	<div>PRODUCT STANDARD</div> <div><u>HYDRO TURBINE ENGINEERING</u></div>	HT 00225
		Rev. 00
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<div><u>PURCHASE SPECIFICATION FOR STEEL WIRE ROPE SLINGS</u></div>		

## 1.0 SCOPE:




The scope of this specification covers steel wire ropes conforming to the various Indian standards including their material, workmanship, quality, inspection and testing and other general requirements for use in hydro turbine power plant.


## 2.0 DETAILS OF MATERIAL / WORKMANSHIP:

1. The steel wire ropes shall have a construction of **R.H. Lay 6 x 36 (14/7+7/7/1)** with **FIBRE CORE** and shall conform to **IS: 2266:2002** and **IS: 6594:2001**.
2. The steel wire ropes shall be manufactured from ungalvanised steel wire having **Tensile Strength Designation 1770 N/mm<sup>2</sup> (180 kgf/mm<sup>2</sup>)**, conforming to **IS: 1835:1976**. The fiber core of the wire shall comply with the requirement of **IS: 1804:2004**.
3. The rope for sling should meet the safe working load specified in the drawing.
4. Splicing shall be as per **IS 5245:1969** - mechanically spliced / hand spliced.

5. **FACTOR OF SAFETY :**  $\frac{\text{BREAKING STRENGTH}}{\text{SAFE WORKING LOAD}} \geq 6$

6. **Marking** - A metal label ring indicating drawing no. and safe working load, diameter, length & date of manufacturing shall be securely attached with the steel wire rope sling.
7. **Freedom from defects** - The completed rope shall be free from loose wires and strands or other irregularities. It shall be evenly laid and shall remain in condition when properly unwound from a reel or coil.
8. The eye ends of the slings shall suit the Ramshorn hooks capacity of which are mentioned in drawing.
9. For endless slings minimum 2 ferrules to be provided.

Rev. No.	Date of Rev.	Remarks	Approved		
			 J.S.Hanspal, AGM (HOD)-HTE		
			<b>Prepared</b>  S. K. Prajapati Sr. Engr. -HTE	<b>Checked</b>  A. Mandal AGM-HTE	<b>Date of issue (Rev 00)</b> 16.03.2016
			Saved in server as no. 420099002--		

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<b><u>PURCHASE SPECIFICATION FOR STEEL WIRE ROPE SLINGS</u></b>		

### 3.0 **INSPECTION AND TESTING:**

1. Inspection shall be carried by BHEL Health & Safety Department (HSE) /Third Party / BHEL's Customer, as specified in purchase order. Minimum 2 week advance notice is to be given by the vendor.
2. Rope size and length shall be verified at vendor's works.
3. The vendor shall test 100% wire rope slings for **2 x safe working load** as specified in drawing.
4. Breaking load test shall be carried out by any of the methods specified in **IS: 2266:2002 & IS: 5245:1969 (PART II) or IS: 6594:2001.**

Note - The breaking strength of the wire rope shall not be less than the minimum breaking load specified in the drawing.

### 4.0 **PACKING & PROTECTION:**

The rope shall be protected suitably to avoid corrosion & damage in transit.

### 5.0 **DEVIATION:**


For any deviation with respect to specified requirements prior approval must be obtained from BHEL.

### 6.0 **REJECTION AND REPLACEMENT:**

In the event of slings proving defective, such slings shall be rejected, notwithstanding any previous certification of satisfactory testing and/or inspection.

The vendor shall undertake to replace the rejected slings at his own cost and the rejected sling will be sent back to the manufacturer/supplier after fulfilling the commercial terms and conditions.

