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**SCHEDULE OF TECHNICAL REQUIREMENTS FOR MANUFACTURING AND
SUPPLY OF "SMALL STEEL CASTING" ITEMS FOR 3-PHASE ELECTRIC
LOCOMOTIVES"**

**जारी कर्ता
ISSUED BY
विद्युत इंजन अभिकल्प कार्यालय
चिरेका/चित्तरंजन
ELECTRIC LOCO DESIGN OFFICE
CHITTARANJAN LOCOMOTIVE WORKS
CHITTARANJAN-713331
WEST BENGAL**

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SMALL STEEL CASTING ITEMS REQUIRED FOR 3-PHASE ELECTRIC LOCOMOTIVES: -

(This STR supersedes STR NO. CLW/2015/ELDO/M/STR/0020 Rev. '0' issued in Oct. 2015)

1.0 NAME OF THE ITEM:

(a) Axle Box Complete (WAG-9/9H/9HC/WAP-7), (b) Axle Guide Bearing (WAP-5),
(c) Holder for TM Suspension (WAG-9/9H/9HC/WAP-7), (d) Housing, (e) Pivot
(f) Spring Guide, (g) Torque Arm, (h) Wheel Set Guide.

2.0 APPLICATION:

Used in 3-Phase Electric Locomotives type WAG-9/9H/9HC/WAP-7 in Indian Railways. The items are to be manufactured as per relevant drawings and specifications.

3.0 SCOPE:

The Schedule of Technical Requirements (STR) is issued to serve as a guide to manufactures (called the “firm” hereafter) and should be read in conjunction with the relevant drawings and specifications with latest Revisions / Alterations. The technical requirements are meant to serve as guidelines only and are not exhaustive. The firm should satisfy themselves having complied with the requirements of drawings and STR. List of relevant Drawings/Specifications is listed as per Annexure –I.

Wherever lacking, existing CLW approved sources must also upgrade their facilities to fulfill the requirements of this STR within a period of one year from date of issue of this STR.

4.0 GENERAL REQUIREMENTS:

The firm should have currently valid ISO-9000 certification issued by an approved agency of the International Accreditation Forum (IAF) with the activity desired clearly mentioned in the scope of certification

4.1 The firm should have currently valid ISO-9000 certification issued by an approved agency of the International Accreditation Forum (IAF) with the activity

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desired clearly mentioned in the scope of certification.

- 4.2 A system of regular submission of rejection details of material giving rejection rate, cause of rejection, corrective action taken etc. on quarterly basis should be followed by firm.
- 4.3 The firm must have system of documentation in respect of rejection at customer end, warranty replacement and failure of item supplied by them during service.
- 4.4 The firm shall have all latest relevant Standards like IS, DIN, BS etc. pertaining to product specification.
- 4.5 The firm shall have system of recording the plant, machinery and control equipments remaining out of service, nature of repairs done etc.
- 4.6 The testing & measuring equipments shall be duly calibrated and the validity of calibration should be current and verified by physically checking the calibration certificate issued by Calibration Agency from whom it was calibrated. Calibration shall be done by NABL accredited labs whose accreditation is valid on the date of calibration.
- 4.7 Firm should have adequately trained personnel and service after sales network.
- 4.8 Whenever there is any change with respect to approved QAP, the same shall be promptly submitted to CLW for approval.

5.0 QUALITY ASSURANCE PLAN (QAP):

The firm shall prepare a quality assurance plan (QAP) before approval is sought and submit the same as part of compliance of this STR. The QAP shall be a comprehensive document covering the following aspects.

- i) Details of quality control organization of the firm along with key personnel engaged in the QC function.
- ii) Qualification log sheet of the personnel manning the quality control set up.

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official along with their qualification and experience should be furnished.

- 5.1.2 The quality control organization should be headed by a senior level official having degree in engineering who shall directly report to plant in-charge.

5.2 INCOMING MATERIAL

- 5.2.1 A complete bill of material indicating all input material items required for manufacturing of the products, governing specification and their sources of supplies as approved by the firm should be furnished.

- 5.2.2 Raw material shall be procured from CLW/RDSO approved sources wherever applicable or from reputed suppliers is no CLW/RDSO source is specified. Documentary proof of purchase and test certificate of each component shall be maintained and produced.

- 5.2.3 Record of each sub-supplier clearly showing the quantity purchased and rejected as well as cases of late delivery, if any shall be kept.

- 5.2.4 Incoming raw material shall be 100% inspected by Quality Control Department of the firm for any defect and deviation. The test results of incoming raw material with references to test certificate issued by the supplier and the results of internal tests carried out by the firm for verification may be submitted as part of QAP.

5.3 PROCESS OF MANUFACTURING:

- 5.3.1 Complete process flow chart covering all steps of process of manufacture for an individual product (or for a family of product if the process is same), including the process flow of outsourced activities along with its integration with main process, shall be clearly enlisted as part of QAP.

- 5.3.2 The following details of machine used for all the steps of machining operations should be included.

- Make, model and commissioning date of the machine.
- Accuracy.

