



**Bharat Heavy Electricals Limited**  
**Heavy Equipment Repair Plant**  
Works Contract Management (WCM) Department  
TARNA, SHIVPUR, VARANASI-221003

**Tender Document**

<b>Name of Work:</b> - Variable Load Hanger ( <b>VLH</b> ) Assembly, Testing & Tack welding of top post testing plate within BHEL HERP premises
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**TENDER NO.:** BHEL/HERP/WCM/FY24/EM/VLH ASSY      **DATE.** 04/10/2024

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**Bharat Heavy Electricals Limited**  
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 TARNA, SHIVPUR, VARANASI-221003

**Notice Inviting Tender (NIT)**

**TENDER NO - BHEL/HERP/WCM/FY24/EM/VLH ASSY**

**DATE. 04/10/2024**

Tender is invited for '**VLH Assembly, Testing & Tack welding of top post testing plate within BHEL HERP premises**, as per details mentioned under:

<b>Last Date of submission of Tender</b>	<b>14/10/2024</b>	<b>Time :</b>	<b>14:00</b>
<b>Date and Time for opening of Technical Bid</b>	<b>14/10/2024</b>	<b>Time :</b>	<b>16:00</b>

Sl. No.	Name of work	Earnest Money Deposit (EMD)	Security Deposit (SD)	Period of contract	Cost of Tender Document	Reverse Auction
1.	VLH Assembly, Testing & Tack welding of top post testing plate within BHEL HERP premises	NIL	10% of the contract value	01 Year	NIL	Applicable

- All NIT/ Tender document/ Corrigenda / Addenda / Amendments / Time extensions etc. to the tender will be hosted on NIC portal (<https://eprocurebhel.co.in/>), Bidders should regularly visit above websites to keep themselves updated.
- **Bidder to note that this is an e-tender and bidders have to submit this through NIC portal (<https://eprocurebhel.co.in/>) site only. No hard copies of tender shall be accepted.**
- For wide publication NIT may also be hosted on <http://www.bhel.com> & <https://herp.bhel.com>
- Bidder is requested to contact undersigned for any query or clarification.

(Issued by)  
 Atendr Kumar Pal  
 Dy. Manager (WCM)  
 Email: [atendrpal@bhel.in](mailto:atendrpal@bhel.in)  
 Phone No. 0542-2720928

1. BHEL reserves the right to accept or reject any/ all application(s) without assigning any reason thereof.
2. If any document submitted by the bidder is found false at any stage, the bid/ work order will be cancelled immediately and the financial loss to BHEL if any in making alternative arrangement will be recovered from the contractor.



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**DIRECTIONS TO PARTIES FOR TENDERING**

1. Bidder to note that work will be awarded at lowest quoted Rates. All other details regarding the same will be as per BHEL Work Policy- 2016, General Condition of Contract (GCC) and SCC.
2. Party may visit the site for assessment of actual quantum or nature of work if they wish before quoting their rates.
3. **RA (Reverse Auction) will be conducted for this enquiry**
4. This is two part bid system and the bidder should submit separate Technical Bid & Price Bid as per details mentioned under:

**Details of Tender Document**

The Tender document has been detailed as follows:

**Part-I (TECHNO-COMMERCIAL BID)**

1. Notice Inviting Tender (NIT)
2. Details of Bid & Bidder
3. Scope of Work
4. Special Terms & Conditions
5. BOQ & Price Schedule
6. Pre-Qualification Requirement
7. No deviation certificate
8. General Condition of Contract (GCC)
9. Bidder's Declaration
10. Test Procedure
11. VLH Drawings

**Part-II (PRICE BID)**

1. Price to be quoted on NIC Portal only.
5. Tenders shall be opened by authorized officers of BHEL at their office at the time and date as specified in the tender notice in the presence of bidders or their authorized representative who may be present.
6. A representative of bidder (only 01 per bidder) shall be permitted to be present at the time of opening of bid. However, ***the bidder should give prior intimation of the same & seek permission after giving details of its representative by contacting designated person as per details mentioned in NIT at least 02 days in advance.***
7. The successful Tenderer shall submit security deposit and must sign contract agreement within 15 days from the date of Letter of Award (LOA) given by Bharat Heavy Electricals Limited and further start the work under reference.
8. All expenses towards procurement of Stamp paper and preparation of contract agreement shall be in the scope of contractor.



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**Details of Bid & Bidder (To be filled by bidder)**

Sl. No.	Description	To be filled by bidder
1	Bidder Offer No. & Date	
2	Legal Name of the bidder (as mentioned in GST registration)	
3	Address for Communication	
		City -
		State
		PIN code:
		Phone / Fax No.
		Name of Contact Person
		Mobile No.
		Email ID
4	Type of firm	Individual / Proprietorship / Partnership / HUF / Association of Persons / Private Limited company / Public Limited company
5	GST registration No.	
6	PAN No.	
7	UDYAM Registration No. (If available)	
8	Remark (If any)	

Certificates to be attached:

Copy of PAN, GST Registration Certificate., UDYAM Certificate (for MSEs).



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### **Scope of Work**

**Validity of Contract:** One Year from the date of Contract Agreement

**LOCATION OF WORK PLACE:** The Assembly & Testing of **Variable Load Hangers (VLH)** is to be carried out inside BHEL – HERP, Varanasi premises, Uttar Pradesh.

**Detailed Scope of Work:**

The scope of work requires removal of tack welded **Variable Load Hangers (VLH)** Top plate, placing the spring inside the housing, mounting the housing to test machine, spring compression to cold load, cold load setting & spot welding of the VLH top Plate, as mentioned below. Tack welded VLH Housing & Springs will be provided to contractor as the input raw material.

Scope of Work	Approx. Quantity (In Nos.)			Estimated rate excluding GST (Rs./ Unit)	Value of the work excluding GST (in Rs.)
	S. No.	VARIANT TYPE	QTY. (Nos.)		
VLH Assembly, Testing & tack welding of top post testing plate within HERP premises for period of 1 years.	1	01-080	105	102	10710
	2	03-080	237	107	25359
	3	04-080	272	123	33456
	4	01-160	18	156	2808
	5	02-080	176	102	17952
	6	03-160	55	157	8635
	7	02-160	36	156	5616
	8	04-160	72	190	13680
	9	05-080	326	123	40098
	10	06-080	301	123	37023
	11	05-160	107	190	20330
	12	06-160	155	190	29450
	13	07-080	399	123	49077
	14	08-080	403	157	63271
	15	07-160	252	190	47880
	16	08-160	260	340	88400
	17	09-080	397	267	105999
	18	10-080	497	299	148603
	19	09-160	446	401	178846
	20	10-160	359	475	170525
	21	11-080	354	301	106554
	22	12-080	315	438	137970
	23	11-160	479	613	293627
	24	13-080	129	509	65661
	25	12-160	387	618	239166
	26	13-160	121	762	92202
	<b>Total</b>		<b>6658</b>		<b>2032898</b>



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**\*\* Each line item qty. may change as per BHEL Requirement. However total Qty. of VLH for the contract may vary by  $\pm 20\%$ .**

**TOTAL VALUE = Rs. 20,32898/- (GST extra as applicable)**

The total quantity of VLH indicated as 6658 above is tentative and may vary up to + or – 20 % in totality after completion of Detailed Engineering. The total quantity indicated above is an estimate based on current order balance & next one-year projection of the scheduled GMS release from HPBP Trichy.

The scope of work Include the following activities:

1. Dismantling of VLH Housing
2. Assembly of VLH Housing Along with Springs
3. Tack Welding of Housing with top plate
4. VLH Testing & Marking.
5. Assembly Locking

***The detailed Procedure of VLH Assembly & Testing (Doc No.: VLH/Proc./01) along with relevant drawings will be Provided along with enquiry.***

The rates against work contract will be firm & valid for ordering for the period of **01-year** from the date of agreement. **Price variation clause (PVC) is not applicable.**



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**Special Terms & Conditions**

**1. Contractor Scope**

- A. Adequate facilities for carrying out the prescribed job must be available with the vendor. All the below equipment's must be under working condition and relevant documents for the same are to be made available for verification by BHEL - HERP Officials.
1. All consumables to be used for the job, shall be approved by BHEL prior to use.
  2. Hand Grinder with consumables.
  3. IGBT or THYRISTOR based Welding sets only.
  4. Qualified Welder as per ASME sec 9.- if qualified welder is not available, BHEL will facilitate to qualify the welder @ Rs 2640/- per test sample.
- B. Springs & Tack welded VLH Housing shall be provided to the contractor. Contractor has to open the housing top plate by removing the tack weld, Placing the spring inside the Housing, Mounting the Spring Housing Assembly to Testing Machine, Cold Setting as per the BHEL input Data and tack welding of VLH top plate in cold position of Spring after testing & marking.
- C. Vendor's scope includes Collection & Transportation Springs & Tack welded VLH housing to Work Location, handing over of excess / balance materials at HERP stores. Vendor has to open the packing boxes, of springs as well as VLH housings. After completing the job, vendor has to dispose the packing materials at the location specified by BHEL. The Manpower for above work will be in the scope of vendor.
- D. The work is to be executed as per the latest approved Drawings for each PGMA, QAP, WPS, Specifications etc.
- E. The Assembled VLHs shall strictly conform to the dimensions and tolerances indicated in the drawings. It must be ensured that correct dimensions and deviations, if any, are recorded properly and is made available to BHEL officials or their authorized agencies.
- F. All indirect materials, consumables like grinding wheels etc. required for tack welding are in the scope of the Vendor.
- G. Qualified Engineers & Supervisors shall be deployed for proper co-ordination of the job. the welders should have qualified for welding of carbon steel and alloy steel/ BQ plate
- H. Any modification work due to revision of the drawings during fabrication is to be carried out by the vendor without any additional cost
- I. Contractors shall abide by all the rules and statutory/legal regulations in force from time to time as per the Factories Act. It is their responsibility to ensure the safety of their workmen and fulfilling the ESI, PF and other relevant statutory regulations
- J. Though not mentioned specifically, any activity which is required for completion of the work is deemed to be included in the scope of work of bidders.



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**2. BHEL's SCOPE:**

**BHEL shall provide the following as free issue:**

- a) Supply of Drawings, GMS, Shipping List, QAP, WPS etc.
- b) Tack welded VLH housing without spring & VLH Springs as input material
- c) Electricity and Water will be provided free of cost at one point and further distribution to the work location is to be carried out by vendor.
- d) Material handling facility shall be provided by BHEL free of cost. (Man-Power for the same to be arranged by Vendor only)
- e) Electrode E-7018.

**3. CONTRACTOR'S RESPONSIBILITY:**

- a. **Minimum Two group including fitter & Worker(s) shall be deployed by contractor to execute the above mentioned allotted work. Each Group will be provided access to one VLH Test stand each.** To complete the assigned task apart from normal working hours, contractor will have to work in 'B' Shifts, Night Shifts (Night Shift Rules will be applicable) and on Holidays for which requisite permission will have to be taken by contractor.
- b. The work shall be supervised by the contractor or by his representative on day-to-day basis.
- c. Welding & Grinding Machine and other accessories will be arranged by the Contractor. Electrical connection for Welding & Grinding Work shall be provided by BHEL at free of cost
- d. Grinding and slag removal machine and consumables (grinding disc and other accessories) and other equipment required shall be arranged by the contractor.
- e. Contractor must obtain labor license from DLC, Varanasi within one month of award of contract, if more than 20 (twenty) workmen are engaged for Welding & Grinding work
- f. The Contractor shall also furnish daily and Monthly report showing the number of employees engaged in various categories of work and a progress report of work as required by BHEL Engineers
- g. After completion assembly, testing & final tack welding of VLH top plate, the information related to VLH is to be filled in the prescribed format. if the welding, testing or cold setting has not been done as per specifications, the same has to be done again to get the desired results
- h. Deployment of all skilled and un skilled manpower required for VLH assembly, testing and supervision of welding work
- i. The work shall be executed under the usual conditions existing in work sites and in conjunction with numerous others operations at site. The bidder and his personnel shall co-operate with other personnel contractor coordinating his work with other and proceed in a manner that shall not delay or hinder the progress of work as a whole
- j. The contractor shall not cause or permit any nuisance on work sites or anything, which may cause un-necessary disturbance or inconvenience to other workers
- k. The contractor should ensure it before start of work that all engineers, supervisors and workmen engaged in the said work are fully insured by the



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contractor at their own risk & cost. Insurance copies are to be submitted before the start of work

- l. If the contractor or his workmen or employees shall break, deface, injure or destroy any part of a building, road curb, fence, enclosure, water pipes, cable drains electric or telephone post or wire, trees or any other property or to any other part of erected component etc. the contractor shall make the same good at his own expense or in case of default, penal action as may be deemed fit may be taken by BHEL
- m. The contractor shall have total responsibility for safety, quality, all his equipment in his custody and quantity of material after it handed over and issued to contractor by BHEL
- n. The contractor shall be responsible for taking all safety precautions during the work. Workman engaged in painting should wear safety shoes, safety goggles/glasses and safety helmets at work places anywhere in HERP premises. Contractor should provide all the safely equipment/arrangement to their workman at his cost
- o. Sometimes it may become necessary for the contractor to handle certain un-required components in order to take out the required materials. The contractor has to take this contingency also into account. No extra payment is payable for such contingency
- p. The contractor has to arrange for dwelling of persons employed by him under this contract at his own cost
- q. The contractor must ensure latest revision of drawing and testing parameters related input from HERP before start of the work. Before doing any work, contract must clear the scope from executing department
- r. Contractor will have to give name of the team to be deployed for work during the contract with their qualification
- s. The workers deployed by the supplier / contractor for this work should be full time employees governed by Supplier's / Contractor's service conditions
- t. The contractor will be provided access to the identified VLH testing stands in the main shop for testing of the assembled VLH. In case of exigencies, limited access to additional VLH testing stand (01 nos.) can be provided on request and record entry.

**4. DELIVERY SCHEUDLE: -**

Job order given for Assembly & Testing of VLH will contain list of VLH of different variant type along with respective quantities. For each Job-Order provided by BHEL to the vendor, the delivery schedule will be calculated by an Online System and the same shall be mentioned in every job order. The same shall be treated as completion period for that Job-Order. The time (in Min.) for each Variant will be as per below table and the same shall be used for Due Date Calculation by Online System.

The Assembly, Testing & tack welding Time for each variant type will be as per below table and the same shall be used by online system to decide the due date of a particular Job-Order Considering a 7 hour per day as the effective working hour.

Minimum Two group including fitter & Worker(s) shall be deployed by contractor to execute the above mentioned allotted work. Each Group will be provided access to one VLH Test stand each.

If Vendor fails to meet the Delivery Schedule Due Date as mentioned against the Job-Order, LD will be applicable as per GCC.



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Scope of Work	Approx. Quantity of Work (In Nos.)			
	S. No.	VARIANT TYPE	QTY. (in Nos.)	Assembly & Testing Time Per Unit Per Group
VLH Assembly, Testing & tack welding of top post testing plate within HERP premises for period of 1 years.	1	01-080	105	25
	2	03-080	237	26
	3	04-080	272	30
	4	01-160	18	38
	5	02-080	176	25
	6	03-160	55	39
	7	02-160	36	38
	8	04-160	72	45
	9	05-080	326	30
	10	06-080	301	30
	11	05-160	107	45
	12	06-160	155	45
	13	07-080	399	30
	14	08-080	403	38
	15	07-160	252	45
	16	08-160	260	57
	17	09-080	397	48
	18	10-080	497	52
	19	09-160	446	72
	20	10-160	359	78
	21	11-080	354	55
	22	12-080	315	60
	23	11-160	479	83
	24	13-080	129	65
	25	12-160	387	90
	26	13-160	121	98
	<b>TOTAL</b>		<b>6658</b>	

**Work-Out Example to Calculate the Due Date**

Job Order Item Details

Job Order No.: XXXXXXXX		DATE: XX/YY/ZZZZ
S. No.	Ref. No. (VLH Variant)	Qty. (in Nos.)
1	VLH-SH-01-080	50
2	VLH-SA-01-160	25
3	VLH-SA-04-160	35
4	VLH-SH-08-160	40
5	VLH-SS-11-160	60
6	VLH-SH-12-160	40
7	VLH-SAT-13-160	35

**The Calculation of Job Order Due Date will be as Following for the above Sample Job Order**



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S. No.	VLH-TYPE	Qty. (in Nos.) (N)	Unit Time of Assembly & Testing (T)	Total Time In Min (T1)= (NxT)
1	01-080	50	25	1250
2	01-160	25	38	950
3	04-160	35	45	1575
4	08-160	40	57	2280
5	11-160	60	83	4980
6	12-160	40	90	3600
7	13-160	35	98	3430
			<i>Total Time in Min for Assembly &amp; Testing. (M)</i>	<i>18065</i>

S. No.	Description of Steps	Calculated Values by Online System	Remark
1	Total Min for Job order (M)	18065	
2	Total Hours H =M/60	301.08	1 Hour = 60 Min
3	Per Day Working Hour	14	As per Contract there will be two Groups working simultaneously on two assemblies & testing stands. Working hours for 1 day will be 7 hours for each group. Hence for two groups, the total Working hours per day will be 14.
4	No. of Days (D)=H/7	21.506	
5	Total No. of Days for Job-Order Rounding off to Next higher Value	22	Total Days will round off to next higher value.
6	Stating Date (Filled By BHEL)	01-10-2024	Starting date will be the date by which contractor shall start the work after receiving the input material by BHEL and the same will be filled by BHEL Executive in Online system before starting of Work.
7	Due Date = (Starting Date) + (Total No. of Days) - (1)	22-10-2024	Starting date will also be a working day hence 1 needs to be subtracted to get due date.
8	Case-1 : Completion Date (Filled By BHEL Executive in Online System)	22-10-2024 or earlier date	LD shall Not be Applicable Job Order Completion Date (Filled By BHEL)



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9	Case-2: Completion Date (Filled By BHEL Executive in Online System)	23-10-2024 or later date	LD shall be Applicable Job Order Completion Date (Filled By BHEL)
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**NOTE:** For each job order, the starting and completion date will be entered by BHEL executive in the Online System.

**If one job order is in progress and a new one is assigned to the vendor, the starting date of the new job order will begin on the next working day of the Due Date/Job Completion Date (Whichever is earlier) of the currently running job order.**

**5. INSPECTION:**

Item will be checked by BHEL personnel for completeness of item and testing as per required parameters.

