



पश्चिम मध्य रेल
West Central Railway

General Manager's Office
Engineering Department
Jabalpur-482 001 (M.P.)

No. W-HQ/W-4/Track-II/Policy/Circular/16

Date: 07.01.21

CTE CIRCULAR No. 16

Sub: Basic Fundamentals: Manufacturing & Installation of In-situ Glued Joint (ISGJ)

(Ref: IRCON L.No. IRCON/2065/Katni-Singrauli/18/1/08 dated 02.01.21)

A No. of New Line/Doubling/Tripling works are being carried out by various executing agencies (Const., RVNL, IRCON) on WCR in which In-Situ Glued Joint (ISGJ) are being used on a large scale. However, many of the ISGJ are failing prematurely indicating lack of awareness/knowledge of the basic fundamentals/elements of manufacturing, testing, competency, and installation of ISGJ. For eg:- Recently vide ref., IRCON has asked for 45-60 min traffic block for executing one ISGJ, indicating non-awareness of basic tenets involved.

Instructions already exists that:

- (i) On New Line/Doubling/Tripling works by Const., RVNL, IRCON, In-situ Glued Joint work has to be carried out on cess (no block required) and not in running track (requiring block) as it affects the quality of ISGJ. Only, Pre-fabricated Glued Joint should be used if being installed on running lines directly.
- (ii) In Open line TRR/CTR works, wherever In Situ Glued Joints are required to be installed, In-situ Glued Joint work has to be carried out on cess (no block required) and not in running track (requiring block)

However, in view of the above, **Basic Fundamentals of Insitu Glued Joint** are being iterated below:

Extracts from

Specification 1: RDSO Technical Specification - In-situ Fabrication of Glued Insulated Rail Joints- Jan 20

Specification 2: Manual for Glued Insulated Rail Joints - 1998 (Up to CS 6)

Sl. No.	Basic Fundamentals	Authority/Reference									
1	Traffic Block Min. 3 hr. block should be ensured. In case, block available is < 3 hr, ISGJ should not be made directly in running track	Spec 1-Para 6.1									
2	Material - Specification & Approved Brand <ul style="list-style-type: none"> - Rail Used - USFD Tested, Straight Rail free from burr/scabbing/wear/corrosion/kink etc; No FB/AT Weld within 4 m - End Post - 6mm thick - Other Material - as per Annexure 1(enclosed) <ul style="list-style-type: none"> o Fish Plates - IRS T-1 o HTS Bolts & Nut - IS 1363 & 1367 - Glass Cloth - IS 11273 Weight : 300 + 36 gm/sq.m, Thickness: 300 +/- 30 microns - Glue (Resin & Hardener) <p>Glue consists of resin and hardener. The nomenclature of resin & hardener manufactured by firms approved at present are as under:</p> <table border="1"> <thead> <tr> <th>Firm's name</th><th>Resin</th><th>Hardener</th></tr> </thead> <tbody> <tr> <td>M/s ATUL Ltd</td><td>Epoxy Resin Lapox L-12</td><td>Epoxy Hardener Lapox K-6</td></tr> <tr> <td>MS HUNTSMAN Advanced Materials INDIA PVT. LTD.</td><td>ARALDITE LY-556</td><td>ARADURE HY-951 IN</td></tr> </tbody> </table> <p>Resin and hardener shall be mixed in the ratio of 10:1.</p>	Firm's name	Resin	Hardener	M/s ATUL Ltd	Epoxy Resin Lapox L-12	Epoxy Hardener Lapox K-6	MS HUNTSMAN Advanced Materials INDIA PVT. LTD.	ARALDITE LY-556	ARADURE HY-951 IN	Spec 1-Para 6.3 (iv) Spec 1-Para 3.2 (vi) Spec 2: Annexure C
Firm's name	Resin	Hardener									
M/s ATUL Ltd	Epoxy Resin Lapox L-12	Epoxy Hardener Lapox K-6									
MS HUNTSMAN Advanced Materials INDIA PVT. LTD.	ARALDITE LY-556	ARADURE HY-951 IN									
3	Procedure - as per Annexure 2 (enclosed) Important Precautions to be followed/ensured <ul style="list-style-type: none"> - SR 30 kmph to be imposed & 3 hr. Traffic block to be taken - Rail to be made free from fittings on 2m on either side. - Cleaning of Rails by acetone - Pressure applied by rail tensor to eliminate gap between rail ends & post - Bolts tightened with torque of 105 kgm - 120 min of setting time to be ensured - Retightening of bolts after 20 min of 1st tightening with same torque 105 kgm - Min. Electrical Resistance: 10 Mega-Ohm - Supported on Wooden Block for 24 hr. - 30 kmph caution order for 24 hr. After completion of work 	Spec 1-Para 6.4									
4	Testing <ul style="list-style-type: none"> - Lot Size: 50 joints or part thereof - including 02 joints prepared on cess - Stage 1: Dimensional Check : 1m straight edge Vertical Tolerance: +1 mm/-0 mm (at end of edge) Lateral Tolerance: +/- 0.5 mm (at centre of edge) Only Dimensionally satisfactory joints shall be tested further in Stage 2. - Stage 2: Dry Insulation Resistance Test 	Spec 1-Para 7.0									

