

CHAPTER- 7

DEPOTS

7.1 INTRODUCTION

Ahmedabad MRTS project will cover APMC/Vasna - Akshardham North-South Corridor and Ahmedabad – Thaltej East-West Corridor. Following are the details of the corridors.

| S.No. | Name of Corridor | Gauge (nominal) | Route length (Km) |
|-------|-------------------------|-------------------|-------------------|
| 1 | APMC/Vasna – Akshardham | 1435m | 31.85 |
| 2 | Ahmedabad – Thaltej | 1435m | 9.85 |

Depending upon the availability of land for Depot and to facilitate operational and maintenance ease, a full fledged Depot cum Workshop is planned at INDRODA CIRCLE for attending to trains of Vishala - Akshardham. This Depot cum workshop shall have stabling lines and facilities required for scheduled/unscheduled maintenance including major repairs and overhauls, wheel reprofiling, heavy interior/under frame/roof cleaning etc. facilities for Rolling Stocks operational on corridor. In order to facilitate operational ease, minimum headway and to avoid idle run of rakes, another stabling cum Inspection Depot is planned at Thaltej which shall provide stabling and minor inspection to rakes operational on East-West corridor. However, major repairs and overhauls, wheel reprofiling, heavy cleaning etc major activities of rakes operational on east-west corridor shall be carried at Indroda Depot cum workshop. For this reason a link line between the two corridors is proposed near ITO crossings. This report covers following aspects of Indroda Depot cum Workshop and Thaltej Stabling cum Inspection Depot of Ahmedabad MRTS :

- Conceptual design and layout of Stabling Shed, Inspection shed, Heavy Repair & Maintenance workshop (only at INDRODA DEPOT-CUM-WORKSHOP), minor repairs and cleaning of Rolling Stock.
- Operational and functional safety requirements
- Ancillary buildings for other maintenance facilities
- Electrical & Mechanical Services, power supply and distribution system.
- Water Supplies, Drainage & Sewerage.
- This report provides conceptual design and will only work as a guide for detailed design later.

7.2 MAINTENANCE PHILOSOPHY

The main outlines of the philosophy followed are:

- Monitoring the performance of equipment by condition monitoring of key parameters. The concept is to evolve the need based maintenance regime, which can be suitably configured in the form of schedules like daily check,

15 days check, "45 days check", annual check, Intermediate Over Haul "IOH" and Periodical Over haul "POH".

- Labour intensive procedures will be kept to the minimum. More automation with state of the art machinery to ensure quality with reliability.
- Multi skilling of the Maintenance staff to ensure quality and productivity in their performance.
- Energy conservation shall be given due attention.
- Eco-friendly provisions will be made.

7.3 MAINTENANCE FACILITY FOR ROLLING STOCKS OF AHMEDABAD MRTS:

7.3.1 ROLLING STOCK MAINTENANCE NEEDS:

The following maintenance schedule has been envisaged for conceptual design of depot assuming 350 km of running per train per day.

| Type of Schedule | Interval | Work content | Locations |
|-----------------------------|----------------------|---|-----------------|
| Daily | Daily | Check on the train condition and function after service completion. Internal cleaning / mopping of floor and walls with vacuum cleaner. | Stabling Bays |
| "A" Service Check | 5,000 Km (15 days) | Detailed inspection and testing of systems, replacement of oils & lubricants and consumables | Inspection Bays |
| "B" Service Check | 15,000 Km (45 days) | Detailed inspection of 'A' type tasks plus items at multiples of 15,000 Km ('B' type tasks) | Inspection Bays |
| Intermediate Overhaul (IOH) | 420,000 Km (4 Years) | Check and testing of all sub-assemblies (Electrical + Mechanical). Replacement of parts and rectification, trial run | Workshop |
| Periodical Overhaul (POH) | 840,000 Km (8 Years) | Dismantling of all sub-assemblies, bogies, suspension system, traction motor, gear, control equipment, air-conditioning units etc. Checking repair and replacement as necessary. Inspection and trial | Workshop |