**6. QUANTITY DISTRIBUTION: -**

There is no quantity distribution for this works contract however in case there are more than one L1 vendors (on Total Landed cost to BHEL basis) then the L1 vendor shall be selected as per GCC.

**7. PAYMENT TERMS:**

Payment to the contractor shall be made on completion of each job-order provided to contractor by executing department. More than one Job-Order may be clubbed in single bill. Rest All terms & conditions of the Payments shall be as per GCC.

**PVC is not Applicable for this contract.**



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**BOQ & Price Schedule**

Important Instruction: -					
1. Bidder is to quote their premium/ discount (% Above, %below OR At par) over total cost of all items i.e. Rs. 23,98,820/-					
2. Lowest bidder shall be decided on overall cost by including premium/ discount. The Premium/Discount offered by L-1 Bidder shall be applied to estimated rate of each VLH variant type for payment.					
3. Each line item qty. may change as per BHEL Requirement. However total Qty. of VLH for the contract may vary by ±20%.					
Scope of Work	Approx. Quantity of work (In Nos.)			Estimated Rate (Rs./ Unit)	Estimated Value of the work (in Rs.) excluding GST
	S. No.	VARIANT TYPE	QTY. (in Nos.)		
VLH Assembly, Testing & tack welding of top post testing plate within HERP premises for period of 1 year.	1	01-080	105	102	10710
	2	03-080	237	107	25359
	3	04-080	272	123	33456
	4	01-160	18	156	2808
	5	02-080	176	102	17952
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	10	06-080	301	123	37023
	11	05-160	107	190	20330
	12	06-160	155	190	29450
	13	07-080	399	123	49077
	14	08-080	403	157	63271
	15	07-160	252	190	47880
	16	08-160	260	340	88400
	17	09-080	397	267	105999
	18	10-080	497	299	148603
	19	09-160	446	401	178846
	20	10-160	359	475	170525
	21	11-080	354	301	106554
	22	12-080	315	438	137970
	23	11-160	479	613	293627
	24	13-080	129	509	65661
	25	12-160	387	618	239166
	26	13-160	121	762	92202
Total			6658		2032898
Total Estimate Cost of Contract (Rs.) Incl. 18% GST				₹ 23,98,820	
I/ We hereby quote...To be Quoted on NIC Portal...% above/ at par/ %below on total cost for all items placed at Sl. No. - 1 to 26.					



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**Pre- Qualifying Requirement (PQR)**

<b>1.</b>	<b>EXPERIENCE:</b> <p>Contractor should have experience of having successfully completed fabrication/assembly works during last 7 years ending last day of month previous to the one in which applications are invited should be any of the following:</p> <p>Three completed similar works each costing not less than the amount equal to Rs 9.6/- lacs.</p> <p style="text-align: center;"><b>OR</b></p> <p>Two completed similar works each costing not less than the amount equal to Rs 12.0/- lacs.</p> <p style="text-align: center;"><b>OR</b></p> <p>One completed similar work costing not less than the amount equal to Rs 19.2/- lacs.</p> <p><b><u>Similar Works:</u></b></p> <p>Similar works include the experience of <b>fabrication/assembly of metal items at Customer premises.</b></p> <p>Copy of such work orders and performance report/completion certificate/inspection clearance report/other equivalent document issued by customer for successful execution of the order is to be submitted.</p> <p><b>Remark-</b></p> <ol style="list-style-type: none"><li>1.The value of work executed against a framework agreement shall be considered as one completed/executed order.</li><li>2.TDS Certificate from customer shall also be furnished.</li><li>3.BHEL reserves the right to verify the contents of given certificate. Complete postal address, name of contact person, phone no. &amp; email address of issuing authority is to be submitted by the Bidder in Techno- commercial bid. In case BHEL intends to visit Bidder's customer, the same shall be facilitated by Bidder (expenditure of visit of BHEL official shall be borne by BHEL).</li></ol>
<b>2.</b>	<b>FINANCIAL CAPABILITY</b> <p>Average Annual Financial turnover during the last 3 years ending 31<sup>st</sup> March of the previous financial year should be minimum Rs. 7.2 Lakhs. Audited Profit &amp; loss account and balance sheet to be submitted for FY 22-23, 21-22 &amp; 20-21.</p> <p><b><i>Note: - All the CA certified/ audited documents should have UDIN</i></b></p>



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**No Deviation Certificate**

To,

Sr. Manager (Store and WCM)  
Bharat Heavy Electricals Ltd.  
Tarna, Shivpur  
Varanasi

**Sub: No deviation certificate for "VLH Assembly, Testing & Tack welding of top post testing plate within BHEL HERP premises"**

Sir,

This is to inform you that we have not taken any deviation from any of the Special Terms and Conditions for **"VLH Assembly, Testing & Tack welding of top post testing plate within BHEL HERP premises"** while quoting the rates. All terms & conditions mentioned in the Special Terms & conditions are acceptable to us except following:

- 1.
- 2.
- 3.

Thanking you,

Yours Sincerely



**Bharat Heavy Electricals Limited**  
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***GENERAL CONDITIONS OF CONTRACT***  
***For***  
***WORKS/SERVICE CONTRACTS***



**BHARAT HEAVY ELECTRICALS LIMITED**  
**HEAVY EQUIPMENT REPAIR PLANT**  
**TARNA, SHIVPUR**  
**VARANASI-221003**



**Bharat Heavy Electricals Limited**  
**Heavy Equipment Repair Plant**  
Works Contract Management (WCM) Department  
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**CHAPTER I**

**1.0 DEFINITIONS**

In these general conditions of contract, the following terms shall have the meaning hereby assigned to them except where the context otherwise requires: -

- a) "CONTRACT" or "CONTRACT DOCUMENT" shall mean and include the Agreement of Work Order, the accepted appendices of Rates, Schedules, Quantities if any, General Conditions of Contract, Special Conditions of Contract, Instructions to the Tenderers, Drawings, Technical Specifications, the Special Specifications if any, the Tender documents, subsequent amendments mutually agreed upon and the Letter of Intent/Award/Acceptance issued by BHEL. Any conditions or terms stipulated by the contractor in the tender documents or subsequent letters shall not form part of the contract unless, specifically mentioned.
- b) "TENDER SPECIFICATION" or "TENDER" or "TENDER DOCUMENTS" shall mean and include General Conditions, Special Conditions, Price Bid, Rate Schedule, Technical Specifications, Appendices, Annexures, Corrigendum, Amendments, Forms, procedures, Site information, etc and drawings/documents pertaining to the work for which the tenderers are required to submit their offers.
- c) "WORK" means all Permanent and Temporary Works as described in the Scope of Work and BOQ in individual work order and /or accompanying drawings and specifications as may be issued from time to time to the contractor by the Engineer - Incharge in writing, including all modifications or additional works and obligations to be carried out either at the site or in factory, workshop or any other place as may be essentially required for the performance of the work.
- d) The "SITE" means the land and/ or other place on/into/ through which the work is to be executed under the contract or any adjacent land, part or structure which may be allotted to or used for the purpose of carrying out the contract.
- e) The "CONTRACTOR" means the individual firm or company whether incorporated or not, undertaking the work and shall include the legal personal representatives of such individuals or the person(s) composing the firm or company and the permitted assigns of such individuals or firm or company.
- f) "ENGINEER" or "ENGINEER IN CHARGE" shall mean an employee of BHEL as may be duly appointed and authorized by Competent Authority/Accepting Officer of BHEL to act as "Engineer" on his behalf for the purpose of the Contract, to perform the duty set forth in this General Conditions of Contract and other Contract documents.
- g) BHEL shall mean Bharat Heavy Electricals Limited, a company registered under Indian Companies Act 1956, with its Registered Office at BHEL HOUSE, SIRI FORT, NEW DELHI - 110 049, or its unit HEAVY EQUIPMENT REPAIR PLANT located at Tarna, Shivpur Varanasi, Uttar Pradesh -221003.
- h) "COMPETENT AUTHORITY" /" ACCEPTING OFFICER" shall mean Executive Director or General Manager (In charge) or General Manager-Head of Unit (HERP) or BHEL Officers who are empowered to act on behalf of the Executive Director or General Manager (In charge) or General Manager of BHEL.
- i) "DEFECT LIABILITY PERIOD" (DLP) in relation to a work means the specified period from the date of Completion Certificate up to the date of issue of Final Certificate during which the Contractor stands responsible for rectifying all defects that may appear in the works executed by the Contractor in pursuance of the Contract and includes warranties against manufacturing/fabrication/erection/construction defects covering all materials plants, equipment, components, and the like supplied by the Contractor, works executed against workmanship defects.



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- j) "Letter of Intent/Letter of Award (LoA)" means the formal letter of intent or letter of acceptance or letter of award issued by BHEL.
- k) "SCC" means 'Special Conditions of Contract forming part of this Contract / Agreement.
- l) "Bill of Quantity" shall mean subsequent to the placement of the Contract/Agreement/Purchase Order the successful bidder shall be required to furnish the detailed price break-up within a specified time frame. This detailed break-up of items and prices shall be considered as Bill of Quantities (BOQ).
- m) "Engineer" shall mean an Executive or Engineer in charge.
- n) "NIT" shall mean Notice Inviting Tender.
- o) "First Party" shall mean BHEL.



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**CHAPTER II**

**2.0 GENERAL INSTRUCTIONS TO THE TENDERERS**

**2.1 GENERAL INSTRUCTIONS**

The General Condition of Contract form part of the Tender Specifications. All pages of the tender documents shall be duly signed stamped and submitted along with the offer by the tenderers.

Tenderers are advised to study all the tender documents carefully. The contractor shall be deemed to have satisfied himself as to the nature of site, local facilities of access and all matters affecting the execution and completion of the work. No extra charges consequent on any misunderstanding in these respects or otherwise will be allowed by the First Party.

The contractor shall examine the quantum of work and shall satisfy himself before submitting his tender. He shall himself assess the requirement of materials, contingencies and other circumstance which may affect or influence his tender, no extra charges on any misunderstanding or otherwise shall be allowed.

The contractor shall be deemed to have satisfied himself before tendering as to correctness and sufficiency of his tender, the work and prices. This shall except as otherwise provided all obligation under the contracts all matters and things necessary for the proper completion and maintenance of the works.

**2.2 SUBMISSION OF TENDERS**

2.2.1. The tenderers must submit their tender as per instructions in NIT.

2.2.2. Tenders submitted by Post shall be sent by Post with due allowance for any postal/ courier delays. BHEL shall not be responsible for any postal delay.

2.2.3. Tenders shall be signed by a person authorised/empowered to do so. In case the tender is signed by an individual other than the sole proprietor, an attested copy of the power of attorney shall be submitted by bidder along with tenders with details mentioned under:

For proprietary firm	Proprietor's full name, address and place & nature of business.
For partnership firm	The names of all the partners and their addresses, A copy of the partnership deed/instrument of partnership duly certified by the Notary Public shall be enclosed.
For companies	Date and place of registration including date of commencement certificate in case of Public Companies (certified copies of Memorandum and articles of Association are also to be furnished. Nature of business carried on by the Company and the provisions of the Memorandum relating thereof.

2.2.5. Unless otherwise specified in NIT the bids shall be invited in two parts:

**PART I (Techno-Commercial bid)** - This shall consist of following documents:

- Signed & stamped copy of all pages of NIT.
- Technical specifications of the offer.



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- Duly filled, signed & stamped forms and documents in support of meeting the pre-qualifying requirement.
- Signed and stamped copy of Price Bid Format (without price).
- Documentary evidence like Cash Receipt, EFT/UPI receipt, DD, FDR, Banker's cheque / Pay order etc for proof of payment against Tender Document Cost and Earnest Money Deposit (EMD).

**PART II (Price Bid)** - This shall consist of price bid in format specified in NIT.

2.2.6 The Part-I (Techno-Commercial bid) and Part-II (Price Bid) shall be submitted by bidder as specified in NIT.

### 2.3 EVALUATION OF TENDERS

- (i) Techno-Commercial bids submitted by the tenderer will be opened first and evaluated for fulfilling Pre Qualifying requirement and other conditions in NIT/ Tender documents
- (ii) The Techno-Commercial bids will be opened as per date & time mentioned in NIT.
- (iii) The Bidder or his authorised representative may be present at the time of opening of bid on the specified date after seeking written permission in this regard from Tender Inviting authority. Written permission shall be taken for this purpose prior to tender opening date. A copy of confirmation /acceptance must be produced in the office by the person attending the opening of bid else he shall be denied permission to attend the opening of bid.
- (iv) In case of unscheduled holiday on the closing/opening day of bid, the next working day will be treated as scheduled prescribed day of closing/opening of bid, the time notified remaining the same.

### 2.4 EARNEST MONEY DEPOSIT (EMD)

2.4.1 EMD amount will be as indicated in NIT. EMD shall not carry any interest.

2.4.2 The EMD may be accepted only in the following forms:

- (i) Cash deposit as permissible under the extant Income Tax Act (before tender Opening).
- (ii) Electronic Fund Transfer credited in BHEL account (before tender opening)
- (iii) Banker's cheque/ Pay order/ Demand draft, in favour of BHEL (along with offer).
- (iv) Fixed deposit receipt (FDR) issued by any scheduled banks/ Public Finance Institutions as defined in Companies Act (FDR should be in the name of the **contractor, a/c BHEL Varanasi**).
- (v) Insurance Surety Bonds

Account details of BHEL-HERP, Varanasi are as mentioned below:

EFT /RTGS Details	UPI Details
Bank Name: State Bank of India, IFSC Code: SBIN0000201, Account No: 011103264820, Branch Code: 0201, Address: State Bank of India, Main Branch Kachaheri, Varanasi.	Scan & Pay Using Any UPI App to UPI ID: bhel20@sbi MERCHANT NAME: BHARAT HEAVY ELECTRICALS LTD



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In addition to above, if the EMD amount is more than Rs Two Lakh, the amount in excess of Rs Two Lakh may also be accepted in the form of Bank Guarantee (BG) from scheduled bank. The Bank Guarantee in such cases shall be valid for at least six months. SFMS message must be included along with BG. ***Format of BG for EMD, List of scheduled banks and beneficiary bank account will be provided to bidders separately in case the EMD amount happens to be more than Rs Two Lakh.***

#### **2.4.3. FORFEITURE OF EMD**

EMD by the Tenderer will be forfeited as per NIT conditions, if:

- i) After opening the tender and within the offer validity period, the tenderer revokes his tender or makes any modification in his tender, which is not acceptable to BHEL.
- ii) The Contractor fails to deposit the required Security deposit or commence the work within the period as per LOI/ Contract.

EMD by the tenderer shall be withheld in case any action on the tenderer is envisaged under the provisions of extant "Guidelines on Suspension of business dealings with suppliers/ contractors" and forfeited/ released based on the action as determined under these guidelines.

2.4.4 EMD given by all unsuccessful tenderers shall be refunded normally within fifteen days of award of work. In case of expiry of offer validity period or any other circumstances, EMD can be released with due approval.

2.4.5 EMD of successful tenderer will be retained as part of Security Deposit.

#### **2.5 SECURITY DEPOSIT (SD)**

2.5.1. The total amount of Security Deposit would be as mentioned in NIT. EMD of the successful tenderer shall be converted and adjusted towards the required amount of Security Deposit.

2.5.2. The balance amount to make up the required Security Deposit of the contract value may be accepted in the following forms:

- i) Cash (as permissible under the extant Income Tax Act)
- ii) Local cheques of Scheduled Banks (subject to realization)/ Pay Order/ Demand Draft/ Electronic Fund Transfer in favour of BHEL
- iii) Bank Guarantee from Scheduled Banks/ Public Financial Institutions as defined in the Companies Act. ***Format of BG for SD, List of scheduled banks and beneficiary bank account will be provided to bidders separately to successful bidder(s).***
- iv) Fixed Deposit Receipt issued by Scheduled Banks/ Public Financial Institutions as defined in the Companies Act (FDR should be in the name of the **Contractor, a/c BHEL, Varanasi**)
- v) Securities available from Indian Post offices such as National Savings Certificates, Kisan Vikas Patras etc. (held in the name of Contractor furnishing the security and duly endorsed/ hypothecated/ pledged, as applicable, in favour of BHEL)
- vi) Insurance Surety Bonds

(Note: BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith)



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**2.5.3. COLLECTION OF SECURITY:**

- 2.5.3.1 At least 50% of the required Security Deposit, including the EMD, should be collected before start of the work. Balance of the Security Deposit can be collected by deducting 10% of the gross amount progressively from each of the running bills of the Contractor until the total amount of the required Security Deposit is collected.
- 2.5.3.2 If the value of work done at any time exceeds the contract value, the amount of Security Deposit shall be correspondingly enhanced and the additional Security Deposit shall be immediately deposited by the Contractor or recovered from payment/s due to the Contractor.
- 2.5.3.3 In case of delay in submission of performance security, enhanced performance security, which would include interest (Repo rate + 4%) for the delayed period, shall be submitted by the bidder.
- 2.5.3.4 The recoveries made from running bills (cash deduction towards balance SD amount) can be released against submission of equivalent Bank Guarantee in acceptable form, but only once, before completion of work, with the approval of the authority competent to award the work.
- 2.5.3.5 (Note: In case of (a) small value contracts not exceeding Rs. 20 lakhs or (b) SAS jobs, work can be started before the required Security Deposit is collected. However, payment can be released only after collection/ recovery of initial 50% Security Deposit).

**2.5.4 REFUND OF SECURITY DEPOSIT:**

- 2.5.4.1 After expiration of the Defect Liability period, provided always that the contractor shall first have been paid final bill and have rendered a "No Demand" certificate, the security deposit shall be refunded to the contractor as follows:  
100% shall be released after satisfactory completion of the Defect liability period of the work after verification/certification by Engineer-In-charge.
- 2.5.4.2 The Defect liability period of work shall be as per section 2.6.

**2.6 PERFORMANCE GUARANTEE FOR WORKMANSHIP/ DEFECT LIABILITY PERIOD**

Unless otherwise specified in Special Conditions of contract (SCC), the contractor shall be responsible for the quality of the workmanship and shall make good or remedy at his own expense within defect liability period, which shall be for a period of 12 months from date of completion of works or else as mentioned in special conditions for contract. During this period the contractor shall rectify free of cost all defects due to faulty erection, installation & commissioning detected during defect liability period. In the event of the contractor, failing to repair the defective works within the time specified by the Engineer, BHEL might proceed to undertake the repairs of such defective works at the contractor's risk and cost without prejudice to any other rights & recover the same from the Security deposit. Completion date of work shall be considered as provided in Form WAM 7 of Works Accounts Manual 2017.

