



NAYA RAIPUR DEVELOPMENT AUTHORITY

**Tender Document for the
Comprehensive Annual Maintenance Contract of CCTV &
FDA System at Mantralaya, Naya Raipur
(Following Three-Envelope Tender Procedure)**

TENDER DOCUMENT (PART ONE)

NIT No. : 82 /MA/CCTVFDA/EC/SE(E)/CE(E)/NRDA/2016-17

Dated: 22.06.2016

Issued by: Chief Executive Officer,
Naya Raipur Development Authority (NRDA)
1st Floor, Utility block, Capitol Complex, Sector- 19,
Naya Raipur- 492 002, Chhattisgarh
Tel No: + 91 771 2511500; Fax No.: +91 771 2511400.
Website: www.nayaraipur.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 (Turn Key Works)

- 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 Work Experience
- (v) Declaration
- (vi) Check list for Technical tender evaluation
- (vii) Integrity Pact
- (ix) Undertaking

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://nayarapur.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')

Signature of Contractor.....

Signature of NRDA.....

 <p>nayaraipur नया रायपुर</p>	<p>NAYA RAIPUR DEVELOPMENT AUTHORITY 1st Floor, Utility Block, Capitol Complex, Sector- 19, Naya Raipur- 492 002, Chhattisgarh. Tel No: + 91 771 2511500; Fax No.: +91 771 2511400. Website: www.nayaraipur.gov.in</p>
Tender Notice	
NIT No: 82 /MA/CCTVFDA/EC/SE(E)/CE(E)/NRDA/2016-17 Dated:22/06/2016	
<p>Sealed tenders are invited from OEMs or their authorized channel partner, for the work of “Comprehensive Annual Maintenance Contract of CCTV and FDA System at Mahanadi Bhawan, Naya Raipur”. Estimated cost of tender is 25.0 lakhs with EMD of 0.5 lakhs for a time period of 12 months.</p> <p>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 15.07.2016. Amendment in tender, if any, will only be uploaded on the website and shall not be published in any newspaper.</p>	
नया रायपुर – मेरा रायपुर	Chief Executive Officer

NAYA RAIPUR DEVELOPMENT AUTHORITY (NRDA) RAIPUR, CHHATTISGARH

DETAILED NIT

NIT No: 82/MA/CCTV/CoEI/SE(E)/CE(E)/NRDA/2016-17, Naya Raipur

Dated: 22.06.2016

Last date and time for submission of tenders: 15.00 hrs on 15.07.2016

- Tenders are invited in the prescribed tender documents by the Chief Executive Officer, Naya Raipur Development Authority (NRDA), Raipur Chhattisgarh from eligible contractors who fulfil the prequalification criteria.
- The detailed NIT is as under:-**

Name of work	Comprehensive Annual Maintenance Contract of CCTV and FDA System at Mahanadi Bhawan, Naya Raipur
Estimated Cost (INR in Lacs)(12 months)	25
EMD (INR in Lacs)	0.50
Time Period	12 months
Cost of Tender (In INR)	2,000.00
Tender to be uploaded on NRDA website to enable download	23/06/2016
Last Date and time of submission of Tender	15/07/2016 at 15.00Hrs
Date and time of opening of Tender	15/07/2016 at 16.00Hrs

- Intended eligible Tenderers may obtain further information from the office of Employer and inspect the Tender Document at, NRDA Raipur from 11 AM to 4 PM on all working days.
- Pre Qualification Criteria** -To be eligible under the contract, the intending tenderer should meet the following mandatory criteria **4.1 and 4.2 (A & B)**:

4.1 Financial Criteria

Average Annual Turnover: Minimum average annual gross turnover of the bidder shall be **INR 25 lakhs** during any three complete financial years out of FY (i.e. 2012-13, 2013-14 , 2014-15 & 2015-2016) can be considered . (Audited balance sheet duly signed by CA and notarized should be enclosed).

Annual turnover is total certified payments received for contracts in progress or 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 those three(3) years, along with the Tender. Where necessary, the Employer can make enquiries with the Tenderer's Bankers.

Signature of Contractor.....

Signature of NRDA.....

4.2 Technical Criteria

A	Intending tenderer shall be either the Original Equipment Manufacturer of CCTV cameras and FDA Systems OR an Authorized Channel Partner of the Original Equipment Manufacturer of <i>CCTV cameras and FDA Systems</i> . In case if the Tenderer is not an Original Equipment Manufacturer itself, it shall submit an undertaking from Messrs. Honeywell Automation India Ltd. (OEM of <i>CCTV cameras and FDA Systems installed at Mantralaya</i>) in the attached format. (SCHEDULE–D Section -I Technical Tenders Forms/(ix) Undertaking)
AND	
B	Intending tenderer should have completed satisfactorily following works during last seven years i.e after 31/05/2009, in any Government body or Public Sector Undertaking or reputed Private Organization as below: - (a) One Similar work costing not less than INR 20 lacs OR (b) Two Similar work costing not less than INR 12.5 lacs

Note: -

- a) *Similar work shall mean a project consisting of Comprehensive Annual Maintenance Contract of CCTV cameras and FDA (Fire Detection and Alarm) devices including control room, necessary hardware like detectors, repeater panels, control cards of main panels, junction boxes etc., necessary software, cabling, power supply arrangements etc. within any building/campus or similar institution.*
- b) *The Original Equipment Manufacturer of the existing CCTV & FDA Systems at Mahanadi Bhawan, Naya Raipur is Messrs. Honeywell Automation India Ltd.*
- c) ***In case if the Authorized Channel Partner of OEM of CCTV Cameras and FDA Systems is bidding, he shall satisfy the work experience criteria mentioned at B ON HIS OWN.***
- d) ***For this 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.***
- e) *Ongoing project / part project experience shall not be considered for evaluation.*
- f) *For the benefit of the intending tenderers a checklist is enclosed at Schedule-D (vi), for the documents to be submitted along with tender.*

Certificates:

- a) All tenderers should submit Commercial tax certificate, balance sheet with profit and loss statement for at least 3 years and Undertaking (in case of Authorized Channel Partner of OEM of CCTV Cameras & FDA Systems).
 - b) The tenderers shall also submit satisfactory work 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 the rank of General Manager in case of public sector or the rank of General Manager in private sector as the case may be.
 - c) In case of work experience in private sector organization, the prospective bidder shall also submit the copies of TDS Certificate issued by the private company to prove the payment made in respect of that work. This shall be in addition to the work completion certificate.
 - 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.nayaripur.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 2 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 2 above.

Signature of Contractor.....

Signature of NRDA.....

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 duly mentioned in the top the name of work, NIT No. and firm address.**

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 (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.

After technical evaluation, date and time of opening of price bid shall be communicated by NRDA to the successful tenderer in technical evaluation. The Price tenders of only the tenderer found qualified as per the PQ criteria shall be opened in presence of the tenderer who wish to be present. The Contract shall be awarded to the tenderer whose tender has been determined to be the lowest evaluated as per tender conditions.

7. All Tenders must be accompanied with the
- 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**
 - 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.
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.

Signature of Contractor.....

Signature of NRDA.....

- (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. Pre tender meeting with the tenderers will be held as mentioned above in the Office of **Chief Executive Officer**, NRDA, and Raipur. Tenderers are advised to participate in the pre-tender meeting. The intending tenderers are advised to send their queries to NRDA either by post or by email to ceo@navaraipur.com and cee@navaraipur.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
Opp. Police Station, Near Water Tank, VIII, New Rakhi, Naya Raipur-492015, Phone: 0771-4066189
 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, 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.
 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 tenderer 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 details for commencement of

Signature of Contractor.....

Signature of NRDA.....

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:-

- a) 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
 - b) 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.
 - c) 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:
- a) if there is a discrepancy between words and figures, following procedure shall be followed:
 - i. the unit price which correspond to the total price for the item worked out by the Tenderer shall be followed;
 - ii. 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.
 - 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.

Signature of Contractor.....

Signature of NRDA.....

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 set 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/ Spiral binding** 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.
 - 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
1st Floor, Utility block, Capitol Complex,
Sector- 19, Naya Raipur- 492 002, Chhattisgarh
Tel No: + 91 771 2511500;
Fax No.: +91 771 2511400.

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).

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(i) Letter of Technical Tender

Date: _____

NIT No.: _____

To:

Chief Executive Officer,
1st Floor, Utility block, Capitol Complex,
Sector-19, Naya Raipur- 492 002, Chhattisgarh
Tel No: + 91 771 2511500; Fax No.: +91 771 2511400

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 those 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		
3	Contractor Registration Certificate	Class in which registered			NOT APPLICABLE	
		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	To																										
5	Average Annual Turnover in Lacs	<table border="1"> <tr><td>2012-2013</td><td></td></tr> <tr><td>2013-2014</td><td></td></tr> <tr><td>2014-2015</td><td></td></tr> <tr><td>2015-2016</td><td></td></tr> <tr><td colspan="2">Chartered accountant certificate in original or photo copy duly notarized can be submitted</td></tr> </table>	2012-2013		2013-2014		2014-2015		2015-2016		Chartered accountant certificate in original or photo copy duly notarized can be submitted																			
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2015-2016																														
Chartered accountant certificate in original or photo copy duly notarized can be submitted																														
6	Details of the projects/works completed as pre-qualification criteria	<table border="1"> <tr><td>Name of the Work</td><td></td></tr> <tr><td>Work Completed</td><td>Yes/No</td></tr> <tr><td>Year of completion</td><td></td></tr> <tr><td>Cost of the Project</td><td></td></tr> <tr><td>Certificate Enclosed</td><td>Yes/No</td></tr> <tr><td>Notarized</td><td>Yes/No</td></tr> <tr><td colspan="2" style="background-color: #f2f2f2;"></td></tr> <tr><td>Name of the Work</td><td></td></tr> <tr><td>Work Completed</td><td>Yes/No</td></tr> <tr><td>Year of completion</td><td></td></tr> <tr><td>Cost of the Project</td><td></td></tr> <tr><td>Certificate Enclosed</td><td>Yes/No</td></tr> <tr><td>Notarized</td><td>Yes/No</td></tr> </table>	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		
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Work Completed	Yes/No																													
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Cost of the Project																														
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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,
1st Floor, Utility block, Capitol Complex,
Sector-19, Naya Raipur- 492 002, Chhattisgarh
Tel No: + 91 771 2511500; Fax No.: +91 771 2511400

Ref for NIT no:-----

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

Dear Sir,

(a) I/We have submitted the Earnest Money Deposit of amount Rs. _____ (In worlds _____) 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:

(viii) 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.).

