT No.) (hereinafter referred to as "Tender/Bid") and intends to award, under laid down organizational procedure, contract for

(Name of work)

Herein after referred to as the "Contract".

AND WHEREAS the Principal/Owner values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relation with its Bidder(s) and Contractor(s).

AND WHEREAS to meet the purpose aforesaid both the parties have agreed to enter into this Integrity Agreement (hereinafter referred to as "Integrity Pact" or "Pact"), the terms and conditions of which shall also be read as integral part and parcel of the Tender/Bid documents and Contract between the parties.

NOW, THEREFORE, in consideration of mutual covenants contained in this Pact, the parties hereby agree as follows and this Pact witnesses as under:

Article 1: Commitment of the Principal/Owner

- (1) The Principal/Owner commits itself to take all measures necessary to prevent corruption and to observe the following principles: (a) No employee of the Principal/Owner, personally or through any of his/her family members, will in connection with the Tender, or the execution of the Contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

- (b) The Principal/Owner will, during the Tender process, treat all Bidder(s) with equity and reason. The Principal/Owner will, in particular, before and during the Tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the Tender process or the Contract execution.
 - (c) The Principal/Owner shall endeavour to exclude from the Tender process any person, whose conduct in the past has been of biased nature.
- (2) If the Principal/Owner obtains information on the conduct of any of its employees which is a criminal offence under the Indian Penal code (IPC)/Prevention of Corruption Act, 1988 (PC Act) or is in violation of the principles herein mentioned or if there be a substantive suspicion in this regard, the Principal/Owner will inform the Chief Vigilance Officer and in addition can also initiate disciplinary actions as per its internal laid down policies and procedures.

Article 2: Commitment of the Bidder(s)/Contractor(s)

- (1) It is required that each Bidder/Contractor (including their respective officers, employees and agents) adhere to the highest ethical standards, and report to the Government / Department all suspected acts of fraud or corruption or Coercion or Collusion of which it has knowledge or becomes aware, during the tendering process and throughout the negotiation or award of a contract.
- (2) The Bidder(s)/Contractor(s) commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the Tender process and during the Contract execution:
- (a) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal/Owner's employees involved in the Tender process or execution of the Contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the Tender process or during the execution of the Contract.
 - (b) The Bidder(s)/Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to cartelize in the bidding process.
 - (c) The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act. Further the Bidder(s)/ Contract(s) will not use improperly, (for the purpose of competition or personal gain), or pass on to others, any information or documents provided by the Principal/Owner as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
 - (d) The Bidder(s)/Contractor(s) of foreign origin shall disclose the names and addresses of agents/ representatives in India, if any. Similarly Bidder(s)/Contractor(s) of Indian Nationality shall disclose names and addresses of foreign agents/representatives, if any. Either the Indian agent on behalf of the foreign principal or the foreign principal directly could bid in a tender but not both. Further, in cases where an agent participate in a tender on behalf of one manufacturer, he shall not be allowed to quote on behalf of another manufacturer along with the first manufacturer in a subsequent/parallel tender for the same item.
 - (d) The Bidder(s)/Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the Contract.
- (3) The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
- (4) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm indulge in fraudulent practice means a willful misrepresentation or omission of facts or submission of fake/forged documents in order to induce public official to act in reliance thereof, with the purpose of obtaining unjust advantage by or causing damage to justified interest of others and/or to influence the procurement process to the detriment of the Government interests.
- (5) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm use Coercive Practices (means the act of obtaining something, compelling an action or influencing a decision through intimidation, threat or the use of force directly or indirectly, where potential or actual injury may befall upon a person, his/ her reputation or property to influence their participation in the

tendering process).

Article 3: Consequences of Breach

Without prejudice to any rights that may be available to the Principal/Owner under law or the Contract or its established policies and laid down procedures, the Principal/Owner shall have the following rights in case of breach of this Integrity Pact by the Bidder(s)/Contractor(s) and the Bidder/ Contractor accepts and undertakes to respect and uphold the Principal/Owner's absolute right:

- (1) If the Bidder(s)/Contractor(s), either before award or during execution of Contract has committed a transgression through a violation of Article 2 above or in any other form, such as to put his reliability or credibility in question, the Principal/Owner after giving 14 days notice to the contractor shall have powers to disqualify the Bidder(s)/Contractor(s) from the Tender process or terminate/determine the Contract, if already executed or exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of transgression and determined by the Principal/Owner. Such exclusion may be forever or for a limited period as decided by the Principal/Owner.
- (2) Forfeiture of EMD/Performance Guarantee/Security Deposit: If the Principal/Owner has disqualified the Bidder(s) from the Tender process prior to the award of the Contract or terminated/determined the Contract or has accrued the right to terminate/determine the Contract according to Article 3(1), the Principal/Owner apart from exercising any legal rights that may have accrued to the Principal/Owner, may in its considered opinion forfeit the entire amount of Earnest Money Deposit, Performance Guarantee and Security Deposit of the Bidder/Contractor.
- (3) Criminal Liability: If the Principal/Owner obtains knowledge of conduct of a Bidder or Contractor, or of an employee or a representative or an associate of a Bidder or Contractor which constitutes corruption within the meaning of IPC Act, or if the Principal/Owner has substantive suspicion in this regard, the Principal/Owner will inform the same to law enforcing agencies for further investigation.

Article 4: Previous Transgression

- (1) The Bidder declares that no previous transgressions occurred in the last 5 years with any other Company in any country confirming to the anticorruption approach or with Central Government or State Government or any other Central/State Public Sector Enterprises in India that could justify his exclusion from the Tender process.
- (2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the Tender process or action can be taken for banning of business dealings/ holiday listing of the Bidder/Contractor as deemed fit by the Principal/ Owner.
- (3) If the Bidder/Contractor can prove that he has resorted / recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal/Owner may, at its own discretion, revoke the exclusion prematurely.

Article 5: Equal Treatment of all Bidders/Contractors/Subcontractors

- (1) The Bidder(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact. The Bidder/Contractor shall be responsible for any violation(s) of the principles laid down in this agreement/Pact by any of its Subcontractors/sub-vendors.
- (2) The Principal/Owner will enter into Pacts on identical terms as this one with all Bidders and Contractors.
- (3) The Principal/Owner will disqualify Bidders, who do not submit, the duly signed Pact between the Principal/ Owner and the bidder, along with the Tender or violate its provisions at any stage of the
- (4) Tender process, from the Tender process.

Article 6- Duration of the Pact

This Pact begins when both the parties have legally signed it. It expires for the Contractor/Vendor 12 months after the completion of work under the contract or till the continuation of defect liability period, whichever is more and for all other bidders, till the Contract has been awarded.

If any claim is made/lodged during the time, the same shall be binding and continue to be valid despite the lapse of this Pacts as specified above, unless it is discharged/determined by the Competent Authority, Naya Raipur Development Authority,Naya Raipur (C.G.).

Article 7- Other Provisions

- (1) This Pact is subject to Indian Law, place of performance and jurisdiction is the Head quarters of the Division of the Principal/Owner, who has floated the Tender.
- (2) Changes and supplements need to be made in writing. Side agreements have not been made.
- (3) If the Contractor is a partnership or a consortium, this Pact must be signed by all the partners or by one or more partner holding power of attorney signed by all partners and consortium members. In case of a Company, the Pact must be signed by a representative duly authorized by board resolution.
- (4) 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. It is agreed term and condition that any dispute or difference arising between the parties with regard to the terms of this Integrity Agreement / Pact, any action taken by the Owner/Principal in accordance with this Integrity Agreement/ Pact or interpretation thereof shall not be subject to arbitration.

Article 8- LEGAL AND PRIOR RIGHTS

All rights and remedies of the parties hereto shall be in addition to all the other legal rights and remedies belonging to such parties under the Contract and/or law and the same shall be deemed to be cumulative and not alternative to such legal rights and remedies aforesaid. For the sake of brevity, both the Parties agree that this Integrity Pact will have precedence over the Tender/Contact documents with regard any of the provisions covered under this Integrity Pact.

IN WITNESS WHEREOF the parties have signed and executed this Integrity Pact at the place and date first above mentioned in the presence of following witnesses:

.....
(For and on behalf of Principal/Owner)

.....
(For and on behalf of Bidder/Contractor)

WITNESSES:

1.
(signature, name and address)

2.
(signature, name and address)

Place:

Date

SCHEDULE- D

Section-II

Scope of work

Signature of Contractor.....

Signature of NRDA.....

Works Requirement

This section contains the brief idea of scope of work, supplementary information drawings etc. regarding the work to be executed under instant tender, may vary as per site requirement. In case of any change the decision of Engineer-in-charge will be final and binding to the contractor.

Section-A : Site Information

1. SITE INFORMATION

1.1 Work Site

- 1.1.1 The project sites are at office complex of Sector 24 and Sector 21 of Naya Raipur. The name of buildings are as under:-

Sr.No.	Building Name	Location
1	Office Complex	Office Complex, Sector 24
2	Retail-Commercial Complex	Plot No. 9 & 10, Sector 21
3	Commercial Complex	Plot No. 3, Sector 21

- 1.1.2 The Contractor shall plan his works keeping in view restriction of approach and availability of space and time.

1.2 GENERAL CLIMATIC CONDITIONS

- 1.2.1 The area in which the work lies is mostly plain terrain.
- 1.2.2 The highest and lowest temperatures in general range from 48 degree Celsius to 8 degree Celsius.
- 1.2.3 Summer season is from April to June and winter season is from November to March.
- 1.2.4 The mean average annual rainfall in the area over a five-year period is of the order of 1065mm, a good portion of which is concentrated during July to mid September, when about 75% of the annual rainfall occurs.
- 1.2.5 Naya Raipur experiences extreme climatic conditions and Bidders must acquaint themselves about the same before submitting the Bid. The Employer shall in no way be responsible on this account.

The above site information is being made available to Bidders in good faith and Bidders are advised to obtain relevant information, as may be considered necessary by them, before quoting for the bid. No claims whatsoever on account of any discrepancy in the above information shall be admissible to Bidders.

Section-B : Scope of Work

1. Objective:-

The objective of the contract is to design, supply, erection, installation, testing, commissioning and Maintenance of Elevator and Escalator in buildings at Naya Raipur alongwith above mentioned buildings in Naya Raipur as per stipulated standards and within the time stipulated by the Contract along with power supply infrastructure development. In full recognition of this objective, and with full acceptance of the obligations, liabilities and risks which may be involved, the Contractor shall undertake the execution of the Works.

2. SCOPE OF WORKS

The work under this contract shall be carried out in accordance with the various documents constituting the contract and shall consist of various salient items for design, supply, erection, installation, testing, commissioning and maintenance of Elevator and Escalator at predefined locations marked in Tender Drawings.

Signature of Contractor.....

Signature of NRDA.....

The broad scope for the proposed work shall be :-

2.1 Submission of General Technical Particulars :-

The contractor shall submit the general technical particulars of equipments as per requirement mentioned in BoQ and technical specification for approval of NRDA.

Manufacturers' drawings, catalogues, pamphlets and other documents submitted for approval shall be in four sets. Each Item in each set shall be properly labeled, indicating the specific services for which material or equipment is to be used, giving reference to the governing section and clause number and clearly identifying. in ink the items and the operating characteristics. Data of general nature shall not be accepted.

Samples of all materials like hall buttons etc shall be submitted to the NRDA/Project Manager for his approval before supply & installation at site. These will be submitted in two sets for approval by NRDA/Project Manager and shall be kept in their site office for reference and verification till the completion of the Project.

2.2 Drawings

The schematic issued with tenders, are diagrammatic only and indicate arrangement of various systems and the extent of work covered in the contract. These drawings broadly suggest the routes to be followed. Under no circumstances shall dimensions be scaled from these drawings. The architectural / interiors drawings and details shall be examined for exact location.

The tenderer shall follow the construction drawings to be issued later, in preparation of his shop drawings, and for subsequent installation work. The tenderer shall check the drawings of other trades to verify spaces in which his work will be installed.

Maximum headroom and space conditions shall be maintained at all points. Where headroom appears inadequate, the tenderer shall notify the project manager before proceeding with the installation. In case installation is carried out without notifying, the work shall be rejected and tenderer shall rectify the same at his own cost.

The tenderer shall examine all architectural, structural and other services drawings before starting the work. Any changes found essential to coordinate installation of his work with other services and trades, shall be made with prior approval of the Project Manager without additional cost to the Owner. The data given in the drawings and specifications is as exact as could be procured, but its accuracy is not guaranteed.

Shop Drawings shall be submitted for approval within two weeks from the award of the work and sufficiently in advance of planned delivery and installation of any material to allow Project Manager / Consultant ample time for scrutiny. No claims for extension of time shall be entertained because of any delay in the work due to his failure to produce shop drawings at the right time, in accordance with the approved program.

Approval of shop drawings shall not be considered as a guarantee of measurements or of building dimensions. Where drawings are approved, said approval does not mean that the drawings supersede the contract requirements, nor does it in any way relieve the tenderer of the responsibility or requirement to furnish material and perform work as required by the contract.

Signature of Contractor.....

Signature of NRDA.....

Where the tenderer proposes to use an item of equipment, other than that specified or detailed on the drawings, which requires any redesign; all such re-design, and all new drawings and detailing required therefore, shall be prepared by the tenderer at his own expense and got approved from the NRDA/Project Manager before starting of manufacturing.

2.3 Deviations

Tenderer shall stipulate the deviations, if any, from these Technical Specifications, and reasons thereof

2.4 Exclusions

Any items excluded from the offer, but functionally required, shall be clearly defined and listed by the tenderers, giving description of the items, quantity and estimated cost and the reason for excluding the items.

2.5 Work by Tenderer

Tenderer shall clearly indicate the structural and electrical requirements for the installation of elevators. Shaft and pit shall be constructed by owners through other agency. Other preparation work and all items of supply and installation in the hoistway shall be the responsibility of the tenderer, including required scaffolding etc.

The following shall be in the scope of the elevator and escalator tenderer and it shall be his responsibility to arrange all items in order to complete the installation.

- MS Scaffolding inside the shaft
- All minor builder works such as chipping of surfaces, cutting and finishing of walls/floors/partitions etc. shall be responsibility of elevator tenderer.
- All steel items included except architraves foundation & support and Elevator hook in the machine room
- Stainless Steel (Brushed finish) Jamb Panel & sill Angles.
- Safety Doors on all landing levels for Elevator openings.

The detail works to be carried out by tenderer is described in technical specification of items.

2.6 Work by other agencies

The following associated civil and electrical work is being carried out by Owner through other Agencies:

Machine Room: Machine room, if any, will be kept ready as per agreed schedule. The machine room will be properly lighted and ventilated and will be fire resistant. Walls and ceiling will be treated and painted to avoid dust accumulation and circulation. The floor will be finished and treated after the machine and other equipment have been taken' in and placed in position by Elevator and Escalator tenderer. The machine room slab as well as the secondary slab (if required) shall have trap doors as per the size and location given by Elevator and Escalator tenderers. The machine room will also be provided with access door and ladders.

Hoist Way: Hoist way shall be made properly framed and enclosed, including a pit of proper depth with drainage provision and water proofing. The hoist way and pit walls shall be duly treated and painted. Smooth vertical & painted /whitewash hoist way shall be provided by the civil tender

Signature of Contractor.....

Signature of NRDA.....

Hoist way Guard: Provision shall be made during construction for proper guarding and protection of hoist way and temporary barricading of hoist way entrances to be done by the tenderer.

Power and Light: Power/light shall be provided:

Power in the machine room or hoistway headroom/location of the Elevator and Escalator panel in case of MRL for the Elevator machine with one isolating switch including independent earth terminal shall be provided by the owners through other agencies. Proper lighting of machine room & Lighting of the Elevator shaft (Bulk head at every floor level, power point (16 A) at every floor and in the Elevator pit) shall also be provided by the owner through other agencies.

Except for items of exclusion mentioned above, all items/materials/equipment required for completion and functioning of the installation in all respect are deemed to be included in the scope of this work whether specifically mentioned or not.

The detail works to be carried out by tenderer is described in technical specification of items.

2.7 Painting

All exposed metal work furnished under these specifications, unless otherwise specified, shall be shop primed and properly painted. Shop coats of paint that have become marred during shipment or erection, shall be cleaned off with mineral spirits, wire brushed and spot painted over the affected areas, then coated with enamel paint to match the finish over the adjoining shop painted surface.

2.8 Tools & Tackles

All tools, tackles, supports, scaffolding and staging etc. required for erection and assembly of the equipment and installation covered by the contract shall be provided by the Tenderer himself. In addition, all other materials such as foundation bolts, nuts etc. required for the installation of the equipment shall also be provided by the tenderer at his cost.

i) Tenderer shall carry out test run of the installation in the presence of representatives of Owner/Service Consultant/Consultant, to establish satisfactory functioning of the installation

ii) The Installations shall be handed over to the Project Manager / representative of the owners after satisfactory testing along with six sets of completion documents each consisting of:

- a) Detailed equipment data and catalogues
- b) Manufacturer's maintenance chart including check chart and Lubrication chart
- c) Set of "AS INSTALLED DRAWINGS" showing layouts, equipment details, electrical power & control wiring diagrams etc
- d) Test certificates for major equipment
- e) Certificates of approval from Statutory and/or Local Authorities for the operating and maintenance of the installation and equipment, wherever such approval of certification is required. (Elevator and Escalator inspector's certificate/ license)
- f) Certificate from the, Engineer that the tenderer has cleared the site of all debris and litter caused by him during the Construction
- g) List of spare parts as minimum stock for one year

Signature of Contractor.....

Signature of NRDA.....

Submission of the above documents shall form a precondition for the final acceptance of the installation and final payment.

Upon handing over, the Project Manager shall issue to the tenderer the necessary certificate of acceptance

2.9 Safety Precautions

A competent and authorized supervisor/Erector shall be on the site whenever the tenderer's men are at work. The supervisor/Erector should ensure that all plant and machinery used on the site are rendered safe for working and meet with the Indian or International safety standards applicable for the use and operation of such machinery. The supervisor/Erector should also ensure that the workmen at site are made to use safety appliances such as safety belts, lifelines, helmets etc.

Smoking shall be altogether strictly prohibited in all areas of work as well as where combustible and inflammable goods/materials are stored or lying about.

Any hot job such as welding, soldering, gas cutting shall not be carried out without the permission of the Engineer. Such jobs shall not be carried out where inflammable materials are stored or lying about.

All electric connections shall be through adequately sized mechanically protected cables without any joints and with proper and adequate terminals boxes. All power supplies shall be through properly rated fuses with isolating devices. No such hot jobs shall be carried out on holidays and without the presence of the Tenderer's Supervisor and Owners permissions.

It is entirely the responsibility of the Tenderer to practice the principles of 'SAFETY FIRST' during the entire tenure of work with adequate insurance covering injury or death to workmen, loss by theft or damage to materials and property and third party.

The Tenderer should clear the site of all debris every day to avoid accidents. In case this is not done, the owners may engage necessary labor to maintain the cleanliness of the premises and removal of debris and recover all or part of the expenditure so incurred from the Tenderer.

Tenderer shall at his own cost ensure that all of his personnel, employees, work men and other associated persons working with him at site are adequately insured as per labour laws and statutory provisions. The Tenderer shall be responsible for all injuries/damages to men, materials and properties etc. which may arise from the operations or negligence of himself and/or his sub tenderers or sub-contractors and indemnify the owners for all such expenses which shall be solely to tenderer's own account.

Tenderer shall at his own cost, provide and maintain a full-fledged first-aid-box to give immediate medical aid to the workers/supervisory staff, in case of emergencies.

Fire Extinguisher: Fire extinguisher in the machine room shall be provided by the tenderer The tenderer shall carry out work strictly as per safety aspects.

2.10 Quality Assurance Program & Test Procedure for Acceptance

Following test procedures shall be carried out prior to acceptance of Elevator and Escalator system

1. Test to determine that the insulation resistance between power and control lines and earth is as per specified IS codes
2. Test to determine that the earthing of all conduit, switch, casings and similar metal works is continuous and of low resistance

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3. Test to determine that the motor, brake, control equipment and door locking devices and limit switches function correctly
4. Brake to be tested to check whether it can sustain a car at rest with 25% of contract load
5. Test to determine that the Elevator car raises and lowers rated load
6. Test to determine that the Elevator car achieves the contract speed
7. Test to determine that the safety gear stops the Elevator with the rated load
8. Test for rated power against actual power consumption under full load
9. Check for current drawn by each elevator during starting and full load operation
10. Sound level check for motors
11. Visual inspection for all components

2.11 Storage at site

The tenderer shall have to make their own arrangement for accommodation of staff, safe storage of materials, etc at the site with the approval of the Client. The tenderer shall be responsible for the safety and security of its staff and Material.

2.12 Annual Maintenance

The Elevator and Escalator tender shall operate and maintain the Elevator and Escalator system in a first class and safe manner during guarantee period. Such maintenance shall be for the entire Elevator and Escalator system except when failure occurs due to work performed by others. Responsibility entails daily inspection by the supervisor/technician and unlimited call back service including nights, weekends and public holidays.

Apart from the above this maintenance shall include 1 (one) visit by Engineer per week during maintenance period of 3 years from the date of handing over of the elevator system. Call back service shall be provided for emergencies, and responded within 2 Hrs.

Engineer’s visits time shall be adjusted so as not to coincide during regular working hours period with the busiest usage period. Call back service shall be responded within 2 Hours and service involving more than one stalled or erratic Elevator and Escalator shall be immediately provided regardless of the time of day or night. Emergency call back service for trapped passengers shall be responded to within 10 minutes. There shall be no compensation for call back service and emergency call back service regardless of the hour/day etc.

The Elevator and Escalator tenderer shall maintain the Elevator and Escalator system in a professional, first class manner and keep and maintain Elevator and Escalator motor room and equipment in a neat workman like order.

The tenderer shall anticipate demand on supplies and parts and keep an inventory of a reasonable number of spare parts, at their own cost, on site in a self-provided lockable metal cabinet.

If the elevators are commissioned prior to commencement of usage by the owners, all portions of the installation including Elevator cars, hoistway, doors, machines etc shall be protected and maintained at the risk and cost of the tenderer till such time the owners have taken over and started using the elevators for the normal purpose it has been designated for. All other guarantees, defect liabilities etc shall continue to be in force and be counted from the date the elevators have been commissioned.

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2.13 Uptime guarantee

The tenderer shall guarantee for the installed system an uptime of 98%.

2.14 Comprehensive Maintenance Program

Tenderer may be required to carry out all inclusive maintenance of the entire system as mentioned below:

1. Defect Liability Period of Three Year
2. The tenderer shall quote for the comprehensive maintenance as per the schedule of work for a period of Three Years from the date of commissioning. The same shall be considered for the evaluation of the tender. The award of work for this item may be carried out separately.

2.15 The contractor shall be take all necessary approval's required from various authority

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SCHEDULE– D
Section-III
Technical Specification of Works

Signature of Contractor.....

Signature of NRDA.....

Technical Specification

Index

- A. Passenger Elevators and Goods Elevators with gear**
- B. Gear less Passenger Elevators**
- C. Escalators**
- D. Annual maintenance Contract (AMC) For Elevators and Escalators**

A. TECHNICAL SPECIFICATIONS OF PASSENGER ELEVATORS AND GOODS ELEVATORS WITH GEAR

1.0 SCOPE OF WORK

These specifications cover the details of PassengerElevators and 1000kg capacity Goods Elevators including suitable Brake release tools (total 3 sets) to be designed supplied, Factory Inspection as may be necessary before dispatch, delivery at site, installation, testing, commissioning and handing over to NRDA and the defects liability for a period of 3 year after completion of all works & handing over to the client. Scope of work shall also include AMC (Annual maintenance contract) for 3 years during defect liability period.

These specifications shall be read in conjunction with the General Conditions of Contract, Additional Conditions of Contract.

2.0 GENERAL

The equipment and installation covered by these specifications shall conform to codes of practice in force and highest standards of workmanship and materials. This work shall be done in accordance with the provisions of the Local Elevators Authority rules and shall also conform to requirements of local municipal by laws, and subsequent provisions, as also any state or local Act in force and latest Indian Standard 14665 and all latest applicable BIS, NBC code and 'CPWD General Specifications for Electrical Works (Part III, Elevators& Escalators) 2003'.