**2.6.1 BANK GUARANTEES**

- 2.6.1.1 Wherever Bank Guarantees are to be furnished / submitted by the contractor, the following shall be complied with:
- Bank Guarantees shall be from scheduled Banks/ Public Financial Institutions as defined in the companies Act.
  - The Bank Guarantees shall be as per prescribed format approved by BHEL.



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- It is the responsibility of the bidder to get the Bank Guarantees revalidated/ extended for the required period (subject to a minimum period of 6 months), as per the advice of Engineer in charge.
  - BHEL shall not be liable for issue of any reminders regarding expiry of the Bank Guarantees.
  - In case of extension / further extensions of any Bank Guarantees are not required, the bidders shall ensure that the same is explicitly endorsed by the Head of Department and approved by the Head of unit.
- 2.6.1.2. In case the Bank Guarantees are not extended before the expiry date, BHEL reserves the right to invoke the same by informing the concerned Bank in writing, without any advance notice/communication to the concerned bidder
- 2.6.1.3. Bidders to note that any corrections to the Bank Guarantees shall be done by issuing Bank, only through an amendment in an appropriate non-judicial stamp paper.
- 2.6.1.4. The Original Bank Guarantee shall be sent directly by the Bank to BHEL under Registered Post (Acknowledgement Due), addressed to the head of contracting department.
- 2.6.1.5. The validity of Bank Guarantee towards security deposit shall initially be up to completion period plus defect liability period plus 3 months, and the same shall be further kept valid as per advice of Engineer in charge. Claim period will be 3 months more than validity period.
- 2.6.1.6. Further BHEL reserves the right of forfeiture of security deposit in addition to other claims & penalty in the event of contractor's failure to fulfil any of the contractual obligations or in the event of termination of contract as per terms & conditions of the contract. BHEL reserves the right to set off the security deposit against any claims of any contracts with BHEL.
- 2.6.1.7 Release of SD: 100% SD shall be released only after expiry of Defect liability period subject to satisfactory completion of work as per contract & submission of claim as per prescribed claim format.

**2.7 TENDOR COST:**

Bidders must deposit the Tender cost as mentioned in the NIT through EFT and submit proof of the same along with bid.

**2.8 VALIDITY OF OFFER:**

The validity of the offer shall be 90 days or else as specified in NIT.

**2.9 RIGHT OF BHEL TO REJECT TENDERS:**

- 2.9.1 The acceptance of tender will rest with BHEL which does not bind itself to accept the lowest tender or any tender and reserves to itself full rights for the following without assigning any reasons whatsoever: -
- a. To reject any or all of the tenders.
  - b. To split up the work amongst two or more tenderers as per NIT
  - c. To award the work in part if specified in NIT
  - d. In case of either of the contingencies stated in (b) and (c) above, the time for completion as stipulated in the tender shall be applicable.
- 2.9.2 Conditional tenders, unsolicited tenders, tenders which are incomplete or not in the form specified or defective or have been materially altered or not in accordance with the tender conditions, specifications etc., are liable to be rejected.



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- 2.9.3 Tenders are liable to be rejected in case of unsatisfactory performance of the tenderer with BHEL, or tenderer under suspension (hold/banning /delisted) by any unit / region / division of BHEL or tenderers who do not comply with the latest guidelines of Ministry/Commissions of Govt. of India. BHEL reserves the right to reject a bidder in case it is observed that they are overloaded and may not be in a position to execute this job as per the required schedule. The decision of BHEL will be final in this regard.
- 2.9.4 In the course of evaluation, if more than one bidder happens to occupy L-1 status, effective L-1 will be decided by soliciting discounts from the respective L-1 bidders. In case more than one bidders happen to occupy the L-1 status even after soliciting discount, the L-1 bidder shall be decided by a toss/draw of lots, in the presence of the respective bidder(s) or their representative(s). When the tender is on GEM portal, in case of multiple L1, effective L1 will be decided through system available on GEM portal. BHEL's decision in such situation shall be final and binding.



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**CHAPTER III**

**3.0 CONTRACT EXECUTION & PERFORMANCE**

**3.1. GENERAL INSTRUCTION TO CONTRACTOR FOR WORK EXECUTION**

- 3.1.1. The decision of BHEL regarding interpretation of any of terms and conditions set forth in the agreement shall be final and binding on the contractor.
- 3.1.2. In case of any discrepancy between the specification and / or the drawing, the Accepting Officer shall be the deciding authority as to which shall prevail and his decision shall be final and conclusive. If neither drawings nor specifications contain any minor details of construction, which are essential and reasonably & fairly intended for the satisfactory completion for the work in the opinion of the Accepting Officer, the decision of Accepting Officer shall be final and conclusive.
- 3.1.3. The contractor shall, at his own expense, supply all stores and material required for the contract other than those, which may be provided by BHEL at the rates detailed therein subject to availability at the place of issue indicated therein. All stores and materials to be supplied by the contractor shall be of the best quality as described in the specification and the contractor shall ensure that the stores and materials comply with the specifications.
- 3.1.4. The contractor shall not sub-contract any portion of the contract without the prior written approval of the Accepting Authority. Employment of piece rate workers shall not be deemed as sub-contracting.
- 3.1.5. Contractor shall decide the number of employees to be deployed for execution of the work awarded to him and he or his authorized representative will be solely entitled to dictate such workers about the manner of carrying out the work as per the prescribed specifications and quality plan. Contractor/ authorized supervisor of the contractor shall supervise the work allotted to him and to be carried out by his employees.
- 3.1.6. Contractor to ensure that the employees deployed in the premises of BHEL are physically and mentally fit and do not have any criminal record. Such employees should possess requisite skill, proficiency, qualification, experience etc.
- 3.1.7. Contractor will keep watch on his employees and he will be liable for any pilferage / loss to BHEL due to acts of omission and commission by his employees. Similarly, liability for any compensation to outsiders on account of any act of omission and commission by the employees deployed by the contractor shall lie exclusively with him.
- 3.1.8. The successful tenderer's responsibility under these contracts commences from the date of issue of the letter of intent (LOI) by BHEL. The tenderer shall submit unqualified acceptance to the letter of intent/ award within the period stipulated therein.
- 3.1.9. The successful tenderer shall be required to execute an agreement with BHEL in the prescribed format 'within time limit specified by BHEL in LOI/LOA (maximum 30 days)' and in any case before releasing the first running bill. The contract agreement shall be signed by a person duly authorized / empowered by the tender. The write-up for agreement will be provided by BHEL and cost of non-judicial stamp paper will be borne by contractor.
- 3.1.10. After signing the formal contract agreement, as above, BHEL shall issue work order to the party containing all salient features of the contract agreement required by both the parties.



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3.1.11. Contractor shall carry out operations hereunder with due diligence and shall maintain strict discipline and shall abide by and conform to all rules and regulations promulgated by BHEL. Should BHEL feel that the conduct of any of contractor/subcontractors employees is detrimental to Organization's interest & Safety, BHEL shall have the unqualified right to request for the removal of such employee either for incompetence, unreliability, misbehavior, security reasons etc. while on or off the job.

**3.2. WORK COMPLETION TIME**

- 3.2.1. Time is the essence of the contract and is specified in the Special Conditions of Contract of the Tender document
- 3.2.2. After issuance of LOI (through E-Mail/Fax/Courier), contractor shall report to the Manager of BHEL-HERP, Varanasi within 07 days and make Kick-of-Meeting (KOM) for discussing & finalizing start date of work, detailed completion program, mobilization of manpower & other resources and other related issues. Date of Start of Work shall be reckoned as 15 days after date of issue of LOI. However, the date of start of work may be reviewed and changed by Engineer In-charge of BHEL-HERP, Varanasi with recorded reasons in the KOM.
- 3.2.3. If the contractor fails to start the work within stipulated time as per LOI or as intimated by BHEL, then BHEL at its sole discretion will have the right to cancel the contract. The Earnest money and or Security Deposit with BHEL will stand forfeited without any further reference to him without prejudice to any and all of BHEL's other rights and remedies in this regard.
- 3.2.4. The contract shall be considered and closed upon completion of all contractual obligations and settlement of Final Bill or completion of Guarantee period whichever is later. Upon closing of contract, BHEL shall issue a completion certificate as per standard format, based on specific request of contractor.
- 3.2.5. The entire work shall be completed by the contractor within the time schedule or within such extended periods as may be allowed by BHEL.

**3.3. EXTENSION OF TIME FOR COMPLETION**

- 3.3.1. If the completion of work as detailed in the scope of work is delayed beyond the contract period, the contractor shall request for an extension of the contract and BHEL at its discretion may extend the contract.
- 3.3.2. Based on the progress review & performance evaluation, the works balance at the end of original contract period less the backlog attributable to the contractor shall be quantified, and the number of months of 'Time extension' required for completion of the same shall be jointly worked out. Within this period of 'Time extension', the contractor is bound to complete the portion of the backlog attributable to the contractor. Any further 'Time extension' at the end of the previous extension shall be worked out similarly.
- 3.3.3. However, if any 'Time Extension' is granted to the contractor to facilitate continuation of work and completion of contract, due to backlog attributable to the contractor alone, then it shall be without prejudice to the rights of BHEL to impose penalty/ LD for the delays attributable to the contractor, in addition to any other actions BHEL may wish to take at the risk & cost of contractor.
- 3.3.4. At the completion of progressive / milestone work / total work as certified by BHEL Engineer and upon total delay analysis, the portion of time extensions attributable to (i) Contractor, (ii) Force Majeure conditions and (iii) BHEL, shall be worked out and shall be considered to be exhausted in the same order. The total period of extensions shall be the sum of (i), (ii) and (iii) above and shall be equal to period between the scheduled date of completion and the actual date of completion of contract. LD shall



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be imposed / levied for the portion of time extensions attributable to contractor and recoverable from the dues payable to the contractor.

**3.4. PROGRESS MONITORING, MONTHLY REVIEW AND PERFORMANCE EVALUATION**

- 3.4.1. As soon as possible after awarding of work, the Engineer-In-charge and the contractor shall (if so required by the Engineer-In-charge) agree on major milestones/ Action Plan / time and progress chart for completion of the work within scheduled time. The chart in the work order shall have the completion date of the individual items thereof and/ or the contract or order as a whole. It shall indicate the forecast of the dates for commencement and completion of the various processes or sequences of the work, and shall be amended as may be required by agreement between Engineer-In-charge and contractor writing the limitations of time imposed in the tender document or order.
- 3.4.2. In the absence of any specific time and progress chart to be agreed to between the contractor and Engineer In charge, the contractor shall ensure and maintain, uninterrupted progress of the work such that the entire work shall be completed within the time imposed in the tender documents or order and the proportion of work that shall be completed up to any time in relation to the entire work to be done under the contract or order shall not be less than the proportion that the time elapsed bears to the total time of completion provided in the tender documents or order.
- 3.4.3. The contractor shall suspend the execution of the work or any part or parts thereof whenever called upon in writing by the Engineer-In-charge. The contractor will be allowed an extension of time for completion limited to not less than the period of suspension but no other claim in respect for compensation or otherwise whatsoever will be admitted. Time may also be extended to allow for alteration of work made by the deviation order as may be decided upon by the Engineer-In-charge in consultation with the contractor.
- 3.4.4 Unless otherwise specified in the Special conditions of contract, evaluation of Contractor Performance shall be carried out as per procedure for performance evaluation. These shall also be used for evaluation of bids for future tenders.

**3.5. QUANTITY VARIATION**

The quantities given in the contract are tentative and may change to any extent (both in plus side and minus side). The quoted rates for individual items shall remain firm irrespective of any variations in the individual quantities. No compensation becomes payable in case the variation of the final executed contract value unless specifically mentioned in NIT.

Increase in quantity by contractor / vendor will be done only after getting confirmation from BHEL / Site Engineer. Quantity variation of 30% in plus side will not require any approval provided there is no increase in contract price. If there is change in contract price, approval from competent authority is required

**3.6. Removed/Deleted**

**3.7. STRIKES & LOCKOUT**

- 3.7.1. The contractor will be fully responsible for all disputes and other issues connected with his labour.
- 3.7.2. In the event of the contractor's labour resorting to strike or the Contractor resorting to lockout and if the strike or lockout declared is not settled within a period of one



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month, BHEL shall have the right to get the work executed through any other agencies and the cost so incurred by BHEL shall be at risk & cost of the Contractor.

**3.8. DELAY AND EXTENSION OF TIME:**

3.8.1 The Contractor shall be entitled to extension of time in following cases:

**3.8.1.1 FORCE MAJEURE**

The following shall amount to Force Majeure: -

- 3.8.1.1.1 Acts of God, act of any Government, War, Sabotage, Riots, Civil Commotion, local combination of worker strike or lockout, Police Action, Revolution, Flood, serious loss or damage by Fire, Cyclones, Earthquake and epidemic and other similar causes over which the contractor has no control.
- 3.8.1.1.2 Non-availability of stores, which are responsibility of BHEL etc. the same shall be covered under force majeure.
- 3.8.1.1.3 Because of any other cause, which in the absolute discretion of the (Accepting officer of the contract) beyond the contractor control.

- 3.8.1.2. The Contractor's work held up for not being given possession of or access to the Site by BHEL.
- 3.8.1.3. Instruction of the Engineer-in-charge to suspend the Works and the Contractor not being in default as to reasons of suspension;
- 3.8.1.4 Any order of Court restraining the performance of the Contract in full or in any part thereof;
- 3.8.1.5 Any other event or occurrence which, according to BHEL is not due to the Contractor's failure or fault, and is beyond its control without BHEL being responsible for the same;
- 3.8.1.6 Acts or omissions of other Consultants in executing their works not forming part of the Contract.

3.8.2. Except as mentioned above, the Contractor shall not be entitled to any extension of time for any reason whatsoever including:

- 3.8.2.1. The Contractor shall not be entitled to any extension of time where the instructions or acts of BHEL are necessitated by or intended to cure any default of or breach of the terms of the Contract committed by the Contractor;
- 3.8.2.2. The Contractor shall also not be entitled to any extension of time where any delay is due to:
  - The failure of its Subcontractor, to commence or to carry out the part of the Works in due time; or
  - Non-availability, or shortage of Contractor's equipment, labour, utility services, Plant and Materials; or
  - Inclement weather conditions except in case of Force Majeure;

3.8.3. If the contractor suffers delay in the due execution of the contractual obligation due to delays caused by factors mentioned in Clause 3.8.1 above, the agreed time of completion of the job covered by this contract or the obligations of the contractor shall be extended by a period of time equal to period of delay, provided that on the occurrence of any such contingency, the contractor reports to BHEL in writing the causes of delay within 07 days of its occurrence and the contractor shall not be eligible for any compensations.

3.8.4 When in such case(s) the accepting officer (or higher Authority), on recommendation of the Engineer-In- charge, may make fair and reasonable extension, in the completion date of the individual items of work of the contract as a whole. Such



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extension, which will be communicated to the contractor by the Engineer- In-charge in writing, but shall nevertheless use constantly his best endeavor to prevent or make good the delay and shall do all that may be reasonable required to the satisfaction of the Engineer-In- charge to proceed with the work.

**3.9. INSURANCE**

- 3.9.1. BHEL shall arrange for insuring the materials/properties of BHEL covering the risks during transit, storage, erection and commissioning.
- 3.9.2. It is the sole responsibility of the contractor to insure his materials, equipment, workers, etc. against accidents and injury while at work and to pay compensation, if any, to workers as per Workmen's compensation Act.
- 3.9.3. If due to negligence and or non-observation of safety and other precautions by the contractors, any accident/injury occurs to the property / labor belong to third party, the contractor shall have to pay necessary compensation and other expense, if so decided by the appropriate authorities.
- 3.9.4. The contractor will take necessary precautions and due care to protect the material, while in his custody from any damage/ loss due to theft or otherwise till the same is taken over by BHEL or customer.
- 3.9.5. For lodging / processing of insurance claim the contractor will submit necessary documents. BHEL will recover the loss including the deductible franchise from the contractor, in case the damage / loss is due to carelessness / negligence on the part of the contractor. In case of any theft of material under contractor's custody, matter shall be reported to police by the contractor immediately and copy of FIR and subsequently police investigation report shall be submitted to BHEL for taking up with insurance. However, this will not relieve the contractor of his contractual obligation for the material in his custody.
- 3.9.6 The contractor shall ensure that no damage is caused to any person/property of other parties working at site. If any such damage is caused, it is responsibility of the contractor to make good the losses or compensate for the same.

**3.10 TEMPORARY WORKS**

- 3.10.1 All Temporary Works necessary for the proper execution of the Works shall be provided and maintained by the Contractor at its own cost and subject to the consent of the Engineer-in-Charge, shall be removed by the Contractor at its own expense when such Works are no longer required and in such manner as the Engineer-in-Charge shall direct. In case the Contractor fails to remove the Temporary Works on completion of the Works, the Engineer-in-charge is authorized to get such Temporary Works removed and recover the cost thereof from the Contractor or deduct such costs from the payments to be made to the Contractor.
- 3.10.2 The contractor shall keep the area of work clean and shall remove the debris etc. while executing day-to-day work. Upon completion of work, the contractor shall remove from the vicinity of work, all scrap, packing materials, rubbish, unused and other materials and deposit them in places specified by the Engineer. The contractor will also demolish all the hutments, sheds, offices, etc. constructed and used by him and shall clean the debris. In the event of his failure to do so, the same will be arranged to be done by the Engineer and the expenses recovered from the contractor.



