

Goods Yard Infrastructure



Presented by-

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INFRASTRUCTURE FACILITIES

(For Freight yard, Sick line and ROH Depots)

A. Categorization of Examination / Repair facilities

I. Intensive Examination Points	
Category	Criteria for Categorization
A	(i) Having pucca pathways on more than 50% of the lines nominated for examination.
	(ii) Sufficient illumination facilities 150 lux.
	(iii) Sufficient material handling facilities.
	(iv) Sufficient welding facilities.
B	(i) Having pucca pathways on more than 50% of the lines nominated for examination.
	(ii) Sufficient illumination facilities.
	(iii) Sufficient material handling facilities.

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I. Intensive Examination Points	
Category	Criteria for Categorization
C	(i) Having pucca pathways on more than 50% of the lines nominated for examination.
	(ii) Sufficient illumination facilities.
D	(i) Having pucca pathways on more than 50% of the lines nominated for examination.
E	No pucca pathway but some other facilities are available
F	No facilities available.

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II. ROH Depots	
Category	Criteria for Categorization
A	Where all the infrastructural facilities are adequate.
B	Where all the infrastructural facilities are available but some not adequate to match target out turn.
C	Where some vital infrastructural facilities like EOT crane/wheel turning lathe etc. are not available, other facilities are adequate.
D	Where facilities are grossly inadequate or non-existent.

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A. Categorization of Examination / Repair facilities

III. Sicklines	
Category	Criteria for Categorization
A	(i) Berthing capacity under covered shed
	(ii) Heavy duty concrete flooring in working area.
	(iii) Availability of welding facility.
	(iv) Availability of Compressor/ Exhauster.
	(v) Availability of EOT crane.
B	(i) Berthing capacity under covered shed
	(ii) Heavy duty concrete flooring in working area.
	(iii) Availability of welding facility.
	(iv) Availability of Compressor/ Exhauster.
	(v) Synchronized whiting jacks.

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(For Freight yard, Sick line and ROH Depots)

A. Categorization of Examination / Repair facilities

III. Sicklines	
Category	Criteria for Categorization
C	(i) Berthing capacity under covered shed.
	(ii) Heavy duty concrete flooring in working area.
	(iii) Availability of welding facility.
	(iv) Hydraulic Jacks for lifting.
D	(i) Berthing capacity under covered shed.
	(ii) Heavy duty concrete flooring in working area.
E	Berthing capacity under covered shed.
F	Without any Berthing capacity under covered shed.

INFRASTRUCTURE & FACILITIES REQUIRED IN THE YARD

- i. Centre to centre distance between tracks for nominated lines for conducting intensive examination should be minimum 7.5 meters.
- ii. Concrete pathways, material handling equipment, multi utility vehicle to facilitate movement of man and material smoothly from one end to other end.
- iii. Proper illumination, specially covering bogies and brake gear locations so that the wagons needing attention can be easily detected.
- iv. Welding grid on the entire length of train of nominated line with proper earthing arrangement so that welding can be carried out without marking the wagon sick.
- v. Enough outlets for tapping air pressure for testing of the stock.
- vi. Duty room for Section Engineer/Junior Engineer (C&W), staff room, air compressor room, store room for stocking material, tool room, welding machine room, battery charging room etc.
- vii. VHF sets / CUG phones for close monitoring and communication between supervisors, staff and Sr. Section Engineer (In-charge).
- viii. Portable LED type inspection lamps.

A. MACHINERY & PLANT ITEMS

The following machinery and plant are essential for train examination during yard maintenance:-

- Diesel and Electrically driven Compressor.
- Welding plants.
- Wagon /Rake Test rig.
- Hydraulic jacks of various capacities.
- Lister truck for carrying material such as brake blocks etc.
- DG set (Cap. 200 kva min.)
- Multi utility vehicle for transportation of Men, Materials and Tools from one end of rake to other.
- Gas/ Plasma cutting set .

B. TOOLS

Fitters should have the following tools.

- Tool Bag
- Hammer
- Chisel
- Punch (Flat & Round End)
- LED head lamp
- Spanners of various sizes
- Pipe wrench
- Wheel tyre defect gauge
- Measuring foot rule
- Measuring tape
- Non contact hot axle detector
- Cord for measuring spring camber
- Gauge for measuring “A” dimension
- Test plate
- “GO /NO GO” gauges

➤ **TOOLS** to be made available in Section Engineer/Junior Engineer (C&W) office-

- All types of jacks.
- Banner flag/Tail lamp.
- CBC height gauge.
- Air pressure gauge.
- Chisel with wire handle.
- Punch with wire handle.
- Sledge hammer.
- Scale – Steel rule 6”
- Measuring tape – 3 m.
- Allen key (full set).
- Circlip plier (internal & external 19-60 mm)
- Hacksaw with blade 12”
- Set of non sparking tools (for yard handling tank wagon)
- LED head lamp.
- Helmet.
- Ladder with platform 10 ft. height raft.

