



भारत सरकार - रेल मंत्रालय  
अनुसंधान अभिकल्प और मानक संगठन

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

**DOCUMENT NO. TDG 0021, Rev. '1'**

ITEM SPECIFIC GUIDELINES  
FOR CAST MANGANESE STEEL CROSSINGS

*Price: Rs. 660/-*

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 CAST MANGANESE STEEL CROSSINGS**

In addition to the "General Guidelines for Vendor Approval" the following shall also be applicable for assessment / re-assessment of firms for manufacturing CMS Crossings.

- i) The list shall be common for 1:8:5 and 1:12 crossings for 52kg and 60kg rail section. The firm should be in possession of all the requisites of Class 'A' foundry as per Bureau of Indian Standards at the time of initial approval.
- ii) The firm shall be required to manufacture two sets of each design of CMS Crossings for Internal Development. During Internal Development, all types of tests as mentioned in the relevant specifications shall be carried out by the firm. Seven stage inspections shall be required to be carried out during internal development.
- iii) After successful completion and approval of Internal Development, the firm shall be asked to produce eleven sets of proto-types of at least one design under consideration (including one set of each design for solidity test). The initial approval shall be given to the firm by the competent authority after the approval of all the above offered proto-type and fulfilling other requirements as per General Guidelines for Vendor Approval.
- iv) For the purpose of re-assessment the firm shall be required to produce two samples of CMS Crossings for inspection by RDSO officials (including one sample for solidity test) and both should pass the tests.
- v) The gauges shall be approved / revalidated at the time of inspection of infrastructural facilities during assessment / reassessment of the firm.
- vi) The inspection gauges, internal development and proto-type shall be approved by RDSO for each design of CMS Crossings on order before start of regular production.

**MINIMUM FACILITIES & MACHINERIES REQUIRED FOR  
MANUFACTURE OF CMS CROSSING**

S. No.	Description	Minimum Capacity	Minimum Quantity
1.	Covered Area	2000 Sq. m	2000 Sq. m.
2.	Sand Mullers	500 Kg. 300 Kg.	One No. One No.
3.	Sand Testing laboratory	With standard Equipments	One Complete Set
4.	Patterns / Core making facilities	As required	One set.
5.	Mould / Core Drying facilities & mould boxes	As required	One set
6.	Electric Arc Furnace (with other refining & alloying facilities) and temperature measuring equipment	5 T (approx.)	One No.
7.	Ladle for molten metal	5 T	One No.
8.	Heat treatment furnace	6m long with matching width x height	One No.
9.	Shot blasting arrangement (complete)	-	One No.
10.	Quenching tank ( with water circulating & agitating facility with digital temperature measuring equipments)	6m x 2.5m x 2.5m	One No.
11.	Fettling Equipment a) Oxy cut b) Grinders	As required As required	One No. Five Nos.
12.	Hydraulic Press	400 T	One No.
13.	Welding facility for Austenitic manganese steel with proper cooling arrangements	-	One set
14.	Finishing Equipments a) Pneumatic or rotary grinder b) Fettle Arc machine/machine c) Heavy duty planers or Plano millers d) Marking Table ( with measuring instruments)	- - 6m stroke 6 x 1m	Five Nos. One No. One No. One No.
15.	Testing Machines / Facilities a) Vaccum spectrometer b) UT machine c) Brinell Hardness Testing Machine d) Poldi hardness Testing Kit e) DP Testing Equipment f) Metallurgical Microscope g) Radiograph Check Up Arrangement	- 40 T	One No. One No. One No. One No. One No. One No. One No.

16.	Handling equipments	5 T	One No.
17.	EOT Cranes	10 T	Two Nos. in each bay.
18.	Inspection Bay	--	Separate levelled area should be dedicated for proper inspection of finished crossings.
19.	Dedicated area with all above machineries installed in a proper flow line.	--	2000 Sq. m.

**ASSESSMENT PROFORMA FOR APPROVAL OF MANUFACTURE  
(FRESH / RENEWAL) OF CAST MANGANESE STEEL CROSSING  
(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.      Fax & E-mail address of**

4.1    Head Office

4.2    Works

4.3    E-mail address

**5.      Description of Works**

5.1    Total land area (in Sq. metres)

5.2    Total covered area (in Sq. metres)

5.3    Different sub-units

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

5.4    Special features, if any

**6.0    Number of personnel employed (category-wise)**

6.1    Managerial

6.2 Supervisory (Encl. list of managers / Tech. Supervisors)

6.3 Skilled / Artisans

6.4 Unskilled

**7.0 Hours of working**

**8.0 State whether the firm is already in the approved list of vendors with RDSO for supply of CMS Crossing. If so, please give details of last approval.**

8.1 Letter date and issued by

8.2 Date of expiry of validity of approval

**9.0 If this application is an application for renewal of approval, have inclusion of any additional items in the approved list also been requested ?**

## **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. Details of Stores / Items / Parts / Components for which fresh approval / renewal of approval is sought (please indicate complete description and drawing nos.)**

**4. Total Power availability ( In KVA / KW)**

a) From State Electricity Board or other regular source (Enclose a copy of current electricity bill)

- b) From own stand-by power generating sets (Also give make, capacity & other details of each generating set).