7.3.2 WASHING NEEDS OF ROLING STOCK :

The Metro trains are maintained to a high degree of cleanliness and therefore needs the following schedules:

| S. No. | Kind of Inspection | Maint. Cycle | Time | Maintenance Place |
|---------------|---|---------------------|-------------|--|
| 1. | Outside Cleaning (wet washing on automatic washing plant) | 3 Days | 10 mins | Single Pass through Automatic washing plant of Depot |
| 2. | Outside heavy Cleaning (wet washing on automatic washing plant and Front Face, Vestibule/Buffer area, Floor, walls inside/outside of cars and roof. Manually) | 30 days | 3 Hrs | (Automatic washing Plant & cleaning & washing shed) |

There is provision for two depots for Ahmedabad MRTS - INDRODA CIRCLE DEPOT-CUM-WORKSHOP in north-south corridor and THALTEJ Stabling cum Inspection Depot in east-west corridor. Facilities at these depots is discussed separately in following paras.

7.4 INDRODA DEPOT CUM WORKSHOP

7.4.1 LOCATION OF THE DEPOT & ITS VARIOUS AUXILLARY BUILDINGS

The INDRODA DEPOT-CUM-WORKSHOP is planned at-grade level. The whole Depot area shall consist of the Stabling Shed, Inspection Shed, Heavy repair workshop, Blow Down Plant, Interior Cleaning Plant, Automatic Washing Plant, Emergency Building, Tower Wagon Shed, Emergency Train Unit/ OHE Workshop, Depot Control Center building, DCO Store, Wiring train shed, Time & Security Offices, Light Vehicle parking area, Depot Substation, Canteen, Workshop Manager Office, Training school & P. Way Office cum workshop. Balance space can be used for housing of staff & property development.

7.4.2 OPERATIONAL FEATURES

The rake induction and withdrawal to main line will be primarily from the stabling shed. Also provisions are there for direct rake induction and withdrawal to main line from Inspection/workshop area. Movement from depot to the main line is so planned that the headway of main line is not affected. Simultaneous receipt and dispatch of trains from depot to main line is feasible in the present site scenario. Both of these activities will be done effectively without affecting the train operation on the main line. The stabling lines as well as approach to the Inspection lines and workshop would be interlocked with the main line thereby induction of train from the stabling and Inspection lines would be safe and without loss of time. The proposition for a transfer track on the incoming line as well as on the outgoing line to facilitate the movement of rake in the depot by Operation Control Centre (OCC) even though the further path inside the depot is not clear shall be explored in the detailed design stage depending on the availability of land. The feasibility of locating Operational Control Center shall be explored within Depot area itself depending upon the availability of land. For this a multi storeyed building is planned within depot area. The top floor of this

building shall occupy depot control center and rest as operation control center. Area for Depot control Center has already been proposed in the layout plan.

An emergency line will be provided from which an emergency rescue vehicle may be dispatched to main line in the event of emergency if necessary.

As per train operation plan, taking into consideration the rake requirement (which is 29 rakes of 3 car configuration) on this corridor for the horizon year 2010, 22 rakes of 3 car length shall be stabled on 11 stabling lines in the stabling shed and 3 rakes will be under inspection in Inspection shed at Indroda Circle depot – cum –workshop. 2 rakes shall be stabled at Vishala station and 2 rakes at Akshardham station which are the two terminating stations on this corridor. For these stations, reversing lines at terminating stations shall be of 200m length. So, a minimum of 11 stabling lines will suffice the requirements till the horizon year 2010 in Indroda Circle workshop. However, beyond 2010, according to Train Operation Plan, headway is reduced to 3 min. keeping the rake configuration same as in phase-1 in order to meet the increased phpdt. This adds 16 more rakes on this corridor at the end of 2025. Space to provide stabling facilities to these additional rakes shall be provided in Phase-II. The capacity of workshop at Indroda Circle is sufficient to cater for IOH/POH of these additional rakes.

The scheduled inspections shall be carried out during the day off peak and night. 2 inspection lines are used for 15 days schedule per day for 4 rakes. So in 15 days 60 rakes are checked on 2 lines. 'B' check requires more than half the day. so 1 inspection line is for "B" check. So, a minimum of 3 inspection lines are planned for Inspection schedule. One more Inspection line is needed for unscheduled adjustment/attention. Provision for expansion of Inspection shed shall be looked in order to meet Inspection requirement of excess rakes required in Phase –II.