The Entire electrical installation shall be done in accordance with the Indian Electricity Act 2003, Indian Electricity Rules 1956 as amended to-date. The Electrical wiring shall strictly comply with IS:732 and latest applicable BIS and NBC code. The electrical works shall also conform to CPWD General Specification for Electrical Work Part-I (Internal) 1994 and Part-II (External) 1994 as amended up to date.

The Contractor shall follow all Statutory Requirements as well as best trade practices in the manufacture & installation of Elevators. The Contractor shall arrange to obtain the statutory approval of the Inspectorate of Elevators / Electricals as may be required for commissioning of the Elevators and handover for operation after satisfactory performance tests.

3.0 DRAWINGS

Before commencing work, the Contractor shall prepare and submit all drawings for individual Elevators in required nos. necessary to show the general arrangement and details of Elevator installation, electrical etc. These drawings must be approved by the NRDA before installation and shall become part of the contract.

The Contractor shall, within 2(Two) weeks of receipt of a Letter of award of contract, submit 4(four) copies of all working drawings showing pit, hois-tway and machine room layouts clearly indicating and specifying all connected structural, electrical and architectural works including imposed structural static / dynamic loads (including breaking load on guides, reaction of buffers on Elevator pits, reaction on support points in machine room, Elevator well etc.) and electrical ratings including calculations for selection of kW rating of motor. Within 10 days of receipt of letter of award of contract, the Contractor shall obtain from the NRDA all the information he needs to prepare his

drawings and shall have any interaction with the NRDA to finalise all parameters and data for design. The Contractor will be responsible for any discrepancies, errors and omissions in the drawings or particulars submitted by him even if these have been approved by the NRDA. On approval of these drawings (within 2 weeks of submission of full documentation), the Contractor shall submit 8(eight) copies of approved working drawings incorporating corrections / comments, if any, and shall immediately commence work.

On completion of work, the contractor shall supply four sets of CD's and 8 (eight) copies of the detailed wiring diagram, 'As built' drawings and equipment operation & maintenance manuals and original certificates from 'Inspector of Elevators' for all the Elevators. Further, a copy of such detailed diagram and a set of instructions for evacuation of passengers in case of breakdown of the Elevators shall be framed and installed in the respective machine room by the Contractor.

The Contractor shall carry out all the work strictly in accordance with drawings, details and instructions of NRDA.

4.0 WORKS TO BE ARRANGED BY NRDA

The following items shall be provided to the Elevator Contractor under instructions of the Department to suit the requirements of the Elevator Contractor.

- i. Hoist-ways, machine rooms and pits of specified dimensions (within normal building tolerances).
- ii. Floor, wall and ceiling finishes in hoist-ways, pits and machine rooms; including painting (except painting of equipment and materials supplied by Elevator Contractor) and waterproofing, as well as doors and windows in machine room.
- iii. Cables from main L.T. Panel Board through the hoist-ways terminating in and including individual Main Switches of required rating for 3 phase and single phase supply in Machine Rooms including necessary earthing.
- iv. 3 phase power supply is provided after group testing and commissioning of Elevators.
- v. Lighting installation within machine rooms as required by the Elevator Contractor including 1-phase main switch with ELCB at machine room.
- vi. The equipment shall be suitable to operate on 415 Volts 3 phase, 4 wires, 50 Hz. A.C. supply with a variation of $\pm 10\%$ in Volts and $\pm 5\%$ in frequency respectively. The supply for illumination and single phase equipment shall be 230 Volts A.C.
- vii. Lighting installation within hoist-ways and pits as required by the Elevator Contractor including 1-phase main switch at machine room.
- viii. Ventilation system of machine rooms with minimum 18" heavy duty exhaust fan in each machine room as per the requirement of NBC / BIS codes.

5.0 ELEVATORS CONTRACTOR’S RESPONSIBILITIES:ANCILLARY WORKS

- i. All cabling, wiring and earthing from 3 - phase main DB in machine room to Elevator Contractor’s equipment.
- ii. All steel items i.e. machine beam/bases, pedestals/ bearing plate in the machine room, separators wherever required and buffer support channels, vertical iron ladder in Elevator and structural steel supports and brackets for the installation in etc., to suit the sizes of the hoist-ways.
- iii. Sill tracks including sill supports, supporting protection at all landings.
- iv. Screen guards, fascia plates and other protection for installation.
- v. To carry out minor civil work, such as chipping & making openings in slabs , grouting of foundation bolts in shaft, pit and machine room, modification and making rail bracket, hall buttons indicators and laying of sills in positions. Or any other work required for smooth operation/ commissioning of Elevators. All chiseling and cutting of pockets and making good. (All cutting shall be as approved by NRDA).
- vi. Ensuring safety against accidents including barricading all openings and caution signs.
- vii. Scaffolding and other Tools & Tackles required for installation in the hois-tway required for erection of Elevators.
- viii. All other items necessary for satisfactory execution & completion of works, whether specified or not.
- ix. 3 phase power supply for group testing and commissioning of Elevators shall be arranged by contractor after erection is completed. Power shall be provided at incoming of main DB for Elevators. Main DB in the machine room shall be provided by the Elevator contractor. From main DB to Elevators, cables shall be in the scope of Elevator contractor. However, lighting for machine room shall be done by others.
- x. Trap doors, floor gratings, steps / ladders and openings in machine rooms and ladders for pits as required by the Elevators Contractor. Contractor shall furnish the details of these items in the layout drawing for Elevators to be submitted after award of the job.
- xi. Temporary power supply connection(s) for erection work shall be arranged by the Elevator Contractor.

6.0 SOUND REDUCTION

The Contractor shall provide necessary sound reduction materials, such as rubber pads/ anti vibration pads of proper density to effectively isolate the machine from the machine beams and/or flooring.

Noise level inside cars and in the machine room shall be maintained at minimum levels as laid down in the relevant codes and in any case not more than specified under PERFORMANCE PARAMETERS.

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7.0 TRACTION MACHINE

The machine shall be worm geared traction type with motor (steel worm, bronze gears, steel sheave shaft & Ferro molybdenum sheave), electro-mechanical type of brake and driving sheave mounted in proper alignment on a single heavy cast iron base or steel bedplate.

The worm shaft shall be fitted with roller bearings to take end thrust. The sheave shaft shall also be fitted with roller bearings to ensure proper alignment. All shafts shall be provided with well-designed keys.

Rotating parts shall be statically and dynamically balanced.

The drive sheave shall be designed with machined V-grooves to ensure adequate traction with minimum wear on rope. All sheaves including deflector sheaves, where used, shall conform to IS: 14665 (Part 4 section 3)

Adequate and dust – proof lubrication shall be provided for all bearings and worm gears.

The brake shall be suitably curved and provided with fire proof friction lining. The operation of brake shall be smooth, gradual and with minimum noise. The brake shall be designed to be of adequate size and strength to stop and hold the car at rest with rated load. The brake shall be capable of operation automatically by various safety devices, current failure and by the normal stopping of the car. The brake shall be released electrically. It shall also be possible to release the brake manually so as to move the Elevator car in short stops. Suitable Brake release tools (total 3 nos.) shall be supplied and stored in the machine rooms.

For manual operation of Elevators, up & down direction of the movement of the car shall be clearly marked on the motor or traction machine. A warning plate in bold signal red colour to switch off the mains supply before releasing the brake and operating the wheel shall be prominently displayed.

8.0 HOIST MOTOR

The motor shall be suitable for 415 Volts +10% to -20%, 50 Hz. ± 5%, 3 Phase A.C. Supply. The motor must be designed for arduous Elevator duty, rapid reversals and constantly repeated starts & stops as defined in the relevant codes of practice. All windings must be heavily insulated, adequately impregnated for tropical climate and mechanically strengthened and must be specifically designed to have a high starting torque and low starting current characteristics within the limits acceptable to electricity supply co. requirements and I.E. Rules. The motor shall be designed in such a way as to withstand occasional overloading above its rated capacity and shall have overload protection. The motor shall have good speed regulation under different conditions of load and shall be designed to give a noiseless and vibration-free operation. Insulation shall be class F.

9.0 MOTOR CONTROL AND DRIVE

The Elevator motor shall be controlled by a variable voltage variable frequency (V.V.V.F.) micro-processor control system which shall control and monitor every aspect of Elevator operation at all stages of the car motion cycle on real time basis.

The A.C. V.V.V.F. drive system shall control A.C. voltage and frequency concurrently with the hoist motor to regulate the Elevator’s actual performance to match closely the ideal speed pattern, obtain maximum efficiency of operation and provide a very smooth ride.

Frequency shall range fully between zero and rated value.

The Controller shall be provided with a self diagnostic programme to keep downtime to a minimum possible.

The controller shall intelligently adjust door times in response to car calls, hall calls and “Door Open” button operation.

An Inspector’s changeover test switch and set of test buttons shall be provided in the controller. Operation of the Inspector’s changeover switch shall make both the car and landing buttons inoperative and permit the Elevator to be operated in either direction from machine room for test purposes by pressing corresponding test buttons in the controller. It shall not, however, interfere with the emergency stop switches inside the car or on the top of the car.

10.0 GUIDES AND FASTENINGS

- i. Guide-rails for car and counterweight shall consist of machined mild steel Tee sections, erected plumb, and securely fastened to the Elevator well framing by heavy steel brackets, suitably spaced, to limit deflection of guide rails to 3 mm under normal working conditions.
- ii. The guide-rails shall be of suitable section with ends tongued and grooved, forming matched joint and shall be connected with steel fish plates.
- iii. Guide-rails shall cover the full height of the hois-tway and pit, such that it shall not be possible for any of the car or counter weights shoes to run off the guides.
- iv. Guides shall be designed to withstand the action of safety gear when stopping a counter weight or fully loaded car.
- v. The maximum deviation from true plumb and alignment of guide rails shall be 2 mm.
- vi. All support framing shall be rigid and shall be designed to restrict displacement of the point of support of brackets to 3 mm under normal working conditions.
- vii. The whole guide rail installation, including expansion joints, shall be designed for a smooth ride.
- viii. The guide-rails shall be protected during storage and installation with a rust inhibiting coating which shall be cleaned off on completion of installation.
- ix. Guide-shoes shall be adjustable type & mounted so as to provide continuous contact with guide rails under all conditions.

Guide shoes shall be provided at top and bottom of each side of car and counterweight and shall be designed for quiet operation.

Additional guide shoes shall be provided on each side of buffer frame in case of oil buffers.

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Each Elevator shall be equipped with roller guides for up and down travel. There shall not be any metal-to-metal contact between Car and rail. Roller shall be mounted on ball bearings to provide quiet operation and excellent ride quality. (It is not required in case the design varies however the ride quality shall not be compromised for any other design).

11.0 SAFETY

In addition to other specifications, the Elevator shall be provided with safety devices as follows:-

- i. Against overload
- ii. Safety gear on car so that in the event of rope breaking or loosening, the car will be brought to rest immediately by means of grips on the guides.

The over-speeding car shall be automatically brought to a gradual stop on guide rails and power supply to the hoist motor shall be switched off.

- iii. Over-speed centrifugal governor operating the safety gear in case of over-speeding of car in the down direction.
- iv. Car gate lock so that in the event of car gate being opened when passengers are in the car, the Elevator will be brought to rest.
- v. Over-travel limit switches at top and bottom limits of travel to disconnect the power supply and apply brakes to stop the car within a defined safe distance in case of over-travel in either direction
- vi. Ultimate terminal switches to stop the car automatically within top & bottom clearances independently of normal over-travel limit switches but with buffers operative.
- vii. Protective guards to counterweights in pit, rope sheaves and wherever required.
- viii. Toe guard apron to the car platform.

12.0 CAR

a. Cabin Size

The internal clear dimensions of the cabin shall not be less than those specified in IS 14665-Part I, NBC & CPWD General specifications for electric work (Elevators). The car shall be so mounted on the frame that vibration and noise transmitted to the passengers inside is minimized. The car sizes are mentioned in BOQ.

b. Frame and Safety Device

The car frame shall consist of mild steel channel/structural steel top and bottom securely riveted or bolted and substantially reinforced and braced so as to relieve the car enclosure of all strains when the safety device comes into action due to over-speed or when the capacity loaded car is run on the buffer springs at normal speed.

The safety device mounted on the bottom members of the frame operated by a centrifugal speed

governor shall be arranged to bring the car to a gradual stop on the guide rails in the event of excessive descending speed; and provision shall be made to shut off the power supply to the motor.

c. Buffers

Substantial spring buffers (2 Nos.) shall be furnished and installed in the pit under the car and counterweight. These buffers shall be mounted on RCC Pedestals in the pit. The car buffer spring must be of correct design to sustain the car with capacity load without damage should the car terminal limits become inoperative. The car buffers must be located symmetrically with reference to centre of car.

The Contractor may alternatively offer oil type buffers. The plunger shall be mild steel, designed for a very high factor of safety and accurately machined. A toughened rubber bumper shall be fitted to the plunger top to cushion the impact of steel buffer plates attached under the car and the counterweight. An oil gauge shall be provided to check the oil level.

d. Counterweight

The Elevator shall be suitably counter-balanced for smooth and economical operation. Cast iron weights shall be contained in a structural steel frame properly guided with suitable guide shoes (minimum 4 Nos). It shall be equal to the total weight of Elevator plus approx. 50% of the contract load.

Substantial expanded metal counter-weight screen guard shall be furnished and installed at the bottom of hoist way, as required by Elevator Inspector.

e. Hoisting and Governor Ropes

Bright steel wire ropes with fibred cores suitable for Elevator duty as per BIS Code shall be used for hoisting ropes.

Not less than 3 independent suspension ropes shall be provided and designed to share load equally by means of adjustable shackle rods with equalizer springs at each end of hoisting ropes.

Each rope shall have adequate section to provide a minimum factor of safety of 4 based on the max. force on the rope.

Governor ropes shall be similar to hoisting ropes. Their ends shall be securely attached to the car and to the safety gear. The governor ropes shall be tensioned by a weight loaded device in the pit.

The contractor shall submit the technical details and source of supply of ropes to the NRDA as well as a certificate of performance of ropes from an approved test laboratory or Authority.

Compensation for travel shall be provided for all Elevators having a travel of more than 30m.

f. Enclosure

The car enclosure shall be as specified in technical data sheet. The cabin floor, roof and walls shall be free of distortion and undue deflection as per IS 14665 – Part 4, Section 3.

g. Brakes

D.C. brakes will be spring-applied and electrically released. They shall be designed to provide smooth stops under variable loads.

h. Doors

Provision shall be made for vertical and horizontal fine adjustment of doors as per the specifications given in technical data sheet.

i. Door Operators

The door operators shall be VVVF inverter controlled heavy duty A. C. motor, allowing variable opening and closing speeds, and full synchronization of car and landing doors.

j. Travelling Cables

The traveling cables shall be multi-core with high conductivity stranded conductors specifically designed for Elevator duty. The cables shall be provided with retaining straps and individual cable clamps.

k. Emergency Lighting

A self-contained, non-maintained emergency light with a trickle boost charger shall be provided.

l. Intercom

An Intercom system shall be provided between the car, main landing, machine room and Fire Console room linked to EPABX located at Admn. Bldg.

m. Manual Cranking Facility

Manual cranking facility shall be provided in the machine room to facilitate evacuation of passengers in case of power failure. The manual mode shall be in addition to automatic car failure operation specified elsewhere.

n. Emergency Stop Switch

A stop switch in the machine room / top of car shall be provided for use by maintenance crew to cancel all car and landing calls for a particular Elevator.

o. Maintenance Switch

On operation of the maintenance switch located on top of the car by the maintenance crew, the car shall travel at slow speed not exceeding 0.85 m / sec by continuous operation of a button

p. Landing Door Interlocks

Electrical interlocks shall be provided to ensure that the car does not operate unless all doors are closed and unless the car reaches a landing zone.

q. Overload Indicator

An overload indicator with buzzer shall be provided in the cabin to indicate to the passengers that the car will not start as it is overloaded.

Other Features

All features specified in the BIS/NBC/CPWD and in the enclosed technical specifications shall be provided.

r. Elevator for Disabled (Divyang)

All the Passengers Elevators shall be suitable for use by disabled persons. The following additional facilities shall be provided in this Elevator:

- i. Full length handrails shall be provided on the rear and side wall panels.
- ii. The door closing time shall be set for min. 5 seconds and the door closing speed shall not exceed 0.25 m/sec.
- iii. The “door open” and “door closed” announcements shall be audibly made in the car.
- iv. Braille signs / buttons.

s. Operating Panels, Buttons & Switches

Main and secondary car operating panels, buttons and switches shall be located on one of the two front wall panels next to the car door and as specified in the Schedule of Elevators & as per approved G.A. drawings.

All buttons and switches shall be clearly legible with fade-proof text and figures, and shall be easily accessible, (especially for disabled persons in the Elevator designated for them).

13.0 ELECTRIC WIRING

Necessary insulated wiring to connect all parts of the equipment shall be furnished and installed. Insulated wiring shall be Flame Retardant Low Smoke and moisture resistant and shall be run in G.S. conduits. All cables shall be flame – retardant with copper conductors.

Trailing cables shall be PVC sheathed copper conductor multi-core ribbon type designed for Elevator service and shall be Flame Retardant Low Smoke and moisture resistant. They shall be flexible and shall be suitably suspended to relieve strains on individual conductors. All copper conductors shall be of appropriate gauge copper to avoid excessive voltage drop. All wires, cables, conduits, metal boxes, fittings and earthing shall comply with statutory requirements and BIS specifications.

The controller unit comprising of the MCCB, 25KA, adjustable overload and phase reversal and phase failure protection, all the circuit elements, transformer, rectifier for D.C. control supply, inverter power pack, terminal blocks etc. shall be enclosed in an insect vermin proof, sheet steel floor or wall mounted cabinet with hinged doors at front or at both front and rear. Proper warning boards and danger plates shall be provided on both sides of the controller casing. Sheet steel used for controller cabinet shall not be less than 14 gauge and shall be properly braced, where necessary. Suitable gland plate shall be provided for cable entry. The battery for the charger unit shall be suitably placed in the machine room. Degree of protection of Enclosure shall be IP54. Enclosure shall have provision of earthing studs.

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All sheet steel work shall be painted with two coats of synthetic enamel paint of suitable shade both inside and outside over two coats of zinc primer.

Apart from Elevator controller enclosure, 7 distribution boards (3 Main DB + 4 DB) are required as per BOQ. Cables to incomer of these DB's shall be terminated by others, whereas outgoing cables for Elevator shall be in the scope of Elevator contractor. Contractor shall furnish the sizes of cables along with KW rating of motors.

14.0 PAINTING

All exposed metal work furnished in these specifications, except as otherwise specified, shall be given one shop coat of anti-corrosive primer after approved surface treatment of metal surfaces and two coats of approved enamel paint of approved shade. After installation of Elevators, a final Touch-up Coat of paint shall be applied.

15.0 WORKS TESTS

The following tests shall be carried out at Works. NRDA shall be given notice of the time and procedure of the tests before they are carried out, and shall be given facilities for observing the tests at Works.

- a. High voltage works tests of equipment which is not already tested in accordance with appropriate IS codes.
- b. Buffer test.

16.0 TESTS ON COMPLETION

The following tests shall be carried out to the satisfaction of the NRDA.

- i. Insulation resistance and earth test for all electrical apparatus.
- ii. Continuous operation of the Elevator under full load conditions and simulated starts and stops (150 nos. per hour each) for one hour at the end of which time the service temperature of the motor and the operating coils shall be tested. This shall be as per B.I.S. specification.
- iii. The car shall be loaded until the weight on the rope is twice the combined weight of the car and the specified load. The load must be carried on for about 30 minutes, without any sign of weakness, temporary set or permanent elongation of the suspension rope strands.
- iv. The following items shall be tested:
 - a. Leveling accuracy at each landing in conditions of fully loaded and empty car.
 - b. No load current and voltage readings both on 'Up' and 'Down' Circuits.
 - c. Full load current and voltage readings both on 'Up' and 'Down' Circuits.
 - d. One and quarter load current and voltage readings both on 'Up and 'Down' Circuits.
 - e. Stalling current and voltage and time taken to operate overload.

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- f. Overload protection.
 - g. Gate sequence relays, if provided and installed.
 - h. Car and landing door interlocks.
 - i. Collective control and priority sequences, if installed.
 - j. Safety gear mechanism for car and counterweight with fully loaded car and also with only 68 kg load.
 - k. Speeds on Up and Down travel with full load, half load and empty car.
 - l. Door contacts.
 - m. Final terminal stopping device.
 - n. Normal terminal stopping device.
 - o. Car and counterweight buffers with contract load and contract speed.
 - p. Operation of controllers.
 - q. Manual operation of Elevator at mid-way travel.
 - r. Emergency operation.
- v. Tests on completion shall also be performed to the satisfaction of Inspector of Elevators and a certificate will be obtained from the 'ElevatorInspector'by the contractor.

17.0 STATUTORY APPROVALS

All statutory approvals from commencement to commissioning of Elevators shall be obtained by the Contractor from the Inspector of Elevators and / or other authorities. However, the client will provide all necessary assistance for providing documents, drawings and certificates pertaining to other contractors, if required.

The contractor shall pay necessary fees in connection with the approval of installation of Elevators.

18.0 FEATURES REQUIRED FOR VVVF ELEVATORS

(a) Group / Independent / Attendant Operation

It shall be possible to group specified cars in a group wherever required with dynamic disposition of cars as required by the traffic pattern. A smart car dispatching system with ring communication shall be provided for optimum passenger comfort and Elevator performance under all traffic conditions. Any defective car shall be automatically eliminated from the group.

Each car shall be provided with a key switch for independent operation housed in a service cabinet. In this mode, the Elevator shall respond only to car calls. Hall calls will not be registered.

It should be possible for an attendant to operate any car.

(b) Fireman’s Switch

A fireman’s toggle switch shall be provided in a break glass for the specified Elevator at ground floor to enable firemen to bring the Elevator non-stop to ground floor from any location and to cancel hall calls until the car is operated on attendant control.

(c) Emergency Power Operation

In case of power failure, standby power equipment shall enable Elevators to reach a pre-determined floor, in a pre-determined sequence, and then permit operation of one or more Elevators on emergency power.

A trickling battery shall be provided to supply power to light fixtures, fan, alarm and intercom.

(d) **Profile Generator**

A profile generator or similar device shall be provided to use the car at an optimum speed level and to improve leveling accuracy.

(e) **Predictive Car Selection**

Once a hall call is registered, a dynamic car algorithm shall transfer the call to an optimally selected car to provide the maximum traffic efficiency.

(f) **Door Safety**

Multi-beam infrared / ultrasonic electronics curtains shall be provided to scan the doorway and reverse the door closing in case of any obstruction.

(g) **Double Door Operation**

If both up and down calls are registered at a hall which is the last registering hall in the direction of the car, the Elevator shall travel to that hall and open / close the doors. After this, the car shall reverse its travel and shall open / close the doors again unless no car calls are registered at that floor.

(h) **Nudging Door Operation**

When the doors remain open for more than a predetermined period, a buzzer shall sound and the door shall close automatically. The door sensing device shall be rendered inoperative but the Door Open button and the safety shoe shall remain operative

(i) **Selective floor Service**

Programming for selective floors services shall be software driven.

(j) **Manual Cranking & Slow speed Travel**

A manual cranking facility shall be provided.

Slow speed operation shall be possible from machine room and car top.

(k) **Auto Fan Off**

In case no calls are registered for a pre-set time, the cabin fan shall be automatically switched off.

(l) **Automatic Rescue Device**

In case of mains power failure and Elevator control system failure, the Elevator's own rechargeable and maintenance free battery power shall move the car to the nearest floor and the door shall open automatically for automatic rescue of passengers. A battery run-down indicator shall be provided.

19.0 PERFORMANCE PARAMETERS

The following parameters shall be achieved in the installation :

* Leveling Accuracy	± 3 mm for 1.5 m/s speed ± 4 mm for 0.75 m/s speed
* Jerk level	0.9 – 1.5 m/s ³
* Noise level in car	58 dB
* Noise level at 1 M in machine room	60 dB
* Acceleration rate	0.6 – 1.0 m/s ² (adjustable)
* Max. car vibration	20 milli gals.

