construction cost reduced, and attention paid to shortening the construction period.

| | | |
|---|---|---|
| Exterior wall: | | Concrete blocks, mortar finish with paint |
| Roof: | | Fluorine resin corrugated metal roof deck |
| Interior wall: | (Offices, etc.) | Concrete blocks, mortar finish with paint |
| | (Workshop) | Concrete and concrete blocks, partial paint finish |
| Floor: | (Offices) | Ceramic tile finish |
| | (Corridor) | Ceramic tile finish |
| | (Working shop) | Concrete metal trowelled finish with synthetic resin non-slip paint |
| | (Lavatory) | Ceramic mosaic tile finish |
| Ceiling: | (Workshop) | Exposed roof |
| | (Offices) | Lightgauge framing with decorative gypsum board |
| Windows and doors: | | Aluminum windows and steel doors |
| Window lattice: | | Galvanized steel |

### 4-3-5 Equipment plan

Key considerations in the selection of machinery to be installed in the work rooms of the major sections pursuant to the project are given below. The composition of major facilities and equipment is also described.

Compressor rooms:

In view of maintenance and administration needs, one compressor will be set up in the maintenance workshop and another in the body workshop.

Power room and battery room:

Gas-generating batteries are not to be stored in the power room.

1) Power room:

To be provided with testing equipment and necessary tools

2) Battery room:

Batteries will be charged with in-house chargers and distilled water; 3-5 battery chargers will be provided

Fabrication shop:

To ensure efficient management all parts processing operations will be coordinated in one room. However, in the layout of the room, the precision processing unit (e.g., for engines) and the relatively rough processing operations (e.g., for brakes) will be separated. Adequate space will be provided for parts storage and tool shelves, since the work in this room will require a variety of accessories.

Machine shop:

To ensure efficient management overhauling operations will be coordinated in one room. However, in the layout of the room, the engine overhauling and another part overhauling will be separated. Tools for overhauling shall be controlled strictly in tool storage.

Injection pump tester room:

A guard will be necessary to expel dust. The operations in this room will require careful administration due to the high value of many of the tools to be installed.

Parts cleaning shop:

To be set up next to the overhauling room in order to remove all dirt and grit before vehicles undergo overhauling.

Inspection shop:

Inspections of substructure will be performed in this room including the filling and changing of grease and oil. The staff at work in this room will also need to consider effective measures for disposal of waste oil.

Body and paint shop:

Since washing with water will be conducted in the paint room, it will be necessary to consider appropriate measures for paint storage and disposal. Easy-to-handle equipment, including processing and repair equipment and work tools, will be selected for body work operations. Welding equipment, in particular, will need to be carefully selected since it involves regular use.

Wreckers, etc.:

Both large and small scale wreckers will be provided to effectively handle different type of vehicles.

1. MACHINE SECTION

| | | | |
|---|---|---|---|
| 1 | Lathe, High Speed Precision | M, S | 2 set |
| 2 | Cylinder Boring Machine | | 1 set |
| 3 | Cyling Horning Machine | | 1 set |
| 4 | Crankshaft Grinding Machine | | 1 set |
| 5 | Valve Sheat Grinding Machine | | 1 set |
| 6 | Valve Refacer | | 1 set |
| 7 | Surfac Grinder | | 1 set |
| 8 | Brake Drum Lathe W/Gauge | | 1 set |
| 9 | Brake Shoe Grinder | | 1 set |
| 10 | Brake Lining Rivetter | | 1 set |
| 11-1 | Electric Bench Drill Machine | 13 mmø | 1 set |
| 11-2 | - do - | 23 mmø | 1 set |
| 12-1 | Electric Portable Drill Machine | 13 mmø | 1 set |
| 12-2 | - do - | 10 mmø | 2 sets |
| 12-3 | - do - | 6.0 mmø | 3 sets |
| 13 | Electric Bench Grinder | 205 mmø | 2 sets |
| 14 | Electric Portable Grinder | 100 mmø | 2 sets |
| 15 | Hacksaw Machine | | 1 set |
| 16 | General Use Tools | | |
| -1 | Valve Seat Cutter Set | | 1 set |
| -2 | Valve Lapper | | 50 each |
| -3 | Compound | | 10 each |
| -4 | Valve Lifter | | 2 each |
| -5 | Piston Ring Tool | | 5 sets |
| -6 | Cylinder Liner Puller | | 1 set |
| -7 | Valve Spring Tester | | 1 set |
| -8 | Connecting Aligner | | 1 set |
| -9 | Surface Plate | | 1 set |
| -10 | Cylinder Gauge Set 4 pcs/set | | 1 set |
| -11 | Piston Heater | | 1 set |
| -12 | Piston Vise | | 1 set |
| -13 | Piston Ring Compressor | | 1 set |
| -14 | Mechanic Tool Set | | 10 sets |
| -15 | Work bench | | 10 sets |
| -16 | Vise, Reed Type 150 mm | | 6 sets |
| -17 | Vise, Swivel Type 150 mm | | 4 sets |

| | | |
|---|---|---|
| -18 | Hydraulic Baby Crane 1,000 kg | 3 sets |
| -19 | Air Hose, 1/4". 3/8", 1/2"×100m | 3 sets |
| -20 | Sling Chain 1.25t×1.5m, 2t×2.5m | 5 sets |
| -21 | Sling Belt 50 mm×2.5m, 50 mm×1.5 m | 5 sets |
| -22 | Brake Drum Gauge | 1 set |
| -23 | Twist Drill Set. Up to 23 mm | 10 sets |
| -24 | Socket Wrench Set, 3/8" drive, mm, inch | 5 each |
| -25 | - do - 1/2" dirve, mm, inch | 5 each |
| -26 | - do - 4/3" drive, mm, inch | 5 each |
| -27 | Offset Wrench Set mm, inch | 5 each |
| -28 | Part Cabinet | 2 sets |
| -29 | Tool Shelf | 2 sets |
| 17 | Over Head Hoist, Manual type | 2 sets |

2. MECHANICAL SECTION

| | | | |
|---|---|---|---|
| 1-1 | Hydraulic Press | 60 ton capacity | 1 set |
| -2 | - do - | 35 ton capacity | 1 set |
| -3 | - do - | 15 ton capacity | 1 set |
| 2-1 | Hydraulic Garage Jack | 1.5 ton | 4 sets |
| -2 | - do - | 5 ton | 2 sets |
| -3 | - do - | 10 ton | 3 sets |
| -4 | - do - | 15 ton | 2 sets |
| 3-1 | Hydraulic Jack. | 10 ton | 3 sets |
| -2 | - do - | 20 ton | 3 sets |
| -3 | - do - | 30 ton | 3 sets |
| 4 | Injection Pump Tester | | 1 set |
| 5 | Nozzle Tester | | 2 sets |
| 6-1 | Nozzle Reconditioning Machine | | 1 set |
| 6-2 | Nozzle Cleaning Kit | | 1 set |
| 7 | Diesel Engine Compression Tester | | 2 sets |
| 8 | Petrol Engine Compression Tester | | 1 set |
| 9 | Surface Plate | | 1 set |
| 10 | Part Cabinet | | 1 set |
| 11 | Tool Shelf | | 2 sets |
| 12 | Mechanical Tool Set | | 8 sets |
| 13 | Master Tool Set | | 3 sets |

| | | | |
|---|---|---|---|
| 14-1 | Torque Wrench | 30~230 kg/cm | 3 sets |
| -2 | - do - | 500~2,800 kg/cm | 3 sets |
| -3 | - do - | 100~920 kg/cm | 5 sets |
| -4 | - do - | 400~2,800 kg/cm | 3 sets |
| -5 | - do - | 1,000~5,600 kg/cm | 3 sets |
| -6 | - do - | 100~450 kg/cm | 3 sets |
| -7 | Vernier Caliper | | 7 sets |
| -8 | Micrometer Caliper, | Outer 0 mm ~ 150 mm | 2 sets |
| -9 | - do - | Inner 25 mm ~ 150 mm | 2 sets |
| -10 | Steel Rule | 0 ~ 300 mm | 5 sets |
| -11 | - do - | 0 ~ 600 mm | 5 sets |
| -12 | - do - | 0 ~ 1,000 mm | 5 sets |
| -13 | Dial Indicator | 0 ~ 10 mm | 2 sets |
| -14 | Magnet Base | | 2 sets |
| -15 | V-Block | | 2 sets |
| -16 | Straight Edge | 500 mm | 2 sets |
| -17 | Square | 100 mm | 2 sets |
| -18 | - do - | 150 mm | 2 sets |
| -19 | - do - | 200 mm | 2 sets |
| -20 | Thermometer | 0 ~ 200°C | 5 sets |
| -21 | Tape Measure | 5m | 3 sets |
| -22 | - do - | 10m | 3 sets |
| -23 | - do - | 30m | 3 sets |
| -24 | Spring Balancer | | 1 set |
| 15-1 | Diesel Tachometer | | 1 set |
| -2 | Diesel Timing Tachometer | | 1 set |
| 16 | Engine Tune-up Tester | | 1 set |
| 17 | Mechanic Swivel Vise | 150 mm | 3 sets |
| 18 | Mechanical Reed Vise | 150 mm | 3 sets |
| 19-1 | Transmission Jack | 1,500 kg | 1 set |
| -2 | - do - | 800 kg | 1 set |
| 20 | Differential Jack | 500 kg | 2 sets |
| 21-1 | Rigid Rack | 2,500 kg | 12 sets |
| -2 | - do - | 5,000 kg | 12 sets |
| 22 | Blacksmith Tool Set | | |
| | 1) Cast iron anvil | 50 kg | 1 set |
| | 2) Cast iron swage block | 45 kg | 1 set |
| | 3) Sledge hammer | 10 LB | 1 set |