Sl. No.	Basic Fundamentals	Authority/ Reference																				
	<p>Insulation Not less than 10 Mega Ohm on 100 V DC Megger Voltage Only Dry Insulation Resistance Test satisfactory joints shall be tested further in Stage 3.</p> <p>Stage 3: Pull Out Test As per Para 3.4 of Glued Joint Manual (enclosed as Annexure 3) Min. Pull Out Load 52 Kg : 1500 KN, 60 Kg : 1700 KN – with no separation of ends posts & rail ends Only Pull Out Test satisfactory joints shall be tested further in Stage 4 if both joints pass this test. If any of the 02 joints fail, 02 more joints shall be taken from the lot and testing shall be repeated. If any of the re-tested joints fail, entire lot shall be marked defective and no payment shall be made for the lot + suitable penalty to be imposed. If rejected lot GJ in track – marked with 'O' yellow paint and kept under observation</p> <p>Stage 4: Wet Resistance Test As per Para 3.5 of Glued Joint Manual (enclosed as Annexure 3) Insulation Not less than 03 Kilo Ohm on 100 V DC Megger Voltage After immersion in water for 48 hours If both joints pass Wet Resistance Test, lot is passed in this test otherwise suitable penalty to be imposed.</p>	<p>Spec 2- Para 3.4</p> <p>Spec 2- Para 3.5</p>																				
5	<p>Competency of Executing Firm & Executing Team</p> <p>QAP Approved QAP by QA Directorate of RDSO & EIC should be available</p> <p>Approved Executing Firm Manufacturer/Vendor/Firm/Workshop should be in the Approved Vendor List of RDSO Three Digit Firm/Workshop Code (AAA) should be available Current Approved RDSO Vendor List is enclosed as Annexure 4</p> <p>Approved Executing Team Branch/Workshop/Firm/Manufacturer Team No. as assigned by QA (Civil) Directorate RDSO should be available Two Digit Branch/Firm/Workshop Team No. Code (BB) should be available</p>	<p>Spec 1- Para 12.0 (i)</p>																				
6	<p>Record Keeping</p> <p>Detailed Record to be kept as per format below</p> <table><tr><th>S N</th><th>Date of fabrication</th><th>Location as per TMS guidelines</th><th>Line UP/DN/ SL</th><th>Block time/ On cess</th><th>The resistance of Glued Joint in dry condition (In mega ohms)</th><th>Name of Agency</th><th>Name of an agency Supervisor</th><th>Name of Railway Supervisor</th><th>Sign of Railway Supervisor</th></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> <p>Marking Every ISGJ shall be marked with a code as below 300mm away from one end of fishplate</p> <p style="text-align: center;">IS/RF-XXXX-AAA-BB- MM-YY</p> <p>IS = Stands for In-situ RF = Stands for refurbished glued insulated rail joints XXXX in four digits = Serial number of glued joints starting from 0001 for each contract separately. The same procedure of numbering shall be followed by departmental workshops also AAA in three digits =Code of firm/workshop BB in two digits = Branch/workshop team no. as assigned by Quality Assurance (Civil) Directorate of RDSO for in-situ/refurbished glued joint MM & YY in two digits each = Month and year of fabrication of glued joint</p>	S N	Date of fabrication	Location as per TMS guidelines	Line UP/DN/ SL	Block time/ On cess	The resistance of Glued Joint in dry condition (In mega ohms)	Name of Agency	Name of an agency Supervisor	Name of Railway Supervisor	Sign of Railway Supervisor											<p>Spec 1- Para 12.0 (i) & (ii)</p>
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7	<p>Life & Warranty</p> <p>Min. Service Life is 200 GMT for ISGJ If ISGJ fails within 50% GMT Life - to be replaced by firm/manufacturer</p>	<p>Spec 1- Para 8.0 & 9.0</p>																				

DA: Annexure 1 to 4


(Rajesh Arora)
Chief Track Engineer

Copy to:

1. **AGM WCR** – for kind information please
2. **PCE/WCR & CAO/C/WCR**– for kind information please.
3. **CPM/RVNL/BPL & KOTA, PD/IRCON/KTE, CE/C-I, II & CPM/C/Kota** – for information & necessary action.
4. **Sr. DEN Co JBP/BPL & KOTA** - for urgent necessary action as above.
5. **All Sec. Sr.DENs/DENs,ADENs & SSE/P-Way**– for urgent necessary action as above.

C.0 SPECIFICATION OF MATERIALSC.1 S. SPECIFICATION FOR FISHPLATES

- i) "Material and manufacturing process of fish plate shall conform to IRST-1 as amended from time to time."
- ii) The dimensions of fish plate shall conform to relevant drawing of the glued joints.
- iii) Special fish plates to be used in fabrication of Glued Insulated Rail Joints shall be inspected by purchaser Railway or its nominated inspecting agency (M/s RITES) at the premises of fish plate in Manufacturer firm. Inspection shall be done as per Para 19 of IRST-1 as amended from time to time. After inspection every accepted fish plate shall be plainly stamped with the inspecting officers stamp at one end of each fish plate on its outer side in the presence of Inspecting officer. The inspection certificate of inspecting agency shall be sent by manufacturer of special fish plate along with the supply to glued joint manufacturer. The glued joint manufacturer will check the supply with respect to the details mentioned in Inspection Certificate of inspecting agency and then only put these in use." C S. No-5

C.2 S. SPECIFICATION FOR HTS BOLTS & NUTS

HTS bolts and nuts shall comply with the following specifications -

- 1) "HTS Bolts - Material and manufacturing process of Hex bolts shall be as per IS: 1363 confirming to property clause 10.9 of IS: 1367."
- 2) "HTS Nuts- Material and manufacturing process of Hex nuts shall be as per IS: 1363 confirming to property clause 12.0 of IS: 1367."

C S. No-5

C.3 SPECIFICATION FOR PUNCHED WASHER

Steel of Punched Washers shall conform to IS: 2062.

SPECIFICATION OF INSULATING BUSHES/SLEEVES, LINERS AND END-POSTS

The insulating components viz. bushes/sleeves, liners and end-posts shall be made with the following materials in the premises of manufacturer as per the procedure indicated under para C.5.2

C.4 MATERIALS

N

C.5

GLASS-CLOTH CARRIER REINFORCEMENT.

C.5.1

Glass-cloth carrier reinforcement shall conform to IS: 11273 1992 clause 4.5 type C for the properties not covered below

a) Nominal weight: 360 \pm 36 gm/sq. m

b) Nominal thickness: 300 \pm 30 microns

c) Construction: i) Ends per 100mm: 61 \pm 2.5%

ii) Picks Weave per 100mm: 55.2 \pm 2.5 % plain

d) Binder: The glass rovings shall contain a sizing agent to facilitate weaving and to impart high wet strength to liners, bushes/sleeves and end-posts. The sizing agent used shall be compatible with epoxy resins. Approximate size of glass-cloth pieces are given below for guidance:

i) For G3(L): 15 X 100 cm for 60kg, 52kg and 90R joints 15 X 65 cm for 75R joints

ii) For G3(S): 15 X 66 cm for 60kg, 52kg and 90R joints 15 X 48 cm for 75R joints. C

5.1.2

GLUE:(for making insulating components)

Glue consists of resin and hardener. The nomenclature of resin & hardener manufactured by firms approved at present are as under:

Firm's name	Resin	Hardener
M/s ATUL Ltd	Epoxy Resin Lapox L-12	Epoxy Hardener Lapox K-6
M/S HUNTSMAN Advanced Materials INDIA PVT. Ltd.	AR ALDITE LY-556	AR ADURE HY-951 IN

Resin and hardener shall be mixed in the ratio of 10:1.

C.5.2

FABRICATION TECHNIQUE

C.5.2.1

The liners, end-posts and bushes/sleeves shall be fabricated either by the hand lay-up process or by pressure-moulding technique or by any other standard method.

C.5.2.2

The hand lay-up process is similar to the method described earlier in para 2.3.6. 2.3.7 The components are to be fabricated by building-up layer after layer till sufficient thickness is achieved. Generally 20 layers of cloth would be needed for end-posts of 6mm thickness and 5 layers for liners, bushes/ sleeves for obtaining the stipulated thickness.

C.5.2.3

The end-post may be built-up by using suitable sized rectangular pieces of glass-cloth. Nominal pressure shall be maintained till the piece is cured. The rectangular piece shall then be cut and profiled to the shape of the end-post

C.5.2.4

The liner may be fabricated in the hollow of a rail-web by placing a rail piece with its web horizontal and by building up layer after layer. Nominal pressure shall be maintained in this case also till the piece is cured.