20.0 SUBMITTALS ‘ALONGWITH TENDER’ AND ‘POST AWARD’

(A) The following items are required to be submitted induplicate **along with the Tender.**

- i. Catalogues with offered items highlighted.
- ii. List of imported components, if any.
- iii. Compliance Statement for guaranteed performance parameters given in Specification 19.0 above.
- iv. Confirmation that offer submitted meets the technical specifications & scope of work and there are no deviations and exclusions from NIT.
- v. The contractor shall specify in his offer the full capability of his system in this regard.

(B) The successful contractor, **after award of the contract**,shall furnish following technical particulars of the equipment/devices for the approval by NRDA.

- i) Single line/ schematic diagram of electronic control panel, Elevator& equipment etc.
- ii) Layout of Hoist-way, Elevator machine room, showing foundation details in the pit, machine room, electric control panel, Elevator& equipment etc.
- iii) Earthing layout.
- iv) Inspection manual for equipment & accessories covered in the scope of supply (8 copies).
- v) Technical literature of operation, control and maintenance etc. (8 copies) along with CDS.
- vi) Schedule of scope of maintenance service during defect liability period and AMC.

The technical parameters furnished by the tenderer would be examined in detail during design submission stage. All improvements considered necessary to meet the tender Technical Specifications would have to be incorporated without any additional cost to NRDA with objective of providing high performance and safety Elevators.

B. TECHNICAL SPECIFICATIONS OF GEARLESS PASSENGER ELEVATORS

1.0 SCOPE OF WORK

These specifications cover the details of 4(Four) nos. 16 persons/ kgs. and 2(Two) nos. 13 persons capacity Passenger Elevators including suitable Brake release tools (total 2 sets) to be designed supplied, inspection as may be necessary before dispatch, delivery at site, installation, testing, commissioning and handing over to NRDA and the defects liability for a period of 1 year after completion of all works & handing over to client. Scope of work shall also include AMC (Annual maintenance contract) for 3 years after one year of defect liability period after handing over to client.

These specifications shall be read in conjunction with the General Conditions of Contract,Additional Conditions of Contract.

2.0 GENERAL

The equipment and installation covered by these specifications shall conform to codes of practice in force and highest standards of workmanship and materials. This work shall be done in accordance with the provisions of the Local Elevators Authority rules and shall also conform to requirements of local municipal by laws, and subsequent provisions, as also any state or local Act in force and latest Indian Standard 14665 and all latest applicable BIS, NBC code and 'CPWD General Specifications for Electrical Works (Part III, Elevators& Escalators) 2003'.

The Entire electrical installation shall be done in accordance with the Indian Electricity Act 2003, Indian Electricity Rules 1956 as amended to-date. The Electrical wiring shall strictly comply with IS:732 and latest applicable BIS and NBC code. The electrical works shall also conform to CPWD General Specification for Electrical Work Part-I (Internal) 1994 and Part-II (External) 1994 as amended up to date.

The Contractor shall follow all Statutory Requirements as well as best trade practices in the manufacture & installation of Elevators. The Contractor shall arrange to obtain the statutory approval of the Inspectorate of Elevators as may be required for commissioning of the Elevators and handover for operation after satisfactory tests.

3.0 DRAWINGS

Before commencing work, the Contractor shall prepare and submit all drawings for individual Elevators in required nos. necessary to show the general arrangement and details of Elevator installation, electrical etc. These drawings must be approved by the NRDA before installation and shall become part of the contract.

The Contractor shall, within 2(Two) weeks of receipt of a Letter of award of contract, submit 4(four) copies of all working drawings showing pit, hoist-way and machine room layouts clearly indicating and specifying all connected structural, electrical and architectural works including imposed structural static / dynamic loads (including breaking load on guides, reaction of buffers on Elevator pits, reaction on support points in machine room, Elevator well etc.) and electrical ratings including calculations for selection of kW rating of motor. Within 10 days of receipt of letter of award of contract, the Contractor shall obtain from the NRDA all the information he needs to prepare his drawings and shall have any interaction with the NRDA to finalise all parameters and data for design. The Contractor will be responsible for any discrepancies, errors and omissions in the drawings or particulars submitted by him even if these have been approved by the NRDA. On approval of these drawings (within 2 weeks of submission of full documentation), the Contractor shall submit 8(eight) copies of approved working drawings incorporating corrections / comments, if any, and shall immediately commence work.

Signature of Contractor.....

Signature of NRDA.....

On completion of work, the contractor shall supply four sets of CD's and 8 (eight) copies of the detailed wiring diagram, 'As built' drawings and equipment operation & maintenance manuals and original certificates from 'Inspector of Elevators' for all the Elevators. Further, a copy of such detailed diagram and a set of instructions for evacuation of passengers in case of breakdown of the Elevators shall be framed and installed in the respective machine room by the Contractor.

The Contractor shall carry out all the work strictly in accordance with drawings, details and instructions of NRDA.

4.0 Works to be arranged by NRDA

The following items shall be provided to the Elevator Contractor under instructions of the Department to suit the requirements of the Elevator Contractor.

- i. Hoist-ways, machine rooms and pits of specified dimensions (within normal building tolerances).
- ii. Floor, wall and ceiling finishes in hoist-ways, pits and machine rooms; including painting (except painting of equipment and materials supplied by Elevator Contractor) and waterproofing, as well as doors and windows in machine room.
- iii. Cables from main L.T. Panel Board through the hoist-ways terminating in and including individual Main Switches of required rating for 3 phase and single phase supply in Machine Rooms including necessary earthing.
- iv. 3 phase power supply is provided after group testing and commissioning of Elevators.
- v. Lighting installation within machine rooms as required by the Elevator Contractor including 1-phase main switch with ELCB at machine room.
- vi. The equipment shall be suitable to operate on 415 Volts 3 phase, 4 wires, 50 Hz. A.C. supply with a variation of $\pm 10\%$ in Volts and $\pm 5\%$ in frequency respectively. The supply for illumination and single phase equipment shall be 230 Volts A.C.
- vii. Lighting installation within hoist-ways and pits as required by the Elevator Contractor including 1-phase main switch at machine room.
- viii. Ventilation system of machine rooms with minimum 18" heavy duty exhaust fan in each machine room as per the requirement of NBC / BIS codes.
- ix. Providing of hoisting beam in the machine room for hoisting of equipment during erection and to facilitate maintenance in future.

5.0 ELEVATORS CONTRACTOR'S RESPONSIBILITIES: Ancillary Works

- i. All cabling, wiring and earthing from 3 - phase main DB in machine room to Elevator Contractor's equipment.
- ii. All steel items i.e. machine beam/bases, pedestals/ bearing plate in the machine room, separators wherever required and buffer support channels, vertical iron ladder in Elevator and structural steel supports and brackets for the installation in etc., to suit the sizes of the hoist-ways.
- iii. Sill tracks including sill supports, supporting protection at all landings.

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- iv. Screen guards, fascia plates and other protection for installation.
- v. To carry out minor civil work, such as chipping & making openings in slabs , grouting of foundation bolts in shaft, pit and machine room, modification and making rail bracket, hall buttons indicators and laying of sills in positions. Or any other work required for smooth operation/ commissioning of Elevators. All chiseling and cutting of pockets and making good. (All cutting shall be as approved by NRDA).
- vi. Ensuring safety against accidents including barricading all openings and caution signs.
- vii. Scaffolding and other Tools & Tackles required for installation in the hoist-way required for erection of Elevators.
- viii. All other items necessary for satisfactory execution & completion of works, whether specified or not.
- ix. 3 phase power supply for group testing and commissioning of Elevators shall be arranged by contractor after erection is completed. Power shall be provided at incoming of main DB for Elevators. Main DB in the machine room shall be provided by the Elevator contractor. From main DB to Elevators, cables shall be in the scope of Elevator contractor. However, lighting for machine room shall be done by others.
- x. Trap doors, floor gratings, steps / ladders and openings in machine rooms and ladders for pits as required by the Elevators Contractor. Contractor shall furnish the details of these items in the layout drawing for Elevators to be submitted after award of the job.
- xi. Temporary power supply connection(s) for erection work shall be arranged by the Elevator Contractor.

6.0 SOUND REDUCTION

The Contractor shall provide necessary sound reduction materials, such as rubber pads/ anti vibration pads of proper density to effectively isolate the machine from the machine beams and/or flooring.

Noise level inside cars and in the machine room shall be maintained at minimum levels as laid down in the relevant codes and in any case not more than specified under PERFORMANCE PARAMETERS.

7.0 TRACTION MACHINE

Delete.

8.0 HOIST MOTOR

The machine shall be of the Gearless A.C. permanent magnet type with a single piece main shaft, integral drive sheave and brake disc. The main brake shall be of the Disc type with independent dual action capable of arresting the load on any single caliper. In the event of undetected brake wear, the brake shall not operate the Elevator andthereby automatically prevent further Elevator operation.

An AC Closed Loop, Variable Frequency, motion control and velocity profile shall be provided. The micro-computer based speed control system shall incorporate a digital closed loop feedback system

ensuring the actual elevator speed is in line with a dictated pattern during all phases of travel, namely acceleration, full running speed and deceleration. All phases of travel shall be controlled regardless of load or direction of travel.

The acceleration and deceleration values shall be easily adjustable on site by qualified personnel and shall be initially set at 1.2m/s squared.

The stopping accuracy shall be no more than +/- 5 mm before loading or unloading the car. The mechanical brake shall not be operative before the car has been electrically stopped and at speed zero.

To compensate for rope stretch under various load conditions, an automatic re-leveling system is to be furnished to ensure the car stays within the floor leveling zone at all times.

The motor shall be suitable for 415 Volts +10% to -20%, 50 Hz. ± 5%, 3 Phase A.C. Supply. The motor must be designed for arduous Elevator duty, rapid reversals and constantly repeated starts & stops as defined in the relevant codes of practice. All windings must be heavily insulated, adequately impregnated for tropical climate and mechanically strengthened and must be specifically designed to have a high starting torque and low starting current characteristics within the limits acceptable to electricity supply co. requirements and I.E. Rules. The motor shall be designed in such a way as to withstand occasional overloading above its rated capacity and shall have overload protection. The motor shall have good speed regulation under different conditions of load and shall be designed to give a noiseless and vibration-free operation. Insulation shall be class F.

9.0 MOTOR CONTROL AND DRIVE

The Elevator motor shall be controlled by a variable voltage variable frequency (V.V.V.F.) micro-processor control system which shall control and monitor every aspect of Elevator operation at all stages of the car motion cycle on real time basis.

The A.C. V.V.V.F. drive system shall control A.C. voltage and frequency concurrently with the hoist motor to regulate the Elevator’s actual performance to match closely the ideal speed pattern, obtain maximum efficiency of operation and provide a very smooth ride.

Frequency shall range fully between zero and rated value.

The Controller shall be provided with a self diagnostic programme to keep downtime to a minimum possible.

The controller shall intelligently adjust door times in response to car calls, hall calls and “Door Open” button operation.

An Inspector’s changeover test switch and set of test buttons shall be provided in the controller. Operation of the Inspector’s changeover switch shall make both the car and landing buttons inoperative and permit the Elevator to be operated in either direction from machine room for test purposes by pressing corresponding test buttons in the controller. It shall not, however, interfere with the emergency stop switches inside the car or on the top of the car.

10.0 GUIDES AND FASTENINGS

- i. Guide-rails for car and counterweight shall consist of machined mild steel Tee sections, erected plumb, and securely fastened to the Elevator well framing by heavy steel brackets, suitably spaced, to limit deflection of guide rails to 3 mm under normal working conditions.
- ii. The guide-rails shall be of suitable section with ends tongued and grooved, forming matched joint and shall be connected with steel fish plates.

- iii. Guide-rails shall cover the full height of the hois-tway and pit , such that It shall be not be possible for any of the car or counter weights shoes to run off the guides.
- iv. Guides shall be designed to withstand the action of safety gear when stopping a counter weight or fully loaded car.
- v. The maximum deviation from true plumb and alignment of guide rails shall be 2 mm.
- vi. All support framing shall be rigid and shall be designed to restrict displacement of the point of support of brackets to 3 mm under normal working conditions.
- vii. The whole guide rail installation, including expansion joints, shall be designed for a smooth ride.
- viii. The guide-rails shall be protected during storage and installation with a rust inhibiting coating which shall be cleaned off on completion of installation.
- ix. Guide-shoes shall be adjustable type & mounted so as to provide continuous contact with guide rails under all conditions.

Guide shoes shall be provided at top and bottom of each side of car and counterweight and shall be designed for quiet operation.

Additional guide shoes shall be provided on each side of buffer frame in case of oil buffers.

Each Elevator shall be equipped with roller guides for up and down travel. There shall not be any metal-to-metal contact between Car and rail. Roller shall be mounted on ball bearings to provide quiet operation and excellent ride quality. (It is not required in case the design varies however the ride quality shall not be compromised for any other design).

11.0 SAFETY

In addition to other specifications, the Elevator shall be provided with safety devices as follows :-

- i. Against overload
- ii. Safety gear on car so that in the event of rope breaking or loosening, the car will be brought to rest immediately by means of grips on the guides.

The over-speeding car shall be automatically brought to a gradual stop on guide rails and power supply to the hoist motor shall be switched off.
- iii. Over-speed centrifugal governor operating the safety gear in case of over-speeding of car in the down direction.
- iv. Car gate lock so that in the event of car gate is being opened when passengers are in the car, the Elevator will be brought to rest.
- v. Over-travel limit switches at top and bottom limits of travel to disconnect the power supply and apply brakes to stop the car within a defined safe distance in case of over-travel in either direction
- vi. Ultimate terminal switches to stop the car automatically within top & bottom clearances independently of normal over-travel limit switches but with buffers operative.
- vii. Protective guards to counterweights in pit, rope sheaves and wherever required.
- viii. Toe guard apron to the car platform.

Signature of Contractor.....

Signature of NRDA.....

12.0 CAR

a. Cabin Size

The internal clear dimensions of the cabin shall not be less than those specified in IS 14665-Part I, NBC & CPWD General specifications for electric work (Elevators) . The car shall be so mounted on the frame that vibration and noise transmitted to the passengers inside is minimized. The car sizes are mentioned in BOQ.

b. Frame and Safety Device

The car frame shall consist of mild steel channel/structural steel top and bottom securely riveted or bolted and substantially reinforced and braced so as to relieve the car enclosure of all strains when the safety device comes into action due to over-speed or when the capacity loaded car is run on the buffer springs at normal speed.

The safety device mounted on the bottom members of the frame operated by a centrifugal speed governor shall be arranged to bring the car to a gradual stop on the guide rails in the event of excessive descending speed; and provision shall be made to shut off the power supply to the motor.

c. Buffers

Substantial spring buffers (2 Nos.) shall be furnished and installed in the pit under the car and counterweight. These buffers shall be mounted on RCC Pedestals in the pit. The car buffer spring must be of correct design to sustain the car with capacity load without damage should the car terminal limits become inoperative. The car buffers must be located symmetrically with reference to centre of car.

The Contractor may alternatively offer oil type buffers. The plunger shall be mild steel, designed for a very high factor of safety and accurately machined. A toughened rubber bumper shall be fitted to the plunger top to cushion the impact of steel buffer plates attached under the car and the counterweight. An oil gauge shall be provided to check the oil level.

d. Counterweight

The Elevator shall be suitably counter-balanced for smooth and economical operation. Cast iron weights shall be contained in a structural steel frame properly guided with suitable guide shoes (minimum 4 Nos). It shall be equal to the total weight of Elevator plus approx. 50% of the contract load.

Substantial expanded metal counter-weight screen guard shall be furnished and installed at the bottom of hoist way, as required by Elevator Inspector.

e. Hoisting and Governor Ropes

Bright steel wire ropes with fibred cores suitable for Elevator duty as per BIS Code shall be used for hoisting ropes.

Not less than 3 independent suspension ropes shall be provided and designed to share load equally by means of adjustable shackle rods with equalizer springs at each end of hoisting ropes.

Each rope shall have adequate section to provide a minimum factor of safety of 4 based on the maximum force on the rope.

Governor ropes shall be similar to hoisting ropes. Their ends shall be securely attached to the car and to the safety gear. The governor ropes shall be tensioned by a weight loaded device in the pit.

The contractor shall submit the technical details and source of supply of ropes to the NRDA as well as a certificate of performance of ropes from an approved test laboratory or Authority.

Compensation for travel shall be provided for all Elevators having a travel of more than 30m.

f. Enclosure

The car enclosure shall be as specified in technical data sheet. The cabin floor, roof and walls shall be free of distortion and undue deflection as per IS 14665 – Part 4, Section 3.

g. Brakes

D.C. brakes will be spring-applied and electrically released. They shall be designed to provide smooth stops under variable loads.

h. Doors

Provision shall be made for vertical and horizontal fine adjustment of doors as per the specifications given in technical data sheet.

i. Door Operators

The door operators shall be VVVF inverter controlled heavy duty A. C. motor, allowing variable opening and closing speeds, and full synchronization of car and landing doors.

j. Travelling Cables

The traveling cables shall be multi-core with high conductivity stranded conductors specifically designed for Elevator duty. The cables shall be provided with retaining straps and individual cable clamps.

k. Emergency Lighting

A self-contained, non-maintained emergency light with a trickle boost charger shall be provided.

l. Intercom

An Intercom system shall be provided between the car, main landing, machine room and Fire Console room linked to EPABX located at Admn. Bldg.

Manual Cranking Facility

Manual cranking facility shall be provided in the machine room to facilitate evacuation of passengers in case of power failure. The manual mode shall be in addition to automatic car failure operation specified elsewhere.

Emergency Stop Switch

A stop switch in the machine room / top of car shall be provided for use by maintenance crew to cancel all car and landing calls for a particular Elevator.

Maintenance Switch

On operation of the maintenance switch located on top of the car by the maintenance crew, the car shall travel at slow speed not exceeding 0.85 m / sec by continuous operation of a button

Landing Door Interlocks

Electrical interlocks shall be provided to ensure that the car does not operate unless all doors are closed and unless the car reaches a landing zone.

Overload Indicator (Only in Passenger elevator)

An overload indicator with buzzer shall be provided in the cabin to indicate to the passengers that the car will not start as it is overloaded.

Other Features

All features specified in the BIS/NBC/CPWD and in the enclosed technical specifications shall be provided.

Elevator for Disabled

All the Passengers Elevators shall be suitable for use by disabled persons. The following additional facilities shall be provided in this Elevator:

- i. Full length handrails shall be provided on the rear and side wall panels.
- ii. The door closing time shall be set for min. 5 seconds and the door closing speed shall not exceed 0.25 m/sec.
- iii. The “door open” and “door closed” announcements shall be audibly made in the car.
- iv. Braille signs / buttons.

Operating Panels, Buttons & Switches

Main and secondary car operating panels, buttons and switches shall be located on one of the two front wall panels next to the car door and as specified in the Schedule of Elevators & as per approved G.A. drawings.

All buttons and switches shall be clearly legible with fade-proof text and figures, and shall be easily accessible, (especially for disabled persons in the Elevator designated for them).

13.0 ELECTRIC WIRING

Necessary insulated wiring to connect all parts of the equipment shall be furnished and installed. Insulated wiring shall be flame retardant and moisture resistant and shall be run in G.S. conduits. All cables shall be flame – retardant with copper conductors.

Trailing cables shall be PVC sheathed copper conductor multi-core ribbon type designed for Elevator service and shall be flame retardant and moisture resistant. They shall be flexible and shall be suitably suspended to relieve strains on individual conductors. All copper conductors shall be of

appropriate gauge copper to avoid excessive voltage drop. All wires, cables, conduits, metal boxes, fittings and earthing shall comply with statutory requirements and BIS specifications.

The controller unit comprising of the MCCB, 25KA, adjustable overload and phase reversal and phase failure protection, all the circuit elements, transformer, rectifier for D.C. control supply, inverter power pack, terminal blocks etc. shall be enclosed in an insect vermin proof, sheet steel floor or wall mounted cabinet with hinged doors at front or at both front and rear. Proper warning boards and danger plates shall be provided on both sides of the controller casing. Sheet steel used for controller cabinet shall not be less than 14 gauge and shall be properly braced, where necessary. Suitable gland plate shall be provided for cable entry. The battery for the charger unit shall be suitably placed in the machine room. Degree of protection of Enclosure shall be IP54. Enclosure shall have provision of earthing studs.

All sheet steel work shall be painted with two coats of synthetic enamel paint of suitable shade both inside and outside over two coats of zinc primer.

Apart from Elevator controller enclosure, 7 distribution boards (3 Main DB + 4 DB) are required as per BOQ. Cables to incomer of these DB's shall be terminated by others, whereas outgoing cables for Elevator shall be in the scope of Elevator contractor. Contractor shall furnish the sizes of cables along-with KW rating of motors.

14.0 PAINTING

All exposed metal work furnished in these specifications, except as otherwise specified, shall be given one shop coat of anti-corrosive primer after approved surface treatment of metal surfaces and two coats of approved enamel paint of approved shade. After installation of Elevators, a final Touch-up Coat of paint shall be applied.

15.0 WORKS TESTS

The following tests shall be carried out at Works. NRDA shall be given notice of the time and procedure of the tests before they are carried out, and shall be given facilities for observing the tests at Works.

- a. High voltage works tests of equipment which is not already tested in accordance with appropriate IS codes.
- b. Buffer test.

16.0 TESTS ON COMPLETION

The following tests shall be carried out to the satisfaction of the NRDA.

- i. Insulation resistance and earth test for all electrical apparatus.
- ii. Continuous operation of the Elevator under full load conditions and simulated starts and stops (150 nos. per hour each) for one hour at the end of which time the service temperature of the motor and the operating coils shall be tested. This shall be as per B.I.S. specification.
- iii. The car shall be loaded until the weight on the rope is twice the combined weight of the car and the specified load. The load must be carried on for about 30 minutes, without any sign of weakness, temporary set or permanent elongation of the suspension rope strands.

- iv. The following items shall be tested:
 - a. Leveling accuracy at each landing in conditions of fully loaded and empty car.
 - b. No load current and voltage readings both on 'Up' and 'Down' Circuits.
 - c. Full load current and voltage readings both on 'Up' and 'Down' Circuits.
 - d. One and quarter load current and voltage readings both on 'Up and 'Down' Circuits.
 - e. Stalling current and voltage and time taken to operate overload.
 - f. Overload protection.
 - g. Gate sequence relays, if provided and installed.
 - h. Car and landing door interlocks.
 - i. Collective control and priority sequences, if installed.
 - j. Safety gear mechanism for car and counterweight with fully loaded car and also with only 68 kg load.
 - k. Speeds on Up and Down travel with full load, half load and empty car.
 - l. Door contacts.
 - m. Final terminal stopping device.
 - n. Normal terminal stopping device.
 - o. Car and counterweight buffers with contract load and contract speed.
 - p. Operation of controllers.
 - q. Manual operation of Elevator at mid-way travel.
 - r. Emergency operation.

- v. Tests on completion shall also be performed to the satisfaction of Inspector of Elevators and a certificate will be obtained from the 'Elevator Inspector ' by the contractor.

17.0 STATUTORY APPROVALS

All statutory approvals from commencement to commissioning of Elevators shall be obtained by the Contractor from the Inspector of Elevators and / or other authorities. However, the client will provide all necessary assistance for providing documents, drawings and certificates pertaining to other contractors, if required.

The contractor shall pay necessary fees in connection with the approval of installation of Elevators.

18.0 FEATURES REQUIRED FOR VVVF ELEVATORS

(a) Group / Independent / Attendant Operation

It shall be possible to group specified cars in a group wherever required with dynamic disposition of cars as required by the traffic pattern. A smart car dispatching system with ring communication shall be provided for optimum passenger comfort and Elevator performance under all traffic conditions. Any defective car shall be automatically eliminated from the group.

Each car shall be provided with a keyswitch for independent operation housed in a service cabinet. In this mode, the Elevator shall respond only to car calls. Hall calls will not be registered.

It should be possible for an attendant to operate any car.

(b) Fireman's Switch

A fireman's toggle switch shall be provided in a break glass for the specified Elevator at ground floor to enable firemen to bring the Elevator non-stop to ground floor from any location and to cancel hall calls until the car is operated on attendant control.