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**CHAPTER-IV**  
**4.0 VALUATION AND PAYMENT**

**4.1. RECORDS AND MEASUREMENTS:**

- 4.1.1. All items having a financial value shall be entered in the BHEL Measurement book so that a complete record is obtained on all work performed under the contract.
- 4.1.2. Measurement shall be carried out as per unit mentioned in the bill of quality (price-bid).
- 4.1.3. The measurements shall be taken jointly by any person or persons duly authorized on the part of the BHEL and the contractor.
- 4.1.4. The Engineer-In-charge shall give reasonable notice in writing to the contractor for appointments for measurements.
- 4.1.5. The contractor shall without extra charge, provide assistance with appliance and other things necessary for measurements.
- 4.1.6. The contractor shall bear all the cost of measurement of his work.
- 4.1.7. Measurement shall be entered in the BHEL measurement book and signed and dated by both parties on the site on completion of measurement. If the contractor objects to any of the measurement recorded on behalf of BHEL in the Measurement Book or against the item or items objected to, and such note shall be signed and dated by both parties engaged in taking the measurements.
- 4.1.8. If as a result of such objection it becomes necessary to re-measure the work wholly or in part, the expense of such measurement shall be borne by the party requiring the measurement to be retaken provided that error found by this re-measurement amounts to less than 5% (five percent) of the value as recorded by the first measurement.
- 4.1.9. If the contractor's representative fails to attend when required, the Engineer-in-Charge shall have power to proceed by himself to take measurements, and in that case, these measurements shall be accepted by the contractor as final.

**4.2. RUNNING & FINAL BILLS:**

- 4.2.1. For progress running bills payment: As soon as possible after completion of each quarter of work (else at any period as specified in Special conditions for contract) to the satisfaction of the Engineer-in-charge, the contractor shall prepare & forward certified bills & work out the financial value. These will be entered in Measurement Book & signed by both parties. Payment shall be made after affecting the recoveries due from the contractor.
- 4.2.2. The contractor shall be entitled to be paid the final sum less the value of payments already made on account subject to certification to the final bill by the Engineer in Charge. No charge shall be allowed to the contractor on account of the preparation of the final bills.
- 4.2.3. Final bill shall be submitted as per prescribed format after completion of work as per scope and upon material reconciliation (if apply) along with the following –
  - No claim certificate by contractor on a non-judicial stamp paper or Indemnity bond as per prescribed format duly notarized indemnifying BHEL in respect of specified works contract against all claims & demand against third party liability including labour and government agencies.
  - Clearance certificates whichever applicable viz., clearance certificate from customer, various statutory authority like labour department, PF authority commercial tax dept. etc.



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4.2.4. BHEL, after receipt of the Bill/invoice complete in all respects, shall settle the final bill to contractor after deducting all dues to BHEL, within the stipulated days as per Clause 4.3.

**4.3. PAYMENT OF BILLS:**

The payment for bills will normally be **released within 30 days of submission of bills complete in all respects** with all documents. The Contractor should submit a duly filled EFT Mandate form certified through Bank for release of payment. It is the responsibility of the contractor to make his own arrangements for making timely payments towards labour wages, statutory payments, outstanding dues etc. and other dues in the meanwhile.

**4.4. RECOVERY FROM THE CONTRACTOR:**

4.4.1. Whenever under the contract any sum of money shall be recoverable from or payable to the contractor, the same may be deducted from any sum then due or which at any time thereafter may become due to the contractor under the contract or under any other contract with BHEL or from his security deposit, or he shall pay the claim on demand.

4.4.2. Recoveries arising out of Risk & Cost and LD or any other recoveries due from Contractor:

Following sequence shall be applicable for recoveries from contractor:

- a) Dues available in the form of Bills payable to contractor, SD, BGs against the same contract.
- b) Demand notice for deposit of balance recovery amount shall be sent to contractor, if funds are insufficient to effect complete recovery against dues indicated in (a) above.
- c) If contractor fails to deposit the balance amount to be recovered within the period as prescribed in demand notice, following action shall be taken for balance recovery.
- d) If recovery cannot be made out of dues payable to the contractor as above, balance amount to be recovered, shall be informed to other Regions/Units for making recovery from the Unpaid Bills/Running Bills/SD/BGs/Final Bills of contractor.

4.4.3 For civil contracts, recoveries on account of water supply charges shall be made at the rate of 0.1% of executed contract value unless exempted as per terms & conditions of contract.

4.4.4 Recoveries for tools, plant, and electricity shall be effected as per terms & conditions of the contract.

**4.5. TAXES AND OTHER DUTIES:**

4.5.1 All statutory taxes, cess, levies & duties shall be deducted from the payment, as per GST Act 2017 & other prevailing government rules.

**4.5.2. GST RELATED TERMS & CONDITIONS**

4.5.2.1 Bidder has to specify the following in their techno commercial bid (part I bid in case of two-part bid):

- a) Legal Name of the bidder as in GST registration, GST registration No., State, Place of business, category of registration under GST i.e. Registered dealer / Unregistered dealer/ dealer opted for Composition Scheme,



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- b) HSN (Harmonised System Nomenclature) / SAC (Service Accounting Code), description of Goods/Services and applicable IGST / CGST / SGST rate and any other statutory levy, if any, for each item of Goods or Services.
- 4.5.2.2 Unregistered Dealer: Since in case of unregistered dealer, GST will have to be paid by BHEL under reverse charge mechanism, the same shall be added to the quoted price for evaluation bid.
- 4.5.2.3 Dealer opting for Composition Scheme in case of registered dealer, who opt for composition scheme at the time of submission of bid, no GST will be payable to the bidder and also same will not be considered for evaluation of bid. Dealer has to declare in technical bid that no GST is shown separately in price bid. However, in case at the time of actual supply, the bidder charges GST at normal rate, the same shall be reimbursed subject to the availability of GST credit to BHEL. In case GST credit is not available to BHEL, no GST will be payable to the bidder.
- 4.5.2.4 Reimbursement of GST shall be made by BHEL HERP on matching of Contractor inputs as mentioned below at GST portal and after ensuring of availability of input credit to BHEL, HERP. Hence, Contractor has to ensure compliance as follows:
- a) Timely raising & submission of GST compliant Invoices
  - b) Timely receipt of Goods & Services
  - c) Timely and correct payment of applicable GST by supplier/contractor
  - d) Timely filing of return
  - e) Compliance of other applicable provisions on supplier/contractor:
- 4.5.2.5 Contractor has to also give consent to accept payment of tax after such matching in all cases where bills are submitted directly to BHEL-HERP or through bank or under LC or through any other mode.
- 4.5.2.6 In the event of any disallowance of input credit (including reversal of credit) or applicability of interest or arising of any other financial liability on BHEL-HERP due to any default of supplier/contractor under GST such as non/delayed receipt of Good/Services, delayed raising & submission of invoices, delayed payment of tax, non/wrong declaration of sale by Contractor in return etc. or any other reason not attributable to BHEL, such implication shall be to supplier's/contractor's account and will be deducted from bills.
- 4.5.2.7 In the event of any change in the status of the bidder after submission of the bid but before the supply/service, GST applicable at the time of supply/service or GST quoted in the bid, based on the registration status of the bidder, whichever is lower shall be payable.
- 4.5.2.8. Statutory Variation in Taxes & duties as applicable at the time of supply shall be payable. However, in the event of no change in law but bidder quoting certain tax structure in bid document which is lower than the applicable one, such amount shall be the maximum amount of tax that can be claimed by bidder.
- 4.5.2.9 In case of Liquidated damage (LD) recovery, GST is not applicable on LD.



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4.5.2.10. As per the extant GST rules, as of now it is not mandatory to file returns immediately and ITC has been allowed on self-declaration. In view of the changed scenario, the payment of GST shall have made to the contractors simultaneously with their work/services invoices. GST portion of invoice value will be paid only after fulfilling following conditions:

- (a) Payment of GST amount into Govt. Account by supplier against invoice raised to BHEL.
- (b) Filing of GST return within scheduled date.
- (c) Display of GST credit against BHEL GSTIN NO.09AAACB4146P2ZC on GSTN portal.

**4.6. INCOME TAX- IT:**

All statutory taxes & levies shall be deducted from the payment, as per prevailing government rules.

**4.7. MISCELLANEOUS CHARGES:**

Unless otherwise specified in the Special conditions of Contract, Electricity shall be provided by BHEL free of cost. All charges on account of octroi, terminal, Entry tax, royalty and/or other duties on materials obtained for the work (excluding materials provided by BHEL) shall be borne by the contractor.

**4.8. LIQUIDATED DAMAGE (LD)**

4.8.1. If the contractor fails to maintain the required progress of work which results in delay in the completion of the work as per the contractual completion period, BHEL shall have the right to impose Liquidated Damage/Penalty at the rate of 0.5% of the contract value, per week of delay or part thereof subject to a maximum of 10% of the contract value. For this purpose, the period of delay shall be the delay attributable to the Contractor for the completion of work as per contract.

4.8.2 LD against delay in executed work/supply in case of Termination of Contract LD against delay in executed work/supply shall be calculated in line with LD clause of the contract for the delay attributable to contractor/ supplier.

For this purpose, contract value shall be taken as Executed Value of work/supply for the purpose of limiting maximum LD value. Method for calculation of "LD against delay in executed work/supply" is given below.

- i. Let the time period from scheduled date of start of work till termination of contract excluding the period of Hold (if any) not attributable to contractor/ supplier= T1
- ii. Let the value of executed work/supply till the time of termination of contract= X
- iii. Let the Total Executable Value of work/supply for which inputs/fronts were made available to contractor/ supplier and were planned for execution till termination of contract = Y
- iv. Delay in executed work/supply attributable to contractor/supplier i.e. T2=  $(1 - X/Y) \times T1$
- v. LD shall be calculated in line with LD clause of the Contract for the delay attributable to contractor/ supplier taking "X" as Contract Value and "T2" as delay attributable to contractor/ supplier.



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Reason for the delay due to drawing, foundation, deputation of resources etc. will be documented properly for delay analysis and same to be submitted to finance for LD calculation, if applicable.

#### **4.9. Risk & Cost Amount against Balance Work**

Risk & Cost Clause, in line with Conditions of Contract may be invoked in any of the following cases:

1. Contractor/ supplier's poor progress of the work vis-à-vis execution timeline as stipulated in the Contract, backlog attributable to contractor/ supplier including unexecuted portion of work/ supply does not appear to be executable within balance available period (#) considering its performance of execution.
2. Withdrawal from or abandonment of the work by contractor before completion of the work as per contract.
3. Non-completion of work/ Non-supply by the Contractor/ supplier within scheduled completion/delivery period as per Contract or as extended from time to time, for the reason attributable to the contractor/ supplier.
4. Termination of Contract on account of any other reason (s) attributable to Contractor/ Supplier.
5. Assignment, transfer, subletting of Contract without BHEL's written permission resulting in termination of Contract or part thereof by BHEL.
6. Non-compliance to any contractual condition or any other default attributable to Contractor/ Supplier.

**Risk & Cost amount against balance work shall be calculated as follows:**

Risk & Cost Amount=  $[(A-B) + (A \times H/100)]$

Where A= Value of Balance scope of Work as per rates of new contract

B= Value of Balance scope of Work as per rates of old contract being paid to the contractor at the time of termination of contract i.e. inclusive of PVC, if any.

H = Overhead Factor to be taken as 5

7. The Supplier / Contractor shall on no account be entitled to any gain on such risk & cost purchase.

#### **4.10. No Interest payable to Contractor**

Notwithstanding anything to the contrary contained in any other document comprising in the Contract, no interest shall be payable by BHEL to Contractor on any moneys or balances including but not limited to the Security Deposit, EMD, Retention Money, RA Bills or the Final Bill, or any amount withheld and/or appropriated by BHEL etc., which becomes or as the case may be, is adjudged to be due from BHEL to Contractor whether under the Contract or otherwise.



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**CHAPTER- V**

**5.0 RESPONSIBILITIES OF THE CONTRACTOR IN RESPECT OF LAWS, EMPLOYMENT OF WORKERS ETC.**

5.1. The contractor should ensure compliance of labour laws, payment of wages, bonus, PF, ESIC, allowances for safety & hardship & other nonmonetary/ statutory benefits etc to labours employed by him either directly or through sub- contractors, in accordance with the provisions of:

- Contract Labour (R&A) Act 1970 and rules 1971.
- Payment of wages Act.
- Minimum Wages act 1948,
- Employees State Insurance Act 1948, Rules and regulations 1950.
- Employees Provident Fund Act 1952 and Pension Scheme 1995.
- Employees Compensation Act 1923.
- Maternity Benefit Act 1961.
- Equal Emolument Act 1976.
- Payment of Bonus Act 1963.
- Inter State Migrant Act.
- Building and Other Constructions Workers Act, 1996,

5.2. The contractor shall at all times indemnify BHEL HERP against all claims, damages or compensation under the provisions of above acts or any modifications thereof or any other law relating thereof and rules made thereunder from time to time or as consequence of any accident or injury to any workman or other persons in or about the works, whether in the employment of the contractor or not, save and except where such accident or injury has resulted from any act of the Corporation, its agents, or servants, and also against all costs, charges and expenses of any suit, action or preceding arising out of such accident or injury and against all sum or sums which may with the consent of the contractor be paid to compromise or compendia any such claim.

5.3 The Contractor in the event of engaging 20 or more workmen, shall obtain Independent license under the Contract labour (Regulation and Abolition) Act 1970 from the concerned authorities based on Form-V issued by the Principal Employer/Customer. In order to issue Form-V by Customer, Contractor shall fulfill all Statutory requirements like Insurance Policy, PF Code/PF Account number etc as per the requirement of BHEL/Customer.

5.4 BHEL shall recover the amount of compensation paid to victim(s) by BHEL towards loss of life/permanent disability due to an accident which is attributable to the negligence of contractor, agency or firm or any of its employees as per Employee's Compensation Act, 1923 & Guidelines for Settlement of Claims for Compensation on accidents applicable to the Department of Public Enterprises.

5.5 Contractor shall ensure payment of statutory prescribed minimum wages as applicable from time to time in the presence authorized representative of BHEL and maintain proper records of their timely disbursement. These records need to be preserved for a period of at least any 3 years and should be made available even after the contract is over for any verification by the statutory/BHEL authorities.

5.6. In case of the contractor employs Women as employee he will discharge his obligation under law in respect of such women workers as per Factory Act, Maternity Benefit Act and other laws of Uttar Pradesh.



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- 5.7. The contractor shall pay and bear all taxes, fees, license charges, Cess, duties, deposits, tolls, royalties, commission or other charges which may be leviable on account of his operations in executing the contract.
- 5.8 All safety rules and codes applied by the BHEL at site shall be observed by the contractor without exception. The contractor shall be responsible for the safety of the equipment/material and works to be performed by him and shall maintain all light, fencing guards, slings etc. or other protection necessary for the purpose. Contractor shall also take such additional precautions as may be indicated from time to time by the Engineer-in-charge with a view to prevent pilferage, accidents, fire hazards. Due precautions shall be taken against fire hazards and atmospheric conditions.
- 5.9. Suitable number of Clerical staff, watch and ward, store keepers to take care of equipment/materials and construction tools and tackles shall be posted at site by the contractor till the completion of work under this contract.
- 5.10. The contractor shall arrange for such personal protective equipment as are necessary for such type of work and carry out the requisite site tests of handling equipment, lifting tools, tackles etc. as per prescribed standards and practices.
- 5.11. Contractor has to ensure the implementation of Health, Safety and Environment (HSE) requirements as per directions given by BHEL. The contractor has to assist in HSE audit by BHEL and submit compliance Report. The contractor has to generate and submit record/reports as per HSE plan/activities as per instruction of BHEL.
- 5.12 The Contractor shall not deploy any person below the age of 18 years or above the age of 60 years.



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**CHAPTER- VI**

**6.0 RIGHTS OF BHEL FOR TERMINATION/CANCELLATION OF CONTRACT**

- 6.1. BHEL reserves the right to withdraw any portion of work and/or to restrict/alter quantum of work as indicated in the contract during the progress of work and get it done through other agencies to suit BHEL's commitment to its customer or in case BHEL decides to advance the date of completion due to other emergent reasons/ BHEL's obligation to its customer.
- 6.2. BHEL reserves the right to terminate the contract or withdraw portion of work and get it done through other agency, at the risk and cost of the contractor after due notice of a period of Two weeks by BHEL in any of the following cases:
- i). Contractor's poor progress of the work vis-à-vis execution timeline as stipulated in the Contract, backlog attributable to contractor including unexecuted portion of work does not appear to be executable within balance available period considering its performance of execution.
  - ii). Withdrawal from or abandonment of the work by contractor before completion of the work as per contract.
  - iii). Non-completion of work by the Contractor within scheduled completion period as per Contract or as extended from time to time, for the reasons attributable to the contractor.
  - iv). Termination of Contract on account of any other reason (s) attributable to Contractor.
  - v). Assignment, transfer, subletting of Contract without BHEL's written permission.
  - vi). Non-compliance to any contractual condition or any other default attributable to Contractor.
- 6.3. If at any time after the acceptance of the tender, BHEL shall for any reason whatsoever not require the whole or any part of the work, to be carried out, the Engineer-In-charge shall give notice in writing of the fact to the contractor, who shall have no claim to any payment of compensation or otherwise, howsoever on account of any profit or advantage which he might have derived from the execution of the work in full but which he did not derive in consequence of the foreclosing of the work.
- 6.4. The contractor shall be paid at contract rates for the full amount of the work executed including such additional work i.e., cleaning of site etc. as may be rendered necessary by the said foreclosing. He shall also be allowed a reasonable payment (as decided by the Accepting Officer) for any expenses sustained on account of labour and material collected but which could not be utilized on the work as verified by the Engineer-In-charge but the contractor shall not have any claim for compensation on account of any alterations having been made in the original specifications, drawings, designs and instructions involving and curtailment of the work as originally contemplated.



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**Chapter VII**

**7.0 MISCELLANEOUS PROVISIONS & OTHER ISSUES.**

**7.1 SETTLEMENT OF DISPUTES & ARBITRATION:**

- i. All questions/interpretations regarding subject matter of the contract shall be decided by the BHEL on the request of the vendor and the decision of the BHEL shall be final.
- ii. In case of dispute, steps shall be taken by the parties to the contract to settle the same through negotiations.
- iii. In case, dispute is not settled in negotiations, it shall be referred to conciliator appointed by the competent authority of the BHEL. The conciliation proceedings with respect to a dispute as defined in the BHEL Conciliation Scheme, 2018 and subsequent revisions can be initiated under the scheme at any stage whether before, during or even after the commencement of arbitration proceedings or litigation before courts. This conciliation scheme is available on our websites <https://herp.bhel.com> and [www.bhel.com](http://www.bhel.com).
- iv. In case dispute is not settled in conciliation proceedings, the same shall be referred to arbitration as per corporate guidelines of the BHEL and the arbitration proceeding shall be conducted as per provisions of the arbitration and conciliation act, 1996 read with corporate guideline as amended from time to time.
- vi. The vendor shall continue to perform the contract, pending settlement of dispute(s).