7.4.3 INFRASTRUCTURE PLANNED AT INDRODA DEPOT-CUM- WORKSHOP:

7.4.3.1 DESIGN OF INSPECTION SHED CAPACITY AT Indroda Depot-cum-Workshop:

Following facilities shall be provided to include the ability to carry out the inspection, of the following equipments of rolling stock fleet:

- Electrical components;
- Electronics; PA/ PIS
- Mechanical components;
- Batteries;
- Rolling stock air conditioning;
- Brake modules;
- Bogie; traction motor
- Vehicle doors, windows and internal fittings.
- Power System including converter/inverter, ckt. breaker etc.

Each Inspection bay will have two Lines each provided with overhead platform for all inspection to roof equipments. Each inspection lines will be able to cater one rake during the day's off peak and one at night time when all the rakes return to the depot. Following are the design calculations for the Inspection shed line requirements.

| S. No. | Schedule | Designed capacity (for 6car rake) | Designed capacity (for 3car rake) | No. of lines for Designed capacity for 6 car length |
|--------|--------------------------------------|-----------------------------------|-----------------------------------|---|
| 1 | Daily safety check on stabling lines | 11 rakes | 22 rakes | 11 |
| 2 | 15 days Schedule | 60rakes | 60rakes | 2line during day & night |
| 3 | 45 days Schedule | 45 rakes | 45 rakes | 1 line during day or night |
| 4 | Unscheduled Line | Unscheduled Maintenance | | 1 line provided in the Unscheduled workshop. |

An Inspection shed consisting of 2 bays of 151m x 14.75m each is planned for the depot. Each inspection bay will have two inspection lines with sunken floor and each line is provided with overhead roof inspection platform. The floor will be sunken by 1100mm. The centerline of both the tracks will be 7750mm apart. The centerline of tracks would be at a distance of 3500mm from the columns of shed. Roof Inspection platforms supported on the columns shall be provided. There would be lighting arrangements below the rail level to facilitate the under frame inspection. Ramps of 1:8 slopes, 3 metre wide have been provided with sunken floor system for movement of material for the cars. Further, 5m pathways are left at each end for movement of material by fork lifter/Leister/Hand trolley. 415V 3 phase 50 Hz, 230V 1 phase 50 Hz AC supply and Pneumatic supply shall also be made available on each inspection shed columns. There shall be overhead current collection arrangement from 25 kV AC systems and access to roof inspection platform shall be only possible when OHE is in discharged condition.

7.4.3.2 STABLING LINES IN DEPOT

In the yard, 11 number 6-car length-stabling lines with covered roof are planned at Indroda Circle Depot-cum-workshop. Three (3) rakes would be housed in the inspection shed. The length of 6cars Rolling Stock is approx 128.3m. Stabling lines are designed for 151m lengths or more to cater for provision of the friction buffer stops and the signaling interlocking needs, assuming the speed of the Rolling Stock in the depot to be 15 kmph. The breakup is as follows:

128.3m(length of 6 car Rolling Stock) + 7m (length of the Buffer for 6 car Rolling Stock & 15kmph speed) + 1m (clear distance between Rolling Stock & buffer) + 2x5m (width of pathway in front & at the end of stabling shed for movement of

man & material) + 5m (clearance between two 3 car trains running initially) = 151.3m.

The space between stabling lines shall be sufficient to include pathway to be constructed between each track, which are necessary for the ' Safe to Run ' examination and to facilitate the workers to move trolleys for the sweeping work.

7.4.3.3 FACILITIES FOR ROLLING STOCK IN MAIN WORKSHOP:

Size of the workshop is planned to be 151 x 75 m in order to meet repairs/overhaul requirement of rakes operational on these lines beyond 2025. This may be developed in different phases depending upon no. of rakes. Workshop of size 151 X 63 m is proposed for phase-I. Following equipment, repair/overhaul facilities are planned in the workshop:

1. Body Furnishing
2. Bogie
3. Wheels
4. Traction Motors
5. Axle Box and Axle Bearing
6. Power collector
7. Electrical equipment like transformers, converter/Inverter, circuit breaker, relays
8. Battery
9. Air compressor
10. Air conditioner
11. Brake Equipment
12. Door actuators
13. Control and measuring equipments
14. Pneumatic equipment
15. Coach Painting

Cross track equipped with turntables shall be provided for movement between bays. The capacity of overhead crane shall be optimized by using this concept, resulting in savings in structure cost. Repair of heavy equipments such as air conditioner shall be located so that it does not affect the workshop environment. The small component for bogie painting and battery maintenance be located such that fumes are extracted by suitable exhaust systems. The unscheduled lifting line shall have sunken floor jack system capable to lift the three-car unit simultaneously for quick change of bogie, thereby saving down time of Rolling Stock.

