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| ISO9001:2008  | Document No: QC-G-7.1-14 | Version No: 1.0 | Date Effective: 01.10.2020 |
| Document Title: Item Specific guideline & Schedule of Technical Requirements for Vendor approval for manufacture and supply of Fabricated Curve Switch and Fabricated Crossings |                          |                 |                            |



## RESEARCH DESIGNS & STANDARDS ORGANIZATION

Manaknagar, Lucknow – 226011

**Document No: QC-G-7.1-0018, 0019 & 0020**

**Document Title : Item Specific guideline & Schedule of Technical Requirements for Vendor approval for manufacture and supply of Fabricated Curve Switch and Fabricated Crossings**

### 1.0 Amendment History:

| S. No. | Amendment Date | Version | Reasons for Amendment  |
|--------|----------------|---------|--|
| 1.     | 01.12.2001     | 0.0     | First issue under new documentation system   |
| 2.     | 01.10.2020     | 1.0     | <b>List of plant &amp; machineries and list of testing &amp; measuring instruments added</b> |

## 2.0 Purpose:

This guideline covers all technical requirement for manufacture and supply of Fabricated Curve Switch and Fabricated Crossings used for vendor registration/ quality audit of vendor. This guideline replaces the provisions of earlier guidelines issued on the subject i.e. QC-G-7.1-14 rev '0'

## 3.0 Scope of Application

This shall be applicable for initial capability assessment, quality audit, up-gradation of vendors and maintaining their approved list. In case of any variation between the procedure/provision given in the work instruction and that in this 'Item-specific guidelines', the later shall prevail. The competent authority wherever referred to in this document shall mean Executive Director, Quality Assurance Civil Dte.

## 4.0 Procedure / Details

Procedure/details is annexed.

## 5.0 Referenced Documents

| S.No. | Document Name                                     | Document No. |
|-------|---|--------------|
| 1.    | Indian Railway Standard Specification : T.10-2000 | Nil          |

## 6.0 Referenced Documents of External Origin

None.

## 7.0 Associated Records

None.

## 8.0 Responsibility and Authority

| Activity  | Responsible    | Approver     | Supporting       | Consulted                    | Informed                               |
|---|----------------|--------------|------------------|------------------------------|--|
| Creation, maintenance of this document              | Director/QAC   | ED/QAC       | DD/XEN/AIE/ARO   | Track Design Dte. & M&C Dte. | All vendors/ concerned through website |
| Compliance of directives contained in this document | DD/XEN/AIE/ARO | Director/QAC | Respective staff | -                            | -                                      |
| Requirement of deviation from this directive        | Director/QAC   | ED/QAC       | DD/XEN/AIE/ARO   | Track Design Dte. & M&C Dte. | All vendors/ concerned through website |

## 9.0 Abbreviations

|       |  |
|-------|--|
| QA    | Quality Assurance.                         |
| QAC   | Quality Assurance Civil.                   |
| ED/QA | Executive Director/Quality Assurance Civil |
| RDSO  | Research Designs & Standards Organisation  |
| DD    | Dy. Director                               |
| XEN   | Executive Engineer                         |
| AIE   | Assistant Inspecting Engineer.             |
| ARO   | Assistant Research Officer                 |

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## **ITEM SPECIFIC GUIDELINES FOR ASSESSMENT / REASSESSMENT OF FIRMS MANUFACTURING 1:16, 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 1:16, 1:12, 1:8½, Fabricated curved switches and Fabricated crossings:

- 2) Separate lists shall be maintained for 1:12 Fabricated curved switches, 1:8½ and 1:16 Fabricated curved switches and fabricated crossings.
- 3) 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.
- 4) For the purpose of assessment of fabricated crossings, one set of proto-type of any design shall be required to be manufactured.
- 5) 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 the lists i.e. for 1:12 curved switches, 1:8½ curved switches and 1:16 curved switches, the sample set of one design can be offered for inspection.
- 6) For the purpose of re-assessment of fabricated crossings, one sample set of any design will be required to be offered for inspection.
- 7) The gauges shall be approved / revalidated at the time of inspection of infrastructural facilities during assessment reassessment of the firm.
- 8) 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   | Available with Firm |
|-------|--|---|--|---------------------|
| 1.    | Covered Area   | -   | 1500 M <sup>2</sup>  |                     |
| 2.    | Gantry Crane facilities  | 4 t   | 1 No.  |                     |
| 3.    | 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) 13m stroke /CNC Planomiller<br>ii) 8.5m stroke<br>iii) 5m stroke                               | 1 No.<br>1 No.<br>1 No.                                    |                     |
| 8.    | Universal Testing Machine  | 40 t (minimum)  | 1 No.  |                     |
| 9.    | Charpy impact testing machine  | -   | 1 No.  |                     |
| 10.   | Hardness tester Poldi/ Rockwell  | -   | 1 No.  |                     |
| 11.   | Compressor with riveting arrangement   |   | One complete set including furnace & riveting gun etc.     |                     |
| 12.   | CO <sub>2</sub> / Mig welding equipment  | -   | One complete set with approved brand of welding wires      |                     |
| 13.   | Jigs & fixtures for drilling stock & tongue rails for switches & fabricated crossings. |   | At least one set for each item separately.                 |                     |
| 14.   | Assembly & Inspection bay  |   | A separate area to be dedicated with proper levelled floor |                     |
| 15.   | Chemical lab   | Spectrometer /For chemical analysis of MS ,Medium & Low alloy steel                               | 1 unit installed in house                                  |                     |
| 16.   | Non-destructive testing facilities   | i) USFD<br>ii) D.P.test<br>iii) Magnaflux<br>iv) Metallurgical Microscope<br>v) Polishing Machine | 1 No.<br>1 No.<br>1 No.<br>1 No.<br>1 No                   |                     |
| 17.   | Dedicated area with all above machines installed in proper flow line.                  | -   | 1500 M <sup>2</sup>  |                     |

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**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:

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6. Number of personnel employed (category-wise)

6.1 Managerial :

6.2 Supervisory :  
(Enclose list of Managers / 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

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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 and capacity of the Machine |
|-------|--|----------------|---------------------|----------------------------------|
| 5.1   | Circular band 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  | Forming Press  |                |                     |                                  |
| 5.13  | Oil Fired Furnance for Rivet   |                |                     |                                  |
| 5.14  | Electric welding sets( Co2 /Mig welding set) with RDSO approved brand of welding wires |                |                     |                                  |
| 5.15  | Gas welding/Gas cutting facility ( including preheating arrangements)                  |                |                     |                                  |
| 5.16  | Jim Crow   |                |                     |                                  |
| 5.17  | Planning machine having stroke of 5m,8.5m,10m,& 13m                                    |                |                     |                                  |
| 5.18  | Air compressor   |                |                     |                                  |
| 5.19  | Pneumatic riveting Gun for 1:12 or flatter angle switches                              |                |                     |                                  |



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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

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- 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-

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- 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.

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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-9001:2015 series. If yes, please enclose a copy of the ISO-9001:2015 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.

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**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

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