APPENDIX "II"

STANDARDISATION OF INFRASTRUCTURAL FACILITIES IN AIR BRAKE ROH DEPOTS

Air brake depots have been classified based on the target capacity for ROH outturn/month as follows :

Category	Targeted capacity for ROH (Average/month)
Super Depots	Above 500
Mega Depots	250 to 500
Major Depots	125 to 250
Minor Depots	Upto 125

A. RECOMMENDED LAYOUT

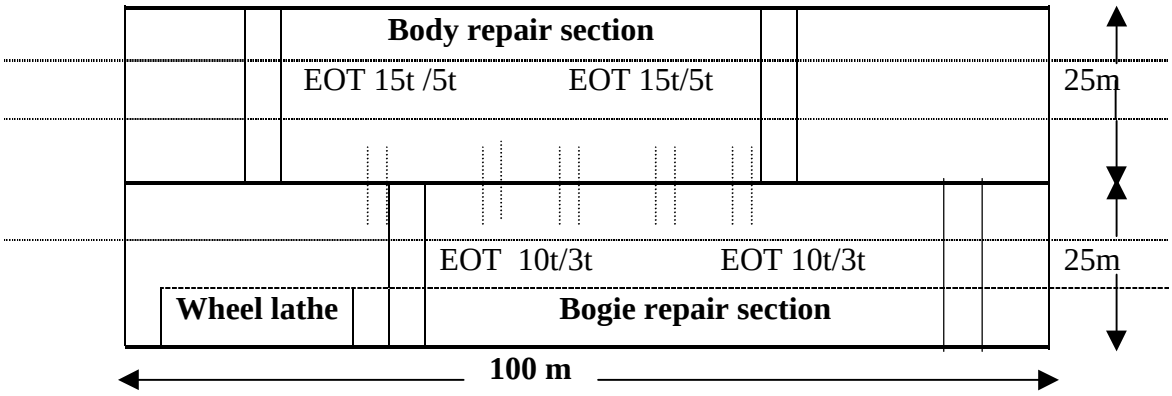
Analysis of sick marking of existing ROH depots on IR reveals that on an average each air brake wagon visits the depot thrice in 18 months, once for schedule ROH and twice for out of course repairs requiring lifting.

Therefore, an air brake depot meant for undertaking 250 ROHs/month needs to tackle another 500 wagons/m out-of-course repairs requiring lifting. Thus the layout should be spacious enough to release about 25-30 wagons/day.

The ROH schedule should be completed within 24 hours including placement and withdrawal time. Thus, if the depot has to undertake 250 ROHs/month the berthing capacity for ROH wagons **on trestles** should be 12 taking 20% margin for heavy repairs. Considering a mixed ROH outturn and the working length for BOXN as 15m & BCN/BTPN as 20 m, the length of the ROH depot works out as 100 m.

Casnub bogies require extensive repairs of bogie components. These bogies need to be tackled on bogie manipulators to ensure downhand welding. All wearing surfaces need to be built up to original (new) sizes. Further, all modifications issued by RDSO need to be implemented to ensure adequate safety. The bogie section is required to supply 20 bogies/day for undertaking 250 ROHs/month apart from repairing bogies required for out-of -course repairs. For this purpose, adequate work stations need to be set in a cranage area of about 2500 sq.m. (including wheel lathe area).

Recommended layout of bogie and body repair section for a Major depot undertaking 250 ROHs per month along with sick line work of out-of-course repairs is given on next page:



Further details of the model layout and its end view are given in the attached Fig. II-A. The above layout has to be supplemented with facilities for Stores, machine shop, smithy shop, air brake equipment overhauling sections, model room, compressor room, canteen, hostel, etc. which will largely depend on the existing layout.

Covered area under cranes i.e. cranage area for a fixed ROH outturn is a function of placement/withdrawal and number of working shifts. The recommended cranage area for depots undertaking 250 to 500 ROHs per month is given below:

1. For ROH depots WITH sickline attention		
250 ROHs/month + sick line repairs with double shift.		5000 sq. m including wheel lathe shed.
300	ROHs/month + sick line repairs with double shift.	5600 sq. m.
350		6200 sq. m.
400		6800 sq. m.
450		7400 sq. m.
500		8000 sq. m.

2. For ROH depots WITHOUT sickline attention
Depots undertaking only ROH workload and no out-of-course repairs can manage the outturn of 250 ROHs/month in about 3000 sq. m. cranage area working in double shifts.