Rev. No.	Date of Rev.	Remarks	<b>Approved</b>		
			J.S.Hanspal, AGM (HOD)-HTE		
			<b>Prepared</b>	<b>Checked</b>	<b>Date of issue</b>
			S. K. Prajapati Sr. Engr. -HTE	A. Mandal AGM-HTE	(Rev 00) 16.03.2016
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<b><u>PURCHASE SPECIFICATION FOR STEEL WIRE ROPE SLINGS</u></b>		

**CHECK LIST**

- |   |          |
|---|----------|
| 1. The steel wire rope slings shall be as per clause no. 2        | YES / NO |
| 2. 100% steel wire rope slings shall be tested as per clause no.3 | YES / NO |
| 3. There shall be no deviation form HT 00225                      | YES / NO |
| 4. For endless slings minimum 2 ferrules shall be provided        | YES / NO |
| 5. Deviations, if any   |          |

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Name/stamp of vendor

Name and authorized signature

Name of project\_\_\_\_\_

BHEL's enquiry no/date\_\_\_\_\_

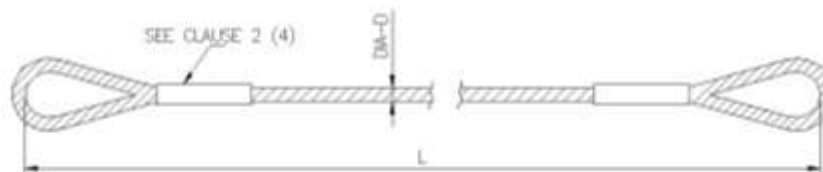
Date: \_\_\_\_\_

Rev. No.	Date of Rev.	Remarks	Approved		
			<div>J.S.Hanspal, AGM (HOD)-HTE</div>		
			Prepared	Checked	Date of issue
			<div>S.K. Prajapati</div>	<div>A. Mandal</div>	(Rev 00)
			Sr. Engr. -HTE	AGM-HTE	16.03.2016
			Saved in server as no. 420099002--		

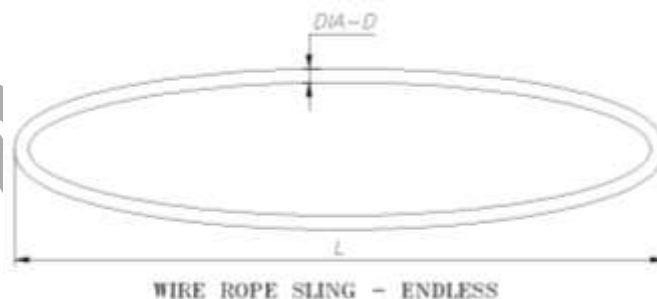
680780/2022/HEB-HTE40204



DESIGNER TO PREPARE SEPARATE DRAWING GIVING DETAILS AS GIVEN BELOW  
(THIS DOCUMENT NOT TO BE SENT TO VENDOR)

**DIMENSIONAL DETAILS:****A. For Eye & Eye sling**

Item no.	Diameter 'D' (mm)	Length 'L' (mm)	Breaking Strength (tonne)	SWL (tonne)	Approx. Weight (KG)	Eye end to suit Ramshorn hook of capacity (tonne)	Remarks

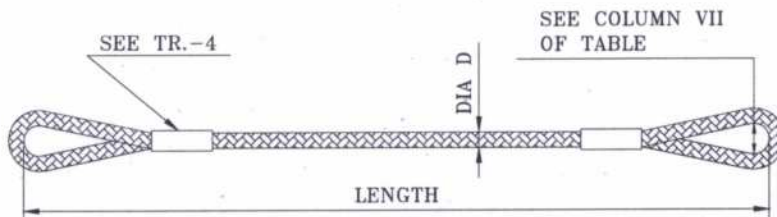
**B. For Endless sling**

Item no.	Diameter 'D' (mm)	Length 'L' (mm)	Breaking Strength (tonne)	SWL (tonne)	Approx. Weight (KG)	Eye end to suit Ramshorn hook of capacity (tonne)	Remarks

FIRST ANGLE PROJECTION

DRG. NO. 3-202-51-19301

## TECHNICAL REQUIREMENTS:-



TABLE

I	II	III	IV	V	VI	VII	VIII
ITEM NO.	DIA-D (mm)	LENGTH (mm)	BREAKING STRENGTH (Kgf)	SAFE WORKING LOAD (Kgf)	APPORX. WEIGHT (Kg)	EYE END TO SUIT RAMSHORN HOOK OF CAPACITY (IN TONNES)	USED IN ASSEMBLY DRG. NO.
001	ø36	13000	77192	12865	70	140	02025119301/01 02025119401/01
002	ø24	13000	34262	5710	30	140	02025119301/02 02025119401/02
003	ø22	9000	28858	4809	20	140	02025119501/01

