TENDER

NATIONAL HEALTH SYSTEMS RESOURCE CENTRE

SUMMARY OF TENDER

Name of Work	**Supply, Installation, Testing and Commissioning of 11KV Compact Substation with 500 KVA Transformer at NHSRC, NIHFW Campus, Munirka, New Delhi -110067**
Notice Inviting Tender	**21.07.2016**
Date of issue of tender documents.	**From 21-07-2016 to 03-08-2016, can be downloaded from the website of NHSRC or issued from NHSRC office, New Delhi**
Date of submission of Tender	**The sealed Tender so as to reach this office on or before 03-08-2016 latest by 1500 hrs**
Date of opening of Tender	**On 03-08-2016 at 1530 hrs in presence of party who may be present.**
Estimate cost	**Rs.32,99,321.00**
EMD	**Rs.66,000.00 (Refundable)- Rupees Sixty Six Thousand only.**
Performance Guarantee	**7% of Contract Amount**
Tender Cost	**Rs.1000.00 (Non-Refundable) Rupees One Thousand only.**
Completion time	**Two Months**
Envelope-1 **Envelope-2** **Envelope-3**	**EMD & Tender Cost** **Pre qualifications cum Tender Documents** **Financial Bid**

Dr.Uddipan Dutta
Principal Administrative Officer
NHSRC

NATIONAL HEALTH SYSTEMS RESOURCE CENTRE

NOTICE INVITING TENDER

Ref:-NHSRC/Admin/14-15/Vertical Extn. NHSRC/01 Dated:-21-07-2016

Name of the work: Supply, Installation, Testing and Commissioning of 11KV Compact Substation with 500 KVA Transformer at NHSRC, NIHFW Campus, Munirka, New Delhi -110067.

Sealed Tenders are invited on behalf of **National Health Systems Resource Centre, New Delhi for Supply, Installation, Testing and Commissioning of 11KV Compact Substation with 500 KVA Transformer at NHSRC, NIHFW Campus, Munirka, New Delhi -110067**.

1. The work is estimated to cost **Rs.32, 99,321.00**. This estimate, however, is given merely as a rough guide.

1. The tender shall be submitted in prescribed form.

2. The works are to be completed in **Two Months** from the 7th day after the day on which the department issues the written order to commence the work or from the date of handing over the site, whichever is later.

3. Application for issue of tender documents shall be submitted to PAO NHSRC, New Delhi so as to reach his office not later than **03-08-2016** and same will be issued only those firms who fulfil following criteria and submit following documents: **(From 4.1 to 4.15)**

4.1. Proof of average annual financial turnover of firm during the last 3 years ending March 2015 should be at least 30% of the estimated cost.

4.2. Proof of experience of having successfully completed similar works during last 7 years ending last days of the month previous to the one in which tenders are invited as per following:

a) Three similar completed works costing not less than the amount equal to 40% of the estimated cost. OR

b) Two similar completed works costing not less than the amount equal to 60% of the estimated cost. OR

c) One similar completed works costing not less than the amount equal to 80% of the estimated cost.

Similar works means 'SITC of substations/compact substations only '

4.3. A tender shall produce a copy of valid PAN Card.

4.4. Proof of registration with EPF.

4.5. Proof of registration with ESI.

4.6. Proof of registration with VAT

4.7. Proof of registration with Service Tax

4.8. Copies of similar work executed in last three years along with performance certificate.

4.9. Audited balance sheet for previous three years.

4.10. Latest bank solvency certificate of value not less than 40% of the estimated cost in any case it should not be older than 12 months from the last day of issue of NIT

4.11. History & structure of firm, name of director/partners/proprietor/with Technical staff.

4.12. List of machinery/tools plants and equipment.

4.13. Valid copy of Electrical License.

4.14. All the above certified documents shall be submitted by the firm duly signed and stamped by Notary Public/gazetted officer and self stamped with seal of the company and original shall be duly produced for verification as required.

4.15. An affidavit duly notarized on stamp paper of Rs.100/- non-judicial stating that "In case of any ambiguity found in the documents submitted (Listed out) at any stage, we shall be entirely responsible and liable for any action as deemed fit under the Law"

5. Alternatively the tender document can be down loaded from our website www.nhsrcindia.org. In such case Bidder should fulfil prequalification criteria as per para **"4.1 to 4.15"** and submit the documents in a sealed envelopes super scribed Envelop No.2-Technical Bid for pre-qualification for "**Supply, Installation, Testing and Commissioning of 11KV Compact Substation with 500 KVA Transformer at NHSRC, NIHFW Campus, Munirka, New Delhi -110067**".

a) Envelope II marked as Technical bid shall contain all the documents downloaded from the web site duly signed and stamped as mark of acceptance of all terms and conditions. Any deviation from terms and conditions shall be notified separately.

b) If all the required documents are not complete as per Para 4 (a) above, Envelope III containing price bid will not be opened.

6. Tender documents consisting of plans, specifications, schedules(s) of quantities of the various classes of work to be done, the conditions of contract and other documents will be open for inspection and issued/sold on payment of Rs.1000/-(Non refundable) on or after **21-07-2016 and up to 03-08-2016**.

a) In case tender documents downloaded from the web site, the tenderers should enclosed tender cost (Rs 1000.00 (Rupee One Thousand only) in form of banker's cheque / demand draft in a separate sealed envelope. Super scribed ENVELOPE-1 for the work of "**Supply, Installation, Testing and Commissioning of 11KV Compact Substation with 500 KVA Transformer at NHSRC, NIHFW Campus, Munirka, New Delhi -110067**".

b). The tender shall be accompanied by earnest money **of Rs.66,000.00 (Rupee Sixty Six thousand only)** through a Bank Draft issued in favour of **National Health Systems Resource Centre, New Delhi** from State Bank of India or a Nationalized Bank or any Scheduled Bank. Tenders without the earnest money and Tender cost if any will be summarily rejected

7. Copies of other drawings and documents pertaining to the works signed for the purpose of identification by the accepting authority of his accredited represent representatives and samples of materials to be arranged by the contractor will be open for inspection by tenderers at the NHSRC office, New Delhi during working hours between the dates mentioned in clause 6 above.