**7.2. LAWS GOVERNING THE CONTRACT:**

The Order/Contract shall be executed and governed by the laws of India and the courts of India alone shall have jurisdiction in respect of any matter arising under or in connection with the Order/Contract.

**7.3. ORDERS UNDER THE CONTRACT:**

All orders, notices etc. to be under the contract shall be in writing, typescript or printed and if sent by registered post to the address given in tender of the contractor, shall be deemed to have been on the date when in ordinary course they would have been delivered to him. The contractor shall carry out without delay all orders given to him.

**7.4. JURISDICTION OF COURT:**

All disputes or differences arising out of or in connections with the contract shall be subject to the exclusive jurisdiction of the court at Varanasi (U.P.) Only.

**7.5. CLOSING OF CONTRACTS**

The Contract shall be considered completed and closed upon completion of all contractual obligations and settlement of Final Bill or completion of Guarantee period whichever is later. Upon closing of Contract, BHEL shall issue a completion certificate as per standard format, based on specific request of Contractor.

**7.6. REVERSE AUCTION:**

BHEL reserves the right to go for Reverse Auction. The Business Rules for Reverse Auction shall be as per BHEL guidelines issued from time to time.

**7.7. SUSPENSION OF BUSINESS DEALINGS WITH CONTRACTORS:**

Guidelines for suspension of business dealings with suppliers/ contractors: the revised guidelines for suspension of business dealings are available on BHEL website at "www.bhel.com" on "supplier registration page". Respective bidders / suppliers may refer



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this before quoting as per their requirement. Action against the defaulted suppliers/ contractors' shall be taken as per these guidelines only.

**7.8 PUBLIC PROCUREMENT POLICY:**

As per the directives of government of India in form of public procurement (preference to make in India) order, 2017 and subsequent orders, BHEL will extend the purchase preference to Indian vendors over foreign suppliers for items identified by the respective nodal ministries from time to time. "for this procurement, public procurement (preference to make in India), order 2017 dated 15.06.2017, 28.05.2018, 29.05.2019 & 04.06.2020 and subsequent orders issued by the respective nodal ministry shall be applicable even if issued after issue of this NIT but before finalization of contract/ PO/ WO against this NIT. In the event of any nodal ministry prescribing higher or lower percentage of purchase preference and/ or local content in respect of this procurement, same shall be applicable."

**7.9 INTEGRITY PACT (IP):**

The revised Implementation Circular, IP document and the IP clause will be applicable for all tenders (covered under Purchase Policy/ Works Policy) above threshold value (presently Rs. 2 Cr.) floated on or after 01.04.2022 as per SS&P Ref: AA: SSP: IP Circular No. 32 of 2021-22 dated 28.02.2022 & Ref: AA: SSP: IP:22-23:01 Circular 12 of 2022-23 dated 26.07.2022.

**7.10 Conflict of interest among Bidders/Agents:**

A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of procuring entity's interests. The bidder found to have a conflict of interest shall be disqualified. A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if

- a) They have controlling partner (s) in common; or
- b) They receive or have received any direct or indirect subsidy financial stake from any of them; or
- c) They have the same legal representative/agent for purposes of this bid; or
- d) They have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another bidder; or
- e) Bidder participates in more than one bid in this bidding process. Participation by a bidder in more than one bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly assemblies from one bidding manufacturer in more than one bid; or
- f) In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorise only one agent/dealer. There can be only one bid from the following:
  - 1. The principal manufacturer directly or through one Indian agent on his behalf; and
  - 2. Indian/foreign agent on behalf of only one principal; or
- g) A bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the bid; or
- h) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business.



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Works Contract Management (WCM) Department  
TARNA, SHIVPUR, VARANASI-221003

**7.11 Breach of contract, Remedies and Termination:**

In case of breach of contract, wherever the value of security instruments like performance bank guarantee available with BHEL against the said contract is at least 10% of the contract value, the same be encashed. In case the value of the security instruments available is less than 10% of the contract value, the balance amount be recovered from other financial remedies (i.e. available bills of the contractor, retention amount, etc. with BHEL) or legal remedies be pursued. The balance scope shall be got done independently without Risk & Cost of the failed supplier/ contractor.

Further, levy of liquidated damages, debarment, termination, de-scoping, short-closure, etc., shall be applied as per provisions of the contract.

**7.12 SPECIAL CONDITIONS FOR MICRO AND SMALL ENTERPRISES (MSEs):**

Special benefits as per govt rules will provided to MSEs unless stated otherwise in Tender Document. Benefits will be passed on only in specific categories of services and only for specific categories of MSEs, which qualifies for exemption as per govt rules. Following conditions will be applicable for MSEs:

- i. MSE contractor can avail the intended benefits as per guidelines of Ministry of MSE only if they submit **Valid UDYAM certificate** along with Technical Bid.
- ii. To avail the benefit intended for MSEs, bidders must claim for such benefit. Without such claims, benefits will not be passed on to them.

**7.13 OTHER ISSUES:**

Value of Non-Judicial Stamp paper for Bank guarantee and for Contract agreement shall be not less than Rs.100 unless otherwise required under relevant statutes. All expenses towards procurement of Stamp paper and preparation of contract agreement shall be in the scope of contractor.

In case of any conflict between the General Conditions of Contract and special Conditions of contract, provisions specified in the Special conditions of contract shall prevail.

BHEL may not insist for signing of Contract Agreements in respect of low value and short time period.



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**Heavy Equipment Repair Plant**  
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**Bidders Declaration**

I / we have read the terms and conditions of the tender document, our contractual obligations towards execution of the Contract as per the tender document, we know of all obligations to be performed by us under the contract, the financing cost, administrative expenses, Statutory liabilities, etc. and undertake to fulfil its entire requirement under the quoted rates.

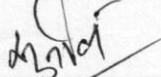
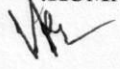
Thanking you,


Yours Sincerely

Signature, seal and address of the party

TD-106-1 Rev No. 5	Form No.		<b>PRODUCT PROCEDURE</b> <b>LOAD HANGERS</b> <b>HERP VARANASI</b>		<b>Procedure No.</b>	<b>RVPROC-002</b>
			<b>Rev No 00</b>			
			<b>Page 1 of 2</b>			

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">           COPYRIGHT AND CONFIDENTIAL            The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED,            It must not be used directly or indirectly in any way detrimental to the interest of the company.         </p>	<p style="text-align: center;"><b><u>PROCEDURE FOR LOAD TESTING OF VARIABLE LOAD HANGERS</u></b>  <b><u>(LISEGA DESIGN)</u></b></p> <p>This document covers the step by step procedure to be followed for functional load testing of Variable Load Hangers (Lisega Design).</p> <ol style="list-style-type: none"> <li>1.0 Check the Load Hanger for completeness as per drawing before loading on Load testing stand.</li> <li>2.0 Prepare the test stand and mount the required mounting fixture for holding the particular type of Variable Load Hanger (VLH) to be tested. Connect the Load Cell of appropriate capacity. Check the Calibration record of connected load cell and Indicator Pair before starting the load test.</li> <li>3.0 Load the VLH on test stand with the help of mounting tackles. Apply light tension for removal of Hydraulic Lock Nut.</li> <li>4.0 Start the testing machine and pull the Cylinder Ram to check rubbing of components in entire travel range. In case some rubbing is observed, same needs to be corrected before final testing.</li> <li>5.0 Tare the load when there is no pulling of Spindle Bolt. Pull the ram of the cylinder and see the increasing load in load indicator. When the load corresponding to 40 mm (for group 80 VLH) and 80 mm (for group 160 VLH) has reached, punch mark the pointer position for mid-scale position. Check the loads above and below mid points at different positions specified in Test Charts (format nos VLH/TC/080/01 to VLH/TC/080/15 for 080 group VLH and format nos. VLH/TC/160/01 to VLH/TC/160/15 for 160 group VLH). Record the observed loads in test charts.</li> <li>6.0 If the observed loads at different positions are found within the limits specified in test charts, fix the travel scale with mid position at punch mark (ref step 5.0) and Mark the Cold and Hot values (Specified in testing parameter) with Green and Red lines with permanent marker. Pull the cylinder ram and set the pointer at Cold position if specified in testing parameter. If no cold and hot position are given in testing parameter, set the pointer at scale zero position. Tighten the Hydraulic Lock Nut. Write the Parameter ID no. on the VLH for further identification.</li> </ol>					
	<b>Revisions:</b>  <b>Refer to record of revisions:</b>		<b>Prepared:</b> <b>S.K.Tiwari</b> 	<b>Approved:</b> <b>V.KUMAR</b> 	<b>Date:</b> <b>04.06.16</b>	

TD-106-1 Rev No. 5 Form No.		<b>PRODUCT PROCEDURE</b> <b>LOAD HANGERS</b> <b>HERP VARANASI</b>	<b>Procedure No.</b>	<b>RVPROC-002</b>
		<b>Rev No. 00</b>		
		<b>Page 2 of 2</b>		

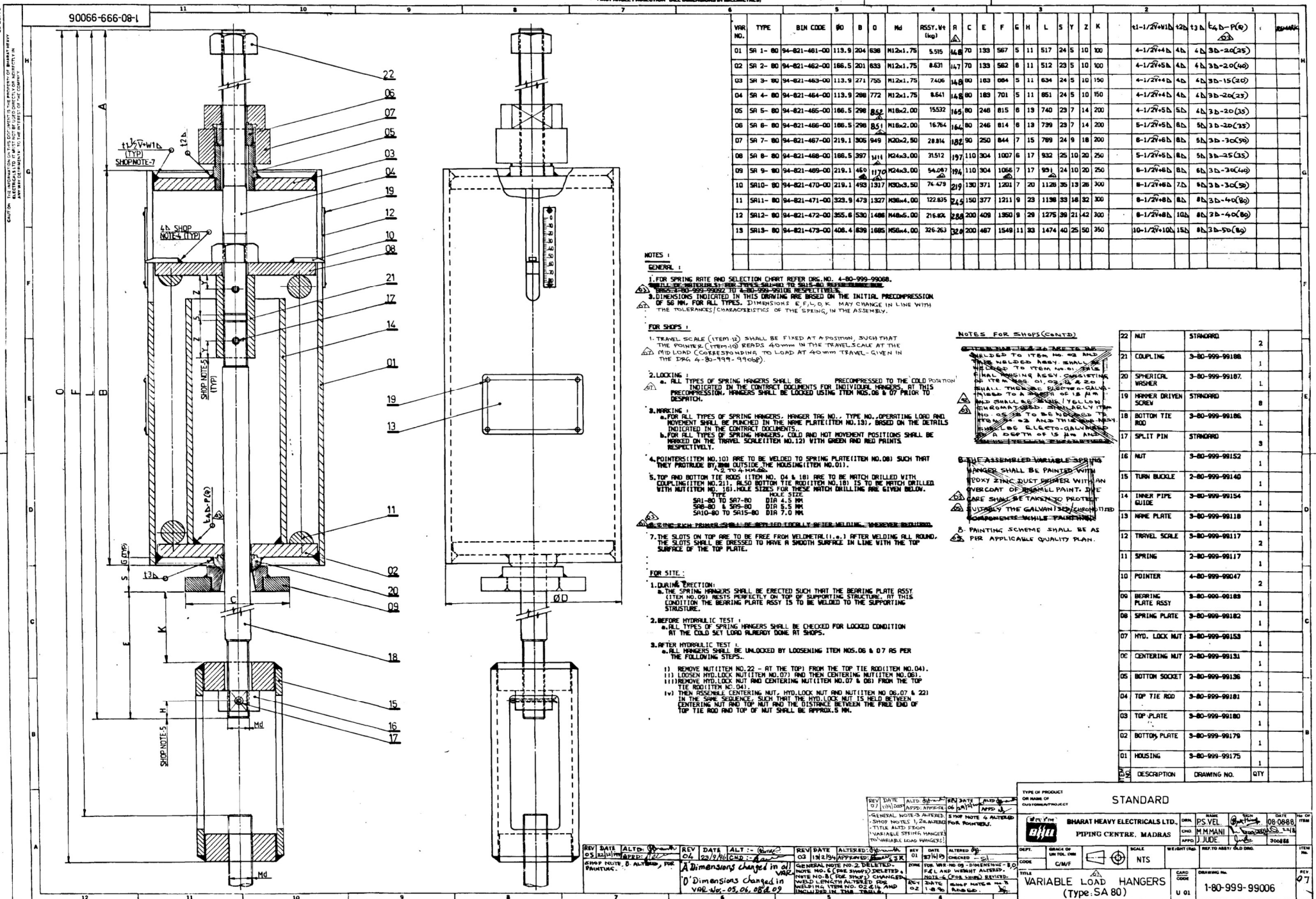
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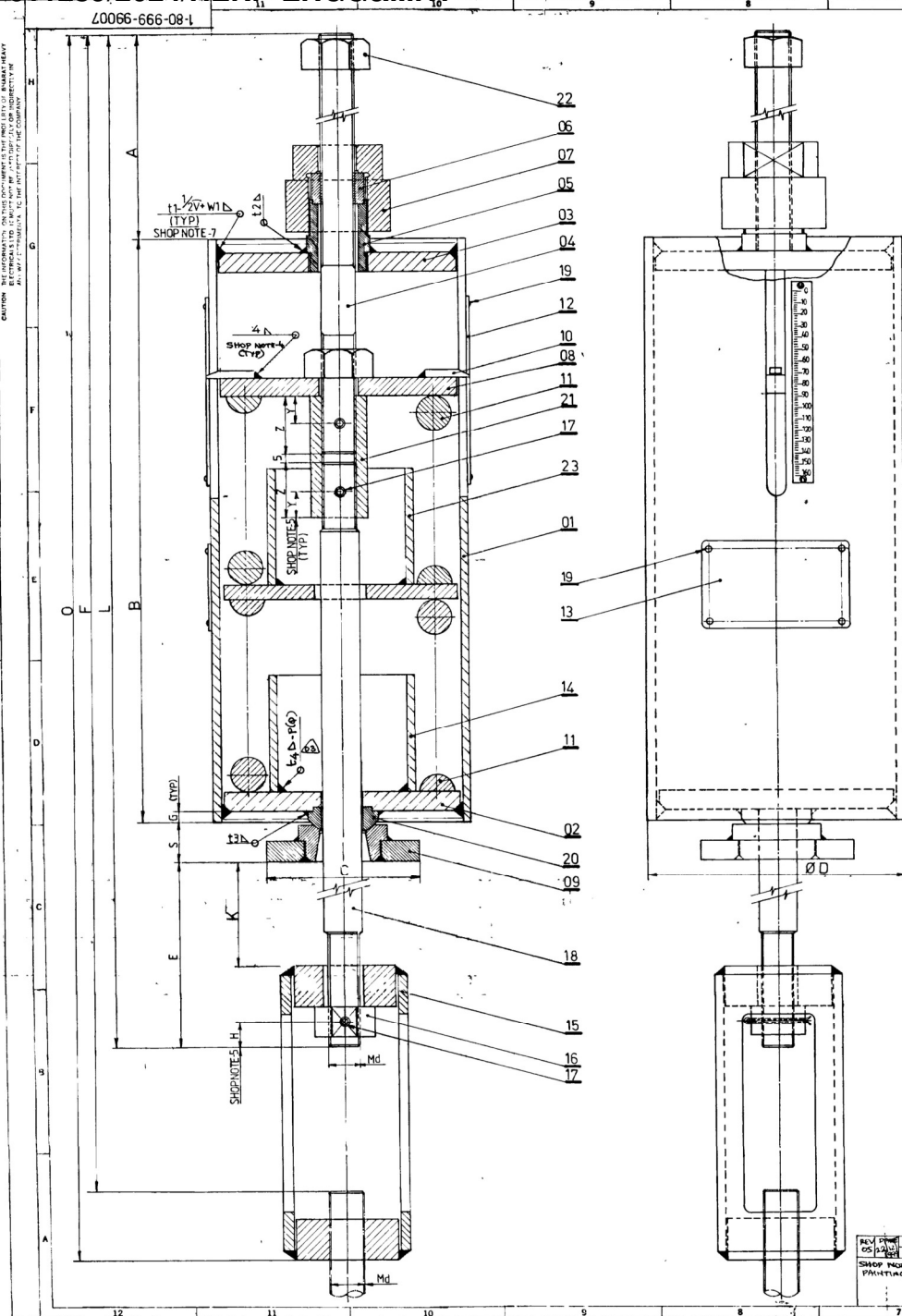
**RECORD OF REVISIONS**