Yours faithfully

**Engineer-in-Charge
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)/Contractor(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 intensions. 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:

(ix) Undertaking
(on stamp paper of Rs 50/- duly notarized)

This is to certify and confirm that M/s. _____ (name) operating their business from _____ (Full Company Address) are our Authorized Channel Partner and are fully authorized to carry out the said project-‘Comprehensive Annual Maintenance Contract for CCTV and FDA Systems’ comprising of cameras and devices of **Honeywell** make. They have experienced and trained personnel to carry out ‘*After Market Services*’ for our product.

This undertaking is executed on _____ (day) of _____ (month) _____ (year).

(Authorized Signatory of OEM)

(Signature and Seal of Notary)

SCHEDULE- D
Section-II

SCOPE OF WORK

Signature of Contractor.....

Signature of NRDA.....

GENERAL SCOPE OF WORK

Mahanadi Bhawan is equipped with Surveillance and Security System consisting of 40 CCTV cameras and 2900 FDA devices provided by Messrs. Honeywell Automation India Ltd.

Naya Raipur Development Authority (NRDA) intends to opt for a Comprehensive Annual Maintenance contract for preventive and corrective maintenance of Mantralaya's CCTV cameras and FDA (Fire Detection and Alarm) Systems.

The period of contract is for 12 months from the date of receipt of order.

The detail of work includes:

1. Parts Holding Service

The maintenance agency will be responsible for stocking of spare parts (critical and non-critical both) as per the requirement of maintaining a fully functional 24*7 CCTV and FDA System at Mahanadi Bhawan, Naya Raipur. Suitable parts should be available as and when required at the nearest office of the agency. The agency shall be responsible for providing fastest possible delivery of the required spare parts to the site (Mahanadi Bhawan) so as to ensure minimum possible down time.

The spare parts shall be stocked and supplied by the agency at no extra cost to NRDA.

2. Parts Replacement Service

All parts within the CCTV (40 Cameras & necessary hardware and software) and FDA System (2900 devices & necessary hardware and software) are under the scope of the comprehensive annual maintenance contract. If any part is found to be defective/faulty/not functioning properly due to any reason, it shall be replaced by the maintenance agency within the agreed SLA time frame at no extra cost to NRDA.

3. Preventive Maintenance Service

The maintenance agency shall carry out periodic maintenance visits (four visits a year) consisting of but not limited to the below mentioned activities:

- Necessary inspection and maintenance of complete CCTV and FDA system and take necessary action for corrective measure.
- Check the system errors and alarms.
- Cleaning of all cameras and devices as per agreed schedule.
- LED indication check in all modules and devices
- Sort out any problematic issues concerned with the system and corrective actions for the problem existing.
- Check and note revision no of various software and hardware. This shall help in identifying correct replacement and for future system upgrade.
- Checking of communication cable for loose terminations.

Signature of Contractor.....

Signature of NRDA.....

- Replacement of faulty detectors, devices, control cards of main panels, repeater panels and junction box etc. installed for CCTV & FDA system.
- Installation, erection and re-commissioning of defective cameras, FDA devices and cards as and when required.
- Maintenance, inspection and replacement of defective terminal/junction box.
- Checking, cleaning, tightness of all connections of control cards of main and repeater panel, battery terminals, junction box terminals and other terminal connections of CCTV and FDA system.
- Maintenance of loop in and loop out connection, all MCB, fuse etc.
- Checking of Main power supply, signal power and Hooter power.
- Generation of documentation such as service report, monthly report etc.
- All electricians, supervisors and labour required to maintain the CCTV & FDA system shall be arranged by the maintenance agency.
- All tools and tackles required to maintain the CCTV & FDA system shall be arranged by the agency.
- All spare parts and items required to maintain the CCTV & FDA system shall be arranged by the agency.

4. **Corrective Maintenance**

– Breakdown maintenance support.

The agency needs to provide 24 hour working phone number where NRDA can register a breakdown complaint.

Service Level Agreement:

- Response Time – Immediate
- Resolution Time – 24 hours
- Except in special cases where the part is NOT available within Chhattisgarh. In that case resolution time may be extended with written permission from NRDA officer in charge specifying the reason for extension and expected date of delivery of the part.

In case if the service engineers do not perform up to mark and NRDA is not satisfied with the agency's service delivery, NRDA shall contact senior officials within the agency's organization for immediate action on the same.

Note: The agency needs to provide details of senior officials (name, designation, phone number) for escalation at the time of agreement.

5. **Software Update Patches**

The agency shall be responsible for regular installation of software update patches on the system to remove any bugs encountered during operation.

In case of any changes/updation in the underlying Operating software or any other system/application software, the agency shall be responsible for installing the required patches to ensure compatibility between the other software and Honeywell System Software.

Signature of Contractor.....

Signature of NRDA.....

6. Reports

Service Report:

For every site visit, whether for preventive or corrective maintenance, the agency's Service Engineer will prepare a Service Report, signed by the agency and NRDA's representative. The Service Report shall be submitted to NRDA.

The Service Report shall list down the maintenance activities carried on the system during that particular visit, parts replaced or new components supplied and the response and resolution time for the same.

Quarterly Report:

The agency needs to submit report on the health of the CCTV and FDA system at Mahanadi Bhawan every quarter based on the preventive maintenance site visits.

SCHEDULE– D

Section-III

Technical Specification of Works

SPECIFICATIONS

GENERAL:

Mahanadi Bhawan is equipped with Surveillance and Security System consisting of 40 CCTV cameras and 2900 FDA devices provided by Messrs. Honeywell Automation India Ltd.

The specification of CCTV cameras and FDA devices is as mentioned below.

Material to be of best quality:

The whole of the materials, employed in connection with the permanent work, is new and of the best of its kind. All materials is in accordance with these specifications and is as approved by the NRDA's representative.

Standards:

Except where otherwise specified or permitted by the Engineer-in-charge, all material shall confirm to the latest edition of Indian /international Standard Specifications for CCTV and FDA Systems.

1. Item Wise Description

Sno.	Description	Quantity	Unit
FIRE ALARM SYSTEM			
1.	Microprocessor based 10 loop (each loop is able to connect minimum 125 detectors and 125 modules), intelligent addressable type fire alarm control panel with LCD Display, 240 volts AC power supply, inbuilt battery charger, 24 Volts sealed lead acid battery complete as per specification	3	Nos.
2.	Fire Alarm System Software capable of following functions: Seamless integration to BAS Software-uploading and downloading of information to FACP, Graphics including autocad drawings-All detector information and change of detector setting is through software	1	Set
3.	Intelligent Addressable Monitor Modules as per specification	80	Nos.
4.	Intelligent Addressable Control Modules as per specification	80	Nos.
5.	Repeater panel with 40 characters back lit super twist LCD display with system function keys like system reset. Alarm acknowledge, Alarm Silence, Trouble Acknowledge etc.	2	Nos.
6.	Intelligent Addressable type Photoelectric type smoke detectors as per specifications	2900	Nos.
7.	Intelligent Addressable type rate of rise and fixed temperature heat detectors as per specifications	50	Nos.

Signature of Contractor.....

Signature of NRDA.....

8.	Intelligent Addressable type manual break glass unit as per specifications	250	Nos.
9.	Intelligent Addressable type hooters with strobe lights	100	Nos.
10.	Response indicator for above false ceiling	950	Nos.
11.	Intelligent Addressable type Fault Isolator Module	200	Nos.
12.	Auto Dialer Unit	1	Nos.
CCTV SYSTEMS			
1.	Indoor Pan/Tilt/Zoom cameras including integrated Housing (Indoor Type), Connectors, Lens, Camera Mounts and all Ancillary Equipment and all accessories (including driver cables and pan tilt unit).	40	Nos.
2.	IP Video Streamer/Encoder for PTZ camera with Enclosure-single channel.	40	Nos.
3.	Power Supply for above camera	40	Nos.
4.	24 port switch 10/100 base-TX RJ45 ports, suitable power socket, complete as per spec.	5	Nos.
5.	Network Attached Storage setup including accessories, suitable power socket, DC power converters, connectors, cables etc. complete as per spec	1	Nos.
6.	Digital Video management software for cameras with seamless integration with FAS, ACS and BMS with 5 client station and licenses.	1	Set
7.	Digital Video Management Database Server	1	Nos.
8.	Digital Video Manager (DVM) Camera Server with 19 inch TFT monitor with power socket etc.	6	Nos.
9.	Server Rack in control Room	3	Nos.