(c) **Emergency Power Operation**

In case of power failure, standby power equipment shall enable Elevators to reach a pre-determined floor, in a pre-determined sequence, and then permit operation of one or more Elevators on emergency power.

A trickling battery shall be provided to supply power to light fixtures, fan, alarm and intercom.

(d) **Profile Generator**

A profile generator or similar device shall be provided to use the car at an optimum speed level and to improve leveling accuracy.

(e) **Predictive Car Selection**

Once a hall call is registered, a dynamic car algorithm shall transfer the call to an optimally selected car to provide the maximum traffic efficiency.

(f) **Door Safety**

Multi-beam infrared / ultrasonic electronics curtains shall be provided to scan the doorway and reverse the door closing in case of any obstruction.

(g) **Double Door Operation**

If both up and down calls are registered at a hall which is the last registering hall in the direction of the car, the Elevator shall travel to that hall and open / close the doors. After this, the car shall reverse its travel and shall open / close the doors again unless no car calls are registered at that floor.

(h) **Nudging Door Operation**

When the doors remain open for more than a predetermined period, a buzzer shall sound and the door shall close automatically. The door sensing device shall be rendered inoperative but the Door Open button and the safety shoe shall remain operative

(i) **Selective floor Service**

Programming for selective floors services shall be software driven.

(j) **Manual Cranking & Slow speed Travel**

A manual cranking facility shall be provided.

Slow speed operation shall be possible from machine room and car top.

(k) **Auto Fan Off**

In case no calls are registered for a pre-set time, the cabin fan shall be automatically switched off.

(l) **Automatic Rescue Device**

In case of mains power failure and Elevator control system failure, the Elevator's own rechargeable and maintenance free battery power shall move the car to the nearest floor and the door shall open automatically for automatic rescue of passengers. A battery run-down indicator shall be provided.

19.0 PERFORMANCE PARAMETERS

The following parameters shall be achieved in the installation:

*	Leveling Accuracy	± 3 mm for 1.75 m/s speed ± 4 mm for 0.75 m/s speed
*	Jerk level	0.9 – 1.5 m/s ³
*	Noise level in car	58 dB
*	Noise level at 1 M in machine room	60 dB
*	Acceleration rate	0.6 – 1.0 m/s ² (adjustable)
*	Max. Car vibration	20 milli gals.

20.0 Submittals ‘Alongwith Tender’ AND ‘Post Award’

(A) The following items are required to be submitted induplicate **along with the Tender**.

- i. Catalogues with offered items highlighted.
- ii. List of imported components, if any.
- iii. Compliance Statement for guaranteed performance parameters given in Specification 19.0 above.
- iv. Confirmation that offer submitted meets the technical specifications & scope of work and there are no deviations and exclusions from NIT.
- v. The contractor shall specify in his offer the full capability of his system in this regard.

(B) The successful contractor, **after award of the contract**,shall furnish following technical particulars of the equipment/devices for the approval by NRDA.

- i) Single line/ schematic diagram of electronic control panel, Elevator& equipment etc.
- ii) Layout of Hoist-way, Elevator machine room, showing foundation details in the pit, machine room, electric control panel, Elevator& equipment etc.
- iii) Earthing layout.
- iv) Inspection manual for equipment & accessories covered in the scope of supply (8 copies).
- v) Technical literature of operation, control and maintenance etc. (8 copies) alongwith CDS.
- vi) Schedule of scope of maintenance service during defect liability period and AMC.

The technical parameters furnished by the tenderer would be examined in detail during design submission stage. All improvements considered necessary to meet the tender Technical Specifications would have to be incorporated without any additional cost to NRDA with objective of providing high performance and safety Elevators.

C. TECHNICAL SPECIFICATIONS OF ESCALATOR

1. SCOPE

- 1.1. This specification covers design, manufacture and supply at site, installation, testing and commissioning of reversible escalators to be provided at the Commercial and Retail complex of NRDA, Naya Raipur for indoor application.
- 1.2. The Escalator shall be of State-of-the-art technology, having nominal step width of 1000 mm, with 4 nos. horizontal Steps on top and bottom landing area and the nominal speed will be 0.5 m/sec. For the aforesaid step width and nominal speed, maximum carrying capacity as per EN115-1:2008 will be 100 passengers per minute. The escalator shall be complete with all safety features and shall fully comply with International Standard EN-115 latest version.
- 1.3. Escalators shall be reversible type and capable of operating safely, smoothly and continuously in both directions for a period of not less than 20 hours a day, seven (7) days a week with an alternating passenger load reaching 100% of Contract Load (120 kg per step) for two hours and 50% of Contract Load for the following hour within the environmental conditions as stated in the specification and at the location where the escalators are to be installed.
- 1.4. The vertical-height of floors generally varies between 4.00 meter to 5.10 meter at the complexes.
- 1.5. The angle of inclination of escalator shall be 35° and minimum transition radius shall be 2.6 meters at the upper landing and 2.0 meters at the lower landing.
- 1.6. The purchaser/ user NRDA shall furnish the exact information by filling in all the entries, as per the format given in Annexure 1.
- 1.7. The contractor’s scope of work shall include but not be limited to the following works:-
 - a) Provision of escalators in complexes for visitor movements.
 - b) All associated civil works for providing
 - i) Pit for housing escalator parts, adjacent sump of size 4.2m x 3.0m x 1.2m, etc.
 - c) Transportation of material and equipment for installation purpose.
 - d) Spare parts, special tools, testing and diagnostic equipment and measuring instruments (if asked for in the tender).
 - e) Training.
 - f) Documentation.
 - g) Control and monitoring system for Escalators.
 - h) Maintenance for specified period.
 - i) Services.

1.8. NRDA’s scope of work

The site preparation works to be undertaken by NRDA may typically include:

Concrete supporting beams will be provided by the Building Contractor at both landings and the intermediate support if required by escalators with a large vertical rise.

suitable arrangement to prevent the public from falling down from the sides at top landing; covering up of open spaces enclosed between escalator-wall and escalator-escalator; triangle protection; anti-

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climbing, access restriction and anti-slide arrangements; railing or other suitable arrangement to ensure that the public approaches the escalator entry in a straight/ orderly manner; A lockable closet/ enclosure for the controller provision of earthing pits for achieving an earthing resistance of max 1.0 Ω, making LT power supply available for the escalator, etc. To minimize the risk of visitors stumbling/ falling down due to the two differential floor levels,

NRDA shall ensure the following: just after the escalator floor plate, there would be a min 315mm long stretch of anti-slip

2. Design criteria and Submittals

2.1. Design criteria

The design shall generally meet the following criteria: -

- a. Application of state of the art technology
- b. Service proven design
- c. Design life 30 years
- d. Minimum life cycle cost
- e. Low maintenance cost
- f. Use of interchangeable, modular components
- g. Extensive and prominent labeling of parts, cable and wires
- h. Use of unique serial numbers for traceability of components
- i. High reliability
- j. Energy efficient
- k. System safety
- l. Adequate redundancy and factor of safety
- m. Fire and smoke protection (provision of smoke detectors, etc.)
- n. Use of fire retardant materials
- o. Environment friendly
- p. Adherence to operational performance requirements.
- q. Indigenization (contractors are encouraged to introduce indigenization in part/ full; in future, the same is likely to be made mandatory)
- r. Safety against garments such as Saree, loose clothes, etc.
- s. All ball or roller bearings whether or not sealed for life time greasing shall have a design life of at least 110,000 operating hours under operating conditions.
- t. Safety against water flooding in pit.

2.2. Submittals

2.2.1. Every bidder must submit the following documents along with the offer:

- A. Typical general arrangement/ layout diagram, which shall convey the following minimum information:
 - a. Vertical rise
 - b. Horizontal span length with break-up of constant span at upper and lower landing
 - c. Step width
 - d. Handrail type
 - e. Handrail center to centre distance
 - f. Width of truss
 - g. Width of escalator
 - h. Width of lower end opening
 - i. Detailed pit dimensions
 - j. Width of top end opening
 - k. Intermediate support, if involved
- B. Clause-by-clause confirmation of compliance to/ deviation from this specification.

2.2.2. The contractor (successful bidder) will be required to submit the following drawings, designs, data and type test reports for approval by the purchaser:

- A. Fully dimensioned layout in plan and elevation indicating component locations, structural supports, access spaces, and point of entry.
- B. Loads on supporting members, reaction points and loads, and deflections under full load. Contractor shall be responsible that these parameters are within safe limits and shall provide the supporting calculations.
- C. Truss FEM analysis shall be submitted for the following two cases: 5m rise without intermediate support; and for maximum rise involved in the contract with intermediate support (if rise is more than 5m). The FEM analyses should report the deflection, stress and the factor of safety thereof. Along with FEM analysis, detail of the truss must also be submitted by the contractor for proper appreciation and quality supervision by the purchaser.
- D. Details of comb, comb plate, landing plate, balustrades, deck, skirt panels, push button fixtures, key switches and required signage.
- E. Technical data and details of track system and supports, including drive chain and gear train; step chain including chain pitch, step and trailer wheels; size, shape and material of each component.
- F. Technical data and details of the drive system, step drive system, handrail drive system, relevant shafts, tension devices, brake system controller, safety devices and switches. Calculation for life of bearings.
- G. Layout of electrical system including motor, control panel; disconnect switches directional start and stop key switches; emergency stop switches and covers; scheme for electrical grounding of escalator; light fixtures and control devices; schematic diagram including single line power diagram of the escalator system, control wiring diagram and sequence of operation, indicating interface connections.
- H. Step chain detail for material configuration, arrangement and lubrication requirement.
- I. Transition radii at upper and lower end; details of step assembly including axle, step tread, rollers, frame and riser; safety brush material, mounting method and profile.
- J. Details of fire protection system.

K. Type test reports in respect of systems/ sub-systems that will form a partof the escalator to be supplied.

L. Type test report in support of EMI/ EMC compliance

2.2.3. The contractor (successful bidder) will be required to submit the following Operation and Maintenance Manuals (one soft and one hard copy per station):

A. Drawings, installation and maintenance instructions, and other data pertinent to the components used in escalator systems, including detailed repair data for all components, including disassembly, inspection/gauging/ torque requirements, inspection and testing schedules, reassembly, testing methods and other related information. Manuals shall cover all mechanical and electrical components, operating panels, controls and indicators. Exploded view drawings shall be included to facilitate repair and maintenance functions.

B. Bill of Materials (BOM) for each escalator. The BOM will be a list of all assemblies, subassemblies and replacement components/ parts of the escalator. This detail will be required in the future for placing orders on the OEM for individual replacement parts and for other managerial purposes.

C. Maintenance tool manuals.

2.2.4. The contractor (successful bidder) will be required to submit the following information in respect of safety factors and safety implication of failures:

A. Strength and safety factor in respect of main drive chain and step chain

B. MTBF (mean time between failures) in respect of fail safe circuits, as called for in EN-115

C. Short technical note, highlighting the escalator sub-system failures which can impact safety.

D. Short technical note listing the failures whose simultaneous occurrence can lead to accident situations. Steps that can be taken to avoid such accident situations.

2.2.5. The contractor (successful bidder) will be required to submit the following electrical calculations for approval by the purchaser:

A. Electrical/ Mechanical calculations for the sizing of driving machine, motor and brake.

2.2.6. The contractor (successful bidder) will be required to submit the following brake calculations:

A. Detailed calculations for the brake. This will include: braking distance and deceleration rate for all loads from no load to the machinery rated load, and for up and down directions.

3. SYSTEM DETAILS & SCHEMATICS (CONSTRUCTION)

The complete Escalator shall comprise of all parts and accessories, which are necessary for its efficient operation, whether specifically mentioned or not. The key parts and accessories along with their functions and features are listed as follows:

4. STEPS

4.1. STEP DEMARCATION

The surface of the steps shall be horizontal at all positions exposed to passenger. The nominal width of steps shall be 1000 mm unless otherwise specified. Yellow lines of 25 mm width shall be marked on both sides and front of the leading/trailing edges of the steps with durable and wear resistant materials to show demarcation between comb and cleat.

4.2. INTEGRAL DIE-CAST ALUMINUM STEP TREAD AND RISER

The step treads shall be die-cast aluminum with closely spaced cleats designed to provide a secure foothold, the latter being grooved parallel to the travel of the steps to mesh with the comb teeth at the entrance and exit. Step risers shall also be die-cast aluminum integral with the step treads and shall include vertical cleats designed to pass between the cleats of the tread on the adjacent steps thus providing a combing action with minimum clearances.

4.3. ROLLERS

Each step shall be supported on four rubber or synthetic material tyred ball bearing rollers, grease sealed for life and so mounted that tilting and rocking of steps is prevented whilst ensuring smooth quiet operation in service.

4.4. TRACTION

Traction to the steps shall be by means of two endless roller chains.

4.5. DIMENSIONS OF STEP

The depth of any step in the direction of travel shall not be less than 400 mm. The rise of any such step shall not be more than 240 mm.

4.6. CLEAR HEIGHT ABOVE STEP

The clear height above the steps at all points shall not be less than 2.30 m.

4.7. FLAT STEPS

There shall be at least a length of four complete steps at either end of the escalator travelling horizontally from the comb line.

5. STEP CHAINS

5.1. STEP CHAIN

The steps shall be driven by at least 2 steel link chains of which at least one shall be located at each side of the step.

5.2. MATERIALS

The step chains shall be made of high tensile steel links with hardened and ground pins.

5.3. QUIET OPERATION

The rollers shall accurately engage with the drive sprockets to ensure smooth and quiet operation.

6. TRACKS

6.1. CURVED SECTION

All the curved sections of the tracks shall be manufactured in steel or aluminum pressure die-castings.

6.2. STRAIGHT SECTION

The straight sections of the tracks shall be of steel or aluminum extrusions. The tracks forming both running surfaces and guards over the trailing rollers shall essentially be channels or of such formation as to prevent derailing.

7. LANDING OPENING AND LANDING PLATE

7.1. OPENING

Openings of adequate size in the floor will be provided by the Building Contractor on both upper and lower landings. The Contractor shall indicate on site the exact dimensions of the openings, excavation, drains and ventilation holes required.

7.2. LANDING PLATE

Removable floor landing plates shall be provided by the Contractor over the openings to give access to the mechanism for maintenance purpose. These landing plates shall be of stainless steel or wear resistant aluminum alloy which shall afford a secure foothold. Alternative material will not be accepted without the prior approval of the Supervising Officer.

7.3. LANDING GAP

The gap between the balustrade exterior paneling and the wall or obstacle shall not exceed 100 mm.

8. COMBS

8.1. COMBS

Combs shall be provided at the top and bottom landings and shall be wear resistant aluminum alloy with anti-slip pattern.

8.2. COMB TEETH SECTION

The comb teeth sections shall have fine pitch teeth to allow the cleats of the step tread to pass them with a minimum of clearance. The comb teeth sections shall be made of synthetic resin, metal or equivalent material. Each such comb teeth sections shall be such that

- (1) It is adjustable horizontally and vertically; and
- (2) Sections forming the same are readily removable in case of emergency. The teeth of every comb teeth section shall be so meshed with and set into the slots of the tread surface of the steps of the escalator that the points of such teeth are always below the upper surface of such tread surface.

9. BALUSTRADING

9.1. BALUSTRADES

Solid balustrades shall be installed on each side of the escalator and shall consist of the following components:-

- (1) Skirting
The skirting panels shall be vertical and constructed of smooth hairline finish stainless steel with thickness of not less than 2 mm. Embossed, perforated or roughly textured materials shall not be used.
- (2) Interior profile
The interior profile shall be of hairline finish stainless steel with thickness not less than 2 mm. The interior profile and the balustrade interior paneling shall have an angle of inclination of at least 35° to the horizontal.
- (3) Interior and exterior paneling
The glass shall be of a laminated or splinter-free one-layer safety glass (tempered glass type) and shall have sufficient mechanical strength and rigidity. The glass panels shall be at least 10 mm thick.
- (4) Balustrade decking

The decking shall be of stainless steel or extruded aluminum, polished and anodized in natural colour. The decking is to be situated under the handrail and forms the top cover of the balustrade paneling. Appropriate measure shall be provided to discourage people from sliding along the decking.

(5) Extended newel

The newel including the handrails shall project beyond the root of the comb teeth by at least 0.6 m in longitudinal direction.

9.2. DRESS GUARD

Dress guards of brush bristles type shall be provided along the full length of the lower part of the skirting panels.

Brush bristles type dress guard shall be made of nylon filaments. The nylon filaments shall not support combustion and shall be durable and with flagged ends to give a soft face and be securely held within a pressed steel holder. The assemblies shall be easily removed when replacement is necessary. It shall consist of anodised aluminum carrier which is suitable for the escalator sidewall. The bottom of the carrier shall have chamfer angle to eliminate trapping of feet, trolley wheels and parcels, etc. The carrier shall be fixed onto the skirting panel by secret fixings which are concealed by the filaments but are easily removable.

9.3. EXTERNAL CLADDING

Unless otherwise specified, the external cladding of the undersides and sides of the escalator will be of materials having a F.R.P. of not less than half an hour and will be provided by the Building Contractor.

9.4. GUARD FOR ADJACENT BUILDING OBSTACLES AND CRISS-CROSS ESCALATORS

Where building obstacles and criss-cross escalators can cause injuries to passengers riding on escalators, appropriate preventive measures shall be taken. In particular, at floor intersections and criss-cross escalators, a set of vertical obstruction guard shall be provided and placed above the balustrade decking.

For vertical building obstacles or columns, unless other approved preventive measures (e.g. buffer protection surfaces) are taken, fixed guards shall be installed. The fixed guards would not be required if the vertical building obstacle or column has a radius of curvature of not less than 300 mm. The part of the vertical building obstacles or columns facing the escalator shall form part or whole of a smooth continuous surface extending from at least 100 mm below the top of the handrail to a height of at least 2100 mm above the step, pallet or belt of the escalator.

The position of the obstruction guards shall be such that it can effectively prevent injuries to the passengers. The guard shall be of light and durable material such as plastic as approved by the Supervising Officer.

It is not necessary to comply with the requirements as mentioned in this Clause when the distance between the centerline of the handrail and any obstacle is equal to or greater than 600 mm.

10. HANDRAILS

10.1. RUBBER HANDRAIL

The handrails shall be constructed of multi-layered canvas with the exposed surface covered with smooth black abrasion resistant rubber which shall be vulcanised into an endless loop.

10.2. SPEED

The handrails shall move in the same direction and substantially at the same speed as the steps. The speed of the handrail is permitted to deviate from the speed of the steps, pallets or belt within the limits of 0% to +2%.

10.3. SAFETY GUARD

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Safety guards shall be provided where the handrails enter and leave the escalator newels to prevent pinching of fingers and hands.

10.4. HANDRAIL GUIDE

The handrail guides shall be in specially formed section to allow easy movement of the handrail but properly shaped as to retain the handrail always in its place.

10.5. WIDTH OF HANDRAIL

The width of the handrail shall be between 70 mm and 100 mm.

10.6. HANDRAIL CLEARANCE

The horizontal distance between the outer edge of the handrail and walls, adjacent criss-cross escalators or other obstacles shall under no circumstances be less than 80 mm and shall be maintained to a height of at least 2100mm above the steps, pallets or belt of the escalator/passenger conveyor.

11. TRUSS

11.1. CONSTRUCTION

The structural steel truss shall be a rigid steel fabricated structure and shall be capable of carrying a full complement of passengers together with mechanism of the escalator, the balustrades and the weight of exterior covering. The supporting structure shall be designed in a way that it can support the dead weight of the escalator plus a passenger weight of 5000N/m². The factor of safety used in the design of structural members of the escalator trusses shall not be less than 5 based on static load.

The truss shall also be designed to support an additional load of the outer cladding panels and truss claddings up to a minimum load of 150N/m². The truss design for NRDA must ensure that for an escalator vertical rise upto 5m, there is no need for intermediate support.

The truss design shall also ensure required safety to sustain the Steps and running Gear in operation. In the event of failure of the track system, it shall retain the running gear in its guides.

The construction and design of truss shall be such that it allows for easy inspection of the interiors of the escalator.

Maximum deflection of Truss shall not exceed 1/750th of the distance between supports (distance between the supports for this purpose being not less than that corresponding to a 5m vertical rise of escalator without intermediate support). This will have to be physically proven by a deflection test for one escalator.

Cladding of the truss shall be done with 1.5mm thick SS 304.

The truss of escalator shall be hot dip galvanized up to minimum thickness of 80µm. Other parts inside the truss such as track, return station, shaft etc. shall be given suitable anti-corrosive treatment with zinc plating/ painting or similar process.

The track system shall be constructed of steel with zinc plating. The track surface shall be straight and smooth. All joints, where possible, shall be diagonal across the width of the running surface. Maximum deflection of track system shall be designed not to exceed 1.00mm between any two adjacent track supports under 6,000 N/m². Anti-jump track above step roller will restrain step up-Elevating near comb area on both landings.

The step roller track and the chain roller track wearing surfaces shall be of minimum 5mm and 3mm thickness on the passenger and return side respectively.

11.2. STEP CHAIN BREAKING

The entire tracking system shall be so designed that in the unlikely event of a step chain breaking, there shall be no likelihood of the steps Elevatoring out of place.

11.3. MACHINERY SPACE

The upper section of the truss shall contain the drive machine and shall be fitted with a trap door. In cases where several drive machines are placed along the length of an escalator, suitable means of access to the drive machines shall be provided.

12. LUBRICATION

12.1. LUBRICATION

Effective means for lubricating the bearings and moving parts as required shall be provided with easy access.

12.2. OIL PAN

Oil tight drip pans shall be provided for the entire length of the escalator to contain any waste and lubricants within the truss. Where necessary, the oil tight drip pans shall be removable to give access to both the machinery space and the return station for maintenance.

13. DRIVING MACHINERY

13.1. INDEPENDENT DRIVING MACHINE

Each escalator shall be driven by at least one machine of its own.

13.2. REDUCTION GEAR

The driving machine shall incorporate a reduction gear system employing worm gear, planetary gear or other proven gear types.

- (1) Worm gear system

The driving machine shall incorporate a worm reduction gear with a vertical flange-mounted motor or other proven design. It may be connected by chain or other proven means to the main drive shaft of the escalator. The worm shaft and worm wheel shall be housed in a substantial cast iron housing which shall also hold the lubricant.

- (2) Planetary gear system

The motor, planetary gears and brakes shall be fully enclosed and form a unique, compact no-chain unit. Motor and bearings shall have life-time lubrication.

13.3. MOTOR

The motor shall be integrally mounted, A.C. squirrel cage, three phase induction motor of continuous rating, reversible type with high starting torque and low starting current and specially designed for escalator application. Other proven motor types may also be used subject to the approval by the Supervising Officer.

Each traction machine shall be mounted within the truss or the machine pit and shall be removable en-bloc from the truss for repair or maintenance. Suitable Elevating points shall be provided.

The escalator’s driving machine shall be suitable for operation on 3-phase, 415Volt ±10%, 50Hz ± 3% AC supply and it shall comply with IS: 325/IEC 60034. The Total Harmonic Distortion (THD) due to escalator motor drive shall be within the following limits:

Current (I)*	Maximum THD (%) in each phase
I < 20A	20%
20A ≤ I ≤ 200A	15%

* Fundamental current of motor drive at no load and rated speed

The 3-phase Induction Motor shall be totally enclosed with external cooling fins having minimum IP-55 Protection and class F Insulation level.

Sound level of the system shall not be more than 65 dBA at 1 meter from the balustrade. The required acoustic treatment shall be provided as necessary, to meet this requirement.

The contractor shall submit information on his past study on vibrational analysis of escalators, if any. In subsequent amendment/ revision of the spec., NRDA may consider specifying vibration measurement through Fast Fourier Transform (FFT) analyzer and lay down specific limits for vibration.

The overall efficiency of the combined motor and gearbox shall not be less than 82% at full load.

The starting current of motor shall not exceed 3.5 times full load current. The starting current characteristic and the speed/torque characteristic for different duty ranges shall be submitted for acceptance by the purchaser.

13.4. SPEED

The rated speed of the escalator shall not be more than 0.5 m/s for an escalator with an angle of inclination not exceeding 35° from the horizontal respectively.