8. Tenderer are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tender to the nature of the ground and sub-soil, the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to the risk, contingencies and other circumstances which may influence or effect their 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.

9. Submission of a 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 of the conditions and rates at which stores, tools, plant etc. will be issued to him by the NHSRC and local conditions and other factors bearing on the execution of the work.

10. A tenderer shall quote in figures as well as in words for rate(s) tendered. The amount for each item should be worked out and requisites total given. Special care shall be taken to write rates in figures as well as words and the amounts in figures only in such a way that interpolation is not possible. The total amount shall be written both in figures and in words. In case of figures, the words 'Rs' should be written before the figure of rupees and the work 'Paisa' after the decimal figures e.g. Rs. 2.15 P and in case of words 'Rupees' should be precede and the word 'Paisa' should be written at the end. Unless the rate is in whole rupees followed by the word 'only' it should invariably be up to two places of decimal.

11. (a) All rates shall be quoted on the price bid form and shall include material, labour, transportation all taxes & duties , supervision, tools, plants, wastage, sundries, scaffolding as required mobilization, demobilization, transportation etc. and nothing extra shall be payable on this account. **However shall not include the service tax, which will be reimbursed on submission of challan duly certified.**

(b) Sales tax or any other tax on materials/ labour in respect of this contract shall be payable by the contractor and the NHSRC will not entertain any claim whatever in this respect.

(c) As per law of land, statuary deduction like income tax / work contract tax etc shall be made from the contractor’s bill as applicable.

(d) The rates of the contractor shall be inclusive of labour cess @ 1% or as applicable and necessary recovery of labour cess shall be made from each RA bill by the NHSRC to be deposited with the labour board of the concerned state. In case the labour board is not established in the state, recovery made by NHSRC on account of labour cess shall be retained under suspense and will be deposited with the labour board and the later date as and when the labour board is established in the state.

12. In case of item rate tenders, only rates quoted shall be considered. Any tender containing percentage below/above the rates quoted will be rejected.

13. Tender complete in all respect shall be put in the Tender Box placed at Security Gate Time Office NHSRC, Baba Gangnath Marg, Munirka New Delhi up to **1500 hours on or before 03.08.2016**.The tenders received shall be opened on same day at 1530 Hrs in the presence of tenderers who may be present. The submission of tender shall be as under:

13.1 Sealed Envelope No.1-supersrcibed"EMD/Tender cost" consisting of draft for Tender cost (Non-refundable) and Earnest money deposit (Refundable) of subject work. It should be superscripted Envelop-1.alongwith name of work-Tender cost & EMD.

13.2 Sealed Envelop No.2-superscribed "Technical bid" along with name of work shall contain complete Tender documents and pre-qualification documents as required as listed **4.1 to 4.15** each page duly signed and stamped.

13.3 A separate sealed envelope No.3 should contain only Price Bid each page duly signed and stamped with prices in the manner specified in this NIT. The envelop shall be super scribed as Envelop-3-Price bid for "**Supply, Installation, Testing and Commissioning of 11KV Compact Substation with 500 KVA Transformer at NHSRC, NIHFW Campus, Munirka, New Delhi -110067**".

14. All the three sealed envelopes should be put in separate sealed cover super scribed as Tender document for the work of "**Supply, Installation, Testing and Commissioning of 11KV Compact Substation with 500 KVA Transformer at NHSRC, NIHFW Campus, Munirka, New Delhi -110067.**

15. On acceptance of tender, the earnest money will be treated as part of the Security.

16. The tenderer whose tender is accepted, shall permit the NHSRC at the time of making any payment to him for work done under the Contract to deduct towards Security Deposit such sum as will along with the amount of earnest money already deposited to 10% of the gross amount of the bill till the sums so deducted amount to Rs. 5 Lacs.

17. NHSRC will return the earnest money, where applicable to every unsuccessful tenderer.

18. NHSRC reserve to themselves the right of accepting the whole or any part of the tender and tenderer shall be bound to perform the same at his quoted rates.

19. The validity of the tender(s) shall be up to 90 (Ninety) days from the date of opening of tender(s).

20. The use of whitener/ eraser in this tender is prohibited. If any correction becomes necessary, the same should be done by SCORING OFF originally written rates/figures etc. and then rewriting should be done under initials of person filling the tender.

21. An undertaking by the agency shall be given to the effect that "they will engage staff and labour of good moral character only at site and will ensure watch and ward and discipline of his employees". Suitable action will be taken against the agency if any deviation is noticed on this account.

22. For consumption of water and Electricity at site, if requested by the agency, the same shall be arranged by NHSRC (subject to their existence at working site) at one mutually convenient point. Necessary extension of this supply will have to be got extended by the agency at their own cost. For this supply of water & Electricity, recovery @ ½% (half percent) for each (total to ONE percent) of the value of actual work done shall be made progressively from the running as well as final bill if used.

