

**JAIPUR VIDYUT VITARAN NIGAM LIMITED  
OFFICE OF THE SUPERINTENDING ENGINEER (PROC)  
OLD POWER HOUSE PREMISES, NEAR RAM MANDIR, BANIPARK, JAIPUR-6  
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**BID DOCUMENTS FOR SUPPLY GALVANISED M.S.FORGED L.T. PINS  
AND H/W FITTINGS FOR L.T. SHACKLE INSULATORS  
AGAINST  
BID SPECIFICATION NO.JPD/SE(Proc)/SPO.IIIII/TN-4331**

<b>Last Date of receipt of bids</b>	<b>19.04.2011 upto 2:30 PM</b>
<b>Date of opening of bids</b>	<b>19.04.2011 at 3:00 PM</b>
<b>Cost of Specification</b>	<b>Rs. 2500.00 ( Rs. Two Thousand Five Hundred only)</b>
<b>Validity</b>	<b>120 days from the date of opening of techno-commercial bids.</b>
<b>Earnest Money</b>	<b>Rs. 2,00,000.00 (Rs. Two Lac Only ) / Exemption Certificate / Vendor Registration Of Class "B " Category.</b>

**Note : The bidders in their own interest are advised to go through the complete specification carefully.**

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**Note:- The bidder, in their own interest, are requested to read very carefully Section-I (Instruction to bidders), Section-II (General Condition of Contract) & Section-III (Technical Specification) before filling the bid. The Bid documents be downloaded from JVVNL website [www.jaipurdiscom.in](http://www.jaipurdiscom.in) . No hard copy of the bidding documents will be provided to the bidders through this office. In case of any discrepancy found in bidding documents downloaded from the website and appended with the bid (as a bid document) and original copy of such document available in the office of Superintending Engineer (Proc.), Jaipur Discom, Jaipur then the copy available with Superintending Engineer (Proc.), Jaipur Discom, Jaipur will be considered as final document for all purpose. The cost of Bid document as published in NIT shall be furnished along with downloaded bid document in the manner prescribed in bid document.**

**TECHCHNICAL SPECIFICATION FOR GALVANISED M.S FORGED L.T.PINS  
AND HARDWARE FITTINGS FOR L.T. SHACKLE INSULATORS FOR USE  
ON L. T. DISTRIBUTION OVERHEAD POWER LINES UNDER TN-4331**

**1.0 SCOPE :**

**1.1** This specification provides for the design, manufacture, inspection and testing before despatch, supply and delivery of Galvanised M.S.Forged L.T. Pins and Hardware fittings for L. T. Shackle Insulators specified herein for their satisfactory use & operation on various distribution overhead power lines of the State.

**1.2** It is not the intent to specify completely herein all the details of the design and construction of equipment. However, the equipment shall conform in all respect to high standards of engineering, design and workmanship and shall be capable of performing in continuous commercial operation up to the bidder's guarantee, in a manner acceptable to the purchaser, who will interpret the meanings of drawings and specification and shall have the power to reject any work or material which in his judgment is not in accordance therewith. The offered equipment shall be complete with all components necessary for their effective and trouble free operation. Such components shall be deemed to be within the scope of bidder's supply irrespective of whether those are specifically brought out in this specification and / or the commercial order or not.

**2.0 CLIMATIC CONDITIONS :**

The pins and Hardware fittings shall be suitable for being installed directly in air with power conductors L.T. single circuit/double circuit overhead distribution lines. These items, therefore, shall be suitable for satisfactory operation under the tropical climatic conditions listed below :

1.	Location	In the state of Rajasthan
i)	Maximum ambient air Temperature (deg.C)	50
ii)	Maximum Temperature attainable to an object exposed to sun (deg.C)	60
iii)	Minimum Ambient air Temperature (deg.C)	(-) 5.0
iv)	Average daily ambient air Temperature (deg.C)	40.0
v)	Maximum relative humidity (%)	100
vi)	Average rainfall per annum (mm)	100-1000
vii)	Average Number of rainy days per Annum	70
viii)	Maximum altitude above mean sea level (meters)	1000
ix)	Isoceraunic level (Days/Annum)	40
x)	Maximum wind pressure (Kg/sq.m.)	195
xii)	Seismic level	0.33 g

### 3.0 PRINCIPAL PARAMETERS :

The material shall conform to the following specific parameters :

S.No.	Item	Specification
1.	Type of Installation	Outdoor
2.	System Voltage	415 Volt(+10%, -15%)
3.	System frequency	50 Hz, + 5%
4.	Number of phases	Three
5.	System of earthing	Solidly grounded.