C.5.2.5

The bushes/sleeves are to be fabricated by winding a wide piece of glass-cloth on a bolt-shank and then cutting up the finished tubing into suitable size after curing.

C.5.2.6

In all the above cases, a coat of a release agent "Releasil-7" or a similar product shall be applied on the surface on which the component is fabricated to enable easy separation of the same after curing.

C.5.3 DIMENSIONS OF FINISHED PRODUCT:

The liners, end-posts and bushes/sleeves shall be given final finish conforming to the dimensions shown in the relevant drawings.

C.5.4 QUANTITY PER JOINT

C.5.4.1 Quantity of raw material required for insulating components for 52kg G3 (L) and 60kg G3 (L) glued joint, with 10mm thick end-post drawing, shall be approximately as under.

S No.	Insulating components	Qty. Reqd. per joint	Fibre Glass cloth (gm)		LY-556 (gm)		HY-951 (gm)		L-12 (gm)		K-6 (gm)	
			52 kg	60 kg	52 kg	60 kg	52 kg	60 kg	52 kg	60 kg	52 kg	60 kg
1.	Insulating Liners	2	500	560	450	500	45	50	450	500	45	50
2.	End post	1	210	225	180	180	18	18	180	180	18	18
3.	Bushes/Sleeves	6	180	190	150	150	15	15	150	150	15	15

C-S- no- 5

C.5.4.2 Quantity of raw material required for G3(S) type joints can be obtained by reducing proportionately.

C.5.5 Other components 8111input materials such as glue, glass cloth carrier reinforcement as mentioned at Para C.5.1, C.5.1.2, C.5.4.1 and C.6 of this manual to be used in fabrication of glued insulated rail joint shall be procured by the manufacturer of glued insulated rail joint from their approved sources mentioned in the current Master List of Approved Vendors issued by Quality Assurance (Civil) Directorate of ROSO which is updated from time to time. While procuring these materials from their respective approved sources, glued joint manufacturer must obtain all the relevant inspection certificates/documents from their approved suppliers and preserve the same. Purchaser Railway/nominated inspecting agency (M/s RITES) while doing the inspection at the premises of glued joint manufacturer must ensure that these input materials used in fabrication of glued joints have been procured from their respective approved sources by verifying the related inspection certificate/documents and records maintained by glued joint manufacturer.

C-S- no- 5

C 6 SPECIFICATION AND QUANTITY REQUIRED OF GLUE

The tangential shear strength of glue is claimed to be about 120 kg/sq.cm by the manufacturer.

i) The Glue as developed by nsis Huntsman Advanced nsaterials (INDIA) Pvt Ltd for prefabricated type Glued 3oints consists of ARALDITE XY 27 and hardener XY 28 IN to be mixed in proportion of 100:40. The approximate quantity of combined adhesive required for 52 Kg rail joint is 1.4Kg for 03 (L) and for 60Kg rail joint is 1.68Kg for G3 (L). The quantity may be estimated proportionately in case of 03 (S) type joints.

ii) Similarly, the Glue as developed by nsIS A TUL Ltd for Prefabricated type Glued 3oints consists of Epoxy resin Lapox A-83 and Hardener Lapox K-83 to be mixed in proportion of 100:40. The approximate quantity of combined adhesive required for 52 Kg rail joint is 1.4 Kg for 03 (L) and for 60kg rail joint is 1.68 Kg for 03 (L). The quantity may be estimated proportionately in case of 03 (S) type joints.

C-S- no- 5

NOTE:

(i) The weight of raw material indicated above is approximate and includes allowance for wastage and is based on experience gained at the time of development of these joints in RDSO.

(ii) Detailed instructions regarding the method of storage, mixing, pot-life and minimum period of curing of adhesive at various temperature shall be obtained by purchaser from the suppliers and shall be scrupulously followed.

(iii) The resin and hardener should be of same firm as approved. i.e. resin of one firm and hardener of another firm can not be used.

6.0 In-situ Fabrication of Glued Insulated Rail Joints:

6.1 General:

Glued joints are fabricated in the shop floor and transported to the site for insertion in running track which will result in the introduction of minimum 02 SKV welds. Glued joints can also be fabricated at the site to save effort needed in transportation and also avoid at least 02 SKV welds. In-situ fabrication of glued joint would preferably be carried out outside the running track i.e. on cess. In case it is required to be inserted in the running track, adequate traffic block (Minimum 3 hours) should be ensured. In case, the traffic block available is less than 3 hours, in-situ fabrication of glued joints should not be done.

6.2 Pre-fabrication Activities:

Following activities shall be ensured before taking up fabrication of glued insulated rail joints:

- (i) The exact location of glued joints shall be identified and marked in advance.
- (ii) All required materials & equipment and manpower shall be arranged before commencing the in-situ fabrication work.

6.3 Selection of Rails:

During the selection of rails for in-situ fabrication of glued insulated rail joints following shall be ensured:

- (i) The rail to be converted into Insulated Joint should be free from burrs, excessive side/vertical wear, kinks, corrosion and scabbing etc.
- (ii) The rails shall be straight and USFD tested.
- (iii) Old free rail joints having battering etc. should be avoided for fabricating insulated joints.
- (iv) Flash butt/thermit welds should be avoided within 4.0m from the insulated Joints.

6.4 Methodology for in-situ Fabrication of Glued Joint:

Methodology for in-situ fabrication of glued insulated rail joints is as under:

- (i) In case, the fabrication is done in running track:
 - a. Speed restriction of 30 kmph shall be imposed at the location of in-situ fabrication of glued joints.
 - b. A minimum of 3 hours traffic block shall be taken and track shall be protected with the help of banner flag and detonators as per stipulated provisions in IRPWM, amended from time to time.
 - c. Rail should be made free of fittings over a length of 2.0 m on either side of the centerline of glued joints.
 - d. The gap shall be maintained marginally more than the thickness of the

end post to be used to enable the insertion of the end-post. Tensor may be applied if required for this purpose.