23. The contractor whose bid is accepted will be required to furnish **performance guarantee of 7% (Seven Percent)** of the bid amount within the 15 days after award of work. This guarantee shall be in the form of Banker's cheque/Demand Draft/ Pay order/ Bank Guarantee/ FDR of any Scheduled Bank or the State Bank of India in accordance with the prescribed form. In case the contractor fails to deposit the said performance guarantee within the period, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor. The earnest money deposited along with bid shall be returned after receiving the aforesaid performance guarantee

24. In case it is found during evolution or at any time before signing of contract or after its execution and during the period of subsistence there of that one or more of the eligibility conditions have not been met by the applicant, or the applicant has made maternal misrepresentation or has given any maternally incorrect or false information, the applicant shall be disqualified forthwith, if not, yet appointed as the contractor/supplier and if the applicant has already been issued the LOA or has entered into the contract, as the case may be, the same shall, not withstanding anything to the contrary contained therein be liable to be terminated along with forfeiter of earnest money deposit (EMD)/ performance security by a communication in writing By the NHSRC to the applicant without the corporation being liable in any matter whatsoever to the applicant and without prejudice to any other right or remedy with the NHSRC may have under the bidding documents the contract or under applicable law.

For & On Behalf of the National Health Systems Resource Centre

Dr.Uddipan Dutta
Principle Administrative Officer

Schedule 'F'

Reference to General Conditions of Contract (To be signed by the Contractor(s) at the time of signing the agreement)

1(a) Accepting Authority — National Health Systems Resource Centre

1(i) Market Rate - percentage addition
To cover profit, overheads and supervision — - 15%

2. (a) Estimated cost of the Works put to tender — -Rs.32,99,321.00

(b) Earnest money (2% of the estimated cost
of The Works subject to a maximum of Rs.1, 00,000.00) — - Rs.66,000.00

(c) Security deposit (10% of gross value of
work done subject to a maximum of Rs. 5.00lakhs) — - as per NIT

3(ii) Schedule of rates applicable: — Latest CPWD S O R

Percentage adjustment to the rates in the Schedule of Rates, for pricing deviations Percentage — Plus/minus _____

4. Time allowed for execution of work — 60 days (To be reckoned from the SEVENTH Day after the date of work order or handing over of Site)

5. Compensation for delay: Compensation for Delay: 1% (one per cent) of the contract amount subject to a maximum of Rs. 50,000/- PER WEEK or a part thereof for first 4 weeks of delay for subsequent delay. The Compensation should be 2% (Two Percent) of the contact amount subject to maximum Rs. 1.00 lac per week or a part there of. The total compensation for delay shall further be subject to an overall maximum or 10% (Ten per cent) of the contract amount as awarded. The decision of the competent officer of the Accepting Authority shall be final and binding.

6. Defects liability Period — Buildings, sanitary works, water supply works, Electrical works, plant and machinery, furniture, Roads and drainage, etc. - ONE YEAR from the date of completion.

Technical Specification for Package Substation

1.0.0 **CODE & STANDARDS**:

1.1.0 All equipment and material shall be designed manufactured and tested in accordance with the latest applicable IEC standards. The 12KV Package Substation Design must be as per IEC 61330.

1.2.0 The Package Sub-station offered shall in general comply with the latest issues including amendments of the following standards.

Title	**Standards**
High Voltage Low Voltage Pre-Fabricated Substation	IEC:61330
High Voltage Switches	IEC 60265
Metal Enclosed High Voltage Switchgear	IEC 60298
High Voltage Switchgear	IEC 60694
Low Voltage Switchgear and Control gear	IEC 60439
Power Transformers	IEC 60076

2.0.0 DESIGN CRITERIA

2.1.0 Package Sub-station consisting of **11KV Non-Extensible SF6/VCB Module Insulated Compact Switchgear + Transformer + Low Voltage Switchgear** with all connection accessories, fitting & auxiliary equipment in an Enclosure to supply Low-voltage energy from high-voltage system as detailed in this specification. The complete unit shall be installed on a substation plinth (base) as **Outdoor substation** located at very congested places. 11KV Isolators controls incoming-outgoing feeder cables of the 11KV distribution system. The Vacuum Circuit Breaker shall be used to control and isolate the 11kV/433V Distribution transformer. The transformer Low Voltage side shall be connected to Low Voltage switchgear. The connection cables to consumer shall be taken out from the Low Voltage switchgear.

2.2.0 The prefabricated-package substation shall be designed for a) Compactness, b) fast installation, c) maintenance free operation, d) safety for worker/operator & public.

2.3.0 The Switchgear and component thereof shall be capable of withstanding the mechanical and thermal stresses of short circuit listed in ratings and requirements clause without any damage or deterioration of the materials.

2.4.0 For continues operation at specified ratings temperature rise of the various switchgear components shall be limited to permissible values stipulated in the relevant standard and / or this specification.

2.5.0 **Service Conditions**:

The Package substation shall be suitable for continuous operation under the basic service conditions indicated below

Ambient Temperature:	40 Deg C
Relative Humidity	upto 95%
Altitude of Installation	upto 1000m

The Enclosure of High Voltage switchgear-control gear, Low Voltage switchgear-control gear & Transformer of the package substation shall be designed to be used under **normal outdoor service condition** as mentioned. The enclosure should take minimum space for the installation including the space required for approaching various doors & equipment inside.

3.0.0 SPECIFIC REQUIREMENT

3.1.0 The main components of a prefabricated- package substation are Transformer, High-voltage switchgear-control gear, Low-voltage switchgear-control gear and corresponding interconnections (cable, flexible , bus bars) & auxiliary equipment. The components shall be enclosed, by either common enclosure or by an assembly of enclosure. All the components shall comply with their relevant IEC standards.