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Vague language like available or will install is not acceptable.

- 5.4.4 The accuracy and capacity of the testing and measuring equipments shall be adequate to meet the requirements of the specification and drawing.
- 5.4.5 Stage inspection detailing inspection procedure, inspection parameters and method of testing / test procedure including sample sizes for destructive and non- destructive testing. Record of test results of stage inspection should be available and furnished.
- 5.4.6 List of typical Testing and measuring instruments required for manufacture is mentioned in Annexure – III. The list is for general guidance only. However, the specific Testing & measuring instruments, gauges used by the firm will also form part of QAP and shall be submitted.

5.5 **FORMAT TO BE SUBMITTED WITH QAP**

Format to be submitted with QAP is enclosed as Annexure-IV. Firms shall fill these formats keeping in view para 5.0.

5.6 **STORAGE FACILITY**

- Adequate dust free, clean and non-humid environment for storage of raw material and finished product separately.
- Adequate dust free, clean and non-humid environment for product assembly area.
- Adequate stacking / handling tables and racks in above storage area.

ANNEXURE – I

LIST OF DRAWINGS, SPECIFICATIONS AND STANDARDS

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Sl. No.	Name of Machinery & Plant	Capacity/ Rating	Purpose	Essential/ Optional**
1.	Casting Facility (Steel Casting)	Standard	Casting should be from Class 'A' Foundry as per IS: 12117:1996 or latest.	Optional**
2.	CNC Milling Machine	700 mm x 500	For machining as per drawing	Essential
3.	CNC Drilling Machine	Standard	For making hole at different location as per drg.	Essential
4.	CNC Boring Machine	Standard	For Axle Box boring	Essential
5.	Grinding Machine	Standard	For surface finishing	Essential
6.	Heat treatment Furnace/Chamber	Standard	For surface or sub-surface treatment	Optional**
7.	Painting	Suitable size	For primary painting as per drg.	Essential

** Optional activity or machinery and plant facility may be outsourced. However, the sub-vendor is also to be assessed.

Annexure-III

List of Measuring & Testing Equipments

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Sl. No.	Name of Measuring & Testing Equipments	Capacity / Rating	Essential/ Optional **
1.	Inside Micrometer	Measuring up to 600mm	Essential
2.	Vernier Caliper	Different sizes	Essential
3.	Depth Gauge	Standard	Essential
4.	Surface Table	For Leveling	Essential
5.	Steel tape	3m	Essential
6.	Dial Gauge	To check Parallelism	Essential
7.	Surface Roughness testing M/c	Standard	Essential
8.	Physical & Chemical Testing Lab	Standard	Optional **
9.	MPT Machine	Standard	Essential
10.	Ultrasonic Testing	Standard	Optional **
11.	Radiography Test	Standard	Optional **

** Testing Laboratory (Whether outsourced or in-house) should be NABL approved laboratory.

ANNEXURE - IV

FORMATS TO BE SUBMITTED WITH QAP:

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1. Organization specific to the product:

Description	Name of person with contact no.	Qualification	Experience	
			Field	Year
(a)	(b)	(c)	(d)	(e)
Design in – charge				
Production in – charge				
Quality Inspection in–charge				

2. Incoming Material Control:

Subject / Product / Process	Sample size & its frequency of Inspection	Parameter for inspection	Mode of Inspection / Equipments used	Acceptance Limit/criteria/specified value as per Drg/Spec.
(a)	(b)	(c)	(d)	(e)

Document Reference	Record No.	Format	Action in case of rejection
(f)	(g)		(h)

3. Process Control:

(i) Proposed M&P

Sl. No.	Process/ Activity	Work Instruction Ref.	Machine Details					In– house / Out source
			Lead parameter	Make	Model	Comm. Dt.	Accuracy	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)

4. Stage Inspection /Test Plan:

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Subject / Product / Process	Instrument / Jig & Fixture test bench used	Inspection stage	Parameter for inspection	Sample size & its frequency of Inspection	Document Reference
(a)	(b)	(c)	(d)	(e)	(f)

Acceptance Limit/criteria/specified value as per Drg./Spec	Inspection Agency	Record Format No	Action in case of rejection
(g)	(h)	(i)	(j)

5. Product Control:

Subject Product / Process	Instrument / Jig & Fixture test bench used	Parameter for inspection	Sample size & its frequency of Inspection	Document Reference	Acceptance Limit/criteria/speci fied value as per Drg./Spec.
(a)	(b)	(c)	(d)	(e)	(f)

Inspection Agency	Record Format No.	Action in case of rejection
(g)	(h)	(i)

6. Calibration Plan:

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Instrument Description	Serial No.	Make	Model	Year of procurement	Capacity / Range	Accuracy	Periodicity of Calibration
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)

Calibration Agency	Record Format No.
(i)	(j)

7. Approved Sources for Raw Materials / Consumables

Raw Material / Consumable	Specification / Standard	Source Address	Whether Source controlled by CLW / RDSO / Others
(a)	(b)	(c)	(d)

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