- (ii) The rail ends shall be properly aligned both laterally and vertically with a straight edge using suitable wedges. The two rails shall then be held firmly in position by clamps and no hammering/disturbance to ends should be done after aligning the rails.
- (iii) The rail ends and fishplate surfaces shall be cleaned with acetone and dried completely. The application of glue shall be commenced only when the finished rails and fishplates have been properly cleaned and have dried completely.
- (iv) The resin and hardener shall be mixed as per supplier's instructions in a suitable container. The constituents shall be thoroughly mixed to get a homogeneous mixture (hereafter called 'glue').
- (v) A thick layer of the glue shall be applied on the mating surfaces of the fishplates simultaneously by two teams of workmen.
- (vi) One piece of clean glass cloth carrier shall be placed on the fishplates and evenly pressed so that the glue squeezes out through the glass cloth. The oozing glue shall be uniformly spread over. A layer of glue shall then be applied on the inside of the insulating liners followed by their placement on the glued glass-cloth carrier on the two fish plates.
- (vii) A layer of glue shall then be applied on the outside of the insulating liners and a clean piece of glass cloth carrier shall be laid. The oozing glue shall be uniformly spread over.
- (viii) Glue shall be applied to both the faces of the end-post, before placing it between the two rail ends. Adequate pressure shall then be applied using tensor at the rail ends so that no gap is left between the end post and the rails. Alignment shall be checked again at this stage with a straight edge.
- (ix) The insulating bushes duly dipped in glue shall be placed in the rail holes.
- (x) The bonding surfaces of the rail shall then be coated with a layer of glue and fishplates made ready as described above shall be placed in a position in contact with the rail web.
- (xi) HTS bolts, washers and nuts shall then be placed in position and tightened with a torque wrench. The torque shall be increased gradually on all the bolts in stages of 25 kg-m per bolt. Care shall be taken to tight inner bolts first and then outer bolts. Finally, all the bolts shall be tightened with a torque of 105 kg-m.
- (xii) The sequence of the above operation shall be completed within 45-60 minutes so that a minimum of 120 minutes setting time is achieved in case the execution is done under traffic block.
- (xiii) About 20 minutes after the initial tightening of bolts, the bolts shall be re-tightened with a torque wrench until a torque of 105 kg-m is attained.

- (xiv) The joints shall be finished by covering all visible edges of the glass-cloth carrier with glue. Fillet shall then be formed around the fishplate by utilizing the oozed out glue. Excess glue shall be removed.
- (xv) After re-tightening the bolts, the joint shall be left for setting with tensor in the clamped condition. Tensor shall be used whether fabrication is done on cess or in-situ.
- (xvi) Electrical resistance shall be checked with insulation tester duly calibrated by appropriate Test House and ensured a minimum 10 Mega Ohm for the proper functioning of Glued Insulated Rail Joint before put in track/permitting the traffic movement.
- (xvii) In-Situ fabricated glued joints shall be supported on wooden blocks for a minimum of 24 hours.
- (xviii) If fabrication is done in running track, the traffic block shall be cancelled after re-fastening the removed rail fittings in their positions. Before, passing the traffic, it shall be ensured that no extra materials i.e. settled glue etc. remain on the top of the head and gauge face side of the rail.
- (xix) If fabrication is done in running track, speed restriction of 30 Kmph shall be imposed for 24 hours after completion of work for proper curing of in-situ fabricated glued joint with the least disturbance.

6.5 Post-fabrication Work:

- (i) All tools and equipment used should be cleaned off glue immediately after the fabrication of the In-situ glued joints.
- (ii) Megger test to check the insulation of In-situ fabricated glued joints must be done jointly with JE/SSE (P.Way) and JE/SSE (Signal).
- (iii) Record of In-situ fabricated glued joints should be maintained in a register for monitoring their performance. The record must indicate month/year of In-situ fabrication, name of the agency and results of the Megger test.

6.6 Precautions during Fabrication of In-situ Fabricated Glued Insulated Rail Joints:

The following precautions shall be taken during fabrication of in-situ fabricated glued insulated rail joints:

- (i) The mating surfaces of rail & fishplates shall be kept clean and free from oily traces and shall not be touched after cleaning.
- (ii) The workers shall wear hand gloves and apron while working. Contact of adhesive and cleaning chemicals with any part of the body/skin can be injurious and, therefore, shall be avoided.
- (iii) Any splash of resin on the body should be immediately removed with tepid soapy water. The use of solvents in such cases is not warranted.

TESTING AND INSPECTION OF GLUED JOINTS

3.0 All the facilities for carrying out stipulated tests on the glued joints should be available at the manufacturing site.

3.1 **Lot size:**

50 joints or part thereof shall form the lot for the purpose of testing and inspection of the joints.

3.2 **Dimensional check**

3.2.1 Every fabricated/assembled joint shall be checked for vertical and lateral alignment with 1 m long straight edge. The tolerances permitted shall be as under:

(i) Vertical alignment- Variation at the joint shall be within +1 mm and -0 mm measured at the end of 1 m straight edge placed at the top of rail head.

(ii) Lateral alignment- Variation at the joint shall not be more than ± 0.5 mm measured at the centre of 1 m straight edge placed along the gauge face.

3.2.2 All the other tests shall be carried out only if the joints are dimensionally satisfactory.

3.3 **INSULATION RESISTANCE TEST IN DRY CONDITION**

Each joint shall be subjected to insulation resistance test in dry condition. A meggering voltage of 100 V DC shall be applied across the joint. The value of the insulation resistance shall not be less than 25 megaohms.

3.4 **PULL-OUT TEST**

3.4.1 Only if the joints are found satisfactory in dimensional check (para 3.2) and insulation resistance test in dry condition (para 3.3), the pull-out test shall be conducted.

The pull out test shall be conducted by suitably gripping the two rail pieces of the joint and subjecting the joint to axial tension. One method of conducting the test is to hold one end of the glued joint with the help of fishplates as fixed end. The other end of the glued joint is held to a moving frame with the help of a wedge inserted in slots cut in the glued joint through the moving frame brackets. The arrangement is shown in figure 2. The other method of conducting the test is to hold the glued joint with the help of fish plates at both ends of the testing frame. One end of the testing frame remains fixed and the other is moved with the help of two hydraulic jacks operated simultaneously, the arrangement is shown in figure 3. Manufacturer can adopt any other method also with prior approval of RDSO.

3.4.3 Acceptance values:

The test joint shall be considered acceptable if there is no indication of separation between end posts and rail end(s) visible to the naked eye, at the pull out load values given in the table below:

S No.	Rail Section	Minimum pull out load in tonnes	
		G3 (L) type joint	G3 (S) type joint
1.	75R	110	70
2.	90R	125	85
3.	52 kg	150	100
4.	60 kg (UIC)	170	110

3.4.4 The basis for acceptance/rejection of the lot with respect to pull-out test shall be as follows:

Four joints should be randomly selected. Out of these four, two joints are to be subjected to pull-out test. If

(i) both joints pass, lot is cleared for insulation resistance test in wet condition ;

(ii) both joints fail, lot is rejected;

(iii) one joint fails, remaining two joints should be tested and if both pass, the lot is cleared for insulation resistance test in wet condition otherwise entire lot is rejected.

3.5 INSULATION RESISTANCE TEST IN WET CONDITION

Only two joints out of those joints which have successfully withstood insulation resistance test in dry condition (para 3.3) and pull out test (para 3.4) shall be tested for insulation resistance in wet condition. The joints shall be immersed in water for 48 hours in suitable clean water tank; and resistance shall be measured immediately after taking out the joint from the water by applying meggering voltage of 100 V DC across the joint and measuring current by an ammeter capable of measuring current upto micro-amperes. The insulation resistance determined by the ratio of voltage to current in amperes shall not be less than 3 kilo-ohms for each of the joint. If both the joint pass this test, the lot will be accepted.