CLASSIFICATION OF GOODS MAINTENANCE DEPOTS.

- **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	Up to 125

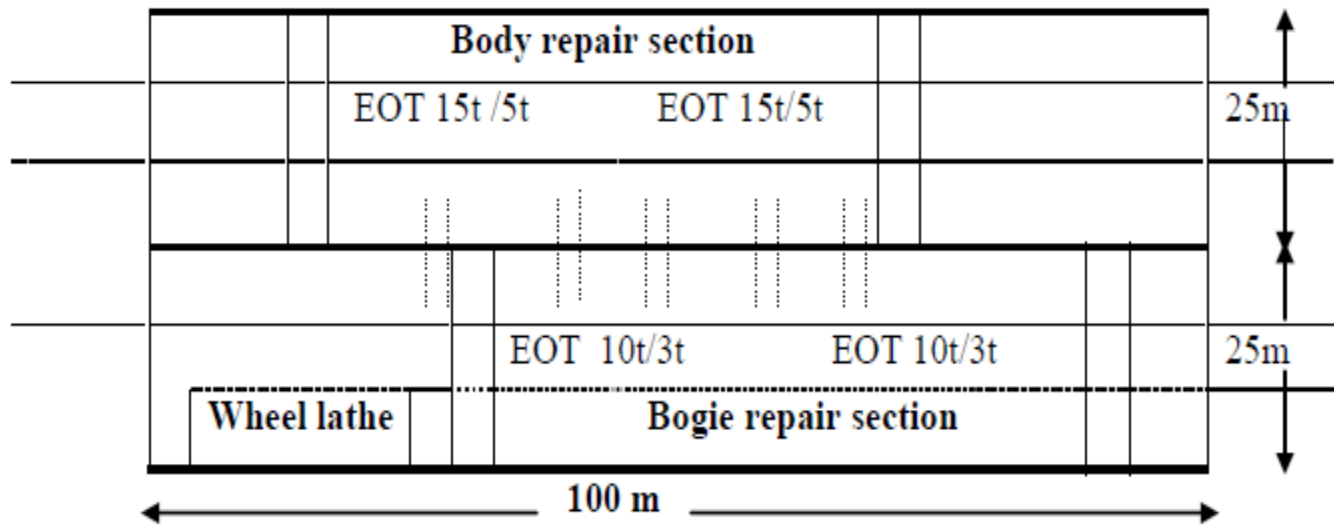
A. RECOMMENDED LAYOUT

- 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.
- 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/month 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.
- 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 down hand 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 crange area of about 2500 sq.m. (including wheel lathe area).

