



GOVERNMENT OF
INDIA MINISTRY OF
RAILWAYS

TI/STR/035 Revision 1

Schedule of infrastructure Requirements for Manufacturing
& testing facilities and Quality Control Requirements

FOR

MODULAR CANTILEVER SYSTEM

(2017)

ISSUED BY

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1.0 **SCOPE:** This schedule covers the technical requirement for manufacturing of Modular Cantilever System (MCS) as per RDSO Specification No.TI/SPC/OHE/MCS/0150 (latest).

2.1 Manufacturer should full fill following requirements:

- (i) **Adequate Covered Accommodation:** Manufacturer should have adequate covered accommodation for storing raw material, finished items awaiting dispatch and arranging Inspection.
- (ii) **MACHINERY & PLANT:** Following machinery and plant of suitable capacity should be available for applicable processes for manufacturing MCS fittings

(iii)

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	MACHINERY & PLANT FOR FORGED ALUMINIUM FITTING		MCHINERY & PLANT FOR ALLUMINIUM ALLOY DIE CASTING FITTINGS		MCHINERY & PLANT FOR ALLUMINIUM ALLOY EXTRUSION FITTINGS
i	Bench grinder of various capacities	i	Bench grinder of various capacities	i	Billet furnace
ii	Shaping machine / molding machine	ii	Shaping machine/molding machine	ii	Hot top casting
iii	Drilling machine	iii	Drilling machine	iii	Die preheating Oven
iv	Lathe machine	iv	Lathe machine	iv	Extrusion puller
v	Induction Furnace or oil fired furnace or gas fired furnace (With Suitable Temperature Control Device)	v	Induction Furnace or oil fired furnace or gas fired furnace (With Suitable Temperature Control Device)	v	Stretching machine
vi	Threading machine	vi	Threading machine	vi	Finish cutting machine
vii	Sand blasting machine or Shot blasting Machine	vii	Sand blasting machine/shot blasting machine	vii	Ageing furnace
viii	Metallic Die/ permanent Mould (Gravity die casting)	viii	Metallic die/ permanent mould (gravity die)	viii	Tooling
ix	Power press	ix	Hand shank (small ladles)	ix	Dies metallic
x	Drop hammer or Forging screw press	x	Pattern for sand casting		
xi	Spark Erosion machine or Vertical machining Centre or CNC	xi	Hacksaw machine/ Degating machine		
xii	Hacksaw machine/ Degating machine	xii	Magnesium treatment ladle		
xiii	Milling machine				

Note a) Aluminum tubes made through a process (extrusion etc) as per design requirement can be procured through outsourcing. If aluminum tubes are manufactured in house then firm will submit the list of required machineries and plants other than mentioned above.

- b) All the sources of outsourcing shall have ISO 9001:2008 certificate for the product/ material being outsourced.
- c) Insulators are to be procured from RDSO approved source. If insulators procurement is to be done from new source, then it has to be processed for approval from RDSO separately. After RDSO approval and inclusion in RDSO approved vendor directory only, insulators of new sources can be supplied as part of the MCS.
- d) Manufacturer shall mention the name of outsourced agencies in the Quality Assurance Plan.
- e) Fasteners shall be outsourced from RDSO/CORE approved vendors as per the specification TI/SPC/OHE/fasteners/0120.
- f) Manufacturer should have the facility for repair of the dies/patterns in use to get precise dimension.

3.0 TESTING FACILITIES: Manufacturer should have adequate facility to test the raw materials as well as the finished product as follows:

SN.	Testing facilities	SN.	Testing facilities
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i	Electromagnetic crack detecting machine (if fittings are made from ferrous material)/ Dye Penetration Testing Facility	vi	Measuring instrument like Vernier caliper, Screw gauge. thread gauge etc
ii	Metallurgical microscope	vii	Meter to measure the thickness of Galvanizing product.
iii	Micro polishing machine .	viii	Hardness Testing Machine
iv	Spectrometer or Chemical laboratory for Chemical composition.		
v	UTM machine		

Note: If the testing facilities as mentioned at SN (i), (ii), (iii) & (iv) for modular cantilever system are not available in the house then the testing can be out sourced to a NABL/NABCB accredited laboratory and manufacturer has to submit the references of laboratories.

4.0 QUALITY CONTROL REQUIREMENTS:

- a) The firm should ensure compliance of RDSO ISO procedure 'QM-RF-8.1 -3 (latest)' & it covers Quality Assurance Plan (QAP). This document may be referred from RDSO website. The QAP shall be submitted to RDSO and got approved. As per RDSO ISO procedures, following should be complied:
 - i) The firm should have acquired ISO: 9000 rectification for the product for which an approval is sought and the product should be broadly covered in the scope of the certification for manufacture.
 - ii) Quality manual of the firm for ISO: 9000 should clearly indicate at any stage the control over manufacturing, quality control and testing of the said product.
- b) Each section shall be headed by a qualified staff with experience in the relevant field.
- c) System and documentation should exist for documentation of the following:
 - i) Incoming raw material with TC reference of supplier as well as internal test/
 - ii) Stage inspection and test result.
 - iii) System for calibration of testing & measuring equipment and record.
 - iv) Easy traceability of the product from raw material stage to finished product stage
 - y) Rejection at Customer end and remedial action taken.
 - vi) To ensure that the product conform to the requirements of above referred RDSO's specifications.
- d) Drawing office facilities should be equipped preferably with AUTO CAD/3D Software.