2. GENERAL TECHNICAL SPECIFICATIONS

A.1 ADDRESSABLE FIRE ALARM SYSTEM

FIRE ALARM PANEL

Microprocessor Based Fire Signalling Panel

The Fire Signalling Panel (FSP) is microprocessor based with its own micro controller, memory, communication modules and fire device loop interface cards including cards for interfacing with initiating and indicating devices.

Signature of Contractor.....

Signature of NRDA.....

a) The FSP has its own Operating System in EPROM and contains job specific data in an EEPROM.

b) The FSP is a standalone unit that functions independent of all other devices/controllers that it may be communicating with. All the various field installed addressable devices are wired in loops to the respective loop interface cards.

c) The FSP has the facility to process all the input signals received and also has facility to control all the output signals connected to various devices in the field through any of the loop interface modules/cards. Its functions are freely programmable as per job's customized logic requirements.

d) The FSP is able to connect to analog addressable devices via its loop interface cards. FSPs meet the requirements of NFPA 72 Signalling Line Circuit Styles as described below:

i. Two-wire (class B) loops of addressable analog fire/smoke sensing signalling, and monitoring devices.

ii. Four-wire (class A) loops of addressable analog fire/smoke sensing signalling and monitoring devices

e) The loops are self-powered for all sensing, monitoring, and communication functions.

i. Each Loop interface card accommodates a maximum of only one 4 wire loop or two 2 –wire loops.

ii. Each loop accommodates at least 99 nos. of analog addressable detectors and 99 nos. of addressable Input/Output modules.

iii. It is possible to connect conventional type fire detectors to the FSP by use of suitable interface cards.

iv. It is also possible to connect conventional /other alarm initiating devices such as manual call points, flow switches, pressure switches, etc. to the FSP by use of suitable interface cards.

v. Each Input/output interface card is able to accommodate at least 4 supervised circuits.

f) It is possible to add suitable interface cards to the FSP to enable it to monitor, supervise and control security devices to enable the FSP to be part of a Life & Property safety System in addition to its primary function as Fire Detection & alarm System.

Such security devices include Intrusion/Motion detectors, Panic push buttons, access control readers, magnetic / electric door locks, etc.

It is also possible for the FSP to be freely programmed such that the security devices, which are controlled, follow the customized logic requirements.

All such devices connected to the FSP also form part of the FSP point database and total Input/output, logic and display functionality of the FSP is applicable to these devices.

g) i. Each FSP is able to accommodate a maximum of 10 addressable device loops. Each loop is individually configurable as a 2 wire or a 4wire loop. ii. In addition to the loop interface cards the FSP has a capacity to accommodate at least 15 additional interface cards for supervisory input and output circuits.

h) The FSP has a modular architecture using different functional interface cards/modules for interfacing of loop and other field devices. Failure of one interface card does not affect the functioning of other interface cards. .

i) Upon a loop cable break/ failure anywhere on the loop, a failure alarm is reported on the loop interface card as well as on the FSP main display.

j) It is possible to connect the following devices to the FSP through the loops:

Analog addressable smoke sensors and thermal sensors in the loops located report sensed levels in analog form to the FSP.

i. Addressable Monitor modules in the loops is provided to monitor pull stations, flow switches, and other contact input devices shown.

ii. Addressable signalling Control modules in the loops are provided to drive signalling circuits. Signal power is provided to each signalling module.

Fault Isolator modules in the loop is provided to detect a fault/short circuit in the loop wiring and to subsequently isolate the faulty circuit thereby ensuring healthiness & total functionality of non-isolated part of the loop.

k) Each detector, monitor module and control module that is connected on the loop is identified by a unique address that is assigned to each device. This address indicates the individual device address as well as the address of the loop to which it is connected.

l) It is possible to create zones or logical groups in an FSP. Each zone may contain number of (group) physical devices and each of these zones is individually addressable.

m) It is possible to program the FSP as per custom job requirements without any hardware modifications in the FSP. It is possible to program any signalling / control / output to be activated based a change –of- state of any point or any zone in the FSP.

n) It is possible to program any signalling/ control/ output to be activated based on any change of state of any point or zone in the FSP. i.e. the changed states may be either trouble, warning or Alarm states

o) It is possible to set a verification time (programmable from 5 to 450 sec) for each detector in the loop. The respective device goes in alarm state only when the device crosses the set threshold limit and stays above the limit for an amount of time that exceeds the verification time.

p) It is possible to provide an activation delay (programmable from 5 to 450 sec.) for each input device in the FSP. The respective device reports a change of state only after the device has remained in the changed state for an amount of time that exceeds the activation delay time.

q) It is possible to provide a cut-out time (programmable from 5 to 450 sec) for each output device in the FSP. It is possible to automatically deactivate the outputs after the outputs have remained activated for an amount of time that exceeds the cut-out time.

r) The FSP processes all analog values for dual level alarm limits. Limits and sensor values is displayable, modifiable, and reportable in decimal values.

i. If a sensor value transitions from a normal level to a warning level over an extended time period (beyond two hours), the sensor reports a "trouble" condition, including the analog value in the FSP.

ii. If a sensor value transitions from a normal level to a warning level over a time period of less than two hours, a Warning/pre-alarm message, including the analog value reports in the FSP.

iii. Anytime any sensor value transitions beyond the second and higher limit value, an alarm initiation and report is issued by the FSP.

iv. Each sensor has FSP resident and unique, warning and alarm limits which is displayable and on-line adjustable.

v. In case any sensor is removed from its base, a trouble is generated in the FSP indicating the address of the point in trouble.

vi. In case of a mismatch between the installed sensor type for a particular address and the programmed type for that address, a trouble alarm is generated for that point.

s) In addition to the Trouble, Warning and Alarm levels of each addressable device, it is possible to segregate the devices in two alarm groups to help operators differentiate between detectors and supervised alarm inputs. It is possible to assign any point to any group. In case of an alarm, the FSP also indicates the Alarm group that represents the alarm point.

t) The FSP automatically and periodically (at least once every 24 Hours) compares each sensor's operating characteristics with the set sensitivity and re-calibrate the dual alarm limits if necessary.

The FSP is equipped with an integral Power supply unit that is provided with a supervised automatic battery backup.

The Power supply unit accepts 110vac/ 230vac mains power.

The Power supply unit supplies DC power to all the interface cards/modules within the FSP as well as to all the devices wired on all the FSP loops.

Batteries are rechargeable, sealed maintenance-free type. The FSP continuously supervises the battery voltage levels and shall generate a trouble alarm in case of low battery voltage. Battery capacity is sized to provide backup power to the FSP for suitable hours of supervision and suitable hours in alarm.

Both mains failure as well as low battery level troubles is annunciated by the FSP.

u) As an option, if required it should be possible to power the FSP with an external float cum boost charger. The external charger has suitable capacity for powering of the FSP as well as all loop devices and has rechargeable Ni-Cd battery backup rated for suitable hours of supervision and suitable hours of alarm backup time.

v) The following conditions is indicated on the FSP by means of different LED indicators built in each FSP: Mains Power fail, CPU running, Low battery, Ground Fault. Trouble in System, Warning (prealarm), Alarm in system.

Additionally each Loop Interface card is provided with different LEDs that depicts Trouble, Warning or Alarm in the specific loop.

The Alarm LEDs is indicated by Red coloured LEDs while Amber differentiates all other Trouble conditions.

w) The FSP is equipped with a seven segment LED display on the FSP that provides at a glance to the operator the address (es) of the points in trouble, warning or alarm states.

x) For ease of operation, operator toggle switches for the following minimum functions provided directly on the FSP without having the operator to use the operator keypad:

Acknowledge Alarm, Reset FSP, Silence Alarm, Scroll switches -to view multiple alarm address. On toggling of this switch, the seven segment display shows the respective alarm while the respective LEDs is lit showing the condition (Trouble, Warning or Alarm) to enable operator to capture the alarm address and alarm type at a glance.

y) The FSP is equipped with an LED test and audible sounder test facility. Activation of this test shall test (light up) all LEDs and activate the sounder for as long as the test switch is held in toggled condition.

z) The FSP is equipped with built in emergency toggle switch that is used in case of emergencies to generate a manual evacuation signal. Toggling of this switch activates all programmed signalling /indicating outputs in all the loops of the FSP.

aa) The FSP has a built in operators display unit with integral operator's keypad and a strip printer. The display is a backlit LCD type that displays clear text as well as numeric and has a minimum of 4 lines and 40 characters-per-line.

The FSP allows an operator with the appropriate privilege to directly set smoke sensor sensitivity in units of percent per foot obscuration, within predefined limits

The display unit continuously displays date & time and a 'System Normal' message when no alarms are present in system.

On a change of state of the devices, the backlighting turns on and the display shows the device address, its condition (e.g. warning, alarm, trouble), date & time of the state change, the point descriptor and an operator action message.

The point descriptors and the action messages is programmable as per custom requirement; the point descriptors is of maximum 32 characters while the action message is of maximum 40 characters

If the display window is inactive for a specific length of time (e.g. 5 minutes) the backlighting automatically turns off.

It is possible to assign at least 2 levels of passwords for granting different access levels to operators.