### 4.0 DETAILS OF ITEMS :

The Galvanised M.S. forged L.T. Pins & shackle insulator hardware fittings shall be suitable for use on single phase/three phase, 230/440 Volts overhead distribution lines in a moderately polluted atmosphere.

### 5.0 GENERAL TECHNICAL REQUIREMENTS :

#### 5.1 GALVANISED M.S. FORGED L.T. PINS :

**5.1.1** The M.S.Forged L.T. Pins suitable for L.T.Pin insulators shall comply in all respect, herein otherwise stated, with figure 2 of IS:7935/1975 (latest amended). The Pins shall be of steel complying with class 2 of IS:2004/1970 (latest amended). The pins shall be of good finish, free from flaws and other defects. The finishing of collar shall be such that sharp angle between the collar and shank is avoided.

**5.1.2 DIMENSIONS :** The L.T. Pins for supply under this specification shall conform to figure 2 of IS:7935/1975 (latest amended) and shall have the following dimensions:

S.No.	Item	Dimensions
1.	Length of Pin	260 mm
i)	Shank length	125 mm
ii)	Stalk length	135 mm
2.	Thickness of stalk collar	5 mm
3.	Diameter of stalk	
i)	at top	16 mm
ii)	at collar	32 mm
4.	Diameter of shank	16 mm
5.	Length of threads	
i)	on stalk	32 mm + 3 mm
ii)	on shank	75 mm
6.	Thickness of nut(M-16)	
i)	Maximum	15.9 mm
ii)	Minimum	14.1 mm
7.	Spring washer thickness(M-16)	3.5 mm + 0.2 mm
8.	Weight of L.T.Pin (Approx.)	<b>0.425 Kg.± 2% Tolerance</b>

**5.1.3 THREADS :** Threads of L.T. pins shall be matching with L.T. Pin Insulators conforming to IS:1445/1977 ( latest amended) and shall be checked by means of gauges.

**5.1.4 HEXAGONAL NUTS :** Hexagonal Nuts of M-16 size shall be used & shall conform to IS:1363(Part-3):1992 (latest amended). The nuts shall be made of material conforming to class 4.8 of IS:1367 (Latest amended) with regard to its mechanical properties. The thickness of the hexagon nuts shall be in accordance with IS:1363 (Pt-3)/1984 (Latest amended). The screw threads on the shank and the nut shall be as prescribed in IS:4218 (Pt-6)/1978 (Latest amended).

**5.1.5 SPRING WASHERS :** Spring washers of 3.5 mm thickness of M-16 size shall be used which should conform to IS:3063:1994 (Latest amended).

**5.1.6 FAILING LOAD :** The minimum failing load of L.T. Pins shall be 2.0 KN.

**5.1.7 GALVANISATION:** The L.T.Pins shall be hot dip galvanised. The galvanisation of Pins shall conform to IS:2633/1986 (latest amended). The threads of nuts shall be cut after galvanisation and shall be well oiled or greased. Small parts like nuts and spring washers etc. may be electro-galvanised in accordance with IS:1573/1986 (latest amended).

## **5.2 GALVANISED HARDWARE FITTINGS FOR L.T. SHACKLE INSULATORS:**

**5.2.1** The hardware fittings for L.T. Shackle Insulators shall comply in all respects, herein otherwise stated, with fig.3, type-1 of IS:7935/1975 (latest amended). The hardware fittings assembly shall comprise the following:

- i) A pair of mild steel straps,
- ii) Two numbers of mild steel bolts with hexagonal head,
- iii) Two numbers of mild steel nuts of hexagonal head to suit bolts under item (ii) above &
- iv) Two numbers suitable washers.

**5.2.2 DIMENSIONS:** The dimensions of hardware fittings for L.T. shackle insulators for supply under this specification shall conform to figure 3, type 1 of IS:7935/1975 (latest amended) and shall have the following dimensions:

S.No.	Item	Dimensions
c	Minimum	7.05 mm
i)	Length of straps	185 mm
ii)	Thickness of nuts	12.2 mm
a)	Width of straps	39 mm
b)	Maximum	30.4 mm
iii)	Thickness of straps	3.5 mm
iv)	Minimum	14 mm
v)	Diameter of holes at the end of straps	Hexagonal
vi)	Shape of bolt heads & nuts	12 mm
vii)	Dia. of bolts	115 mm
viii)	Length of bolts	65 mm
ix)	Length of threaded portion of bolts.	17 mm
x)	Dia. of bolt head	3 mm + 0.15 MM
xi)	Thickness of galvanized spring washer	
xii)	Thickness of bolt head.(M-12)	
xiii)	Weight of complete hardware fitting	0.475 Kgs. + 2% Tolerance
b	Maximum (approx.)	7.95 mm