Workshop will have service building with room of size 151x 8m and 75 x 8 m, made of brick works to cater for offices, costly item store, locker room, toilet etc.

7.4.3.4 AUTOMATIC COACH WASHING PLANT

Provision is made for Rolling Stock exterior surfaces to be washed using a fully automated Train Washing System, with a throughput capacity of approximately

nine trains per hour. This shall be accommodated in the 90m x 10m area. Trains can move to the stabling shed from Automatic wash Plant through Z-Shunting.

7.4.3.5 WASHING APRON

Monthly heavy cleaning of interior walls, floors, seats, windows glasses etc, outside heavy Cleaning, Front/ rear Face, Vestibule/ Buffer area, outside walls and roof shall be done manually in the interior cleaning plant designed for cleaning of one 6 car train at a time.

7.4.3.6 POWER SUPPLY

An auxiliary substation has been planned for catering to the power supply requirement of the whole depot and workshop. Details of connected load feeder shall be worked out. Taking diversity factor of 0.5, the maximum demands shall be computed. Two Auxiliary sub-stations are proposed as the demand by machines in Workshop area would be very large.

7.4.3.7 STANDBY POWER SUPPLY

The standby power supply is proposed through DG set with AMF panel. The capacity of DG set will be adequate to supply all essential loads without over loading. This will also be housed in both the sub-stations.

7.4.3.8 WATER SUPPLY, SEWERAGE AND DRAINAGE WORKS

In house facilities shall be developed for the water supply of the entire depot cum workshop. Sewerage, storm water drainage shall be given due care while designing the depot for efficient system functioning. Past records of Municipal Corporation shall be used to design the drainage system. Rainwater harvesting would be given due emphasis to charge the under ground reserves.

7.4.3.9 OHE DEPOT CUM ETU WORKSHOP

This workshop will have two lines, both at floor level with provision of pits. In this workshop major & minor repairs of Tower wagon, shunters, Rail-Road Vehicles and other ancillary vehicles will be done. These vehicles will also be housed here itself. Heavy lifting works can be carried out in main Workshop.

OHE Depot will be used for storing all OHE parts and their maintenance. Provision for small lifting is done in this shed.

7.4.3.10 WATCH TOWERS

There shall be provision of 3 no. of watch towers for the vigilance of depot activities.

7.4.3.11 SHED AND BUILDINGS

The shed and buildings normally provided in the depot with their sizes and brief functions are indicated in **Annexure-I**. Some of these buildings are not depicted on the layout drawing. At the detailed design stage depending upon the land availability, the decision to have these buildings can be taken. These can then be architecturally and functionally grouped.

7.4.3.12 PLANT AND MACHINERY

Requirement of major plants and machinery, which are vital for operational needs, is given in **Annexure-II**. The estimated cost of plant and machinery at Indroda Circle Depot-cum-Workshop is about Rs. 73 Cr.

7.4.4.13 FIRE FIGHTING ARRANGEMENTS

Adequate provision has been made for firefighting arrangements such as dedicated water reservoirs, water pipelines, fire extinguishers, emergency exits and fire-lifts.

7.5 THALTEJ STABLING CUM INSPECTION DEPOT:

Rolling stocks operational on East-West corridor of Ahmedabad MRTS shall have stabling as well minor Inspection facility at Thaltej Stabling cum Inspection Depot. Facility for major repairs and scheduled overhauls of these rakes shall be carried at Indroda Circle Workshop. There is provision for rake transfer between the two corridors of Ahmedabad MRTS.

Design of Stabling shed and Inspection shed remains the same as in Indroda Depot cum Workshop. There shall be 10 stabling lines and single bay of 2 Inspection lines of 6-car size.

