Ministry of Transportation and Communication
Kyrgyz Republic

# PREPARATORY SURVEY REPORT

# THE PROJECT FOR IMPROVEMENT OF THE MIDDLE WORKSHOP FOR ROAD MAINTENANCE EQUIPMENT IN THE KYRGYZ REPUBLIC

March 2015

JAPAN INTERNATIONAL COOPERATION AGENCY
（JICA）
KATAHIRA & ENGINEERS INTERNATIONAL

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**PREFACE**

Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey on the Project for Improvement of the Middle Workshop for Road Maintenance Equipment and entrust the survey to KATAHIRA & ENGINEERS INTERNATIONAL.

The survey team held a series of discussions with the officials concerned of the Government of Kyrgyz Republic, and conducted field investigations. As a result of further studies in Japan, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of Kyrgyz Republic for their close cooperation extended to the survey team.

March, 2015

NAKAMURA Akira
Director General,
Infrastructure and Peacebuilding Department
Japan International Cooperation Agency

# Summary

1. Background of the Project

The Kyrgyz Republic relies on road transport for approximately 95 percent of domestic mobility of people and goods, so the domestic road network of approximately 34,000km in length plays a crucial role in the people's daily lives. The road network also serves as an important part of the country's economic infrastructure and is heavily used for trade with the neighboring countries. The importance is increasingly given to domestic roads for logistics in Kyrgyzstan. On the other hand, however, most part of the road network was constructed in the former Soviet era and has been neglected due to, among other things, the economic stagnation after the independence in 1991, so the damage and degradation has been developing over the years, while road maintenance equipment is long past its service life. Degradation of the road conditions causes various problems with transport of goods necessary for daily lives of Kyrgyzstan people and trade with the neighboring countries, and ultimately interferes with the economic growth and vitalization.

In response to these circumstances, JICA has cooperated with Kyrgyzstan's Ministry of Transport and Communications (hereinafter referred to as "MOTC") through technical cooperation to improve the technical and other capabilities necessary for road maintenance. It has also helped Kyrgyzstan improve their road maintenance equipment through two grant aid projects – that is, the Project for the Improvement of the Equipment for Road Maintenance in Naryn and the Project for Improvement of the Equipment for Road Maintenance in Issyk-Kul and Chui Oblasts – and is currently working on another grant aid project, the Project for Improvement of the Equipment for Road Maintenance in Osh, Jalal-Abad and Talas Oblasts.

Although MOTC appropriately operates and maintains the equipment supplied or repaired under the above-mentioned grant aid projects, but is faced with urgent necessity of improving the present situations with the equipment that is long past its service life (an average of 12 years or so) and breakdowns that cannot be repaired with simple tools.

At the moment, when any piece of road maintenance equipment owned by an Oblast Level Road Management Units or a Main Road Management Unit (PLUAD/UAD) affiliated to MOTC has a breakdown, MOTC sometimes asks such large or medium-scale repair works (see the definition of repair works by scale in the next page) to private maintenance factories. But it takes time to deliver and repair such equipment because private maintenance factories do not exclusively specialize in PLUAD/UADs but have many other services, and also because maintenance factories are unavailable to PLUAD/UAD distant from Bishkek. All this prolongs maintenance of road maintenance equipment and poses problems for road maintenance of the country.

The Government of Kyrgyzstan has designated the road sector as one of the priority areas in the National Development Strategies of Kyrgyzstan for the period of 2013-2017 and places an emphasis on securing the access to the neighboring countries and domestic market. As stated earlier, however, road maintenance equipment including items procured in the former Soviet era is getting aged, and an increasing number of equipment items have a breakdown. Assuming that the equipment aging and

breakdown would continue further, such circumstances would seriously interfere with road maintenance. The Government of Kyrgyzstan requested the Government of Japan in August 2013 to implement grant aid cooperation for procurement of equipment (six (6) sets of 165 road maintenance equipment items worth approximately 300 million yen) necessary for repair and maintenance of its road maintenance equipment.

This Project will procure equipment necessary for repair and maintenance of road maintenance equipment owned by MOTC within the Kyrgyz Republic, thereby contributing for more efficient maintenance of the MOTC road equipment, which in turn result in more efficient maintenance of the road network managed by MOTC.

## 2. Summary and Project contents

In response to the request of the Government of Kyrgyzstan, the Government of Japan decided to implement a preparatory survey on improvements of the capacity of MOTC, the project implementing agency, to repair and maintain road maintenance equipment. JICA delegated a preparatory survey team to the country during the period between May 28 and July 11, 2014. The survey team held a series of discussions with officials concerned of the Government of Kyrgyzstan and conducted field investigations. As a result of further studies in Japan, the survey team formulated an outline design incorporating appropriate project contents, and summarized it into a (proposed) preparatory survey report. To give an account of the report, JICA delegated the survey team again to Kyrgyzstan between December 7 and December 14, 2014. The team discussed and confirmed the report with officials of the Government of Kyrgyzstan.

In light of equipment requested, the Japanese side and MOTC, the project implementing agency, concluded minutes of meeting (M/M) on December 10, where both parties confirmed that the Project would be addressed to medium-scale maintenance works and provide maintenance equipment to a total of six Roads Maintenance Offices (DEP958, DEP8, DEP35, DEP19, DEP52, DEP45), those are directly controlled under PLUAD1, PLUAD3, PLUAD4, PLUAD5, PLUAD6 and OSI UAD.

The maintenance works covered by the equipment to be procured are classifiable into the following categories. Types of equipment necessary for these works will be selected.

(1) Chassis Maintenance

Removal and installation of engines and other large parts from and into chassis

(2) Engine Maintenance

Removal, installation and cleaning of engine parts

(3) Electric & Battery Repair Maintenance

Measurement and recharging of batteries

(4) Tire & Brake Repair Maintenance

Replacement of tires, adjustment of brakes

(5) Welding & Fabrication Work

Sheet-metal work, welding and fabrication

(6) Cleaning Work

High-pressure washing of the main bodies of equipment

(7) Machining & Decomposition / Assemble Work

Parts cutting, grinding, drilling, decomposition, assembling and measurement

(8) Lubrication & Refueling Work

On-site replacement and refilling of engine oil and various lubricants

The equipment considered under this project should basically cover the medium-scale maintenance works stated above. Therefore, the equipment specifications are set by taking into account the weight class, sizes, engine classification, power current, pressure standards and etc. The minimum required quantities of the equipment have been considered.

Currently medium-scale maintenance works for road maintenance equipment are not implemented because of lack of tolls and instruments. But usually MOTC were implementing medium-scale maintenance works and MOTC technicians are capable to implement such works. After the maintenance equipment installation, the repairing period would be minimized, which will decrease the equipment idling rate and etc. By this way the efficiency will be increased.

As for the large-scale maintenance, it is out of the scope of works for MOTC technicians, and the outsourcing to the private maintenance factory is more appropriate. The execution frequency of the large-scale maintenance is less than the medium-scale maintenance, and high technical abilities and the special equipment are necessary.

**Road equipment repair and maintenance works by scale**

| | |
|---|---|
| Small-scale maintenance | Small-scale maintenance is a kind of maintenance for the small trouble confirmed in daily check, etc. |
| Medium-scale maintenance | Medium-scale maintenance is a kind of maintenance which can be executed by the partial machine decomposition. For example, the replacement of a brake lining, the repair of electric system, etc.<br>The replacement of Engine oil, other oils and grease on the regular maintenance, etc. |
| Large-scale maintenance | Large-scale maintenance is an overhaul maintenance which needs the decomposing the machine, and replacement of all most parts, etc. |

**List of Requested Equipment**

| Equipment | Unit | Quantity | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | | PLUAD1 DEP958 | PLUAD3 DEP8 | PLUAD4 DEP35 | PLUAD5 DEP19 | PLUAD6 DEP52 | OSI UAD DEP45 | |
| 1. Chassis Repair Equipment and Tools | | | | | | | | |
| ・Hydraulic shop press | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Gantry crane | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Blocking tool | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Mechanic tool set | Set | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Other Equipment and Tools for Chassis | Set | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| 2. Engine Repair Equipment and Tools | | | | | | | | |

| Equipment | Unit | Quantity | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | | PLUAD1 DEP958 | PLUAD3 DEP8 | PLUAD4 DEP35 | PLUAD5 DEP19 | PLUAD6 DEP52 | OSI UAD DEP45 | |
| ・Floor crane | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Jet parts cleaner | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Mechanic tool set | Set | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Other Equipment and Tools for Engine | Set | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Fuel injection pump tester | Unit | 1 | 1 | 0 | 0 | 0 | 1 | 3 |
| 3. Electric & Battery Repair Equipment and Tools | | | | | | | | |
| ・Electricians tool set | Set | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Mobile work bench | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Silicon quick charger | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Other Equipment and Tools for Electric & Battery | Set | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| 4. Tire & Brake Repair Equipment and Tools | | | | | | | | |
| ・Tire changer | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Hydraulic tire removing tool | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Brake pipe flaring tool | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Other Equipment and Tools for Tire & Brake | Set | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| 5. Welding & Fabrication Equipment and Tools | | | | | | | | |
| ・Diesel arc welder | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・High-speed abrasive cut-off machine | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Bench electric grinder | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Other Equipment and Tools for Welding & Fabrication | Set | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| 6. Cleaning Equipment | | | | | | | | |
| ・Hot water high pressure washer | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| 7. Machining Equipment and Tools | | | | | | | | |
| ・Mechanic tool set | Set | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Bench electric grinder | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Torque wrench | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Hydraulic hand pump | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Other Equipment and Tools for Machining | Set | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| 8. Lubrication Equipment | | | | | | | | |
| ・Lubrication truck | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |

PLUAD 1：Chui road management unit　　PLUAD 3：Naryn road management unit
PLUAD 4：Issyk-kul road management unit　　PLUAD 5：Talas road management unit
PLUAD 6：Jalal-abad road management unit　　OSI UAD：Osh-Sarytash-Irkeshtam road management unit

MOTC senses the strong confidence in the performance and quality of the Japanese products procured in the previous two grant aid cooperation projects (the Project for the Improvement of the Equipment for Road Maintenance in Naryn and the Project for Improvement of the Equipment for Road Maintenance in Issyk-Kul and Chui Oblasts), and requests Japanese maintenance equipment to be procured in this Project.

The Project needs to have a procurement plan that conforms with the procurement rules for grant aid

cooperation, but will basically consider a Japanese supplier first. If any Japanese product is unavailable or if a limited number of suppliers are available in Japan, the relevant equipment items will be procured from European and other third countries where there are suppliers can offer products with the same quality as Japanese ones. Of the equipment items considered by this project, fuel injection pump testers need to be procured from a third country. British and German manufacturers offer quality fuel injection pump testers.

3. Project implementation schedule and project cost

If this Project should be implemented pursuant to the Grant Aid Scheme of the Government of Japan, project design period will be 4.5 months, and equipment supply period is 12.5 months. The Project will be implemented in accordance with the Japan's Grant Aid scheme and the cost will be determined before concluding the Exchange of Note (E/N) for the Project.

4. Project Evaluation

(1) Relevance

To date, MOTC has taken advantage of outputs of cooperation provided by Japan and other donors to manage road maintenance more effectively and efficiently. But some 67 percent of the road maintenance equipment held by MOTC was procured in the former Soviet era, is long past its service life (an average of 12 years or so) and breaks down in the manner that the equipment cannot be repaired with simple tools, so prompt maintenance of it is necessary. Moreover, if any piece of road maintenance equipment has a breakdown which cannot be repaired under the direct management, MOTC sometimes asks the repair to private maintenance factories, but it takes time to deliver and repair such equipment because private maintenance factories do not exclusively specialize in PLUAD/UADs but have many other services, and also because maintenance factories are unavailable at some areas. All this prolongs maintenance of road maintenance equipment and poses problems for road maintenance of the country.

In response to these circumstances, this Project will procure equipment necessary for the repair of road maintenance equipment for a total of six (6) PLUAD/UADs under MOTC to help MOTC maintain their road maintenance equipment more efficiently, thereby contributing to more efficient maintenance of roads under the management of MOTC.

The Government of Kyrgyzstan has designated the road sector as one of the priority areas in the National Development Strategies of Kyrgyzstan for the period of 2013-2017, places an emphasis on securing the access to the neighboring countries and domestic market, and has an intention to commit itself to more efficient road maintenance. This Project will contribute to the achievement of their objective.

Meanwhile, the Government of Japan has formulated the Assistance Policy to meet the policies of the Government of Kyrgyzstan, which places an emphasis on, among other things, "maintenance and management of transport infrastructure, and correction of the regional gap". This Project has been relevant to this priority area in Japan's ODA policy, so that its relevance is high.

(2) Effectiveness

1) Quantitative Effects

**Quantitative Effects**

| Indicator | Baseline (2014) | Target (2019) |
|---|---|---|
| No working ratio of MOTC's road maintenance equipment *1 | 20.2 | 13.5 |

※1 : Calculated based on excluding 263units which will be scrapheaped in 5 years from 1,658 units of road maintenance equipment .

At the moment of the survey, the equipment idling rate was 22.1% (367units under repair/ total equipment 1,658units).

263 units were planned to be scrapheaped in the next 5 years (equipment produced before 1985), of those 85 units were under repair (idled equipment). Therefore after 5 years, the equipment idling rate is to be:

(367-85 units) / (1,658-263units) = 20.2% (282 units / 1,395 units)

The equipment produced after 1985, disbursed almost evenly by production years. Therefore it is assumed that after 5 years, the equipment idling caused by repair will not change and will be as present 282 units.

After the maintenance equipment installation, the efficiency of the repair works will increase at least by 1.5 times (as interviewed to each PLUAD/UAD and RMD), though the work content differs according to the equipment. The quantity of the equipment under repair after 5 years is assumed to be 282 units / 1.5 = 188 units. Following this, the equipment idling rate caused by repair should be 188 units / 1395 units = 13.5%.

2) Qualitative Effects

This Project is expected to bring about the following qualitative effects:

① Road maintenance equipment will be made long-lived operation.

② Execution of medium-scale maintenance*2 of road maintenance equipment by MOTC will increase.

③ Maintenance time of road maintenance equipment will be shortened.

④ Execution of road maintenance by MOTC will increase.

※2 : Medium-scale maintenance is a kind of maintenance which can be executed by the partial machine decomposition. For example, the replacement of a brake lining, the repair of electric system, etc. The replacement of Engine oil, other oils and grease on the regular maintenance.