| | | | |
|---|---|---|---|
| | 4) Tong Round | | 1 set |
| | 5) Tong, Flat | | 1 set |
| | 6) Tong, Straight | | 1 set |
| | 7) C-clamp | 150 mm | 1 set |
| 23 | Workbench | | 6 sets |
| 24 | Rear Axle Stand | 450 kg | 1 set |
| 25-1 | Engine Stand | 450 kg | 1 set |
| -2 | - do - | 1,500 kg | 1 set |
| 26 | Engine Cleaning Gun | | 5 sets |
| 27 | Washing Brush | | 50 pc |
| 28 | Air Blow Gun | | 5 sets |
| 29 | Air Hose W/Chuck | 20m | 10 sets |
| 30 | Bearing Scaper | | 5 sets |
| 31 | Clutch Aligner | | 1 set |
| 32 | Ply Bar | | 2 sets |
| 33 | Pinch Bar | | 2 sets |
| 34 | Cotter Pin puller | | 2 sets |
| 35 | Tool Tray | | 8 sets |
| 36 | Brake Bleeder Wrench | | 2 sets |
| 37-1 | Brake Cylinder Hone Set | | 10 sets |
| -2 | - do - | | 10 sets |
| -3 | - do - | | 10 sets |
| 38-1 | Brake Spring Plier | | 5 sets |
| -2 | - do - | | 5 sets |
| 39 | Pitman Arm Puller | | 1 set |
| 40 | Tie-rod End Lifter | | 1 set |
| 41 | Universal Housing Nut Wrench | | 1 set |
| 42 | Wheel Bearing Puller | | 2 sets |
| 43 | Wheel Dolly | | 2 sets |
| 44 | Service Creeper | | 15 sets |
| 45 | Hex Wrench Set | | 5 sets |
| 46 | Open End Wrench Set | mm | 10 sets |
| 47 | - do - | inch | 10 sets |
| 48 | Adjustable Wrench Set, 100, 150, 250, 300, 450 mm | | 5 sets |
| 49 | Adjustable Pipe Wrench Set, 200, 250, 300, 450, 900mm | | 5 sets |
| 50 | Bolt Clipper | 10 mm, 15 mm | 2 sets |
| 51 | Snapping Plier | | 3 sets |
| 52 | Wood Hammer | | 10 sets |

| | | | |
|---|---|---|---|
| 53 | Plastic Hammer | | 10 sets |
| 54 | Copper Hammer | | 10 sets |
| 55 | Sledge Hammer | | 5 sets |
| 56 | Screw Extractor | | 5 sets |
| 57 | Stud Remover | | 5 sets |
| 58-1 | Tap & Dies Set | mm | 2 sets |
| -2 | - do - | inch | 2 sets |
| 59 | Adjustable Reamer | | 2 sets |
| 60 | Chisel & Punch Set | | 5 sets |
| 61 | Gasket Punch Set | | 2 sets |
| 62 | Universal Puller Set | | 2 sets |
| 63 | Hack Saw Flame | | 5 sets |
| 64 | Hack Saw Blade | 10 dz | 10 sets |
| 65 | Hand Truck | 300 kg | 2 sets |
| 66 | Injection Pump Tool Set | | 1 set |
| 67 | Washing Stand | L | 3 sets |
| 68 | Washing Stand | S | 1 set |
| 69 | Washing Brush | L, S | 50 each |
| 70 | Fileer Gauge | | 10 sets |
| 71 | Pitch Gauge | mm, inch | 4 each |
| 72 | Pit Jack | | 4 sets |

## 3. ELECTRIC SECTION

| | | |
|---|---|---|
| 1 | Battery Charger, Quick Type | 3 sets |
| 2 | Generator & Starter Test Bench | 1 set |
| 3 | Circuit Tester | 2 sets |
| 4 | Engine Analyzer | 1 set |
| | 1) Timing Advance tester | |
| | 2) Tacho-advance tester | |
| | 3) Volt-ampere tester | |
| | 4) Coil-condenser tester | |
| | 5) Tester stand | |
| 5 | Timing Light | 1 set |
| 6 | Battery Tester | 2 sets |
| 7 | Spark Plug Service Kit | 1 set |
| 8 | Motor Puller Set | 1 set |

| | | | |
|---|---|---|---|
| 9 | Soldering Iron Set | 60W, 150W, 200W | 3 sets |
| 10 | Solder | 500 gr | 10 sets |
| 11 | Paste | 300 gr | 5 sets |
| 12 | Solderless Terminal Kit | | 2 sets |
| 13 | Electric Bench Grinder | 205 mmø | 2 sets |
| 14 | Electric Portable Grinder | 100 mmø | 2 sets |
| 15 | Electric Disc Sander | 100 mmø | 5 sets |
| 16 | Electric Bench Drill | 13 mm | 1 set |
| 17 | Electric Portable Drill | 13 mm | 2 sets |
| 18 | - do - | 6 mm | 2 sets |
| 19 | Work Bench | | 1 set |
| 20 | Mechanical Swivel Vice | 150 mm | 1 set |
| 21 | Tool Shelf | | 1 set |
| 22 | Battery Booster Cable | 300 A | 5 sets |
| 23 | - do - | 200 A | 5 sets |
| 24 | Battery Hydrometer | | 5 sets |
| 25 | Battery Filler | | 5 sets |
| 26 | Battery Funnel | | 5 sets |
| 27 | Battery Jug | | 5 sets |
| 28 | Battery Sylinge | | 5 sets |
| 29 | Battery Tool Set | | 3 sets |
| 30 | Air Compressor | 11 kW | 2 sets |
| 31 | Air Regulator | | 2 sets |
| 32 | Air Hose W/Chuck | 1/4"×20m | 10 sets |
| 33 | Electric Extension Cord Reel | 30m | 5 sets |
| 34 | Water Purifier | 50 L/hr | 1 set |
| 35 | Working Lamp | 7.7m cord length | 10 sets |
| 36 | Chain Nose Cutting Plier | | 5 sets |
| 37 | Part Tray | | 2 sets |
| 38 | Battery Charger | | 3 sets |
| 39 | Mechanic Tool Set | | 5 sets |

## 4. TIRE REPAIR SERVICE SECTION

| | | | |
|---|---|---|---|
| 1 | Tire Repair Service Tool Set | | 5 sets |
| 2 | Tire Bead Hammer | | 3 sets |
| 3 | Air Hose W/Chuck | 20m | 10 sets |

| | | | |
|---|---|---|---|
| 4 | Tire Bead Breaker | | 1 set |
| 5 | Tire Lever Set | 4 pcs/set | 10 sets |
| 6 | Hot Patch | L.M.S 10 pcs/set | 50 sets |
| 7 | Hot Patch Clamp | | 5 sets |
| 8 | Air Gauge Set | | 5 sets |
| 9 | Double Face Hammer | 10LB | 3 sets |
| 10 | Tire Changer | | 1 set |
| 11 | Tire Service Tool Set | | 5 sets |

## 5. BODY REPAIR & PAINT SECTION

| | | |
|---|---|---|
| 1 | Gas Welding Equipment | 3 sets |
| | 1) Oxygen Container | |
| | 2) Acetylene Generator (20 kg) | |
| | 3) Oxygen Regulator | |
| | 4) Acetylene Safety Valve W/Regulator | |
| | 5) Oxygen-Acetylene Twin Hose 10m | |
| | 6) Welding Torch Set, with 5 Tips | |
| | 7) Cutting Torch Set, with 3 Tips | |
| | 8) Lighter | |
| | 9) Eye glass | |
| | 10) Hose Clamp | |
| | 11) Valve Wrench | |
| | 12) Nozzle cleaner | |
| | 13) Leather gloves | |
| 2 | Electric Arc Welder | 5 sets |
| | 1) Welding cable W/Holder & Clamp 15 m long | |
| | 2) Welding Helmet | |
| | 3) Welding Gloves | |
| | 4) Chipping Hammer | |
| | 5) Welding Rod 2.6, 3.0, 4.2 mm 100 kg/each | |
| 3 | Body Repair Tool Set | 5 sets |
| 4 | Body Fender Tool Set | 5 sets |
| 5 | Spot Welder | 2 sets |
| 6 | Hydraulic Repair Set 10 ton | 2 sets |
| 7 | - do - 20 ton | 2 sets |
| 8 | Shearing Machine 4.5 mm×2,550 mm | 1 set |

| | | | |
|---|---|---|---|
| 9 | Bendinng Machine | 80 ton 2,550 mm | 1 set |
| 10 | Body Puller Set | | 2 sets |
| 11 | Metal Cutting Snip Set | 6 pcs/set | 5 sets |
| 12 | Vise Grip Plier Set | 10 pcs/set | 10 sets |
| 13 | C-clamp 50, 100, 150, 200, | 4 pcs/set | 10 sets |
| 14 | Swage Block, Cast Iron | 45 kg | 1 set |
| 15 | Anvil, Cast Iron | 50 kg | 1 set |
| 16 | Blacksmith Tool Set | | 2 sets |
| 17 | Work Bench | | 2 sets |
| 18 | Mechanic Vise, Reed Type | 150 mm | 1 set |
| 19 | Mechanic Vise, Swivel Type | 150 mm | 1 set |
| 20 | Hand Rivetter Set (Rivet 1,000 pcs include) | | 2 sets |
| 21 | Torch Lamp | | 2 sets |
| 22 | Paint Spray Equipment | | |
| | 1) Putty Surface Plate | | 10 sets |
| | 2) Putty Spreader | 20 pcs/set | 20 sets |
| | 3) Putty Filing Tool Set | 4 pcs/set | 10 sets |
| | 4) Sanding Paper 100 pcs | 4 each/set | 50 sets |
| | 5) Sanding Paper Holder | | 5 sets |
| | 6) Paint Spray Gun L, M | | 5 sets |
| | 7) Paint Container L, M | | 5 sets |
| | 8) Spray Mask | | 50 sets |
| | 9) Air Polisher | | 3 sets |
| | 10) Air Hose W/chuck | 20m | 5 sets |
| 23 | Painting Shelf | | 1 set |
| 24 | Working Wagon | | 1 set |
| 25 | Drier Stand | | 2 sets |
| 26 | Work Bench | | 1 set |
| 27 | Sawing Machine | | 2 sets |
| 28 | Sawing Tool Set | | 2 sets |
| 29 | Carpenter Tool Set | | 1 set |
| 30 | Hydraulic Garage Jack | 1.5 ton | 2 sets |
| 31 | - do - | 5 ton | 2 sets |
| 32 | - do - | 10 ton | 2 sets |
| 33 | - do - | 15 ton | 2 sets |
| 34 | Rigid Rack | 2.5 ton | 12 sets |
| 35 | - do - | 5 ton | 12 sets |
| 36 | Mechanical Tool Set | | 8 sets |

| | | | |
|---|---|---|---|
| 37 | Electric Bench Grinder | 205 mmø | 2 sets |
| 38 | Electric Portable Grinder | 100 mmø | 2 sets |
| 39 | Electric Disc Sander | 100 mmø | 2 sets |
| 40 | Hydraulic Jack | 10 ton | 3 sets |
| 41 | - do - | 20 ton | 3 sets |
| 42 | Hydraulic Press | 15 ton | 1 set |
| 43 | - do - | 35 ton | 1 set |
| 44 | - do - | 60 ton | 1 set |
| 45 | Electric Bench Drill | 13 mm | 1 set |
| 46 | - do - | 23 mm | 1 set |
| 47 | Electric Portable Drill | 6 mm | 2 sets |
| 48 | - do - | 13 mm | 2 sets |
| 49 | - do - | 10 mm | 2 sets |
| 50 | Twist Drill Set | up to 20 mm | 10 sets |
| 51 | File Set | 5 pcs/set | 10 sets |
| 52 | Surface Plate | | 1 set |
| 53 | Double Face Hammer | 10LB, 5LB | 2 sets |
| 54 | Air Compressor | 11 kW | 2 sets |
| 55 | Air Regulator | | 2 sets |
| 56 | Air Impact Wrench Set | 16 mm | 2 sets |
| 57 | - do - | 20 mm | 2 sets |
| 58 | - do - | 42 mm | 2 sets |
| 59 | Socket for Impact Wrench | 3/4" Dr.inch, mm | 3 sets |
| 60 | - do - | 3/8" Dr.inch, mm | 5 sets |
| 61 | - do - | 1/2" Dr.inch, mm | 5 sets |
| 62 | - do - | 1" Dr.inch, mm | 3 sets |
| 63 | Air Hose for Impact Wrench W/Chuck 20m | | 5 sets |
| 64 | Rubber Pad Set (Sanding Pad 3 pcs/set) | | 10 sets |
| 65 | Service Creeper | | 10 sets |
| 66 | Hack Saw Frame | | 5 sets |
| 67 | Hack Saw Blade | 10 dz | 10 sets |
| 68 | Gas Welding Rods | 6 pcs/20 kg | 6 sets |