**5.2.3 HEXAGONAL NUTS :** Hexagonal Nuts of M-12 size shall be used & shall conform to IS:1363(Part-3):1992 (latest amended). The nuts shall be made of material conforming to class 4.8 of IS:1367 (Latest amended) with regard to its mechanical properties. The thickness of the hexagon nuts shall be in accordance with IS:1363 (Pt-3)/1984 (Latest amended). The screw threads on the shank and the nut shall be as prescribed in IS:4218 (Pt-6)/1978 (Latest amended).

**5.2.4 SPRING WASHERS :** Spring washers of 3.0 mm thickness of M-12 size shall be used which should conform to IS:3063:1994 (Latest amended).

**5.2.5 Galvanisation:** The Hardware fittings shall be hot dip galvanised. The galvanisation of Hardware fittings shall conform to IS:2633/1972 (latest amended). The threads of nuts and tapped holes shall be cut after galvanisation and shall be well oiled or greased. Small parts like nuts and spring washers etc. may be electro-galvanised in accordance with IS:1573/1970 (latest amended)

### **5.3 IDENTIFICATION & MARKING :**

**5.3.1** The pins and hardware fittings for shackle insulators shall be marked with the manufacturer's name or trade mark.

**5.3.2** The package containing the insulator fittings may also be marked with the ISI certification mark if available.

### **6.0 TESTS :**

**6.1 TEST BEFORE DESPATCH:** The Galvanised M.S.Forged L.T. pins and Hardware fittings for L.T.shackle insulators shall be subjected at manufacturer's works before despatch, to the tests mentioned here-under as per IS: 7935/1975 (latest amended).

#### **6.1.1 ROUTINE TESTS :**

The following tests shall be conducted on each unit by the bidder at his works as per relevant standard - IS:7935/1975 (latest amended) :

- a) Visual Examination ( Clause-4.4)

#### **6.1.2 ACCEPTANCE TESTS :**

The following tests shall be conducted on samples taken at random from a lot as per relevant standard, IS:7935/1975 (latest amended) in presence of purchaser's representative :

- a) Checking of threads on heads (Clause 4.6 )
- b) Galvanizing / Electroplating test (Clause 4.7)
- c) Verification of dimensions (Clause 4.5)
- d) Mechanical Strength Test (Clause 4.8)

## 6.2 TYPE TESTS

a) The bidder shall furnish valid and authenticated type test certificate from a Govt. approved/ a Govt. recognized/ NABL accredited laboratory/ ILAC i.e. International Laboratory Accredited laboratory / ILAC i.e International Laboratory Accrediation Cooperation ( In case of foreign laboratory) . Such type test certificates should not be older than three years as on the date of bid opening. For this purpose date of conduction Type Test(s) will be considered.

b) The type test certificates by in house laboratory of bidding firm even if it is a Govt approved/ Govt recognized/ NABL accredited/ ILAC accredited,shall not be accepted, in case of their own bid. This will not apply if bidding firm is Govt. Company/ Public Sector Undertaking.

c) The bidder should furnish documentary evidence in support of the laboratory whose type test have been furnished, that the said laboratory is a Govt/ a Govt. approved/ a Govt. recognized/ NABL accredited laboratory/ ILAC accredited ( in case of foreign laboratory)

d) The type test certificates shall be furnished either in original or duly attested by notary.

e) The bids of only those bidders shall be considered to be meeting the type test criteria who furnishes complete type test certificates with the bid as per above provision.

f) However, in the following cases the bid of the bidder may be considered meeting the type test criteria if the bidder furnishes an undertaking stating that valid type test certificates from a Govt/ a Govt. approved/ a Govt. recognized/ NABL accredited laboratory/ ILAC accredited shall be furnished from first lot (without asking for any delivery extension) along with Bank Gurantee, with the technical bid from a Nationalized/ Scheduled Bank in prescribed proforma at Schedule-III C or DD/ Pay order amounting **Rs. 5 Lac.** The initial validity of BG shall be 9 months with claim period of 3 months in addition

- i) Where a new Rajasthan based firm is participating & is technically competent.
- ii) Where one or more type test(s) is/ are older than 3 years.
- iii) Where Rajasthan/outside Rajasthan firm furnishes requisite type test reports of higher rating material