13.5. BEARING

The motor shall be fitted with grease lubricated ball bearings.

14. BRAKING

14.1. ELECTRO-MECHANICAL BRAKE

Each escalator shall be provided with braking that is mechanically applied and electrically held off type of sufficient capacity to efficiently bring the escalator to rest with uniform deceleration when travelling at full contract speed in either direction.

The brake shall automatically bring the escalator to a halt whenever the power is interrupted, or any of the operating and safety switch is operated.

A device shall be provided to prevent the starting of the escalator if the brake does not operate properly. An indicator to indicate the wearing of the brake lining shall also be provided.

Provisions for hand winding and the necessary tools to affect the hand winding shall be provided for each escalator.

14.2. AUXILIARY BRAKE

Escalators and inclined passenger conveyors shall be equipped with auxiliary brake(s) acting immediately on the non-friction part of the driving system for the steps, pallets or the belt (one single chain is not considered to be a non-friction part), if

- (a) the coupling of the operational brake and the driving wheels of the steps, pallets or the belt is not accomplished by shafts, gear wheels, multiplex chains, two or more single chains; or
- (b) The rise exceeds 6 m;
- (c) The operation brake is not an electro-mechanical brake;
- (d) They are "Public Service Escalators" as defined in the Code of Practice on the Design and Construction of Elevators and Escalators.

14.3. HANDWINDING

Provision shall be made for hand winding the escalator in either direction, and shall be suitably marked for "UP" and "DOWN" operation. Crank handles and perforated hand wheels are not permitted. Instructions for hand winding devices in English and Hindi shall be displayed prominently in the machinery space. If the hand winding device is detachable, it shall not be accessible to unauthorized persons. The hand winding device shall be painted yellow.

14.4. STOPPING DISTANCES

The stopping distances for unloaded and downward moving loaded escalators shall be between the following values:-

Rated Speed Stopping distance between 0.50 m/s min. 0.20 m and max. 1.00 m

The stopping distance for an unloaded escalator shall be close to the minimum value, while for a downward moving loaded escalator it shall be close to the maximum value.

For escalators with intermediate speeds the stopping distances are to be interpolated. The stopping distances shall be measured from the time the electric stopping device is actuated.

15. FOOTLIGHTS AND STEP LIGHTS UNDER LANDINGS

15.1. FOOTLIGHT

Footlights shall be provided on either side of the interior of the skirting at both upper and lower landings and energy efficient fluorescent luminaries shall be used. The intensity of illumination shall be not less than 50 lux at the landings, measured at floor level.

15.2. STEP LIGHTS UNDER LANDINGS

Energy efficient LED luminaries shall be provided underneath landings to illuminate the clearance between steps, steps and skirting, steps and comb, at the horizontal steps portion of the escalator. The colour of these lights shall be green.

15.3. REPLACEMENT OF LUMINARIES

Facility shall be incorporated for the easy replacement of luminaries.

16. SUPPORT BEAMS

16.1. CONCRETE SUPPORT

Concrete supporting beams will be provided by the Building Contractor at both landings and the intermediate support if required by escalators with a large vertical rise.

16.2. MOUNTING FACILITIES

All other supports and mounting facilities, e.g. R.S.J. beams, mounting brackets, bearing plates, etc. required for the installation of the escalator shall be provided by the Tenderer/Contractor.

17. SAFETY DEVICES

17.1. SAFETY DEVICE

- (1) Emergency stopping devices
Emergency stop devices shall be placed in conspicuous and easily accessible positions at or near to landings of the escalator. For escalators with rise above 12 m, and for passenger conveyors with a length of the tread way of more than 40m, additional emergency stopping devices shall be installed.
- (2) Broken step chain device
The broken chain safety device shall be incorporated as part of the tension carriage, and they shall operate if the bottom sprocket moves unduly in either direction in the event of either both step chains breaking or becoming unduly lengthened due to wear of the pins, or tension in either chain dropping below a pre-determined value.
- (3) Broken drive chain device
A device shall operate for breakage of the chain between the driving machine and the escalator main drive shaft. Auxiliary brake if provided shall also operate.
- (4) Broken step device
If any part of the step is sagging so that meshing of the combs is no longer ensured, switching off shall be operated at a sufficient distance before the comb intersection line to ensure that the step which has sagged does not reach the comb intersection line. The control device can be applied at any point of the step.
- (5) Broken handrail device
Broken handrail devices shall be situated inside both balustrades at the lower end of the incline, which shall be actuated if either or both handrails break.
- (6) Non-reverse device
A non-reversing device shall be arranged to prevent a travelling escalator to slow unduly or attempts to reverse its direction of travel. The escalator shall be stopped once the device is operated and it shall only be started again by the key operated switch.

17.2. OPERATION OF THE SAFETY DEVICE

The operation of any one of these safety devices shall cause the electrical supply to the driving motor to be disconnected and the electro-mechanical brake to be operated thus bringing the escalator to rest.

18. CONTROL

18.1. CONTROL STATION

(1) Position

Control station shall be provided at both the upper and lower landing newel, which shall contain an emergency stop switch, two key operated direction switches, an audio alarm switch and if specified a foot light switch. The station shall be so positioned as to enable any person operating any of the switches to afford a full view of the escalator.

(2) Type of switch

The emergency stop switch shall be push button type with a red button and shall be suitably protected against accidental operation. But the up and down directional starting switch shall be of the key-operated spring off type.

(3) Marking

All control switches shall be provided with clearly engraved markings both in English and Hindi.

18.2. AUTOMATIC OPERATION

Escalators which start automatically by the passing of a user shall start to move before the person walking reaches the comb intersection line. This can, for instance, be accomplished by light-rays or contact mat.

The escalator shall be stopped automatically after a sufficient time (at least the anticipated passenger transfer time plus 10 seconds) the passenger has actuated the automatic starting device.

18.3. PROVISION FOR FUTURE REMOTE MONITORING OF ESCALATOR

The Contractor shall provide dry contacts of the following output signals for each escalator installation in a stainless steel cabinet to serve as the interface unit for future connection by others:-

- (1) Normal/Fault status
- (2) Duty/Standby status
- (3) Power Supply Normal/ Fault status
- (4) Normal/ Essential Power status
- (5) Emergency stop button activated

This interface unit shall be located at the management office/caretaker’s room next to the escalator monitoring panel unless otherwise specified on the Drawing and/or in the Particular Specification.

19. CONTROLLER

19.1. CONTENT

The controller shall be a self-contained unit containing all the necessary electromagnetic switchgears including a residual current circuit breaker, local control push buttons, D.C. power supply, etc.

19.2. LOCATION

The controller shall be located in the truss at the upper landing, and provision shall be made for easy access for maintenance.

19.3. METAL CABINET

The controller shall be fitted inside a dust proof 1.2 mm thick stainless steel cabinet.

20. MAINTENANCE FACILITIES AND NOTICES

20.1. MACHINERY SPACE LIGHTING

A permanent light, suitably protected, will be provided in the machinery space by the Electrical Contractor, and which can be switched without passing over or reaching over any part of the machinery.

20.2. SWITCHED SOCKET OUTLET

A 15 amp. 3 pin switched socket outlet will be provided by the Electrical Contractor in each escalator machinery space. The socket outlet will be fitted adjacent to the light switch.

20.3. EMERGENCY STOP SWITCH IN MACHINERY SPACES

A stop switch for the machinery shall be provided in each machinery space where means of access to the space is provided.

The stop switch shall:-

- (1) Be of a manually opened and closed type;
 - (2) Be conspicuously and permanently marked "STOP".
- EXCEPTION: A stop switch needs not be provided in a machinery space if the main switch is located therein and close to the machinery.

20.4. NOTICE ON THE ACCESS DOOR

On each access door to the machinery space in upper and lower landing a notice of durable materials with the inscription of the following message in English and Hindi shall be fixed :-
"Machinery space - danger, access prohibited to unauthorized persons".

20.5. MARKING OF ESCALATOR

At least at one landing, the name of the manufacturer & the manufacturer's serial number shall be indicated, visible from outside.

20.6. NOTICE FOR AUTOMATIC START

In the case of escalators starting automatically, a clearly visible and audible signal system, e.g. road traffic signals, shall be provided indicating to the user whether the escalator is available for use, and its direction of travel.

20.7. NOTICES NEAR ENTRANCES OF ESCALATOR

All signs shall be written in clearly legible characters in bilingual (as decided by the purchaser) where the escalator is in operation.

The following mandatory signs shall be provided by the contractor and fixed in the vicinity of the entrances as per the dimensions mentioned in EN 115:

- (1) Small children must be held firmly.
- (2) Dogs must be carried.
- (3) Stand facing the direction of travel; keep feet away from sides.
- (4) Hold the handrail.
- (5) Transportation of bulky and heavy loads not permitted.

Whenever possible, these notices shall be given in the form of pictographs. The minimum size of the pictographs shall be 80 x 80 mm.

21. REQUIREMENTS FOR WEATHER-PROOF ESCALATORS OR ESCALATORS IN MARKETS

21.1. PROTECTION AGAINST WEATHER

The escalator(s) will be protected by a canopy or other similar structure constructed by the Building Contractor.

21.2. PROTECTION AGAINST CORROSION

21.2.1. Truss and metal work of escalator

The entire truss and metal work of the escalator other than moving parts shall be hot-dipped galvanized or adequately protected against corrosion by epoxy paint coating system designed for marine application.

The surface of the completed truss and metal work shall be prepared and treated in accordance with the epoxy paint coating manufacturer's recommendation. All rust and dirt on the surface of the truss and metal work shall be removed by wire brushing and the truss and metal work shall be thoroughly degreased by degreasing solvent prior to application of any paint coating.

The number, thickness and method of application of paint coating shall be in accordance with the epoxy paint coating manufacturer's recommendation but in any case at least three coats of epoxy

paint coating system primer shall be applied followed by at least three coats of finishing epoxy paint coating.

Each coat of paint shall be thoroughly dried before application of the next coat.

All the above-mentioned degreasing and painting process shall be carried out at the factory and painting of truss and metal work at site is not permitted without prior approval except for touching up of damaged paint coating during installation at site.

Welding carried out on site on the truss or any metal work that will damage the protective paint coating is not permitted unless prior approval is given.

Where rust appears on the parts of the truss or metal work due to damage of paint coating, it must be thoroughly removed by wire brush, degreased and followed by application of the same number of paint coatings as in the factory to the satisfaction of the Supervising Officer.

Information on the epoxy coating system including details of surface preparation, method of application, number of coatings and samples of paints shall be submitted for approval prior to manufacture.

21.2.2. Movingparts

Moving parts of the escalator including step driving chains, sprocket gears, steps, etc. which require greasing or oiling and any metal components which for functional reasons, shall not be painted.

These parts shall be constructed of corrosion resistant materials such as stainless steel or heavily electroplated with corrosion resistant materials such as nickel or chromium. These moving parts shall be adequately lubricated all the time by automatic oilers and suitably protected from water entering into the escalator interior.

All ball or roller bearings such as those installed on the step driving chain, driving mechanism shall be of the sealed type.

21.3. LUBRICATION

Automatic oilers shall be provided for chain lubrication and operated in pre-determined period. Device for separation of oil and water shall be provided if the lubrication system is of re-circulating type.

21.4. DRIVING MACHINE

The driving motor shall have a degree of protection of at least IP 54. Watertight cover shall be provided on all bearings.

21.5. ELECTRICAL WIRINGS AND ACCESSORIES

All exposed wiring terminals, junction boxes, switches, etc. shall have a degree of protection of at least IP 54.

21.6. DRAINAGE

The Contractor shall provide effective drainage facilities for the escalator. A permanent drain point will be provided by the Building Contractor at the bottom of the escalator pit.

An additional drain point at the upper pit of an escalator shall be provided by the Contractor if found practicable so that water can be collected and directed to the nearest drain pit provided by others. An alarm giving a warning of flooding at the lowest escalator pit coupled with a timer to stop the escalator after a preset time shall be provided by the Contractor.

D. TECHNICAL SPECIFICATION FOR ANNUAL MAINTENANCE CONTRACT (AMC) FOR ELEVATORS AND ESCALATORS

1. Scope of Work

- a. To maintain the elevator and Escalator in proper and safe working condition.
- b. To regularly examine, lubricate and adjust the equipment and carry out planned maintenance in systematic and controlled manner by employing only qualified, trained and skilled persons.
- c. To examine periodically all safety device and governors and make all customary safety tests and to submit a certificate regarding the safety.
- d. To systematically examine and adjust the all components as installed.
- e. To maintain the performance characteristics of the equipment as originally designated and installed.
- f. To maintain a reasonable stock of genuine and original spare parts for replacement so that these are made available at the time of breakdown.

2. Testing and Commissioning

a. ADJUSTMENTS, PERFORMANCE TESTS AND COMMISSIONING

The Contractor shall commission the installation and carry out complete performance tests for all equipment and systems installed by him, making all necessary adjustments including setting all controls and checking the operation of all protective and safety devices in accordance with the manufacturers’ instructions, the requirements of the statutory rules and regulations and to the satisfaction of the Supervising Officer. Prior to any tests, the Contractor shall submit detailed procedures and a programme for testing and commissioning to the Supervising Officer for approval

b. LABOUR AND MATERIALS

The Contractor shall employ a Registered Lift/Escalator Engineer under the Lifts and Escalators (Safety) Ordinance to undertake examination, testing and commissioning of the complete installation. All labour, materials, tools and instrument necessary for carrying out the work shall be provided by the Contractor. The Building Contractor will provide the necessary electricity supply but the Contractor shall coordinate with and to inform the Building Contractor his requirements.

c. TESTING

The tests and examination undertaken by the Registered Lift/Escalator Engineer shall include those specified in the Code of Practice on the Design and Construction of Lifts and Escalators, the Code of Practice for Lift Works and Escalator Works and those recommended by the lift/escalator/passenger conveyor manufacturer. The relevant forms/certificates as required by the Lifts and Escalators (Safety) Ordinance shall be signed and submitted by the Registered Lift/Escalator Engineer to the Supervising Officer on completion of the lift/escalator/passenger conveyor installation.

Test and examination certificates as shown in the Appendix of BSB Testing and Commissioning Procedure No. 4 for Lift, Escalator and Passenger Conveyor Installation shall be submitted together with the relevant statutory forms upon completion of the installation.

Tests which purely demonstrate the performance characteristics of the lift shall be performed in the presence of the Supervising Officer or his/her Representative at the acceptance of the installation. All instruments used in the testing and commissioning shall be calibrated as required. The period between calibration and testing shall not exceed the calibration period as recommended by the instrument manufacturer or twelve (12) months whichever is shorter.

At the end of the period of free maintenance as defined in Section 2 hereinafter, a thorough test shall be carried out by the Contractor and any defects found shall be rectified by the Contractor without charge to the Employer.

3. MAINTENANCE DURING PERIOD OF FREE MAINTENANCE

a. FREE MAINTENANCE

The Contractor shall, in addition to his obligations under the General Conditions of Contract, furnish maintenance free of charge for the entire installation for the whole Maintenance Period following the certified date of completion of the Contract. The extent of work required to be carried out is as follows:-

i. Planned maintenance

- 1. To be responsible for any repairs necessary to maintain the installation in good and safe working order at all times.
- 2. To dispatch competent workers once weekly during normal working hours to maintain each lift in accordance with Appendix 1A – Maintenance Schedule for Electric Passenger, Goods and Service Lifts and to maintain each escalator in accordance with Appendix 1B – Maintenance Schedule for Escalator.
- 3. To supply all lubricants, cleaning materials, rope preservatives etc.
- 4. Replace all burnt out lamp bulbs/tubes with bulbs/tubes of correct rating.
- 5. To provide, repair or replace at no additional cost to the Employer such mechanical and electrical parts of the installation necessary for the safe and normal operation of the installation.

ii. Emergency maintenance

- 1. To provide a 'call-out' service during and outside normal working hours to carry out emergency maintenance by competent workers.
- 2. To attend to any breakdowns reported to him by telephone (or other means) with the utmost effort and in no circumstances attendance to the breakdown shall exceed 30 minutes after the call is received. The Contractor's performance in this aspect will be reflected in the Contractor's Performance Appraisal Report for the Contract.

iii. Statutory examination and testing

- 1. To carry out the periodic examination and periodic testing of the safety equipment as stated in the Lifts and Escalators (Safety) Ordinance and to provide such copies of the test certificates, duly signed by a Registered Lift/Escalator Engineer.
- 2. Provided always that any renewals or repairs necessitated by reason of negligence or misuse of the equipment by others or by reason of any other cause beyond the Contractor's control with the exception of normal wear and tear, these works shall be carried out by the Contractor, if so required by the Employer, at an additional cost to be negotiated by both parties.
- 3. All works under this maintenance provision shall be performed by the Contractor's directly employed competent workers under the supervision of the Contractor.

The Contractor shall at his own expense, make all suitable arrangements to avoid damage to the installations and works provided by others.

b. FAULTS AND REPAIRS TO BE REPORTED AND RECORDED

A report in duplicate shall be sent to the Supervising Officer immediately following a major repair, or repeated breakdowns of service due to system or equipment fault of similar nature, or as and when required by the Supervising Officer.

The report shall include the cause necessitating such a repair, the reason of such a breakdown of service, the time and date that the repair carried out, the remedial actions taken, and the time and

date that normal service is resumed. A list of equipment replaced shall also be attached to the report.

Reports on routine visits are not required to be sent to the Supervising Officer except where it is necessary to draw the attention of the Supervising Officer to the defects that could not be rectified during the routine visit. Each routine or callout visit shall be recorded on a logbook provided by the Employer. This logbook shall be retained in the lift machine room, or a location designated by the Supervising Officer. The format of the logbook is standard for filling the logbook are provided inside the logbook.

c. MAINTENANCE SCHEDULES

The Contractor shall carry out periodic inspections, tests, repairs, adjustments and maintenance of the installation during the Maintenance Period as stipulated in Appendix 1A and, Appendix 1B.

4. Terms &Condition:

- a. The material/parts required for maintenance/servicing from time to time as per schedule A shall be arranged by the contractor at his own cost and nothing extra shall be paid.
- b. The spare parts used for repair/maintenance/servicing of the Elevators and Escalators shall be of original make.
- c. The maintenance/servicing of the Elevators and Escalators shall be done as per guidelines of manual of the manufacturer.
- d. The contractor shall intimate the name/address/telephone number of his own service representative/service Centre with whom complaint is to be lodged in case of breakdown.
- e. All normal/minor complaints shall be attended within 4 hours of lodging complaint however in case of major breakdown the Elevators shall be made operational within 24 hours. However, if the contractor fails to put the Elevator in operation within 24 hours, then the contractor shall be liable to pay compensation @ Rs 5000.00 per day exceeding 24 hours. The minimum unit for deduction shall be one day even if the time is less than 01 (one) day.
- f. The complaints shall be attended on all working days including Saturdays, Sundays, Gazetted Holidays, National Holidays between 7.00 Hrs - 24 Hrs. normally.

5. Manpower :-

Adequate number of persons to the satisfaction of the owner’s site representative shall be provided including relievers.

- i. Statutory requirements of EPF, ESIC and other applicable labour legislations to be complied with; and monthly certification to that effect to be submitted.
- ii Duty allocation and Roaster control shall be tender’s responsibility
- iii No overtime shall be payable by Owner for any reason whatsoever

6. Penalty Clause:

- a. Non Availability of manpower or their absence will attract a penalty as under:
Supervisor: Rs. 300/- per day/ shift
Technician: Rs. 200/- per day/ shift.
- b. If work is not done as per approved schedule or any system is not functioning then a penalty @ rate of Rs. 1000/- per day shall be imposed on contractor for each location separately and will be deducted from the AMC amount due to the tenderer and if unsatisfactory performance is

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continued for more days as felt by Engineer in-charge AMC is liable to be terminated and decision for this shall rest with the Chief Executive Officer, NRDA.

- c. If the tenderer is NOT able to locate and rectify the fault and the reasons attributable to non performance of tenderer as assessed by officials nominated by C.E.O., NRDA, the penalty clause is applicable as follows: System remained non-functional for 2 hours or more. The penalty will be Rs. 1000/- per day.
- d. If tenderer is not able to rectify the fault then the same may be got done through some other agency at the risk and cost of tenderer and amount will be deducted from AMC bill and penalty as stipulated above will also be imposed.

However, the decision of the Chief Executive Officer, NRDA in this regard shall be final and binding.

- e. At the time of attending of the complaint, breakdown, the mechanic of the contractor shall prepare a service report in which he shall clearly mention the fault occurred in the Elevator/Escalator, spare part replaced (name of the spare parts) in his report. The report should have name of the mechanic, date and timing of attending the complaint. In case the service report is not signed by the J.E./Supervisor In-charge, the complaints shall be assumed unattended for which recovery shall be made. One copy of the service report will be handed over to the maintenance wing for record.
- 1. A log book shall be maintained by the contractor to record the behavior of the working of these Elevators/Escalator. Every visit/ repair servicing replacement of any damaged part shall be accorded in the Log Book with the name of mechanic, date and time. The log book will be available in the maintenance department of the hotel.
- f. The spare parts used for replacement shall be got checked from the J.E./Supervisor In-charge before their use.
- g. All unserviceable/replaced parts shall be taken by the contractor at his own cost conditional tenders are likely to be rejected.

APPENDIX 1A

MAINTENANCE SCHEDULE FOR ELECTRIC PASSENGER, GOODS AND SERVICE ELEVATORS

Schedule	Description of Job	Frequency
1	(a) Top up Elevator machine gearbox and lubricate bearings.	Weekly
	(b) Check brake for correct mechanical action. Ensure linings and drums are free from oil or grease. See Note 1	Weekly
	(c) Clean over-speed governor and lubricate.	Weekly
	(d) Inspect bearings of drums, sheaves and pulleys. Lubricate.	Weekly
	(e) Inspect motor/generator/exciter commutators and sliprings operating under working conditions and stationary. Lubricate bearings.	Weekly
	(f) Clean, inspect and adjust controller contacts, interlocks and dashpots. Lubricate. Observe and adjust operation sequence and timing of contactors.	Weekly
	(g) Clean floor selector, check action and adjust. Lubricate drive gear.	Weekly
	(h) Top up counterweight guide shoes lubricators.	Weekly
	(i) Clean up Elevator well as necessary. Clean pit. Inspect condition of Elevator well enclosure.	Weekly
	(j) Clean guides and lubricate where applicable.	Weekly
	(k) Check limit switches, direction switches and their operating devices. Ensure rollers and spindles are free to rotate. Lubricate.	Weekly
	(l) Inspect car exterior and clean car top. Top up car guide shoe lubricators. Inspect tensioning devices for correct adjustment. Clean and inspect door operating gear and check for oil leaks. Lubricate.	Weekly
	(m) Check door locks for safe operation. Ensure rollers and spindles are free to rotate. Lubricate. See Note No. 2.	Weekly
	(n) Check that car and landing doors operate freely and bottom tracks are clear of debris.	Weekly
	(o) Ride in car, observe and record irregularities in starting, stopping and general running.	Weekly
(p) Check for correct operation: - Car controls, car door switches, door re-opening device, emergency stop, alarm bell and intercom system. Inspect condition of car interior and floor covering. Observe leveling accuracy.	Weekly	
(q) Test operation of landing buttons, indicators, and fireman switch.	Weekly	
2	(a) Inspect Elevator machine gearing and bearings. Ensure keys and fixing bolts are secure.	Monthly
	(b) Inspect brake coupling and linings for wear. See that keys and fixing bolts are secure. Check that brake release gear and hand winding wheel are readily available.	Monthly
	(c) Check drums, sheaves and pulleys for visible cracks, ensure keys and fixing bolts are secure. Inspect bearings and sheave grooves.	Monthly
	(d) Check condition of wire ropes. Ensure suspension ropes are evenly tensioned. See Note No. 4.	Monthly
	(e) Inspect over-speed governor for wear. Ensure keys and	Monthly

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NRDA F-1- Schedule-D- Section III-Technical Specification of Works

Design, Supply, Installation, Testing, Commissioning & Maintenance of Elevator and Escalator for office complex building ,retail complex building and Commercial building at Sector -21&24 of Naya Raipur

Schedule	Description of Job	Frequency
	fixing bolts are secure.	
	(f) Extract dust from interiors of motors and generators. Inspect bearings, ensure fixing bolts are secure.	Monthly
	(g) Inspect floor selector bearings. Check connections and flexes. Inspect driving rope, tape or chain for wear and correct tension.	Monthly
	(h) Inspect and operate by hand the slack rope switch, safety-gear switch, broken tape or rope switch and over-speed governor switch.	Monthly
	(i) Inspect guides for wear and ensure fixings are secure.	Monthly
	(j) Check counterweight clearances for rope stretch. Inspect rope equaliser. Ensure main tie bolts are secure. Inspect rope guide shoes for wear and "float". Ensure filler weights are properly positioned and secure. Check safety-gear for guide clearance and free movement.	Monthly
	(k) Open, clean and inspect limit switches, direction switches. Inspect fixed ramps and inductor plates.	Monthly
	(l) Ensure spring buffers are secure. Clean oil buffers and top up. Check for oil leaks.	Monthly
	(m) Inspect conditions of landing and car sill nosings and check car clearance. Inspect lock beaks, door rollers and spindles for wear. Inspect door inter-connecting wires or chains for wear and correct tension.	Monthly
	(n) Ensure car frame bolts are secure. Check guide shoes for minimum "float". Ensure car body is secure in frame. Check safety-gear for guide clearance and free movement. Check tension of safety rope. Inspect door operating mechanism for wear and ensure driving sprockets, keys and fixing bolts are secure. Ensure that the "pick-up" between car and landing doors is correctly aligned. See Note 5.	Monthly
	(o) Open, clean and inspect car controls, floor switches, door switches. Check action of emergency opening and movable floor. Inspect car lighting.	Monthly
	(p) Inspect travelling cables and their anchorages.	Monthly
	(q) Open, clean and inspect landing button boxes and ensure that they and any indicator boxes are securely fixed.	Monthly
3	(a) Open, clean and inspect landing door locks. See Notes No. 6.	Three monthly
	(b) Carry out electrical load test on emergency lighting, batteries and battery charger for a period of 1 hour.	Three monthly
4	(a) Renew wire rope. See Note No. 4.	
	(b) Test safety gear on no load.	(i) After Major repair (ii) Every year
	(c) Test over speed governors and safety gear on full load.	(i) After major repair (ii) Every 5 years

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NOTES TO APPENDIX 1A

The attention of all personnel engaged on lift maintenance services is drawn to the need for the proper observance of all safety rules, regulations and statutory requirements. It is essential that all apparatuses are rendered, and kept, safe during servicing operations. Protective clothing and other safeguards shall be worn or used by the maintenance personnel. All defects in tools, steps, ladders and other items are to be reported immediately and the equipment shall not be used until the fault is rectified.