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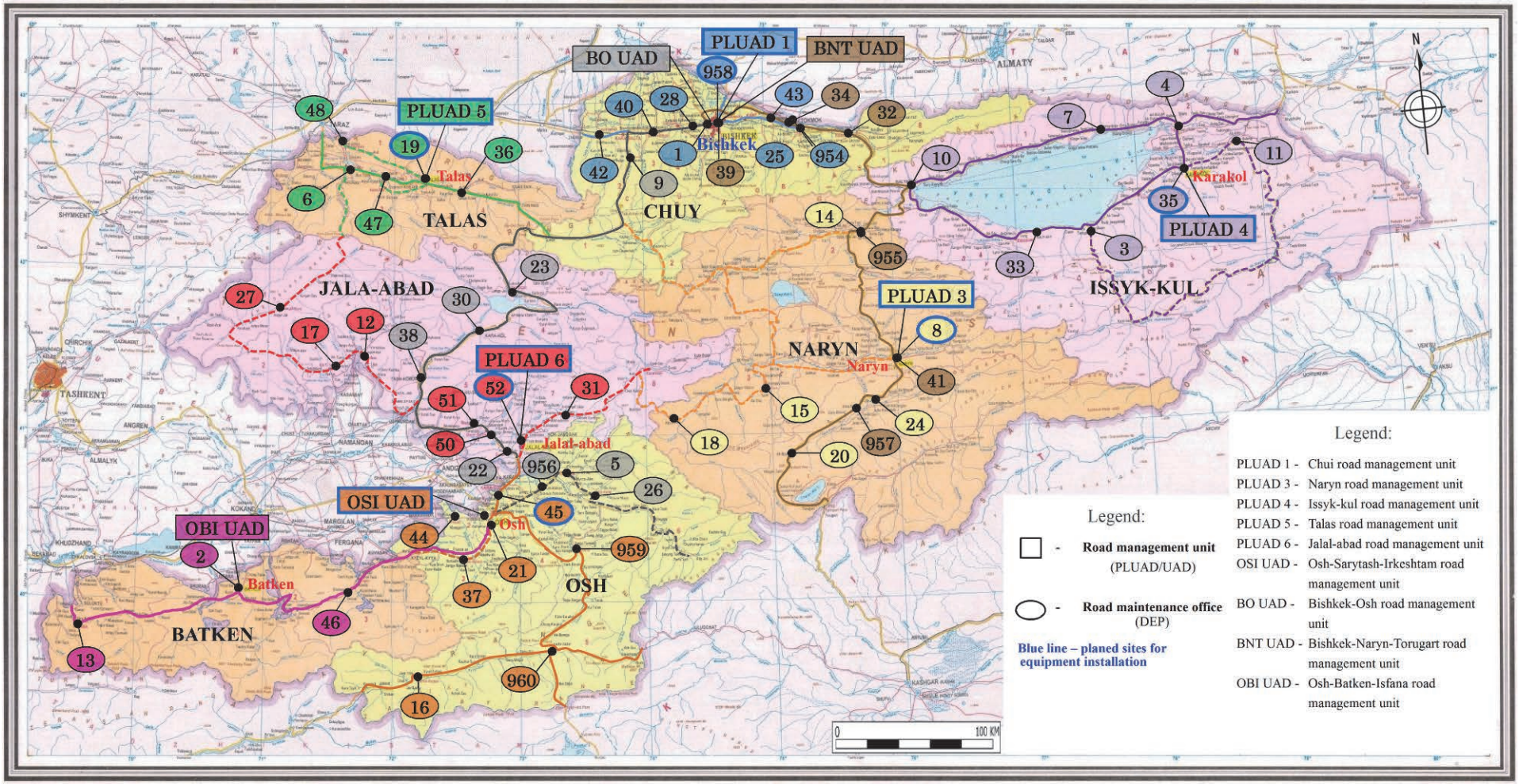
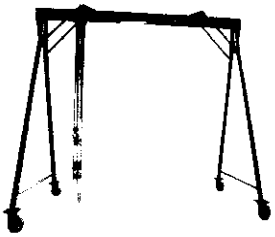



**Location Map of Study Area**

# Images of Major Equipment（1/2）

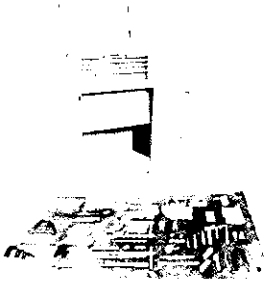
1. Chassis Repair Equipment and Tools

Hydraulic shop press



Gantry crane

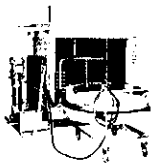
Blocking tool



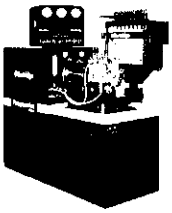
Mechanic tool set

2. Engine Repair Equipment and Tools

Mobile floor crane



Jet parts cleaner



Fuel injection pump tester

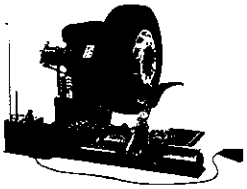
3. Electric & Battery Repair Equipment and Tools

Electric tool set

Mobile work bench

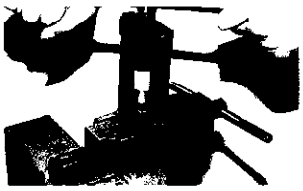

Silicon quick charger

4. Tire & Brake Repair Equipment and Tools



Tire changer

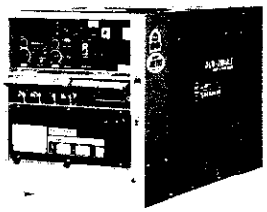
Hydraulic tire removing tool



Brake pipe
flaring tool set

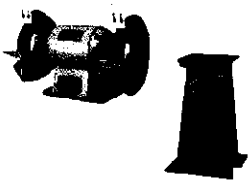
# Images of Major Equipment（2/2）

5. Welding & Fabrication Equipment and Tools



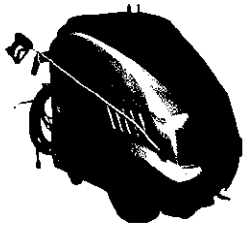
Diesel arc welder

High-speed cut-off machine



Bench electric grinder

6. Cleaning Equipment



Hot water high pressure washer

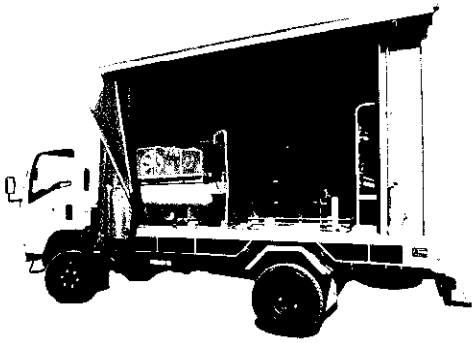
7. Machining Equipment and Tools

Mechanic tool set

Torque wrench set

Hydraulic hand pump

8. Lubrication Equipment



Lubrication truck

# List of Figures and Tables

## Abbreviations

| | |
|---|---|
| ADB | Asian Development Bank |
| B/A | Banking Arrangements |
| BNT | Bishkek - Naryn - Torugart |
| BO | Bishkek – Osh |
| CAREC | Central Asia Regional Economic Cooperation |
| DEP | Roads Maintenance Office |
| EIA | Environmental Impact Assessment |
| E/N | Exchange of Notes |
| G/A | Grant Agreement |
| GDP | Gross Domestic Product |
| GNI | Gross National Income |
| IMF | International Monetary Fund |
| IsDB | Islamic Development Bank |
| JICA | Japan International Cooperation Agency |
| M/D | Minutes of Discussions |
| MOTC | Ministry of Transport and Communications |
| OSI | Osh - Sarytash – Irkeshtam |
| PBM | Performance Based Maintenance |
| PLUAD | Oblast Level Road Management Unit |
| PTO | Power Takeoff |
| RAA | Road Administration Advisor |
| RMD | Road Maintenance Department |
| UAD | Main Road Management Unit |
| WCTS | Weight Control and Tunnel Service |
| 4WD | 4 Wheel Drive |

# CHAPTER 1. Background of the Project

## 1-1 Background of the Request and Summary

The Government of the Kyrgyz Republic (hereinafter referred to as "Kyrgyzstan") has designated the road sector as one of the priority areas in National Sustainable Development Strategy (NSDS) for the period of 2013-2017 and it places an emphasis on securing the access to the neighboring countries and domestic market. In order to achieve this goal, road maintenance should be conducted more efficiently. However, as mentioned above, road maintenance equipment has been getting older and breakdown occurs more frequently. These are causing the barriers for smooth maintenance of the road network. Under these circumstances, the Government of Kyrgyzstan requested the Government of Japan for a grant aid for procuring the equipment (about 300 million yen, six (6) sets of 165 tools) necessary for the repair of road maintenance equipment in August, 2013.

This Project will procure equipment necessary for repair and maintenance of road maintenance equipment owned by MOTC within the Kyrgyz Republic, thereby contributing for more efficient maintenance of the MOTC road equipment, which in turn result in more efficient maintenance of the road network managed by MOTC.

The Preparatory Study for this Project (hereinafter referred to as "the Study") was conducted for the purpose of verifying the validity of the requested Project and drafting a preliminary design appropriate for grant aid in order to produce a project plan (quantities and specifications of the equipment to be procured) and equipment maintenance plan and estimate the approximate cost of the Project. The final list of requested equipment items is shown in Table 1-1 below.

**Table 1-1 List of Requested Equipment**

| Equipment | Unit | Quantity | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | | PLUAD1 DEP958 | PLUAD3 DEP8 | PLUAD4 DEP35 | PLUAD5 DEP19 | PLUAD6 DEP52 | OSI UAD DEP45 | |
| 1. Chassis Repair Equipment and Tools | | | | | | | | |
| ・Hydraulic shop press | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Gantry crane | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Blocking tool | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Mechanic tool set | Set | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Other Equipment and Tools for Chassis | Set | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| 2. Engine Repair Equipment and Tools | | | | | | | | |
| ・Floor crane | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Jet parts cleaner | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Mechanic tool set | Set | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Other Equipment and Tools for Engine | Set | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Fuel injection pump tester | Unit | 1 | 1 | 0 | 0 | 0 | 1 | 3 |
| 3. Electric & Battery Repair Equipment and Tools | | | | | | | | |
| ・Electricians tool set | Set | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Mobile work bench | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Silicon quick charger | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Other Equipment and Tools for Electric & Battery | Set | 1 | 1 | 1 | 1 | 1 | 1 | 6 |

| Equipment | Unit | Quantity | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | | PLUAD1 DEP958 | PLUAD3 DEP8 | PLUAD4 DEP35 | PLUAD5 DEP19 | PLUAD6 DEP52 | OSI UAD DEP45 | |
| 4. Tire & Brake Repair Equipment and Tools | | | | | | | | |
| ・Tire changer | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Hydraulic tire removing tool | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Brake pipe flaring tool | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Other Equipment and Tools for Tire & Brake | Set | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| 5. Welding & Fabrication Equipment and Tools | | | | | | | | |
| ・Diesel arc welder | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・High-speed abrasive cut-off machine | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Bench electric grinder | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Other Equipment and Tools for Welding & Fabrication | Set | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| 6. Cleaning Equipment | | | | | | | | |
| ・Hot water high pressure washer | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| 7. Machining Equipment and Tools | | | | | | | | |
| ・Mechanic tool set | Set | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Bench electric grinder | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Torque wrench | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Hydraulic hand pump | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| ・Other Equipment and Tools for Machining | Set | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| 8. Lubrication Equipment | | | | | | | | |
| ・Lubrication truck | Unit | 1 | 1 | 1 | 1 | 1 | 1 | 6 |

PLUAD 1：Chui road management unit　　PLUAD 3：Naryn road management unit
PLUAD 4：Issyk-kul road management unit　　PLUAD 5：Talas road management unit
PLUAD 6：Jalal-abad road management unit　　OSI UAD：Osh-Sarytash-Irkeshtam road management unit

In this plan, the procurement of equipment which is necessary for the maintenance of the road maintenance equipment managed by MOTC are considered for more efficient maintenance to 6 road maintenance offices (PLUAD1, PLUAD3, PLUAD4, PLUAD5, PLUAD6 and OSI UAD).

The installation sites on PLUAD/UADs, which will be directly responsible for maintenance works, were selected by considering the location in the center city in each region and have the good accessibility from other DEPs. The installation sites, which meet the above criteria, should also have enough workshop space for installation of procured equipment. The study team and MOTC agreed on the installation sites which are shown in the table below.

| PLUAD/UAD | State | City | DEP |
|---|---|---|---|
| PLUAD 1 | CHUI | Bishkek | 958 |
| PLUAD 3 | NARYN | Naryn | 8 |
| PLUAD 4 | ISSYK-KUL | Karakol | 35 |
| PLUAD 5 | TALAS | Talas | 19 |
| PLUAD 6 | JALA-ABAD | Jalal-abad | 52 |
| OSI UAD | OSH | Osh | 45 |

Maintenance works covered by equipment provided under this project are medium-scale maintenance works described below.

Currently, MOTC directly implements small-scale maintenance works. Medium and large scale maintenance works are outsourced to the private maintenance factories. From the other hands, the private maintenance factories do not specialize only in road maintenance equipment and holds many other repair works. For this reason, it takes long time before road equipment get repaired and put in order. Furthermore, remote road maintenance offices have to transport their equipment to Bishkek, where the private repair services are available. It adds even more time for repair period, and creates barriers for proper maintenance of the road network.

Currently medium-scale maintenance works for road maintenance equipment are not implemented because of lack of tolls and instruments. But usually MOTC were implementing medium-scale maintenance works and MOTC technicians have enough capability to implement such works. After the maintenance equipment installation, the repairing period would be minimized, which will decrease the equipment idling rate and etc. By this way the efficiency will be increased.

As for the large-scale maintenance, it is out of the scope of works for MOTC technicians, and the outsourcing to the private maintenance factory is more appropriate. The execution frequency of the large-scale maintenance is less than the medium-scale maintenance, and high technical abilities and the special equipment are necessary.

