



इंजीनियरिंग कारखाना, साबरमती

AUTOMATIC RAILWELDING PLANT



BRIDGE WORKSHOP SHED



HISTORY OF WORKSHOP

The bridge workshop, which was originally functioning at Valsad with a staff strength of about 500 with annual production amounting to Rs. 30,00,000/-, was shifted to Sabarmati in June, 1958 to cater the requirement of both BG & MG sections of civil engineering department of this Railway. The engineering workshop, Sabarmati came into existence on 2nd June 1958. At the time of shifting, there were only three shops viz. structural shop, plant repair shop & points & crossing shop. The average monthly turnover of the structural shop was 80 ton while average production of points & crossing shop was 6 sets.

With the pressing demand from divisions and construction department, the capacity of existing shops was increased and new shops like foundry, flash butt welding, smithy for conversion of ST sleepers and manufacturing of tie-bars were added over a period of time. Out of these new shops, foundry shop was closed as per Railway Board's Policy.

In flash butt welding shop, initially AI welding plant of England make having maximum butting force of 37 ton was installed in the year 1964. This plant had capacity to weld 90R/52 kg - 72 UTS rails. Flash butt welding plant, namely ESAB plant of Sweden make was installed in the year 1983 as replacement of overage old AI plant. However, in order to meet the requirement of FBW Joints in field, both the plants worked with the permission from Railway Board. Later on, due to over age of AI welder plant it was condemned in September-2007. ESAB plant had 79 ton butting force capacity & was capable of welding 60 kg /52 kg 90 UTS rails.

The location of engineering workshop, Sabarmati including flash butt welding plant at old location was identified for development of centralized maintenance depot by NHRCL. As such engineering workshop, Sabarmati including flash butt welding plant set up were shifted to new location (about 2 Km away from old workshop) chargeable to NHRCL.

DETAILS OF VARIOUS SHOPS AND MAIN ACTIVITIES THEREIN

Shop	Activities
BRIDGE WORKSHOP	<ul style="list-style-type: none">❖ Fabrication of all type of steel bridge girders.❖ Regular fabrication : Welded Plate Girders up to 12.2 & 18.3 m Span Welded open web girder for span of 30.5& 45.7m (Through). Fabrication of 30.5m Underslung welded girder.❖ Fabrication of all types of jigs & fixtures required for fabrication of steel bridge girders.❖ Developing Jigs & fixtures for fabrication of 61.0m span Welded Open Web Steel Bridge Girder.
FLASH BUTT WELDING SHOP	<ul style="list-style-type: none">❖ Welding of new Rails (60kg-R260 grade) for making it 20 Rail Panel length.
TOOL ROOM SHOP	<ul style="list-style-type: none">❖ Aiding STR shop in fabrication work of steel bridge girders❖ Innovative works❖ Joggling of fishplates.❖ Manufacturing & repairs of EUR, Threader, funnel chute.❖ Repairs to machines parts required for day to day maintenance of machines
MILL WRIGHT SHOP	<ul style="list-style-type: none">❖ Repair and maintenance of plant and machineries of entire Workshop.
QUALITY CONTROL LABORATORY	<ul style="list-style-type: none">❖ Equipped with sophisticated special purpose machine for testing of rail joints, strength of material etc.❖ Non-destructive testing of materials such as X-ray examination, Dye penetration and magnetic particle testing, USFD Testing.❖ Metallurgical examination of material.
SOIL MECHANICS LABORATORY	<ul style="list-style-type: none">❖ Ballast testing and soil investigation in connection with rehabilitation of weak formation.

Salient features of New Flash Butt Welding Plant at Sabarmati

FBW shop comprises mainly:-

- **Gantry -2:** 132 m x 76 m
Rail feeding area for feeding of rails (13 m, 26 m)
- **Machine shed :** Length 145 m comprising 20 types of machines.
- **Gantry -1:** 260 m x 49 m
For handling 260 m long welded rail panels
- Cost of new flash butt welding workshop: Rs. 85 Crore
- This shed comprises mainly following machines:

DESCRIPTION	QTY.
Automatic Rail Flash Butt weld machine with electrical equipment, instrumentation, automation system of Schlatter make	1
Rail brushing machine	1
Rail pre-straightening machine	1
Rail grinding machine for finishing of joints.	1
Rail profile weld grinder	6
Rail post straightening press	1
Rail hydraulic test press	1
De-mineralization plant	1

- Workshop is certified with ISO certificate since the year 2023 and validity up to 2026.

Sr. No.	Item	Capacity
1.	Stacking capacity of 13 m long free rails	15.509 TKM
2.	Stacking capacity of 26 m long free rails	130.312 TKM
3.	Stacking capacity of 260 m long welded rail panels	105.95 TKM
4.	Stacking capacity of 260 m long metalized rail panels	85.15 TKM
5.	Welding capacity of Schlatter plant with two shifts working of 08 hours each	652.08 TKM/year

Free rails available as on date 20.05.2024 :

60 Kg 880 Grade : 0.75 Tkms

60 Kg R260 Grade : 23.354 Tkms

52 Kg 880 Grade : 23.908 Tkms

New flash butt welding (FBW) plant

- ❖ Final QAP for 60 kg R-260 Gr. rails has been approved by RDSO-LKO on 13.09.2023 incorporating standardized weld parameters.
- ❖ Vide Rly. Bd. letter no. Track/22/98/05/08/7 Vol. IV Dt. 25.07.2022, Rly. Bd. decided, in principle, to hand over the flash butt welding plant, Sabarmati/W.Rly. to SAIL-BSP for operation and maintenance of FBW plant by SAIL-BSP.
- ❖ MoU between Railways and SAIL regarding handing over of FBW infrastructure to SAIL was done on 26.12.2022.
- ❖ The FBW plant is operated and maintained by SAIL-BSP.

Salient features of new bridge workshop (Structural shop) at Sabarmati

- New engineering bridge workshop at Sabarmati commissioned on 15.06.2021
- Area of Machine Shed in Workshop = 7200 SQM (approx.)
- Total 29 types of machines of bridge workshop received and commissioned at site. Apart from conventional machines, this comprises new modern state of the art imported CNC machines also which are capable of high productivity with precise accuracy. This shed comprises mainly following machines:
 - ❖ Plate straightening machine from M/S Nantong, China-01 no.
 - ❖ CNC Plate cutting machine (1 plasma head and 1 oxy fuel head) along with gas manifold) – 01 no.
 - ❖ CNC Plate drilling machine from M/S Shandong SCM, China – 02 nos.
 - ❖ CNC Beam welding machine from M/S NUOVO CMM, Italy-01 no.
 - ❖ CNC Beam drilling machine from M/S Shandong: SCM, China-01 no.
 - ❖ CNC Gantry type MIG welding machine (2 heads) – 02 nos.
 - ❖ Automatic shot blasting machine- 01 no.
 - ❖ Goliath cranes – 05 nos.
 - ❖ Metalizing and shot blasting shed (Approx. area is 469 sqm)
 - ❖ Outer Goliath crane area (Approx. area is 9000 sqm)
 - ❖ Template shop (Approx. area is 638 sqm)
- **Other Important features**
 - Cost of new bridge workshop: Rs. 61.3 Crore
 - Workshop is certified with ISO since the year 2023.
- **Available work order and planning of procurement of steel**
 - Pending work orders for fabrication on hand as on date: 10184 MTs
 - On hand steel available: 7676 MTs
 - Purchase order placed and supply awaited: 6135 MTs
 - Sanctioned Indent pending for placing purchase orders: 235 MTs
 - Indent under process of sanction: nil