## 6. LUBRICATION SECTION

| | | | |
|---|---|---|---|
| 1 | Grease Pump Set | | 4 sets |
| 2 | Oil Pump Set | | 8 sets |
| 3 | Waste Oil Receiver | | 2 sets |
| 4 | Grease Pump, Lever Type | | 10 sets |
| 5 | Oil Measure 1L, 2L, 5L | | 10 sets |
| 6 | Pistol Oiler | | 10 sets |
| 7 | Drain Plug Wrench | | 2 sets |
| 8 | Oil Filter Wrench | | 2 sets |
| 9 | Drum Pump, Rotary Type | | 5 sets |
| 10 | Drum Opener | | 2 sets |
| 11 | Fuel Tank | 20ℓ capacity | 10 sets |
| 12 | Air Hose W/Chuck | 20m long | 3 sets |
| 13 | Air Blow Gun | | 3 sets |
| 14 | Air Stand | | 1 set |
| 15 | Work Bench | | 1 set |
| 16 | Mechanic Vise, Type | 150 mm | 1 set |
| 17 | Mechanic Tool Set | | 2 sets |
| 18 | Washing Pan | L, M, S | 2 sets |
| 19 | Test Hammer | | 10 sets |
| 20 | Water Hose | 15 mm×100m | 5 sets |
| 21 | Hot Water Car Washer | | 2 sets |
| 22 | Washing Brush | L, M | 100 sets |
| 23 | Air Compressor | 5.5 kW | 2 sets |

## 7. EMERGENCY & OTHERS

| | | | |
|---|---|---|---|
| 1 | Fork Lift. Diesel Engine | 2,500 kg | 2 set |
| 2 | Crane and Wrecker Truck | 5,000 kg | 1 set |
| 3 | Wheel Lift Wrecker Truck | 1,500 kg | 1 set |
| 4 | Mobile Workshop Truck | 4,000 kg | 2 sets |
| 5 | Part Storage Shelf | | 1 set |
| 6 | Part Control Card Rack | | 1 set |
| 7 | Working Desk | | 2 sets |
| 8 | Working Chair | | 2 sets |
| 9 | Tool Storage Shelf | | 1 set |

| | | | |
|---|---|---|---|
| 10 | Tool Control Card Rack | | 1 set |
| 11 | Waste Cloth | | 500 kg |

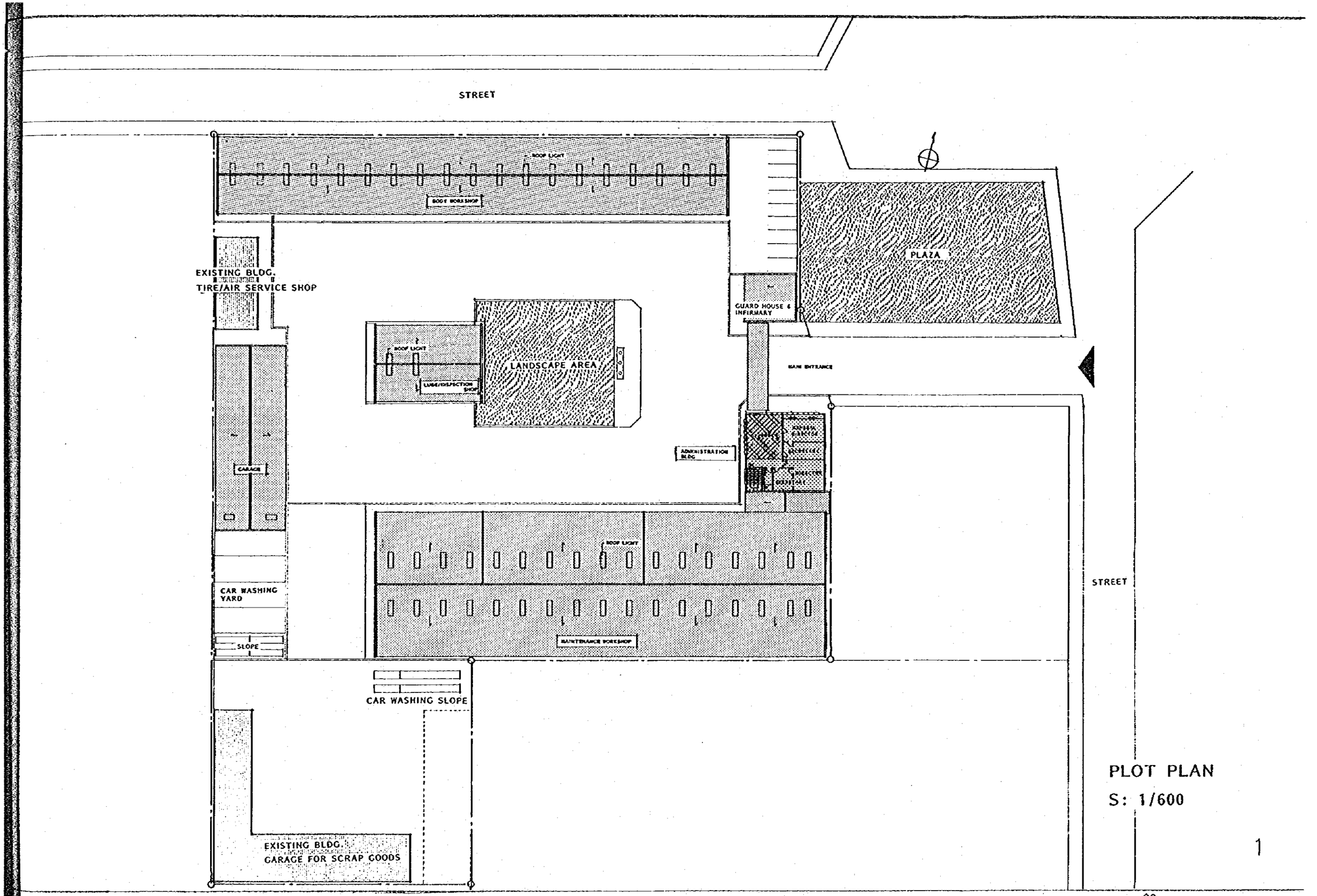
8. SPARE PARTS FOR JAPAN VEHICLES INCLUDE

| | | | |
|---|---|---|---|
| 1-1 | Large vehicle Parts | | 1 set |
| -2 | Middle Vehicle Parts | | 1 set |
| -3 | Tire for Truck | 9.00 - 20 - 14 pr | 150 sets |
| -4 | Tire for Small Truck | 7.50 - 16 - 8 pr | 100 sets |
| -5 | Battery for Truck | N120 | 100 sets |
| -6 | Battery for small Truck | N70 | 50 sets |
| -7 | Lighting Bulb for 24V (Head Light, Tail Lamp, Flasher Lamp) | | 500 sets |
| 2 | Special Tool Set for Japanese Vehicles | | 1 set |

※ L = Large size, M = Medium size, S = Small size.

### 4-3-6 Basic Design Drawings

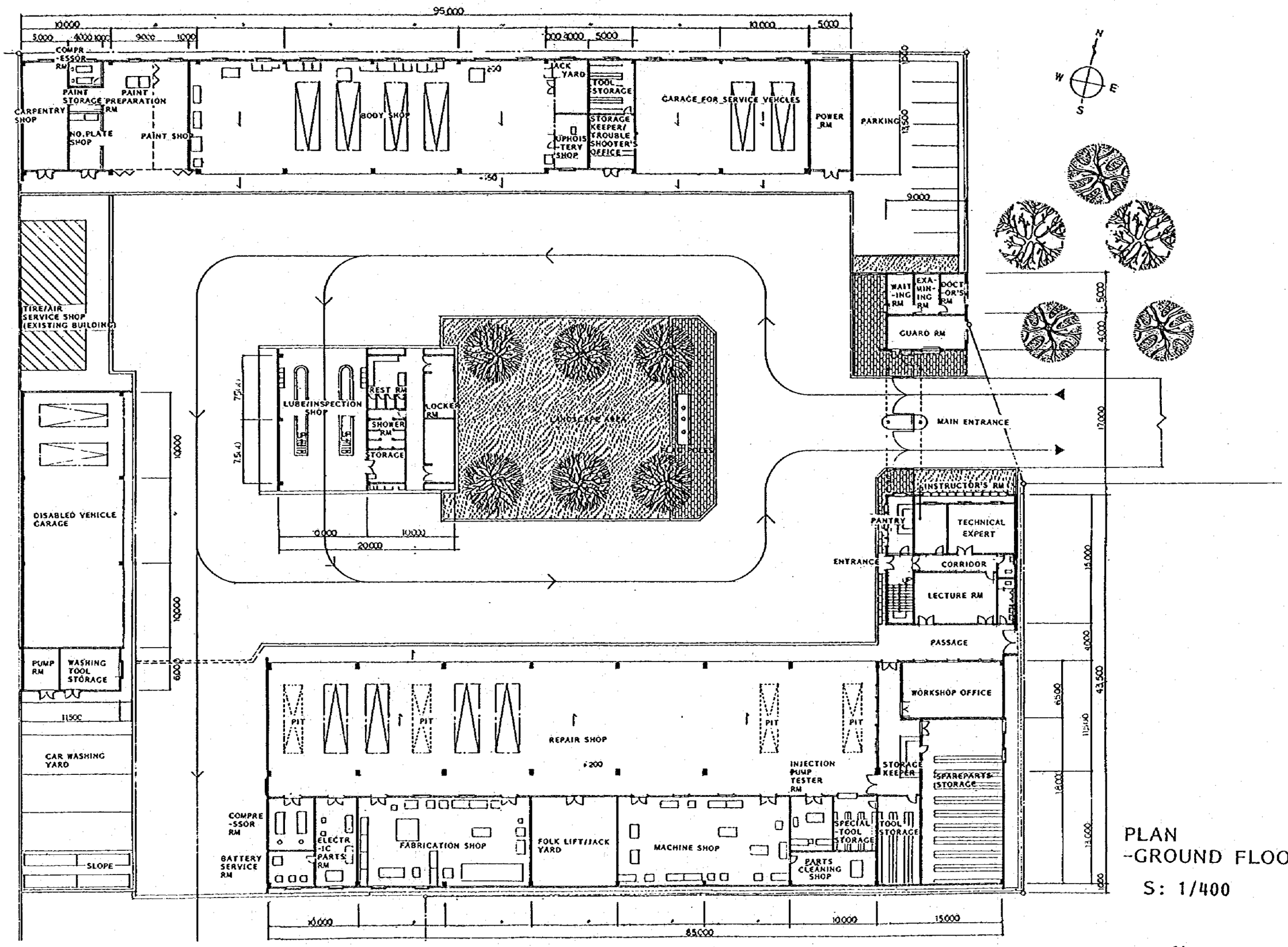
(1) Plot Plan
(2) Ground Floor Plan
(3) 1st. Floor and Roof Plan
(4) Elevation
(5) - do -
(6) Section