3.6.3 Pieces of the rail of tested joints shall be returned by the manufacturer to the railway / purchaser.

3.7 DISPOSAL OF PULL-OUT TESTED JOINTS:

3.7.1 The pull-out tested joints shall not be repaired or welded and shall be distinctly marked 'NOT TO BE PUT IN TRACK' on both the surfaces of the web of the rail on either side of the joint with approved enamel **RED PAINT** immediately after the pull out test.

- 3.7.2 The pull out tested joints shall be dismantled soon after the inspection. Fishplates may be re-used in subsequent fabrications if their condition is satisfactory

3.8 **DISPOSAL OF REJECTED LOT**

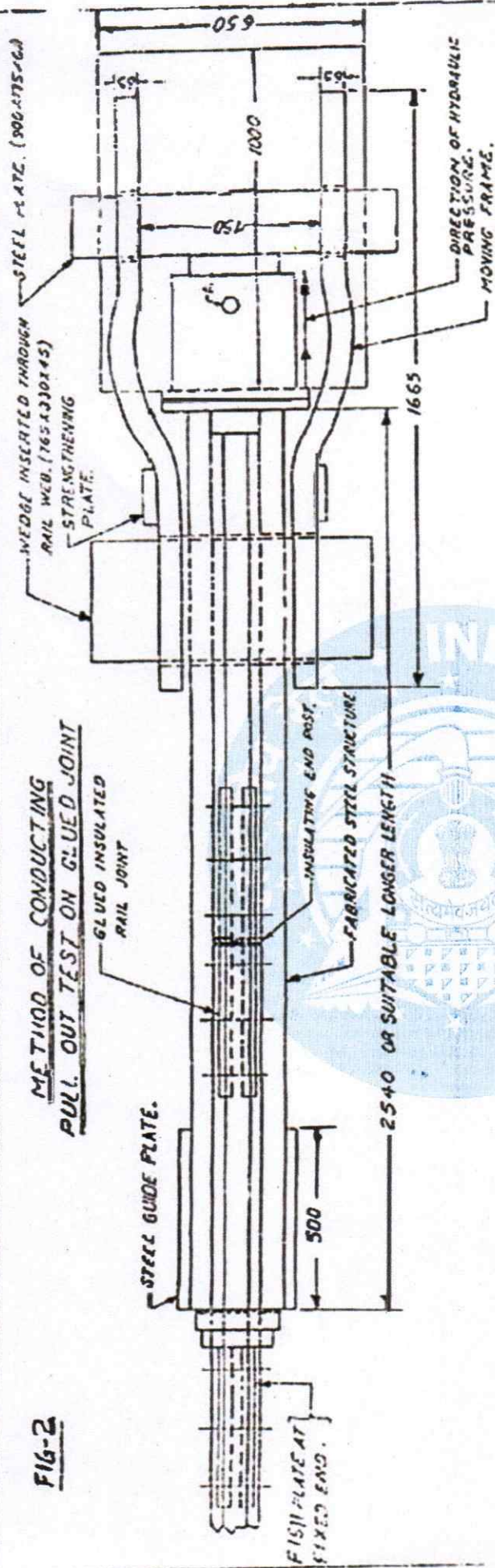
Each joint of the rejected lot shall be marked with red paint over at least 30 cm length at both ends

3.9 **MAINTENANCE OF RECORDS**

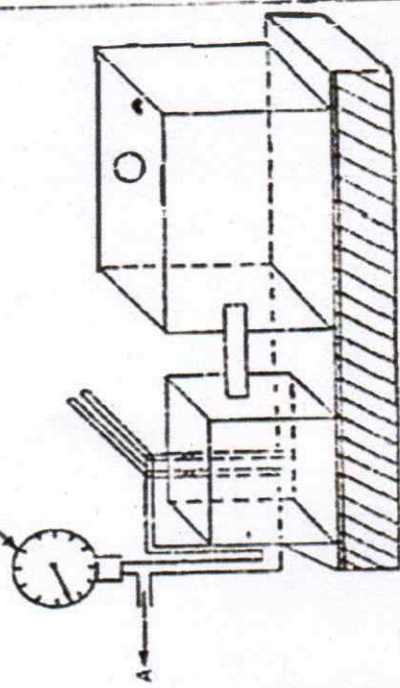
Records in respect of fabrication of glued joints should be maintained in the performae as given in Annexure G

FIG-2

**METHOD OF CONDUCTING
PULL-OUT TEST ON GLUED JOINT**



PRESSURE GAUGE.



HAND OPERATE HYDRAULIC PUMP

1. THE ABOVE METHOD IS ONLY SUGGESTION THE MANUFACTURER IS FREE TO ADOPT ANY OTHER SUITABLE VARIANT AND OBTAIN RDSO'S APPROVAL BY SENDING WORKING DRAWINGS OF PULL-OUT TESTING FRAME.
2. THE DETAILED DIMENSIONS OF STEEL BAR, SLOT, STEEL FRAME, WEDGES ETC. MAY BE MODIFIED/CALCULATED BY MANUFACTURER TO SUIT THE PULL-OUT LOAD TO BE APPLIED.
3. ALL DIMENSIONS ARE IN MILLIMETRES.

List of item control by Civil Directorates

QUALITY ASSURANCE CIVIL DTE.	
1	SPHEROIDAL GRAPHITE CAST IRON INSERT
2	ELASTIC RAIL CLIPS-III
3	ELASTIC RAIL CLIPS Mk-V
4	ELASTIC RAIL CLIPS – J
5	GLASS FILLED NYLON-66 INSULATING LINERS
6	POLYETHYLENE DOWEL
7	COMPOSITE GROOVED RUBBER SOLE PLATE (6.2 MM THICK)
8	GROOVED RUBBER SOLE PLATES (6MM THICK)
9	10 MM THICK GROOVED RUBBER SOLE PLATES
10	NYLON CORD REINFORCED ELASTOMERIC PAD
11	METAL LINERS
12	GLUED INSULATED RAIL JOINTS
13	FIBRE GLASS CLOTH WOVEN ROVING-360
14	HIGH TENSILE FISH BOLTS & NUTS
15	GLUE
16	FABRICATED SWITCHES
17	FABRICATED CROSSINGS
18	CAST MANGANESE STEEL CROSSINGS A (52Kg & 60Kg 1 in 8.5 and 1 in 12)
19	SWITCH EXPANSION JOINTS (SEJ)
20	SINGLE COIL SPRING STEEL WASHER
21	FISH PLATES
22	FISH PLATE BARS
23	SSD FOR OR CURVED SWITCHES
24	FUSION WELDING OF RAILS BY ALUMINO-THERMIC PROCESS
TRACK DESIGN DTE.	
1	RECONDITIONING OF CUPPED WELDED JOINTS
2	RECONDITIONING OF WHEEL BURNS/SCABS
3	H3B CLASS ELECTRODES (MINIMUM LIFE -35 GMT)
4	H3C CLASS ELECTRODES (MINIMUM LIFE -50 GMT)
5	IMPROVED SWITCH EXPANSION JOINT FOR 65 MM GAP (MAX.)
6	IMPROVED SWITCH EXPANSION JOINT FOR 80 MM GAP (MAX.)
7	CAST MANGANESE STEEL CROSSINGS B (60Kg 1 in 16 & Special Layouts)
8	10MM THICK CGRSP
9	METAL LINER
10	GFN-66 INSULATING LINER
11	SCGI INSERT
BRIDGES & STRUCTURES DTE.	
1	STEEL BRIDGE GIRDER
2	POT-PTFE BEARINGS
3	ELASTOMERIC BEARINGS
4	EXPANSION JOINTS