It is possible for operators (with authorized passwords) to: i. Enable/disable and Isolate devices ii. Initiate (command) devices iii. Display desired device status, iv. Test the FSP (run self- diagnostics) v. Modify Analog Warning & Alarm limits vi. Modify Action messages, device descriptors vii. Add, modify or delete privileged operators viii. Add, delete devices in the system ix. Change type of detector x. Enable/ Disable alarm verification for individual detectors xi. Run / print-out Reports

It is possible to carry out all above operations without having to power off the FSP or make any hardware changes.

The Operators display unit on the FSP allows operators with authorized password to generate and print out the following types of reports:

Alarm Summary: Report on all points in alarm condition

All Devices' status: Report on all points in the system

Disabled Devices: Report on all points that are disabled

Trouble Summary: Report on all points that are in trouble condition

Detector Sensitivity: Report on Analog sensitivity values for the detectors

History Log: Report on all change-of-state history events and operator actions history in chronological order

Logical Groups (Zones): Report on all created zones including list of physical points in each zone.

Isolated device summary: Report on all points that are isolated from the FSP .

Device Trend: A trend report on sampled values recorded with date & time stamp at each sample.

ab) i. The FSP has integral capability to be connected and to communicate with a higher order PC based Central Station without any additional hardware requirements in the FSP. ii. The communication to the Central Station is through a fault tolerant redundant network using at least two cable pairs such that communication with the Central would continue even in case of breakage/failure of one cable pair.

FIRE ALARM DEVICES

a) Intelligent Loop Devices

General

Each device is assigned a unique address via easily understood decade (01 to 99) switch. Address selection via binary switches or by jumpers is not acceptable.

- i. Devices, which take their address from their position in the circuit, are unacceptable because if devices are later added, existing addresses, descriptors and commands is reprogrammed.
- ii. Devices receive power and communication from the same pair of conductors. For fault-tolerant circuits, any separate power wiring is also made fault-tolerant.
- iii. Each device contains screw terminals with rising plates for positive termination of up to 12 AWG wire.

b) Sensors

- i. All fire sensors mount on a common base to facilitate the changing of sensor type if building conditions change. The base is incompatible with conventional detectors to preclude the mounting on a non-intelligent device.
- ii. Each sensor contains an LED, which blinks each time the sensor is scanned by the Fire Signalling Panel (FSP). If the FSP determines that the sensor is in alarm, the FSP commands the sensor LED to remain latched on to indicate alarm.
- iii. Each sensor contains a magnetically actuated test switch such that it can be tested for alarm from the sensor location.
- iv. Each sensor is capable of being tested for alarm via command from the FSP.
- v. Each sensor responds to FSP scan for information with its type identification to preclude inadvertent substitution of another sensor type. The FSP operates with the installed type but initiates a mismatch (trouble) condition until the proper type is installed or the programmed sensor type changed.
- vi. Each sensor responds to FSP scan for information with an analog representation of measured fire-related phenomena (smoke density, particles of combustion, temperature). Such response proves end-to-end sensor response including the operation of the sensor electronics.
- vii. Each Photoelectric detector contains an optical sensing chamber with nominal sensitivity of 2.3%/foot obscuration.
- viii. Provide Ionization Smoke Sensors as indicated on the plans. Each contains a unipolar dual chamber configuration with nominal sensitivity of 1.55/foot obscuration.
- ix. Each Thermal sensor provides temperature measurement when scanned by the FSP for information.

c) Input Module:

The Input Device provides an addressable input for N.O. or N.C. contact devices such as manual stations, waterflow switches, sprinkler supervisory devices, etc.

The Input Device provides a supervised initiating circuit. An open-circuit fault is annunciated at the FSP. (Subsequent alarms is reported in spite of the fault)

The device contains an LED, which blinks upon being scanned by the FSP. Upon determination of an alarm condition, the LED is latched on.

d) Output Devices:

i. The Output Device provides an addressable output for a separately powered alarm indicating circuit or for a control relay.

ii. The Output Device provides a supervised indicating circuit where indicated on the plans. An open-circuit fault is annunciated at the FSP. (Subsequent alarm signalling shall occur in spite of the fault condition.)

- iii. The Output Device provides a control relay where indicated on the plans. The relay contacts is SPDT (Form "C") rated at two amps @ 28 V dc.
 - iv. The device module contains an LED, which blinks upon being scanned by the DGP. Upon activation of the device, the LED is latched on.
 - v. The device mounts in a standard electrical box.
- e) Fault Isolator Device:
- i. The Fault Isolator Device detects and isolate a short-circuited segment of a loop.
 - ii. The device automatically determines a return to normal condition of the loop and restore the isolated segment.
 - iii. Devices are placed every few devices to limit the number lost in the event of a short-circuit. .

ADDRESSABLE MANUAL STATIONS

- 1. Manual stations are of rugged die cast construction designed for semi-flush mounting. For durability, plastic stations will not be acceptable. Stations are of the break-glass design, and is opened to be reset. Closing the box after opening it shall automatically perform the reset function. It is possible, for testing purposes, to initiate an alarm without breaking the glass. All stations are furnished with a spare glass rod.
- 2. Provisions are made such that the address cannot be changed merely from opening the station.

a) Manual Stations

Manual stations are of rugged die cast construction designed for semiflush mounting. For durability, plastic stations will not be acceptable.

Stations are of the break-glass design, and is opened to be reset. Closing the box after opening it shall automatically perform the reset function.

It is possible, for testing purposes, to initiate an alarm without breaking the glass. All stations are furnished with a spare glass rod.

3. Temperature Detectors (Fixed, Rate-of-Rise)

Temperature detectors respond to temperatures exceeding (135o) (200o). The detector is off-white color, and has a low silhouette profile to blend into the ceiling decor.

- i. The detector utilizes a separate mounting base wired into the system with screw terminals. The detector plugs into the mounting base for easy replacement without tools. Contacts are single pole N.O. rated for three ampere at 120 V ac.

- ii. Combination Temperature/Rate-of-Rise detectors respond to temperatures exceeding 135oF, and/or a temperature rise of 15oF per minute. The detector is an off-white colour and has a low silhouette profile to blend into the ceiling decor. The detector utilizes a separate mounting base wired into the system with screw terminals. The detector plugs into the mounting base for easy replacement without tools. Contacts are single pole N.O. rated for three ampere at 120 V ac.

4. Alarm Chimes

Alarm chimes have a pitch of 980 Hz and the tone is sustained by a resonating chamber. The chimes is 24 V dc polarized. The tone has an adjustable volume with a sound level output of 70 dB at four feet. Chimes are semi-flush mounted, except as noted on the plans.

5. Alarm Horns

Alarm horns are suitable for indoor, or outdoor, application with the appropriate 4 x 4 in. electrical box. All horns are 24 V dc polarized. The minimum sound level is 90 dB at 10 feet. Horns are semi-flush mounted. Single and dual projectors are to be supplied as shown on the plans.

6. Visual Signals

Visual signals are supplied with each fire-signalling device. (One enclosure incorporates both devices.) (The visual signal is mounted directly above the alarm bell.) The visual signal flashes on alarm occurrence. The bezel extends 1-1/2 inches minimum from the finished wall, and is approximately 3-1/2 x 5 inches engraved "FIRE".

7. Visual Signals (To meet ADA requirements)

Visual signals required to meet ADA requirements provide a light intensity of 117 candela, using a Xenon flash tube clearly visible through a clear lens.

A.2. INTEGRATED BUILDING MANAGEMENT SYSTEM

1. CENTRAL STATIONS HARDWARE

The Control stations comprises of Personal computers (PC) providing high level operator interface with the system. The terminals are capable of providing the operator with the facility for remote system interrogation, control, retrieval/storage of logged data, annunciation of alarms and reports, analysis of recorded data and the formatting of management reports.

The control station consists of hardware with all of them suitable for the power supply voltage of 230 V AC \pm 10% , 50 HZ + 3%.

CCTV SYSTEMS

Database Servers

The Database Server contains a database of all network-connected cameras and their configuration.

The Database Server can:

Manage the system database, containing details including

System configuration

Camera configuration and settings

Recording configuration and settings

Configuration of Quad Views and Sequences

Details of recordings

Schedules

Operator security details

Configuration of Surveillance and Alarm Monitors

Configuration of Video Motion Detection

Manage communication between the Operator Stations and the Camera Server

Allow alarms/events in the Security System or Control System to initiate recordings

Report any camera failures or recording failures to the integrated Control system or Security system

Provide a full audit log of all system status (camera, streamer, server availability) and operator actions.

The Database Server can be used in a redundant configuration, using two separate Database Servers (being executed on separate computers). The backup Database Server is continuously synchronised with the master Database Server to ensure that it is always up-to-date and ready

for a fail-over, when required. There is only one Database Server or Redundant Database Server pair in the system.

Redundant Database Server

The DVRMS is capable of running a pair of similarly configured computers in a hot backup configuration where at any point in time, one is the acting Primary and the other is acting as the Hot Backup. An on-line database duplication mechanism is supported.

Simply having each Database Server scan each Camera Sever, or requiring the Camera Servers send all updates to both Database Servers is not acceptable. The database duplication is performed on a per-transaction basis for two reasons:

- To ensure that the duplicated Backup database is consistent at all times with the Primary database
- To avoid unnecessary loading of Camera Servers caused by duplicate polling

It is possible to remove one of the redundant systems for maintenance without interrupting operation, and upon its reinstatement, re-synchronize the databases, again without interruption to system operation.