3.1.1 **Ratings**:

Description	**Unit**	**Value**
Rated Voltage / Operating Voltage	kV rms	11
Rated frequency & Number of phases	Hz & nos.	50 & 3
Rated maximum power of substation	KVA	500 kVA
Rated Ingress protection class of Enclosure	IP:	IP-23 for substation enclosure and IP:54 for LT Switchgear & HT Switchgear enclosure
Rated temp Class of Transformer Compartment		K20
HV Insulation Level		
Rated withstand voltage at power frequency of 50 Hz	kV rms	28
Rated Impulse withstand Voltage	kV peak	75
HV Network & Busbar		
Rated current	Amp	630A
Rated short time withstand current	kA rms / 1sec	12.5

Making capacity for switch-disconnector & earthing switches	kA peak	52.5kA
Breaking capacity of Isolators (rated full load)	A	630A
LV Network		**As per BOQ**

OUTDOOR ENCLOSURE

3.2.0 **Outdoor enclosure**:

3.2.1 The enclosure shall be made of Sheet Steel tropicalised to local whether conditions.

3.2.2 The metal base shall ensure rigidity for easy transport & installation.

3.2.3 The protection degree of the Enclosure shall be **IP54 for LT & HT switchgear compartment & IP23 for Transformer compartment.** Proper / adequate ventilation aperture shall be provided for natural ventilation by way of Louvers etc.

3.2.4 The doors shall be provided with proper interlocking arrangement for safety of operator.

3.2.5 The H.V. & L.V. outgoing of the transformer are to be connected to Vacuum Circuit Breaker of RMU & incomer of the Low Voltage Switchgear by means of Copper Cables / Flexible Busbars.

3.2.6 **Internal Fault** : Failure within the package substation due either to a defect, an exceptional service condition or mal-operation may initiate an internal arc. Such an event may lead to the risk of injury, if persons are present. It is desirable that the highest practicable degree of protection to persons shall be provided. The Design shall be tested as per IEC 61330.

3.2.7 **Covers & Doors** : Covers & doors are part of the enclosure. When they are closed, they shall provide the degree of protection specified for the enclosure. Ventilation openings shall be so arranged or shielded that same degree of protection as specified for enclosure is obtained. Additional wire mesh may be used with proper Danger board for safety of the operator. All covers, doors or roof shall be provided with locking facility or it shall not be possible to open or remove them before doors used for normal operation have been opened. The doors shall open outward at an angle of at least 90^0 & be equipped with a device able to maintain them in an open position.

3.2.8 **Earthing** : All metallic components shall be earthed to a common earthing point. It shall be terminated by an adequate terminal intended for connection to the earth system of the installation, by way of flexible jumpers/strips & Lug arrangement. The continuity of the earth system shall be ensured taking into account the thermal & mechanical stresses caused by the current it may have to carry. The components to be connected to the earth system shall include :

a) The enclosure of Package substation,

b) The enclosure of High voltage switchgear & control gear from the terminal provided for the purpose,
c) The metal screen & the high voltage cable earth conductor,
d) The transformer tank or metal frame of transformer,
e) The frame &/or enclosure of low voltage switchgear,

3.2.9 There shall be an arrangement for internal lighting activated by associated switch for HV , Transformer & LV compartments separately.

3.2.10 **Labels**: Labels for warning, manufacturer's operating instructions etc. shall be durable & clearly legible.

3.2.11 **Cleaning & Painting :**
The paints shall be carefully selected to withstand tropical heat and rain. The paint shall not scale off or crinkle or be removed by abrasion due to normal handling.

11KV Non-Ext SF6 INSULATED Vacuum Circuit Breaker

3.3.0 **11KV Non-Ext SF6 RMU with VCB:** The requirement of 11kv Ring Main Unit is as under.

3.3.1 SF6 Gas filled Non-extensible Ring Main Units with Vacuum Circuit Breaker comprising of 3 panels as indicated below:

3.3.2 **Module No.1** : Dummy Module with direct incoming at one cable box accessible from the front.

3.3.3 **Module No.2 – Vacuum Circuit Breaker** complete with operating mechanism, protection system and One Number of cable box accessible from the front.

3.3.4 **The above breaker, Busbars should be mounted inside a robotically welded sealed for life , stainless steel tank of 3 mm thick sheet metal. The tank should be filled with SF6 gas at adequate pressure. The degree of protection for gas tank should be IP67.**

3.3.5 The Vacuum Circuit Breaker is required to control 11 kV/433 volts distribution Transformer of rating 630 KVA and relay settings shall be selected accordingly.

3.3.6 **General Finish**: Totally enclosed, metal clad, vermin and dust proof suitable for tropical climate use as detailed in the specification.

3.3.7 **Ratings**: The busbars shall have continuous rating of 400 Amps. The isolator shall have a continuous rating of 400 Amps, Vacuum Circuit Breaker shall have a continuous rating of 200 Amps. in accordance with relevant IEC standard

3.3.8 **Breaking & Making Capacity**: The isolators shall be capable for breaking rated full load current. Vacuum Circuit Breaker shall be capable of having rupturing capacity of 12.5kA symmetrical at 11KV.

3.3.9 **Busbar**: Switchgear shall be complete with all connection, bus-bars etc. Copper busbars continuous rating shall be 400 Amps. The busbars should be fully encapsulated by SF6 gas inside the steel tank.