MODEL LAYOUT FOR UNDERTAKING 250 ROHs/ MONTH

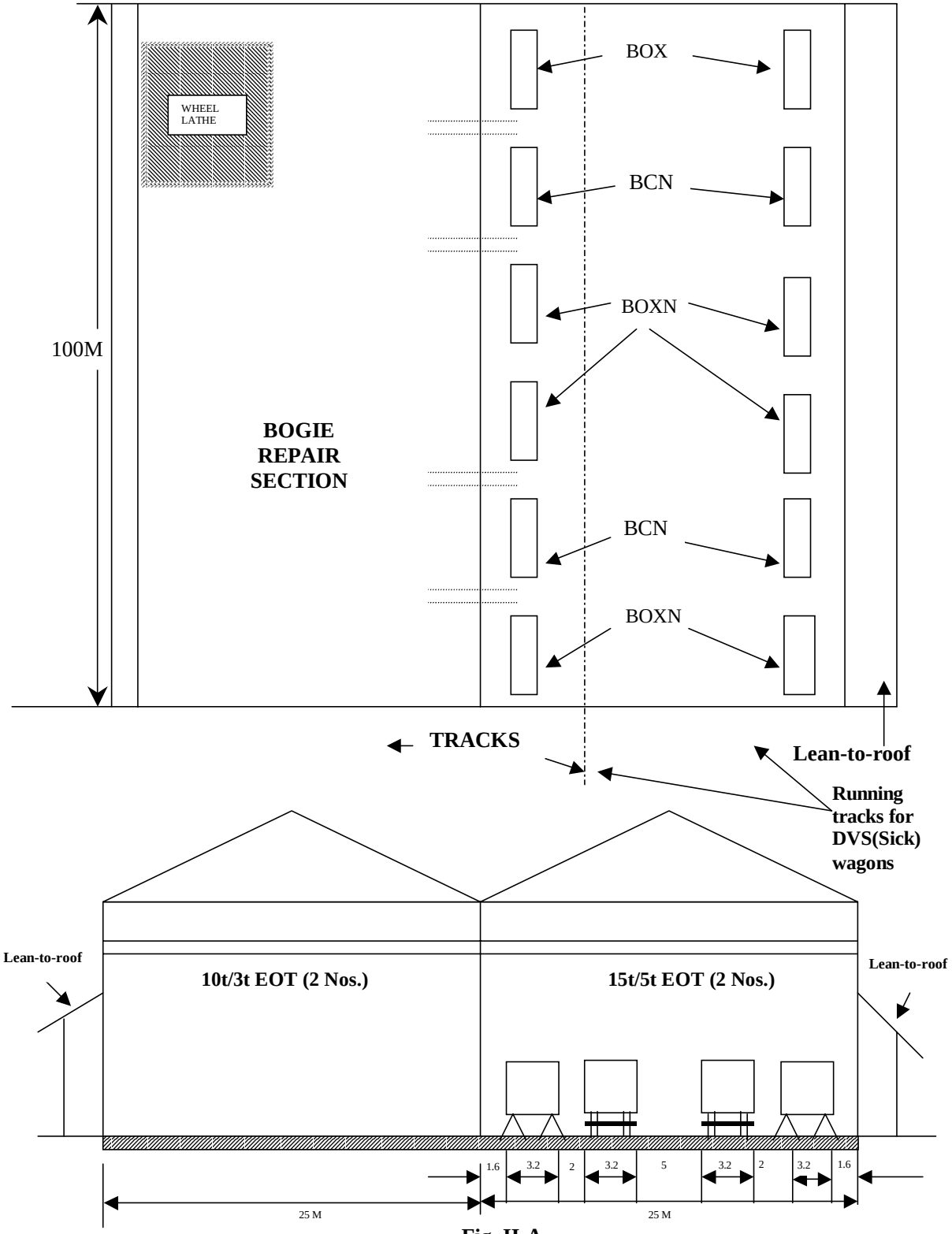


Fig. II-A

B. REQUIREMENT OF MACHINERY AND PLANTS

M&P requirement is closely linked with the Depot layout and the system of working. Certain M&Ps are directly related to outturn of depot (e.g. welding machines) but certain M&Ps are related to depot layout, especially material handling equipment. Various repair centres/sections in a depot are as follows :

1. Body shop
2. Bogie shop
3. Air brake equipment
4. Wheel reconditioning
5. Machine shop & material reclamation
6. Stores
7. Black smithy shop
8. Training equipment
9. Canteen & Staff amenities
10. Management information system
11. Office equipment
12. CMT laboratory
13. Miscellaneous.

Recommended list of M&P for a unit depot i.e. handling 250 ROH per month has been prepared. For a depot handling more than 250 ROH per month, the requirement has to be scaled up depending on depot layout and facilities created. Requirement of M&P for each section is given below:

1. Body section

Sr.No.	**M&P**	**Quantity**
1	EOT cranes 15t/5t	2 Nos.
2	Welding machines	4 Nos.
3	Portable hydraulic rivetter	1 Nos.
4	Trestles	12 sets
5	PC terminal (common with bogie section if layout permits)	No. will depend on layout.
6	Winches	As per layout
7	Portable Grit Blasting Machine	1 No.