Camera Servers

The Camera Server(s) is capable of supporting a large amount of disk space for online video storage and access to high capacity archiving mechanisms for the removal of stored video to off-line media.

The Camera Server can:

- Manage live video from camera streamers
- Transmit live video to Operator Stations
- Receive camera control commands from Operator Stations and then send the commands to cameras
- Store live video to hard disk
- Transmit previously stored video to Operator Stations
- Archive previously stored video to off-line storage media
- Retrieve archived video from off-line storage media
- Provide video motion detection
- Export the recordings into MPEG format so that it can be viewed using standard tools including Microsoft's Video Player.

The Camera Servers rely on the Database Server for all camera database information.

The system supports multiple Camera Servers, with no limit to the number of Camera Servers used in the DVRMS system.

Security System

The Security System monitors and controls Security and Access. It provides a real-time view of the status of the security system to operators using dedicated Operator Station machines.

- In relation to the DVRMS system, the Security System can:
- limit and grant operators access to live and recorded video images
 - send requests to record video
 - provide indication of any cameras or recordings which have failed.

Building Control System

The Building Control System monitors and controls HVAC, lighting, fire panels and other building assets. It provides a real-time view of the status of the building control system to operators using dedicated Operator Station machines.

In relation to the DVRMS System, the Building Control System can:
Limit and grant operator access to live and recorded video images.
Send requests to record video
Provide indication of any cameras or recordings which have failed

Operator Station

Operator view is provided using one or more Operator Station machines. These are connected via a TCP/IP network to the Security, Building Control or Industrial Control System. They are capable of viewing live video and recorded video from the Camera Servers. They also provide levels of operator security.

System Sizing

The security system or control system for the site/complex requires that operators be able to view, record and replay video, as detailed in this specification, for an unlimited number of cameras throughout the site/complex.

Hardware

Database Server

The Database Server is able to operate with no performance degradation using the following hardware and operating system configuration:

- Pentium IV, 2.4GHz
- 1024 MB RAM
- Hard Disk storage
- 100/1000 Mbps NIC for network connection to the other components of the DVRMS Windows 2000 Professional, Windows 2000 Server and Windows 2003 Server

Camera Server

The Camera Server is able to operate with no performance degradation using the following hardware and operating system configuration:

- Pentium IV, 2.4GHz
- 512 MB RAM
- Hard Disk storage
- 100/1000 Mbps NIC for video transmission to Operator Stations
- 100/1000 Mbps NIC for video transmission from camera streamers
- Windows 2000 Professional, Windows 2000 Server and Windows 2003 Server

For the failure of a Camera Server, all cameras which were managed by that Camera Server are dynamically re-allocated to other Camera Servers. This is only done through the DVRMS software, without requiring changes to cabling or the network.

Multiprocessor Support

The Database Server and Camera Server software is able to run on both multiple and single processor computers. Where a multiple processor system is used the DVRS software is able to make optimal use of that configuration.

System Fault Tolerance

A failure of any one of the Database Servers or Camera Servers does NOT cause the DVRMS system to cease operation. As a worst case, only the cameras controlled by the Camera Server will be temporarily unavailable until re-allocated to other Camera Servers using the DVRMS software. No physical changes to hardware, cabling or connections are required.

Operator Station

The Operator Station as a minimum conforms to the Security System or Building Control System specifications for hardware requirements.

In addition to the Security System, Building Control System or Industrial Control System requirements, the Operator Station has as a minimum the following hardware components required to support digital video integration:

Pentium IV
CPU, 1.8GHz
256 MB RAM
100 Mbps NIC

Proprietary hardware platforms are not acceptable.

Cameras and Camera Streamers

The Digital Video Recording & Management System is expandable to support a minimum of 4096 cameras.

Network and Video Cabling

A Local Area Network (LAN) is provided by customer for communication between the system elements. All interfaces to the LAN are a minimum of 100BaseTX Ethernet. The LAN may use additional technologies within the backbone for greater speed or distance. Acceptable types are:

FDDI
100BaseFX
1000BaseSX or 1000BaseLX Gigabit Ethernet
Asynchronous Transfer Mode (ATM)

The LAN uses standard network cables. Acceptable cable types are: Optical Fiber or Category 5e or Category 6 Unshielded Twisted Pair (UTP).

The LAN is logically and/or physically separate from any existing LAN infrastructure. Interconnection to other LANs is through one of the following:

A router

A Layer 3 capable network switch as an additional VLAN to the existing LAN equipment. Where required to interconnect VLANs, a router or Layer 3 capable switch is provided.

Video Cabling

Where standard CCTV cameras are used, RG59/RG11/RG6 coaxial cable or optical fiber is used to connect the camera to a video streamer. Video streamers are located at locations closest to the CCTV cameras. In a new installation it is not acceptable to install a star topology video cabling system with all cabling coming back to a single location.

It is not acceptable for video cables to be run back to the Camera Server. All communications with the Camera Server is via the LAN.

Each network camera or video streamer has a single network interface to be used for video and Pan/Tilt/Zoom communications.

Database Server

The Database Server includes the following system software components:
Windows 2000 Professional, or Windows 2000 Server operating system
Microsoft SQL Server 2000 database Microsoft Internet Information Server (IIS) (web server)
Application software

Camera Server

The Camera Server includes the following system software components:
Windows 2000 Professional, or Windows 2000 Server operating system
Application software

Security Server

The Security System includes the following system software components:
System and Application software
Application software

Building Control Server

The Building Control System includes the following system software components:
System and Application software detailed in the Building Control System Specification
Application software with functionality detailed above.

Operator Station

The Operator Station includes the following system software components:
Application software detailed in the Security System or Control System Specification.
Windows 2000 Professional or Windows XP operating system
Microsoft Internet Explorer 6 or greater
Application software

Network

Each Ethernet Switch supports:
Simple Network Management Protocol (SNMP)
IEEE 802.1D bridging capability and loop detection
IEEE 802.1Q tagged VLANs
IEEE 802.1p traffic prioritization for multiple Quality of Service levels
IEEE 802.1w rapid spanning tree with fast link support
IEEE 802.3ad link aggregation support
IGMP snooping for IP Multicast support
Multicast network traffic
Non-blocking configuration capable of simultaneous wire-speed switching across all ports.

Application Software Functions

Live Video

The live output from cameras is viewed through a series of displays. These support:
Single camera view
Quad view of up to four cameras
Sequence view of camera preset positions
Modifying settings for a camera
Modify recording settings for a camera
Adding and deleting cameras
Creating schedules for recordings and video motion detection
Modifying Video Motion Detection settings and tuning

Users are able to select a camera from a tree control listing the cameras available to the user.

The system supports multiple monitors in the following way:

Alarm monitor: When an alarm occurs in the Security or Control System Server, the live video output of the camera associated with that alarm is switched directly to an alarm monitor. The user is able to acknowledge the alarm to clear the monitor using the numeric keypad.

Surveillance monitor: Operators are able to send any Quad View, Sequence View or Single Camera View to a surveillance monitor. User is able to clear the monitor using the numeric keypad. Monitors can be configured to act as both Alarm and Surveillance monitors. In this case, the monitor behaves as a Surveillance monitor until an alarm occurs, in which case it shows the alarm video. Once the alarm is acknowledged, the video previously shown (as a surveillance monitor) is displayed again.

In each of these cases, these additional monitors are either connected to an Operator Station using a multi-monitor PC card or to other PCs.

Systems that do not offer this functionality are not acceptable.

Single Camera

From this display, the user is able to:

View the live output from the selected camera

Pan, tilt, zoom and focus the camera using a joystick attached to the Operator Station PC

Pan, tilt, zoom and focus the camera using a pointing device attached to the Operator Station PC.

Standard Microsoft Windows 2000 or Microsoft XP Professional pointing devices such as a mouse or touch-screen is supported.

For cameras which support continuous pan, tilt, zoom (PTZ), a mouse can be used for continuous PTZ directly in the live video window. By dragging the mouse up or down, left or right in the video window, the operator is able to tilt the camera up or down, or pan the camera left or right. Zooming must also be provided using the mouse in a similar way.

Manually record live video. Recording will continue for the configured period of time. Once recording has begun, a stop button is provided as well as a counter showing the recording time remaining.

Manually store the current frame of video (snapshot) as a bitmap image file. The file name is automatically generated by the DVRMS software and includes the camera name, date and time of the recording (to millisecond precision). Indicate whether video motion detection is currently enabled for the selected camera.

Quad View

The DVRMS supports quad views. A quad view consists of up to four related cameras viewed simultaneously on a single display.

The quad view is divided into four quadrants. For each quadrant the quad view has a camera or be blank. Within each quadrant the quad view is configured to cycle between any of the cameras accessible to the user on a configurable time basis.

There is no limit to the number of cameras that can be assigned to a single Quad View. There is also no limit to the number of available Quad Views.

Sequence View

The DVRMS supports sequence views. A sequence view consists of a single camera view, which can be cycled on a time basis. Pan-tilt-zoom cameras, which support preset positions, can have these presets cycled on a time basis. In this way an operator can view a variety of presets on a series of PTZ cameras. Fixed cameras can also be included in the sequence and cycled accordingly.

There is no limit to the number of cameras that can be assigned to a single Sequence View. There is also no limit to the number of available Sequence Views.

