



भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन

Government of India - Ministry of Railways
RESEARCH DESIGNS & STANDARDS ORGANISATION

DOCUMENT NO. TDG 0018, 0019 & 0020 Rev. '0'

**ITEM SPECIFIC GUIDELINES FOR MANUFACTURE OF
FABRICATED CURVED SWITCHES
AND FABRICATED CROSSINGS**

Price: Rs. 600/-

गुणवत्ता आश्वासन सिविल निदेशालय
अनुसंधान अभिकल्प और मानक संगठन
मानक नगर, लखनऊ -226011

QUALITY ASSURANCE CIVIL DIRECTORATE
RESEARCH DESIGNS & STANDARDS ORGANISATION
MANAK NAGAR, LUCKNOW – 226011

**ITEM SPECIFIC GUIDELINES FOR ASSESSMENT / REASSESSMENT
OF FIRMS MANUFACTURING 1:12, 1:8.5 FABRICATED CURVED
SWITCHES & FABRICATED CROSSING**

In addition to the "General Guidelines for Vendor Approval", the following shall also be applicable for assessment / re-assessment of firms for manufacturing 1:12, 1:8½ Fabricated curved switches and Fabricated crossings:

- i) Separate lists shall be maintained for 1:12 Fabricated curved switches, 1:8½ Fabricated curved switches and fabricated crossings.
- ii) For the purpose of assessment of switches, the firm shall be required to manufacture proto-type of the design for which the firm has to be approved comprising of two sets - one set of left hand and one set of right hand switch complete. One set of switch shall consist of two tongue rails, two stock rails and all components as per Part List of the respective drawing.
- iii) For the purpose of assessment of fabricated crossings, one set of proto-type of any design shall be required to be manufactured.
- iv) For the purpose of assessment of the firm for switches, one sample set of switch (either left hand or right hand switch) of the design for which the firm is approved shall be required to be offered for inspection. In case, the firm is approved in both the lists i.e. for 1:12 curved switches and 1:8½ curved switches, the sample set of one design can be offered for inspection.
- v) For the purpose of re-assessment of fabricated crossings, one sample set of any design will be required to be offered for inspection.
- vi) The gauges shall be approved / revalidated at the time of inspection of infrastructural facilities during assessment reassessment of the firm.
- vii) The inspection gauges and proto-type shall be required to be approved by RDSO for each design of Switches / Crossings on order before regular production.

**Minimum Facilities & Machineries required for manufacture of
Fabricated Curved Switches and Fabricated Crossings**

S. No.	Description	Minimum Capacity	Minimum Quantity
1	Covered Area	-	1500 M ²
2	Gantry Crane facilities	4 t	1 No.
3	Circular saw / Circular band saw	900 mm dia.	1 No.
4	Hydraulic horizontal bending / straightening machines	350-500 t	1 No.
5	Radial drill	32 mm dia.	1 No.
6	Shapers	600 mm stroke	3 No.
7	Planing machines	i) 13 m stroke	1 No.
		ii) 8.5 m stroke	1 No.
		iii) 5 m stroke	1 No.
8	i) Universal Testing Machine	40 t (minimum)	1 No.
	ii) Charpy impact testing machine	-	1 No.
9	Compressor with riveting arrangement		One complete set including furnace & riveting gun etc.
10	CO ₂ / Mig welding equipment		One complete set with approved brand of welding wires.
11	Hardness tester Poldi / Rockwell		1 No.
12	Jigs & fixtures for drilling stock & tongue rails for switches & fabricated crossings.		At least one set for each item separately.
13	Assembly & Inspection bay		A separate area to be dedicated with proper levelled flooring.
14	Chemical lab	For Chemical Analysis of MS, Medium & Low ally steel.	1 Unit installed in house
15	Non-destructive testing facilities	i) USFD	1 No.
		ii) D.P. test	1 No.
		iii) Magnaflux	1 No.
		iv) Metallurgical Microscope	1 No.
		v) Polishing Machine.	1 No.
16	Dedicated area with all above machines installed in proper flow line.		1500 M ²

**ASSESSMENT PERFORMA FOR APPROVAL OF MANUFACTURE
(FRESH / RENEWAL) OF FABRICATED CURVED SWITCHES AND
FABRICATED CROSSINGS**

(To be prepared in duplicate)

Section-I : GENERAL INFORMATION

1. Name of the firm :

2. Postal address of
 - 2.1 Head office :

 - 2.2 Works :

3. Telephone No. (with STD Code)
 - 3.1 Head office :

 - 3.2 Works :