However, in case lifting of rake is required for minor repair, an unscheduled shed is proposed which shall have single bay with two lines with 5 T capacity EOT crane to provide lifting facility to roof mounted equipments. Out of the two lines, one shall have sunken floor to facilitate approach to underframe equipment for minor repairs.

List of buildings and machinery requirement in this depot is placed on **Annexure-III**. Estimated cost of M&P in this depot is Rs. 10.00 Cr. (approx) placed at **Annexure-IV**.

- 7.5.1 During the discussions with Gujarat Government on 26.05.2005, it was suggested that DMRC should also study alternative arrangement in case acquisition of land and building of Prasar Bharti/Custum is not possible. In that case, it will be necessary to develop Thaltej Depot as a mother depot to do maintenance and repairs upto IOH and POH. The additional cost would be Rs. 62 crore.

Annexure - 1

LIST OF BUILDINGS FOR *Indroda Circle Depot- cum- Workshop*

| S. No. | Name of Building | Size | Brief Function |
|--------|---|---|---|
| 1 | Inspection Shed Associated sections Stabling Sun shade roof | 151 x 29.50m 151 x 8 m 151x 30.6m | Servicing of 360 cars for 15day & 270 cars for 45 day inspections. Rooms d/ storey for carrying out the inspection activity. Inspection of overhead roof equipments of rolling stock. For stabling 6 rakes of 6cars or 12 rakes Of 3 cars each, during off peak hours. |
| 2. | DCOS Stores & Offices including Goods Platform with Ramp | 45 X 45m | (i) Stocking of spares for regular & emergency requirement including consumable items. (ii) This store caters for the requirement of depot for rolling stock & other disciplines. (iii) To be provided with computerized inventory control. Loading/ Unloading of material received by road. |
| 3. | Elect. Substation | 25x22 m | To cater for normal and emergency power supply for depot, workshop, service and all other ancillary buildings, Essential power supply for essential loads and security light. |
| 4. | ETU Shed cum Traction repair depot & E&M repair shop | 80 x 30 m (partly double storey) | Stabling and routine maintenance of shunting engine, tower wagon etc. & Traction maintenance depot For maintenance of lifts / escalators and other General service works. |
| 5. | Cycle & Scooter Stand | 25 x 6 m | To park cycles and Scooter |
| 6 | Auto Coach washing plant | 90 x10 m | For automatic washing of coaches. Washing apron is for collection of dripping water and its proper drainage. |

| S. No. | Name of Building | Size | Brief Function |
|--------|---|------------------------------|---|
| 7 | Washing Apron | 140 x 6.5m | Heavy cleaning of Interiors, Exterior, underframe and roof of rolling stock. |
| 8 | Blow down plant | 31 x 14m | Dusting out the underframe structure of Rolling stocks. |
| 10. | P. Way Office, store & Workshop including Welding plant | 80 x 20m | For Track maintenance of AHMEDABAD MRTS Corridor and depot. To weld rails for construction period only To stable track Tamping machine. |
| 11. | Security office & Time Office Garages (4 Nos) | 15 x 8m Approx 6 x 8m | For security personnel. For time Punching For parking vehicle jeep, truck etc. |
| 12. | Check post (2 Numbers) | 5 x 3 | For security check of incoming / outgoing staff material and coaches. |
| 13. | Watch tower (3 Nos.) | 3.5x2.5 | For security of the depot especially during nighttime. |
| 14. | Depot control centre & Crew booking centre | 25X20 (double Storey) | To control movement of trains in and out of the depot & for crew booking. |
| 15. | O.H raw water Tank | 1,00,000 Ltrs Capacity | Storage of water, capacity 1,00,000 litres each. |
| 16. | Pump house Bore well | 7.3x5.4 200 mm | Submersible type pump planned with 200-mm diameter bore well. |
| 17. | Repair shops for S&T | 40x20 | For the AFC gates, Signaling and telecom equipment |
| 18. | Work shop Manager Office | 30x20m | Office of Depot in charge |
| 19 | ATP& ATO Room | 4x5 m | To keep equipments of ATP/ATO. |
| 20 | Waste Water Treatment Plant | 12x6m | For treating the discharge waters of the depot and remove the oil, acids etc. before discharging into the river, with U/G tank. |
| 21. | Canteen | 400 sqm | To cater staff of depot and workshop. Obligatory as per statutory requirements. |
| 22. | Compressor room | 12 x 6m | To supply pneumatic air to workshop and servicing shed |