Camera settings

Users are able to change important settings for an individual camera. The details are grouped into several sections:

- Camera Details
- Camera Connection
- Camera PTZ Control
- Security
- Camera Deletion

Only users with the highest level of security are permitted to modify camera connection details, camera PTZ control or delete cameras.

Camera Details

The user is able to configure the following parameters for each camera:

- Name
- Location
- Description
- Camera Number (for fast numeric keypad call-up)

Camera Connection

The user is able to configure the following parameters for each camera:

- Camera Streamer Type
- Resolution: The following resolutions are supported (depending on the functionality of the camera and camera streamer)
 - 160x120
 - QCIF (PAL 192x144, NTSC 176x112)
 - 240x180
 - 320x240
 - CIF (PAL 384x288, NTSC 352x240)
 - 480x360
 - 640x480
 - 2CIF (PAL 768x288, NTSC 704x240)
 - 4CIF (PAL 768x576, NTSC 704x480)
 - Half-D1 (PAL 720x288, NTSC 720x240)
 - D1 (PAL 720x576, NTSC 720x480)
- Video Frame Rate: The supported frame rates (in frames per second) is as follows:
 - For Motion JPEG encoding: 30, 25, 20, 15, 10, 5, 3, 2 and 1. Slower frame rates of 1 frame every 2, 3, 5, or 10 seconds are also available.
 - For MPEG encoding: 30, 25, 15, 12.5, 7.5, 6.25, 3.75 and 1
- Choice of five levels of video compression, equally distributed from minimum to maximum compression
- Streamer IP Address
- Streamer Camera Number (when connected to a multiple port Camera Streamer)
 - Choice of frame rate or bandwidth limited streaming
- Unicast or multicast transmission of video
- PAL or NTSC camera format

Camera Control

The user is able to configure any appropriate camera to be PTZ controllable. The following camera types are supported as a minimum:

- Video Controls Limited (VCL) Orbiter cameras.
- Ademco Video RapidDome cameras
- Cameras supporting the Pelco P protocol

American-Dynamics Speed Dome
Hernis Scan System's Cameras
Axis Streamer supported PTZ cameras and devices

The following PTZ characteristics are tuneable on a camera-by-camera basis from the camera definition pages:

- Pan speed
- Tilt Speed
- Zoom speed
- Focus speed
- Iris speed
- Increment step size

For the Pelco "P" and Hernis cameras, ability to control the washer and wiper is provided from within the DVRMS software.

Security

The following parameters are configurable for each camera:

Area: Allows the system to be configured to only allow users to view specified cameras. These areas are defined by the Security System, or Building Control System

Control Level: Determines if a user is allowed to operate the PTZ controls for a camera. Also used to allow higher-level users to take control of cameras. These Control Levels is defined by the Security System, or Building Control System.

Control Reservation Period: Once a particular user has controlled the camera no other user can control the camera until this reservation period has expired. If this user controls the camera again within the period, the reservation period is reset. Users with higher security permissions are able to take control of the camera at any time.

Camera Deletion

The "Delete" function allows a user with the highest-level security to delete the camera from the system. Deleting a camera should delete all the records relating to the camera from the database. The name of the camera will no longer appear in the list of cameras. All camera settings will be deleted.

The user is also asked if they also wish to delete video clips captured for the camera. If the video clips are not deleted they will stay on the Camera Server and archive media unless they are later individually deleted. The camera name will also continue to appear in the list of cameras used for searching the video clip database.

If the user chooses to delete video clips captured for the deleted camera, all video clips related to the deleted camera will be deleted. The camera name will be removed from the list of cameras used for searching the video clip database.

Recording

The following methods of recording live video are supported:

- User activated
- Event activated
- Scheduled
- Video motion detection
- Snapshot
- User Activated

The user is able to configure the following parameters for each camera:

Pre-Record Duration: The amount of pre-recorded video that will be associated with a user

request for recorded video. This will allow the Camera Server to capture video prior to the user request, as well as after the request. Is selectable from a list of values ranging between 0 seconds and 5 minutes.

Frame Rate: Video quality required for user activated recording. It is possible to have different frame rates for user and event-activated recordings. Is selectable from the entire range of frame rates supported for the camera.

For MPEG encoding, support is provided to record only the Index frames, or a subset of the Index frames.

Record Duration: User activated recordings terminate after this period. Is selectable from a list of values ranging between 0 seconds and 5 minutes

Retention Period: The default period that the Camera Server retains user activated recordings before being deleted. The retention period of individual recordings is able to be changed on a per-recording basis. Is selectable from a list of values ranging between one hour and forever.

Event Activated

There are at least four priorities of alarms/events in the Security or Control System:

Event (journal priority)

Low priority alarms

High priority alarms

Urgent priority alarms

The following settings are individually configurable for each alarm and each camera:

Pre-Record Duration: The amount of pre-recorded video that will be associated with an alarm/event. This allows the Camera Server to capture video prior to the alarm/event, as well as after the alarm/event. Is selectable from a list of values ranging between 0 seconds and 5 minutes.

Post Record Duration: Event activated recordings terminate after this period. Is selectable from a list of values ranging between 0 seconds and 5 minutes

Frame Rate. Video quality required for event activated recording. It is possible to have different frame rates for user, event-activated, scheduled and motion detection activated recordings. Is selectable from the entire range of frame rates supported for the camera/streamer. For MPEG encoding, support is provided to record only the Index frames, or a subset of the Index frames.

Retention period. The default period the Camera Server will retain event-activated recordings before being deleted. The retention period of individual recordings can be changed as necessary. Is selectable from a list of values ranging between one hour and forever.

The pre-record and post-record durations in the paragraph above define the maximum allowable limits for each camera. They are configured on a camera by-camera basis. However each alarm or event causing video to be recorded is also capable of individual configuration with pre and post alarm periods being selected from a range defined by the maximum settings for the camera.

DVRMS systems requiring a single pre and post record event period to be defined for all alarms and events on an individual camera are not acceptable. DVRMS systems requiring a single pre and post event period to be defined for all alarms and events on all cameras are also not acceptable.

In the case of multiple alarms/events relating to the same camera, a video clip is created for each alarm/event.

For cameras that support Pan/Tilt/Zoom Presets, a specified preset location is selected automatically when the alarm/event occurs prior to the event activated recording commencing. For example, when an alarm is detected on a security door, the alarm triggers a PTZ camera to

move to a preset position, which is pointing at the door prior to the DVRMS commencing recording.

Scheduled

The system supports the ability to schedule recordings for each individual camera for times in the future. For each scheduled recording the user is able to configure:

- Start time
- Stop time
- Frame rate for the recording
- Retention period before the recording will be deleted
- Recurrence (if this is to be a recurring schedule)
- Description (at least 255 characters)

There is no limit on the number of schedules that can be entered for the system. There is no limit to the number of schedules per camera.

Motion Detection

The DVRMS system is able to activate recordings automatically when motion is detected on any cameras that have video motion detection enabled. The enabling of video motion detection is either: on a continuous basis scheduled for particular times, dates, days, months etc

The DVRMS system is able to support video motion detection algorithms, which can be executed by the video streamer or the Camera Server. The Camera Server-based algorithm is able to provide the following functionality:

- Detect and track objects
- Learn the scene
- Adapt to a changing outdoor environment
- Ignore environmental changes including rain, hail, wind, swaying trees and gradual light changes

The user is able to configure the following parameters for each camera:

Detection Type: Continuous or scheduled

Actions to Perform When Motion is Detected: When motion is detected, the following actions is performed automatically:

Generate an alarm in the Security System, Building Control System or Industrial Control System of configurable priority (journal, low, medium, high)

Start a recording, with the following configurable settings

Pre-Record Duration: The amount of pre-recorded video, allowing the Camera Server to capture video prior to the detection of motion, as well as after the detection of motion. Is selectable from a list of values ranging between 0 seconds and 5 minutes.

Post Record Duration: Motion detection activated recordings will terminate after this period. Is selectable from a list of values ranging between 0 seconds and 5 minutes or until motion has stopped.

Frame Rate. Video quality required for motion detection activated recordings. Is selectable from the entire range of frame rates supported for the camera/ streamer. For MPEG encoding, support is provided to record only the Index frames, or a subset of the Index frames.

Retention period. The default period that motion detection activated recordings will be retained by the Camera Server before being deleted. The retention period of individual recordings is able to be changed as necessary. Is selectable from a list of values ranging between one hour and forever.

Send video to an operator station or alarm monitor: Automatically switch an operator station or alarm monitor to view the camera which has motion detected

Motion Finished Time: The amount of time where no motion (inactivity) is detected before the previous motion is classified as completed. This is used for allowing recordings to continue until motion has finished.

The DVRMS provides a means of automatic and manual tuning of the Video Motion Detection for each camera. Incorporated within this tuning are the following:

- Selection of the frame rate used for detection
- Optimization for directions of movement
 - In any direction
 - Across the camera view
 - Towards and away from the camera
- Sensitivity level to fine tune the motion detection algorithm

The DVRMS also provides the ability to only detect motion in particular regions of the camera view. The ability to graphically select these regions using the mouse is provided, with an unlimited number of regions permitted per camera. Each region is able to be individually tuned and have separate tuning parameters.

This method of tuning also provides a live tuning window whereby these settings and regions can be altered and tested prior to being used. This live tuning window shows the live video as well as the regions of interest. During the time that motion is detected within a region, the border of the region changes to a different colour. In this way, tuning can be performed to achieve the desired performance. Text is also provided in the window to alert the user that motion has been detected.