**6.2.1** The following shall constitute the type tests which are to be conducted on at least three units of each rating as per standard IS:7935/1975 (Latest amended) and other relevant standards :-

- a) Visual examination test (Clause 4.4).
- b) Verification of dimensions (Clause 4.5)
- c) Checking of threads on heads ( clause 4.6)
- d) Galvanising/electroplating test (Clause 4.7)
- e) Mechanical strength tests (Clause 4.8) (for pins only)

**6.2.2** However, the purchaser reserves the right to demand repetition of some or all the type tests in presence of purchaser's representative. For this purpose, the bidder should indicate unit rates for carrying out such type tests. These test charges shall not be taken into consideration for bid evaluation.

**6.3 SAMPLING :** As per IS:7935/1975 (latest amended)

**6.4 TOLERANCE ON TEST RESULTS :** The tolerance for dimensions when not indicated in the drawing i.e. fig. 2 & 3 of IS:7935/1975 (Latest amended) for L.T.Pins & Hardware Fittings for L.T.Shackle Insulators, shall be + 5% except on collar thickness of L.T.pins for which tolerance is allowed upto 2 mm on plus side and 0.5 mm on minus side.

**6.5 TEST AT SITE:**

The purchaser reserves the right to conduct all tests on Galvanised M.S.Forged L.T. Pins & Hardware fittings after arrival at site / store and the contractor shall guarantee test certificate figures under actual service conditions.

**6.6 TESTING FACILITIES:**

The bidder must indicate clearly about the various testing facilities for the acceptance tests as well as routine tests as per relevant ISS as are available at their works. In case no testing facilities are available at the bidder's works, particulars of the place where such testing is proposed to be conducted during the course of inspection must be indicated.

**7.0 INSPECTION**

**7.1** All the tests as mentioned at Clause 6.1.1 & 6.1.2 for pre-despatch inspection shall be made at the place of manufacturer unless otherwise especially agreed upon by the bidder and purchaser at the time of purchase. The bidder shall afford the inspection officer(s) representing the purchaser all reasonable facilities without charges, to satisfy him that the material is being furnished in accordance with this specification. The purchaser has the right to have the tests carried out at his own cost by an independent agency whenever there is a dispute regarding the quality of supply.

**7.2** The Inspection may also be carried out by the purchaser at any stage of manufacture/ before despatch as per relevant standard.

**7.3** Inspection and acceptance of any material under the specification by the purchaser, shall not relieve the bidder of his obligation of furnishing material in accordance with the specification and shall not prevent subsequent rejection if the material is found to be defective. The Bidder shall keep the purchaser informed in advance, about manufacturing programme so that arrangements can be made for inspection.

**7.4** The purchaser reserves the right to insist for witnessing the acceptance/ routine testings of the bought out items.

**7.5** The Bidder shall give 15 days advance intimation to enable the purchaser to depute his representative for witnessing the acceptance and routine tests. The inspection charges would be to the purchaser's account.

## **8.0 DOCUMENTATION :**

**8.1** The Bidder shall furnish full description and illustrated catalogues of material offered alongwith the bid.

**8.2** The Bidder shall also furnish alongwith the bid the outline drawing of L.T. Pins & hardware fittings as per reference fig. of relevant ISS.

## **8.3 TEST REPORTS :**

**8.3.1** Two sets of type test reports duly approved by the purchaser shall be submitted by the supplier for distribution before commencement of supply. Adequate copies of acceptance & routine test certificate, duly approved by the purchaser shall accompany the despatched consignment.

**8.3.2** All records of routine test reports shall be maintained by the Supplier at his works for periodic inspection by the Purchaser.

**8.3.3** All test reports of tests conducted during manufacture shall be maintained by the Supplier. These shall be produced for verification as and when requested for by the Purchaser.

## **9.0 PACKING & FORWARDING :**

**9.1** All insulator fittings shall be packed in double bags, one HDP bag (inner) and one gunny bag (outer) or in double gunny bag. The gross mass of the each packing shall not normally exceed 50 Kg.

**9.2** The packing shall be of sufficient strength to withstand rough handling during transit, storage at site and subsequent handling in the field.

## **10.0 DELIVERY SCHEDULE:**

The bidder is required to quote monthly delivery. The delivery of quoted quantity should be completed in **Ten months** period including commencement period of **maximum 30 days in equal monthly installments**. In case ordered quantity is different than quantity monthly delivery shall be adjusted proportionately. Bids in which monthly delivery schedule is not indicated shall be ignored.