Recommended layout of bogie and body repair section-



Covered area under cranes i.e. cranage area for a fixed ROH

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

2. For ROH depots WITHOUT Sick line 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

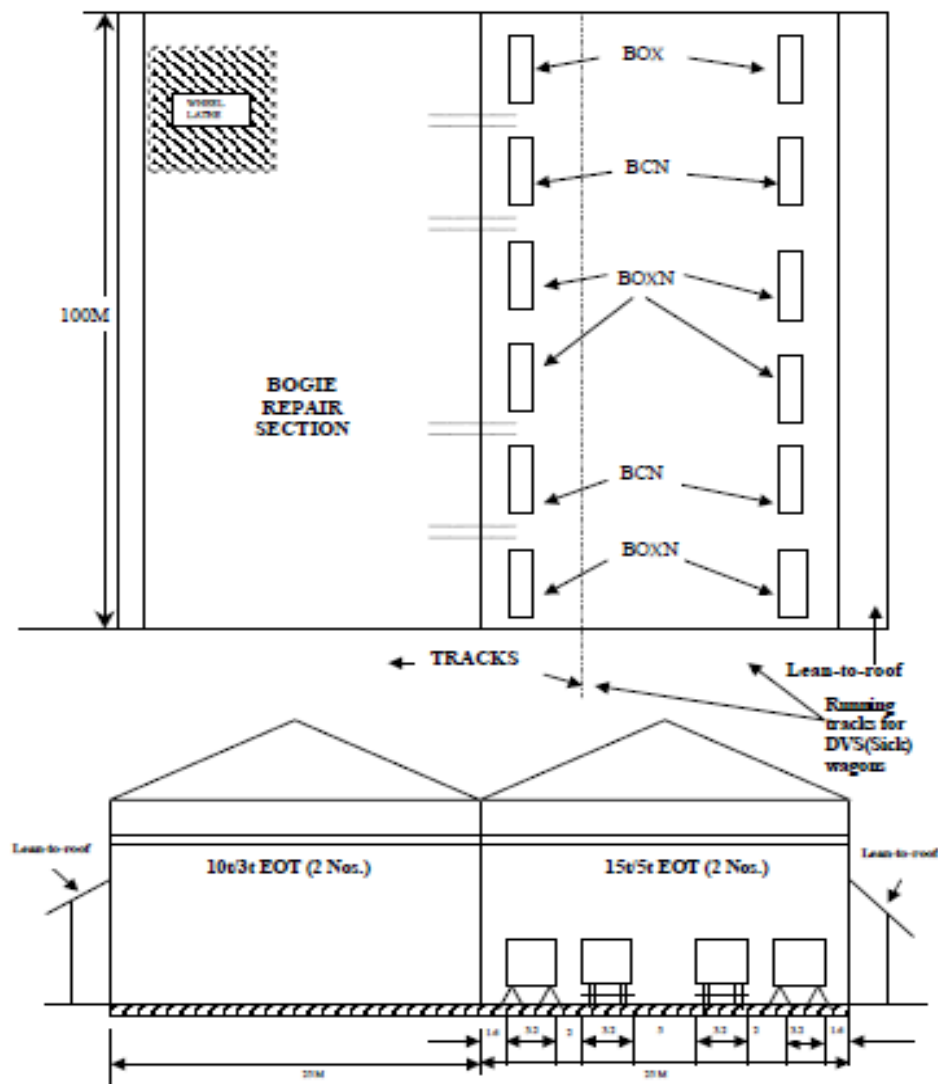
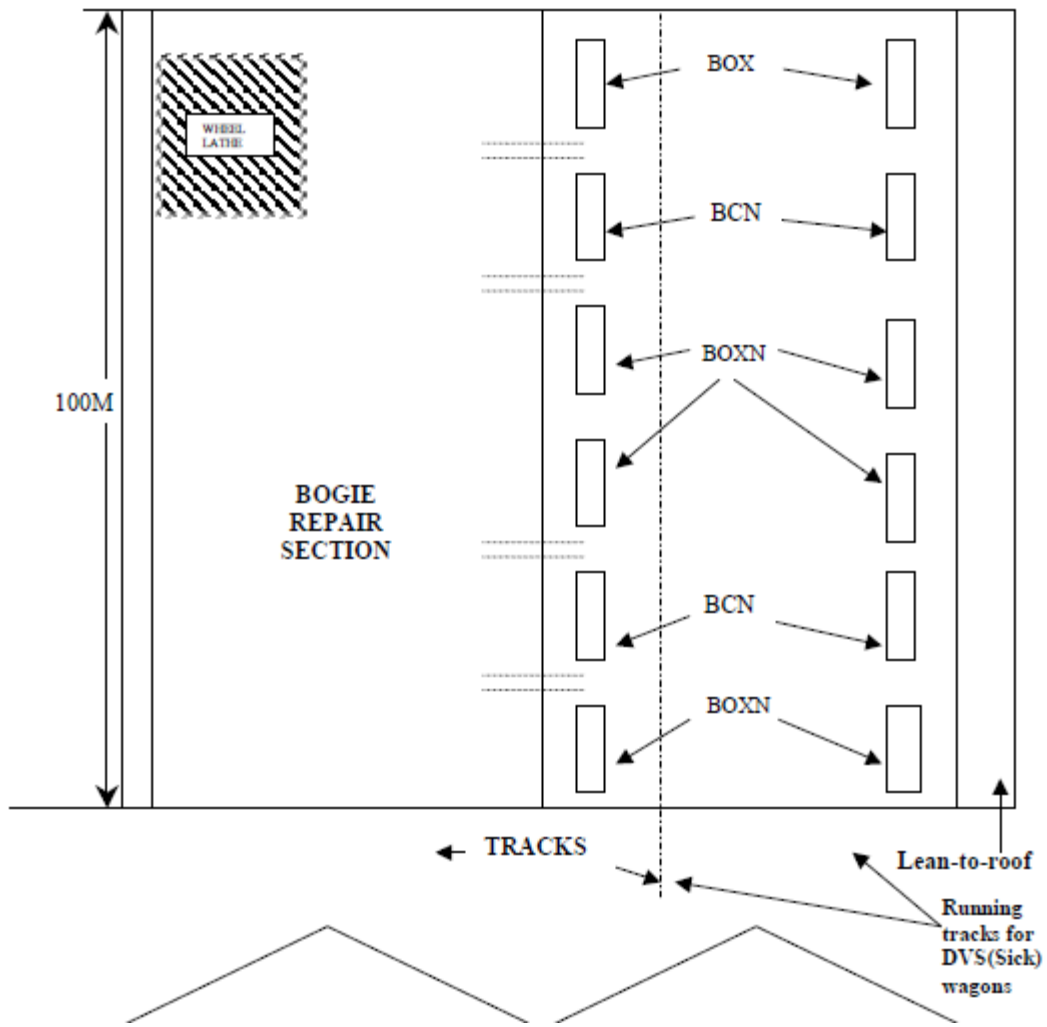
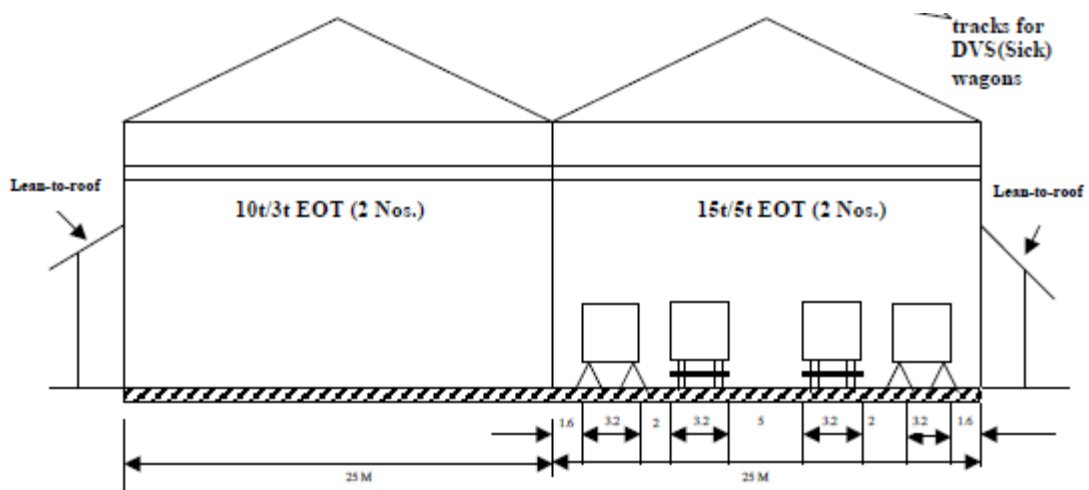