| S. No. | Name of Building | Size | Brief Function |
|--------|----------------------------|-----------|---|
| 23. | Diesel oil refueling point | 3 x 3m | For refueling of diesel Shunter and other vehicles with under ground tank for diesel oil 2 m dia |
| 24. | Main Workshop | 151X 75 m | Major repair & overhaul of Rolling stocks, diesel shunters, electric tractors, tower wagons. IOH, POH & all heavy lifting jobs. |

Note

- 1 Some of these buildings are not depicted on the layout map. Depending on the administrative decision, this shall be suitably done at the detailed design stage incorporating the site topography, architectural nitty gritty and minor adjustment in sizes looking to the available land.
- 2 Some of the buildings like stabling shed; security office etc shall be pre-engineered structure. The decision in this regard may be taken at the detailed design stage.

Annexure II**Machinery for Indroda Circle depot-cum-workshop**

| Sl. No. | Equipment | Qty | Unit |
|----------------|--|------------|-------------|
| 1 | Under floor Pit wheel lathe including shunter | 1 | Set |
| 2 | Synchronized pit jacks for three car lifting consisting of 12 jack system | 1 | Set |
| 3 | Mobile lifting jacks-15T(1 set of 12 jacks) | 1 | Set* |
| 4 | Mobile lifting jacks 12T(1 set of 12 jacks) | 4 | Set* |
| 5 | Turntable for bogies | 7 | Nos. |
| 6 | Automatic Washing plant for Metro cars. | 1 | Nos. |
| 7 | Diesel Shunting Engine | 2 | Nos. |
| 8 | Electric bogie tractor for pulling cars and bogies | 2 | Nos. |
| 9 | Re-railing equipment consisting of rail cum road vehicle and associated jack system etc | 1 | Set |
| 10 | Turn table for one car | 1 | Nos. |
| 11 | Accommodation bogie 3 car sets for Metro Cars | 5 | Set |
| 12 | Jib Crane | 1 | Nos. |
| 13 | Mobile portal type A | 4 | Nos. |
| 14 | Mobile portal type B | 4 | Nos. |
| 15 | Mobile jib Crane | 4 | Nos. |
| 16 | Mobilejib crane (overhang type) | 4 | Nos. |
| 17 | Car body stands | 24 | Nos. |
| 18 | Underframe & Bogie blowing plant | 1 | Set |
| 19 | Vertical carousel storage system | 1 | Set |
| 20 | Bogie cleaning plant | 1 | Nos. |
| 21 | Rail fed Bogie wash plant | 1 | Nos. |
| 22 | Shot blast cleaner | 1 | Nos. |
| 23 | Chemical cleaning tank. | 1 | Nos. |
| 24 | Ultrasonic cleaning tank | 1 | Nos. |
| 25 | Ultrasonic machine for cleaning electronic equipment | 1 | Nos. |
| 26 | Computer MMIS for the workshop | L.:S. | |
| 27 | Welding equipments (Mobilewelding, oxyacetelene, fixed arc welding) | 1 | Set |
| 28 | Set of machine tools(one radial drilling machine, one universal milling machine, two slide lathes, one panel sawing machine, one guillotine shears, one cutting machine. | L.s. | Set |
| 29 | Mobile safety steps | 10 | Nos. |
| 30 | Mobile lifting table | 4 | Nos. |
| 31 | Work lift platform | 3 | Nos. |