The bidders are required to indicate the delivery schedule in the schedule attached with the Specification.

## **11.0 PRICES AND PRICE VARIATION:**

a) The prices quoted shall be variable as per price variation formula given in the specification (**Schedule-II**). The IEEMA formula allowing price variation for transmission line accessories & H/W containing all steel as under, shall hold good

for Galvanised M.S. Forged L.T. pins and Hardware fittings for L.T.shackle insulators.

$$P = \frac{P_o}{100} \left( 20 + 58 \frac{LA}{LA_o} + 7 \frac{Zn}{Zn_o} + 15 \frac{W}{W_o} \right)$$

The details of this PV clause are available at (Schedule-II).

b) If the price variation formula is changed, the same shall be applicable for the price variation. During the transit period when both old and new indices are being circulated, then the admissible price variation shall be applicable, which is advantageous to NIGAM, and the period from which old indices are discontinued then the PV shall be admissible with the new indices.

c) The date of delivery ( i.e. date of readiness of material ) is to be considered as per clause No. 1.10 of Section-I(Instructions to bidder).

## 12.0 TEST CHECKING OF MATERIAL AT STORES

The material received in the stores of the NIGAM shall be subjected to the test checking at stores before final acceptance of the material, the procedure for the same shall be as under :

### 12.1 SAMPLING

One sample out of each sub-lot / lot of **3000** Nos. or part thereof from each inspected lot received in stores shall be selected for test checking of material and shall be got tested. The sample selection shall be done in the presence of supplier or his authorised representative for which 7 days notice shall be given to the supplier.

### 12.2 TESTS

**12.2.1** The following tests shall be carried out on the above items :

- a) Visual Examination, Verification of Dimension, weight and marking.
- b) Mechanical Strength Test ( for LT Pins only).
- c) Galvanisation (Uniformity) Test.

Only those test shall be conducted at CTL for which facility with CTL is available.

**12.2.2** Test of the material shall be got done at the test laboratory of the NIGAM or any other test laboratory designated by the Chief Engineer (MM). For witnessing of the testing, 7 days notice shall be given to the supplier stating date, time & place where the test is to be conducted. In case the supplier do not attend for witnessing the testing, the testing shall be proceeded and completed and action taken as per the contract.

**12.2.3** The witnessing officers of the NIGAM or as designated by the purchaser shall send copies of test reports to the purchaser, consignees and the supplier.

### **13. CRITERIA FOR ACCEPTANCE**

#### **13.1 Visual Examination, Verification of Dimension, weight and marking .**

As per specification/ ISS

#### **13.2 Mechanical Strength Test (for LT Pins only)**

In case of failure of sample in Mechanical Strength Test, the material contained in the lot / sub-lot to which the sample belongs, shall be rejected. The rejected material shall have to be replaced by the supplier free of cost.

#### **13.3 Galvanisation (Uniformity) Test.**

**13.3.1.** The sample(s) shall be first tested for (n-2) number of dips where (n) is specified number of dips in the contract. If the sample(s) does not pass the uniformity of Galvanisation Test for (n-2) dips, the material shall be rejected and the material relating to relevant lot / sub-lot to which sample(s) pertains shall have to be replaced by the supplier free of cost.

**13.3.2** If the sample has passed the uniformity of Galvanisation Test for (n-2) dips, then it shall be tested for (n-1) dips. If the sample has not passed the uniformity of Galvanisation Test with (n-1) dips, then material pertaining to relevant lot / sub-lot shall be accepted with a deduction @ 10% of cost of material.

**13.3.3** If the sample has passed the uniformity of Galvanisation Test with (n-1) dips, then sample shall be tested for last one dip of one minute to complete the test for 'n' dips. If the sample does not pass the uniformity of Galvanisation Test with 'n' dips, then the material pertaining to relevant lot/ sub-lot shall be accepted with a deduction @ 5% of cost of material.

**13.3.4** If the sample(s) have passed the Test with number of dips as specified in the contract (n), then material pertaining to relevant lot / sub-lot shall be accepted.

#### **14.0 TEST CHARGES :**

All test charges incurred towards test checking of the material received in our stores shall be borne by the NIGAM.

#### **15.0 PAYMENT :**

Payment shall be made only after receipt of successful test report from the CTL on the samples selected from the material received at the stores. However, the due dates for payment shall be considered from the date of submission of the bills along with receipted challans to Accounts Officer(CPC), JVVNL, Jaipur