3.3.10 **Remote Operation**: Remote operation of the RMU's Isolators & Breaker CB shall be possible using Motors fitted to the operating mechanism (Optional if asked). It shall be possible to fit the motors either directly in manufacturing plant or on site as & when required. Installation on site shall be possible

3.4.0 **Isolator** :

The Isolators offered shall conform to IEC60129. The isolator shall be triple pole, spring assisted, hand operated, non-automatic type with quick break contacts. The operating handle shall have three positions 'ON', 'OFF' and 'EARTH' which shall be clearly marked with suitable arrangement to padlock in any position. A safety arrangement for locking shall be provided by which the isolator operation shall be prevented from 'ON' position to 'EARTH' position or vice versa in a single operation.

3.6.1 Switchgear:

3.6.1.1 The SF6 RMU shall be Sealed for life, the enclosure shall meet the "sealed pressure system" criteria in accordance with IEC: 298 (a system for which no handling of gas is required through out service life of approximate 25 years.) There shall be no requirement to 'top up' the SF6 gas. In addition, manufacturer shall confirm that maximum leakage rate is lower than 0.1% per year. It shall provide full insulation, making the switchgear insensitive to the environment. Thus assembled, the active parts of the switchgear unit shall be maintenance free.

3.6.1.2 The switchgear & switchboard shall be designed so that the position of different devices is visible to the operator on the front of the switchboard & operations are visible as well. The switchboard shall be designed so as to prevent access to all live parts during operation without the use of tools.

3.6.1.3 RMU should be tested for internal arc fault test.

3.6.2 **Vacuum Circuit Breaker**:

3.6.2.1 The Unit shall consist 400/ 630A Tee-off spring assisted three positions, three pole Vacuum circuit breaker, with integral fault making / dead breaking earth switch. The function shall be naturally interlocked to prevent the main & earth switch from being switched 'ON' at the same time & the CB not allowed to trip in 'Earth On' position. The selection of the main/earth switch lever on the panel, which is allowed to move only if the main or earth switches in the off position. The lever shall be able to pad locked in either the main or earth position.

3.6.2.2 The manual operation of the circuit breaker shall not have an effect on the trip spring. This should only be discharged under a fault (electrical) trip condition; the following manual reset operation should recharge the trip spring & reset the CB mechanism in 'main off' position.

3.6.3 **Protection** : **Protection Relays**: The CB shall be fitted with microprocessor based self powered relay inside the front cover to avoid any tampering. The relay should be 2 Over Current + 1 Earth Fault, self powered type, fed by protection CTs mounted in the cable box.

3.7.0 **Cable Box**:

3.7.1 Every isolator shall be provided with suitable and identical cable boxes in front for connecting 3 core, 11kV cable from vertically below. The cable boxes shall be so located at convenient height to facilitate easy cable jointing

work. The height available for cable termination should be minimum **500 mm The Cable termination shall be done by Heat shrinkable Termination method** so adequate clearances shall be maintained between phases for Termination.

3.7.2 **Locking Arrangement** : Suitable padlocking arrangements shall be provided as stated below

a) CB manual operating handle in the "OFF" position.
b) Each feeder Panel operating handle in 'Closed' 'Open" or 'Earth' position.
c) Each isolator operating handle in 'Closed', ' Open', or 'Earth' position.

3.5.0 **Ratings** :

		Non-Extensible ring main unit with VCB
3.8.1	***Switchgear Data***	
a)	Service	Outdoor but inside Enclosure
b)	Type	Metal clad
c)	Number of phases	3
d)	Voltage	11000V
e)	Rated Frequency	50 Hz
f)	Rated Current	630 Amp (isolator)
g)	Short Circuit rating	
	i) Breaking	12.5 kA rms for Breaker
	ii) Short time withstand for 3 Sec.	12.5 KA rms
	iii) Rated S/c making	52.5 kA peak for Breaker
h)	Short duration pwer freq.	28 kV
i)	Insulation Level	75 KV peak
j)	System earthing	Solidly earthed at substation
3.8.2	**Breaker**	

a)	Type	VCB in SF6 tank
b)	Rated voltage	11kV
c)	Breaking current	
	i) Load breaking	12.5 KA rms.
d)	Making current	52.5 KA peak
e)	Rated current	630 Amps.
f)	No. of poles	3
g)	Operating mechanism.	Trip free & free handle type with mechanically operated indication & pad locking.
3.8.3	***Isolators***	
a)	Type	*load breaking and fault making in SF6 tank*
b)	*Rated current*	400 Amps.
d)	Rated breaking capacity	400 Amps.
e)	*Fault making capacity*	52.5 KA peak
f)	*No. of poles*	3
g)	*Operating mechanism*	Operating handle with ON, OFF, Earth positions with arrangement for padlocking in each position.
3.8.4	**Busbars: (If any)**	
a)	Material	Copper
b)	Type	SF6 insulated
c)	Rated Current	630 Amps
d)	Short time rating for 3 Sec.	-

3.6.0 **Tests For RMU**: Each type of 11kV Switchgear shall be completely assembled, wired, adjusted and tested at the factory as per IEC:265, IEC:298.

3.7.0 **Routine Tests :** The tests shall include but not necessarily limited to the following.…

a) Operation under simulated service condition to ensure accuracy of wiring, correctness of control scheme and proper functioning of the equipment.

b) All wiring and current carrying part shall be given appropriate High Voltage test.

Distribution Transformer

Oil Type Transformer :

4.1.1 **Requirement**: 11000/433 Volt Oil Type, 500KVA, OAN cooled transformer suitable for installation at outdoor in Enclosure for ground mounting.

4.1.2 **Voltage Ratio:** No load voltage 11000/433 volt within tolerance as stipulated in IS.

4.1.3 **Rating:** The transformer shall have a continuous rating as specified at any of the specified tapping position and with the maximum temperature rise specified.

4.1.4 **Magnetic Core:** The Core will be made from Laminations of grain oriented silicon steel, insulated with mineral oxide and will be protected against corrosion with coat of varnish.