| Sl. No. | Equipment | Qty | Unit |
|---------|---|------|------|
| 32 | Fork lift tractor | 2 | Nos. |
| 33 | Pallet trucks | 10 | Nos. |
| 34 | Minor equipment and collective tools | L.s. | Set |
| 35 | Electric and pneumatic tools | L.s. | Set |
| 36 | Measuring and testing equipment | L.s. | Set |
| 37 | Axle shaft inspection station | 1 | Set |
| 38 | Tool kits | L.s. | Set |
| 39 | Floor cleaning machine | 1 | Nos. |
| 40 | EMU battery charger | 2 | Nos. |
| 41 | Battery Charger (for road vehicles) | 1 | Nos. |
| 42 | Water de-mineralizing plant (Distillation plant) | 1 | Nos. |
| 43 | Road vehicles (pickup van/ truck) | 2 | Set |
| 44 | Industrial furniture | 1 | L.S. |
| 45 | Storage racks | 1 | Set |
| 46 | High-pressure washing pump for front and rear end cleaning of cars. | 2 | Nos. |
| 47 | Simulator with 6 degrees of freedom on motion for the modern rolling stock, to train the drivers. | 1 | Set |
| 48 | Cleaning booth for TM | 1 | Nos. |
| 49 | Painting booth for separate parts | 1 | Nos. |
| 50 | Induction heater | 1 | Nos. |
| 51 | Oven for Traction Motor drying | 1 | Nos. |
| 52 | Special jigs and fixtures and test benches for Rolling stock | | L.S. |
| 53 | Flat Wagon | 2 | Nos. |
| 54 | Cherry picker/ Snorkel. High lift platform type vehicle to reach viaduct and OHE from road | 1 | Nos. |
| 55 | Bearing puller & press | 1 | Nos. |
| 56 | Vertical boring machine | 1 | Nos. |
| 57 | Press for wheel fitting and removal | 1 | Nos. |
| 58 | Surface wheel lathe | 1 | Nos. |
| 59 | Axle journal turning and burnishing lathe | 1 | Nos. |
| 60 | Misc. jigs, fixture etc. | L.s. | |
| 61 | 15 T cranes | 2 | Nos. |
| 62 | 5 T cranes | 6 | Nos. |
| 64 | 1.5 T cranes for Inspection shed | 4 | Nos. |
| 65 | Compressor | 2 | Nos. |
| 66 | DG Set | 4 | Nos. |
| | | | |
| | Total estimated cost of M&P at Inderoda Depot= Rs.73.00 Cr. | | |
| | | | |
| 61 | Machinery for Thaltej satellite depot=Rs. 10.00 Cr. (details on next sheet) | | |

Annexure-III**LIST OF BUILDINGS FOR *Thaltej Stabling cum Inspection Depot***

| S. No. | Name of Building | Size | Brief Function |
|---------------|---|---|--|
| 1 | Inspection Shed Associated sections Stabling Sun shade roof | 151 x 14,75m 151 x 8 m 151x 51m | Servicing of 360cars for 15 day inspections. Rooms d/ storey for carrying out the inspection activity. Inspection of overhead roof equipments of rolling stock. For stabling 10 rakes of 6cars or 20 rakes Of 3 cars each, during off peak hours. |
| 2. | DCOS Stores & Offices including Goods Platform with Ramp | 25 X25m | (iv) Stocking of spares for regular & emergency requirement including consumable items. (v) This store caters for the requirement of depot for rolling stock & other disciplines. (vi) To be provided with computerized inventory control. Loading/ Unloading of material received by road. |
| 3. | Elect. Substation | 25x22 m | To cater for normal and emergency power supply for depot, workshop, service and all other ancillary buildings, Essential power supply for essential loads and security light. |
| 4. | ETU Shed cum Traction repair depot & E&M repair shop | 80 x 30 m (partly double storey) | Stabling and routine maintenance of shunting engine, tower wagon etc. & Traction maintenance depot For maintenance of lifts / escalators and other General service works. |
| 5. | Cycle & Scooter Stand | 25 x 6 m | To park cycles and Scooter |
| 6 | Auto Coach washing plant | 90 x10 m | For automatic washing of coaches. Washing apron is for collection of dripping water and its proper drainage. |