REV. NO	DATE	REVISION DETAILS	REVISED	APPROVED

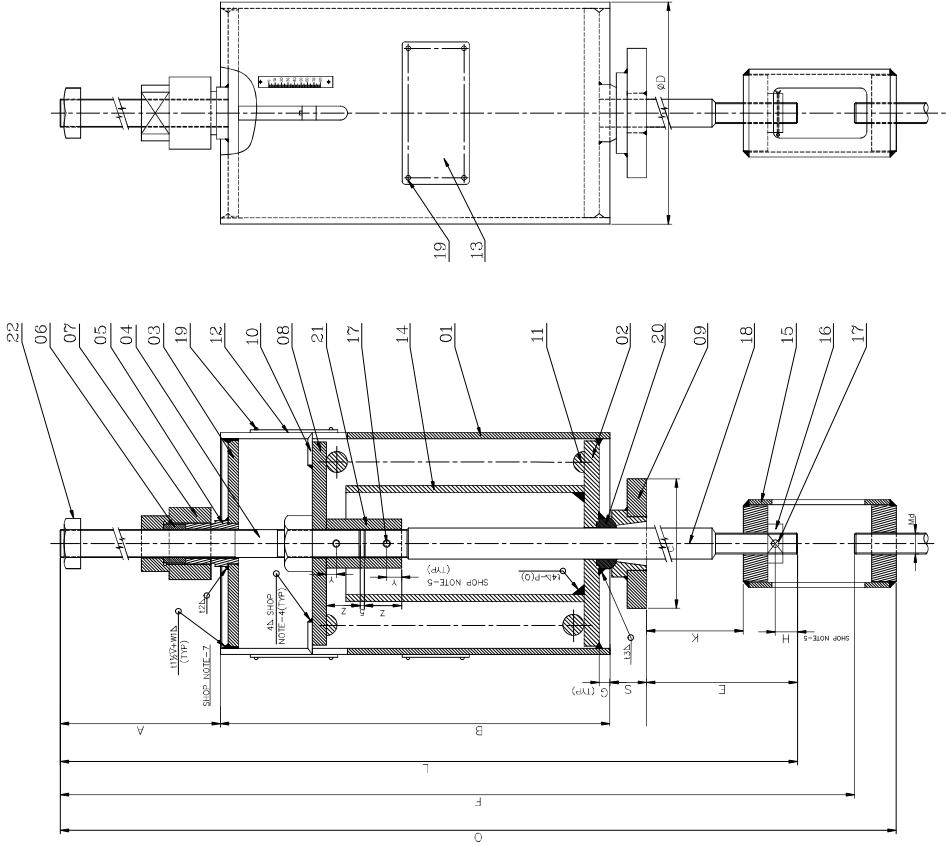
611289/2024/HERP-ENGG&amp;MKT



611289/2024/HERP-ENGG&amp;MKT



1-12-000-01482



VAR. NO.	TYPE	BIN CODE	ØD	B	O	MdP	ASSY. WEIGHT (kg)	A	C	E	F	G	H	L	S	Y	Z	K	t1-t1/20+WB	t2-t2	t3-t3	t4-t4+F(0)
01	SAT 1-80	948210461002	113.9	204	1255	M14x2	6.1	156	70	750	1184	5	11	1134	24	5	10	717	4-1/20+WB	4L	4L	3L-20(25)
02	SAT 2-80	948210462002	166.5	201	1255	M14x2	9.2	155	70	755	1184	6	11	1134	23	5	10	722	4-1/20+WB	4L	4L	3L-20(40)
03	SAT 3-80	948210463002	113.9	271	1338	M14x2	7.9	156	80	766	1267	5	11	1218	24	5	10	733	4-1/20+WB	4L	4L	3L-15(20)
04	SAT 4-80	948210464002	113.9	285	1339	M14x2	9.1	156	80	750	1268	5	11	1218	24	5	10	717	4-1/20+WB	4L	4L	3L-20(25)
05	SAT 5-80	948210465002	166.5	295	1331	M27x3	16.3	173	80	725	1294	6	13	1219	23	7	14	679	4-1/20+WB	5L	4L	3L-20(35)
06	SAT 6-80	948210466002	166.5	295	1333	M27x3	17.5	172	80	728	1296	6	13	1221	23	7	14	682	5-1/20+WB	6L	5L	3L-20(35)
07	SAT 7-80	948210467002	219.1	305	1424	M27x3	30	190	90	725	1319	7	15	1244	24	9	18	675	6-1/20+WB	8L	5L	3L-25(50)
08	SAT 8-80	948210468002	166.5	397	1531	M27x3	33	205	110	725	1427	6	17	1362	25	10	20	671	5-1/20+WB	8L	5L	3L-25(35)
09	SAT 9-80	948210469002	219.1	460	1590	M27x3	55.6	202	110	725	1486	7	17	1411	24	10	20	671	6-1/20+WB	8L	6L	3L-30(40)
10	SAT 10-80	948210470002	219.1	493	1671	M27x3	76.4	227	130	725	1555	7	20	1490	35	13	26	654	6-1/20+WB	7L	6L	3L-30(40)
11	SAT 11-80	948210471002	323.9	473	1675	M27x3	125.6	253	150	725	1559	9	23	1484	33	16	32	648	8-1/20+WB	8L	8L	3L-40(80)
12	SAT 12-80	948210472002	355.6	530	1801	M36x3	221.2	296	200	725	1665	9	28	1590	39	21	42	616	8-1/20+WB	10L	8L	3L-40(80)
13	SAT 13-80	948210473002	406.4	639	1943	M48x3	331.1	328	200	725	1807	11	33	1732	40	25	50	608	10-1/20+WB	15L	8L	3L-50(80)

NOTES:

1) FOR SPRING RATE AND SELECTION CHART REFER DRG. 4-80-999-99068.  
2) DIMENSIONS INDICATED IN THIS DRAWING ARE BASED ON THE INITIAL PRECOMPRESSION OF 56 MM. FOR ALL TYPES, DIMENSIONS EXPLICITLY MAY CHANGE IN LINE WITH THE TOLERANCES/CHARACTERISTICS OF THE SPRING IN THE ASSEMBLY.

FOR SHOPS:

1. TRAVEL SCALE (ITEM-12) SHALL BE FIXED AT A POSITION, SUCH THAT THE POINTER (ITEM-10) READS 40MM IN THE TRAVEL SCALE AT THE MID LOAD (CORRESPONDING TO LOAD AT 40MM TRAVEL GIVEN IN THE DRG 4-80-999-99068).

2. LOCKING:

a. ALL TYPES OF SPRING HANGERS SHALL BE PRECOMRESSED TO THE COLD POSITION INDICATED IN THE CONTRACT DOCUMENTS FOR INDIVIDUAL HANGERS. AT THIS PRECOMPRESSION, HANGERS SHALL BE LOCKED USING ITEM No.06 & 07 PRIOR TO DESPATCH.

3. MARKING:

- a. FOR ALL TYPES OF SPRING HANGERS, HANGER TAG No. TYPE No., OPERATING LOAD AND MOVEMENT SHALL BE PUNCHED IN THE NAME PLATE (ITEM No.13), BASED ON THE DETAILS INDICATED IN THE CONTRACT DOCUMENTS.
- b. FOR ALL TYPES OF SPRING HANGERS, COLD AND HOT MOVEMENT POSITIONS SHALL BE MARKED ON THE TRAVEL SCALE (ITEM No.12) WITH GREEN AND RED PAINTS RESPECTIVELY.
- 4. POINTERS (ITEM No.10) ARE TO BE WELDED TO SPRING PLATE (ITEM No.08) SUCH THAT THEY PROTRUDE BY 2 TO 4 MM OUTSIDE THE HOUSING (ITEM No.01).
- 5. TOP & BOTTOM TIE RODS (ITEM Nos. 04 & 18) ARE TO BE MATCH DRILLED WITH COUPLING (ITEM No.21) ALSO BOTTOM TIE ROD (ITEM No.18) IS TO BE MATCH DRILLED WITH NUT (ITEM No.16) HOLE SIZES FOR THESE MATCH DRILLING ARE GIVEN BELOW.



TYPE

- SAT1-80 TO SAT7-80 DIA 4.5 MM
- SAT8-80 TO SAT9-80 DIA 5.5 MM
- SAT10-80 TO SAT15-80 DIA 7.0 MM

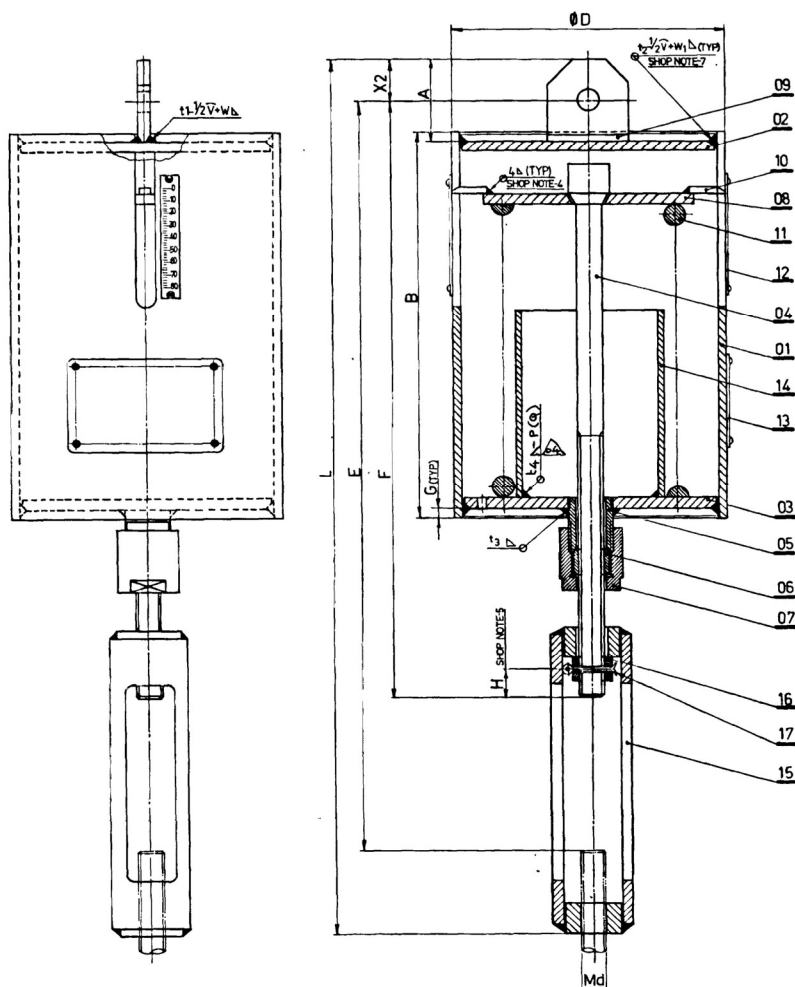
FOR SITE:

- 1. DURING PRECTION:
  - a. THE SPRING HANGERS SHALL BE PRECTED SUCH THAT THE BEARING PLATE ASSY. IS IN THE SAME SEQUENCE, SUCH THAT THE HYD. LOCK NUT IS HELD BETWEEN CENTERING NUT AND TOP NUT AND THE DISTANCE BETWEEN THE FREE END OF TOP TIE ROD AND TOP OF NUT SHALL BE APPROXIMATELY 5MM
- 2. BEFORE HYDRAULIC TEST:
  - a. ALL TYPES OF SPRING HANGERS SHALL BE CHECKED FOR LOCKED CONDITION AT THE COLD POSITION AND AT THE HOT POSITION.
- 3. AFTER HYDRAULIC TEST:
  - a. THE SPRING HANGERS SHALL BE UNLOCKED BY LOOSENING ITEM No.06(07) AS PER THE FOLLOWING STEPS:
    - i. REMOVE NUT (ITEM No.22 AT THE TOP) FROM THE TOP TIE ROD (ITEM No.04)
    - ii. LOOSEN HYD. LOCK NUT (ITEM No.07) AND THEN CENTERING NUT (ITEM No.08)
    - iii. REMOVE HYD. LOCK NUT AND CENTERING NUT (ITEM No.07 & 08) FROM THE TOP TIE ROD (ITEM No.04)
    - iv. THEN ASSEMBLE CENTERING NUT, HYD. LOCK NUT AND NUT (ITEM No.06,07 & 22) IN THE SAME SEQUENCE, SUCH THAT THE HYD. LOCK NUT IS HELD BETWEEN CENTERING NUT AND TOP NUT AND THE DISTANCE BETWEEN THE FREE END OF TOP TIE ROD AND TOP OF NUT SHALL BE APPROXIMATELY 5MM

TYPE OF PRODUCT		CUSTOMER/PROJECT	
Bharat Heavy Electricals Ltd		UNIT: HIGH PRESSURE BOILER PLANT	
TIRUCHIRAPPALLI - 620014		APPS: P.T.	
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REV: 155		DATE: 16.12.2014	
REV: 156		DATE: 16.12.2014	
REV: 157		DATE: 16.12.2014	
REV: 158		DATE: 16.12.2014	
REV: 159		DATE: 16.12.2014	
REV: 160		DATE: 16.12.2014	
REV: 161		DATE: 16.12.2014	
REV: 162		DATE: 16.12.2014	
REV: 163		DATE: 16.12.2014	
REV: 164		DATE: 16.12.2014	
REV: 165		DATE: 16.12.2014	
REV: 166		DATE: 16.12.2014	
REV: 167		DATE: 16.12.2014	
REV: 168		DATE: 16.12.2014	
REV: 169		DATE: 16.12.2014	
REV: 170		DATE: 16.12.2014	
REV: 171		DATE: 16.12.2014	
REV: 172		DATE: 16.12.2014	
REV: 173		DATE: 16.12.2014	
REV: 174		DATE: 16.12.2014	
REV: 175		DATE: 16.12.2014	
REV: 176		DATE: 16.12.2014	
REV: 177		DATE: 16.12.2014	
REV: 178		DATE: 16.12.2014	
REV: 179		DATE: 16.12.2014	
REV: 180		DATE: 16.12.2014	
REV: 181		DATE: 16.12.2014	
REV: 182		DATE: 16.12.2014	
REV: 183		DATE: 16.12.2014	
REV: 184		DATE: 16.12.2014	
REV: 185		DATE: 16.12.2014	
REV: 186		DATE: 16.12.2014	
REV: 187		DATE: 16.12.2014	
REV: 188		DATE: 16.12.2014	
REV: 189		DATE: 16.12.2014	
REV: 190		DATE: 16.12.2014	
REV: 191		DATE: 16.12.2014	
REV: 192		DATE: 16.12.2014	
REV: 193		DATE: 16.12.2014	
REV: 194		DATE: 16.12.2014	
REV: 195		DATE: 16.12.2014	
REV: 196		DATE: 16.12.2014	
REV: 197		DATE: 16.12.2014	
REV: 198		DATE: 16.12.2014	
REV: 199		DATE: 16.	

TYPE OF PRODUCT OR NAME OF CUSTOMER	Brand Heavy Electricals Ltd		DATE	
	UNIT: SAT 160 (S) SAT 160 (T) UNIT: (H) SAT 160 (T) 6/2004		15.12.2004	
CUSTOMER PROJECT		NAME	SOURCE	DATE
		DESIGN	REVISION NUMBER	15.12.2004
TITLE		REVISION (No)	DATE	DATE
		121	15-12-2004	15.12.2004
<p>THE INFORMATION ON THIS DRAWING IS THE PROPERTY OF BRAND HEAVY ELECTRICALS COMPANY. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, WITHOUT PERMISSION IN WRITING FROM THE COMPANY.</p>		DRAWING NO : 1-12-000-01483 00		

20066-666-08-1



1			2			3			4			5			6			7		
V#	NO	TYPE	BIN CODE	D	B	L	Nd	RSSY WEIGHT (kg)	R	F	K	G	H	X2	13b	$1\frac{1}{2}\sqrt{V}+Wb$	$1\frac{1}{2}\sqrt{V}+Wb$	$L_{6b}-P(8)$	REMARKS	
01	SH 1-80	94-821-401-00	113.9	219	477	M12h1.75	5.557	50	336	306	5.0	11	20	4b	$2.5-1/2\sqrt{V}+4b$	$1\frac{1}{2}\sqrt{V}+4b$	$3b-2a(23)$			
02	SH 2-80	94-821-402-00	186.5	216	472	M12h1.75	8.874	50	331	301	6.0	11	20	4b	$2.5-1/2\sqrt{V}+4b$	$1\frac{1}{2}\sqrt{V}+5b$	$3b-2a(40)$			
03	SH 3-80	94-821-403-00	113.9	206	544	M12h1.75	6.928	50	403	453	5.0	11	20	4b	$2.5-1/2\sqrt{V}+4b$	$1\frac{1}{2}\sqrt{V}+4b$	$3b-15(20)$			
04	SH 4-80	94-821-404-00	113.9	300	561	M12h1.75	8.165	50	420	470	5.0	11	20	4b	$2.5-1/2\sqrt{V}+4b$	$1\frac{1}{2}\sqrt{V}+4b$	$3b-20(23)$			
06	SH 5-80	94-821-405-00	186.5	310	608	M16h2.0	14.806	80	448	498	6.0	13	30	5b	$3-1/2\sqrt{V}+5b$	$1\frac{1}{2}\sqrt{V}+5b$	$3b-20(35)$			
08	SH 6-80	94-821-406-00	186.5	310	608	M16h2.0	16.055	80	448	498	6.0	13	30	5b	$3-1/2\sqrt{V}+5b$	$1\frac{1}{2}\sqrt{V}+5b$	$3b-24(35)$			
07	SH 7-80	94-821-407-00	219.1	314	701	M20h2.5	27.612	70	486	561	7.0	15	35	8b	$4-1/2\sqrt{V}+6b$	$1\frac{1}{2}\sqrt{V}+6b$	$3b-30(50)$			
08	SH 8-80	94-821-408-00	186.5	403	822	M24h3.0	29.246	80	602	677	6.0	17	40	8b	$5-1/2\sqrt{V}+6b$	$1\frac{1}{2}\sqrt{V}+6b$	$3b-25(35)$			
09	SH 9-80	94-821-409-00	219.1	466	893	M24h3.0	51.234	80	543	708	7.0	17	40	8b	$5-1/2\sqrt{V}+6b$	$1\frac{1}{2}\sqrt{V}+6b$	$3b-30(40)$			
10	SH10-80	94-821-410-00	219.1	494	989	M30h3.5	6.8543	100	748	823	7.0	20	50	7b	$6-1/2\sqrt{V}+6b$	$1\frac{1}{2}\sqrt{V}+6b$	$3b-20(30)$			
11	SH11-80	94-821-411-00	323.9	469	1012	M36h4.0	12.2552	120	761	836	9.0	23	60	8b	$8-1/2\sqrt{V}+6b$	$1\frac{1}{2}\sqrt{V}+8b$	$3b-40(30)$			
12	SH12-80	94-821-412-00	365.6	517	1183	M48h5.0	200.531	154	905	980	9.0	29	77	10b	$10-1/2\sqrt{V}+6b$	$1\frac{1}{2}\sqrt{V}+8b$	$3b-40(80)$			
13	SH13-80	94-821-413-00	406.4	619	1363	M56h6.0	303.837	180	1062	1137	11.0	33	90	15b	$12.5-1/2\sqrt{V}+6b$	$1\frac{1}{2}\sqrt{V}+10b$	$3b-50(80)$			

**NOTES :**

## GENERAL

1. FOR SPRING RATE AND SELECTION CHART REFER Dwg. NO. 4-80-999-99068  
~~2. DIMENSIONS INDICATED IN THIS DRAWING ARE BASED ON THE INITIAL PRECOMPRESSION~~  
~~OF 58 MM FOR ALL TYPES. DIMENSIONS L, E, F MAY CHANGE IN LINE WITH~~  
 3. DIMENSIONS INDICATED IN THIS DRAWING ARE BASED ON THE INITIAL PRECOMPRESSION  
 OF 58 MM FOR ALL TYPES. DIMENSIONS L, E, F MAY CHANGE IN LINE WITH  
 THE TOLERANCES/CHARACTERISTICS OF THE SPRING IN THE ASSEMBLY.