Fig. II-A





• **C. 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

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 No.
4.	Trestles	12 set
5.	Winches	As per Layout
6.	Portable Grit Blasting Machine	01 No.
7.	Lock bolting machine	02 Nos.
8.	MIG welding sets	02 Nos.
9.	Plasma /Gas cutting	04 Nos.

Recommended list of M&P for a unit depot i.e. handling 250 ROH per month

2. Bogie section

Sr. No.	M&P	Quantity
1.	EOT cranes 10t/3t	2 Nos.
2.	Welding machines	6 Nos.
3.	Portable hydraulic rivetter	1No.
4.	Stores bin	50 No.
5.	Portable electric grinders	03 No.
6.	Jib crane 2.5t	10 No.
7.	Fixture for rivetting spring plank	02 Nos.
8.	Work station for bogie repair	10 Nos.
9.	Turn table for wheel sets	As per layout
10.	Road crane 10t capacity	1No.
11.	Bogie manipulators	3 Nos.
12.	Roller bearing diagnostic equipment	2 Nos.
13.	Magnetic flaw detector	2 Nos.
14.	CO2 welding machine	2 Nos.

Recommended list of M&P for a unit depot i.e. handling 250 ROH per month

3. Air brake equipment

Sr. No.	M&P	Quantity
1.	Elec. Stationery screw air compressor completes 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.	04 Nos.
8.	Ultrasonic cleaning table for DV components	1 No.

Recommended list of M&P for a unit depot i.e. handling 250 ROH per month

4. Wheel Reconditioning Equipment

Sr. No.	M&P	Quantity
1.	Surface wheel lathe with Servo controlled voltage stabilizer	1 Nos.
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	1sets
6.	Mono-rail for handling swarf (detail plan will depend on layout)	1sets
7.	Bins for storing bearings	As per req.
8.	Fork lifter 2.5t	01 No.
9.	P.C. Terminal	01 No.
10.	Wheel diameter measuring gauge	02 Nos.

Recommended list of M&P for a unit depot i.e. handling 250 ROH per month

5. Machine shop & material reclamation

Sr. No.	M&P	Quantity
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	01 No.
7.	Heavy duty pedestal grinder double ended	1 No.
8.	Shearing machine 6 mm	1 No.