APPROVED VENDORS AND VENDORS FOR DEVELOPMENTAL ORDERS

GLUED INSULATED RAIL JOINTS

CONTROLLING AUTHORITY: QA CIVIL DIRECTORATE	INSPECTION AUTHORITY
SPECIFICATION: IRS MANUAL OF GLUED INSULATED RAIL JOINTS (1998) CORRIGENDUM NO. 6 OF SEP 2016	INITIAL QUANTITY: QA CIVIL DIRECTORATE
DRAWING NOS: 52 kg Rail Category, 52 kg & 60 kg Rail Category, 60 kg Rail Category, RDSO/T-2572, RDSO/T-5361, RDSO/T-5843, RDSO/T-671	REGULAR: RITES/CONSIGNEE RAILWAY

APPROVED VENDORS

Office Address and Ph. Nos.	Work's Address and Ph. Nos.	Firm Code	Drawing	Prod. Capacity (Per Month)
1. Arvind Industries Stephen House, 4, BBD Bag (E), III Floor, Room No. 51-C Kolkata-700001 Ph: 033-2231-4497/4498 Fax: 033-22314498Mob:	Arihant Complex, Howrah Amta Road, P.S.- Domjur, P.O.- Nanakundu, Village Rajapur, Howrah -711405 (W.B.) Ph: 033-64159491 Fax: Mob: arvindindustriesik@gmail.com	AI	52 kg & 60 kg Rail Category	385 Nos.
Allied/Sister Concern :		D.K.Steels, Kolkata		
Whether Micro/Small Enterprises :		Micro Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
2. Avdesh Tracks Pvt. Ltd. Plot No. D-51 Industrial Estate Phase-V, SAS Nagar, Mohali-160055 (Punjab) Ph: 0172-4621992 Fax: 0172-2652520Mob:	Village Jawaharpur, Ambala Road, Block Derabassi, Distt. Mohali-140507 (Punjab) Ph: 01762-645248 Fax: Mob: avdeshtracks@yahoo.in	ATL	60 kg Rail Category	455 Nos.
Allied/Sister Concern :		No Sister Concern.		
Whether Micro/Small Enterprises :		Small Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
3. Balaji Fastners Plot No.134, Sector-24 Faridabad(Haryana)-121005 Ph: Fax: Mob: 9818008888 pisplvinodgarg@yahoo.com	Plot No.134, Sector-24 Faridabad(Haryana)-121005 Ph: Fax: Mob: balajifastners@gmail.com	BLJ	52 kg Rail Category	420 Nos.
Allied/Sister Concern :		No Sister Concern		
Whether Micro/Small Enterprises :		Small Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
4. Bridge Track & Tower Pvt. Ltd. 18, R. N. Mukherjee Road, 6th Floor Kolkata -700001 Ph: 033-22489039/1696 Fax: 033-22485121/9599Mob:	Plot No. 403 - 407, 413-451, Sector-A, Urla Industrial Area, Raipur-492003 (C.G.) Ph: 033-22485121/9599 Fax: -Mob: - fng@btnti.com	MF	52 kg & 60 kg Rail Category	350 Nos.
Allied/Sister Concern :		No Sister Concern		
Whether Micro/Small Enterprises :		Micro Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
5. Calcutta Springs Limited. 18, R.N. Mukherjee Road, Kolkata-700001(W.B.) Ph: 033-22109542/43 Fax: 033-22486987Mob: - calsprings.group@gmail.com	Village: Sandhipur, P.O. Joy Nagar, NH-6 Howrah -711302 (W.B.) Ph: 033-26617214 Fax: -Mob: calsprings.group@gmail.com	CSL	52 kg & 60 kg Rail Category	350 Nos.
Allied/Sister Concern :		No Allied Concern		
Whether Micro/Small Enterprises :		Small Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
6. Cemfis India Pvt Ltd. Flat no. 2/3, G.K. Mansions, Pedawaltair, Visakhapatnam-530017, (A.P) Ph: - Fax: -Mob: - cemfisindia@gmail.com	Plot No.191, Industrial Growth Center, Bobbili-535558, Vizianagaram Dist.(A.P) Ph: 0891-2784235 Fax: -Mob: 09493906594 cemfisindia@gmail.com	CI	60 kg Rail Category	245 Nos.
Allied/Sister Concern :		No Sister Concern		
Whether Micro/Small Enterprises :		Micro Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		