**FOR SHOPS :**

1. TRAVEL SCALE (ITEM 12) SHALL BE FIXED AT A POSITION, SUCH THAT THE POINTER (ITEM 10) READS 40 mm IN THE TRAVEL SCALE AT THE MID LOAD (CORRESPONDING TO LOAD AT 40 mm TRAVEL - GIVEN IN DRG 4-80-999-99082).

## 2. LOCKING :

- a. TYPES SH1-80 TO SH5-80 SHALL BE LOCKED IN 'ZERO' POSITION USING ITEM NO. 08 & 07 PRIOR TO DESPATCH. (i.e. WITH POINTER AT '0' READING)
- b. TYPES SH10-80 & ABOVE SHALL BE PRECOMPRESSED TO THE 'COLD POSITION' INDICATED IN THE CONTRACT DOCUMENTS FOR INDIVIDUAL HANGERS. AT THIS PRECOMPRESSION, HANGERS SHALL BE LOCKED USING ITEM NOS. 08 & 07 PRIOR TO DESPATCH.

9. MARKING :

- 3. MARKING :**
- a. FOR TYPES SH10-80 & ABOVE, HANGER TAG NO., OPERATING LOAD AND MOVEMENT SHALL BE PUNCHED IN THE HANGER PLATE (ITEM NO.12), BASED ON THE DETAILS INDICATED IN THE CONTRACT DOCUMENTS..
  - b. FOR TYPES SH10-80 & ABOVE, COLD AND HOT SETTING POSITIONS SHALL BE MARKED ON THE TRAVEL SCALE (ITEM NO.12) WITH GREEN AND RED PAINTS RESPECTIVELY.
  - c. TYPE NUMBERS SHALL BE PUNCHED ON ALL HANGERS.

4. POINTERS (ITEM NO. 10) ARE TO BE WELDED TO SPRING PLATE (ITEM NO. 08) SUCH THAT THEY PROTRUDE BY ~~1/8"~~ OUTSIDE THE HOUSING (ITEM NO. 01).

5. SPINDLE BOLT AND NUT (ITEM NOS. 04 & 10) SHALL BE MATCH-DRILLED, FOR EACH AND EVERY ASSEMBLY, TO THE HOLE SIZE INDICATED BELOW :

TYPE	HOLE SIZE
SH1-80 TO SH7-80	DIA 4.5 MM
SH8-80 & SH9-80	DIA 5.5 MM
SH10-80 TO SH15-80	DIA 7.0 MM

7. THE SLOTS ON TOP ARE TO BE FREE FROM WELD METAL (i.e) AFTER WELDING ALL ROUND, THE SLOTS SHALL BE DRESSED TO HAVE A SMOOTH SURFACE IN LINE WITH THE TOP SURFACE OF THE TOP PLATE.

FOR SITE :

1. BEFORE HYDRAULIC TEST :
- a. TYPES SH1-80 TO SH9-80 : HANGERS SHALL BE ADJUSTED TO THE COLD SET LOAD INDICATED IN THE CONTRACT DOCUMENTS FOR THE RESPECTIVE HANGER TAG NOS. PRIOR TO ERECTION. AT THIS SET LOAD, HANGERS SHALL BE LOCKED USING ITEM NOS.06 & 07.
- b. TYPES SH10-80 & ABOVE : HANGERS SHALL BE CHECKED FOR LOCKED CONDITION AT THE COLD SET LOAD ALREADY DONE AT SHOPS.

2. AFTER HYDRAULIC TEST :
- ALL HANGERS SHALL BE UNLOCKED BY LOOSENING ITEM NOS. 08 & 07 UNTIL THEY ARE SEATED ON TURN BUCKLE (ITEM NO. 15).

8. MARKING FOR SH1-B0 TO SH9-B0:
- HANGER TAG NO., OPERATING LOAD AND MOVEMENT SHALL BE PUNCHED IN THE NAME PLATE (ITEM NO.13), BASED ON DETAILS INDICATED IN THE CONTRACT DOCUMENTS.
  - COLD AND HOT SETTING POSITIONS SHALL BE MARKED ON THE TRAVEL SCALE WITH GREEN AND RED PAINTS RESPECTIVELY.

NOTES FOR SHOPS (CONTD.)

2. ITEM NO. 2 & 4, AUG. 10  
 3. ITEM NO. 3 AND  
 4. ITEM NO. 1, THIS FINAL  
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 100. ITEM NO. 1, THIS FINAL

REFERENCE DRAWINGS:

18	HAMMER DRIVEN SCREW	STANDARD	8
17	SPLIT PIN	STANDARD	1
16	NUT	3-80-999-99152	1
15	TURN BUCKLE	2-80-999-99140	1
14	INNER PIPE GUIDE	3-80-999-99154	1
13	NAME PLATE	3-80-999-99118	1
12	TRAVEL SCALE	3-80-999-99117	2
11	SPRING	2-80-999-99117	1
10	POINTER	4-80-999-99047	2
09	LUG PLATE	2-80-999-99138	1
08	SPRING PLATE	2-80-999-99133	1
07	HYD. LOCK NUT	3-80-999-99153	1
06	CENTERING NUT	2-80-999-99131	1
05	BOTTOM SOCKET	2-80-999-99138	1
04	SPINDLE BOLT	2-80-999-99137	1
03	BOTTOM PLATE	2-80-999-99136	1
02	TOP PLATE	2-80-999-99130	1
01	HOUSING	3-80-999-99157	1
ITEM NO.	DESCRIPTION	DRAWING NO.	QTY

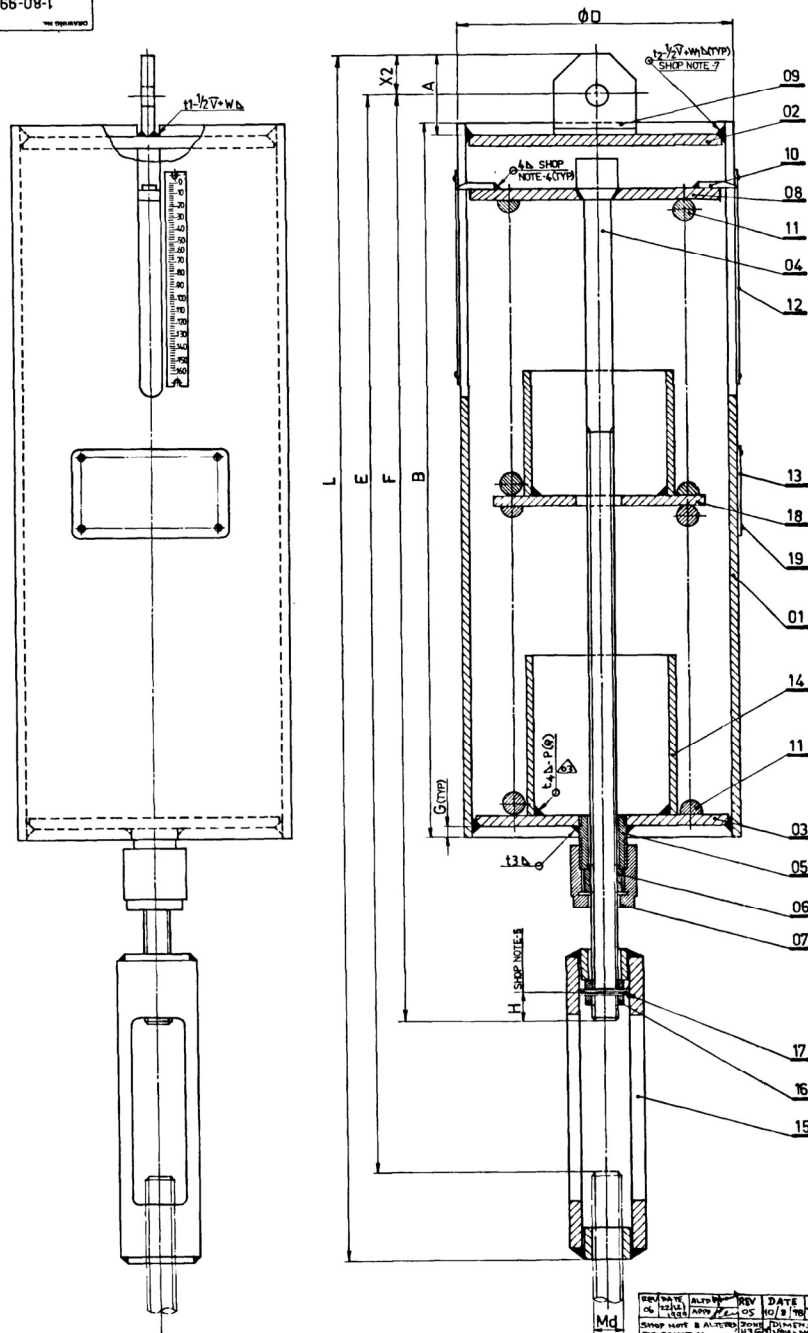
[illegible]

TYPE OR PRODUCT OR NAME OF CUSTOMER/PROJECT		STANDARD					
BHARAT HEAVY ELECTRICALS LTD. PIPPING CENTRE, MADRAS		ORDER NO.	204218	DATE	01.07.88	NO. OF	07
		CHIT NO.	1000000000	DATE	25.07.88	OF	
		APPROV.	Z JWD		200788		
REF.	ORDER NO. UNIT/LOT/TYPE	SCALE	UNIT/TYPE	UNIT/TYPE	UNIT/TYPE	UNIT/TYPE	UNIT/TYPE
		NTS					
TITLE		CAD CODE	REVISIONS		REV.		
VARIABLE LOAD HANGERS (Type SH 8)		U 01	1-80-999-99002.		07		

611289/2024/HERP-ENGG&amp;MKT

FIRST ANGLE PROJECTION (ALL DIMENSIONS IN MILLIMETRES)

E0066-666-08-1



## NOTES

## GENERAL

1. FOR SPRING RATE AND SELECTION CHART REFER DRG. NO. 4-80-999-99068.

2. DIMENSIONS INDICATED IN THIS DRAWING ARE BASED ON THE INITIAL PRECOMPRESSION

3. DIMENSIONS INDICATED IN THIS DRAWING ARE BASED ON THE INITIAL PRECOMPRESSION OF 112 MM. FOR ALL TYPES, DIMENSIONS L, E, F, MAY CHANGE IN LINE WITH THE TOLERANCES / CHARACTERISTICS OF THE SPRING, IN THE ASSEMBLY

## FOR SHOPS

1. TRAVEL SCALE (ITEM 12) SHALL BE FIXED AT A POSITION, SUCH THAT THE POINTER (ITEM 11) READS 80MM IN THE TRAVEL SCALE AT THE MID LOAD (CORRESPONDING TO LOAD AT 80MM TRAVEL, GIVEN IN DRG. 4-80-999-99068).

## 2. LOCKING

a. TYPES SH1-160 TO SH9-160 SHALL BE LOCKED IN "ZERO" POSITION USING ITEM NO. 06 &amp; 07 PRIOR TO DESPATCH. WITH POINTER AT "0" READING. b. TYPES SH10-160 &amp; ABOVE SHALL BE PRECOMPRESSIONED TO THE COLD POSITION INDICATED IN THE CONTRACT DOCUMENTS FOR INDIVIDUAL HANGERS. AT THIS PRECOMPRESSION, HANGERS SHALL BE LOCKED USING ITEM NOS. 06 &amp; 07 PRIOR TO DESPATCH.

## 3. MARKING

a. FOR TYPES SH10-160 &amp; ABOVE, HANGER TAG NO., OPERATING LOAD AND MOVEMENT SHALL BE PUNCHED IN THE NAME PLATE (ITEM NO. 13), BASED ON THE DETAILS INDICATED IN THE CONTRACT DOCUMENTS. b. FOR TYPES SH10-160 &amp; ABOVE, COLD AND HOT SETTING POSITIONS SHALL BE MARKED ON THE TRAVEL SCALE (ITEM NO. 12) WITH GREEN AND RED PRINTS RESPECTIVELY. c. TYPE NUMBERS SHALL BE PUNCHED ON ALL HANGERS.

4. POINTERS (ITEM NO. 11) ARE TO BE WELDED TO SPRING PLATE (ITEM NO. 08) SUCH THAT THEY PROTRUDE BY 10MM OUTSIDE THE HOUSING (ITEM NO. 01).

5. SPINDLE BOLT AND NUT (ITEM NOS. 04 & 18) SHALL BE MATCH-DRILLED FOR EACH AND EVERY ASSEMBLY TO THE HOLE SIZE INDICATED BELOW:  
TYPE HOLE SIZE  
SH1-160 TO SH7-160 DIA 4.5 MM  
SH8-160 & SH9-160 DIA 5.5 MM  
SH10-160 TO SH15-160 DIA 7.0 MM

6. THE SLOTS ON TOP JOSE TO BE FREE FROM WELD METAL (V) AFTER WELDING OPERATION. THE SLOTS SHALL BE DRESSED TO HAVE A SMOOTH SURFACE IN LINE WITH THE TOP SURFACE OF THE TOP PLATE.

## FOR SITE

## 1. BEFORE HYDRAULIC TEST

a. TYPES SH1-160 TO SH9-160 : HANGERS SHALL BE ADJUSTED TO THE "COLD SET" LOAD INDICATED IN THE CONTRACT DOCUMENTS FOR THE RESPECTIVE HANGER TAG NOS. PRIOR TO ERECTION. AT THIS SET LOAD, HANGERS SHALL BE LOCKED USING ITEM NOS. 06 &amp; 07. b. TYPES SH10-160 &amp; ABOVE : HANGERS SHALL BE CHECKED FOR LOCKED CONDITION AT THE COLD SET LOAD ALREADY DONE AT SHOPS.

## 2. AFTER HYDRAULIC TEST

a. ALL HANGERS SHALL BE UNLOCKED BY LOOSENING ITEM NOS. 06 &amp; 07 UNTIL THEY ARE SEATED ON TURN BUCKLE (ITEM NO. 15).

## 3. MARKING FOR SH1-160 TO SH9-160

a. HANGER TAG NO., OPERATING LOAD AND MOVEMENT SHALL BE PUNCHED IN THE NAME PLATE (ITEM NO. 13), BASED ON DETAILS INDICATED IN THE CONTRACT DOCUMENTS. b. COLD AND HOT SETTING POSITIONS SHALL BE MARKED IN THE TRAVEL SCALE WITH GREEN AND RED PRINTS RESPECTIVELY.