**Road equipment repair and maintenance works by scale**

| | |
|---|---|
| Small-scale maintenance | Small-scale maintenance is a kind of maintenance for the small trouble confirmed in daily check, etc. |
| Medium-scale maintenance | Medium-scale maintenance is a kind of maintenance which can be executed by the partial machine decomposition. For example, the replacement of a brake lining, the repair of electric system, etc.<br>The replacement of Engine oil, other oils and grease on the regular maintenance, etc. |
| Large-scale maintenance | Large-scale maintenance is an overhaul maintenance which needs the decomposing the machine, and replacement of all most parts, etc. |

## 1-2 Natural Conditions

Most equipment procured by this project doesn't have the one that a natural condition greatly influences to use it indoors. However, the specification of the lubrication truck to use in the field was considered for the following natural conditions.

Target area is 760 m – 2500 m above the sea level. The lowest temperature is -30℃ (January) at the highest mountain area, and the highest temperature is 35℃ at the south region Jalal-abad and Osh oblasts. Mountainous areas snowfalls reach up to 160 cm.

## 1-3 Environmental and Social Considerations

This Project, which plans to procure maintenance equipment for road maintenance equipment, falls under Category C under “JICA Guidelines for Environmental and Social Considerations” (issued by April, 2010). In other words, implementation of this Project will have no serious impact on the environment or society.

Currently, Kyrgyzstan is not practicing strict regulations on emission control for construction equipment and engine vehicles. But taking into account the quality of the fuel available in Kyrgyzstan, environmentally friendly emission standards will be proposed.

# CHAPTER 2. Contents of the Project

## 2-1 Basic Concept of the Project

This Project will procure equipment necessary for the repair of road maintenance equipment for a total of six (6) PLUAD/UADs under MOTC to help MOTC maintain their road maintenance equipment more efficiently, thereby contributing to more efficient maintenance of roads under the management of MOTC.

## 2-2 Outline Design of the Requested Japanese Assistance

### 2-2-1 Design Policy

#### (1) Basic Policy

This project plans to procure equipment necessary for the repair of road maintenance equipment for six PLUAD/UADs (PLUAD1, PLUAD3, PLUAD4, PLUAD5, PLUAD6 and OSI UAD) for more efficient maintenance works for the road maintenance equipment of MOTC.

The maintenance works covered by the equipment to be procured are classifiable into the following categories. Types of equipment necessary for these works will be selected.

(1) Chassis Maintenance

Removal and installation of engines and other large parts from and into chassis

(2) Engine Maintenance

Removal, installation and cleaning of engine parts

(3) Electric & Battery Repair Maintenance

Measurement and recharging of batteries

(4) Tire & Brake Repair Maintenance

Replacement of tires, adjustment of brakes

(5) Welding & Fabrication Work

Sheet-metal work, welding and fabrication

(6) Cleaning Work

High-pressure washing of the main bodies of equipment

(7) Machining & Decomposition / Assemble Work

Parts cutting, grinding, drilling, decomposition, assembling and measurement

(8) Lubrication & Refueling Work

On-site replacement and refilling of engine oil and various lubricants

The specifications of each piece of equipment will be determined in accordance with the weight, dimensions, specifications of the relevant engine, and voltage and electric current, and pressure of road maintenance equipment to be repaired.

The maintenance workload to be conducted will be restricted by the area of workshops where the equipment will be installed as well as the workforce. This Project will procure a set of the minimum necessary number of maintenance tools for each of the six workshops. However, the use of fuel injection pump tester necessary for engine maintenance is limited in the entire MOTC, so one each tester will be procured to three PLUAD/UADs only: that is, PLUAD1 DEP958 (Chuy Oblast), PLUAD3 DEP8 (Naryn Oblast) and OSI UAD DEP45 (Osh Oblast).

### (2) Policy Concerning the Climatic Conditions

Of the climatic conditions of the target regions, those relevant to the equipment plan are as follows:

- Temperature: -30˚C – +35˚C
- Elevation: 760 – 3,000 m
- Snowfall: 5 – 160 cm

### (3) Policy Concerning the Environment

While Kyrgyzstan currently has no regulations on emissions from construction equipment or motor vehicles, Russian-produced fuels widely used in the country are designed to meet the Euro-3[1] standards. Most construction equipment and vehicles imported from China and Europe are also Euro-2 or Euro-3 compliant.

However, some fuels sold in Kyrgyzstan contain water, lubricant, or other impurities and thus are of low quality. To counter this, a fuel filter or a water separator will be attached to each of the main equipment items to prevent failure of the engine system and mitigate air pollution by emissions.

By taking into account the qualities of fuels and the types of construction equipment and vehicles that are widely used in Kyrgyzstan, emission standards equivalent to Euro-2 and Euro-3 will be applied to the equipment to be procured by this Project. For engines of certain manufacturers not complied with Euro-2 or Euro-3, applicable standards will be determined individually.

### (4) Policy Concerning Operations and Maintenance

Equipment to be procured by this Project will be operated and maintained by DEP under the jurisdictions of their respective PLUAD/UAD. The estimated costs required for operating and maintaining the procured equipment was confirmed that the budget would be secured by MOTC.

Table 2-1 shows the current staff at the workshops, and Table 2-1 shows staff newly required when the maintenance equipment is procured.

Currently, operators and drivers are in charge of maintenance of pieces of equipment they use, and few mechanics exclusively for maintenance are stationed. Thus, when the maintenance equipment is procured, the workshops will need new mechanics well versed in specialized technologies.

**Table 2-1 Newly-required Staff**

| Equipment | Newly staff to the workshops | | | | | | |
|---|---|---|---|---|---|---|---|
| | PLUAD1 DEP958 | PLUAD3 DEP8 | PLUAD4 DEP35 | PLUAD5 DEP19 | PLUAD6 DEP52 | OSI UAD DEP45 | TOTAL |
| 1. Chassis Repair Equipment and Tools | 3 | 3 | 3 | 3 | 3 | 3 | 18 |
| 2. Engine Repair Equipment and Tools | 2 | 2 | 2 | 2 | 2 | 2 | 12 |
| 3. Electric & Battery Repair Equipment and Tools | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| 4. Tire & Brake Repair Equipment and Tools | To serve concurrently with above-mentioned 1 "Chassis Repair Equipment and Tools" | | | | | | |

[1] European emission standards define the acceptable limits for exhaust emissions of new vehicles sold in EU member states. The higher numbers in "Euro-(number)" mean the higher standards for exhaust emissions. Currently, Euro-6 is applied in EU member states, but in developing countries other than EU membres, usually older standards are applied such as EURO-2 or Euro-3.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5. Welding & Fabrication Equipment and Tools | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| 6. Cleaning Equipment | To serve concurrently with above-mentioned 1 "Chassis Repair Equipment and Tools" | | | | | | |
| 7. Machining Equipment and Tools | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| 8. Lubrication Equipment | 2 | 2 | 2 | 2 | 2 | 2 | 12 |
| TOTAL | 10 | 10 | 10 | 10 | 10 | 10 | 60 |

Existing drivers and operators well versed in maintenance of the equipment held will be transferred to the newly required posts shown above, and mechanics well versed in specialized technologies will be newly hired to make up for the shortage. A shortage of drivers and operators due to the transfer will be made up for by new hiring. MOTC has certain expectation for personnel with necessary capabilities, and the survey team has confirmed that they will secure such personnel without fail.

The DEPs subject to the Project have the basic capacity for the medium-scale road maintenance but have little experience in using fuel injection pump testers and some other machines. Thus, the Project will conduct operational guidance when the equipment is delivered so that they will secure self-reliant and sustainable maintenance capacity.

For electrically-powered machines and tools, operational and maintenance manuals in Russian will be attached to help mechanics understand the machines and tools.

To prevent any loss and theft of the machine to be procured, repair rooms in the workshops will be equipped with shelves and lockers with doors to store and manage small tools, measuring instruments and so on.

Staff members in charge of the repair rooms to be newly hired will confirm the storage of tools and fixings every time repair and maintenance work is finished to prevent any loss and theft. The shelves and lockers will be labeled with nameplates so that right tools and fixings will be stored at right places. This arrangement enables to visually confirm which tools and fixings are in use or lost.

### (5) Policy Concerning the Grade of Equipment

The maintenance equipment needs to have necessary clamping capacity and measuring precision, as well as strength and hardness, pressure resistance and dimensional accuracy to avoid any deformation while in use. Thus, maintenance equipment with performance and quality equivalent to products of Japanese manufacturers which are excellent in performance and quality.

More specifically, maintenance equipment will be selected in consideration of, for example, whether manufacturers have obtained ISO9001, an international standard of the quality management system.

### (6) Policy Concerning Procurement Method and Schedule

All the pieces of equipment to be procured are for maintenance of road maintenance equipment, so the Project will not be large scale for a grant aid cooperation project. Thus, the pieces of equipment will not be divided into multiple lots when the bidding of a supplier is conducted. This also serves as incentive for suppliers to participate in the bidding.

The manufacturing lead time varies among the pieces of equipment, ranging between two and seven

months. If the delivery is conducted to meet a variety of the lead time, the arrival time will also vary widely for around six months. In order to deliver and install them in the same time range as much as possible, the timing of shipping will be arranged, accordingly.

### 2-2-2 Basic Plan (Equipment Plan)

#### (1) Overall Plan

The previous section outlined the maintenance works of MOTC for road maintenance equipment. This section describes these maintenance works and cautions for the selection of maintenance equipment.

1) Chassis Maintenance

- Construction machines and vehicles will be carried in work bays to diagnose any problems, and necessary repair schedules will be planned. At the same time, components will be disassembled for smooth work operations. After welding, fabrication and repair works, the components will be reinstalled in the chassis. The performance of the chassis will be checked before they are returned to the initial parking aprons. It should be kept in mind that the specifications will be determined in consideration of the size and weight of the chassis and components.

2) Engine Maintenance

- Engines will be carried in work bays to be cleaned and disassembled, and necessary repair and adjustment will be conducted. At the same time, major components will be made detachable to request third-party professionals to overhaul the engines. After repair work, the components will be reinstalled in the engines, and the performance will be checked. It should be kept in mind that the specifications will be determined in consideration of the size and weight of the engines.
- Mechanical fuel injection pump testers that can be easily handled will be selected because the pumps subject to maintenance are mechanical ones.

3) Electric & Battery Repair Maintenance

- Batteries and electric equipment will be carried in work bays to diagnose any problems, and the batteries will be recharged and the electric equipment will be adjusted and repaired. It should be kept in mind that the specifications will be determined in consideration of the capacity of the batteries and the capacity and dimensions of the electric equipment.

4) Tire & Brake Repair Maintenance

- Tires and rims of construction machines and vehicles will be removed, repair work will be conducted, and they will be reattached to the machines and vehicles. It should be kept in mind that the specifications will be determined in consideration of the dimensions and weight of the tires.

5) Welding & Fabrication Work

- Welding and fabrication works will be conducted to repair construction machines and vehicles, and operating machines and attachments. It should be kept in mind that the specifications will be determined in consideration of the dimensions of the structures, the thickness of steels and other factors.

6) Cleaning Work

- Before carried in work bays, construction machines and vehicles will be cleaned to remove mud, oil stains and grime. It should be kept in mind that high pressure washers that can use

hot water should be selected to get rid of mud, oil stains and grime.

7) Machining & Decomposition / Assemble Work

- Machining, decomposition, measurement, processing, repair and production works will be conducted for construction machines and vehicles, and operating machines and attachment components. It should be noted that the specifications will be determined in consideration of the weight, dimensions, nature of processing of parts, and other factors.

8) Lubrication & Refueling Work

- Engine oil, operating oil, grease, coolant water will be refilled and replaced on site in construction machines in operation. It should be noted that the maintenance equipment will feature a tank with the capacity meeting the engine output, tools to replace filters and other parts, and four-wheel drive (4WD) that enables the vehicle to run in snowy or poor road conditions.

### (2) Determining the Content of Equipment

Table 2-2 lists equipment items that correspond to the aforementioned operations.

**Table 2-2 Equipment Configuration by Work Type**

| Work type | Equipment configuration |
|---|---|
| 1) Chassis Maintenance | Hydraulic shop press, Gantry crane, Air compressor, etc. |
| 2) Engine Maintenance | Mobile floor crane, Hand truck, Jet parts cleaner,<br>Fuel injection pump tester, etc. |
| 3) Electric & Battery Maintenance | Digital circuit tester, Clamp tester, Silicon quick charger,<br>Battery and coolant tester |
| 4) Tire & Brake Maintenance | Tire changer, Wheel dolly, Portable brake compression tester set, etc. |
| 5) Welding & Fabrication Work | Diesel arc welder, Gas welder set, Isc sander, etc. |
| 6) Cleaning Work | Hot water high pressure washer |
| 7) Machining &<br>Decomposition / Assemble Work | Various types of electric and hand tools, Hand tools,<br>Measurement tools, etc. |
| 8) Lubrication & Refueling Work | Lubrication truck |

### (3) Determining the Basic Specifications of Each Equipment Item

The basic specifications of the equipment items have been determined in consideration of the weight, dimensions, specifications of engines, electric voltage and current, and pressure of the road maintenance equipment to be repaired.

One set of the minimum necessary number of maintenance equipment items will be procured for each of the six workshops. However, the use of fuel injection pump tester necessary for engine maintenance is limited in the entire MOTC, so one each tester will be procured to three PLUAD/UADs only: that is, PLUAD1 DEP958 (Chuy Oblast), PLUAD3 DEP8 (Naryn Oblast) and OSI UAD DEP45 (Osh Oblast).

Table 2-3 shows the basic specifications and quantity of the equipment items.