## **5. Crane facility**

	No. of Cranes	Make	Capacity
5.1	EOT Crane		
5.2	Mobile Crane		
5.3	Jib Crane		

## **6. Manufacturing facilities**

### **6.1 Steel making**

- 6.1.1 Type of furnace
- 6.1.2 Capacity
- 6.1.3 Stages of checking bath samples
- 6.1.4 Bath homogenisation arrangement
- 6.1.5 Carbon boil to be maintained
- 6.1.6 Steel killing practice. If Aluminum killing is followed, please specify maintaining of the residual Aluminum content of the product
- 6.1.7 Whether facilities for secondary refining of molten steel exist? If so, please give details.

### **6.2 Proposed Raw material to be used**

- 6.2.1 Proposed charge mix for CMS Crossing
- 6.2.2 Preventive measures taken to reduce tramp elements in the product. Please specify.
- 6.2.3 Weighing facilities for ingredients and additives charged into the furnace and ladle.
- 6.2.4 Overhead crane facility & capacity.

### **6.3 Pattern making**

**6.4 Foundry ( Sand Control System)**

- 6.4.1 Moulding ( Hand / Machines) and mix testing facilities
- 6.4.2 Core making
- 6.4.3 Mould and core drying
- 6.4.4 Decoring and shake-out

**6.5 Dressing facilities (Mainly before and after heat treatment)****6.6 Shot blasting facilities (Travel type / Discrete loading type).****6.7 Heat treatment**

- 6.7.1 Size of the furnace
- 6.7.2 Type of furnace
- 6.7.3 Size of quenching tank ( L x B x H )
- 6.7.4 Cooling water system of the quenching tank & digital temperature recording devices
- 6.7.5 Distance of quenching tank from the furnace
- 6.7.6 Handling facility of crossing from furnace to quenching tank
- 6.7.7 Digital temperature indicating and recording facility of furnace (Pyrometric control device).
- 6.7.8 Heavy duty hydraulic press for straightening CMS Crossings (indicating type and capacity)

**6.8 Finishing facilities**

- 6.8.1 Welding repair & grinding facilities
- 6.8.2 (Fettle Arc) Gouging machine
- 6.8.3 Plano milling machine with vertical cutter
- 6.8.4 Milling / Boring machine with horizontal cutters and rotating table



6.8.5 Other machines / facility for finishing fishing plane of fish plated area, flange way, wheel tread, bottom surface etc.

6.8.6 Facilities for checking welding defects on the crossings.

**6.9 Inspection bay facilities (Inspection table with lighting arrangement, handling facilities etc.)**

**6.10 A fully dimensioned plan of the works showing locations of various equipments and facilities for manufacture of CMS crossings, flow line indicating locations of various operations during manufacture in proper sequence and storage facilities for finished products may please be enclosed.**

#### **PAST PERFORMANCE**

**1. List of important customers of the firm (as relevant to the works for which requisition is sought)**

**2. Details of important orders executed in past, in reference to the supplies made.**

2.1 To other important firms / companies / undertakings etc.

2.2 Directly to the Railways.

**3. Important orders in hand**

#### **QUALITY ASSURANCE PROGRAMME**

**1. Does the factory has any established Quality Assurance Programme as per ISO: 9000 series. If yes, please enclose a copy of the write-up in sequential order.**

**2. Details of Quality Assurance Organization. Name of key personnel, their qualification, designations and positions in overall management structure (Explain with organizational chart, if necessary).**

**3. Quality Control Testing facilities, laboratory equipments available to be listed along with the make, year of procurement and commissioning.**

**4. Calibration of laboratory test equipments / gauges, as indicated in para 3 above (Enclose copy of Calibration Certificates).**

- 4.1 How the calibration is done
- 4.2 Frequency of calibration of each instrument
- 5. Source of procurement of raw materials / bought-out items and steps taken to ensure their quality.**
- 6. Brief details of manufacturing process as relevant to the items for which registration is sought.**
- 7. Details of inspection / checks done on material during various stages of the above manufacturing process (Enclose copy of QAP of CMS Crossing).**
  - 7.1 Have the acceptable value for the parameters inspected during above stage checks been laid down? If yes, the action taken against values of the parameters inspected does not meet the desired laid-down value.
- 8. System for documentation of the results of the above stage check.**
- 9. Whether facilities for carrying out the following tests are available, also indicate the capacity of each equipment, maker's name and calibration details etc.**
  - 9.1 Chemical Analysis
  - 9.2 Spectrometric / Instrumental Analysis
  - 9.3 Hardness test
  - 9.4 Tensile Bend Test
  - 9.5 Impact Bend Test
    - 9.5.1 Izod / Charpy Impact Test
  - 9.6 Macroscopic test
    - 9.6.1 Dye-penetrant test
    - 9.6.2 Portable tester for checking residual magnetism
  - 9.7 Microscopic test (if microscope with digital photographic attachment available)

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- 9.8 X-Ray
- 9.9 Gamma Ray
- 9.10 Any other test
- 10. Whether two sample set of CMS Crossings of any one design are ready for inspection during reassessment (Report to be submitted by Inspecting Officials)**
- 11. Whether the firm is possessing officially issued prints of relevant drawings and specifications.**

#### **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 of Manufacturer

Place

Date

Office Seal