VAR NO	TYPE	BIN CODE	D	B	L	Md	ASSY WEIGHT (kg)	A	F	E	G	H	X2	13b	t1-1/2 V4b	t2-1/2 V4b	t3-1/2 V4b	t4-1/2 V4b	t5-1/2 V4b	t6-1/2 V4b	t7-1/2 V4b	t8-1/2 V4b	t9-1/2 V4b	t10-1/2 V4b	t11-1/2 V4b	t12-1/2 V4b	t13-1/2 V4b	t14-1/2 V4b	t15-1/2 V4b	t16-1/2 V4b	t17-1/2 V4b	t18-1/2 V4b	t19-1/2 V4b	t20-1/2 V4b	t21-1/2 V4b	t22-1/2 V4b	t23-1/2 V4b	t24-1/2 V4b	t25-1/2 V4b	t26-1/2 V4b	t27-1/2 V4b	t28-1/2 V4b	t29-1/2 V4b	t30-1/2 V4b	t31-1/2 V4b	t32-1/2 V4b	t33-1/2 V4b	t34-1/2 V4b	t35-1/2 V4b	t36-1/2 V4b	t37-1/2 V4b	t38-1/2 V4b	t39-1/2 V4b	t40-1/2 V4b	t41-1/2 V4b	t42-1/2 V4b	t43-1/2 V4b	t44-1/2 V4b	t45-1/2 V4b	t46-1/2 V4b	t47-1/2 V4b	t48-1/2 V4b	t49-1/2 V4b	t50-1/2 V4b	t51-1/2 V4b	t52-1/2 V4b	t53-1/2 V4b	t54-1/2 V4b	t55-1/2 V4b	t56-1/2 V4b	t57-1/2 V4b	t58-1/2 V4b	t59-1/2 V4b	t60-1/2 V4b	t61-1/2 V4b	t62-1/2 V4b	t63-1/2 V4b	t64-1/2 V4b	t65-1/2 V4b	t66-1/2 V4b	t67-1/2 V4b	t68-1/2 V4b	t69-1/2 V4b	t70-1/2 V4b	t71-1/2 V4b	t72-1/2 V4b	t73-1/2 V4b	t74-1/2 V4b	t75-1/2 V4b	t76-1/2 V4b	t77-1/2 V4b	t78-1/2 V4b	t79-1/2 V4b	t80-1/2 V4b	t81-1/2 V4b	t82-1/2 V4b	t83-1/2 V4b	t84-1/2 V4b	t85-1/2 V4b	t86-1/2 V4b	t87-1/2 V4b	t88-1/2 V4b	t89-1/2 V4b	t90-1/2 V4b	t91-1/2 V4b	t92-1/2 V4b	t93-1/2 V4b	t94-1/2 V4b	t95-1/2 V4b	t96-1/2 V4b	t97-1/2 V4b	t98-1/2 V4b	t99-1/2 V4b	t100-1/2 V4b	t101-1/2 V4b	t102-1/2 V4b	t103-1/2 V4b	t104-1/2 V4b	t105-1/2 V4b	t106-1/2 V4b	t107-1/2 V4b	t108-1/2 V4b	t109-1/2 V4b	t110-1/2 V4b	t111-1/2 V4b	t112-1/2 V4b	t113-1/2 V4b	t114-1/2 V4b	t115-1/2 V4b	t116-1/2 V4b	t117-1/2 V4b	t118-1/2 V4b	t119-1/2 V4b	t120-1/2 V4b	t121-1/2 V4b	t122-1/2 V4b	t123-1/2 V4b	t124-1/2 V4b	t125-1/2 V4b	t126-1/2 V4b	t127-1/2 V4b	t128-1/2 V4b	t129-1/2 V4b	t130-1/2 V4b	t131-1/2 V4b	t132-1/2 V4b	t133-1/2 V4b	t134-1/2 V4b	t135-1/2 V4b	t136-1/2 V4b	t137-1/2 V4b	t138-1/2 V4b	t139-1/2 V4b	t140-1/2 V4b	t141-1/2 V4b	t142-1/2 V4b	t143-1/2 V4b	t144-1/2 V4b	t145-1/2 V4b	t146-1/2 V4b	t147-1/2 V4b	t148-1/2 V4b	t149-1/2 V4b	t150-1/2 V4b	t151-1/2 V4b	t152-1/2 V4b	t153-1/2 V4b	t154-1/2 V4b	t155-1/2 V4b	t156-1/2 V4b	t157-1/2 V4b	t158-1/2 V4b	t159-1/2 V4b	t160-1/2 V4b	t161-1/2 V4b	t162-1/2 V4b	t163-1/2 V4b	t164-1/2 V4b	t165-1/2 V4b	t166-1/2 V4b	t167-1/2 V4b	t168-1/2 V4b	t169-1/2 V4b	t170-1/2 V4b	t171-1/2 V4b	t172-1/2 V4b	t173-1/2 V4b	t174-1/2 V4b	t175-1/2 V4b	t176-1/2 V4b	t177-1/2 V4b	t178-1/2 V4b	t179-1/2 V4b	t180-1/2 V4b	t181-1/2 V4b	t182-1/2 V4b	t183-1/2 V4b	t184-1/2 V4b	t185-1/2 V4b	t186-1/2 V4b	t187-1/2 V4b	t188-1/2 V4b	t189-1/2 V4b	t190-1/2 V4b	t191-1/2 V4b	t192-1/2 V4b	t193-1/2 V4b	t194-1/2 V4b	t195-1/2 V4b	t196-1/2 V4b	t197-1/2 V4b	t198-1/2 V4b	t199-1/2 V4b	t200-1/2 V4b	t201-1/2 V4b	t202-1/2 V4b	t203-1/2 V4b	t204-1/2 V4b	t205-1/2 V4b	t206-1/2 V4b	t207-1/2 V4b	t208-1/2 V4b	t209-1/2 V4b	t210-1/2 V4b	t211-1/2 V4b	t212-1/2 V4b	t213-1/2 V4b	t214-1/2 V4b	t215-1/2 V4b	t216-1/2 V4b	t217-1/2 V4b	t218-1/2 V4b	t219-1/2 V4b	t220-1/2 V4b	t221-1/2 V4b	t222-1/2 V4b	t223-1/2 V4b	t224-1/2 V4b	t225-1/2 V4b	t226-1/2 V4b	t227-1/2 V4b	t228-1/2 V4b	t229-1/2 V4b	t230-1/2 V4b	t231-1/2 V4b	t232-1/2 V4b	t233-1/2 V4b	t234-1/2 V4b	t235-1/2 V4b	t236-1/2 V4b	t237-1/2 V4b	t238-1/2 V4b	t239-1/2 V4b	t240-1/2 V4b	t241-1/2 V4b	t242-1/2 V4b	t243-1/2 V4b	t244-1/2 V4b	t245-1/2 V4b	t246-1/2 V4b	t247-1/2 V4b	t248-1/2 V4b	t249-1/2 V4b	t250-1/2 V4b	t251-1/2 V4b	t252-1/2 V4b	t253-1/2 V4b	t254-1/2 V4b	t255-1/2 V4b	t256-1/2 V4b	t257-1/2 V4b	t258-1/2 V4b	t259-1/2 V4b	t260-1/2 V4b	t261-1/2 V4b	t262-1/2 V4b	t263-1/2 V4b	t264-1/2 V4b	t265-1/2 V4b	t266-1/2 V4b	t267-1/2 V4b	t268-1/2 V4b	t269-1/2 V4b	t270-1/2 V4b	t271-1/2 V4b	t272-1/2 V4b	t273-1/2 V4b	t274-1/2 V4b	t275-1/2 V4b	t276-1/2 V4b	t277-1/2 V4b	t278-1/2 V4b	t279-1/2 V4b	t280-1/2 V4b	t281-1/2 V4b	t282-1/2 V4b	t283-1/2 V4b	t284-1/2 V4b	t285-1/2 V4b	t286-1/2 V4b	t287-1/2 V4b	t288-1/2 V4b	t289-1/2 V4b	t290-1/2 V4b	t291-1/2 V4b	t292-1/2 V4b	t293-1/2 V4b	t294-1/2 V4b	t295-1/2 V4b	t296-1/2 V4b	t297-1/2 V4b	t298-1/2 V4b	t299-1/2 V4b	t300-1/2 V4b	t301-1/2 V4b	t302-1/2 V4b	t303-1/2 V4b	t304-1/2 V4b	t305-1/2 V4b	t306-1/2 V4b	t307-1/2 V4b	t308-1/2 V4b	t309-1/2 V4b	t310-1/2 V4b	t311-1/2 V4b	t312-1/2 V4b	t313-1/2 V4b	t314-1/2 V4b	t315-1/2 V4b	t316-1/2 V4b	t317-1/2 V4b	t318-1/2 V4b	t319-1/2 V4b	t320-1/2 V4b	t321-1/2 V4b	t322-1/2 V4b	t323-1/2 V4b	t324-1/2 V4b	t325-1/2 V4b	t326-1/2 V4b	t327-1/2 V4b	t328-1/2 V4b	t329-1/2 V4b	t330-1/2 V4b	t331-1/2 V4b	t332-1/2 V4b	t333-1/2 V4b	t334-1/2 V4b	t335-1/2 V4b	t336-1/2 V4b	t337-1/2 V4b	t338-1/2 V4b	t339-1/2 V4b	t340-1/2 V4b	t341-1/2 V4b	t342-1/2 V4b	t343-1/2 V4b	t344-1/2 V4b	t345-1/2 V4b	t346-1/2 V4b	t347-1/2 V4b	t348-1/2 V4b	t349-1/2 V4b	t350-1/2 V4b	t351-1/2 V4b	t352-1/2 V4b	t353-1/2 V4b	t354-1/2 V4b	t355-1/2 V4b	t356-1/2 V4b	t357-1/2 V4b	t358-1/2 V4b	t359-1/2 V4b	t360-1/2 V4b	t361-1/2 V4b	t362-1/2 V4b	t363-1/2 V4b	t364-1/2 V4b	t365-1/2 V4b	t366-1/2 V4b	t367-1/2 V4b	t368-1/2 V4b	t369-1/2 V4b	t370-1/2 V4b	t371-1/2 V4b	t372-1/2 V4b	t373-1/2 V4b	t374-1/2 V4b	t375-1/2 V4b	t376-1/2 V4b	t377-1/2 V4b	t378-1/2 V4b	t379-1/2 V4b	t380-1/2 V4b	t381-1/2 V4b	t382-1/2 V4b	t383-1/2 V4b	t384-1/2 V4b	t385-1/2 V4b	t386-1/2 V4b	t387-1/2 V4b	t388-1/2 V4b	t389-1/2 V4b	t390-1/2 V4b	t391-1/2 V4b	t392-1/2 V4b	t393-1/2 V4b	t394-1/2 V4b	t395-1/2 V4b	t396-1/2 V4b	t397-1/2 V4b	t398-1/2 V4b	t399-1/2 V4b	t400-1/2 V4b	t401-1/2 V4b	t402-1/2 V4b	t403-1/2 V4b	t404-1/2 V4b	t405-1/2 V4b	t406-1/2 V4b	t407-1/2 V4b	t408-1/2 V4b	t409-1/2 V4b	t410-1/2 V4b	t411-1/2 V4b	t412-1/2 V4b	t413-1/2 V4b	t414-1/2 V4b	t415-1/2 V4b	t416-1/2 V4b	t417-1/2 V4b	t418-1/2 V4b	t419-1/2 V4b	t420-1/2 V4b	t421-1/2 V4b	t422-1/2 V4b	t423-1/2 V4b	t424-1/2 V4b	t425-1/2 V4b	t426-1/2 V4b	t427-1/2 V4b	t428-1/2 V4b	t429-1/2 V4b	t430-1/2 V4b	t431-1/2 V4b	t432-1/2 V4b	t433-1/2 V4b	t434-1/2 V4b	t435-1/2 V4b	t436-1/2 V4b	t437-1/2 V4b	t438-1/2 V4b	t439-1/2 V4b	t440-1/2 V4b	t441-1/2 V4b	t442-1/2 V4b	t443-1/2 V4b	t444-1/2 V4b	t445-1/2 V4b	t446-1/2 V4b	t447-1/2 V4b	t448-1/2 V4b	t449-1/2 V4b	t450-1/2 V4b	t451-1/2 V4b	t452-1/2 V4b	t453-1/2 V4b	t454-1/2 V4b	t455-1/2 V4b	t456-1/2 V4b	t457-1/2 V4b	t458-1/2 V4b	t459-1/2 V4b	t460-1/2 V4b	t461-1/2 V4b	t462-1/2 V4b	t463-1/2 V4b	t464-1/2 V4b	t465-1/2 V4b	t466-1/2 V4b	t467-1/2 V4b	t468-1/2 V4b	t469-1/2 V4b	t470-1/2 V4b	t471-1/2 V4b	t472-1/2 V4b	t473-1/2 V4b	t474-1/2 V4b	t475-1/2 V4b	t476-1/2 V4b	t477-1/2 V4b	t478-1/2 V4b	t479-1/2 V4b	t480-1/2 V4b	t481-1/2 V4b	t482-1/2 V4b	t483-1/2 V4b	t484-1/2 V4b	t485-1/2 V4b	t486-1/2 V4b	t487-1/2 V4b	t488-1/2 V4b	t489-1/2 V4b	t490-1/2 V4b	t491-1/2 V4b	t492-1/2 V4b	t493-1/2 V4b	t494-1/2 V4b	t495-1/2 V4b	t496-1/2 V4b	t497-1/2 V4b	t498-1/2 V4b	t499-1/2 V4b	t500-1/2 V4b	t501-1/2 V4b	t502-1/2 V4b	t503-1/2 V4b	t504-1/2 V4b	t505-1/2 V4b	t506-1/2 V4b	t507-1/2 V4b	t508-1/2 V4b	t509-1/2 V4b	t510-1/2 V4b	t511-1/2 V4b	t512-1/2 V4b	t513-1/2 V4b	t514-1/2 V4b	t515-1/2 V4b	t516-1/2 V4b	t517-1/2 V4b	t518-1/2 V4b	t519-1/2 V4b	t520-1/2 V4b	t521-1/2 V4b	t522-1/2 V4b	t523-1/2 V4b	t524-1/2 V4b	t525-1/2 V4b	t526-1/2 V4b	t527-1/2 V4b	t528-1/2 V4b	t529-1/2 V4b	t530-1/2 V4b	t531-1/2 V4b	t532-1/2 V4b	t533-1/2 V4b	t534-1/2 V4b	t535-1/2 V4b	t536-1/2 V4b	t537-1/2 V4b	t538-1/2 V4b	t539-1/2 V4b	t540-1/2 V4b	t541-1/2 V4b	t542-1/2 V4b	t543-1/2 V4b	t544-1/2 V4b	t545-1/2 V4b	t546-1/2 V4b	t547-1/2 V4b	t548-1/2 V4b	t549-1/2 V4b	t550-1/2 V4b	t551-1/2 V4b	t552-1/2 V4b	t553-1/2 V4b	t554-1/2 V4b	t555-1/2 V4b	t556-1/2 V4b	t557-1/2 V4b	t558-1/2 V4b	t559-1/2 V4b	t560-1/2 V4b	t561-1/2 V4b	t562-1/2 V4b	t563-1/2 V4b	t564-1/2 V4b	t565-1/2 V4b	t566-1/2 V4b	t567-1/2 V4b	t568-1/2 V4b	t569-1/2 V4b	t570-1/2 V4b	t571-1/2 V4b	t572-1/2 V4b	t573-1/2 V4b	t574-1/2 V4b	t575-1/2 V4b	t576-1/2 V4b	t577-1/2 V4b	t578-1/2 V4b	t579-1/2 V4b	t580-1/2 V4b	t581-1/2 V4b	t582-1/2 V4b	t583-1/2 V4b	t584-1/2 V4b	t585-1/2 V4b	t586-1/2 V4b	t587-1/2 V4b	t588-1/2 V4b	t589-1/2 V4b	t590-1/2 V4b	t591-1/2 V4b	t592-1/2 V4b	t593-1/2 V4b	t594-1/2 V4b	t595-1/2 V4b	t596-1/2 V4b	t597-1/2 V4b	t598-1/2 V4b	t599-1/2 V4b	t600-1/2 V4b	t601-1/2 V4b	t602-1/2 V4b	t603-1/2 V4b	t604-1/2 V4b	t605-1/2 V4b	t606-1/2 V4b	t607-1/2 V4b	t608-1/2 V4b	t609-1/2 V4b	t610-1/2 V4b	t611-1/2 V4b	t612-1/2 V4b	t613-1/2 V4b	t614-1/2 V4b	t615-1/2 V4b	t616-1/2 V4b	t617-1/2 V4b	t618-1/2 V4b	t619-1/2 V4b	t620-1/2 V4b	t621-1/2 V4b	t622-1/2 V4b	t623-1/2 V4b	t624-1/2 V4b	t625-1/2 V4b	t626-1/2 V4b	t627-1/2 V4b	t628-1/2 V4b	t629-1/2 V4b	t630-1/2 V4b	t631-1/2 V4b	t632-1/2 V4b	t633-1/2 V4b	t634-1/2 V4b	t635-1/2 V4b	t636-1/2 V4b	t637-1/2 V4b	t638-1/2 V4b	t639-1/2 V4b	t640-1/2 V4b	t641-1/2 V4b	t642-1/2 V4b	t643-1/2 V4b	t644-1/2 V4b	t645-1/2 V4b	t646-1/2 V4b	t647-1/2 V4b	t648-1/2 V4b	t649-1/2 V4b	t650-1/2 V4b	t651-1/2 V4b	t652-1/2 V4b	t653-1/2 V4b	t654-1/2 V4b	t655-1/2 V4b	t656-1/2 V4b	t657-1/2 V4b	t658-1/2 V4b	t659-1/2 V4b	t660-1/2 V4b	t661-1/2 V4b	t662-1/2 V4b	t663-1/2 V4b	t664-1/2 V4b	t665-1/2 V4b	t666-1/2 V4b	t667-1/2 V4b	t668-1/2 V4b	t669-1/2 V4b	t670-1/2 V4b	t671-1/2 V4b	t672-1/2 V4b	t673-1/2 V4b	t674-1/2 V4b	t675-1/2 V4b	t676-1/2 V4b	t677-1/2 V4b	t678-1/2 V4b	t679-1/2 V4b	t680-1/2 V4b	t681-1/2 V4b	t682-1/2 V4b	t683-1/2 V4b	t684-1/2 V4b	t685-1/2 V4b	t686-1/2 V4b	t687-1/2 V4b	t688-1/2 V4b	t689-1/2 V4b	t690-1/2 V4b	t691-1/2 V4b	t692-1/2 V4b	t693-1/2 V4b	t694-1/2 V4b	t695-1/2 V4b	t696-1/2 V4b	t697-1/2 V4b	t698-1/2 V4b	t699-1/2 V4b	t700-1/2 V4b	t701-1/2 V4b	t702-1/2 V4b	t703-1/2 V4b	t704-1/2 V4b	t705-1/2 V4b	t706-1/2 V4b	t707-1/2 V4b	t708-1/2 V4b	t709-1/2 V4b	t710-1/2 V4b	t711-1/2 V4b	t712-1/2 V4b	t713-1/2 V4b	t714-1/2 V4b	t715-1/2 V4b	t716-1/2 V4b	t717-1/2 V4b	t718-1/2 V4b	t719-1/2 V4b	t720-1/2 V4b	t721-1/2 V4b	t722-1/2 V4b	t723-1/2 V4b	t724-1/2 V4b	t725-1/2 V4b	t726-1/2 V4b	t727-1/2 V4b	t728-1/2 V4b	t729-1/2 V4b	t730-1/2 V4b	t731-1/2 V4b	t732-1/2 V4b	t733-1/2 V4b	t734-1/2 V4b	t735-1/2 V4b	t736-1/2 V4b	t737-1/2 V4b	t738-1/2 V4b	t739-1/2 V4b	t740-1/2 V4b	t741-1/2 V4b	t742-1/2 V4b	t743-1/2 V4b	t744-1/2 V4b	t745-1/2 V4b	t746-1/2 V4b	t747-1/2 V4b	t748-1/2 V4b	t749-1/2 V4b	t750-1/2 V4b	t751-1/2 V4b	t752-1/2 V4b	t753-1/2 V4b	t754-1/2 V4b	t755-1/2 V4b	t756-1/2 V4b	t757-1/2 V4b	t758-1/2 V4b	t759-1/2 V4b	t760-1/2 V4b	t761-1/2 V4b	t762-1/2 V4b	t763-1/2 V4b	t764-1/2 V4b	t765-1/2 V4b	t766-1/2 V4b	t767-1/2 V4b	t768-1/2 V4b	t769-1/2 V4b	t770-1/2 V4b	t771-1/2 V4b	t772-1/2 V4b	t773-1/2 V4b	t774-1/2 V4b	t775-1/2 V4b	t776-1/2 V4b	t777-1/2 V4b	t778-1/2 V4b	t779-1/2 V4b	t780-1/2 V4b	t781-1/2 V4b	t782-1/2 V4b	t783-1/2 V4b	t784-1/2 V4b	t785-1/2 V4b	t786-1/2 V4b	t787-1/2 V4b	t788-1/2 V4b	t789-1/2 V4b	t790-1/2 V4b	t791-1/2 V4b	t792-1/2 V4b	t793-1/2 V4b	t794-1/2 V4b	t795-1/2 V4b	t796-1/2 V4b	t797-1/2 V4b	t798-1/2 V4b	t799-1/2 V4b	t800-1/2 V4b	t801-1/2 V4b	t802-1/2 V4b	t803-1/2 V4b	t804-1/2 V4b	t805-1/2 V4b	t806-1/2 V4b	t807-1/2 V4b	t808-1/2 V4b	t809-1/2 V4b	t810-1/2 V4b	t811-1/2 V4b	t812-1/2 V4b	t813-1/2 V4b	t814-1/2 V4b	t815-1/2 V4b	t816-1/2 V4b	t817-1/2 V4b	t818-1/2 V4b	t819-1/2 V4b	t820-1/2 V4b	t821-1/2 V4b	t822-1/2 V4b	t823-1/2 V4b	t824-1/2 V4b	t825-1/2 V4b	t826-1/2 V4b	t827-1/
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