| S. No. | Name of Building | Size | Brief Function |
|--------|---|--------------------------|---|
| 7 | Washing Apron | 140 x 6.5m | Heavy cleaning of Interiors, Exterior, underframe and roof of rolling stock. |
| 8. | Unscheduled Shed | 80X20m | Unscheduled lifting of Rakes directed to be stabled at Thaltej depot for minor repairs. |
| 9. | P. Way Office, store & Workshop including Welding plant | 80 x 20m | For Track maintenance of AHMEDABAD MRTS Corridor and depot. To weld rails for construction period only To stable track Tamping machine. |
| 10. | Security office & Time Office Garages (4 Nos) | 15 x 8m Approx 6 x 8m | For security personnel. For time Punching For parking vehicle jeep, truck etc. |
| 11. | Check post (2 Numbers) | 5 x 3 | For security check of incoming / outgoing staff material and coaches. |
| 12. | Watch tower (3 Nos.) | 3.5x2.5 | For security of the depot especially during nighttime. |
| 13. | Depot control centre & Crew booking centre | 25X20 (double Storey) | To control movement of trains in and out of the depot & for crew booking. |
| 14. | O.H raw water Tank | 40,000 Ltrs Capacity | Storage of water, capacity 40,000 litres each. |
| 15. | Pump house Bore well | 7.3x5.4 200 mm | Submersible type pump planned with 200-mm diameter bore well. |
| 16. | Repair shops for S&T | 40x20 | For the AFC gates, Signaling and telecom equipment |
| 17. | Work shop Manager Office | 30x20m | Office of Depot in charge |
| 18 | ATP& ATO Room | 4x5 m | To keep equipments of ATP/ATO. |
| 19 | Waste Water Treatment Plant | 12x6m | For treating the discharge waters of the depot and remove the oil, acids etc. before discharging into the river, with U/G tank. |
| 20. | Canteen | 400 sqm | To cater staff of depot and workshop. Obligatory as per statutory requirements. |
| 21. | Compressor room | 12 x 6m | To supply pneumatic air to workshop and servicing shed |

| S. No. | Name of Building | Size | Brief Function |
|--------|----------------------------|--------|--|
| 22. | Diesel oil refueling point | 3 x 3m | For refueling of diesel Shunter and other vehicles with under ground tank for diesel oil 2 m dia |

Note

- 1 Some of these buildings are not depicted on the layout map. Depending on the administrative decision, this shall be suitably done at the detailed design stage incorporating the site topography, architectural nitty gritty and minor adjustment in sizes looking to the available land.
- 2 Some of the buildings like stabling shed; security office etc shall be pre-engineered structure. The decision in this regard may be taken at the detailed design stage.

Annexure IV**List of M & P for Thaltej stabling cum Inspection depot:**

| SL NO. | MACHINES | QTY. | UNIT |
|--------|---|------|------|
| 1 | 1.5T Cranes for the Inspection shed | 2 | nos |
| 2 | 5 T Cranes for Unscheduled repair workshop | 1 | no. |
| 3 | Bogie Turn table | 1 | no. |
| 4 | Car body Stands | 8 | nos |
| 5 | DG set for the depot | 1 | no. |
| 6 | Compressed air supply system with 1 Compressors. | 1 | set |
| 7 | Mobile lifting jacks-15T (1 set of 8 nos) | 1 | set |
| 8 | Automatic Washing plant for Metro cars. | 1 | no. |
| 9 | Electric bogie tractor for pulling cars and bogies inside unscheduled shed | 1 | no. |
| 10 | Re-railing equipment consisting of rail cum road vehicle and associated jack system etc | 1 | no. |
| 11 | Storage racks | 1 | set |
| 12 | Industrial furniture | L.S. | |
| 13 | Road vehicles (pickup van/ truck) | 1 | no. |
| 14 | Fork lift | 1 | no |
| 15 | Battery Charger (for road vehicles) | 2 | no. |
| 16 | EMU battery charger | 1 | no. |
| 17 | Tool kits | L.S. | |
| 18 | Minor equipment and collective tools | L.S. | |
| 19 | Electric and pneumatic tools | L.S. | |
| 20 | Measuring and testing equipment | L.S. | |
| 21 | Pallet trucks | 2 | no. |
| 22 | Work lift platform | 1 | no. |
| 23 | Mobile safety steps | 4 | no. |
| 24 | Welding equipments (Mobilewelding, oxyacetelene, fixed arc welding) | LS | set |
| 25 | Vertical carousel storage system | 1 | no. |
| 26 | Misc Zigs and fixtures | L.S. | |
| | Total Value= Rs. 10.00 Cr | | |