The lubricants used shall be of the brands and grades recommended by the component manufacturer or their approved equivalents. Ensure adequate lubrication, but avoid excessive. Spillage shall be wiped off. Oily rags or waste shall be removed.

The following items are general guidance for the proper maintenance of the lift installation. These items are by no means exhaustive. The maintenance personnel shall follow all instructions and guideline as recommended by their relevant manufacturer.

- 1. A brake operating solenoid shall be adjusted to the shortest stroke that will expand the brake bands equally with minimum clearance, consistent with free running of the brake drum.
- 2. It is essential that a lift will not operate with a car or landing door open, and that landing doors are kept locked except when a car is standing at that floor.
- 3. (a) Wear on rope grooves of sheaves shall not be such as to cause rope slip.
 - (b) All grooves must be equal, i.e. all ropes shall sit to the same depth. Sheave grooves shall only be allowed to be re-cut once to satisfy the above conditions.
- 4. Wire ropes should be renewed when any one of the following conditions exists:
 - (a) The visible number of broken wires in any length of eight diameters exceeds 10% of the total number of wires in the rope.
 - (b) Where undue stretching occurs after the initial stretch has taken place.
 - (c) There is corrosion/rust.
 - (d) There is birdcaging of strands.
 - (e) The rope has been damaged.
 - (f) The rope is more than six years old.

Wire ropes are well lubricated during manufacture and have a certain amount of reservoir lubricant. If no lubricant is apparent in the interstices between wires, apply a thin coating of a dressing recommended by the rope maker, or approved equivalent, i.e. an acid-free grade material such as petroleum jelly.

- 5. Where a power limiting device is incorporated in the door operating mechanism, it shall, when a door is obstructed, clear of the safety edge, operate at a force not exceeding 150N.
- 6. Door locks are to be examined internally at least once every six months (except if fitted with transparent covers, permitting observation of working parts and no defects are apparent). The opening up and internal examinations are to be carried out in sequence and spread evenly over the period.

Remarks: The word "Door" in the Schedule means any sliding or hinged part which gives access to the car or liftwell enclosure.

APPENDIX 1B

MAINTENANCE SCHEDULE FOR ESCALATORS AND PASSENGER CONVEYORS

Schedule No.	Description of Job	Frequency
1	(a) Check the clearance between the steps/pallets and the skirt guard to ensure adequate clearance.	Weekly
	(b) Inspect bearings of drums, pulleys and all moving parts, Lubricate.	Weekly
	(c) Clean up the machine room as necessary.	Weekly
	(d) Ride in escalator/passenger conveyor, observe whether the operation is normal. Check whether there is undue vibration.	Weekly
	(e) Check for correct operation of all safety devices; i.e. skirt guard safety devices, handrail inlet safety switches, emergency stop buttons, step/pallets chain safety switches, step/pallets safety switches, step/pallets roller switches driving chain safety switches, comb safety switches, etc.	Bi-weekly
2	(a) Check and inspect the main drive system.	Monthly
	(b) Check and lubricate the step/pallets rollers.	Monthly
	(c) Check and inspect the handrail to ensure adequate tightness and proper functioning. Clean the inside surface of the handrail.	Monthly
	(d) Check and inspect the control box.	Monthly
	(e) Check and record the braking efficiency.	Monthly
3	(a) Check the landing comb for completeness.	Three monthly
	(b) Check the lubricating pump to see if there is enough lubricating oil. Check the quality of lubricating oil.	Three monthly
	(c) Check and clean the motor gear box.	Three monthly
	(d) Check the lighting system	Three monthly
4	(a) Remove all steps/pallets and clean the rail.	Bi-yearly
	(b) Check for correct operation of the current overload and safety switches and non-reversal switches.	Bi-yearly
5	(a) Replace all the lubricating oil.	5-yearly

NOTES TO APPENDIX B

The attention of all personnel engaged on escalators/passenger conveyors maintenance services is drawn to the need for the proper observance of all safety rules, regulations and statutory requirements. It is essential that all apparatuses are rendered, and kept safe during servicing operations. Protective clothing and other safeguards shall be worn or used by the maintenance personnel.

All defects in tools, steps, ladders and other items are to be reported immediately and the equipment shall not be used until the fault is rectified. The lubricants used shall be of the brands and grades recommended by the component manufacturer or their approved equivalents. Ensure adequate lubrication, but avoid excessive. Spillage shall be wiped off. Oily rags or waste shall be removed.

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SCHEDULE– D
Section-IV
Special Conditions of Contract

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Special Conditions of Contract

1. GENERAL

The Special Conditions of Contract are to be read in conjunction with General Conditions of Contract. If there are any variations or discrepancies or conflicting provisions, the provisions in Special Conditions shall take precedence over the provisions in the General Conditions of Contract.

All additional facilities/equipment/ office etc to be provided by the contractor, as mentioned in the tender, document outside the BOQ shall not be paid separately, and shall be deemed to have been included in the rates quoted by the contractor.

2. ACCESS

The Contractors are to verify the work site details including:-

- a) Access,
- b) Availability of water supply and electrical energy,
- c) Space for dumping stores and materials and
- d) Space for erection of site office,

The Contractors are deemed to have catered for all contingencies connected with the site, access, water & electricity.

3. SUPPLY OF WATER

Water will not be supplied by NRDA and the Contractor shall make his own arrangements. NRDA will give recommendatory letter to the concerned authority if so requested by the Contractor. However, NRDA shall be in no way responsible for obtaining permission and no claim on account of this will be entertained.

4. ELECTRIC SUPPLY

- (a) Electric power both for construction and lighting shall not be made available to contractor. Contractor shall arrange at his own cost power with necessary switch boards, energy meter etc. and shall be responsible for their maintenance.
- (b) Further distribution by the Contractor at his cost shall be done as per approved layout. He shall provide required clearances for overhead lines to facilitate easy movement of heavy machinery such as cranes etc. These shall be shifted and rerouted at Contractors cost during execution of work if the same are found to obstruct any other work of any agency working at site or requires shifting due to unforeseen reasons.
- (c) On completion of the work the Contractor shall remove all wiring installed by him and make good to the satisfaction of Engineer if any disturbance or damage is done.
- (d) The Contractor shall employ an Electrical Agency as approved by the Engineer for carrying out this work.
- (e) The Contractor has to keep alternative arrangement ready at his own cost for any failure/interruption of electric power that takes place and under no circumstances can this be deemed to be reason for any consequential delay in the works.
- (f) Any disputes in sharing of power obtained directly/ indirectly from CSPDCL with other agencies shall be resolved by the contractor at his risk and cost. NRDA shall not be responsible or a party for such disputes.

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5. DEFECT LIABILITY

The Contractor shall be responsible for rectification of defects, during the defect liability period as per clause 17 of GCC after the certified date of completion by the NRDA. This period shall be known as Defects Liability period as defined in CL. No. 17 of the General Conditions of Contract. Subsequent to the taking over of the works and after it has been in use, its removal/correction of defects would be the responsibility of the Contractor. Any defects or failures during this period shall be rectified by Contractor within one week of intimation in writing. If the same is not carried out in the stipulated time, NRDA shall have the right to get it repaired departmentally or through any other agency, entirely at the risk and costs of the Contractor as detailed in the GCC clause. No. 17.

6. SAMPLES**6.1 Material**

(a) The Contractor shall furnish to Engineer for approval, with reasonable promptness and with reasonable time for consideration, adequate numbers of samples of all the materials to be used in the work, irrespective of whether material/product is from approved list given in tender. He shall permit and account for all costs in his quotation toward supply, testing, examination at site or at any approved place by the Engineer. The choice of approval of materials rests with NRDA unless otherwise specified.

(b) All material samples shall be delivered to the Engineer's office at the Contractor's cost. Each sample shall be in duplicate and properly labelled as under-

- Name of Project
- Name of Contractor
- Name of Product
- Name of Manufacturer
- Item reference of BOQ
- Date of Submission

(c) Samples shall be accompanied with technical specifications/ catalogues/ test results of manufacturer.

(d) In case the Contractor intends to keep an approved sample in his possession, he shall submit additional set of samples for Engineer's approval.

6.2 Standards of Acceptability

(a) In order to establish the standards of acceptability for materials and finishes, the Contractor shall finish in all respect a mock up for one span which include 2 no pole foundation, laying of HDPE pipe between these foundation. The material used in this shall be as approved and special attention shall be paid to establish the workmanship and finishing standards to be achieved for the project.

(b) The Contractor shall give notice in writing in this respect and shall obtain approval through Engineer in Charge from the CE NRDA. Approval should be taken well in advance so as not to delay execution of work.

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7. TESTING OF MATERIALS IN OTHER LABORATORY

As a valedictory measure, 10 % (ten percent) of the samples shall be sent for testing in one of the following laboratory:-

- i) Chief Engineer (PWD) Laboratory, Raipur
- ii) National Institute of Technology, Raipur
- iii) Govt. Engineering College, Raipur
- iv) B.I.T., Durg
- v) Sriram Test House N. Delhi
- vi) National Test House N. Delhi
- vii) Any NABL accredited lab

7.1 In case, certain testing facility for typical/ special materials are not available in Chhattisgarh, then it can be tested at a recognized laboratory anywhere in India.

7.2 All testing charges for the above shall be borne by the Contractor. The charges i.e. travelling, boarding & lodging of Inspecting officer shall also be borne by the contractors as per class I officer of Govt of CG. In case, the testing charges demanded by the testing authorities is not paid by the Contractor within 15 (fifteen) days, then the same will be paid by NRDA with due recovery from the Contractor's bill for the project.

8. CRECHE FACILITIES FOR THE CHILDREN OF CONSTRUCTION LABOURER

Contractor undertakes to provide creche facilities for the children of construction labour through a volunteer agency within one month from start of work. The facility is open to children of construction labourers employed by the Contractor. In case the Contractor fails to provide this facility within stipulated time, following charge shall be levied on the Contractor.

Range of Contract Amount	Amount of Creche fund
Upto Rs. 50 lacs	Nil
Above Rs. 50 lacs to Rs. 5 Crores	Rs. 50000/-
Above Rs. 5 Crores	Rs. 5 lacs.

8.1 The amount shall be recovered if such facility is not provided by the Contractor from running account bills in one or more instalments but not exceeding 6 (six) instalments.

8.2 If the facility is provided after 3 months 50% of the amount shall be refunded to the contractor, after 6 months 25% will be refunded.

9. SUBMISSION OF DETAILED BAR/ PERT CHART OF COMPLETION

The Contractor shall, within the stipulated time in Tender, submit to the Engineer for his approval a detailed programme covering-

- a) Descriptive note explaining sequence of various activities.
- b) Network (PERT/ CPM), bar chart.

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- c) Programme for supply of working drawing.
- d) Phased requirements of plant and equipment to be deployed by the Contractor.

10. Method of Working

After Contract award and before starting Work at the site, Contractor, NRDA's representative/ Engineer shall together make a thorough survey of the grounds where Work under this Contract will occur and areas to be used as access ways to the Work areas. Contractor shall list, and photograph, if Contractor desires, existing conditions not requiring alterations, shall note discrepancies between Drawings and existing conditions, and shall designate areas of storage and routes of access agreed upon by NRDA.

The Contractor shall, within the stipulated time in Tender, submit to the Engineer for his approval the following information,

- a) A general tentative plan of construction plant and equipment for the execution of work within time period stipulated in schedule.
- b) Layout and details of temporary works that the Contractor wants to carry out to fulfill his obligation under the contract.
- c) Indication of shuttering system to be followed.

11. Project Monitoring

- 11.1 Within 7 (seven) days the Engineer shall give their approval to proceed with the work, with or without modification. However acceptance of programme and method of working as submitted by the Contractor or with any modification there to in the opinion of the Engineer, shall not relieve the Contractor of any of his contractual obligation.
- 11.2 All these programmes and plans submitted by the Contractor and approved by the Engineer shall become part of the contract.
- 11.3 The acceptance of programmes as submitted by the Contractor or with any modification thereto in the opinion of the Engineer, shall not relieve the Contractor of any extension of time unless delay, if any, is expressly sanctioned by the Engineer.
- 11.4 **Construction Photographs-**
A General: Contractor will provide construction photographs taken, developed, printed, and mounted by a recognized commercial photographic studio or reputable photographer acceptable to Owner, in the number and type and at construction stages enumerated below:-
 - (i) Before Starting Work: Have photographs taken at site from different points of view sufficient in number to show site (and conditions at existing structures) but not fewer than 25 photographs.
 - (ii) During Progress of the Work: Have not fewer than 10 photographs taken at least once a week from points of view (both inside and outside), as necessary to show progress of construction and site development for each part of the

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Work. Co-ordinate taking photographs with utility Work and back filling. Photograph each buried utility line before back filling. During later stages of the Work, have photographs taken from suitable locations inside the building showing the progress of various stages of the Work, such as piling, centering, reinforcement, water proofing, concreting, etc. Size of photographs will be 125 mm X 250mm. Photographs shall be supplied with negatives/ CD to the Engineer. Each photograph shall be attached with date of photograph and location of work. These photographs shall be from location as fixed by the Engineer at start of work

12. QUARRY RELATED DEDUCTIONS

The royalty for Minor minerals used in the work like murrum, stone metals, sand, rubble etc. will be levied as per prevailing practice in PWD of Chhattisgarh and shall be recovered suitably through R.A./ Final bill and will be kept in deposit. The above royalty charges kept under deposit shall be refunded as soon as the Contractor submits relevant NOC from Collector, Raipur, Chhattisgarh.

13. CONTRACTORS ALL RISK POLICY (C.A.R. POLICY)

The successful Contractor shall take out a C.A.R. policy from any approved company by IRDA India. Chhattisgarh Govt., administered by Directorate of Insurance. The policy so obtained shall cover the entire period of construction (including all extensions) and also shall cover the defects liability period. The policy shall be for the total contract amount including cost of free supply material by NRDA, if any. All amounts/ charges towards premium etc. on this account shall be borne by the Contractor.

14. INDEMNITY BOND

The Contractor shall require to execute an Indemnity Bond for satisfactory performance of the entire project on stamp paper of Rs.100/- (Rupees Hundred only) in the format approved by the NRDA. This Indemnity Bond shall remain in force for the Defect Liability period after completion of the project to be furnished in contract form E of GCC.

15. ACCIDENTS

Should any accidents, fatal or otherwise occur, a detailed report about the same shall be made promptly by the Contractor to the Engineer. The Contractor should at all times during execution of work keep the NRDA fully indemnified against all risks, claims, litigations and financial burdens arising out of all incidental operations on work and accidents.

16. TRAFFIC

The Contractor shall have to make all necessary arrangements for regulating traffic day and night during the period of construction and to the entire satisfaction of the Engineer. This includes the construction and maintenance of diversion, if necessary, at no extra cost to the NRDA. The Contractor shall provide necessary caution boards, barricades, flags and lights, watchmen etc. so as to comply with the latest Motor Vehicle Rules and Regulations and for traffic safety. The Contractor shall be responsible for all claims for the

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accidents which may arise due to his negligence whether in regulating traffic, in stacking materials on the road or by any other reason. The contractor must comply with the following:-

- A. General: Plan and control use of site and access to site in co-operation with Owner and other contractors working at site to minimise disruption of use of other facilities; portions of buildings and site areas affected by this Contract and to remain in use; and the work of other contractors.
- B. Temporary Access Drives: Construct on the premises as necessary, and maintain in good usable condition; remove when no longer needed. Until permanent improvements have been completed, when necessary to prevent excessive dust, periodically water temporary unpaved access roads.
- C. Construction Site Access: Use most direct route from public streets as agreed to by Owner. Construction traffic elsewhere on Owner's property is prohibited.
- D. Driveways Between and Around Combustible Storage Piles: Maintain at least 15 feet wide and free of accumulation of rubbish, equipment, and materials.
- F. Access for Fire-Fighting Equipment: Maintain.
- G. Access: Refer to other sections for requirements to keep access to site and buildings open to Owner, other contractors, and fire-fighting equipment.
- H. Use of Streets and Sidewalks on Public Property: Make arrangements with authorities having jurisdiction for use. Restrictions shall be those of the Municipal Authorities. Be solely responsible for adherence.
- J. Roadways, Driveways, and Walkways: Where outside indicated Contract limit on Owner's property and on public property, keep open to pedestrian and vehicular traffic at all times. When temporary closing of a roadway, driveway, or walkway is absolutely unavoidable, provide alternative access routes. Such temporary closings shall be approved by Owner in each case and shall be for the shortest possible time. Strictly adhere to requirements of governmental authorities having jurisdiction.
- K. Parking: Owner will issue temporary parking permits for use by construction personnel and will make available, at the location shown. Construction personnel shall not park in any other location on Owner's property, even when bearing permits. Access to allocated parking spaces shall be by most direct route from public streets. Construction personnel shall not drive vehicles elsewhere on Owner's property and shall take the most direct pedestrian way along walks and roadways (not on lawns) from parking lot to construction site.
- L. Barricades and Signs: Should barricades or directional signs for traffic control be necessary, prepare and install such signs and barricades of approved size, colour, and lettering or other markings. Remove signs when no longer needed, or at Substantial Completion, whichever is latest.
- M. Restricted Use of Premises: Enforce Contract requirements, local ordinances and Owner's instructions pertaining to signs, fires, smoking, trucking, parking, and other use of premises.
- N. On-Site Storage:-
 - 1 General: Extent of Work and site area available limits amount of on-site material and equipment storage. Do not unnecessarily encumber job site with excess materials or equipment and means of delivery of materials, equipment, and supplies, removal of rubbish, and, hours

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Signature of NRDA.....

during which deliveries may be made. Determine, and take into account in the Work, limitations on storage space and of times, rates, and means of deliveries to and removals from the job site whether such limitations are imposed by laws, rules, ordinances, or physical conditions. Owner will not pay extra amounts due to such limitations. Co-ordinate arrangements for delivery and storage of materials.

2 Paved Areas: Do not use paved areas on Owner's property to stockpileexcavated materials or to store construction materials except where shown. Use of paved areas on public property is subject to requirements of authorities having jurisdiction, and arrangements for such use are solely Contractor's responsibility.

3 Protection and Repair: Protect roadways, walks, and other permanent site improvements, and access ways subject to damage. Satisfactorily repair improvements and surfaces damaged during construction operations, or remove damaged improvements or surfaces and provide new acceptable improvements or surfaces. Except where new Work is required, return areas used for temporary access to original condition.

17. ALIGNMENT AND BENCH MARKS

The alignment of the work to be carried out under the contract shall be marked on the ground as per the drawing and as per the instructions of the Engineer. For the purpose of facilitating the work, the series of temporary bench marks on masonry pillars will have to be established. These pillars will be constructed along with the alignment and such other locations as may be initiated by the Engineer. The temporary bench-marks shall be established for the work line-out and its connections to other proposed roads in Naya Raipur using the DGPS instrument and Total Station software. All expenses involved in the process of marking alignment on ground, checking the alignment, constructing masonry pillars in establishing bench marks thereon, shall be borne by the Contractor. It will be responsibility of the Contractor to ensure that the masonry pillars so constructed are notdamaged during the period of work in progress.

18. PREVENTION OF MOSQUITO BREEDING AT CONSTRUCTION SITE

The Contractor shall on the respective construction site install mosquito proof and accessible water storage tanks or to cover/protect the present waterstorage tanks properly. The Contractor shall periodically give larvaecidal treatment to water storage tanks, sites of water stagnation, water collection.

Any expenditure that may be incurred by NRDA to ensure that the above conditions are fulfilled by the Contractor will be debitable to Contractor's account and will be recovered from the bills of the Contractor from time to time.

19. INSPECTION OF SITE AND SUFFICIENCY OF THE TENDER

If the NRDA is not in a position to deliver to the Contractors the site of the Contract work for any reason whatsoever at the agreed time, delaying the commencement of the contract work, or part thereof not beyond 50 % (fifty percent) of contract period for completion, such omissions of the NRDA shall not be breach of any its obligations under the contractor and the Contractor shall not

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be entitled to claim from the NRDA for loss or damage, if any, caused thereby, but shall be entitled to a reasonable extension of the period agreed for the completion of contract work. If the contractor shall be obstructed in the execution of the work by any person other than an agent or servant of the NRDA, the Contractor shall exclusively deal with such set by the due process of law but shall not be entitled to attribute thereby the breach of any obligation under the contract to the NRDA compensation for damage or loss, if any, thereby suffered but shall be entitled to an appropriate extension of period agreed for the completion of the contract work, provided that the contractor has reported to the NRDA every such act of obstruction with particular soon after its occurrence and the NRDA has after enquiry found the same to be substantially true and has determined the duration of such obstruction.

20. PROGRESS OF WORK

The Contractor shall carry out the work as per the programme approved by the Department from time to time. He will also not be allowed to proceed with the work in a scattered manner.

21. ENGINEER

21.1 Engineer for this project shall be the Engineer or the person nominated or appointed by NRDA from time to time and shall include any person duly authorised by them.

21.2 Engineer shall be responsible for the execution of the project with regards to management and supervision. Instructions issued by the Engineer to the Contractor shall be deemed to be the Employer's instructions in respect of-

1. Day to day supervision including material testing using ISO formats proforma of which should be got approved from Engineer.
2. Approval of material and workmanship using ISO formats proforma of which should be got approved from Engineer.
3. Matter of urgency involving safety or protection of person or property.
4. Monitoring progress of work using System Application of Projects (SAP). (Refer 3.5 hereunder).
5. Interpretation of drawings
6. Interpretation of specifications
7. Issue of additional drawings
8. Certification of measurements and bills and issue of certificates accordingly for interim and final bills.