The choice and grade of steel and the cutting pattern and method of assembly minimizes the loss level and the no load current with the effect of a very low noise level.

4.2.0 **FITTINGS / ACCESSORIES**

1) 2 nos. earthing terminals
2) Rating and diagram plate
3) 1 no. Winding Scanner
4) Off circuit tapping links
5) 4 nos. flat bi-directional rollers
6) Lifting lugs
7) Cooling fans

L.T. Panel

5.1.0 **System**:-

a) **Declared voltage** :– 3 Phase,400V (±6%) 50 Hz,

b) **Neutral** :– Solidly earthed at substation.

5.2.0 **General finish**:- Tropical, totally enclosed, metal-clad, weather-proof, vermin and dust proof.

5.3.0 **Construction :**

Enclosure:- Dead Front type of enclosure shall be able to provide the degree of Protection IP:4X.

5.4.0 **Circuit Ways:**
For 500 KVA -

1 No. Incoming cum Outgoing 800A, 4 Pole ACB, (Microprocessor Based)

5.5.0 **Earthing**:

5.5.1 Earthing arrangement shall be provided for earthing each cable, PVC cable gland, neutral busbar, chassis and frame work of the cubicle with separate earthing terminals at two ends. The main earthing terminals shall be suitably marked .The earthing terminals shall be of adequate size, protected against corrosion, and readily accessible. These shall be identified by means of sign marked in a legible manner on or adjacent to terminals.

5.5.2 Neutral bus bar strip shall be connected to Earthing terminal with help of GI strip of suitable capacity & nut-bolt arrangement.

TYPE / ROUTINE TEST ON PACKAGE SUBSTATION:

6.0.0 TYPE TESTS FOR THE PACKAGE SUBSTATION COMPLETELY ASSEMBLED:

6.1.0 The Package Substations offered must be type tested as per IEC 61330. The copy of type test summary should be submitted along with the tender.

6.2.0 **Routine Tests**: The routine tests shall be made on each complete prefabricated substation.

a) Voltage tests on auxiliary circuit.
b) Functional test.
c) Verification of complete wiring.

6.3.0 **Test Witness:** Routine test shall be performed in presence of Owner's representative if so desired by the Owner at factory before dispatch. The cost for inspection shall be bear by the contractor. The Contractor shall give at least fifteen (15) days advance notice of the date when the tests are to be carried out.

6.4.0 Test Certificates:

Certified reports of all the tests carried out at the works shall be furnished in three (3) copies for approval of the Owner.

ACCEPTABLE MAKES

S.No	Item	Makes
1.	Transformer	Cahors (Pristine) /ABB/C&S/Schneider / Kriloskar
2.	H.T.VCB Panel	Cahors (Pristine) /ABB/C&S/Schneider / Kriloskar
3.	Microprocessor Relay	Shall be of same make as of HT VCB
4.	Main L.T Panel	PRISTINE /ABB / L&T / Schneider / TRICOLITE
5.	Sandwich type Bus Duct / Rising Main	L&T /C & S / G.E / ABB / Schneider / Godrej.
6.	Air Circuit Breaker	L&T /Schneider/ Siemens / ABB / C&S
7.	MCCB	L&T /Schneider /Siemens/ ABB / C&S
8.	MCB	L&T /Schneider / Siemens / ABB / C&S
9.	Capacitor Panel	PRISTINE / Schneider / ABB / L&T / TRICOLITE/ AVS
10.	Intelligent APFC Relay	Pristine /L&T /Enercon/Siemens/ EPCOS/ /Trinity / BCH
11.	Thyristor Switch	Pristine /Schneider/Siemens/ ABB/ /Trinity / BCH
12.	Selector Switches	Kaycee / L&T / AE / GE / Rishab / C&S
13.	Voltmeter / Ammeter	AE / L&T / Rishab / IMP / MECO / Enercon.
14.	Multi Function meter	L&T / Schneider Enercon / /Secure / Trinity.
15.	L.E.D.	L&T /BCH / Telemecanique / GE / C&S
16.	Push Buttons	L&T / Siemens / Rass control./C&S
17.	11 KV End Joints	Raychem / Denson / M-Seal / Safe Kit / 3M
18.	LT current transformer	AE / KAPPA/ Schneider / Siemens / L&T/Meco/IMP

19.	Power Capacitors – ISI marked	Pristine / Schneider /Asian /C&S / L&T / ABB .
20.	11 KV XLPE cables ISI Marked.	Havells / Universal /CCI / RPG / KEI / Polycab
21.	LT Cable	Havells / Universal /CCI / RPG / KEI / Polycab
22.	LT Current Transformers	AE /Kappa / Siemens / Crompton/MECO
23.	Cable Lugs	Dowells / Johnsons / Lotus / Wago/Action
24.	Cable Glands	Commet / Gripwel / Dowells / Metro
25.	Control fuses	L&T / Siemens / ABB / C&S / GE
26.	Fire Extinguisher	Any ISI marked.
27.	Rubber Mat	Any ISI marked.
28.	First Aid Box	St. Johan Ambulance Brigade/Indian Red Cross society.
29.	Compact Sub Station	Cahors (Pristine)/ Compton Greaves / Kriloskar / ABB Danish .