Office Address and Ph. Nos.	Work's Address and Ph. Nos.	Firm Code	Drawing	Prod. Capacity (Per Month)
7. Chintpurni Engineering Work Pvt. Ltd. Wallmax House, HIG-4 Sector-E, Aliganj, Lucknow -226024 (U.P.) Ph: 0522-2329716 Fax: 0522-2331458Mob: cewbbk@hotmail.com	Jahangirabad Road, Barabanki - 225123 (U.P.) Ph: 05248-230300 Fax: Mob: cewbbk@hotmail.com	CEW	52 kg & 60 kg Rail Category	350 Nos.
Allied/Sister Concern :		No Sister Concern		
Whether Micro/Small Enterprises :		Small Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
8. Creative Engineers F/189, Road No. 5, Indraprastha Industrial Area, Kota -324005 (Rajasthan) Ph: 0744-2428021, 2427021 Fax: 0744-2361205Mob: creativeengineers189@gmail.com	F/189, Road No. 5, Indraprastha Industrial Area, Kota -324005 (Rajasthan) Ph: 0744-2428021, 2427021 Fax: 0744-2361205Mob: creativeengineers189@gmail.com	CRE	52 kg & 60 kg Rail Category	350 Nos.
Allied/Sister Concern :		No Sister Concern		
Whether Micro/Small Enterprises :		Small Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
9. D.K.Steels 4, BBD Bag (East), Stephen House 3rd floor, Room No. 51-C Kolkata-700001 Ph: 033-22314497 Fax: 033-22314498Mob: dkjain@vsnl.com	Arihant Complex, Dakshin Bari, P.O. Nonakundu, Domjur, Howrah-711405 Ph: 033-22314497 Fax: Mob: dksteelsik@gmail.com, dkjain@bsnl.com	DKS	52 kg & 60 kg Rail Category	420 Nos.
Allied/Sister Concern :		M/s Arvind industries & M/s Techma Engineering Enterprise Pvt Ltd.		
Whether Micro/Small Enterprises :		Small Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
10. Diamond Steel Industries Plot No-879, Sector-16, Faridabad-121002(Haryana) Ph: 0129-4073909 Fax: 0129-4073909Mob: 09810022285	Plot No.8, sarupur Industrial Area,, Sohna Road ,Faridabad(Haryana) Ph: 0129-4073909 Fax: Mob: diamondsteel@rediffmail.com	DSI	52 kg & 60 kg Rail Category	175 Nos.
Allied/Sister Concern :		No Sister Concern		
Whether Micro/Small Enterprises :		Micro Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
11. Dynamic Engineers Plot No. E-20, Chambal Industrial Area opposite Multi-metals, Kota-324003 Ph: 0744-2481721 Fax: 0744-2481723Mob: - info@dynegg.com	Plot No. E-20, Chambal Industrial Area opposite Multi-metals, Kota-324003 and Khasra no. 24, Polaikalan, Kota Ph: - Fax: -Mob: -	DYN	52 kg & 60 kg Rail Category	385 Nos.
Allied/Sister Concern :		NO Sister Concern		
Whether Micro/Small Enterprises :		Small Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
12. Eastern Track Udyog Pvt. Ltd. 5A, Justice Dwarkanath Road, 4th Floor Kolkata-700020(WB) Ph: 033-22314263 Fax: 033-24869515Mob: 9903597721 kediakedia@jaidadigroup.com	Village: Nakrajoria, P.O.: Salanpur, Distt.: Burdwan -713357 (W.B.) Ph: 03412015153 Fax: Mob: kediakedia@jaidadigroup.com	ETU	52 kg & 60 kg Rail Category	420 Nos.
Allied/Sister Concern :		Ked Sati Iron & Steel Pvt. Ltd. Kolkata and Eden Vinimay Pvt.Ltd.Kolkata		
Whether Micro/Small Enterprises :		Small Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
13. Eden Vinimay Pvt. Ltd. 22, Strand Road, Ground Floor Kolkata-700001 Ph: 033-22105764 Fax: 033-22308424Mob: kediakedia@jaidadigroup.com	Village: Nakrajoria, P.O. Salanpur, Distt. Burdwan -713357 (W.B.) Ph: 0341-1215153 Fax: Mob: eden_vinimay2009@rediffmail.co, kediakedia@jaidadigroup.com	EDV	52 kg & 60 kg Rail Category	437 Nos.
Allied/Sister Concern :		Eastern Track Udyog Pvt. Ltd., Kolkata Ked Sati Iron & Steel Pvt. Ltd., Kolkata		
Whether Micro/Small Enterprises :		Small Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		

Office Address and Ph. Nos.	Work's Address and Ph. Nos.	Firm Code	Drawing	Prod. Capacity (Per Month)
14. Fateh Chand Jain 1433, Sector-16,, First Floor, Faridabad-121002(Haryana) Ph: Fax: 0129-4071433Mob:	Plot No. 22, Gali No. 8-B,, Sarurpur Industrial Area, , Faridabad(Haryana) Ph: Fax: Mob: fchandjain@yahoo.in	FCJ	52 kg & 60 kg Rail Category	210 Nos.
Allied/Sister Concern :		No Sister Concern		
Whether Micro/Small Enterprises :		Micro Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
15. Ganpati Industrial Pvt. Ltd. 2, Hare Street (Nicco House), 3rd Floor, Kolkata-700001 Ph: 033-22484772 Fax: 033-22481877Mob: sales@jekay.com, ganpati@jekay.com	Plot No. 65 & 66, Sector - C, Urla Industrial Area, URLA, Raipur - 493221 (C.G.) Ph: 0771-4212500 / 513/514 Fax: 0771-4212555/526Mob: ganpati@jekay.com	GI	52 kg & 60 kg Rail Category	350 Nos.
Allied/Sister Concern :		R.V Rail Products (P) Ltd., Kolkata		
Whether Micro/Small Enterprises :		Small Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
16. Haryana Metal Fabricators Plot No.1410, sector 16, Faridabad- 121002(Haryana) Ph: 09868223211,0129-4101410 Fax: 0129-4101410Mob:	Plot No. 61, Gali No. 6W, Sarurpur Industrial area, Sohna Road, Faridabad. Ph: Fax: Mob: hmfrail@gmail.com	HMF	52 kg & 60 kg Rail Category	210 Nos.
Allied/Sister Concern :		No Sister Concern		
Whether Micro/Small Enterprises :		Micro Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
17. Indiana Track Engineers F-80, Phase-7, Industrial Area SAS Nagar, Mohali-160055 Ph: 0172-5090843-44 Fax: 0172-5090843Mob: 8427756872 indianatrack@gmail.com	E- 140, Phase-7, Industrial Area SAS Nagar, Mohali- 160055 Ph: 0172-5090842 Fax: Mob:	ITE	52 kg & 60 kg Rail Category	350 Nos.
Allied/Sister Concern :		No sister concern		
Whether Micro/Small Enterprises :		Micro Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
18. Jagdambe Track Fasteners B-29, Jhilmil Industrial Area, Near Saibaba Temple, shahdara, Delhi- 110095 Ph: 011-43070340, 09818531700 Fax: 0129-4043872Mob:	G1-353A , Industrial Area, Chopanki Bhiwadi, Distt. Alwar-302019 (Rajasthan) Ph: 09910045777/09910218800 Fax: 01142420130Mob: jagdambeTrackFastners@gmail.com	JTF	60 kg Rail Category	175 Nos.
Allied/Sister Concern :		Nityannand Aasocifts Delhi & M/s Republic Sales (India), New Delhi.		
Whether Micro/Small Enterprises :		Small Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
19. Ked Sati Iron & Steel Pvt. Ltd. 5A, Justice Dwarkanath Road, 2nd Floor, Kolkata-700020 (WB) Ph: Fax: Mob:	18, Gadhadhar Bhatta Road, Liluah, Howrah (W.B.)711102 Ph: 033-26451492 Fax: Mob: 7890877137 kediakedia@jaidadigroup.com	KS	52 kg & 60 kg Rail Category	315 Nos.
Allied/Sister Concern :		Eastern Track Udyog Pvt. Ltd. Kolkata and Eden Vinmay Pvt. Ltd. Kolkata		
Whether Micro/Small Enterprises :		Small Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
20. Kushal Engg. Company F132/133, Ark Arcade, first floor shri Ashtavinayak CHS Ltd., Ganesh Chowk , Old D.N Nagar ,Andheri(W) Mumbai-400053(M.H) Ph: 0220-26255950/022-26255902 Fax: 022-22641460Mob: 7738390944 kushlEng123@gmail.com	Village: Vadavali, Mohana Road, Kalyan , Thane Distt. (MH)-421102 Ph: 0201-2272804 Fax: Mob: etours@born3.vsnl.net.in; kushaleng123@gmail.com	KEC	52 kg & 60 kg Rail Category	420 Nos.
Allied/Sister Concern :		No Sister Concern		
Whether Micro/Small Enterprises :		Small Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		