PLOT PLAN

S: 1/600

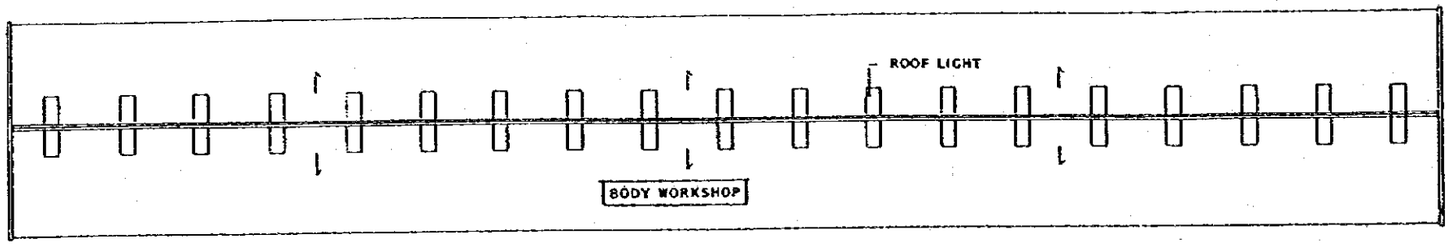
1

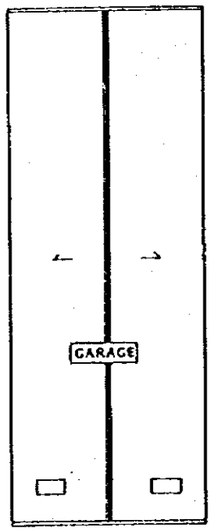


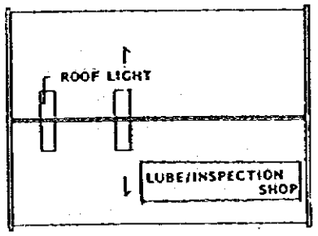

PLAN
-GROUND FLOOR

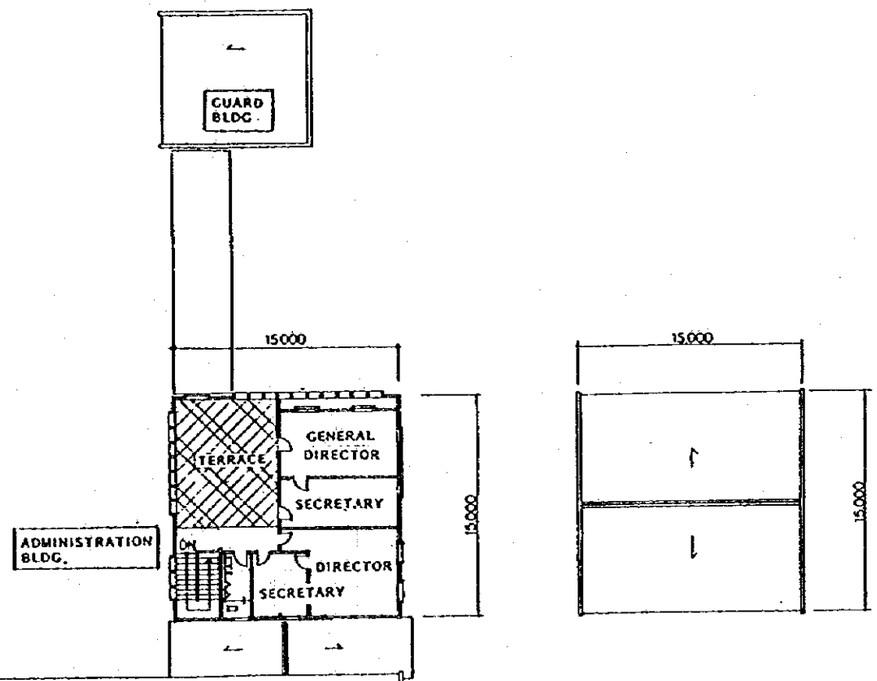
S: 1/400

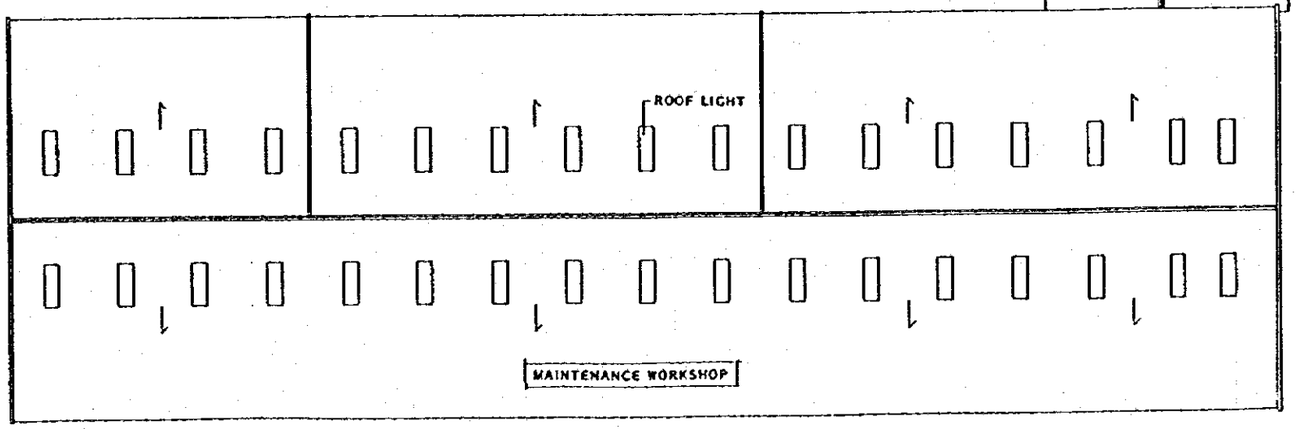
2



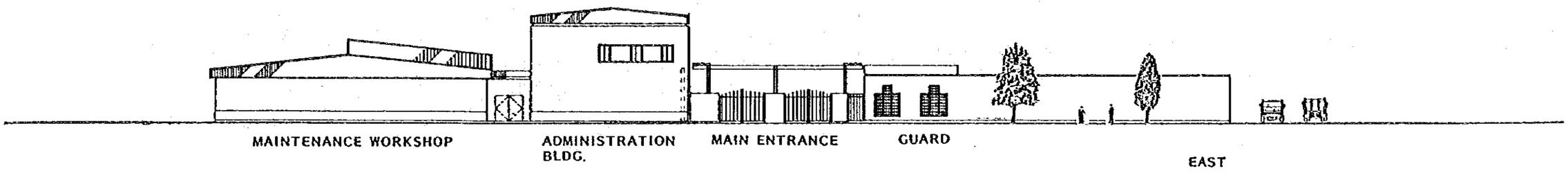



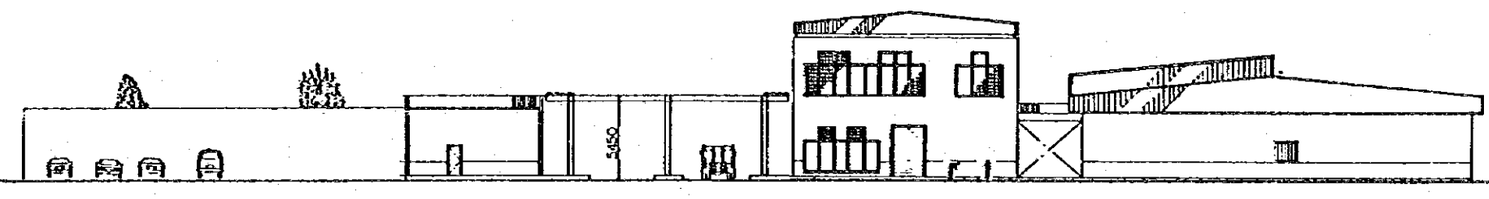



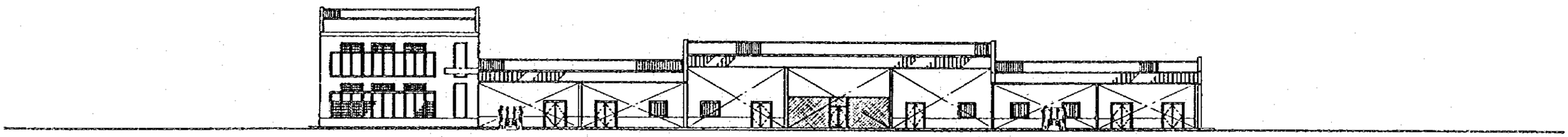




PLAN
-1st. FLOOR
- ROOF

3



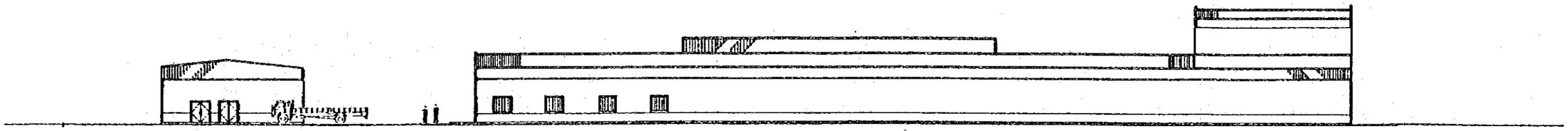




ELEVATION

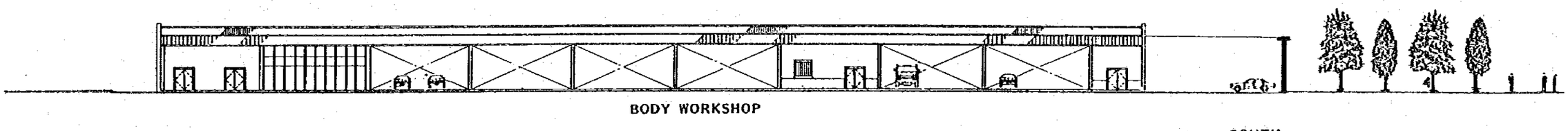
S: 1/400

4



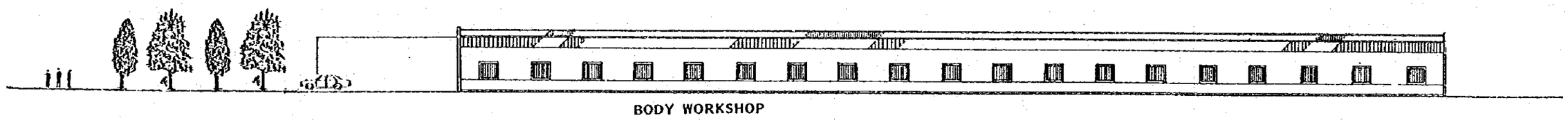
MAINTENANCE WORKSHOP

SOUTH



BODY WORKSHOP

SOUTH



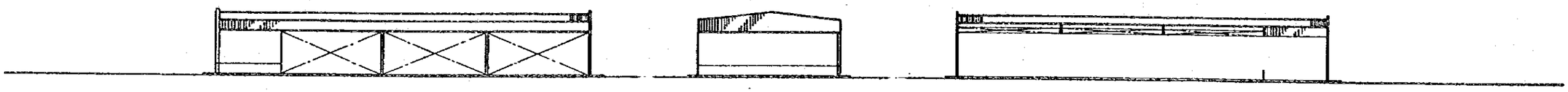
BODY WORKSHOP

NORTH

ELEVATION

S: 1/400

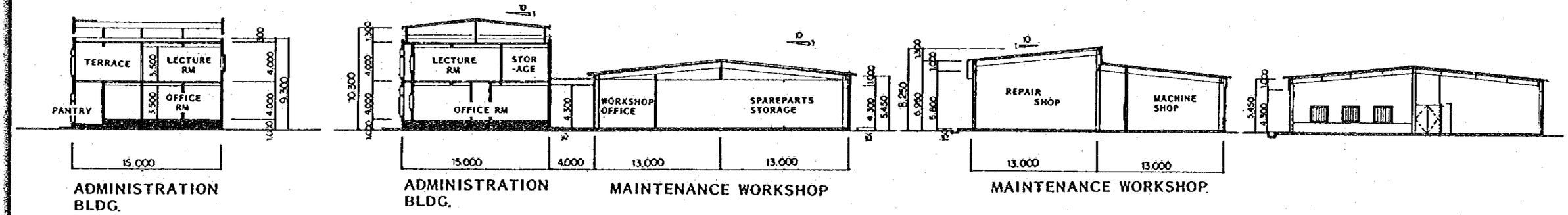
5



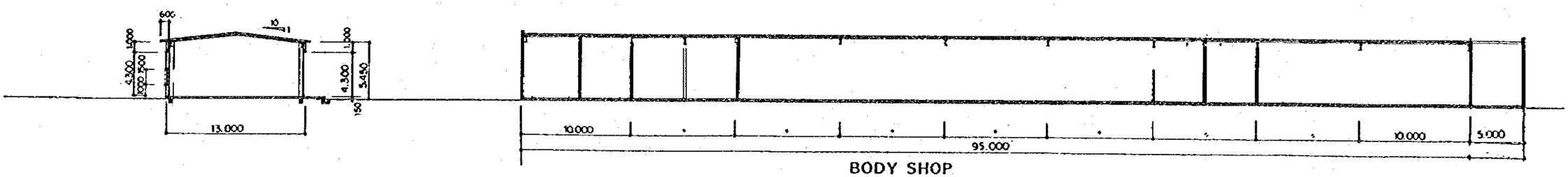
EAST NORTH WEST

# DISABLED VEHICLE GARAGE ELEVATION

S: 1/400




ADMINISTRATION BLDG. ADMINISTRATION BLDG. MAINTENANCE WORKSHOP MAINTENANCE WORKSHOP




BODY SHOP

# SECTION

S: 1/400

6

## 4-4 Execution Plan of the Construction

### 4-4-1 Construction Condtions and Execution Concept

(1) Local construction companies

The construction enterprises with a capacity to undertake this project are leading construction companies located in Mogadishu. Since the main structure is steel frame construction, it is necessary to select companies with the necessary equipment and materials eg., cranes, etc. as subcontractors.

Similarly, concerning the electrical and mechanical sub-contractor, to secure the overall quality of this project, the work shall be carried out by these leading general construction companies rather than the separate subcontractors.

Points to consider:

1) Availability of heavy machinery and temporary machines
2) Possession of construction techniques and skilled technicians
3) Certain process control

(2) Notes on work

Since there are many problems with the delivery period and quantity in terms of the size of this plan for items supplied on-site, an accurate and precise construction schedule and its realization are important so as to fulfill the construction period. Further, it shall be a plan based on the reinforcing concrete block construction steel frame truss roof that is a general construction process at the site, and poor on-site concrete work will be minimized.

Further, before commencement of work the removal of existing buildings, scrap vehicles, etc. located at the planned site shall be removed at the expense of the Somali side.

## 4-4-2 Scope of Works

The scope of work to be borne by the Japan side and that to be borne by the Somalia at the time of construction of this maintenance workshop are as follows:

(1) Japanese Side Work

1) Facilities

a) Maintenance workshop

b) Body workshop

c) Garage

d) Administration building

e) Guard house and infirmary

f) Lube and inspection shop

2) Utilities

a) Water supply facilities (well, water reservoir tank and elevated water tank)

b) Sewage facilities (rain water drainage, sewage and oil-contaminated water)

c) Receiving and distribution facilities

d) Telephone facilities (telephone cables in the field)

3) Site work

a) Road, parking lot pavement and car washing yard pavement

b) Drainage

c) Septic tank and Seepage pit

4) Equipment

a) Equipment for maintenance and repair

b) Inspection, lubricating and testing materials and equipment

c) Emergency vehicles (wrecker trucks with crane and mobile workshop)

d) Some consumables from among the above-mentioned materials and equipment

e) Spare parts

(2) Somali Side Work

1) Items

a) To secure the site necessary for the construction of this maintenance workshop

b) To clear the site before commencement of work and removal of obstruction and existing buildings (except buildings to remain for this project)

c) Utilities

- Water supply line to the site
- Power supply line to the site

d) Landscaping including tree planting

e) Furnishing and building equipment and accessories (building equipment and accessories, furniture and curtain)

2) Responsibility of Somali

a) Offering of related information necessary for the realization of the Project

b) Tax exemption procedure and customs clearance for equipment and materials related to the construction

c) Tax exemption procedure of the Somali domestic taxes for Japanese who are engaged in the construction of facilities (customs duty, income duty, etc.)

e) To give necessary conveniences to Japanese staff on entry and stay in Somali Democratic Republic for the execution of the Project.

e) Maintenance and running expenses of facilities and equipment

f) Other expenses

- Expenses related to banking arrangement
- Expenses related to power supply, telephone and water supply