**Table 2-3 Basic Specifications of Equipment (draft)**

| Work | Equipment | Function / Reason for selection | Basic specification | Qty | Qty (set) |
|---|---|---|---|---|---|
| 1. Chassis Repair Equipment and Tools | 1-1 Hydraulic shop press | Pick out bearing, Adjustment bend<br>General specification | Capacity 55 ton, with push tools | 1 unit | 6 sets |
| | 1-2 Gantry crane | Lifting heavy parts(engine)<br>General specification | Capacity 3 ton | 1 unit | |
| | 1-3 Sling chain, wire rope and nylon sling | Lifting heavy and long parts<br>General specification | Sling chain (6 kinds), Wire rope (8 kinds),<br>Shackle (3 kinds),<br>Nylon sling (3 kind) | 1 set | |
| | 1-4 Mobile work bench | Temporary putting, Work bench<br>General specification | (L)1,200x(W)800x(H)740mm with vise | 2 units | |
| | 1-5 Mechanic tool set | Decomposition / assemble hand tools<br>General specification | Inch and metric size, 144 kinds with steel case | 2 sets | |
| | 1-6 Hydraulic garage jack | Lifting chassis from floor<br>General specification | Capacity 10 ton | 2 units | |
| | 1-7 Puller set | Put out gear, bearing and shaft, etc.<br>General specification | Capacity 13 ton | 1 set | |
| | 1-8 Blocking tool | Holding chassis on maintenance<br>General specification | Capacity 10, 20, 25 ton, each 2 units | 1 set | |
| | 1-9 Air hose reel | Supply of compressed air<br>General specification | (dia) 9mm × (L)10m | 2 pcs | |
| | 1-10 Grease gun | Feeding grease<br>General specification | Capacity 400cc, with micro hose | 2 pcs | |
| | 1-11 Oil drain | Waste oil tray from engine<br>General specification | Capacity 77 Litter | 1 pc | |
| | 1-12 Parts rack | Storage for parts<br>General specification | Open type<br>(L)1,250×(D)610×(H)1,800mm | 3 units | |
| | 1-13 Service creeper | Working board under chassis<br>General specification | (W)450×(L)850mm | 2 units | |
| | 1-14 Air compressor | Air supply for tools<br>General specification | Output7.5kW, Pressure 0.95MPa | 1 unit | |
| | 1-15 Air piping materials | Air pipe, joint<br>General specification | Steel pipe 1/2& 3/4 inch × 5m,<br>Joint clasp, Stop valve | 1 set | |
| | 1-16 Hydraulic pressure gauge set | Hydraulic measurement<br>General specification | Pressure gauge 2.5, 6, 40, 60Ma (4 kinds) | 1 set | |
| | 1-17 Flow meter set | Flow measurement<br>General specification | Flow 15-320 Litter/min with hose, joint | 1 set | |
| | 1-18 Cleaning pan | Cleaning small parts<br>General specification | Large, Medium, Small | 2 sets | |
| | 1-19 Engine cleaning gun | Cleaning fine parts<br>General specification | Length 450mm | 1 pc | |
| | 1-20 Hand truck | Carrying small parts<br>General specification | Capacity 300kg | 1 unit | |

| Work | Equipment | Function / Reason for selection | Basic specification | Qty | Qty (set) |
|---|---|---|---|---|---|
| 2. Engine Repair Equipment and Tools | 2-1 Mobile floor crane | Lifting parts to hand truck, bench / General specification | Capacity 1 ton | 1 unit | 6 sets |
| | 2-2 Hand truck | Carrying heavy parts / General specification | Capacity 800kg | 1 unit | |
| | 2-3 Mobile work bench | Temporary putting, Work bench / General specification | (L)1,200×(W)800×(H)740mm with vise | 1 unit | |
| | 2-4 Jet parts cleaner | Cleaning engine parts (auto) / General specification | Water volume 350 Litter/minute | 1 unit | |
| | 2-5 Part cleaner | Cleaning parts (manual) / General specification | Tank capacity 140 Litter | 1 unit | |
| | 2-6 Valve lapper | Lapping inlet and exhaust valve / General specification | Air driving with suction cap | 1 unit | |
| | 2-7 Valve lapping compound | Valve lapping compound / General specification | Coarse & fine each contents 200g/can | 20 セット | |
| | 2-8 Mechanic tool set | Hand tools for decomposition and assemble / General specification | Inch and metric size, 144 kinds with steel case | 1 set | |
| | 2-9 Spring pusher | Spring pusher for valve / General specification | For diesel engine | 2 units | |
| | 2-10 Valve lifter & compressor | Out putting inlet and exhaust valve / General specification | Opening range: 50-225mm | 2 units | |
| | 2-11 Cleaning pan | Cleaning small parts / General specification | Large, Medium, Small | 2 sets | |
| | 2-12 Piston ring tool | Out putting piston ring / General specification | Piston dia. Capacity: 70-105/100-175mm | 1 set | |
| | 2-13 Piston ring compressor | Inserting piston / General specification | Piston dia. Capacity: 70-105/100-175mm | 1 set | |
| | 2-14 Air blow gun | Cleaning by air / General specification | Length: 250mm | 2 pcs | |
| | 2-15 Nozzle cleaning kit | Cleaning injection nozzle / General specification | Scraper, holder, wire brush | 1 set | |
| | 2-16 Double-face sledge hammer | Hammer working / General specification | Weight: 3.6kg | 1 pc | |
| | 2-17 Nozzle tester | Pressure test for injection nozzle / General specification | Pressure gauge: 50MPa (500kg/cm2) | 1 unit | |
| | 2-18 Cylinder gauge | Bore diameter measurement / General specification | Measuring range: 35-60, 50-100, 100-160mm × 1 | 1 set | |
| | 2-19 Dial indicator | Bend measurement / General specification | Minimum scale: 1/100mm with magnet stand | 1 set | |
| | 2-20 Straight edge | Straightness measurement / General specification | Measuring range: 1,000mm | 1 pc | |
| | 2-21 Surface plate | Measurement for various types / General specification | (L)900×(W)900×(H)125mm | 1 pc | |
| | 2-22 V' Block | Support for measurement / General specification | (L)200×(W)70×(H)110mm | 1 pc | |

| Work | Equipment | Function<br>Reason for selection | Basic specification | Qty | Qty (set) |
|---|---|---|---|---|---|
| 2. Engine Repair Equipment and Tools | 2-23 Torque wrench set | Tighten bolt with regulations torque<br>General specification | Measuring range: 5-46, 20-130, 50-280, 100-700, 150-850 N-m | 1 set | 6 sets |
| | 2-24 Outside micrometer caliper set | Outer diameter measurement<br>General specification | Measuring range: 0-150mm | 1 set | |
| | 2-25 Oil measure | Oil jug for refueling<br>General specification | Capacity: 4 Litter | 2 pcs | |
| | 2-26 Parts rack | Storage of parts<br>General specification | Open type<br>(L)1,500×(D)450×(H)2,100mm | 1 unit | |
| | 2-27 Tool storage cabinet | Storage for small tools<br>General specification | Door: Swing out type, lockable<br>(L)900×(D)450×(H)1,760mm | 1 unit | |
| | 2-28 Fuel injection pump tester | Fuel injection pump tester<br>General specification | No. of cylinder: 12<br>Drive motor output: 7.5kW | 1 unit | 3 sets |
| 3. Electric & Battery Repair Equipment and Tools | 3-1 Digital circuit tester | Low voltage circuit tester<br>General specification | AC/DC voltage: 0-1,000V<br>AC/DC current: 0-1A | 2 pcs | 6 sets |
| | 3-2 Clamp tester | High voltage current<br>General specification | AC/DC voltage: 0-600V<br>AC/DC current: 0-2,000A | 1 pc | |
| | 3-3 Electric tool set | Electric tool set<br>General specification | 19 items with case | 2 set | |
| | 3-4 Mobile work bench | Temporary putting, Work bench<br>General specification | (L)1,200×(W)800×(H)740mm with vise | 1 unit | |
| | 3-5 Silicon quick charger | Battery-charging<br>General specification | DC output: Max 12/24V, 100A<br>AC input: single phase 220V, 4kVA | 1 unit | |
| | 3-6 Battery and coolant tester | Gravity measurement<br>General specification | Optical type | 1 unit | |
| | 3-7 Battery service tools set | For battery-charging<br>General specification | Battery filler, Battery syringe, Booster cable | 1 set | |
| | 3-8 Electric soldering iron | Solder work<br>General specification | Capacity: 100W | 1 unit | |
| 4. Tire & Brake Repair Equipment and Tools | 4-1 Tire changer | Out putting tire and rim for vehicle<br>General specification | Rim capacity: 14-26 inch | 1 unit | 6 sets |
| | 4-2 Hydraulic tire removing tool | Out putting tire and rim for machine<br>General specification | Capacity: 10 ton | 1 set | |
| | 4-3 Tire bead remover | Out putting tire and rim for machine<br>General specification | Length: 1.5m | 1 unit | |
| | 4-4 Double-face sledge hammer | Hammer working<br>General specification | Weight: 2.7kg, 4.5kg | 2 set | |
| | 4-5 Tire lever | Out putting tire and rim for vehicle<br>General specification | 5kinds | 1 set | |
| | 4-6 Tire pressure gauge | Measurement tire air pressure<br>General specification | For tire pressure valve: small and large | 2 sets | |
| | 4-7 Air chuck | Pneumatic filling<br>General specification | For tire pressure valve: small and large | 2 sets | |
| | 4-8 Valve repair tool | Valve repair tool<br>General specification | For tire pressure valve: small and large | 2 sets | |
| | 4-9 Wheel nut wrench set | Tighten a wheel nut<br>General specification | Wrench size: 32×17-41×21mm 4kinds | 2 sets | |

| Work | Equipment | Function / Reason for selection | Basic specification | Qty | Qty (set) |
|---|---|---|---|---|---|
| 4. Tire & Brake Repair Equipment and Tools | 4-10 Tube repair materials | Tire tube repair / General specification | Tube patch, with tools | 10 sets | 6 sets |
| | 4-11 Brake pipe flaring tool set | Brake pipe and flare repair / General specification | Applicable pipe diameter: 4-15mm | 1 set | |
| | 4-12 Portable brake compression tester set | Brake pressure measurement / General specification | Pressure gauge: 4 kinds | 1 set | |
| | 4-13 Brake pipe nut wrench | Wrench for brake pipe / General specification | Opening: 11×12mm | 1 pc | |
| | 4-14 Brake spring plier | Plier for brake spring / General specification | Small, Medium, Large | 1 set | |
| | 4-15 Wheel dolly | Lifting tire and carry / General specification | Tire diameter: 750-1,430mm | 1 unit | |
| 5. Welding & Fabrication Equipment and Tools | 5-1 Diesel arc welder | Power supply for arc welder / General specification | Welding current: 250A<br>Engine output: 14kW, Accessories | 1 unit | 6 set |
| | 5-2 Electrode drier for welding rod | Drier for welding rod / General specification | Capacity: 10kg | 1 unit | |
| | 5-3 Gas welder set | Gas welder set / General specification | Welding torch, Regulator, Gas hose | 1 set | |
| | 5-4 Mobile work bench | Temporary putting, Work bench / General specification | (L)1,200×(W)800×(H)740mm with vise | 1 unit | |
| | 5-5 Jet multiple chisel | Chisel by pneumatic / General specification | Pneumatic drive<br>Length: 150mm | 1 unit | |
| | 5-6 Screw clamp (type C) | Clamp for welding / General specification | Type C Opening: 100, 150, 200mm ×1 | 2 set | |
| | 5-7 Screw clamp (type L) | Clamp for welding / General specification | Type L Opening: 150, 250, 300mm ×1 | 2 set | |
| | 5-8 Grip Plier | Supporting small parts for welding / General specification | Opening: 40, 45mm ×1 | 2 set | |
| | 5-9 Double-face sledge hammer | Hammer working / General specification | Weight: 0.9, 1.8, 4.5kg ×1 | 1 set | |
| | 5-10 Adjustable hacksaw frame | Cutting metal / General specification | Length: 250mm | 1 unit | |
| | 5-11 Tinner scissors set | Tinner scissors / General specification | 3 kinds | 1 set | |
| | 5-12 High-speed cut-off machine | Cutting metal / General specification | Cutting stone diameter: 405mm | 1 unit | |
| | 5-13 Disc sander | Grinding metal / General specification | Grinding disc diameter: 100mm | 2 units | |
| | 5-14 Mini grinder | Grinding small diameter hole / General specification | Chuck capacity: 6mm | 1 unit | |
| | 5-15 Iron anvil | Metallic working / General specification | Cast iron<br>Weight: 70kg | 1 unit | |
| | 5-16 Tong firing | Handling hot metal / General specification | Length: 450mm<br>flat & round ×1 | 1 unit | |
| | 5-17 Electric soldering iron | Solder iron work / General specification | Capacity: 60W, 200W | 2 unit | |

| Work | Equipment | Function / Reason for selection | Basic specification | Qty | Qty (set) |
|---|---|---|---|---|---|
| 5. Welding & Fabrication Equipment and Tools | 5-18 Bar solder | Solder iron work (for large parts) / General specification | Weight: 1kg | 1 pc | 6 sets |
| | 5-19 Thread type solder with flux | Solder iron work (for small parts) / General specification | Weight: 1kg | 1 pc | |
| | 5-20 Bench electric grinder | Grinder work / General specification | Grinding wheel diameter: 205mm with support bench | 1 unit | |
| | 5-21 Cylinder carrier | Oxygen, acetylene cylinder carrier / General specification | Application: for 2 cylinder | 1 unit | |
| | 5-22 Parts rack | Storage small parts / General specification | Open type (L) 1,500× (D) 450× (H) 2,100mm | 1 unit | |
| | 5-23 Tool storage cabinet | Storage small tools / General specification | Door: swing out type, lockable (L) 900× (D) 450 × (H) 1,760mm | 1 unit | |
| | 5-24 Body puller set | Body repairing / General specification | For large vehicles | 1 set | |
| | 5-25 Body & fender tool set | Body and fender repairing / General specification | For large vehicles | 2 sets | |
| 6. Cleaning Equipment | 6-1 Hot water high pressure washer | Washing machine and vehicle (Hot and high pressure washer) / Detachment mad/oil | Discharge volume: 900L/h<br>Pressure: 10MPa<br>Water temperature: Max. 80℃<br>Motor: three-phase, 2.2kW | 1 unit | 6 sets |
| 7. Machining Equipment and Tools | 7-1 Bench drill press | Boring metal / General specification | Capacity: 13mm | 1 unit | 6 sets |
| | 7-2 Straight shank twist drill set | Drill bit / General specification | Size: 1.0-13.0mm(@0.5mm) | 2 sets | |
| | 7-3 Mechanic tool set | Decomposition / assemble hand tools / General specification | Inch and metric size, 144 kinds with steel case | 1 set | |
| | 7-4 Bench electric grinder | Grinder work / General specification | Grinding wheel diameter: 205mm with support bench | 1 unit | |
| | 7-5 Surface plate | Measurement for various types / General specification | (L)900×(W)900×(H)125mm | 1 unit | |
| | 7-6 V' Block | Support for measurement / General specification | (L)200×(W)70×(H)110mm | 2 units | |
| | 7-7 Parts rack | Storage small parts / General specification | Open type (L) 1,500× (D) 450× (H) 2,100mm | 4 units | |
| | 7-8 Parts rack with drawer | Storage small tools / General specification | No. of drawer: Small 42 pcs. (L) 900× (D) 450× (H) 1,800mm | 2 units | |
| | 7-9 Torque wrench set | Tighten bolt with regulations torque / General specification | Measuring range: 100-120, 40-320, 100-700, 100-850, 100-1,000 N-m | 1 set | |
| | 7-10 Magnetic Base | Support dial indicator / General specification | Holding power: 80N | 1 pc | |
| | 7-11 Dial indicator | Measurement for parts / General specification | Measuring range: 0-50mm<br>Accuracy: 1/100 | 1 pc | |
| | 7-12 Square set | Measurement for squareness / General specification | Dimensions: 150×100, 300×200mm | 1 set | |