1. THE STEEL WIRE ROPES SHALL HAVE A CONSTRUCTION OF 6X36 R.H. LAY (14-7+7-7-1) WITH FIBRE CORE AND SHALL CONFORM TO IS:2266 AND IS:6594.
2. THE STEEL WIRE ROPE SHALL BE MANUFACTURED FROM UNGALVANISED STEEL WIRE HAVING TENSILE STRENGTH OF 180 kg/mm<sup>2</sup> CONFORMING TO IS:1835. THE FIBRE CORE OF THE WIRE SHALL COMPLY WITH THE REQUIREMENTS OF IS:1804.
3. THE ROPE FOR SLING SHOULD MEET THE SAFE WORKING LOAD (SWL) SPECIFIED IN THE TABLE.
4. SPLICING SHALL BE AS PER IS:5245 - MECHANICALLY SPLICED/HAND SPLICED.
5. FACTOR OF SAFETY :  $\frac{\text{BREAKING STRENGTH}}{\text{SAFE WORKING LOAD}} \geq 6$
6. A METAL LABEL RING INDICATING DRAWING NO., ITEM NO. AND SAFE WORKING LOAD SHALL BE SECURELY ATTACHED WITH THE STEEL WIRE ROPE SLING.
7. FREEDOM FROM DEFECT  
THE COMPLETED ROPES SHALL BE FREE FROM LOOSE WIRES AND STRANDS OR OTHER IRREGULARITIES. IT SHALL BE EVENLY LAID AND SHALL REMAIN IN CONDITION WHEN PROPERLY UNWOUND FROM A REEL OR COIL.
8. TESTING
  - a. THE SUPPLIER SHALL TEST THE WIRE ROPE SLING FOR 2 X SAFE WORKING LOAD.
  - b. BREAKING LOAD TEST SHALL BE CARRIED OUT BY ANY OF THE METHODS SPECIFIED IN IS:2266 & IS:5245 (PART II) OR IS:6594.  
THE BREAKING STRENGTH OF THE WIRE ROPE SHALL NOT BE LESS THAN THE MINIMUM BREAKING LOAD SPECIFIED IN THIS DRAWING.  
THE TEST IN a. AND b. ABOVE SHALL BE WITNESSED BY BHEL OR ITS REPRESENTATIVE.

## ADDITIONAL INFORMATION

## STATUS OF DRAWING

## DISTRIBUTION OF PRINTS

HTE-2, THX-1,  
WTM (P)-1, WTM(S)-4.

TYPE OF PRODUCT OR  
NAME OF CUSTOMER/PROJECT 3x33MW SHAHPURKANDI HEP-I



BHARAT HEAVY ELECTRICALS LTD.  
BHOPAL

NAME	SIGN	DATE	NO. OF VAR.
POONAM	<i>[Signature]</i>	31.01.15	—
MRIDUL GARG	<i>[Signature]</i>	31.01.15	—
J.S. HANSAL	<i>[Signature]</i>	31.01.15	—

DEPT. H.T.E.	UNTOL. DIMS. GR.	SCALE	WEIGHT(K.G.)	REF. TO ASSY. DRG.	ITEM NO.	NO. OF ITEM
CODE 402	32000049014	NTS	SEE TABLE	0-202-51-19301 0-202-51-19401 0-202-51-19501	SEE TABLE	03
TITLE SLING				DRAWING NO. 3-202-51-19301		REV. 00
				SHT. NO. 01		NO. OF SHT. 01

A3 SIZE

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SIGN. &amp; DATE REF. DRG. NO.

INVENTORY NO.

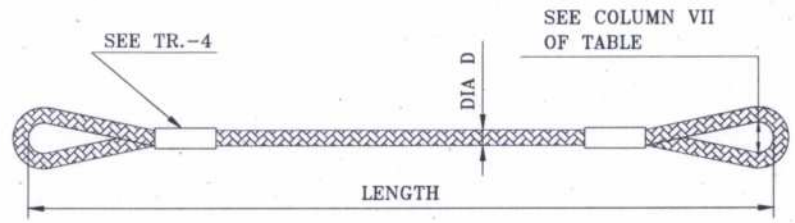
REV.	DATE	ALTERED	REV.	DATE	ALTERED
		CHECKED			CHECKED
		APPD.			APPD.