- Expenses related to procedures of approvals and licenses

## 4-4-3 Construction and Supervision plan

### (1) Construction plan

After conclusion of exchange of notes, The Ministry of Land and Air Transport conclude the consultant contract with Japanese consultant, and carry out the detail design, bid and work contract operations, detailed discussions on construction and full adjustments in accordance with the principle of basic design.

Before commencement of work of the construction, the Somali side must carry out the removal of existing buildings and other obstacles to work construction. With regard to the construction plan, the actualization process will be studied between the person in charge on the Japanese side and the Ministry of Land and Air Transport, the scope of work of both countries are determined, and the appropriate period of commencement of work on connection, etc. is planned. The setting of a process must be observed by engineers from the Ministry of Land and Air Transport at the time of procurement of construction materials, site delivery, construction and installation of equipment and test run, etc.

A cooperative relationship between the Japanese contractor and the sub-contractor is important, the Japanese side assumes the role as general contractor. There is a need to coordinate the work of both staff and the organizational system to ensure smooth construction.

### (2) Supervision plan

Along with the principle of Japanese grant-aid assistance, the consultant will set up a plan for detail design and supervision of the construction, monitor discussions between interested parties, and make efforts to ensure the smooth execution of the Project.

1) Main concept

- Close communication with the Ministry of Land and Air Transport and other competent organizations of both countries; a comprehensive report is prepared as required, to be carried out until completion of facilities as well as throughout the construction process.

- To realize the aims of this plan, an appropriate and prompt guidance and counseling is given to interested parties of construction.

- For the purpose of improving construction techniques in Somalia, technical transfer is fully taken into account, and the effects of non-gratis aid cooperation fully considered.

- For the purpose of smooth operation of facilities after completion of facilities, appropriate counseling and guidance to the Somali side are given.

2) Services

The following operations are carried out by the client's agent communicating with the client:

a) Operations in work contract

b) Dispatch of site supervisor technicians

c) Inspection and approval of shop drawings, materials, etc.

d) Inspection

e) Cooperation in payment approval procedures

Upon confirmation that the work is completed and the contractual conditions are fulfilled, the consultant witnesses the delivery of project articles of the contract, and completes the operations. Further, he reports to the Japanese government progress in construction, payment procedures and necessary items on completion delivery. At the time of work supervision of this facility, it is considered that under the so-called spot supervision system specialists in each field should stay for an adequate period

of time than the regular stay of a engineer at the site in view of the contents and scale of the building.

### 4-4-4 Materials and Equipment Procurement Plan

(1) Materials

As for construction materials, the procurement will target available materials in Mogadishu unless there is a problem in the supply. For materials of aggregates, cement, reinforcing steels, bricks, concrete blocks, asphalt, forms structural materials, etc., site products will be used. Those which do not satisfy the required quality and performance and materials unavailable at the site will exported from Japan.

1) Domestically supplied materials
   - Sand
   - Aggregate
   - Concrete block
   - Form work
   - Reinforcing bar
   - Ceramic tile
   - Glass
   - Paint

2) Imported materials
   - Cement

3) Imported materials from Japan
   - Structural steel
   - Corrugated steel roof
   - Aluminum window

(2) Equipment and materials

All the equipment and materials for maintenance of vehicles will be exported from Japan.

(3) Procurement

In Mogadishu there are many workers and sufficient labor. Concerning the maintenance equipment and materials, since sophisticated techniques are required, technical instructors will be dispatched from Japan at the time of installation and commissioning. Further, with regard to the construction work requiring sophisticated techniques, as the procurement of skilled workers at the site will be difficult, technical instructors will be dispatched similarly from Japan.