| Work | Equipment | Function<br>Reason for selection | Basic specification | Qty | Qty (set) |
|---|---|---|---|---|---|
| 7. Machining Equipment and Tools | 7-13 V' Block set | Support for measurement<br>General specification | Small: 51×24×32<br>Large: 102×41×67mm | 1 set | 6 sets |
| | 7-14 Steel compass | Measurement for various types<br>General specification | Size: 150mm | 1 pc | |
| | 7-15 Firm joint caliper set | Bore/Outer diameter measurement<br>General specification | Size: 150, 300mm | 1 set | |
| | 7-16 Straight rule set | Length measurement<br>General specification | Size: 300, 1,000mm | 1 set | |
| | 7-17 Straight edge set | Straightness measurement<br>General specification | Size: 300, 1,000mm | 1 set | |
| | 7-18 Measuring tape | Length measurement<br>General specification | Measuring range: 2m | 1 pc | |
| | 7-19 Iron bench level set | Level measurement<br>General specification | Measuring range: 150mm, 600mm | 1 set | |
| | 7-20 Hand tachometer | Revolution speed measurement<br>General specification | Measuring range: 0-10,000rpm | 2 pcs | |
| | 7-21 Stop watch | Timing measurement<br>General specification | Display: Digital | 2 pcs | |
| | 7-22 Socket wrench set | Tighten a bolt<br>General specification | Input square: 3/8 inch<br>Metric: 6-21mm (12 kinds) | 2 sets | |
| | 7-23 Socket wrench set | Tighten a bolt<br>General specification | Input square: 3/8 inch<br>Inch: 1/4-7/8 inch (12 kinds) | 2 sets | |
| | 7-24 Socket wrench set | Tighten a bolt<br>General specification | Input square: 1 inch<br>Metric: 32-80mm (12 kinds) | 2 sets | |
| | 7-25 Socket wrench set | Tighten a bolt<br>General specification | Input square: 1 inch<br>Inch: 7/8-2 inch (13 kinds) | 2 sets | |
| | 7-26 Double offset box wrench set | Tighten a bolt<br>General specification | Size: 27×30-35×41 (4 kinds) | 2 sets | |
| | 7-27 Open end wrench set | Tighten a bolt<br>General specification | Double head<br>Size: 27×30-46×50 (4 kinds) | 2 sets | |
| | 7-28 Open end wrench set | Tighten a bolt<br>General specification | Single head<br>Size: 30-60mm (12 kinds) | 2 sets | |
| | 7-29 Solder less terminal kit | Crimp terminal tool<br>General specification | Solder less terminal kit | 2 sets | |
| | 7-30 Adjustable pipe wrench set | Tighten a bolt/nut<br>General specification | Nominal size: 200, 600, 900mm | 1 set | |
| | 7-31 Chain wrench set | Tighten a large bore pipe<br>General specification | Opening: 12-50, 26-170mm | 1 set | |
| | 7-32 Hammer set | Hammer work<br>General specification | Ball peen hammer (3)<br>Double face sledge hammer (3)<br>Plastic hammer, Test hammer,<br>Copper hammer, Wooden hammer | 1 set | |
| | 7-33 Flat chisel set | Cutting metal<br>General specification | 4 kinds<br>Width 10-19mm | 1 set | |
| | 7-34 Tinner scissors set | Cutting metal<br>General specification | 3 kinds | 1 set | |

| Work | Equipment | Function / Reason for selection | Basic specification | Qty | Qty (set) |
|---|---|---|---|---|---|
| 7. Machining Equipment and Tools | 7-35 Screw plate (tap & dies ) set | Threading tap & cutting die / General specification | Screw size: M3-M20 | 1 set | 6 sets |
| | 7-36 Electric soldering iron | Solder iron work / General specification | Capacity: 60W, 100, 200W | 1 set | |
| | 7-37 Thread type solder with flux | Solder iron work (for small parts) / General specification | Weight: 1kg | 4 pcs | |
| | 7-38 Bar solder | Solder iron work (for large parts) / General specification | Weight: 1kg | 4 pcs | |
| | 7-39 Portable hydraulic jack | Lifting chassis / General specification | Capacity: 50ton | 2 units | |
| | 7-40 Portable hydraulic jack | Lifting chassis / General specification | Capacity: 30ton | 2 units | |
| | 7-41 Air impact wrench | Tighten a bolt / General specification | Input square: 1/2 inch | 1 pc | |
| | 7-42 Air impact wrench | Tighten a bolt / General specification | Input square: 3/4 inch | 2 pcs | |
| | 7-43 Air impact wrench | Tighten a bolt / General specification | Input square: 1 inch | 2 pcs | |
| | 7-44 Impact socket set | Tighten a bolt / General specification | Input square: 1/2 inch<br>Size: 8-32mm | 2 sets | |
| | 7-45 Impact socket set | Tighten a bolt / General specification | Input square: 3/4 inch<br>Size: 9-46mm | 2 sets | |
| | 7-46 Impact socket set | Tighten a bolt / General specification | Input square: 1/2 inch<br>Size: 32-50mm | 2 sets | |
| | 7-47 Air hose set | Hose for air tools / General specification | Inside dia.: 6, 9, 12mm<br>Length: each 10m | 6 sets | |
| | 7-48 Quick connector | Socket & Plug for air tools / General specification | Size (socket, plug):<br>1/4, 3/8, 1/2 inch | 6 sets | |
| | 7-49 Electric drill | Portable electric drill / General specification | Drill capacity: 13mm | 1 unit | |
| | 7-50 Straight shank twist drill set | Drill bit for electric drill / General specification | Size: 1-13.0mm (@0.5mm) | 2 sets | |
| | 7-51 Mini grinder | Grinder for small dia. / General specification | Chuck capacity: 6mm | 1 unit | |
| | 7-52 Electric cord reel | Extension electric cord / General specification | Cord length: 30m | 1 unit | |
| | 7-53 Garage lamp | Lighting under chassis / General specification | Capacity: 100W<br>Cord length: 10m | 2 units | |
| | 7-54 Flood lamp | Lighting under chassis / General specification | Capacity: 500W<br>with clamp | 2 units | |
| | 7-55 Lever block | Lifting heavy parts / General specification | Capacity: 0.75 ton | 1 unit | |
| | 7-56 Lever block | Lifting heavy parts / General specification | Capacity: 1.5 ton | 1 unit | |
| | 7-57 Spray gun | Spray painting / General specification | Type: Suction type | 2 units | |

| Work | Equipment | Function<br>Reason for selection | Basic specification | Qty | Qty (set) |
|---|---|---|---|---|---|
| 7. Machining Equipment and Tools | 7-58 Container for spray gun | Spray painting<br>General specification | Capacity: 1,000cc | 2 pcs | 6 sets |
| | 7-59 Hydraulic hand pump | Hand pump for hydraulic puller<br>General specification | Pressure: 68MPa | 1 unit | |
| | 7-60 Hydraulic puller | Pulling bush, bearing<br>General specification | Capacity: 50 ton | 1 unit | |
| | 7-61 Hydraulic puller | Pulling bush, bearing<br>General specification | Capacity: 30 ton | 1 unit | |
| 8. Lubrication Equipment | 8-1 Lubrication truck | Lubricating engine oil, grease and coolant water<br>Lubrication on site of work | 4 wheel drive, Aluminum van body,<br>On-board:<br>Drum can for oil and grease,<br>Drum pump, Water tank,<br>Air compressor | 1 unit | 6 sets |

### (4) Spare Parts

Spare parts are basically unnecessary for the most of procured equipment other than lubrication truck.

It is planned to procure a whole set of periodic replacement parts, expendables, and other items needed for periodic servicing of equipment during the initial operation phase of the first two years or so, which translates to 60,000 km of mileage for lubrication truck.

**Table 2-4 List of Spare Parts (tentative)**

| Item | | Quantity |
|---|---|---|
| Periodic replacement parts | Fuel filter | Quantity of each spare part, which differs for each product and manufacturer, will be determined after collecting data from the manufacturers. In terms of cost, it will be around 5 % of the price of the equipment. |
| | Air filter | |
| | Engine oil filter | |
| | Hydraulic oil filter | |
| Expendables | Brake shoe | |
| | V-belt | |
| | Spare cutting stone and grinding disk for high-speed cut-off machine, grinder | |
| Other | Head lamp | |
| | Brake lamp | |
| | Fuse | |
| | Hydraulic hose | |
| | Other spare parts recommended by manufacturers | |

After procurement of the equipment, MOTC will check the consumption of spare parts for two years and formulate a plan for procurement of spare parts. After the initial two years, MOTC will secure budgets and procure spare parts in accordance with procurement plans.

Information about distributors of equipment items necessary for procurement will be delivered to

officers responsible at MOTC and staff members in charge of equipment maintenance at RMD, together with detailed account of the information, at the time of delivery of the equipment. Information will be in written form and data format.

Information about distributors will also be attached to contract documents with the supplier. RMD will be required to keep the information in safe custody.

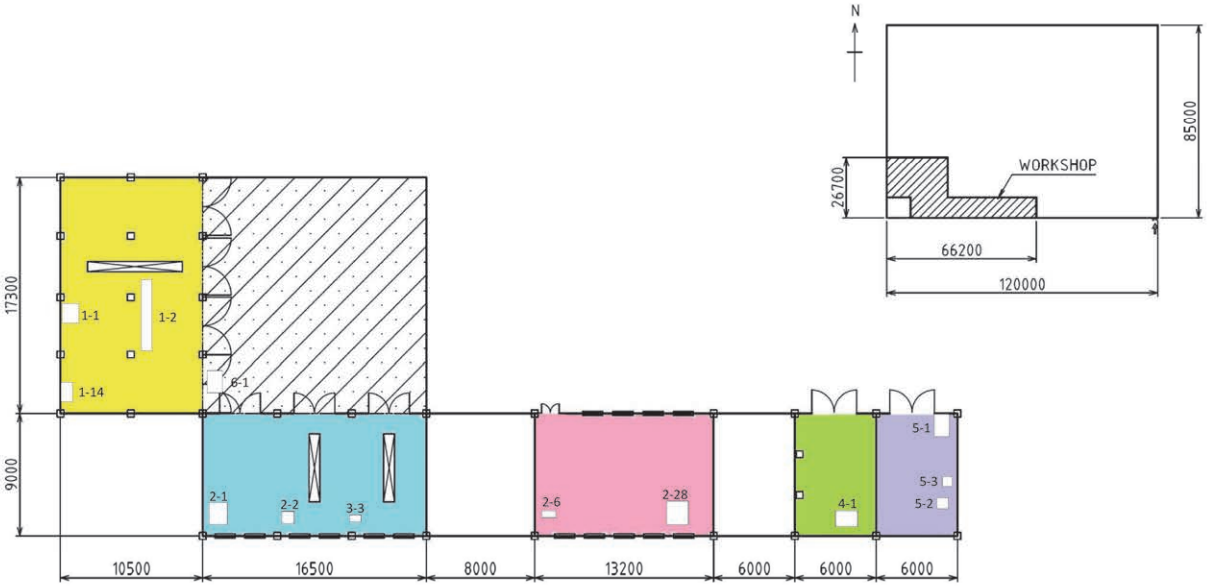
## 2-2-3 Equipment Layout Plan

| Description | Q'ty |
|---|---|
| **EPAIR SHOP** | |
| Hydraulic shop press, 55 ton & push tools | 1 |
| 3 ton gantry crane | 1 |
| Air compressor, 7.5kW, 0.95 MPa | 1 |
| **PAIR SHOP** | |
| Mobile floor crane, 1000kg | 1 |
| Jet parts cleaner, 350 lit/min | 1 |
| Part cleaner, 140 liter | 1 |
| Diesel fuel injection pump test stand | 3 |
| **AND BATTERY SERVICE** | |
| Silicon quick charger, 100A | 1 |

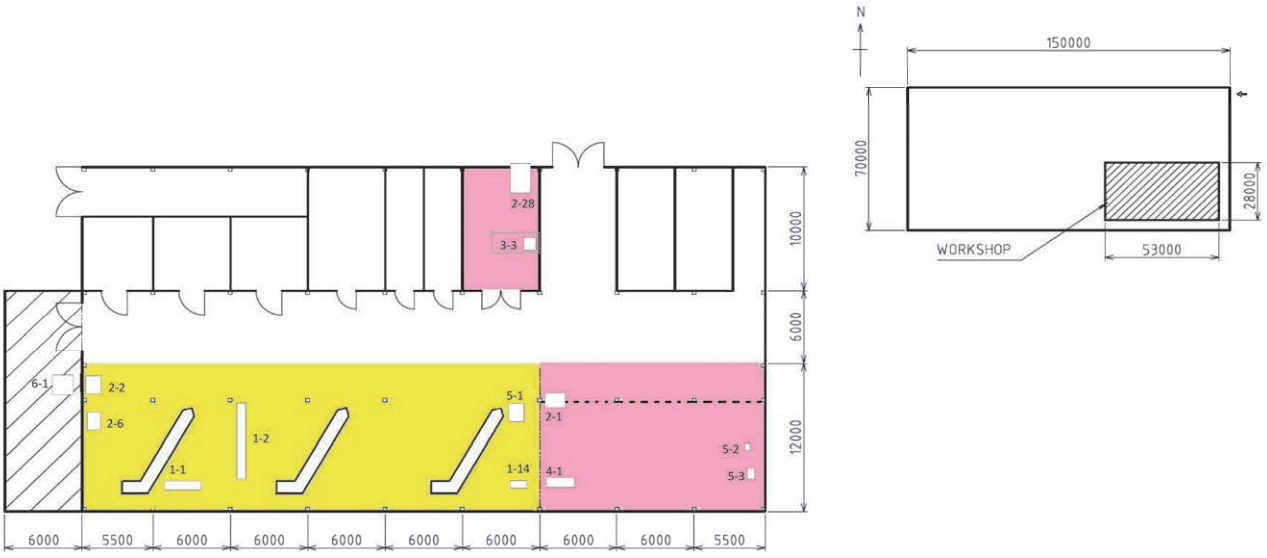
| item No. | Description | Q'ty |
|---|---|---|
| **4. TIRE & BRAKE SERVICE TOOLS** | | |
| 4-1 | Tire changer, 14″-26″ | 1 |
| **5. WELDING & FABRICATION** | | |
| 5-1 | Diesel arc welder, 250A with accessories | 1 |
| 5-2 | High-speed abrasive cut-off machine, 405mm | 1 |
| 5-3 | Bench electric grinder, 205mm with pedestal | 1 |
| **6. CLEANING EQUIPMENT** | | |
| 6-1 | Hot water high pressure washer, 900l/h, 10MPa | 1 |