Snapshot

The DVRMS system provides every operator with the ability to record the current frame of video. This snapshot of video is stored as a bitmap file. The file name is automatically generated by the DVRMS software and includes the camera name, date and time of the recording (to millisecond precision). An audible sound is produced by the Client computer, to ensure that the operator has feedback when the snapshot is taken.

Recorded Video

The DVRMS allows camera output to be recorded for the following conditions:

- Activated by a Security System or Control System alarm or event
- Manually activated by a user viewing a live camera
- Scheduled recording
- Video Motion Detection

Event activated recording is a process that allows a segment of video or a snapshot to be associated with a Security System, Building Control System or Industrial Control System alarm or event.

User activated recording occurs when a user viewing live video chooses to record the currently viewed camera output by selecting the "Record" button.

Scheduled recording allows video to be recorded between start and stop times on defined days.

Video Motion Detection activated recording is a process that allows a segment of video or a snapshot to be recorded when motion is detected by the DVRMS.

Recorded video is stored on the Camera Server. The Operator station is able to query the Database Server to locate relevant recorded video and to then replay that video at the Operator Station.

Search

The DVRMS provides a simple search for all video recorded. The user selects the time indicator which shows a calendar and time line. The user selects the required search period.

Once the time criterion is entered, the “search” is selected. Video recorded during the selected period will be returned by the search.

The user is able to search on combinations of cameras by clicking on an “Advanced Search” icon as described in the next section.

Advanced Search

The DVRMS provides an advanced search of recorded video. The search is based on recording time, camera and recording details.

The user selects from the list of cameras. It also includes any cameras that have been deleted from the system but still have video stored on a Camera Server or on archived media. If a camera has been deleted and all video associated with the camera has been deleted, the camera name will not appear in this list.

The time criterion is selected from a calendar and time line control. Days containing recorded video are shown in bold on the calendar control. Cameras are able to be added and removed from the search list.

The user is able to choose to filter the search based on the following criteria: Alarm or event type for alarm/event activated recordings

Recording type (schedule, event, operator, video motion detection, all)

Area Point name

Event description

Operator name

Camera name or number

Wildcards are accepted for the Point ID, description, area, priority and value for alarm/event activated recordings.

Search Results

The DVRMS shows the results of the basic and advanced searches in a table format, such that the user is able to select columns within the list to sort the output.

Functionality is provided to allow the user to see a list of recordings for a camera from the past 24 hours without needing to use one of the searches.

Viewing Recordings

The recorded video is available to all users, which have adequate security. Each user is only able to view recordings from cameras they have security access to view.

A display is provided to view recordings from any Operator Station. From this display, the operator can select the recording he/she wishes to view, which is immediately shown in an embedded video player.

The following information and controls is provided on this display:

A navigation panel to allow the user to select the required camera

A calendar control (similar to Microsoft Outlook) to select the desired date. All days which have recordings for the chosen camera is displayed in bold font.

A table listing all the recordings on the chosen camera for the chosen day. The user is able to select the required recording from this table. Each column is able to be sorted by selecting the column heading. This table displays the following information as a minimum:

The time each recording was activated

The duration of each recording

The type of recording (operator activated, alarm/event activated, video motion detected, or scheduled)
The Operator or user that activated the recording (for operator activated recordings)
The Name, Description and Value of the Security System Server or Control System Server which activated the recording (for alarm/event activated recordings)
An embedded video player with controls (buttons) similar to a VCR (video cassette recorder).
The information displayed on the video player and the controls provided include:
The time and date of the frame being displayed
A slider control which is used to move backwards and forwards through the recording
Play, pause and stop buttons
Step forward and step backward buttons, to move through the recording frame by frame
Fast forward and rewind buttons, to play the recording at speeds of x2, x4, x8, x16, etc (to a minimum of x1024).
A snapshot button, to allow for the frame being displayed to be stored as a bitmap file (in a similar way to the snapshot button for live video).
Information about the chosen recording. The following information as a minimum is displayed with the chosen recording
The type of recording (operator activated, alarm/event activated, video motion detection or scheduled)
The Operator or user that activated the recording (for operator activated recordings)
The Name, Description and Value of the Security System, Building Control System or Industrial Control System which activated the recording (for alarm/event activated recordings).
The sub-priority of the recording (for alarm/event activated recordings)
The frame rate that the recording was recorded at
The resolution of the recording
The compression used
The recording start time and date (including pre-record)
The recording end time and date
The date and time that the recording will be deleted by default (which can be changed as required)
Operator comments and notes about the recording (made by the scheduled recording configuration automatically or by an operator)
When a recording is displayed, the exact frame of video when the recording was activated is shown. The slider is positioned accordingly along with the frame time. It is not appropriate to show the first frame in the recording, as the recording may have pre-record. Buttons to allow the operator to archive delete or export the chosen recording
A button is provided to playback the recording at the recorded resolution. This is done using a display that pops up containing the embedded video control with full playback functionality as described above.

System and User Audit Trail

It is a requirement that all user actions on the DVRMS Operator Station be recorded in a log file along with the Security System or Control System's actions. User actions include:
Interventions such as manual recording and configuration setting changes
Cameras viewed
Video replayed
Video exported
Cameras pan/tilt/zoomed and preset switching

This log also contains a history of the status of the DVRMS system components. It lists the status of all cameras, streamers, servers and other system components including when they were disabled or failed.

The log of user and system actions is available in text format and automatically included with any video recordings that are exported.

Digitally Signed Recordings and Audit Logs

It is a requirement for all exported recordings and exported audit logs to be digitally signed. This is required to prove authentication (origin of the recording and audit log) and integrity (exported recording and audit log have not been altered or tampered with).

The DVRMS system provides a default digital certificate for signing the exported recordings and audit logs. Customization is also provided to allow for the user to supply his/her own digital certificate.

A utility is provided to display the exported recording, view the audit log and verify the digital signatures. A visual indication is provided to whether the exported recording and audit log have been altered or tampered with.

Watermarking of recordings is not an acceptable method to prove authentication and integrity as it alters the recording and audit log.

Storage

Online Storage

The system holds a configurable amount of video in online storage. The amount of video stored on-line is only limited by the Camera Server's disk capacity.

For each Camera Server a limit on available storage space for on-line video is configurable.

The system supports RAID 0+1, 1, 3 or 5 for video recordings (clips).

Off-line Storage

The Camera Server is able to manage several off-line media devices for archiving and restoring video. The Camera Server must use a standard archiving method such as Microsoft Remote Storage Services to handle offline media.

At least one of the following off-line devices is supported:

- CD-RW
- DVD-RW
- Magnetic tape media,

If a user attempts to replay video stored in off-line media then the Camera Server automatically restores and plays the video if it is accessible to the robotic tape unit, or prompts the user to make the media containing the video available to the archive device.

Operator Station

Video Integration User Tasks

The following system tasks is performed from the Operator Station

View live video

- Adjust the PTZ position of a camera
- Live video is automatically displayed on a monitor when an event occurs
- Search through the stored video clips of a camera
- An operator records an incident
- An operator records a snapshot of the current viewed video
- Add a new camera to the system
- Change the configuration settings for a camera
- Provide alarm/event activated recording from the integrated Security System, Building Control System or Industrial Control System

- Search for video clips from different cameras
- Create a sequence (camera tour)
- Conduct a sequence (camera tour)
- Create a quad view
- View a quad view
- View live video from a custom schematic
- Add live video to a custom schematic
- Configure, schedule and tune video motion detection
- View the audit log

The following tasks are also performed from the Operator Station
View the organization's Intranet from within the Operator Station window.
Security or Building Control Integration User Tasks

It is possible to perform the following tasks in the Security or Control System from the DVRMS Operator Station:

- Acknowledge an alarm
- Reset an acknowledged alarm
- Control a security or control system point
- Run a report containing security information
- Run a report containing process control information
- Respond to a security alarm
- View security and control system information on a process control schematic
- Configure a security report
- Configure a point control schedule
- Change an access level and download it to all affected access controllers
- View Access Controller details

All alarms and events from the DVRMS, Security and Control systems appear and can be managed from the same display on the Operator Station.

The system supports the display of live video within custom display screens of the Security or Control System. The DVRMS system supports the simultaneous display of dynamic data from the Security or Control System and live video.

The system supports the display of dynamic Intranet information on DVRMS displays.

Network

The Network Management Station performs the following functions:

- Provide a graphical display of the network topology
- Provide network traffic statistics for each LAN port
- Configuration of network equipment
- Support standard Management Information Bases (MIBs)

Application Development Interface

The DVRMS provides the ability of custom developed applications to access and control the DVRMS system using a complete application development interface. These applications are able to be developed without the need to contact the DVRMS manufacturer. Complete documentation of this application development interface is also provided.

1. CCTV Cameras

a) The camera employs complete solid-state circuitry, ensuring high operational reliability. The cameras considered for this project are high resolution color cameras with vari-focal lens or zoom lens for outdoor application.

b) The camera delivers well-defined, clear, high resolution, colored picture without lag or geometric distortion.

c) The camera also possesses the following features:

i. Camera adjusts to the ambient light level conditions and its variations (auto iris) A high sensitive automatic light compensation circuit ensuring constant video signal independent of wide variations in light levels is incorporated(BLC).

ii. Phase adjustable line lock facility or with internal crystal oscillator is provided.

iii. The camera unit is complete with all electronic circuitry, devices, components, standard mount for lenses, mounting assemblies etc. The mounting assemblies of the cameras are individually selected depending upon the special requirements as per actual site conditions. Focal length of lens for cameras is vari-focal with adjustment at site.