- Roof worker:
  Structural steel, Roof, Aluminum window, Steel door, Finishing bed
- Electrical worker:
  Assembly of receiving and distribusion facilities, Installation and adjusting of generator, Piping, Cable, Assembly of panel board
- Piping and ducting worker:
  Air compressor piping, Oil piping, Water supply for equipment

## 4-5 Maintenance and Management Expenses

At the time of implementing the plan of this project, it is natural to pay attention to ease of maintenance and management and to the building management and equipment and materials handling. Clarification is made at points of completion of work and delivery. Explanations are made from the instruction manual and by demonstration. Maintenance and management, method of application and maintenance, and inspection methods are also covered.

The maintenance and management expenses, running expense, consumables expense, etc. of facilities of this maintenance workshop are to be paid out of the budget of the Ministry of Land and Air Transport.

The annual maintenance and control expenses of this facility calculated on the basis of the site survey and data are roughly as follows:

| | |
|---|---|
| Facility operations expenses | 1,466,000 So.Sh |
| Equipment, materials and expendable supplies expenses | 943,000 |
| Building maintenance expenses | 941,000 |
| Total | 3,350,000 So.Sh. |

The facility operations expenses are mainly composed of power rate, water rate, etc.

(1) Calculation system of power rate

1) Calculation of usage power volume (Table 4-4)

| Load item | Load capacity (kW) | Occupied time (H/day) | Occupied day (day/mon) | Demand factor (%) | Electric energy consumed (kWH) |
|---|---|---|---|---|---|
| Lighting & Receptacle | 16 kVA | 7h | 25 days | 30% | 840 |
| Power (Bldg.) | Air-conditioning 4 kVA | 7h | 25 days | 60% | 420 |
| | Pump 5.9×1.25 kVA | (7+1)h | 25 days | 30% | 442 |
| Power (Equipment) | 248 KVA | 3h | 25 days | 30% | 5,580 |
| Total | | | | | 7,282 kWH/month |

2) Calculation of power rate

a. There is no basic rate.

b. Usage rate

7,282 kWh/month x 14 So.Sh./kWh = 101,948 So.Sh./month

(2) Provisional estimate of water usage rate

The provisional estimate of water rate is made in accordance with the water supply facility plan.
However, well water is used as water supply for car wash,the rate shall not be applied.

| | |
|---|---|
| Usage water volume per day | 14 $m^3$/day |
| Number of operation days per month | 25 days/month |
| Water usage rate | 25 So.Sh/$m^3$ |

Therefore, the water service rate per month is as follows:
14 $m^3$/day x 25 days/month x 25 So.Sh./$m^3$ = 8,750 So.Sh/month

## 4-6 Approximate Operation Expenses

The approximate operation expenses required for the realization of this project of Somali side are esitmated as follows:

Operation expenses at the expense of the Somali side

The total amount of operation expenses at the expense of the Somali side is estimated as 11,415,000 So.Sh.

The breakdown is as follows:

| | | |
|---|---|---|
| a. | Water supply main connection work | 35,000 So.Sh |
| b. | Power supply work | 2,080,000 |
| c. | Demolition work of existing buildings and obstacles | 9,300,000 |
| | | 11,415,000 So.Sh |

# CHAPTER 5 EVALUATION

# CHAPTER 5 EVALUATION

The establishment of comprehensive social structures is an urgent task for Somalia, a young nation that was founded just over 20 years ago. It is especially important to determine which sector holds the greatest potential for effective investment, since the national budget is burdened by deficits with 91% of the nation's development funds dependent on overseas aid (1987 estimates).

In this context, increasing investments have been made in the transportation and communication sectors since 1985. The priority for 1987 is on the construction and maintenance of road facilities and related infrastructures. This emphasis is intended to upgrade the living standards of regional inhabitants as well as activate key industries. The demand for improved transportation is also arising from the promotion of livestock, agricultural, and manufacturing industries along with expanding trade.

Thus, the number of vehicles imported by the government during the five-year period 1981-85 rose to 1,675, an annual average increase of 335 vehicles (Table 3-2). The capacity of the workshops responsible maintaining the durability and operability of these vehicles has a direct impact on the stability of the land transportation system.

Maintenance of government-owned vehicles is performed by the Central Workshop under the jurisdiction of the Ministry of Land and Air Transport. However, the current capacity of the workshop is not sufficient to meet the demand placed upon it. Consequently, the government is being forced to increase its repair expenditures by sending vehicles in need of repair to outside agencies, including WAGAD and private workshops. Thus, a concentrated effort to improve the maintenance capacity of the Central Workshop represents a highly effective approach for Soamlia. This would ensure fast and reliable service for government-owned vehicles. In addition, this project would upgrade vehicle operability through preventive inspections leading to the establishment of a confident, dependable vehicle maintenance system. This in turn would strengthen Somalia's ability to meet the rising demands upon land transportation and eventually contribute to the social and economic development of the nation.

With Somali inhabitants scattered across the vast expanse of equatorial savanna, the transport by land of daily necessities to remote regions is

vital. Instability in the transportation system directly affects local residents who live under severe conditions of terrain and climate with frequent droughts. Since the nation has no railroad, the major portion of its domestic transportation depends on the vehicles that travel its roads. Thus, improved vehicle operability and expanded maintenance capacity will directly contribute to the firm establishment of transportation capabilities in Somalia and raise the living standard of its inhabitants. Along with ongoing industrial development efforts, transport vehicles will play a significant role in the delivery of raw materials and finished products eventually leading to a dependable distribution system.

The Ministry of Land and Air Transport will be responsible for the construction of the Mogadishu Central Workshop as an executing agency of this project.

For the purpose of operation and control, the Central Workshop is divided into the following sections: management, manufacturing and working, mechanical and electrical, and maintenance and procurement of parts. It is headed by a manager from the Ministry of Land and Air Transport, Vehicle Maintenance Bureau. The system is deemed appropriate to the objectives of its operation as vehicle maintenance workshop. It has eighty-nine (89) mechanics more than half, the staff (47) have a class 2 license, which is supposed to be equivalent to Japanese class 3 mechanics. There are no problem in the operation of workshop, and the further improvement at the technical level in the new maintenance workshop can be expected.

From the perspective of maintenance techniques and skills, the project will encourage mutual research and communication among government workshops. This exchange of technical information will be especially active between the Central Workshop and WAGAD, since they are both under the same ministry and are situated in close proximity.

The Central Workshop, as a technical facility of the Ministry of Land and Air Transport, is expected to play an instructive role in upgrading the work capacity of mechanics in the Somali maintenance industry.

Designing shall be done so to minimize the financial burden on maintenance of the facilities, so a maintenance free criteria was set for selecting construction methods and materials.

Spare parts and shop materials, which are provided for a temporary period, are included in this project.

After the completion of construction, the approximate annual cost for building maintenance and utilities is calculated at 3,350,000 Somali shillings, which corresponds to an amount less than last years expenditure of the Central Workshop for the same.

Therefore, future maintenance costs of the facilities will not produce any financial hardships for the Somali Government.

# CHAPTER 6 CONCLUSION AND RECOMMENDATIONS

# CHAPTER 6 CONCLUSION AND RECOMMENDATIONS

## 6-1 Conclusion

Considering the present situation of the Central Workshop management, maintenance and skilled staff, the new facilities should not add extra burdens to the Somali Government in the future.

The improvement of vehicle maintenance is expected to make a noticable contribution in activating social and economic development in Somalia as well as raising the standard of living for its people.

## 6-2 Recommendations

(1) Work undertaken by the Somali government side

The removal of existing buildings and obstacles including equipment and materials in the site related to the construction work of this maintenance workshop and the infrastructure work of electricity, water service, etc. are to be carried out by the Somali side, and since the removal work of existing buildings and obstacles in the site influences the progress in terms of construction process, the prompt completion of the Somali work is required. In addition, the customs clearance procedures for equipment and materials, various approvals and licenses, etc. also influence the construction process, so prompt correspondence with the Somali government is hoped for.

(2) Maintenance of facilities and budget procedure

At the time of delivery of facilities, after completion of work, it is necessary to carry out thorough guidance on the maintenance of buildings, operations, periodical inspections, plant equipment, for engineers in charge of the maintenance and operation of all buildings, etc. In this matter the consultant should fully advise the constructor. There is a need to create a budget to maintain buildings and plant in good condition as well as for the maintenance equipment and materials for vehicles.

(3) Personnel plan

No particular reorganization of the actual personnel is necessary, however, there is a need to adopt new techniques in terms of the maintenance technology aiming at the maintenance quality improvement, and it is also necessary to improve the control of such work. For this reason, it is intended to make technical improvements by daily basic training of the technical staff to promote self-effort in the vehicle maintenance workshop.

(4) Establishment of preventive maintenance system

To prevent troubles occurring and to enhance the operating rate of vehicles, the establishment of a system to carry out the periodical inspection and maintenance at determined cycles is required. Thoroughness of this preventive maintenance system is one of main tasks in the improvement of the maintenance workshop.

It is planned to provide bays (spaces for vehicle) to ensure inspection and maintenance of vehicles is possible maintenance on the basis of periodical inspection and maintenance every 6 months (approximately each 25,000 km of travel), taking into account the severe running conditions in Somalia.

(5) Establishment of parts supply system

For maintenance efficiency improvement of the maintenance workshop, a supply system for vehicle parts should be established. Vehicles owned by the government include those from Japan, Italy, West Germany, England, etc., and depending on manufacturers and models the supply of parts from parts shops in the city of Mogadishu is sometimes unsatisfactory. In case they are imported, the loss in terms of the time is critical. Therefore, as a result of daily inspection of vehicles, the establishment of a system that allows for prompt assessment of the maintenance situation and parts procurement is necessary.

(6) Technical Cooperation

As stated above, the Central Workshop is provided with expert mechanics who are experienced in overhauling and parts'

processing. However, the Somali government is also requesting Japan's technical cooperation through the dispatching and participation of maintenance experts in the project. The machinery to be provided under the project will be selected on the basis of its suitability to the level of maintenance in Somalia and will therefore be operable only by staff members of the workshop. However, there is a need to strengthen administration and management capabilities including such aspects as maintenance planning and improving maintenance techniques. Consequently, the implementation of technical cooperation in parallel with the grant-in-aid will further enhance the effectiveness of the project.

(7) Others

Somali side has conceived the construction of the vehicle registration office and they made the request that this vehicle registration office should be included in this project at the time of draft final explanation.

It is recommended that this vehicle registration office should be constructed after establishing the vehicle maintenance system of the Central Workshop.