4. E-mail address :
 - 4.1 Head office :

 - 4.2 Works:

5. Description of works-
 - 5.1 Total land area (in Sq. meters) :

 - 5.2 Total covered area (in Sq. meters) :

 - 5.3 Different sub-units:

 - 5.4 A fully dimensioned plan of the works showing covered area and different shops shall be enclosed :

 - 5.5 Special features, if any:

6. Number of personnel employed (category-wise)
 - 6.1 Managerial :

- 6.2 Supervisory :
(Enclose list of Mangers / Technical Supervisors)
- 6.3 Skilled / Artisans :
- 6.4 Unskilled :
7. Hours of working :
8. Weekly off day :
9. State whether the firm is already in approved
List with RDSO for supply of switches / crossings.
If so, please give details of last approval.
- 9.1 Letter dated and issued by
- 9.2 Date of expiry of validity of approval.
10. Details of important orders executed in past
for switches and crossings separately. :
- 10.1 To other important firms / companies / undertakings.
- 10.2 Directly to Railways.

SECTION II: TECHNICAL INFORMATION

1. Production capacity-
- i) Per month
- ii) Per year
2. Type of Stores / Items which the firm is capable of manufacturing:
3. Crane facilities No. of cranes Make of crane capacity
- 3.1 EOT Crane-
- 3.2 Mobile Crane-
- 3.3 Jib Crane-
4. Total Power Availability (in kVA / kW)
- a) From the State Electricity Board or other regular
source (Enclose a copy of current electricity bill).
- b) From own stand by generating sets (Also give make,
capacity and other details of each generating set).

5. Machines (For manufacturing of Points and Crossings and related components).

S. No.	Name of Machine	No. of Machine	Make of the Machine	Size & capacity of Machine
5.1	Circular band / Circular Saw			
5.2	Radial Drill			
5.3	Hydraulic Bending Machine(Horizontal 350 T & 500T)			
5.4	Milling Machine			
5.5	Shapers			
5.6	Pillar Drills			
5.7	Grinding Machine			
5.8	Portable Grinders			
5.9	Power Hammer			
5.10	Forging Press			
5.11	Forming Press			
5.12	Slide chair straightening machine			
5.13	Oil Fired Furnaces for rivets			
5.14	Electric welding sets (CO ₂ / Mig welding set) with RDSO approved brand of welding wires			
5.15	Gas-welding / Gas cutting Facilities (Including preheating arrangements)			
5.16	Jim Crow			
5.17	Planing machines having stroke of 5m, 8.5m, 10m & 13m.			
5.18	Air-compressor			
5.19	Pneumatic riveting Gun for 1:12 or flatter angle switches.			

6. Heat Treatment Facilities

6.1 Heat Treatment facilities for high speed steel.

6.2 Heat treatment facility for hot die steel

6.3 hardening furnace

6.4 Tempering furnace.

6.5 Salt bath furnace.

7. Testing Equipment / facilities Nos. Make Size / Capacity

7.1 Ultrasonic test of rails

7.2 Magnaflux

7.3 Tensile testing machine (UTM Machine)

7.4 Polishing Machine

7.5 Hardness testing machine

i) Poldi

ii) Rockwell

7.6 Charpy Impact testing machine

7.7 Lab for finding out the chemical composition of any sample.

7.8 Other NDT facilities (DP test etc.)

8. Handling facilities (It should be mentioned whether there is proper facilities for handling of finished switches & crossings)

9. Jigs and fixtures

9.1 Drilling Jigs (for switches)

Name of the Jigs

No. of Jig

Drg. No.