22.3 Engineer shall hold fortnightly progress meetings at site for evaluation and execution of works. The Contractor shall assist in providing revised programmes, cash flow charts in the format required by Engineer/ NRDA.

22.4 The Engineer shall coordinate works at site of all agencies appointed by the Employer.

22. EXCAVATED OBJECTS

All the materials obtained during the process of excavation shall remain the property of the NRDA and shall be disposed off as instructed by the Engineer. The Contractor is supposed to use the selected materials for filling. All operations including loading,

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unloading, transportation of materials where required with all leads and lifts and handling them and leveling at disposal site etc., shall be included in the quoted cost and no extra payment whatsoever shall be made to the Contractor on the account.

23. AS BUILT DRAWINGS

The Contractor shall during the course of execution, prepare and keep updated a complete set of 'as- built' drawings recording all works on the blue prints, which shall be corrected daily, if necessary, to show each and every change from the Contract Drawings as a approved working drawings, shop drawings and the exact 'as-built' location, sizes and kinds of work etc. This set of drawings shall be kept on the site and shall be used for record purposes. Changes recorded shall be countersigned by the Engineer and the Contractor. Copies of 'as-built' drawings shall be supplied to the CE), NRDA/ and the Engineer on request.

The Contractor shall submit complete 'as-built' drawings on reproducible tracings and ammonia prints 10 (ten) sets in form of hard copies and Compact Discs 2 nos. for building work and all services as directed by the Engineer within 30 (thirty) days of the completion of entire work by using AutoCAD facility. Maintenance manuals and original warranties shall be submitted at the time of submitting the As-built drawings. In case the Contractor fails to submit complete 'as-built' drawings as aforesaid [in form of hard copies [10 (ten) sets] and Compact Discs [2 (two) nos.], he shall be liable to pay a sum equivalent to 0.1 percent of the value of work subject to maximum of Rs.10 lakhs (Rupees ten lac only) or as may be fixed by NRDA and this decision shall be final and binding. Pre-final & Final Bill shall not be released until all the as-built drawings are submitted & approved.

24. ENGINEER'S SITE OFFICE

Deleted

25. TRANSPORTATION

Deleted

26. PROVIDING COMPUTER & OTHER EQUIPMENTS AT SITE OFFICE

Deleted

27. TELEPHONE CONNECTION

Deleted

28. TIME SCHEDULE FOR COMPLIANCES

The tenderers should please note the following time schedule for various compliances and follow the same:

- a) The Initial Security Deposit shall be paid within 15 (fifteen) days of receipt of Letter of Acceptance.

The Contractor should construct the site office within 1 (one) month of date of work order. The site office should be as per relevant clause in the tender document.

The CAR policy and Labour license shall be taken by the Contractor within 1 (one) month from the date of work order.

Signature of Contractor.....

Signature of NRDA.....

29. APPROVAL OF ENGINEER

The foundation strata as well as steel reinforcement provided in all RCC members shall be got approved from the NRDA/ Engineer or his authorised representative. At every stage of work, approval of the Engineer shall be taken by the Contractor. Before starting any work like concreting, laying of DWC HDPE pipe, cables, Pole erection and installation of feeder pillar etc. detailed information of the work in the prescribed proforma shall be given to the Engineer and his approval shall be taken by the Contractor. It is the responsibility of the Contractor to get all the hidden measurements like foundation work, reinforcement, etc. recorded before covering the same. All the measurements shall be taken jointly by NRDA's representative and the Contractor's authorized representative and then only the measurements will be forwarded by the Engineer, who will forward it for payment to Chief Executive Officer, NRDA through Chief Engineer, NRDA and directions on any matter whether mentioned explicitly or otherwise.

30. PERMISSION FOR CONSTRUCTION OF SITE OFFICE/ GODOWN/ LABOUR HUTS:

The Contractor shall be permitted to construct temporary structures such as site office, godown, labour huts, Engineer site office, etc. on the land of NRDA within 1 Km radius of site.

The Contractor will have to submit requirement of land for Godown/ Labour Camp/ Batching Plant etc. with logistic layout in Technical Bid. The land shall be provided to the Contractor on Lumpsum lease rent of Rs. 100/- (Rupees Hundred only) per year with Lease Agreement as per prevailing NRDA format. However the Contractor shall require permission of NRDA for erecting site office, labour huts. In the event the Contractor fail to remove site office/ godown and labour huts from the land immediately after construction is over, NRDA will charge rent as per the rules prevalent at the time. No final bill payment shall be made, unless the site is cleared by the contractor in all respects.

The Contractor shall number the structures and display name of the Company, period for which permission is granted, etc. at such approved sites.No final bill payment shall be made unless the site is cleared in all respects by the Contractor.

31. CONDITIONAL TENDER

The Tenderer shall note that the clarifications shall be obtained in the pretender meeting and the tender should be submitted without any conditions, whatsoever. Clarifications given to the various tenderers in the pre-tender meeting would be summarized by NRDA and would be issued to every tenderer as "Minutes of Pre-Tender Meeting". The same will be binding on all the tenderers irrespective of whether they have attended the pre-tender meeting or not. The Minutes of the Pre-Tender Meeting would form part of the Contract Agreement and the Tenderers should submit the Financial Offer taking into consideration the same. The Tender submitted with conditions would be summarily rejected.

32. SITE ORDER BOOK& OTHER BOOKS REQUIRED

The Engineer will maintain Site Order Book at the site of work. The Contractor or his authorized representative shall sign all the instructions received therein, in token of having received the same and shall comply with them forthwith.

All other books of record at site shall have to be maintained as required in the CPA Code of works.

Signature of Contractor.....

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33. POURCARD SYSTEM

Pour card system/RFI system to be introduced for approval of individual activity. Format to be got approved from engineer before start of work

34. CLEANING OF SITE

- a) All water which may accumulate on the site during the progress of the works or in trenches and excavation shall be removed from the site to the satisfaction of the Engineer at the Contractor's cost. Site shall be maintained free from rubbish. Proper stacking of scaffolding material, shuttering material bricks/ brickbats, steel pieces, etc. needed for work on day to day basis shall be organized in proper stacks. Heaps of material lying around in unplanned manner and disorderly fashion shall not be permitted. Engineer's decision in this matter shall be final.
- b) The Contractor shall not, at any time, do cause or permit any nuisance on the site or do anything which shall cause unnecessary disturbance or inconvenience to Employer, tenants or occupiers of other properties near the site and to the public in general. The Contractor shall install mosquito proof and accessible water storage tanks for construction and drinking water.
- c) The Contractor shall periodically give largasidal treatment to water storage tanks, sites of water stagnation, water collection.
- d) Prior to handing over the contractor shall appoint Professional Cleaning Agency to clean the building works prior to handing over. The Agency shall have minimum 5 (five) years prior experience in the hospitality industry and shall be appointed with the prior approval by the Engineer.
- e) Any expenditure that may be incurred by NRDA to ensure that the above conditions are fulfilled by the Contractor will be debitable to Contractor's account and will be recovered from the running bills of the Contractor from time to time.
- f) Cleaning: Remove staining or reactive materials from new surfaces immediately during course of the Work.
- g) Debris: Remove hazardous accumulations of debris promptly, at least daily.
- h) Dust: Confine dust producing operations during painting and finishing. Vacuum immediately after completion.
- i) TRASH DISPOSAL
- j) General: Keep new buildings and site free from accumulations of waste materials.
- k) Removal: Remove cartons, crates, wrappings, lunch trash, and other trash from each room daily. Provide trash receptacles on each floor of each building and in convenient locations on the site.
- l) Burning: Do not burn trash or other materials on Owner's property.
- m) EXCESS MATERIAL: General: Remove excess materials, including demolished materials, excess earth, and excess building materials from Owner's property and dispose of legally.
- n) Clean: Keep paved drives on Owner's property and public streets and alleys clean, by cleaning daily, or more often if necessary, of earth and debris spillage from trucking involved in construction operations.

Signature of Contractor.....

Signature of NRDA.....

35. FENCING

During the construction, care shall be taken so that, areas around are not polluted and where required Hessian cloth shall be tied around, while work is in progress. Further, it is obligatory on the part of the Contractor to fence the area allotted and earmarked by NRDA for labour camp, batching plant of the Contractor within a month of issuance of work order. The temporary fencing shall be provided in the area as directed by Engineer using vertical blinds using corrugated GI sheets about 3m high with necessary metal frame work and staging to cordon off the view of the premises. The Contractor shall maintain the fencing properly throughout the construction period.

36. WATCH AND WARD

The Contractor shall make necessary watch and ward arrangement for a period of three months from the date of total completion of work. No claim shall be paid to the Contractor towards the watch and ward during this period.

Protection General Requirements:

- a) **Laws:** Comply with applicable laws, ordinances, rules, regulations, and orders of authorities having jurisdiction for safety of people and protection of property from damage, injury, or loss.
- b) **Responsibility:** Be solely responsible for initiating, maintaining, and supervising safety precautions and programs concerning Project security, but obtain Owner's approval of methods to be used and location of safeguards. Submit to NRDA, through Engineer, drawings and written description of methods and devices Contractor intends to use and do not begin Work at the site until such means and methods are mutually agreed on by Owner and Contractor.
- c) **On Public Property:** In addition to other means used in the interest of safety or security, comply with the requirements of governmental agencies having jurisdiction
- d) **Safeguards:** Erect and maintain, as required by conditions and progress of the Work, necessary safeguards, for safety and protection, including temporary fences, guards, railings, barricades, canopies, lighting, shoring, directional and danger signs, signals, and other warnings against hazards.
- e) **Security:** Protect and secure the site, new materials and equipment from theft and damage by whatever reasonable means are effective. Use methods such as the following, singly or together: locks, fences, signs, patrols, radio, alarms, locked storage on-site, and off-site warehousing.
- f) **Wall Closures:** Unless other acceptable means are provided, provide temporary closures for openings in walls along adjoining to make the building and site secure. Secure temporary closures when Work is not in progress using suitable means such as dead bolts inaccessible from the public side or locks or padlocks construction master keyed in accordance with Section, "Finish Hardware."
- g) **Entrances:** Do not block entrances to premises to remain in use or in any way inhibit access to them.
- h) **Design Live Loads:** Do not permit placing materials or equipment on new to exceed design load of structure or endanger structure or people.
- i) **Trenches:** Do not permit trenches to remain open for prolonged periods without adequate board covering or fencing.
- j) **Broken Glass:** Be responsible for glass broken during construction period; at completion,

Signature of Contractor.....

Signature of NRDA.....

replace broken glass.

- k) **Weather Protection:** During construction, provide protection against weather (rain, wind, storms, frost, or heat), and maintain work, materials, apparatus, and fixtures free from damage. At end of each workday, cover new work likely to be damaged.
- l) **Dust:** Take precautions necessary to keep Work under this Contract and adjoining property reasonably free of dust.
- m) **Protection of Construction Materials:** Refer to other specification sections for specific requirements.
- n) **Materials Hoist:** Do not permit transporting of people on materials hoisting facilities.
- o) **Removals:** Except for fences, remove temporary construction and protection specified in this section promptly when no longer needed and when removal is approved.
- p) Maintain temporary fences until date of Substantial Completion, unless approval is obtained for earlier removal; then remove the temporary fence.
- q) **Damaged Site Improvements:** Repair and restore to condition at beginning of construction, or better, existing site improvements, such as pavements, curbs, buildings, fences, lawns, plantings, and lighting which are not to be removed under this Contract but are damaged or defaced by Contractor's operations, except where new Work is required by the Contract.
- r) **First Aid Equipment:** Provide at the site. Also provide continually available trained and qualified personnel to render first aid when needed.
- s) **Emergency Signs:** Provide signs posted at telephones listing telephone numbers of emergency medical services, physicians, ambulance services, and hospitals.

37. **MOBILISATION PERIOD**

This clause shall be read in continuation of Clause No 10 (B) (ii) of GCC. No mobilization advance shall be given by NRDA.

38. **METHOD OF CARRYING OUT THE WORKS**

The Contractor shall, within 15 (fifteen) days of receipt of the Employer's order to commence work under respective clause of General Conditions of Contract submit for his approval a detailed programme and statement with drawings and diagrams showing how he proposes to carry out the works based on the tender programme. The statement shall describe the methods to be employed in carrying out the works, the Constructional Plant and temporary works which the Contractor intends to supply or use and shall include a list, classified into trades of labour force envisaged. The programme shall give the estimated dates on which the various sections of the works will commence together with the estimated date of completion and estimated output so that the whole of the works may be completed within the Contract Period.

- a) In addition, the Contractor shall submit to the Engineer drawings and full particulars of Temporary Works he intends to construct at least 8 (eights) days before he intends to commence such works. The Engineer may require modifications to be made if he considers the proposals to be insufficient and the Contractor shall give effect to such modifications at his own cost but shall not be relieved of his responsibility for the sufficiency thereof.
- b) The Contractor shall prepare a detailed survey of existing services on the

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Signature of NRDA.....

- site which he shall clearly mark up on a drawing for the approval by the relevant service authorities prior to commencement of the works.
- c) The Contractor is to progress the works thoroughly and to take such action as is necessary in order to ensure that the approved programme is strictly adhered to in all its stages. The Contractor shall submit detailed programmes of the various sections of the works as and when required by the Engineer, the Contractor shall take all precautions and cover all contingencies to ensure that adequate spare equipment and materials are available at all times to ensure completion of this work in accordance with the agreed programme.
 - d) The acceptance of programmes as submitted by the Contractor or with any modification thereto, in the opinion of Engineer, shall not relieve the Contractor of his responsibility to complete the work within period specified in as per Annexure 'A' unless extension of time limit is expressly sanctioned under respective clause of standard General Conditions of Contract or Special Conditions of Contract.
 - e) The Contractor shall prepare the CPM programme on computer and the same to be monitored by proper installation of PC and printer facilities at the site.
 - f) The bills shall be on computer and the programme will incorporate the deductions of Mobilisation Advance and other items.

39. CONTRACTOR RESPONSIBLE FOR SUFFICIENCY OF MEANS EMPLOYED

The Contractor shall take upon himself the full and entire responsibility for the sufficiency of plant, centering, scaffolding, timbering, machinery, tools or implements and generally for all means used for the fulfilment of the Contract. In the event of any of these means proving insufficient, the Contractor is still fully and entirely responsible for the sufficiency of these means notwithstanding any previous approval or recommendation that may have been given by the Engineer.

40. DRAWINGS

The Contractor will receive from the Engineer, 2 (two) prints of the tender drawings listed hereof, together or thereafter with any further drawings issued for Road and Electrical System. Working drawings shall be progressively issued as per the approved construction schedule submitted by the contractor & approved by NRDA.

41. STANDARDS

In various places throughout this specification and the bills of quantities, reference is made to the standards, specifications and byelaws issued by the Indian Standard Institutions and other similar organizations. These references shall in every case be deemed to include the latest edition or issue of such standards, specifications and byelaws including all revisions, amendments and addendum subsequently issued. Where materials are not specified and standard exists in respect of such materials, then the materials shall in all respects comply with relevant and current I.S.I. In such cases where I.S.I. do not exist, the best

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manufacturers' specification shall be followed; in absence of all these, Engineer's instruction shall be followed.

42. SUPERVISORY STAFF (As per clause 36 (i) of schedule F of the tender)

The Contractor shall engage on the work a qualified and experienced Engineers, Supervisor, capable of managing and guiding the work properly as detailed in Cl36(i) of schedule F of the tender Form F-1. This supervisor shall be authorized by the Contractor in writing to receive the orders issued by the Engineer from time to time. The Contractor shall be responsible for carrying out these orders promptly.

43. FIRE PRECAUTIONS

The Contractor shall comply with fire regulations of the controlling authority in force at the site of the works relating to the precautions to be taken against fire hazards.

44. USE OF SITE

The Contractor shall not use any portion of the site for purpose not connected with the works without the prior written approval of the Engineer. He shall maintain permanent and site access roads free of spillage and shall not interfere with the flow of traffic. Also same shall apply to terraces and other developed areas. This clause shall be read in conjunction with clause no. 15 of the Special Conditions of Contract.

45. SAFETY ENGINEER

The Contractor shall employ and depute at site on full time basis a fully qualified Safety Engineer(s) who shall be responsible to ensure observance of safety precautions and measure required to be taken at site. Further he shall make sure stipulations laid down in safety code as provided in GCC.

46. QUALITY ASSURANCE MANUAL AND SAFETY MANUAL

Successful tenderers will be required to submit Quality Assurance Manual and Safety manual made as per applicable specification for various items of work and get the same approved from Engineer before start of work and the adhere the same during actual execution of work.

i. Quality Assurance Manual (QAM)-

A quality assurance manual constituting a base document outlining quality policy of the agency, procedures, name of action, compliance, acceptance criteria and documentation etc. Shall be prepared by the successful tenderer and submitted to the Engineer for approval within 15 (fifteen) days from the date of receipt of work order. The QAM shall be prepared in such a way that it follows all the applicable specifications. The document shall generally cover aspects listed below, but not limited to the same.

Scope of work

Signature of Contractor.....

Signature of NRDA.....

- a) Planning for items to be executed including method statement and resource deployment both physical and financial.
- b) Identification of all parties involved in QA and their inter-relationship.
- c) Execution plan of QualitySystem giving reference - standard - frequency and acceptance criteria.
- d) Levels of cross checking/ verification in case of multiple verifications/ controls, including systems of inspection and audit, wherever applicable.
- e) Organization of personnel, responsibilities and lines reporting for QA purpose.
- f) Testing and statistical analysis.
- g) Inspection reports at the end and during defect liability period/ maintenance period.
- h) Items to be covered for maintenance manual,
- i) Check list viz. Forms and formats.

ii. Inspection of Works at Factory/ Workshop

For any visits that maybe necessary for the purpose of performance of testing, inspection of factory made goods/ equipments, at a location other than the site ,or Raipur, the actual cost of travel (to & fro airfare/ train A/c 1st class), boarding & lodging, local transport & per diem (per person per day) costs at the rate of Rs. 3000 (Rupees three thousand only) for any visit made by officials from NRDA/ PMC/ Architect/ Consultant (maximum 3 (three) persons per instance), shall be borne by the Contractor. Such visits may be necessary for the inspection of transformers, RMUs, GSM base street light automatic control system, cable, pipes, lighting fixtures and DBs etc. that require inspection prior to shipping from the place of its manufacture. Any other item which is required to be tested before being processed/ fabricated in the factory, such visits shall require the prior written approval from the NRDA.

47. QUALITY ASSURANCE SYSTEM

A quality assurance procedure covering all aspects of the work shall be adopted for this work to ensure the desired quality. Details of the procedure shall be decided by mutual consultation between the Engineer and the contractor at the start of the works.

- a) The contractor shall submit within the time stipulated by the Engineer in writing, the details of actual methods that would be adopted by the contractor for the execution of any item as required by the Engineer at each of the locations, supported by necessary detailed drawings and sketches including those of the equipment and machinery that would be used, their locations, arrangements for conveying and handling materials etc., and obtain prior approval of Engineer well in advance of starting of such item of work.
- b) The Engineer reserves the right to suggest modifications or make complete changes in the methods proposed by the contractor, whether accepted previously or not, at any stage of work, to obtain the desired accuracy, quality safety and progress of work which shall be binding on the contractor and no claim on account of such change in method of execution will be entertained by the Employer so long as Specifications of the items remains unaltered.
- c) The Contractor shall furnish within the period of 15 (fifteen) days a detailed programmed schedule using PERT/ CPM technique in quadruplicate including

Signature of Contractor.....

Signature of NRDA.....

the date of actual start, the monthly progress expected to be achieved and the anticipated completion date of each major item of work to be done by him, also indicating, plant and machinery and material procurement schedule.

- d) The schedule is to be such as is practicable of achievement towards the completion of the whole work in the time limit and of the particular items, if any, on the due date specified in the contract and shall have the approval of the Engineer. No revised schedule shall be operative without such acceptance in writing. The Engineer is further empowered to ask for more detailed schedule or schedules say weekly for any item or items, in any case of urgency of work as will be directed by him and the contractor shall supply the same as and when asked for.
- e) The contractor shall furnish sufficient plant, equipment and labour as may be necessary to maintain the progress schedule. The working and shift hours for operations to be done under.
- f) Further, the contractor shall submit the progress of work in forms and statements etc. at periodical intervals in the form of progress charts, forms, statements and/ or reports as may be approved by the Engineer.
- g) The contractor shall maintain proforma, charts, details regarding machinery, equipment, labour, materials, periodical returns thereof as may be specified by the Engineer.

48. EQUIPMENT MAINTENANCE MANUAL

The Contractor shall mention the list of machinery procured at site for the work in this manual. This manual shall also reflect the name of the manufacturer, age of machinery and the agency entrusted with the maintenance work of the machinery listed in the manual.

49. MINIMUM PLANTS,EQUIPMENTS AND SHUTTERING

Delete

50. SUBMITTALS:

Unless otherwise specified or directed by NRDA, the Contractor shall submit to NRDA for his review and approval all Co-ordinated services drawings, shop drawings, samples, materials lists, equipment date, instruction manuals, record documents, manufacturers' equipment manuals, design calculations for proprietary items of work, technical submittals, and other information required by the Contract Documents. Submittals and their contents including deviation shall be properly prepared, identified, and transmitted as provided herein or as the Owner may otherwise direct. Except for record documents and instruction manuals for operation and maintenance, submittals including deviation shall be approved before the material or equipment covered by the submittal is delivered to the site. The contractor shall furnish an authority if required from material suppliers.

51. PLANT, MACHINERY AND SHUTTERING

The contractor is required to submit details of plants and machineries to be deployed by him in a Proforma indicating all details such as make, year of manufacture, registration etc be submitted. The details are to be provided with in 10 days after award of contract.

Signature of Contractor.....

Signature of NRDA.....

52. SUB-CONTRACTORS

All **specialised** works will be carried out by licensed (where applicable) sub contractors approved by NRDA.

- i. It may be noted that the contractors will have to submit credential of the selected contractors to NRDA for approval.
- ii. It may further be noted that even if the contractor has in house licensed subcontractors for these works, they will have to select and engage contractors with prior approval of NRDA.
- iii. All specialists, merchants, tradesmen and other agency executing any work or supplying and fixing any goods which items have been included in the Schedule of Quantities and/ or Specifications or for Extra/ Substituted items of works, who may be nominated or selected by the Engineer/ Contractor are hereby declared to be Sub-contractors employed by the Contractors. No nominated Sub-contractor shall be employed on or in connection with the works against whom the contractor shall make reasonable objection or (save where the Engineer and contractor shall otherwise agree) who will not enter into a contract provided:
 - 1. That the nominated sub-contractor shall indemnify the Contractor against the same obligations in respect of the sub-contractor as the contractor is under in respect of this contract.
 - 2. That the nominated sub-contractor shall indemnify the Contractor against claims in respect of any negligence by the Sub-contractor, his servants or agents or any misuse by him or them or any scaffolding or other plant, the property of the Contractor or under any Workmen's Compensation Act in force.
 - 3. That the nominated sub-contractor shall submit his bills to the Contractor.
 - 4. That the Contractor shall make payment to the nominated Sub-Contractor within 3 (three) days of the Contractor's receipt of the payment from NRDA against the Engineer certificates of payment providing that before any Certificate is issued, the Contractor shall upon request, furnish to the Engineer proof that the nominated sub-contractor's accounts included in previous certificates have been duly discharged in default whereof NRDA may pay the nominated Sub-contractors upon a certificate of the Engineer and deduct the amount thereof from any sums due to the Contractor. The exercise of this power shall not create privity of contract as between NRDA and Sub-Contractors.
 - 5. The Engineer in his absolute discretion may recommend payment to the nominated Sub-Contractor directly by NRDA and deduct the amount thereof from any sums due or which may become due to the Contractor or recover the same amounts from the Contractor.
 - 6. **No Labor contracts shall be permitted.**
 - 7. Prior approval of the Sub-contractor by the NRDA is mandatory.
 - 8. Required 2 No. of contractors as choice would be of NRDA
 - 9. Further sub-contracting/ sub-letting of the work shall not be permitted.
 - 10. NRDA shall not permit under any circumstances Assigning, Transferring or Subletting of entire work or substantial part of work to be executed under this contract. If the Contractor attempts or assigns, transfers and sublets the entire or substantial work, the contract shall be terminated by the NRDA without prejudice to any right or remedy which shall have accrued or shall accrue thereafter to the NRDA.
 - 11. The Contractor shall not be permitted to give power of attorney for executing the work to any other agency or person on their behalf. The power of attorney for executing the work shall only be given to regular employee of the agency with prior approval of NRDA.