## APPENDICES

Appendix 1 Minutes of Discussions (Phase I)

# MINUTES OF DISCUSSIONS
# ON
# THE PROJECT FOR IMPROVING
# THE CENTRAL WORKSHOP
# IN
# SOMALI DEMOCRATIC REPUBLIC

In response to request of the Government of Somali Democratic Republic, the Government of Japan decided to conduct a basic design study on the Project for improving the Central Workshop (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent to Somali Democratic Republic the study team headed by Mr Yukio HORIBE, Deputy Director, Vehicle Service, Land Transport Engineering Department, Regional Transport Bureau, Ministry of Transport, from April 5 to 30, 1987.

The team had a series of disoussions on the Project with the officials concerned of the Government of Somali Democratic Republic and conducted a field survey.

As a result of the study, both parties agreed to recommend to their respective Governments that the major points of understanding reached between them, attached herewith, should be examined towards the realization of the Project.

Mogadishu April 29, 1987

森郁幸男

Mr. Yukio HORIBE
Leader
Basic Design Study Team

Dr. Mohamed S.Osman Jawari
Vice Minister
Ministry of Air and Land Transport

ATTACHMENT

1) The objective of the Project is to provide necessary facilities for improving the Central Workshop in order to contribute to the development of land transportation in Somalia.

2) The executing agency for the implementation of the Project in Somalia is Directorate General of Workshops, Ministry of Land and Air Transport.

3) The proposed site of the Project is located in the existing Central Workshop area, and shown in Annex I.

4) The Japanese Study Team will convey to the Government of Japan the desire of the Government of Somali Democratic Republic that the Government of Japan takes necessary measures to cooperate in providing the items listed in Annex II within the scope of Japan's Grant Aid Program.

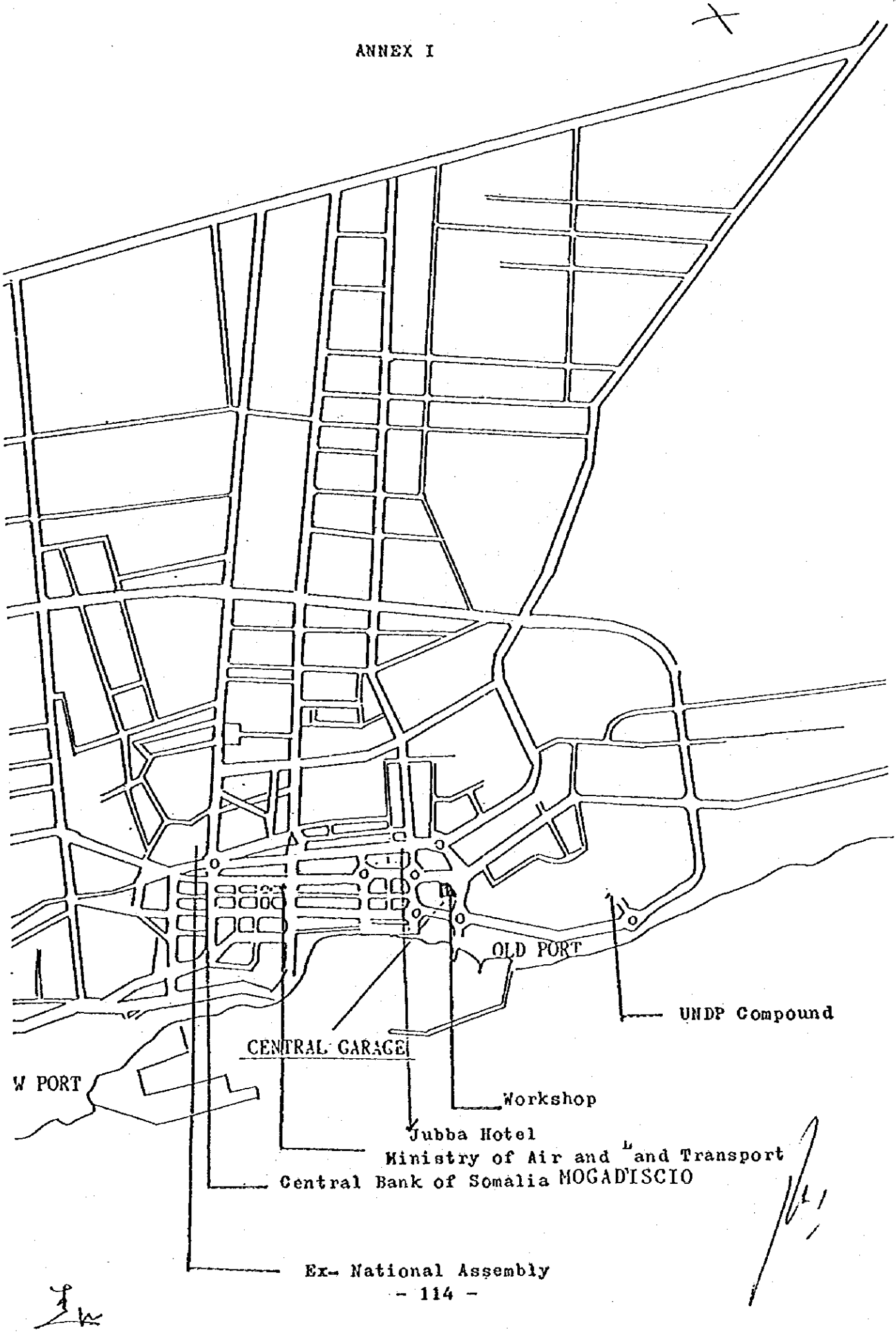
5) The Government of Somali Democratic Republic has understood the Japan's Grant Aid system explained by the Japanese Study Team, including a principle that a Japanese consultant firm and a Japanese general contractor should be used for the implementation of the Project.

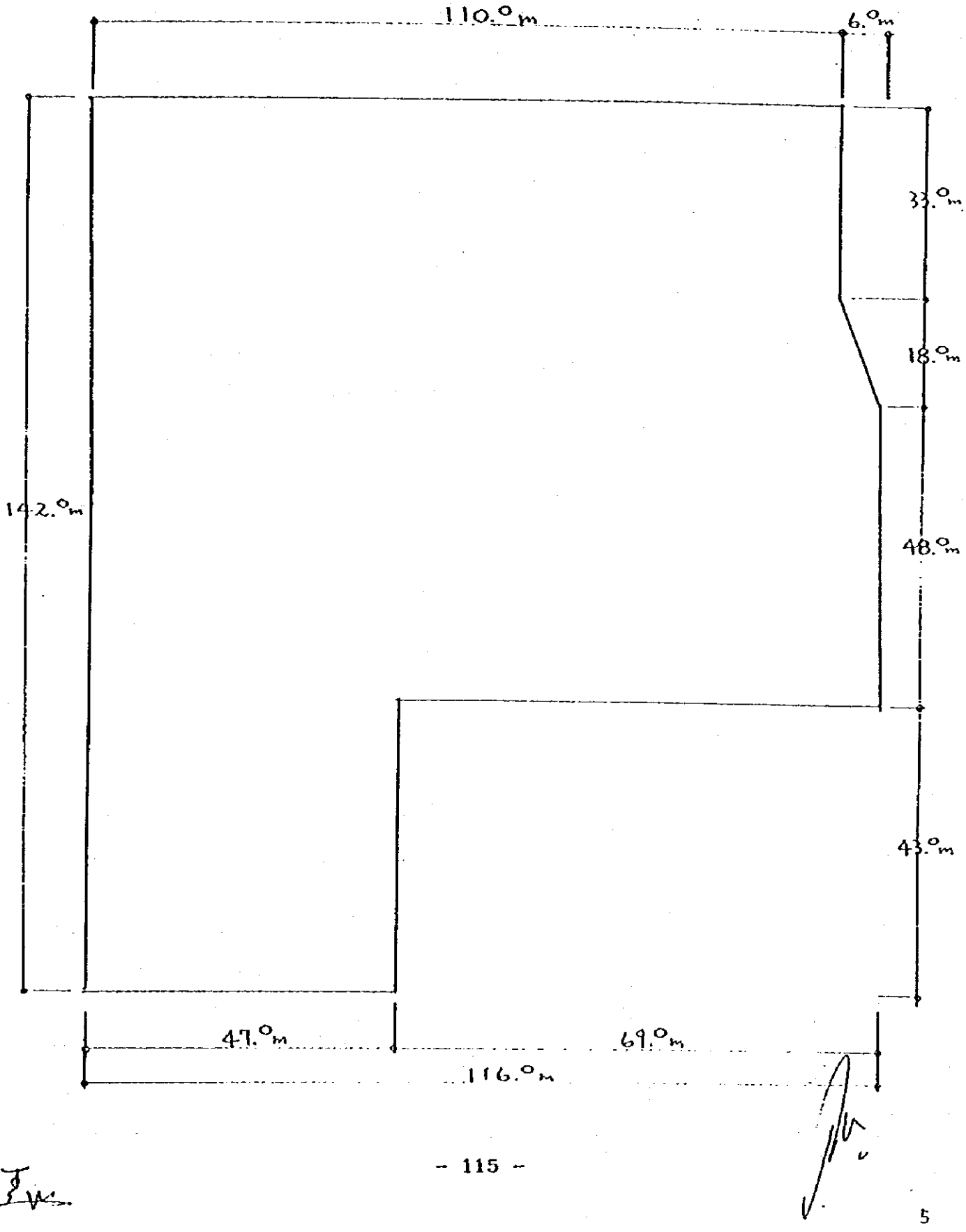
6) The Government of Somali Democratic Republic will take necessary measures as listed in Annex III on condition that the Grant Aid by the Government of Japan is extended to the Project.

7. The Japanese Study Team will convey to the Government of Japan the desire of the Government of Somali Democratic Republic that the Government of Japan will consider the possibility of supplying the equipment and tools for seven Regional Workshops after the Project contributes the improvment and development of land Transportation in Somalia.

8. The Government of Somali Democratic Republic expressed the desire of being provided an expert specialised in vehicle repair and maintenance for the Central Workshop by the technical cooperation.

ANNEX I


OLD PORT
UNDP Compound
CENTRAL GARAGE
W PORT
Workshop
Jubba Hotel
Ministry of Air and Land Transport
Central Bank of Somalia MOGADISCIO
Ex- National Assembly


110.0m
6.0m
33.0m
18.0m
142.0m
48.0m
43.0m
47.0m
69.0m
116.0m

ANNEX II

1. Facilities

   a. Engine and chassis repair

   b. Body repair and painting

   c. Machine shop

   d. Electrical repair

   e. Lubrication and washing

   f. Parts and tools storage

   g. Administration

2. Equipment

   a. Engine and chassis repair equipment

   b; Body repair and painting equipemnt

   c. Machine shop equipment

   d. Electrical repair equipment

   e. Lubrication and washing equipment

   f. Parts and tools equipment

   g. Emergency equipment

3. Spare Parts for Japanes made Vehicles owend by the Somali Government.

ANNEX III

Following arrangement are required to be taken by the Goverment of Somali Democratic Republic.

1) To acquire necessary development budget for the Project and to clear and level the Project site before the start of the con.s-truction.