FINANCIAL BID

Financial Bid

Schedule of work 500 kva Package Substation

S.no	Schedule of Items	Quantity	Unit	Rates in Figure & Words	Amount
1	**Design, Manufacturing & Supply of 11kV Outdoor type 500Kva Package Sub-Station consisting of 11/0.433KV, Oil type transformer, HT panel, LT panel inside GI sheet steel enclosure with all interconnections, fully type tested as per the IEC-1330 complete in all respect each consisting of following items & as per detailed technical specifications:**				
	Outdoor Enclosure	1	no.		
	Outdoor type enclosure having modular construction of 1.5/2mmGalvanised Sheet Steel. The Enclosure shall have IP54 degree of protection for HT & LT switchgear compartment & IP23D degree of protection for Transformer compartment. The enclosure exterior shall be painted with polyurathene paint (colour Light Gray & D.A.Gray). Each compartment will be provided with the door and pad locking arrangement. The Compartment illumination lamp with door operated switch shall be provided for each compartment. Interconnection Between HT switchgear & Transformer using XLPE Single core cable & Interconnection between Transformer & LT switchgear using Busbars. Internal earthing connections. All metallic components shall be earthed to a common earthing point. Dimensions: 2330 X 3230 X 2415 mm (W X L X H) or as per the final decision at Site for components to be included in enclosure.				

S.no	Schedule of Items	Quantity	Unit	Rates in Figure & Words		Amount
	HT Panel:- 11kV, 630A, 25KA/3 sec HT Switchgear consisting of 1 no. fixed type Vacuum Circuit Breaker module for transformer protection. All the live parts, VCB modules , isolators, earth switches must be sealed within robotically welded 3 mm thick single stainless steel tank filled with SF6 gas as insulation having IP67 degree of protection. Each module of the panel should have hinged arc proof cable doors with self interlocking mechanism to the corresponding earth switch, all cable terminations shall be from the front, ringcore CTs for protection purposes with self powered microprocessor based numerical 3 O/C & 1 E/F relay, arrangment for connecting incoming cable & outgoing to primary of transformer. Switchgear shall be complete with all connection, Copper bus-bars, cable supports, manometer, voltage indications, mechanical indications for breaker as per IS:13118, 5227, 5463. IEC:265,129, 298, 694, 529.	1	Nos			In Figures
	Transformer	1	no.			
	500 KVA , 11KV / 433V ,DYn11, oil type AN cooled transformer alongwith with Off Circuit tap links of rating - 5% to +5% in steps of 2.5 % each.					
	Interconnection & Earthing	1	no.			
	Internal factory connections Between HT switchgear & Transformer shall be done using 1Cx3x50Sq.mm XLPE single core cable & Interconnection between Transformer & LT switchgear using Busbars.					
	LT PANEL OUTGOING	1	no.			
	433V LT Indoor panel with Aluminium Busbars , Fabrication using 1.5/2 MM CRCA sheet steel , Ingress protection IP4X , solidally earthed at substation complete with internal wiring, indication lamps etc consisting of following switchgear					
	1 no - 800 A,433 V, 4P, 50 Hz, 50KA, ACB with microprocessor Release Fix type as Incomer Cum Outgoing.	1	no.			
	500 kva Package Substation	**1**	**Set**			

Financial Bid

S.no	Schedule of Items	Quantity	Unit	Rates in Figure & Words		Amount
2	**150 Kvar APFC Panel Thyristor Type**					
	APFC Panel :- SITC of factory built floor mounted auto-manual APFC panel of 100 KVAR capacity having 3 phase APP type with threaded terminals (total power loss not exceeding 0.5W/KVAR) ISI marked power capacitor in six steps (5+10+15+20+50x2) provided with single phase Electronic switching of below given rating to suppress switching of inrush current and reducing harmonics to improve capacitor life complete with all accessories. The system shall have micro processor based power factor controller provided in the command module for target P. F setting with digital P. F. display. The panel shall be made of 2mm thick CRCA Sheet including powder coated painting provided with exhaust fans (with thermostat) and grills for proper ventilation, interconnections with suitable size conductor cables & lugs and accommodating the following switchgears & accessories: a. 250 Amp TP MCCB 25 KA : 1 No. b. LED type Indicating lamp with holder:5 Nos. c. Six step APFC relay:1 No. d. Electronic switching suitable for max 25A Load Current, 480V:6Nos. e. Electronic switching suitable for max 50A Load Current, 480V: 6 Nos f. Electronic switching suitable for max 100A Load Current, 480V: 6 Nos g. Heat Dissipaters for ES: 3 sets h. 25 Amp MCB TP: 2 Nos. i. 50 Amp MCB TP: 2 Nos j. 100 Amp MCCB TP: 2 Nos k. Selector switches: 6 Nos. l. APP Shunt capacitors ISI mark 3phase, 440V :5 KVAR -1 No, 10 KVAR-1 No, 15 KVAR -1 No, 20 KVAR-1 No, 50(25x2) KVAR-2 No					
	150 Kvar APFC Panel Thyristor Type	**1**	**Set.**			