Chassis shop (Construction M/C)
Chassis shop (Vehicle)
Engine, machine shop
Tire shop
Welding shop
Concrete pavement

PLUAD 1 DEP598




PLUAD 3 DEP8



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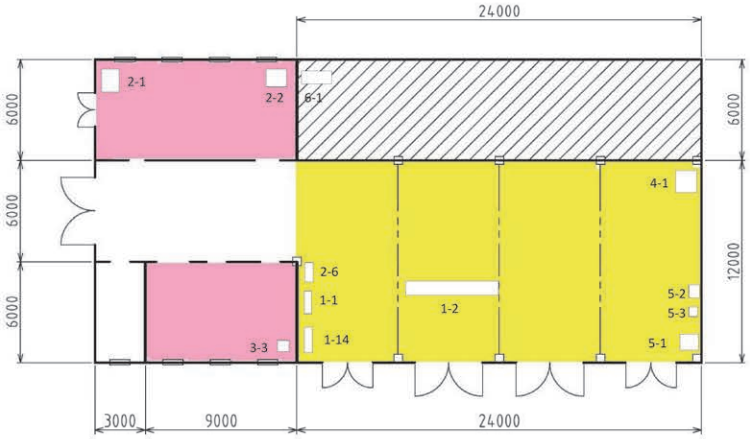


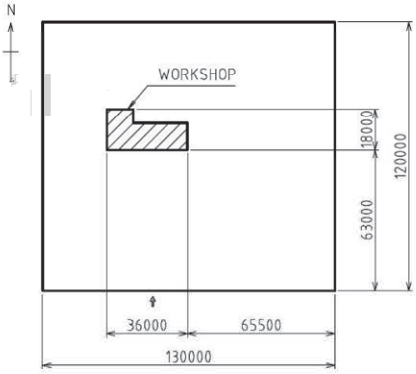


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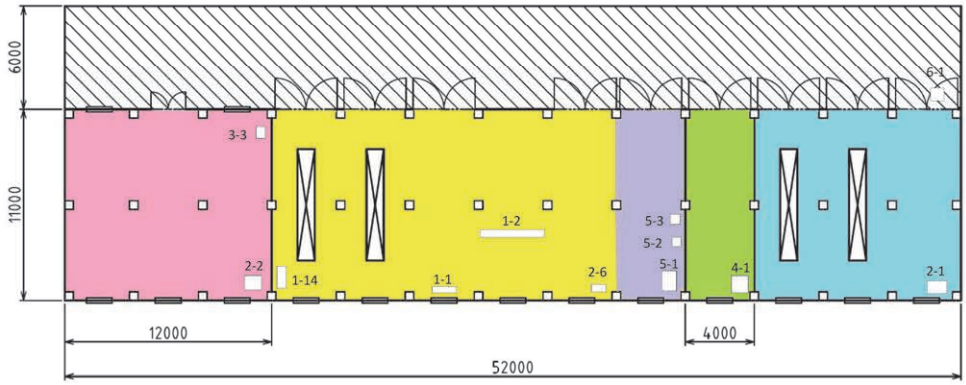
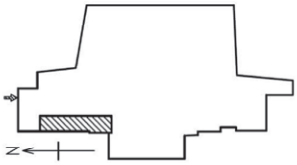
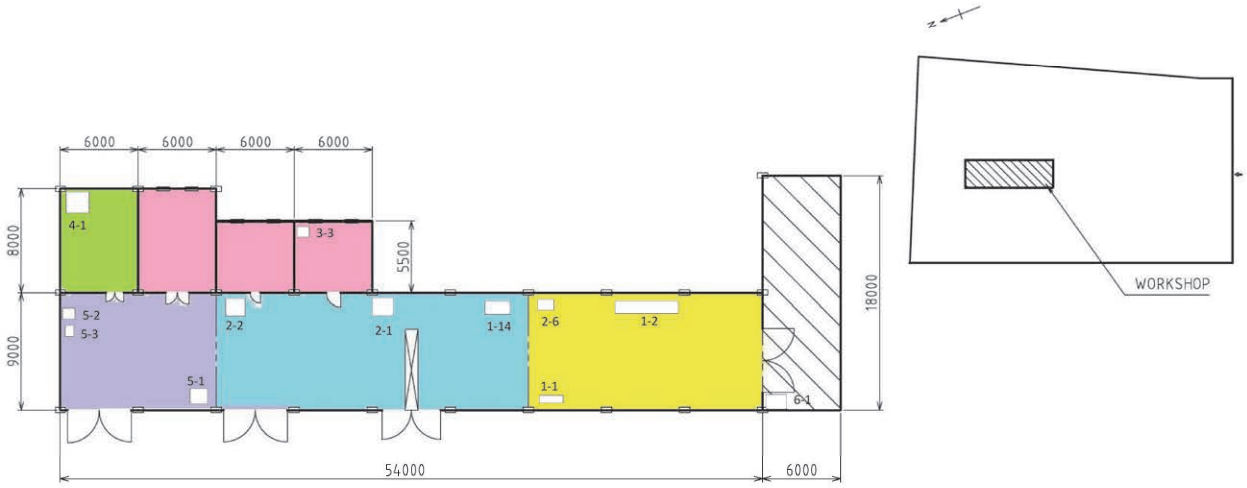
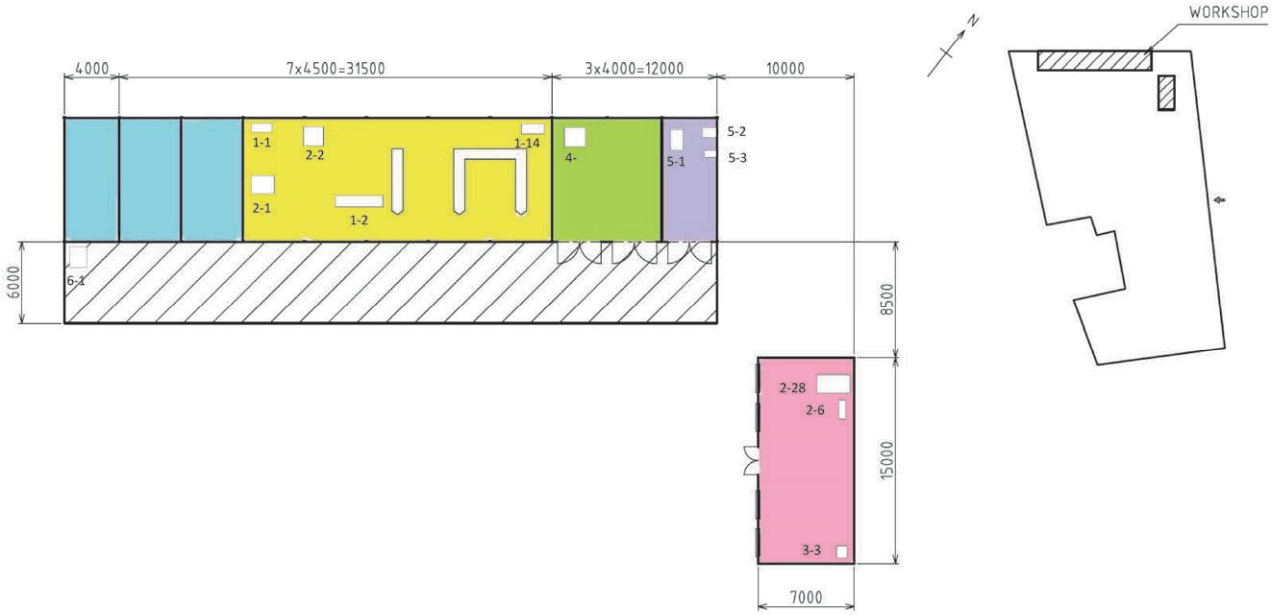


PLUAD 6 DEP52




OSI UAD DEP45



### 2-2-4 Procurement Plan

#### 2-2-4-1 Procurement Policy

**(1) Project Implementing Bodies**

Figure 2-1 shows the interrelations among the Japanese and Kyrgyz organizations, which will be engaged in the implementation of the Project if it is to be carried out using Grant Aid from the Government of Japan.

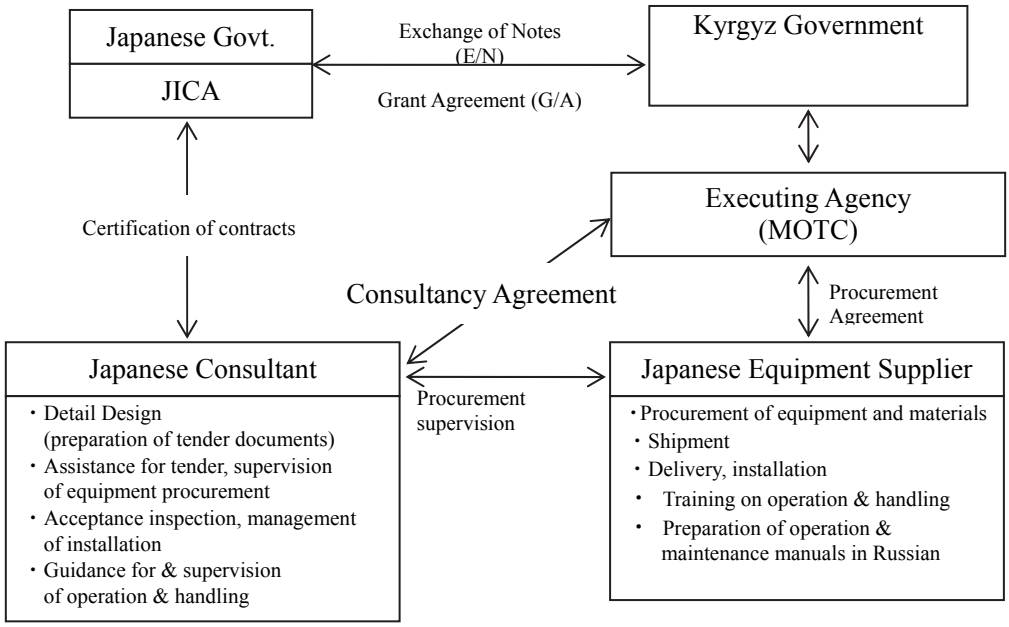



**Figure 2-1 Interrelations Among Project Implementing Bodies**

The executing agency on the Kyrgyz side of this Project will be the Ministry of Transportation and Communications (MOTC). Detailed design and procurement supervision will be undertaken by a Japanese consultant firm (the Consultant) under the Grant Aid Scheme of the Government of Japan. Equipment for this Project will be procured by a Japanese contractor (the Equipment Supplier), who will be the main signatory to Procurement Agreement.

**(2) Consultant**

Immediately after the signing of E/N and G/A, MOTC will conclude a Consultancy Agreement with the Japanese Consultant, which will, in accordance with the agreement, provide engineering services for the Project, including detail design, preparation of tender documents, assistance for tender execution, and supervision of procurement activities, and assume responsibility for these services until the handover of the equipment is complete.

**(3) Equipment Supplier**

The Equipment Supplier, who will be selected as a result of satisfying the required qualities and specifications and winning a tender open only to qualified bidders, will conclude a Procurement

Agreement with MOTC with respect to the supply of equipment planned for this Project.

### 2-2-4-2 Implementation Conditions

The equipment will be shipped by sea from Japan, transported on the Siberian or Chinese railway, and passed through the custom clearance in Bishkek, the capital city of Kyrgyzstan, where the equipment is transported inland and delivered to the designated destinations below.

- Equipment and spare parts except lubrication trucks will be delivered to the DEPs.
- The lubrication trucks will be delivered to DEP958 located near Bishkek.

The maintenance equipment includes many small items. If they are delivered to one place in Kyrgyzstan and sorted out in terms of destination, errors in counting the quantity and loss will be likely to occur. On the other hand, electrically-powered machines need to be connected to power sources on site to check if they properly work. Thus, all the equipment items except the lubricant trucks will be sorted and packed in terms of destination in Japan, and transported to the destinations in Kyrgyzstan, where the quantity, delivery and operation are confirmed.

As for the lubricant trucks, two grant aid cooperation projects in the past adopted the process, where vehicles and heavy machines were delivered to one place in Bishkek and transported inland to the final destinations. Because these previous projects had no particular problem with the delivery, this Project will adopt the same delivery process.

After the equipment is delivered to the designated places, the supplier will conduct the trial operations of all the equipment items to check if they properly work, and deliver them to MOTC. The supplier will then promptly provide MOTC with guidance on the operation and handling, and inspection and maintenance.

Table 2-5 lists the actual destinations of the equipment, which are the six DEPs. As stated earlier, the lubricant trucks will be delivered to DEP958. The transport and distribution of the trucks from DEP958 will be conducted on the responsibility of MOTC.