9.1.1 Tongue Rail Drilling Jig

9.1.2 Stock Rail Drilling Jig

9.1.3 Check Rail Drilling Jig

9.1.4 Drilling jigs for stretcher bars

9.1.5 Drilling jigs for slide chairs

9.1.6 Drilling jigs for Bearing Plates

- 9.1.7 Drilling jigs for Brackets
- 9.2 Drilling jigs for crossings
 - 9.2.1 Point Rail Drilling Jig
 - 9.2.2 Splice Rail Drilling Jig
 - 9.2.3 Wing Rail Drilling Jig
 - 9.2.4 Drilling Jigs for Diamond crossings
- 9.3 Bending Jigs & Fixtures
 - 9.3.1 Jig & fixture for Tongue Rail (for switches)
 - 9.3.2 Jig & fixture for Splice Rail (for normal & diamond crossings)
 - 9.3.3 Jig & fixture for Point Rail (for normal & diamond crossings)
 - 9.3.4 Jig & fixture for Wing Rail (for normal & diamond crossings)
 - 9.3.5 Jig & fixture for Obtuse Elbow Rail (for normal & diamond crossings)
- 9.4 Fixtures for Milling (for crossings)
 - Fixtures for Milling Splice Rails
 - Fixtures for Milling Point Rails
- 9.5 Other Fixtures
 - Fixtures for planning of-
 - 9.5.1 Tongue Rail Head Machining (for switches)
 - 9.5.2 Tongue Rail Flange Machining (for switches)
 - 9.5.3 Check Rail Machining (for switches)
 - 9.5.4 Point Rail Machining (for crossings)
 - 9.5.5 Splice Rail Machining (for crossings)
 - 9.5.6 Wing Rail Machining (for crossings)
 - 9.5.7 Assembled Vee Machining (for crossings)
 - 9.5.8 Fixtures for machining of bearing plates (for switches)
 - 9.5.9 Fixtures for multiple drilling of slide chair base holes (for switches)

- 9.5.10 Fixtures for drilling of Slide Chair Lug Hole (for switches)
- 9.5.11 Fixtures for Drilling (for switches)
- 9.5.12 Brackets (for switches)
- 9.5.13 Lugs (for switches)
- 9.5.14 Fixtures for Drilling of Special Chairs (for switches)
- 9.5.15 Fixtures required for the assembly of 'Vee' of all types and sizes (for crossings)
- 9.5.16 Fixtures for all sizes of blacks (for crossings)
- 9.5.17 Nose Block (for crossings)
- 10. Checking Gauges
Drawing of relevant inspection gauges for checking dimensions of switches, crossings & check rails etc including components shall be made available along with relevant gauges to inspecting agency at the time of Assessment / Reassessment.
- 11. Assembly of Vee / Crossing / Switches
It should be mentioned that how much leveled area is provided for the assembly section of each 'Vee', 'Crossing' and 'Switches' assembly.
- 12. Leveling -Jogan for laying the full turnout.
It should be mentioned whether there is sufficient leveled space for laying the turnout, it should also be mentioned that there are facilities for track gauge, Jim Crow, Crow Bar, Spirit level, hammer etc.
- 13. Railway siding facilities.
- 14. A fully dimensioned plan of the works showing locations of various equipment and facilities for the manufacture of Fabricated switches and crossings, flow line indicating location of various operations during manufacture in proper sequence and storage facilities for finished products and dispatch may please be enclosed.
- 15. QUALITY ASSURANCE
 - 15.1 Does the factory has any established quality assurance programme as per ISO-9000 series. If yes, please enclose a copy of the ISO-9000 certificate.
 - 15.2 Detail of quality assurance organization. Name of key personal, their qualification, designations, and position in overall management structure (Enclose organizational chart for quality control)
 - 15.3 Quality control testing facilities laboratory equipment available to be listed along with the make, year of procurement and commissioning.
 - 15.4 Calibration of laboratory / test equipment / gauge. (Enclose copy of calibration certificate).
 - 15.5 Frequency of calibration.

- 15.6 Source of procurement of raw materials / bought outs and steps taken to ensure their quality.
- 15.7 Brief details of manufacturing process as relevant to the items for which registration is sought (Switches and crossings separately).
- 15.8 Details of inspection / checks done on material during various stages of the above manufacturing process (Enclose copy of QAP of switches & crossing separately).
- 15.9 Has the acceptable value for the parameters inspected during the above stages checks been laid down? If yes, the action taken if value of the parameters inspected does not meet the desired laid down value.
- 15.10 System for documentation of the results of the above stage check.
16. Whether one sample set of switches and crossing separately ready for inspection during reassessment (Report to be submitted by inspecting official).
17. Whether the firm is possessing officially issued prints of relevant drawings and specifications.

SECTION - III : DECLARATION

- (i) We do hereby declare that the above particulars are correct and no discrepancy shall be found during actual investigation before and during execution of order on our firm.
- (ii) Any change in the plant and machinery and change of place of office and of works site shall be brought to the notice of RDSO for clearance and approval.
- (iii) We also declare that our concern has not been black listed by Railway, Railway Board / RDSO for business with the Railways.
- (iv) We hereby undertake that all our equipments for manufacturing and testing as listed above shall be maintained in good working order at all times.

Signature

Name in full of Signing Authority

Status in the Firm,

Place :

Date :

Stamp of the firm