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INVENTORY NO. 32045118607  
SIGN. & DATE REF. DRG. NO.

DRG. NO. 3-201-51-19301



TABLE

I	II	III	IV	V	VI	VII	VIII
ITEM NO.	DIA-D (mm)	LENGTH (mm)	MINIMUM BREAKING STRENGTH (kn)	SAFE WORKING LOAD (kgf)	APPROX. WEIGHT (kg)	EYE END TO SUIT RAMSHORN HOOK OF CAPACITY (tonnes)	USED IN ASSEMBLY DRG. NO.
001	ø22	12000	283	4300	22.0	140	02015119301/01 02015119401/01
002	ø16	10000	149	2300	10.0	140	02015119301/02 02015119401/02
003	ø16	7000	149	2300	7.0	140	02015119501/01

TECHNICAL REQUIREMENTS:

1. THE STEEL WIRE ROPES SHALL HAVE A CONSTRUCTION OF 6X36 S.W. LAY (14-7+7-7-1) WITH FIBRE CORE AND SHALL CONFORM TO IS:2266 AND IS:6594.
  2. THE STEEL WIRE ROPE SHALL BE MANUFACTURED FROM UNGALVANISED STEEL WIRE HAVING TENSILE STRENGTH OF 180 kg/mm<sup>2</sup> CONFORMING TO IS:1835. THE FIBRE CORE OF THE WIRE SHALL COMPLY WITH THE REQUIREMENTS OF IS:1804.
  3. THE ROPE FOR SLING SHOULD MEET THE SAFE WORKING LOAD (SWL) SPECIFIED IN THE TABLE.
  4. SPLICING SHALL BE AS PER IS:5245 – MECHANICALLY/HAND SPLICED.
  5. FACTOR OF SAFETY :  $\frac{\text{BREAKING STRENGTH}}{\text{SAFE WORKING LOAD}} \geq 6$
  6. A METAL LABEL RING INDICATING DRAWING NO., ITEM NO. AND SAFE WORKING LOAD SHALL BE SECURELY ATTACHED WITH THE STEEL WIRE ROPE SLING.
  7. FREE FROM DEFECT  
THE COMPLETED ROPE SHALL BE FREE FROM LOOSE WIRES AND STRANDS OR OTHER IRREGULARITIES. IT SHALL BE EVENLY LAID AND SHALL REMAIN IN CONDITION WHEN PROPERLY UNWOUND FROM A REEL OR COIL.
  8. TESTING
    - a. THE SUPPLIER SHALL TEST THE WIRE ROPE SLING FOR 2 X SAFE WORKING LOAD.
    - b. BREAKING LOAD TEST SHALL BE CARRIED OUT BY ANY OF THE METHODS SPECIFIED IN IS:2266 & IS:5245 (PART II) OR IS:6594.  
THE BREAKING STRENGTH OF THE WIRE ROPE SHALL NOT BE LESS THAN THE MINIMUM BREAKING LOAD SPECIFIED IN THIS DRAWING.  
THE TEST AT a. AND b. ABOVE SHALL BE WITNESSED BY BHEL OR ITS REPRESENTATIVE.
- NOTE: IS NOS. REFERRED MUST BE OF LATEST ISSUE.

ADDITIONAL INFORMATION  
STATUS OF DRAWING  
DISTRIBUTION OF PRINTS  
HTE-2, THX-1,  
WTM-5

TYPE OF PRODUCT OR  
NAME OF CUSTOMER/PROJECT SHAHPURKANDI HEP-I

	BHARAT HEAVY ELECTRICALS LTD BHOPAL		DRN	NAME	SIGN	DATE	NO. OF VAR.
	CKD	VS				26.03.15	
	APPD	JSH				26.03.15	
DEPT. H.T.E.	UNTOL. DIMS. GR.	SCALE	WEIGHT(K.G.)	REF. TO ASSY.DRG.		ITEM NO.	NO. OF ITEM
CODE 402	32000049014	NTS	SEE TABLE	SEE TABLE		SEE TABLE	03
TITLE WIRE ROPE SLING				DRAWING NO. 3-201-51-19301		REV. 00	
				SHT. NO. 01		NO. OF SHT. 01	