**Table 2-5 List of Equipment for Distribution**

| Equipment | Quantity | | | | | | |
|---|---|---|---|---|---|---|---|
| | PLUAD1 DEP958 | PLUAD3 DEP8 | PLUAD4 DEP35 | PLUAD5 DEP19 | PLUAD6 DEP52 | OSI UAD DEP45 | TOTAL |
| Fuel injection pump tester | 1 unit | 1 unit | — | — | — | 1 unit | 3 units |
| Equipment other than the above | 1 set | 1 set | 1 set | 1 set | 1 set | 1 set | 6 sets |

### 2-2-4-3 Scope of Works

The cost of transport to the delivery places, unloading and other relevant procurement works will be borne by the Japanese side, whereas the arrangements for tax exemption related to the imports will be made by the Kyrgyzstan side. Table 2-6 shows the division of work. The division of work for installation is as follows.

・The Kyrgyzstan side will repair the workshops where the equipment is installed, and prepare the water supply and drainage facilities, and primary power sources for installation.
・The Japanese side will install the equipment, and conduct connection and installation works for water supply and drainage pipes, and electric power lines.

**Table 2-6 Responsibilities of the Two Governments**

| Work | Content | Responsible party | | Remarks |
|---|---|---|---|---|
| | | Japan | Kyrgyz | |
| Equipment procurement | Procurement of equipment | ○ | | |
| | Ocean/land transportation | ○ | | To custom house |
| | Customs clearance | | ○ | Incl. tax exemption |
| | Inland transportation | ○ | | From custom house |
| Preparation for installation | Renovation of workshops | | ○ | |
| | Water service & drainage | | ○ | |
| | Primary power supply | | ○ | |
| Installation work | Installation of equipment | ○ | | |
| Operational guidance, etc. | Training on operation | ○ | | |
| | Training on inspection & maintenance | ○ | | |
| Operations and maintenance | Forwarding of equipment | | ○ | To equipment stations |
| | Securing of storage sites | | ○ | |
| | Equipment maintenance | | ○ | |

### 2-2-4-4 Consultant Supervision

#### (1) Basic Policy

After the signing of E/N and G/A, the Japanese Consultant will conclude a Consultancy Agreement with the Government of Kyrgyzstan to undertake the supervision of the procurement work defined in the E/N according to the framework of the Grant Aid Scheme. It is important for the Consultant to perform its duties based on thorough understanding of the background of the Project, as well as the rationale and key points of the outline design.

#### (2) Work Content

The Consultant's supervisory work consists mainly of the following elements:

・Pre-launch consultation, verification of Project sites (workshops renovation, new personnel assignment)
・Review of equipment specifications
・Preparation of tender documents
・Briefing on tender documents, obtaining of approval
・Assistance for tender procedure (announcement, distribution of documents, execution of tender, evaluation of bids)
・Facilitation of contract signing (negotiation, witnessing, certification)
・Confirmation of issuance of purchase orders for equipment

・Factory/pre-shipment inspections
・Pre-shipment inspection (entrusted to a third party)
・Previous arrangements in Kyrgyzstan (to confirm delivery/installation schedule, tax exemption, and startup training procedure)
・Identification and promotion of Kyrgyz side obligation (progress workshops renovation, procurement plan renewal)
・Supervision of installation work
・Acceptance inspection, handover
・Witnessing of training on driving, operation, inspection, and servicing
・Preparation of a completion report

### 2-2-4-5 Quality Control Plan

In order to ensure that the procured equipment items satisfy the quality requirements and specifications stipulated in the agreement, the Consultant will conduct the following inspections in various stages of the procurement work.

・Checking of the contents of purchase orders issued by the Equipment Supplier
・Factory and pre-shipment inspections at the manufacturing plants of the equipment
・Pre-shipment survey
・Inspection at the time of equipment installation
・Inspection at the time of equipment handover

### 2-2-4-6 Procurement Plan

#### (1) Countries of Origin

MOTC senses the strong confidence in the performance and quality of the Japanese products procured in the previous two grant aid cooperation projects, and requests Japanese maintenance equipment to be procured in this Project.

The Project needs to have a procurement plan that conforms with the procurement rules for grant aid cooperation, but will basically consider a Japanese supplier first. If any Japanese product is unavailable or if a limited number of suppliers are available in Japan, the relevant equipment items will be procured from European and other third countries where there are suppliers can offer products with the same quality as Japanese ones. Of the equipment items, fuel injection pump testers need to be procured from a third country. British and German manufacturers offer quality fuel injection pump testers.

#### (2) Procurement Route

Judging from the locations of manufacturers, it is likely that equipment items to be procured in Japan will be shipped from Yokohama and/or Kobe. As for transport afterwards, the Siberian and Chinese railway routes are available, but it is likely that equipment items other than the lubrication trucks will be transported on the Chinese railway route as container cargoes, and that the lubrication trucks will be transported on the Siberian railway to avoid theft. The estimated lead time will be a total of 60 days: 10 days for marine transport and 50 days for inland transport. It is also estimated that it takes about 30 days

to deliver cargoes from Europe by rail or truck.

In the previous two grant aid projects, some lamps, cables, batteries and other items of construction machines and vehicles were stolen during transport. To avoid theft, every part of the lubricant trucks will be completely covered before transport. On the other hand, containers will be used for transportation of other maintenance equipment items, so there will be no need to worry about theft.

### 2-2-4-7 Operation Guidance Plan

#### (1) Trial Operation and Adjustment

At the timing of delivery of the equipment, the Equipment Supplier will dispatch engineers to test-run and adjust the delivered equipment to ensure that all items operate properly. Though this Project intends to procure 25 types of equipment from many different manufacturers, it is planned to dispatch four engineers to take charge of multiple equipment types, including training on their startup and operation.

#### (2) Training on Startup and Operation

After the delivery of the equipment, training on startup and operation will be conducted to mechanics. Mechanics of the DEPs are familiar with maintenance works for basic road maintenance equipment but not with works using equipment items to be supplied for the first time under the Project. Thus, training on startup and operation will focus on such new items. The content, period and participators of the training will be discussed and adjusted with RMD. After the completion of all trainings, a training completion report will be submitted to RMD and thus the contents of the training will be shared.

Operational and maintenance manuals in Russian will be attached to major equipment items to help mechanics understand them. Table 2-7 shows the duration of training on startup and operation.

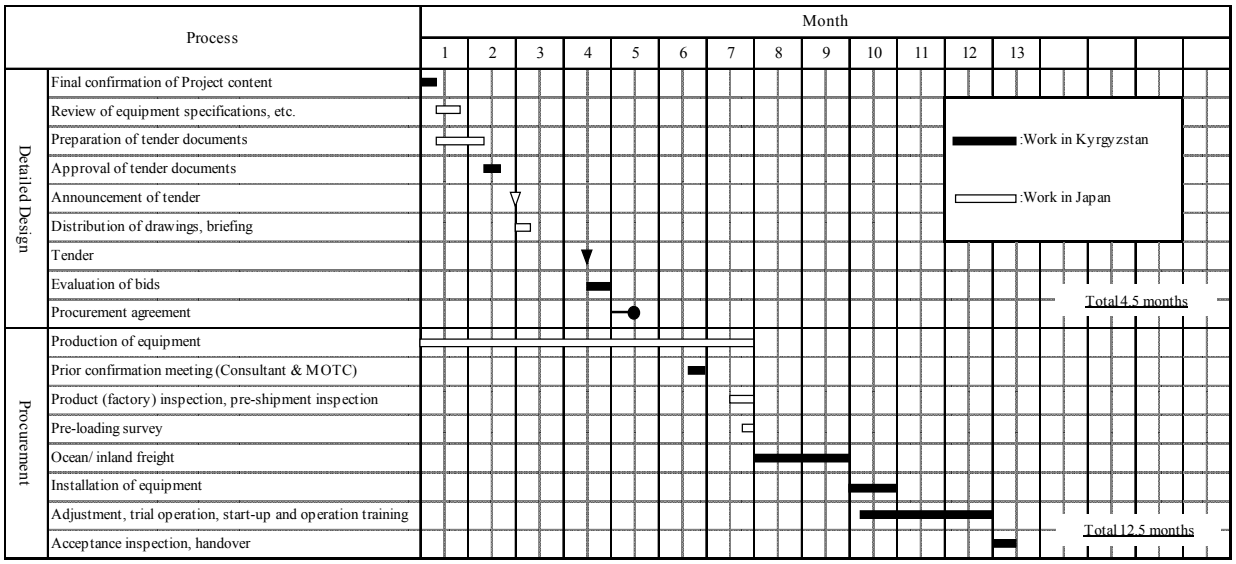
**Table 2-7 Duration of Training on Startup and Operation**

| No | Equipment | No. of days | No. of sites | Total days | Engineer |
|---|---|---|---|---|---|
| 1 | Chassis Repair Equipment and Tools<br>Tire & Brake Repair Equipment and Tools<br>Welding & Fabrication Equipment and Tools<br>Cleaning Equipment | 5 | ×6 | 30 | A |
| 2 | Engine Repair Equipment and Tools<br>Electric & Battery Repair Equipment and Tools<br>Machining Equipment and Tools | 6 | ×6 | 36 | B |
| 3 | Fuel injection pump tester | 3 | ×3 | 9 | C |
| 4 | Lubrication truck | 2 | ×1 | 2 | A |

### 2-2-4-8 Implementation Schedule

This Project will be implemented pursuant to the Grant Aid Scheme of the Government of Japan according the schedule shown in Table 2-8.

**Table 2-8 Project Implementation Schedule**




### 2-3 Obligations of Recipient Country

If this Project is to be implemented as a Grant Aid project of the Government of Japan, the undertakings of the Government of Kyrgyzstan will consist of the following:

- Payment of fees associated with Banking Arrangement (B/A) to a designated Japanese bank.
- Provision of facilities necessary for Japanese nationals engaged in this Project to enter and stay in Kyrgyzstan and visit Kyrgyz government agencies in order to carry out their duties.
- Exempting the Japanese citizens and corporations engaged in this Project from tariffs, duties, and all other internal taxes.
- Preparation of documents necessary for customs clearance and tax exemption of equipment to be procured as part of this Project.
- Assignment of personnel and provision of facilities necessary for training on startup, operation, inspection, and servicing.
- Acquisition and preparation of 6 workshops for installation of equipment.
- Proper and effective use and maintenance of the procured equipment.
- Proper maintenance and administration of the target roads.
- Payment of all expenses other than those borne by the Government of Japan using Grant Aid.

The Kyrgyz side has assumed responsibilities similar to the above in the past two Grant Aid projects and thus is deemed capable of to implementing this Project without major problems.

The renovation of the six workshops for installation of equipment will be made by MOTC after the conclusion of E/N and G/A. It will be completed in about 11 months before manufacturing of the equipment is completed.

Table 2-9 outlines the schedule of the workshop renovation.

**Table 2-9 Workshops Renovation Outline Schedule**

| Work Item | Necessary Number of Months | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| E/N、G/A | ▼ | | | | | | | | | | |
| Workshop renovation | | | | | | | | | | | |
| Preparation of work order | ■ | | | | | | | | | | |
| Tender & Contract | | ■ | | | | | | | | | |
| Detailed design | | | ■ | ■ | | | | | | | |
| Roofing work* | | | | ■ | ■ | ■ | | | | | |
| Interior work | | | | | ■ | ■ | ■ | ■ | | | |
| Water supply and drainage work | | | | | | | ■ | ■ | ■ | | |
| Electrical power supply work | | | | | | | ■ | ■ | ■ | | |
| Lighting work | | | | | | | | ■ | ■ | | |
| Exterior work | | | | | | | | | ■ | ■ | |
| Cement concrete outer floor work* | | | | | | | | | | ■ | |

*: Roofing and cement concrete outer floor work should be execute excluding winter (Dec.-Feb.)

The roofing work and cement concrete outer floor work need to be conducted during a time other than winter (December to February) to avoid snow coverage and freezing of concrete.

The consultant will inspect the progress of the renovation of the workshops in the middle of the above-mentioned schedule (in about five months' time). If the renovation delays, MOTC will be requested to revise the schedule to complete the renovation before the equipment is delivered so as to clarify the timing of the completion. Additionally, the consultant will clarify the allocation of human resources necessary to operate procured equipment.

## 2-4 Project Operation Plan

If equipment is procured under the Project, DEPs affiliated to their respective PLUAD/UADs will operate, maintain and, if necessary, repair the equipment. Prior to delivery of the equipment to the designated sites, the Kyrgyzstan side will formulate a personnel plan and assign their staff members to the training of startup and operation conducted by the Japanese side so that the staff members become familiar with the handling, operation and maintenance of the equipment. Personnel newly required in relation to the Project are as listed in Table 2-1.

The DEPs supplied with the equipment will be basically in charge of maintenance of the road maintenance equipment owned by DEPs within the relevant oblast. But they will flexibly help one another repair and maintain the road maintenance equipment.

Small portable tools and fixings will be stored on predetermined shelves or in lockers with doors in repair rooms of the workshops. Staff members in charge of the repair rooms to be newly hired will confirm the storage of tools and fixings every time repair and maintenance work is finished to thoroughly prevent any loss and theft. The shelves and lockers will be labeled with nameplates so that right tools and fixings will be stored at right places. This arrangement enables to visually confirm which tools and fixings are in use or lost.

It is also necessary to distribute budgets necessary for equipment maintenance taking advantage of the equipment to be procured to the DEPs referred to in Section 2-5-2.

## 2-5 Project Cost Estimation

### 2-5-1 Initial Cost Estimation

The Project will be implemented in accordance with the Japan's Grant Aid scheme and the cost will be determined before concluding the Exchange of Note (E/N) for the Project.

#### (1) Cost to be borne by the Kyrgyz side

| Item | Cost | |
|---|---|---|
| | 1,000 KGS | 10,000 JPY |
| Workshops renovation | 19,370 | 3,758 |
| Banking arrangement fee | 156 | 30 |
| Total | 19,526 | 3,788 |

#### (2) Estimation Parameters

- Timing: June 2014
- Exchange rate: 1.00 USD = 103.16 JPY
  1Kyrgyz som = 1.94JPY
- Procurement period: durations of the detailed design and equipment procurement processes are as shown in the implementation schedule.
- Other: this Project will be implemented under the framework of the Grant Aid Scheme of the Government of Japan.

### 2-5-2 Operation and Maintenance Cost

The annual cost of fuel and oil necessary for the operation of the equipment is estimated at 1.75 million som (approx. 3.4 million yen) as shown in Table 2-10, and the annual maintenance cost at 0.95 million som (approx. 1.84 million yen) as shown in Table 2-11. The annual labor cost of newly-recruited staff will be around 5.76 million som (approx. 11.17 million yen).