Office Address and Ph. Nos.	Work's Address and Ph. Nos.	Firm Code	Drawing	Prod. Capacity (Per Month)
21. Oberoi Thermit Pvt. Ltd., D-33, Sector-59, Noida-201301 Ph: 0120-4261938,4336499 Fax: 0120-4331938Mob: 8527122228 railwelding@oberoithermit.com	Plot no.33 Sector 11, IIE, SIDCUL, Haridwar - 249403(Uttarakhand) Ph: 01334-239798 Fax: 01334-239799Mob: railwelding@oberoithermit.com	OT	52 kg & 60 kg Rail Category	437-Nos.
Allied/Sister Concern :		No Sister Concern		
Whether Micro/Small Enterprises :		Small Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
22. Paramount Enterprises 4-1-889/16/3, Tilak Road, Hyderabad -500001 Ph: 040-24753325 Fax: 040-24758853Mob: perailtech@gmail.com	Survey No. 142, 38/2 Km, Hyderabad -Vikarabad Road, Chevella Mandal, R.R. Distt. ,Kandawada -501503 (Telangana) Ph: 040-24753325 Fax: 24758853Mob: perailtech@gmail.com	PE	52 kg & 60 kg Rail Category	315 Nos.
Allied/Sister Concern :		No Sister Concern		
Whether Micro/Small Enterprises :		Small Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
23. Rahee Track Technologies Private Limited NH-6, P.O. Argori, P.S. Sankrail, Jangalpur Howrah-711 302 (WB) Ph: 033-64552125/26 Fax: 033-26698282Mob: infortt@rahee.com	N.H.-6 Post Office- Argori, P.S. Sankrail, Jangalpur , Howrah- 711302 (WB) Ph: 033-64552125/26 Fax: 033-26698282Mob: infortt@rahee.com	RTT	52 kg & 60 kg Rail Category	263 Nos.
Allied/Sister Concern :		Rahee Track Technologies Pvt. Ltd Howrah		
Whether Micro/Small Enterprises :		Others		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
24. Shanti Udyog Co. B-22 & 24, Phase-I, Adityapur Industrial Area Jamshedpur-831013 (Jharkhand) Ph: Fax: Mob:	B-22 & 24, Phase-I, Adityapur Industrial Area , Jamshedpur - 831013 (Jharkhand) Ph: 0657-2371533 Fax: 0657-2371533Mob: shantiudyog@rediffmail.com	SUC	52 kg & 60 kg Rail Category	280 Nos.
Allied/Sister Concern :		No Sister Concern		
Whether Micro/Small Enterprises :		Small Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
25. Shivom Enterprises D-235-B Vivek Bihar Ph.1,2nd floor, Delhi-110095 Ph: Fax: Mob: 9871003939,9811234623,99101726 26 ashokahuja07@gmail.com, shivom_730yahoo.com	H1-730 Industrial Area, Chopanki, Bhiwadi, Distt Alwar (Rajasthan)-301 019 Ph: Fax: Mob: ashokahuja07@gmail.com	SOM	60 kg Rail Category	210 Nos.
Allied/Sister Concern :		Jagdambe Track Fasteners Delhi & Republic Seles (India) New Delhi		
Whether Micro/Small Enterprises :		Micro Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
26. Shyamashyam Gluetech Corporation Opp. Sudhir Dharam Kanta, Mathura Road, Sikandara Agra -282007 (U.P.) Ph: 0562-2641348 Fax: Mob:	Opp. Sudhir Dharam Kanta, Mathura Road, Sikandara , Agra -282007 Ph: 0562-2641348 Fax: Mob: rajatgeminissgc@yahoo.com	SGC	52 kg & 60 kg Rail Category	350 Nos.
Allied/Sister Concern :		No Sister Concern		
Whether Micro/Small Enterprises :		Small Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
27. Srinivasa Enterprises 14/173, Sarvodaya Nagar, Main Road,, Saroonagar Mandal, Meerpet Hyderabad-500097 (Telangana) Ph: Fax: 07569194908Mob: 09949111088	Plot No-7,8 & 9, Survey No 51 & 52, Main Road,, Saroonagar Mandal, Nadergul (v), Distt- Ranga Reddy -501510 (Telangana) Ph: 08415-245246 Fax: 07569194908Mob: gluedjoint@yahoo.co.in	SE	52 kg & 60 kg Rail Category	315 Nos.
Allied/Sister Concern :		No Sister Concern		
Whether Micro/Small Enterprises :		Micro Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		

Office Address and Ph. Nos.	Work's Address and Ph. Nos.	Firm Code	Drawing	Prod. Capacity (Per Month)
28. The India Thermit Corporation Ltd. 84/22, Fazalganj, Kanpur-208012 Ph: 0512 - 2215161-64 Fax: 2216423, 2220125Mob: 7408440080 qc@indiathermit.com, general@indiathermit.com	C-27 & 28 Panki Industrial Estate, Kanpur-208022 Ph: 0512-2691523 Fax: 0512-2691523Mob:	ITC	52 kg & 60 kg Rail Category	437 Nos.
Allied/Sister Concern :		No Sister Concern		
Whether Micro/Small Enterprises :		Others		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
29. The Kotson Engg. Corp. 18-12-16, Andhra Ratna Road Tenali -522201 (A.P.) Ph: 08644-228795 Fax: 08644-228795Mob:	Krishna Canal Railway Station,,Tadepalli , Vijaywada (A.P.)- 522501 Ph: 08645 - 272479 Fax: 08645 - 272419Mob: kotsoninfra@gmail.com	KE	52 kg & 60 kg Rail Category	437 Nos.
Allied/Sister Concern :		No Sister Concern		
Whether Micro/Small Enterprises :		Small Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
30. Tirupati Metal Fabricators 1433, Sector-16, Faridabad- 121002(Haryana) Ph: 0129-4071433,09818161665 Fax: 0129-4071433Mob:	Plot No.1A, Gali No. 8-B, sarurpur Industrial Area,,Faridabad(Haryana) Ph: Fax: Mob: t.mfabricators@yahoo.in	TMF	52 kg & 60 kg Rail Category	175 Nos.
Allied/Sister Concern :		No Sister Concern		
Whether Micro/Small Enterprises :		Micro Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		
31. Vaishno Mata Track Plot No- 1410, Ist Floor, Sector- 16, Faridabad-121002 Ph: - Fax: 0129-4101410Mob: 9868223211 vaishnomata81@gmail.com	Village Raipurkalan Tigaon- Munjhawali Road, Faridabad-121101 (Haryana) Ph: Fax: Mob: vmtrack@gmail.com	VMT	60 kg Rail Category	175 Nos.
Allied/Sister Concern :		No Sister Concern		
Whether Micro/Small Enterprises :		Micro Enterprise		
Whether Owned by Schedule Caste/Schedule Tribe/Others :		Others		