2. Bogie section

1	EOT crane 10t / 3t	2 Nos.
2	Welding machines	6 Nos.
3	Portable hydraulic rivetter	1 Nos.
4	Stores bin	20 Nos.
5	Portable electric griders	3 Nos.
6	Jib crane 2.5t	10 Nos.
7	Fixture for rivetting spring plank	2 Nos.

8	Work station for bogie repair	10 Nos.
9	Turn table for wheel sets	As per layout.
10	Road crane 10t capacity	1 No.
11	Bogie manipulators	3 Nos.
12	Roller bearing diagnostic equipment	2 Nos.
13	Magnetic flaw detector	2 Nos.
14	CO_2 welding machine	2 Nos.

3. Air brake equipment

1	Elec. Stationery screw air compressor complete with air receiver 15 m 3/min (This is for depot only. Additional compressors will be required for yard).	1 No.
2	Portable diesel compressor	1 No.
3	Single Wagon test rig	2 Nos.
4	DV test stand	1 No.
5	Hydraulic pipe bending machine	1 No.
6	Air conditioners with voltage stabilizer	2 Nos.
7	Torque wrench with various sizes of sockets less than 1 inch.	4 set.
8	Ultrasonic cleaning table for DV components	1 Nos.

4. Wheel Reconditioning Equipment

1	Surface wheel lathe with Servo controlled voltage stabilizer	1 No.
2	Pneumatic torque wrench with sockets 1” to 2”	4 sets
3	Pressure grease drum with guns 15t capacity.	2 Nos.
4	Ultrasonic flaw detector	2 Nos.
5	Bearing marking gadget	1 set
6	Mono-rail for handling swarf (detail plan will depend on layout)	1 set
7	Bins for storing bearings	As per requirement
8	Fork lifter 2.5t	1 No.
9	P.C. Terminal	1 No.
10	Wheel diameter measuring gauge	2 Nos.

5. Machine shop & material reclamation

1	Heavy duty shaping machine	1 No.
2	Jib crane 2.5t	1 No.
3	Centre lathe 12 ½” cap.	1 No.
4	Redial drilling machine	1 No.
5	Centre lathe 6” cap	1 No.
6	Bench drilling machine	1 No.
7	Heavy duty pedestal grinder double ended	1 No.
8	Shearing machine 6 mm	1 No.

6. Stores

1	Truck 10t capacity	1 No.
2	Tractor with hydraulic lifting machine and 3 trolleys (trailers)	1 No.
3	Fork lift 2t	2 No.
4	Platform truck 2t	2 Nos.
5	Battery charger	2 No.
6	Weighing machine 500 kg	1 No.
7	Light store vehicle	1 No.
8	Hand trolleys with rubber wheels	10 Nos.
9	Storage racks	As per layout
10	Computer terminal with printer	1 No.
11	Furniture	As per layout

7. Black smithy

1	Black smithy hearth	1 No.
2	Anvil	1 No.
3	Hand tools	5 sets
4	Motorised blower	1 No.

8. Training equipment

1	Cut models of DV, SAB, Angle cock.	1 No. of each design
2	Television (large screen) projector type	1 No.
3	VCR	1 No.
4	Furniture	As per layout
5	Hostel along with kitchen equipment	
6	Overhead projector	1 No.
7	LCD projector	1 No.

9. Canteen & staff amenities

1	Water cooler	3 No.
2	Stainless steel tables & chairs	As per reqt.
3	Kitchen equipment, cooking gas, utensils	As per reqt.
4	Fitter's lockers	As per reqt.

10. Office Equipment

1	PC terminal	2 No.
2	Printer	1 No.
3	Furniture	As per layout

4	Air conditioner for DME's chamber & computer room.	3 No.
5	Intercom 10 lines	1 No.
6	Fax with P&T line	1 No.
7	First aid equipment	4 set
8	Photocopier	1 No.
9	V.H.F. sets.	10 sets

11. Miscellaneous

1	Gas cutting equipment	4 Nos.
2	Hydraulic jacks	As per requt.
3	SAB test bench	1 No.
4	CBC and draft gear replacement equipment	1 No.
5	DG set 350/500 KVA	1 No.
6	Lumpsum for electric and pneumatic tools	
7	Lumpsum for fitter's hand tools.	
8	Lumpsum for gauges & instruments.	
9	Wheel flat detector system	*
10	Wheel flange welding machine	*

(*) To be installed in depots/yards as per instructions of Railway Board.

12. Where power failures are rampant, a Diesel Generating Set to run the wheel lathe and cranes may also be planned.

■■■■■