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iv. ESSENTIAL CONDITIONS FOR ELETRICAL WORKS:-

1. The Sub-contractor for carrying out the electrical works under the contract should strictly be in accordance with the above criteria.
2. All above referred works will have to be carried out under the supervision of Engineer.
3. Power supply distribution scheme given in tender document is only for guideline purpose. However, successful agency will be responsible for obtaining necessary sanctions to over all power supply distribution scheme, from CSPDCL/ applicable local authority and Engineer before starting execution of work. No extra charges will be paid for obtaining necessary approvals/ sanctions to power supply distribution scheme sanctioned by concerned power supply authority CSPDCL/ applicable local authority, successful agency will have to take up and complete the work accordingly.
4. Successful agency will have to obtain the required approvals to the total electrical works such as, LT distribution, etc from CSPDCL/ applicable local authority/ concerned power supply authority, Electrical Inspector, authority or any other statutory body at their own cost before starting execution of the work and the original sanctions obtained should be submitted to NRDA's concerned Electrical Division before execution of the work. Any statutory cost for obtaining the approval will be reimbursed on production of original receipts.
5. The electrical works under the scheme should be carried out strictly in Co-ordination with the concern CSPDCL/ applicable local authority and necessary approvals should be obtained from time to time.
6. Activity Bar Chart and the makes of material should be submitted for electrical works for necessary approvals from the competent authority from NRDA before execution of the work and work should be started only after the approvals.
7. It will be the agency's responsibility to obtain the following listed documents from CSPDCL/ applicable local authority. Electrical Inspector authority and other concerned Statutory Body towards completion of the work at their own cost, without which work will not be treated as completed.
 - a) Sanction papers for the total external electrification works along with BOQ of material, demand note for supervision charges, if any.
 - b) Charging permission of the installation.
 - c) Inspection report of the various equipments & material supplied under the electrification work certified by CSPDCL/applicable local authority and NRDA authorities.
 - d) Manufacturers test certificates and guarantee certificates in original for all the equipments and material supplied for execution of electrification work under the scheme.
 - e) As Built drawings as stated Volume I showing all the details and certified by CSPDCL, Electrical Inspector authority (along with soft copy).
 - f) Earth test report for the total installation.
 - h) Work completion report from CSPDCL/ applicable local authority for the total electrification work should be submitted.
 - i) Separate guarantee should be submitted to NRDA against the electrical works carried out under the scheme, for a period of 24 (twenty four) months including defects liability period in order to avoid any inconvenience under the scheme and also to attend any defects in installation during this period.

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k) All material & equipments to be supplied under this contract shall be offered for inspection at the manufacturing place. No material shall be supplied by the agency without the clearance from the Engineer.

9. The total electrification work under the scheme will have to be carried out as per the terms & conditions mentioned in various sections of the Tender Document.

10. Electrical works under the contract will not be treated as completed unless and until above listed activities are completed by successful agency.

53. Subject work is strictly to be completed within stipulated work completion period and in accordance with the activities listed below completely as per the directives from Engineer. The charges and the expenses for completing the following listed activities should be included in the quoted offer and no separate payments against this will be made.

1. Successful agency will have to obtain and submit the Contractor All Risk Insurance Policy (CAR) in original within 1 (one) week from date of work order from Director of Insurance, Government Insurance Fund, Raipur, Chhattisgarh. The Contractors All Risk (CAR) Policy as said above shall be inclusive of insurance coverage under workman's compensation insurance policy for all workmen employed by contractor to complete the works covered under present contract. Further the contractors All Risk Policy period completely as stated in the tender. In case of time period extension (If any), it is essential that, premium of CAR policies should be timely paid by agency in order to ensure the continuity of CAR policy without any break in the same, suitable action will be taken against defaulters as per General Conditions of Contract unless and until the Contractors All Risk Policy as stated in above manner is submitted to the office of Engineer no payments will be released against any work executed.

2. Obtaining necessary scheme sanctions in detail towards execution and completion of subject work in all respect, from concerned CSPDCL/ applicable local authority. This activity includes required co-ordination and follow-up with concerned CSPDCL/ applicable local authority for obtaining necessary scheme sanctions. The scheme sanction should be inclusive of specifications and required layout and other drawings etc. completely as per the requirement.

The payment towards the supervision charges of CSPDCL/ applicable local authority shall be paid directly to CSPDCL/ applicable local authority on behalf and in the name of NRDA by the agency.

The original scheme sanctions along with original certified drawings, specification details, quotations, payment receipt against supervision charges etc. should be submitted to the Engineer.

The supervision charges paid in the name of NRDA as mentioned above shall be reimbursed on submission of original payment receipts.

3. If required, preparation and submission of execution drawing in co ordination with concerned planning authority of NRDA by engaging Govt. approved Surveyor for confirmation and marking of proposed cable routes, location of control pillar, existing services along the proposed route under the present contract as per the sanctioned scheme obtained from CSPDCL Reports and marked computerized plans duly certified by surveyor in 3 sets of should be submitted after carrying out the details survey as mentioned above.

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4. Obtaining necessary road/ soil/ footpath etc. cutting permission for cable trenching from concern authorities like NRDA/ CSPDCL/applicable local authority/ RMNN/ PWD etc. as applicable along the approved route and submit the approval in original along with the drawings and permission to Engineer.
- The charges required for obtaining the approvals and permission as mentioned above should be directly paid on behalf and in the name of NRDA by the agency.
- The charges paid in the name of NRDA as mentioned above shall be reimbursed on submission of original payment receipt to the Engineer
5. Preparation and submission of shop/ execution drawing to Engineer for approvals. Submitting list of Makes of various items and material to be used under present contract for approvals.
- The Contractor or his qualified engineer having updated technical knowledge for execution of the subject work should invariably remain present and co-ordinate during every inspection and testing programme at manufacturers works, similarly during every joint site visits and when required.
7. After supply of material at site, all the documents such as delivery challan, excise gate pass, material test report (in original), etc. should be submitted to Engineer for obtaining installation clearance.*
- The complete work under the present contract shall be carried out with required supervision, stage-wise inspection from concerned authority of CSPDCL/ applicable local authority & Electrical Inspector authority in co-ordination with Engineer complete with required power shutdowns. The record of all inspection and shutdowns shall be submitted to Engineer.
8. The execution work of cable trenching/ foundation for poles/ foundation of feeder pillar/excavation and trenching in all types of surfaces rocks, soils etc. shall be carried out as per approved route plan by using appropriate tools and machines in close co-ordination with concerned authorities from NRDA, CSPDCL/ applicable local authority, etc. completely as per the requirement so as to avoid the damages to the existing services.
9. Obtaining clearance certificate from concern authority of NRDA, RNN, PWD, CSPDCL/ applicable local authority, etc. as applicable, towards completion of re-surfacing work of cable trenches, excavated surfaces and removal of debris and submission of this clearance certificate in this regard obtained from concerned authorities to Engineer.
- * In absence of activity No. 1 & 15 above, the payment towards cable trenches erection and installation will not be released.
10. Arranging and carrying out pre & post testing and commissioning of the completed installation in presence of Engineer, his representative and the representative of any other statutory authorities like CSPDCL/ applicable local authority & Electrical Inspector etc. as required.
11. Excess saving statement as per final execution of work, item wise measurement break up in detail and escalation claim as applicable along with detail calculations and copies of confirmed indices etc. to be submitted to Engineer.

It is mandatory to complete all the activities listed above from Sr.No.1 to 11 for releasing the final payment.

Signature of Contractor.....

Signature of NRDA.....

- 54.** Following conditions are the essential conditions of contract for carrying out and completing the subject work in all respect within stipulated time period. The successful agency will be responsible for completing the same as per the directives of Engineer. The charges and expenditure if any required for completing the same should be including in the quoted offer, and no separate payments against this will be made.
1. The contractor shall visit the site to access the actual quantum of work and period required for completing the same before quoting the offer.
 2. Scheme specifications and quantity of the material to be used for the subject work under the contract and specified in the tender document is only for guideline purpose. However it will be the responsibility of the successful agency to obtain the measurements and specifications in detail of each and every item before starting the execution of work and complete the work in accordance with the approvals, clearances obtained for the same. All cost required for completion of work as per statutory approval, shall deemed to have included in the offer quoted.
 3. The foundation and excavation for feeder pillar and control pillar, grouting of frames in wall/ ground etc, are require to be carried out by the agency, and cost for the same shall be include in the offer quoted.
 4. It will be Agency's responsibility to obtain necessary sanctions and permissions by paying necessary charges towards;
 - a) Obtaining necessary scheme sanctions and permissions for completing the subject work in all respect from any concerned statutory authority.
 5. The successful agency will be completely responsible for accidents occurred if any during the execution of work as well as during 24 (twenty four) months defect liability period under this contract. It will also be the responsibility of agency, for making police complaints against any thefts and accidents etc. under intimation to NRDA.
 6. Charges against following listed activates should be included in the quoted offer itself and no separate payments will be made against same.
 - a) Arranging and carrying out the material inspecting at respective manufactures unit as stated in Annexure - I.
 - b) Arrangements for performing site visits and other connected activities as and when required by Engineer or his representative.
 - c) Carrying out necessary co-ordination and follow up with concern authorities for obtaining necessary sanctions and permissions as required towards completion of work in all respects.
 - d) Appointing Govt. approved surveyorfor carrying out site survey and preparation of computerized shop drawing, Execution drawing, As built drawing etc. with soft copy.
 - e) Any other incidental charges required towards completion of work in all respect.
 5. Bills submitted against the executed and completed works at site, will be processed further by Engineer, after necessary scrutiny and verification.
- 55.** The services/ tasks/ works as referred to under clauses shall be suitably applicable to all Utility services executed by the contractor, whetherspecifically mentioned herein above or no.

Signature of Contractor.....

Signature of NRDA.....

56. Safety, Security and Protection of the Environment

The Contractor shall, throughout the execution and completion of the Works and the remedying of any defects therein:

- (a) have full regard for the safety of all persons entitled to be upon the Site and keep the Site (so far as the same is under his control) and the Works (so far as the same are not completed or occupied by the Employer) in an orderly state appropriate to the avoidance of danger to such persons,
- (b) provide and maintain at his own cost all lights, guards, fencing, warning signs and watching, when and where necessary or required by the Engineer or by any duly constituted authority, for the protection of the Works or for the safety and convenience of the public or others, and
- (c) take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation.

57. HANDING OVER PROCESS:-

The handing over process shall be based on a performance comprising individual activities. The process shall be approved by the Engineer.

58. EROSION AND SEDIMENTATION CONTROL

- i. **General:** Prevent pollution of land, air, and water; control erosion, washout, and surface runoff of earth and stockpiled materials. Preclude sedimentation in general and especially in existing on-site and public storm-water system and public right of way.
- ii. **Procedures:** Perform erosion, sedimentation and temporary storm-water control. Follow procedures stipulated in local laws and regulations and as shown on Sitework drawings.
- iii. **Maintenance:** Maintain controls in place until permanent controls are functioning. Remove when no longer needed.

59. NOISE AND VIBRATION CONTROL

Noise and Existing Building Structure Vibration Generated by Construction Procedures, Equipment, Tools, and Operations: Keep to minimum practicable during demolition and removal from building and site, including loading and removing storage containers. Equipment generated noise levels shall not exceed the following in decibels:-

- 1. Concrete mixer: 85
- 2. Concrete pump: 82
- 3. Crane: 83
- 4. Materials elevator: 85
- 5. Pumps: 76
- 6. Generators: 78
- 7. Compressors: 81
- 8. Pneumatic tools: 86

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- 9. Saws: 78
- 10. Vibrators: 76
- 11. Other tools: 85

- i. Operation of Air Hammers, Compressors, and Reciprocating Equipment: Not permitted inside existing buildings unless specifically approved in writing by Owner.
- ii. Laws: Comply with applicable noise control laws, ordinances, and regulations.
- iii. Acoustical Enclosures: Stationary equipment may be enclosed to produce required sound attenuation subject to continued maintenance of such enclosures to ensure that specified sound levels are not exceeded.
- iv. Violations: Where field sound measurements reveal sound levels exceeding those specified, cease operating such equipment and repair or replace it with equipment that complies with the sound levels specified.
- v. Cutting and Drilling Concrete: Use only rotary or core drilling for holes through concrete. Do not use impact tools to cut or otherwise remove concrete or to install inserts.
- vi. Power-Activated Tools: Not permitted in or immediately adjacent to existing buildings, except with Owner's written approval in each specific case, except where such use is specifically specified.

60. EXISTING CONDITIONS

- i. Contractors Examination of Site:-
 - 1. By executing Contracts, Contractor and subcontractors represent that they have:
 - a. Visited the site and made due allowances for difficulties and contingencies;
 - b. Compared Contract documents with existing conditions and informed themselves of conditions to be encountered, including work by others, if any, being performed; and
 - c. Notified Architect of ambiguities, inconsistencies, and errors they have discovered within Contract documents or between Contractdocuments and existing conditions.
 - 2. Failure to visit the site and become familiar with conditions shall not relieve Contractor or a subcontractor from furnishing materials or equipment or completing the Work in accordance with Contractdocuments at no additional cost.
 - 3. Contractor or subcontractors will not be given extra payment for Work related to conditions they can determine by examining the site and Contract Documents.
 - 4. Contractor or subcontractors will not be given extra payment for work related to ambiguities,inconsistencies, or errors within Contract documents, or between Contract documents and existing conditions, when such ambiguities, inconsistencies, or errors are known to Contractor or subcontractor before Contract execution unless Contractor or subcontractor has notified Architect in writing of such condition before execution of Agreement Between Owner and Contractor.
- ii. Make use of public property and make arrangements for that use. No extracompensation will be paid due to costs associated with using public

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- property.
- iii. Access by Contractor to portions of Owner's property beyond the actual area of Work under this contract is denied, except where necessary to perform the Work, and then only with specific written approval in each case. Refer to other sections for additional requirements.
 - iv. Contractor shall accept the site in the condition in which they exist at the time Contractor is given access to begin the Work.
 - v. Damage caused by Contractor to existing structures, grounds plants, pavements, utilities, work by others, fixtures, or furnishings, shall be repaired by Contractor and left in as good condition as existed before the damaging, unless such existing work is shown to be removed or replaced by new Work.
 - vi. Immediately upon entering the site for purposes of beginning Work, locate general reference points and take such action as is necessary to prevent theirdestruction; lay out Work and be responsible for lines, elevations, and measurements, and Work executed under this Contract. Exercise proper precautions to verify figures shown on Drawings before laying out Work. See Section "Field Engineering" for additional requirements.
 - vii. Contractor and each subcontractor, before starting work, shall verify governing dimensions at the premises, including floor elevations, floor-to-floor heights, and column locations and shall examine adjoining Work on which Contractor's or subcontractor's Work is in any way dependent. No "Extra" or additional compensation will be allowed on account of differences between actual measurements and dimensions shown. Submit differences discovered during the Work to Architect for interpretation before proceeding with associated Work.
 - viii. Employment of local labour shall be given priority wherever possible. However,
 - ix. this shall not in anyway affect/ dilute the Contractors obligations listed within the Tender document.

61. LAMINATION OF DRAWINGS

All drawings issued to site shallbe kept in lamination condition.

62. Handing Over:

At the time of handing over after completion of work, all the equipment, spare including standby equipment etc. must be in good working order as were taken over before commencement of defect liability period.

63. Penalties for failure toachieve the functional guarantees during Defect liability Period

In case of failure to deliver the required quality of work, liquidated damages shall be imposed for such failure to meet the performance criteria, as described below. The Employer will be entitled to recover any such damages from Maintenance bill, the security deposits of the contractor or any other sun due to him.However, the contractor shall be allowed to take up routine/ periodical maintenance as per IS guidelines and mentioned in technical specification.

Non redressel of any complaint or instruction given in writing by NRD/NRDA authorized representative within 4 hours: Penalty @ Rs. 5000.00 for each such complaint.

Signature of Contractor.....

Signature of NRDA.....

64. PAYMENT

This clause shall be read in continuation of Clause No 7 of GCC, payment schedule for SITC work is as below in percentage cost of the total cost quoted for the item:-

Sr. No.	Particulars	Payment In %	Cumulative Payment in %
a.	As advance against receipt of bank guarantee(as per approved proforma) for equivalent amount	5%	5%
b.	On approval of Shop drawings	5%	10%
c.	After delivery of all items at site	65%	75%
d.	After Installation, testing and commissioning at site	10%	85%
e.	For I st year Maintenance period @ 0.75% for each quarter	3%	88%
f.	For II nd year Maintenance period @ 1.25% for each quarter	5%	93%
g.	For III rd year Maintenance period @ 1.75% for each quarter	7%	100%

65. ORDER OF PRECEDENCE

In case of any discrepancy between the items mentioned in the BoQs/Specifications/Drawing, the Order of precedence should be as follows:

- i. Item details as mentioned in the BoQs, read along with the specification shall prevail. However in case of conflict specification shall hold good.
- ii. Drawings.

Signature of Tenderer
Date :

For
Chief Executive Officer,
4th floor, Paryawasbhawan, Sector-19,
Naya Raipur 492002, Chhattisgarh.
Date :

Signature of Contractor.....

Signature of NRDA.....

SCHEDULE– D
Section-V
List of Approved Makes

Signature of Contractor.....

Signature of NRDA.....

NRDA” APPROVED MAKE LIST FOR ELEVATOR/ESCALATOR

1. OTIS
2. JHONSON
3. THYSSEN KRUPP
4. MITSUBISHI
5. SCHINDLER
6. HITACHI

Note:- Wherever makes have not been specified for certain items conform to **IS**, the same shall be as per BIS and as per approval of NRDA

Signature of Contractor.....

Signature of NRDA.....

SCHEDULE- D
Section – VI
Drawings

NOT APPLICABLE

Signature of Contractor.....

Signature of NRDA.....

SCHEDULE- E

Reference to General Conditions of contract.

Signature of Contractor.....

Signature of NRDA.....

SCHEDULE-E

Reference to General Conditions of contract

Name of Work: “Design, Supply, Installation, Testing, Commissioning & Maintenance of Elevator and Escalator for office complex building ,retail complex building and Commercial building at Sector -21& 24 of Naya Raipur”.

Estimated cost of work : Rs. **2023.64 Lacs**

(i) Earnest Money : Rs. **21.00 Lacs**

(ii) Performance Guarantee : 5% of tendered value

(iii) Security Deposit : 5% of tendered value

Signature of Contractor.....

Signature of NRDA.....

SCHEDULE- F

General Rules & Directions

Signature of Contractor.....

Signature of NRDA.....

SCHEDULE-F

GENERAL RULES & DIRECTIONS: Officer inviting tender

Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clauses 12.2 & 12.3:

See below

Definitions:

2(v)	Engineer-in-Charge	Executive Engineer (EEE), NRDA or Any Officer Appointed by CEO, NRDA
2(viii)	Accepting Authority	Chief Executive Officer, NRDA
2(x)	Percentage on cost of materials and Labour to cover all overheads and profits:	15 %
2(xi)	Standard Schedule of Rates	CG SoR with Updated Amendments
2(xii)	Department	Naya Raipur Development Authority

Clause 1

- (i) Time allowed for submission of Performance Guarantee from the date of issue of letter of acceptance **7 days**
- (ii) Maximum allowable extension beyond the period provided in (i) above **7 days**

Clause 2

Authority for fixing compensation under clause 2 **CEO, NRDA**

Clause 2A

Whether Clause 2A shall be applicable **NO**

Clause 5

Number of days from the date of issue of letter of acceptance for reckoning date of start **15 days**

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Mile stone(s) as per table given below:-

Milestone will be governed as per work schedule submitted by the tenderer on award of work and approved by NRDA

Sl. No.	Description of Milestone (Physical)	Time allowed in days(from date of start)	Amount to be with-held in case of non achievement of mile stone
1.		NA	
2.		NA	
3.		NA	

Time allowed for execution of work

5 months including Rainy Season

Authority to decide:

- (i) Extension of time **CEO, NRDA** (Engineer in Charge or Engineer in Charge of Major Component in case of Composite Contracts, as the case may be)
- (ii) Rescheduling of mile stones **Chief Engineer (Engineering)**

Clause 6, 6A

Clause applicable - (6 or 6A)

6A

Clause 7 Payment on intermediate Certificate to be regarded as Advances :-In addition to Clause No 7 of GCC, payment schedule for SITC work is as below in percentage cost of the total cost quoted for the item:-

Sr. No.	Particulars	Payment In %	Cumulative Payment in %
a.	As advance against receipt of bank guarantee(as per approved proforma) for equivalent amount	5%	5%
b.	On approval of Shop drawings	5%	10%
c.	After delivery of all items at site	65%	75%
d.	After Installation, testing and commissioning at site	10%	85%
e.	For I st year Maintenance period @ 0.75% for each quarter	3%	88%
f.	For II nd year Maintenance period @ 1.25% for each quarter	5%	93%
g.	For III rd year Maintenance period @ 1.75% for each quarter	7%	100%

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Signature of NRDA.....

Clause 10A All the materials as per contract and as per details specified in Clause 21 F1 , Schedule D – Section IV Special conditions of contract.

1. 2. 3.
 4. 5. 6.

Clause 10B(ii)

Whether Clause 10B (ii) shall be applicable **NO**

Clause 10C

Component of labour expressed as percent of value of work **Not Applicable**

Clause 10CA Not Applicable

Sl. No.	Material covered under this clause	Nearest Materials (other than cement, reinforcement bars and the structural steel) for which All India Wholesale Price Index to be followed	Base Price of all Materials covered under clause 10 CA*

* Base price of all the materials covered under clause 10 CA is to be mentioned at the time of approval of NIT.

Clause 11

Specifications to be followed for execution of work **Tender specification attached with Tender document, CPWD, MORTH, CPHEEO and relevant IS Specifications.**

Clause 12

- 12.2. & 12.3 Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for building and allied infrastructure work..... **25%**
- 12.5 Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for foundation work..... **25%**

Clause 16

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Competent Authority for deciding reduced rates. **Chief Engineer (Engineering), NRDA**

Clause 18

List of mandatory machinery, tools & plants to be deployed by the contractor at site:-

As per relevant Clause of Special Conditions of Contract

Clause 36 (i): Minimum Technical Representative(s) and recovery Rate

Sl. No.	Designation (Principal Technical/ Technical Representative)	Discipline	Designation (Principal Technical/ Technical Representative)	Number	Educational and Relevant Experience	Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of clause 36(i)
1	Graduate Engineer (Electrical Engg.)	Electrical	Project Manager	1	8	2500/day/head
2	ElectricalEngineer	Electrical	Senior Engineer	1	5	2500/day/person
3	Diploma Engineer	Electrical	Site Engineer	2	3	1000/day/person

Assistant Engineers retired from Government services that are holding Diploma will be treated at par with Graduate Engineers

Clause 42

- (i) (a) Schedule/statement for determining theoretical quantity of cement & bitumen on the basis of C.G.S.O.R

Not Applicable

- (ii) Variations permissible on theoretical quantities:

Signature of Contractor.....

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- (a) Cement
For works with estimated cost put to tender not more than Rs. 5 lakh. 3% plus/minus.
For works with estimated cost put to tender more than Rs.5 lakh. 2% plus/minus.
- (b) Bitumen All Works 2.5% plus & only & nil on minus side.
- (c) Steel Reinforcement and structural steel sections for each diameter, section and category 2% plus/minus
- (d) All other materials. Nil

RECOVERY RATES FOR QUANTITIES BEYOND PERMISSIBLE VARIATION

Sl. No.	Description of Item	Rates in figures and words at which recovery shall be made from the Contractor	
		Excess beyond permissible variation	Less use beyond permissible variation
1.	Cement	NA	NA
2.	Steel Reinforcement	NA	NA
3.	Structural Sections	NA	NA
4.	Bitumen issued free	NA	NA
5.	Bitumen issued at stipulated fixed price	NA	NA

Signature of Contractor.....

Signature of NRDA.....