S.no	Schedule of Items	Quantity	Unit	Rates in Figure & Words	Amount
3	**Main LT Panel**				
	Supplying, installation, testing & commissioning of cubical type LT panel suitable for 415V, 3 Phase, 4 wire 50 Hz AC supply system having front surface area as following minimum fabricated in compartmentalized design from CRCA sheet steel of 2mm thick for frame work and covers, 3mm thick for gland plates i/c cleaning & finishing complete with 7 tank process for powder coating in approved shade, having suitable capacity extensible type TPN aluminum alloy bus bars of high conductivity, DMC/SMC bus bar supports, with short circuit withstand capacity of 31 MVA for 1 Sec., bottom base channel of MS section not less than 100mm x 50mm x 5mm thick, fabrication shall be done in transportable sections, entire panel shall have a common Alluminium earth bar of size 25mm x 5mm at the rear with 2 Nos. earth stud, solid connections from main bus bar to switch gears with required size of Al. bus bars and control wiring with 2.5 sq.mm. PVC insulated copper conductor S/C cable, cable alleys, cable gland plates in two half iLoad Current, 480V:6Nos. e. Electro				
(A)	**INCOMER**				
(i)	800 Amp 50 KA 4 Pole ACB with MP releases MDO Type 415 AC supply - 1 No.				
(ii)	Digital flush pattern type voltmeter (0-500 Volt) with built in selector switch - 1 Set.				
(iii)	Digital flush pattern type ammeter (0-1000 Amp), with built in selector switch and one set of 3 Nos. CTs of ratio 400/5A Class I accuracy and 15VA buden - 1 Set.				
(iv)	3 Nos. phase indication LED lamps with 2 Amp SP MCB protection etc - 1 Set.				
(B)	BUS BAR				
	TPN aluminum bus bars of 1000 Amps capacity with heat shrinkable coloured sleeves and i/c DMC/SMC bus bars supports at required intervals complete as required.				

Financial Bid

S.no	Schedule of Items	Quantity	Unit	Rates in Figure & Words		Amount
(D)	**OUTGOINGS**					
(ii)	400 Amp. 50 KA TP MCCB with thermal magnetic protection releases with rotary operating mechanismand suitable netural link - 2 Nos.					
(iv)	200 Amp. 25 KA TP MCCB with thermal magnetic protection releases with rotary operating mechanismand suitable netural link - 2 Nos.					
(v)	125 Amp. 15 KA TP MCCB with thermal magnetic protection releases with rotary operating mechanism and suitable netural link. - 2 Nos.					
	(All MCCB's shall be Ics = 100% Icu.)					
	Main LT Panel	**1**	**Set**			
4	Supplying of following size of XLPE insulated and PVC outer sheathed aluminium conductor armoured UG cable of 1.1 KV grade confirming to IS:7098 (Part-I) 1988 with upto date amendments complete as required. 3.5 x 400 Sq.mm	64	Rmt			
5	Laying of One No. PVC insulated & PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation, sand cushioning, protective covering, and refilling the trench etc as required. Above 185 Sqmm and upto 400 Sqmm	64	Rmt			
6	Supplying and making outdoor end termination with cast resin compound including aluminium lugs and other jointing materials for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required **3½ X 400 sq. mm**	16	Each			
7	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	1	Each			

S.no	Schedule of Items	Quantity	Unit	Rates in Figure & Words		Amount
8	Supplying and laying 25 mm X 5 mm G.I strip at 0.50 metre below ground as strip earth electrode, including connection/ terminating with G.I. nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of G.I. nut bolt & spring washer spaced at 50mm)	20	Meter			
9	Providing and fixing 25 mm X 5 mm copper strip in 40 mm dia G.I. pipe FRLSom earth electrode including connection with brass nut, bolt, spring, washer excavation and re-filling etc. as required.	20	Meter			
10	Construction of foundation with Concrete/Brick masonary with plastering for the installation of Compact Substation of Size 2500mm X 3500mm including trench for the cabling work etc complete in all respect as per the direction of engineer in charge.	1	LS			
11	Providing and fixing M.V. danger notice plate of 200 mm X 150 mm, made of mild steel, at least 2 mm thick, and vitreous enameled white on both sides, and with inscription in single red colour on front side as required.	2	Each			
12	Providing and fixing H.T. danger notice plate of 250 mm X 200 mm, made of mild steel, at least 2 mm thick, and vitreous enameled white on both sides, and with inscription in single red colour on front side as required.	2	Each			
13	Misc charges for unloading of Compact Substation at site, Electrical Clearence from concerned authority or any other small works required to complete the work excluding any major item or component of costing more than Twenty Thousand.	1	LS			
	Total				Rs.	

Amount in words……..

Supply, Installation, Testing and Commissioning of 11KV Compact Substation with 500 KVA Transformer at NHSRC, NIHFW Campus, Munirka, New Delhi -110067

Checklist forTender		
S.no	**Description**	**Remarks**
1	Proof of average annual financial turnover of firm during the last 3 years ending March 2015 should be at least 30% of the estimated cost.	
2	Proof of experience of having successfully completed similar works during last 7 years ending last days of the month previous to the one in which tenders are invited as per following:	
a	a) Three similar completed works costing not less than the amount equal to 40% of the estimated cost. OR	
b	b) Two similar completed works costing not less than the amount equal to 60% of the estimated cost. OR	
c	c) One similar completed works costing not less than the amount equal to 80% of the estimated cost	
3	A tender shall produce a copy of valid PAN Card	
4	Proof of registration with EPF	
5	Proof of registration with ESI	
6	Proof of registration with VAT	
7	Proof of registration with Service Tax	
8	Copies of similar work executed in last three years along with performance certificate	
9	Audited balance sheet for previous three years	
10	Latest bank solvency certificate of value not less than 40% of the estimated cost in any case it should not be older than 12 months from the last day of issue of NIT	
11	History & structure of firm, name of director/partners/proprietor/with Technical staff	
12	List of machinery/tools plants and equipment.	
13	Valid copy of Electrical License	
14	All the above certified documents shall be submitted by the firm duly signed and stamped by Notary Public/gazetted officer and self stamped with seal of the company and original shall be duly produced for verification as required	
15	An affidavit duly notarized on stamp paper of Rs.100/- non-judicial stating that “In case of any ambiguity found in the documents submitted (Listed out) at any stage, we shall be entirely responsible and liable for any action as deemed fit under the Law”	
16	EMD of Rs.66,000.00	
17	Tender Cost of Rs.1000.00	