2) To provide facilities for distribution of electricity, water supply, drainage, telephone system and other incidental facilities to the project site.

3) To provide date and information necessary for the Project.

4) To ensure prompt unloading, tax exemption and customs clearance of materials and equipment under the Grant Aid at the port of disembarkation in Somalia and also to facilitate the internal transportation of them.

5) To bear the following commissions to a Japanese foreign exchange bank for the banking services based upon the Banking Arrangement.
- Advising commission of Authorization to Pay
- Payment commission

6) To exempt Japanese nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Somalia with respect to the supply of the products and the services under the verified contracts.

7) To provid and/or acquire necessary permissions, licensed and other authorizations necessary for carrying out the Project.

8) To bear all the expenses other than those borne by the Grant such as gardening, fencing, gates, exterior lighting , etc.

9) To maintain and use properly and effectively the facilities constructed and equipment provided under the Japanese Grant Aid program and to prepare the maintenance cost for the facilities and equipment sufficiently after completion of the Project.

# MINUTES OF DISCUSSIONS
# ON
# THE PROJECT FOR IMPROVING
# THE CENTRAL WORKSHOP
# IN
# SOMALI DEMOCRATIC REPUBLIC

In response to the request of the Government of Somali Democratic Republic for Grant Assistance for the Project for Improving the Central Workshop (hereinafter referred to as "the Project"), the Government of Japan decided to conduct a basic design study on the Project and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent to Somali Democratic Republic a team headed by Mr. Yukio Moribe, Deputy Director, Vehicle Service Division, Land Transport Engineering Department, Ministry of Transport, from April 5 to 30, 1987.

As a result of the study, JICA prepared a draft report and dispatched a mission to explain and discuss it from August 1 to 16, 1987.

Both parties had a series of discussions on the report and agreed to recommend to their respective Government that the major points of understanding reached between them, attached herewith, should be examined towards the realization of the Project.

Mogadishu August 9th, 1987.

森部幸男

Mr. YUKIO MORIBE
LEADER,
JICA TEAM.

MR. MOHAMED HAJI HASHI
PERMANENT SECRETARY
MINISTRY OF LAND & AIR
TRANSPORT.

## MAJOR POINTS OF UNDERSTANDING

1. The Somali side principally agreed to the basic design proposed in the Draft Final Report and appropriate alternations in design mutually agreed during the discussions will be incorporated in the Final Report.

2. The Final Report will be submitted to the Somali side in September.

3. The Somali side understood the system of Japan's Grant Aid and confirmed the measures to be taken by the Somali side towards the realization of the Project.

4. The Somali side assurred the Team that the necessary budget for the implementation of the Project would be prepared in the next Somali fiscal year.

5. The team will convey the following request made by the Somali side to the Japanese Government.

   1. Dispatch of Japanese experts.
   2. Training of Somali personnel in Japan
   3. Construction of vehicle registration office to be included in the Project, if possible.

## Appendix 3 Organization of the Study Team

### Basic Design Survey (Phase I)

| | |
|---|---|
| Team Leader<br>Mr. Yukio MORIBE | Deputy Director,<br>Vehicle Service Div.<br>Land Transport Engineerion Dept.<br>Regional Transport Bureau,<br>Ministry of Transport |
| Project Coordinator<br>Mr. Ryota ONO | Staff<br>2nd Basic Design Study Div.<br>Grant Aid Planning & Survey Dept.<br>JICA |
| Architectural Planning<br>Mr. Toshiro KAWADA | Ishimoto Architectural &<br>Engineering Firm, Inc. |
| Architectural Design<br>Mr. Hiroyuki TAKAHASHI | Ishimoto Architectural &<br>Engineering Firm, Inc. |
| Electrical Planning<br>Mr. Nobuhiko BEFU | Ishimoto Architectural &<br>Engineering Firm, Inc. |
| Equipment Planning<br>Mr. Kazuhiko HARUYAMA | Ishimoto Architectural &<br>Engineering Firm, Inc. |
| Cost Analyst<br>Mr. Kazuo ISHIHARA | Ishimoto Architectural &<br>Engineering Firm, Inc. |

### Draft Confirmation (Phase II)

| | |
|---|---|
| Team Leader<br>Mr. Yukio MORIBE | Deputy Director,<br>Vehicle Service Div.<br>Land Transport Engineering Dept.<br>Regional Transport Bureau,<br>Ministry of Transport |
| Project Coordinator<br>Mr. Norio SHIMOMURA | Staff<br>JICA Nairobi Office |
| Architectural Planning<br>Mr. Toshiro KAWADA | Ishimoto Architectural &<br>Engineering Firm, Inc. |
| Equipment Planning<br>Mr. Kazuhiko HARUYAMA | Ishimoto Architectural &<br>Engineering Firm, Inc. |

Appendix 4 List of Counterparts

Ministry of Land and Air Transport

| | |
|---|---|
| Minister; | Mr. Jama Gaas Maawiyeh |
| Vice Minister; | Dr. Mohamed Sheikh Osman "Jawari" |
| Permanent Secretary; | Mr. Mohamed Haji Hashi |
| Director of Transport; | Mr. Mohamed Ali |
| Director of Workshops; | Mr. Abudullahi Osman |

Ministry of Foreign Affaires

| | |
|---|---|
| Director of Economic Department; | Mr. Abdulkadir Ali Ahmed |
| Japanese desk officer; | Mr. Abdirahman Mohamed Abdillahi |

International Monetary Fund

| | |
|---|---|
| Resident Representative to Somalia; | Mr. Salvatore Schiavo-Campo |

World Bank

| | |
|---|---|
| Dupity Economist; | Mr. G. Beier |

U.N.D.P. Mogadishu

| | |
|---|---|
| Mechanical Engineer; | Mr. Ahmed Ali |

The Consulting Engineering Agency

| | |
|---|---|
| General Manager; | Mr. Sharif Mohmed |
| Engineer; | Mr. Luqman Ismail |

Warshadda Dayactirka Isgaarsiinta (Spare parts Factory)

| | |
|---|---|
| General Manager; | Mr. Cabdi Raage Jaamac |

National Transport Agency

| | |
|---|---|
| General Manager; | Mr. Farah Maxamed Jama |

ENEE (Ente Nationale Energia Elettrica)

| | |
|---|---|
| Director; | Mr. Mohidden Sheikh Nurein |

Ministry of Posts and Telecommunications

Engineer; Mr. Ahmed Mohamed Aden

Mogadishu Water Agency

General Manager; Mr. Aden Farah Shirwa

Director of Planning Department;
Dr. Osman

Director of Technical Department;
Mr. M. Osman

Mogadishu Water Development Agency

Director of Planning Department;
Mr. Omar M. Abdi

Appendix 5 Survey Schedule

1. Basic Design Survey (5 April - 30 April, 1987)

| Date | Place | Detail |
|---|---|---|
| Apr. 5(Sun.) | Tokyo - Paris | AF269 Lv. Narita |
| 6(Mon.) | Paris - Rome | AF634, HH501 |
| 7(Tue.) | Mogadishu(MOG) | Ar. MOG. |
| 8(Wed.) | " | Visit to Ministry of Land & Air Transport(MLAT). Explanation of Inception Report. Survey of Site (Exist. Central Workshop) |
| 9(Thu.) | " | Visit to Shalambod Workshop |
| 10(Fri.) | " | Visit to Baydoa Workshop |
| 11(Sat.) | " | Visit to 5 Workshops in Mogadishu. Ishihara Ar. at MOG. |
| 12(Sun.) | " | Team leader Moribe, Coordinator Ono Ar. at MOG. Team meeting. |
| 13(Mon.) | " | Courtesy call to MLAT. MFA. |
| 14(Tue.) | " | Meeting (MLAT) |
| 15(Wed.) | " | Meeting (MLAT) Visit to Jowhar (Moribe, Ishihara) |
| 16(Thu.) | " | Meeting (MLAT) |
| 17(Fri.) | " | Team meeting |
| 18(Sat.) | " | Meeting (MLAT) Preparation of minutes draft Visit to WAGAD (Ono, Haruyama, Befu) |
| 19(Sun.) | " | Meeting (MLAT) Minutes signed Lv. MOG. Team leader Moribe Coordinator Ono |
| 20(Mon.) | " | Meeting (MLAT) Market research (Befu, Ishihara) |
| 21(Tue.) | " | Meeting (MLAT) Inspection of Japanese donated tracks. Survey of site infrastructure. |

| Date | Place | Detail |
|---|---|---|
| Apr. 22(Wed.) | Mogadishu | Meeting (MLAT). Site and existing building survey for demolish work. |
| 23(Thu.) | " | Meeting (MLAT) discussion of plot plan.<br>Market research. |
| 24(Fri.) | " | Team meeting |
| 25(Sat.) | " | Meeting (MLAT)<br>Site survey |
| 26(Sun.) | Mogadishu-Nairobi | Courtesy call to MFA. MLAT.<br>Lv. MOG. (Kawada, Haruyama) |
| 27(Mon.) | Nairobi(NOB) | Visit to Embassy of Japan and JICA NOB Office<br>(Kawada, Haruyama) |
| 28(Tue.) | Nairobi-London | BA054 Ar. London |
| 29(Wed.) | London | BA005 |
| 30(Thu.) | Tokyo | Ar. Narita |

2. Draft Final Report Explanation (1 Aug. - 16 Aug., 1987)

| Date | | Place | Detail |
|---|---|---|---|
| Aug. | 1(Sat.) | Tokyo - | KL868 |
| | 2(Sun.) | Amsterdam | Ar. Amsterdam |
| | 3(Mon.) | Amsterdam - | KL591 |
| | 4(Tue.) | Nairobi | Visit to Embassy of Japan and JICA NOB Office |
| | 5(Wed.) | Nairobi - | HH611 |
| | | Mogadishu | Ar. Mogadishu |
| | 6(Thu.) | Mogadishu | Meeting (MLAT). Explanation of draft final report. |
| | 7(Fri.) | " | Team meeting |
| | 8(Sat.) | " | Meeting (MLAT) |
| | | | Preparation of Minutes draft |
| | 9(Sun.) | " | Meeting (MLAT) |
| | | | Minutes signed |
| | | | Courtesy call to Minister of Land and Air Transport |
| | | | Lv. MOG. (Coordinator Shimomura) |
| | 10(Mon.) | " | Meeting (MLAT) |
| | 11(Tue.) | " | Team meeting |
| | 12(Wed.) | Mogadishu - | HH610 |
| | | Nairobi | Ar. Nairobi |
| | 13(Thu.) | Nairobi | Visit to JICA NOB Office |
| | 14(Fri.) | Nairobi - | BA054 |
| | | London | Ar. London |
| | 15(Sat.) | London _ | BA007 |
| | 16(Sun.) | Tokyo | Ar. Narita |