Equipment specification for high resolution indoor dome camera: :

Imager : 1/3 "Interline transfer CCD
Signal System : PAL
Resolution : 480 TV lines (high resolution)
Scanning system : 2:1 interlaced
Scanning Frequency : Horizontal 15.63 KHz Vertical 50.00Hz
Minimum scene : 1.2 Lux at F 1.2
Optimal Illumination : 0.5 Lux
Lens : Electronic Iris
Video output : 1.0 V (P-P)/75 Ohms
S/N ratio : 47dB(AGC=Off)
Ambient Temperature : 0°C to +50°C (Without condensation)
Power Supply : 12/ 24 VAC
Power Consumption:
Gain control : on/off or auto
White balance : Auto
Back light compensation : Auto
Mounting Position : Indoor (Ceiling & Wall)
Appearance : Body = ABS resin(white),
cover = acyrlc resin
Listing : CE Marked

d) Equipment specification for PTZ cameras

Imager : 1/4" Interline transfer CCD
Signal System : PAL
Resolution : 460 / 480 TV lines
Scanning system : 2:1 interlaced scanning
Scanning frequency : Horizontal - 15.63KHz Vertical - 50.00 Hz
Minimum scene : 0.5 Lux illumination
Optimal Illumination : 0.1 Lux
Video output : 1.0 Vpp, 75 ohms

Signature of Contractor.....

Signature of NRDA.....

S/N ratio	: 47dB or more
Lens	: Motorised zoom with 16X lens
Ambient Temperature	: 0°C to+ 60°C(Without Condensation)
Mounting Position	: Outdoor/Indoor (Ceiling, Wall & Pole)
Receiver / Driver Unit	: Built-in feature.
Housing NEMA 4X	: Factory fitted dome type housing.Indoor IP 40 , Out door IP 66 /
Hardware	: Integral , Auto sensing, multi protocol receiver
Variable speed	: 0.1 to 250 Deg. /sec.
Accuracy	: ±0.25 degree preset accuracy
Rotation	: 360 Degree continuous
Software	: 120 presets
Listing	: CE Marked

Signature of Contractor.....

Signature of NRDA.....

SCHEDULE– D
Section-IV

Special Conditions of Contract
&
Service Level Agreement for Comprehensive
Annual Maintenance
Contract for CCTV & FDA Systems

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 etc. to be provided by the Contractor, as mentioned in the tender document, 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 electrical energy,

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

3. 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 NRDA fully indemnified against all risks, claims, litigations and financial burdens arising out of all incidental operations on work and accidents.

4. ENGINEER

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.

Engineer shall be responsible for the Maintenance 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. Approval of material and workmanship using ISO formats proforma which should be got approved from Engineer.
2. Matter of urgency involving safety or protection of person or property.
3. Monitoring progress of work.
4. Interpretation of specifications
5. Certification of measurements and bills and issue of certificates accordingly for interim and final bills.

5. CONDITIONAL TENDER

The Tenderer shall note that the clarifications shall be obtained in the pre-tender 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.

6. SITE ORDER BOOK & OTHER BOOKS REQUIRED

The Contractor 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.

7. CLEANING OF SITE

a) Site shall be maintained free from rubbish. 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 be responsible for the following during work at site:

Cleaning: Remove staining or reactive materials from new surfaces immediately during course of the Work.

Debris: Remove hazardous accumulations of debris promptly, at least daily.

Dust: Confine dust producing operations during fixing/installation. Vacuum immediately after completion.

c) TRASH DISPOSAL

General: Keep site free from accumulations of waste materials.

Removal: Remove cartons, crates, wrappings, lunch trash, and other trash from site.

Burning: Do not burn trash or other materials on Owner's property.

Excess Material: Remove excess materials, including demolished materials, excess earth, and excess building materials from Owner's property and dispose of legally.

d) 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.

8. CONTRACTOR RESPONSIBLE FOR SUFFICIENCY OF MEANS EMPLOYED

The Contractor shall take upon himself the full and entire responsibility for the sufficiency of work, centring, 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.

9. STANDARDS

In various places throughout this document, reference is made to the standards, specifications and bye laws 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 manufacturers' specification shall be followed; in absence of all these, Engineer's instruction shall be followed.

10. 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.

11. 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.

12. QUALITY ASSURANCE MANUAL AND SAFETY MANUAL

i. Quality Assurance Manual (QAM)-

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.

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 chillers, panels, elevators, transformers, DG sets, fabricated doors, 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.

13. EQUIPMENT MAINTENANCE MANUAL

The Contractor shall mention the list of equipments (both hardware and software) procured for the work in this manual. This manual shall also reflect the name of the manufacturer, age of equipment and the agency entrusted with the maintenance work of the equipment listed in the manual.

14. 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. 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.

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. 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. The contractor shall visit the site to access the actual quantum of work and period required for completing the same before quoting the offer.
 3. 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.
 4. It will be Agency's responsibility to obtain necessary sanctions and permissions by paying necessary charges towards;
 - Obtaining necessary 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 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 to the site.
 - 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) Any other incidental charges required towards completion of work in all respect.
 7. Bills submitted against the executed and completed works at site, will be processed further by Engineer, after necessary scrutiny and verification.
- 15.** The services/ tasks/ works as referred to under clauses shall be suitably applicable to all Utility services executed by the contractor, whether specifically mentioned herein above or no.
- 16. Safety, Security and Protection of the Environment**
The Contractor shall, throughout the maintenance period 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) 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.
- 17. 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
 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

18. 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 Contract documents 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 Contract documents 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 extra compensation will be paid due to costs associated with using public 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 their destruction; lay out Work and be responsible for lines, elevations, and measurements, and Work executed under this Contract.
- 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 any way affect/ dilute the Contractors obligations listed within the Tender document.

19. CONTRACTOR'S OBLIGATIONS

1. The Contractor shall engage all the men, tools and equipments required for the work. NRDA will not supply any of the same.
2. The Contractor shall engage their own conveyance for transporting the men and materials, tools and equipments required for the work.
3. NRDA will not be responsible for any loss or damage to the men/ materials, tools and equipments engaged by the firm for the work.
4. The Contractor will be responsible for any damage to NRDA's property during the work.

20. HANDING OVER PROCESS

The Contractor/maintenance agency shall hand over the fully functional and intact CCTV and FDA system to NRDA on completion of the contractual time period. In case taking over is delayed on account of Contractor's failure, the O & M period will be extended further till it meets the above requirement without any extra cost to NRDA.

21. PENALTY

Penalty shall be imposed due to delay in recovering the system to normal working conditions i.e. the system has to be restored to normal working condition within 24 hours after reporting, failing to which, penalty of Rs. 1000/- for delay of every 1 day and maximum upto 10% of the total contract value.

In addition, the Contractor shall be penalized if the following compliances are not met on each site visit:

Item	Compliances	Monetary Penalty
1.	Incidents of Labor Law recordable accidents. This shall include incidents/accidents which due to acts of negligence by the Contractor staff, caused injuries to the general public and staff.	The Technical Committee appointed by NRDA shall evaluate the actual rate of penalty to be levied on the damages caused.
2.	Contractor's staff misbehaving in public (for e.g. smoking, showing disrespect to the general public, and staff, spitting, sleeping on the job)	Rs 1000 per incident
3.	Cause damages to equipment either owned by NRDA or others, due to acts of negligence by the Contractor's staff.	The Technical Committee appointed by NRDA shall evaluate the actual rate of penalty to be levied based on the damages caused

The decision of CEO NRDA will be final and binding in this regard.

22. PAYMENT TERMS

Payment shall be made on quarterly basis.

23. EXTENSION OF CONTRACT

The contract shall be valid for one year .However the same shall be extended upto one or more years with annual increment @ rate 5 % per year compounded with mutual consent of both the parties.

Signature of Tenderer

Chief Executive Officer, NRDA,
 1st Floor, Utility Block, Capitol Complex,
 Sector-19, Naya Raipur 492002,
 Chhattisgarh.

Date :

Date :

SCHEDULE– D
Section-V

Approved Makes

NOT APPLICABLE

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: “Comprehensive Annual Maintenance Contract of CCTV and FDA System at Mahanadi Bhawan, Naya Raipur”.

- Estimated cost of work : Rs. **25 Lacs**
- (i) Earnest Money : Rs. **0.50Lacs**
- (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

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	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 | 10 days |

Clause 2

Authority for fixing compensation under clause 2	CEO, NRDA
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Clause 2A

Whether Clause 2A shall be applicable	Not Applicable
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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	

Time period for maintenance **12 months**

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

Gross work to be done together with net Quarterly payment shall be made payment /adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment

Clause 10A The Contractor shall at his own expense provide all materials required for the works.

Clause 10B(ii)

Whether Clause 10B (ii) shall be applicable

Clause 10C

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

Clause 10CA Not Applicable

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

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:-
Applicable subjected to Clause as per Special conditions of contract

Clause 36 (i): Minimum Technical Representative(s) and recovery Rate - **Not Applicable**

Sl. No.	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)

The above Technical Representative shall be got approved from Engineer in Charge prior to deployment. The monthly attendance of Technical Representative shall be monitored by EIC and any recovery shall be levied in the none fulfilling the designated technical manpower.

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:
- (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