Recommended list of M&P for a unit depot i.e. handling 250 ROH per month

6. Store-

Sr. No.	M&P	Quantity
1.	Truck 10t capacity	1 No.
2.	Tractor with hydraulic lifting machine and 3 trolleys (trailers)	1 No.
3.	Fork lift 2t	2 Nos.
4.	Platform truck 2t	2 Nos.
5.	Battery charger	2 Nos.
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	01 No.
11.	Furniture	As per layout

Recommended list of M&P for a unit depot i.e. handling 250 ROH per month

7. Training equipment

Sr. No.	M&P	Quantity
1.	Cut models of DV, SAB, Angle cock.	1 set (each)
2.	Television /DVD player	1 set.
3.	Furniture	As per reqt.
4.	Hostel along with kitchen equipment	As per reqt.
5.	LCD projector	1 No.
6.	PC	02 Nos.

Recommended list of M&P for a unit depot i.e. handling 250 ROH per month

8. Canteen & staff amenities

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

Recommended list of M&P for a unit depot i.e. handling 250 ROH per month

9. Office Equipment

Sr. No.	M&P	Quantity
1.	PC terminal.	As per reqt.
2.	Printer	As per reqt.
3.	Furniture	As per reqt.
4.	Air conditioner & computer room.	As per reqt.
5.	Intercom 10 lines	01No.
6.	Fax with P&T line	01 No.
7.	First aid equipment	02 sets.
8.	Photocopier	01 No.
9.	V.H.F. / CUG phones	As per reqt.

Recommended list of M&P for a unit depot i.e. handling 250 ROH per month

10. Miscellaneous

Sr. No.	M&P	Quantity
1.	Gas cutting equipment	04Nos.
2.	Hydraulic jacks	As per reqt.
3.	SAB test bench	01 No.
4.	CBC and draft gear replacement equipment	02 sets.
5.	DG set 350/500 KVA	01 No.
6.	Electric and pneumatic tools	As per reqt.
7.	Rivetting equipment	As per reqt.
8.	Fitter's hand tools.	As per reqt.
9.	Gauges & instruments	As per reqt.
10.	Wheel flat detector system (*)	As per reqt.

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

FACILITIES REQUIRED FOR MAINTENANCE OF STAINLESS STEEL WAGONS:-

Sr. No.	Item/description	Freight Yard (maintaining 3 rakes/ day)	Sick line (5 wagons /day)	ROH Depot (ROH/month 200 wagons)
1.	MIG/MAG Welding Sets (400 Amp.)	02 Nos.	02 Nos.	03 Nos.
2.	DC Arc Welding Rectifier (600 Amp.)	02 Nos.	02 Nos.	03 Nos.
3.	Portable Air Plasma cutting machine (max. capacity 16 mm)	02 Nos.	02 Nos.	03 Nos.
4.	Consumables for Air Plasma M/c i.e. torch tip, catalyst etc	As per requirement	As per requirement	As per requirement
5.	Welding electrodes (For IS2062 to IRS-M44 and IRS-M44 to IRSM44)	As per requirement	As per requirement	As per requirement

FACILITIES REQUIRED FOR MAINTENANCE OF STAINLESS STEEL WAGONS:-

Sr. No.	Item/description	Freight Yard (maintaining 3 rakes/ day)	Sick line (5 wagons /day)	ROH Depot (ROH/month 200 wagons)
6..	Lock Bolts of various sizes	As per requirement	As per requirement	As per requirement
7.	Lock bolts equipment	2 Sets	2 Sets	2 Sets
8.	Portable grinding machine	03	03	03
9.	Stainless steel wire brushes	As per requirement	As per requirement	As per requirement
10.	SS (IRS-M44) plates	As per requirement	As per requirement	As per requirement
11.	CRF section (IRS-M44)	As per requirement	As per requirement	As per requirement

Note: The class of welding electrodes for different combinations of materials shall be as per RDSO document no.G-72.

MINIMUM INFRASTRUCTURE REQUIRED FOR PREMIUM & CC EXAMINATION

- Dedicated two or more examination lines with pathways (depending upon nos. of rakes examined)
- Embedded track/ Pucca pathway of 02 m width as per layout.
- Welding facilities and Portable welding set.
- Adequate illumination.
- Pallets for material storage/dispensing.
- Road between office/store and examination yard.
- Connectivity with FOIS.
- Walkie Talkie sets.
- Provision of MUV (e.g.Tata Ace truck) for transportation of staff and materials/equipments to examination point.
- Rechargeable LED head lamp.

THANK YOU