Based on the above, the O & M cost associated with the procured equipment to be borne by MOTC totals to 8.46 million som (approx. 16.41 million yen).

The estimated O & M cost of 8.46 million som will account for about 0.4% of MOTC's annual maintenance budget for 2014 (2136 million som) and about 0.6% of the road maintenance budget (1473 million som), which has increased since 2012 at an average annual rate of 119%, indicating that it will be able to secure necessary budget for operating and maintaining the equipment to be procured by this Project.

Considering that MOTC has a track record of raising the O & M budget for the equipment procured by each of the past two Grant Aid projects in the same fiscal year when the equipment was procured and that MOTC has promised to allocate similar funding to this Project, it is deemed likely that adequate funds will be secured for operating and maintaining the planned equipment.

**Table 2-10 Estimated Cost for Fuel and Oil (newly incurred cost)**

| No. | Equipment | Spec. (kw) | Qty. | Working hour (h/year) | Fuel consumption (L/kw・h・unit) | (L/h・unit) | (L/year・unit) | (L/year) |
|---|---|---|---|---|---|---|---|---|
| 1 | Maintenance equipment | - | 6 | - | - | - | - | - |
| 2 | Lubrication truck | 177.0 | 6 | 760 | 0.050 | 8.9 | 6,726.0 | 40,356 |
| | Total | | 12 | | | | | 0 |

Conditions in the cost estimate:

Fuel consumption is based on the "Depreciation Calculation Table for Construction Equipment, Etc."

Cost of diesel fuel: 43.0 som/Litter＝83.6 yen/Litter

Cost of oil: 1% of fuel cost

1Kyrgyz som

=1.94 yen (avarage exchange rate as of April to June, 2014, 1USD=51.6KGS, 1USD=103.16 yen)

| | | |
|---|---|---|
| Fuel cost (annual) | 40,356L×43.0KGS/L＝1,735,308 som | Approx. 3,370 thousand yen |
| Oil cost (annual) | 1,735,308×1%＝17,353 som | Approx. 30 thousand yen |
| Total | 1,752,661 som | Approx. 3,400 thousand yen |

**Table 2-11 Estimated Cost for Maintenance and Repair**

| No. | Equipment | Spec. (kw) | Qty. | Rate of maintenance (%) | Standard tenure of use in Japan (yr.) | Standard tenure of use in Kyrgyz (yr.) | Annual maintenance ratio (%) | Maintenance and repair cost/yr・unit (10,000 yen) | Maintenance and repair cost/yr (10,000 yen) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Maintenance equipment | - | 6 | 7.0% | 15.0 | 15.0 | 0.47% | 9.8 | 58.9 |
| 2 | Lubrication truck | 177.0 | 6 | 12.0% | 12.0 | 12.0 | 1.00% | 20.8 | 124.9 |
| | Total | | 12 | | | | | | 183.8 |

Conditions in the cost estimate:

Based on the "Depreciation Calculation Table for Construction Equipment, Etc." (Japan Construction Mechanization Association) 2013 edition

Equipment price: body price or estimated price (CIF)

Standard tenure of use in Kyrgyz (yr.) = Standard tenure of use in Japan (yr.)

Annual maintenance ratio = maintenance ratio÷standard tenure of use in Kyrgyz

Annual maintenance cost = equipment price x annual maintenance ratio

1Kyrgyz som＝1.94 yen

| | | |
|---|---|---|
| Annual maintenance cost | 947.4 thousand som | 1,838 thousand yen |

# CHAPTER 3. Project Evaluation

## 3-1 Preconditions

Obligations of Recipient Country and others described in Table 3-1.

**Table 3-1 Preconditions for Project implementation**

| Issues | Description | Note |
|---|---|---|
| Obligations of Recipient Country | MOTC will execute the workshops renovation by the own budget which will be secured MOTC's settlement without acceptance of Ministry of Finance. And also, the execution of workshops renovation is judged to be no matter, because MOTC has already make an execution plan according with each DEP's renovation content.<br>MOTC has committed to relocate existing technicians or employ new workers to operate procured equipment. MOTC has already positive experience in allocating human resources for newly procured equipment in the past similar projects. No problems should be expected in this aspect.<br>The counterpart MOTC has already several experiences with Grand Aid projects, and there were no problems with implementation. It is considered that there is no problem concerning with implementation aspects. | See "2-3 Obligations of Recipient Country" |

## 3-2 Necessary Inputs by Recipient Country

For the effective application of the equipment, provided by the Project, necessary inputs and costs by Kyrgyz Republic are described in Table 3-2.

**Table 3-2 Necessary Inputs (costs) by Recipient Country**

| No | Content | Note |
|---|---|---|
| 1 | Sufficient budget allocation to buy fuel and oil to run construction equipment. | |
| 2 | Sufficient budget allocation to repair and periodical inspection of the equipment | Procurement of spare parts, tools, etc. |
| 3 | Employing operators and drivers to run and operate the equipment | Reassigning and new employment |

## 3-3 Important Assumptions

Table 3-3 shows important assumptions for realization and continuation of the project effects.

**Table 3-3 Important Assumptions**

| Items | Description | Important Assumptions |
|---|---|---|
| Vision | Execution of more efficient road maintenance management | |
| Project goals | Road maintenance equipment is maintained more efficiently | ➢ Each DEP will continue to implement repair works of the road maintenance equipment |
| Results | Maintenance equipment for road maintenance equipment is provided in DEPs which MOTC has jurisdiction | ➢ Sufficient budget will be allocated<br>➢ Enough number of staff will be employed<br>➢ Operators and mechanics will continue to work in MOTC |
| Activities | ➢ Procure maintenance equipment<br>➢ Start-up operation guidance<br>➢ Implementing road maintenance works | |

## 3-4 Project Evaluation

### 3-4-1 Relevance

To date, MOTC has taken advantage of outputs of cooperation provided by Japan and other donors to manage road maintenance more effectively and efficiently. But some 67 percent of the road maintenance equipment held by MOTC was procured in the former Soviet era, is long past its service life (an average of 12 years or so) and breaks down in the manner that the equipment cannot be repaired with simple tools, so prompt maintenance of it is necessary. Moreover, if any piece of road maintenance equipment has a breakdown which cannot be repaired under the direct management, MOTC sometimes asks the repair to private maintenance factories, but it takes time to deliver and repair such equipment because private maintenance factories do not exclusively specialize in PLUAD/UADs but have many other services, and also because maintenance factories are unavailable at some areas. All this prolongs maintenance of road maintenance equipment and poses problems for road maintenance of the country.

In response to these circumstances, this Project will procure equipment necessary for the repair of road maintenance equipment for a total of six (6) PLUAD/UADs under MOTC to help MOTC maintain their road maintenance equipment more efficiently, thereby contributing to more efficient maintenance of roads under the management of MOTC.

The Government of Kyrgyzstan has designated the road sector as one of the priority areas in the National Development Strategies of Kyrgyzstan for the period of 2013-2017, places an emphasis on securing the access to the neighboring countries and domestic market, and has an intention to commit itself to more efficient road maintenance. This Project will contribute to the achievement of their objective.

Meanwhile, the Government of Japan has formulated the Assistance Policy to meet the policies of the Government of Kyrgyzstan, which places an emphasis on, among other things, “maintenance and management of transport infrastructure, and correction of the regional gap”. This Project has been relevant to this priority area in Japan’s ODA policy, so that its relevance is high.

## 3-4-2 Effectiveness

### (1) Quantitative Effects

**Table 3-4 Quantitative Effects**

| Indicator | Baseline (2014) | Target (2019) |
|---|---|---|
| No working ratio of MOTC's road maintenance equipment *1 | 20.2 | 13.5 |

※1 : Calculated based on excluding 263units which will be scrapheaped in 5 years from 1,658 units of road maintenance equipment .

At the moment of the survey, the equipment idling rate was 22.1% (367units under repair/ total equipment 1,658units).

263 units were planned to be scrapheaped in the next 5 years (equipment produced before 1985), of those 85 units were under repair (idled equipment). Therefore after 5 years, the equipment idling rate is to be:

(367-85 units) / (1,658-263units) = 20.2% (282 units / 1,395 units)

The equipment produced after 1985, disbursed almost evenly by production years. Therefore it is assumed that after 5 years, the equipment idling caused by repair will not change and will be as present 282 units.

After the maintenance equipment installation, the efficiency of the repair works will increase at least by 1.5 times (as interviewed to each PLUAD/UAD and RMD), though the work content differs according to the equipment. The quantity of the equipment under repair after 5 years is assumed to be 282 units / 1.5 = 188 units. Following this, the equipment idling rate caused by repair should be 188 units / 1395 units = 13.5%.

### (2) Qualitative Effects

This Project is expected to bring about the following qualitative effects:

① Road maintenance equipment will be made long-lived operation.

② Execution of medium-scale maintenance*2 of road maintenance equipment by MOTC will increase.

③ Maintenance time of road maintenance equipment will be shortened.

④ Execution of road maintenance by MOTC will increase.

※2 : Medium-scale maintenance is a kind of maintenance which can be executed by the partial machine decomposition. For example, the replacement of a brake lining, the repair of electric system, etc. The replacement of Engine oil, other oils and grease on the regular maintenance.

# ATTACHMENTS

1. Study Team Members
2. Survey Itinerary
3. List of Related Authorities (interviewees)
4. Minutes of Discussions (M/D)

# Attachment 1 Study Team Members

1．Study Team Members

（1）Site Survey（May 28 ～ July 10, 2014）

| | Name | Responsibility | Organization |
|---|---|---|---|
| 1 | Mr. Tanaka Fusato | Team Leader | Manager, Transportation and ICT Division 3, Economic Infrastructure Development Department, JICA |
| 2 | Mr. Wakabayashi Kota | Project coordinator | Transportation and ICT Division 3, Economic Infrastructure Development Department, JICA |
| 3 | Mr. Kobayashi Kiyohito | Chief Consultant/Road Planner | Katahira & Engineers International |
| 4 | Mr. Baba Hideaki | Equipment Planner/ Operation and Maintenance Planner | Katahira & Engineers International |
| 5 | Ms. Suzuki Masako | Procurement Planner/Cost Estimator | Katahira & Engineers International |
| 6 | Mr. Asano Tomu | Translator (Russian) | Katahira & Engineers International (supporting staff) |

（2）Survey for explanation and discussion of Draft Preparatory Survey Report（December 5 ～ December 14, 2014）

| | Name | Responsibility | Organization |
|---|---|---|---|
| 1 | Mr. Tsuneoka Nobuyuki | Team Leader | JICA, International cooperation specialist |
| 2 | Mr. Wakabayashi Kota | Project coordinator | Transportation and ICT Division 3, Economic Infrastructure Development Department, JICA |
| 2 | Mr. Kobayashi Kiyohito | Chief Consultant/Road Planner | Katahira & Engineers International |
| 3 | Mr. Baba Hideaki | Equipment Planner/ Operation and Maintenance Planner | Katahira & Engineers International |
| 4 | Mr. Abdukadirov Rasulbek | Procurement Planner/Cost Estimator | Katahira & Engineers International |

# Attachment 2 Survey Itinerary

## ２． Survey Itinerary

### （１） Survey Itinerary

| | | | JICA | | Consultants | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Team Leader<br>Fusato TANAKA | Planning Coordinator<br>Kota WAKABAYASHI | Chief Consultant/<br>Road Maintenance<br>Eqquipment Planner<br>Kiyohito Kobayashi | Equipment Planner/<br>O&M Planner<br>Hideaki BABA | Procurement Planner/<br>Cost Estimator<br>Masako SUZUKI | Interpreter<br>Tomu ASANO | Stay |
| 1 | 5/28 | Wed | | | NARITA (21:20) HY528→ | | | | in the plane |
| 2 | 5/29 | Thu | | | TASHKENT (05:30) HY779→ BISHKEK (07:45), Meeting at JICA office(14:00) | | | | Bishkek |
| 3 | 5/30 | Fri | | | Meeting with MOTC | | | | Bishkek |
| 4 | 5/31 | Sat | | | Internal meeting, Meeting with MOTC | | | | Bishkek |
| 5 | 6/1 | Sun | | | Internal meeting | | | | Bishkek |
| 6 | 6/2 | Mon | | | Explanation of inception report to MOTC, Discussion with MOTC | | | | Bishkek |
| 7 | 6/3 | Tue | | | Naryn oblast　PLUAD3, DEP visit survey | | | | Naryn |
| 8 | 6/4 | Wed | | | Naryn oblast　PLUAD3, DEP visit survey | | | | Naryn |
| 9 | 6/5 | Thu | | | Move from Naryn oblast to Issykul oblast | | | | Karakol |
| 10 | 6/6 | Fri | | | Issykul oblast　PLUAD4, DEP visit survey | | | | Karakol |
| 11 | 6/7 | Sat | | | Issykul oblast　PLUAD4, DEP visit survey, Move to Bishkek | | | | Bishkek |
| 12 | 6/8 | Sun | | | Summarizing and analyzing materials | | | | Bishkek |
| 13 | 6/9 | Mon | | | Chui oblast　PLUAD1, DEP visit survey | | | | Bishkek |
| 14 | 6/10 | Tue | | | Chui oblast　PLUAD1, DEP visit survey | | | | Bishkek |
| 15 | 6/11 | Wed | | | Chui oblast　PLUAD1, DEP visit survey | | | | Bishkek |
| 16 | 6/12 | Thu | | | Chui oblast　PLUAD1, DEP visit survey | | | | Bishkek |
| 17 | 6/13 | Fri | | | Supplementary day for additional survey | | | | Bishkek |
| 18 | 6/14 | Sat | | | Summarizing and analyzing materials | | | | Bishkek |
| 19 | 6/15 | Sun | | | Summarizing and analyzing materials | | | | Bishkek |
| 20 | 6/16 | Mon | | | Osh oblast　OSI UAD, DEP visit survey | | | | Osh |
| 21 | 6/17 | Tue | | | Osh oblast　OSI UAD, DEP visit survey | | | | Osh |
| 22 | 6/18 | Wed | | | Move from Osh oblast to Jalalabad oblast, PLUAD6, DEP visit survey | | | | Jalalabad |
| 23 | 6/19 | Thu | | | Jalalabad oblast　PLUAD6, DEP visit survey, Move to Talas oblast | | | | Toktogul |
| 24 | 6/20 | Fri | | | Talas oblast　PLUAD5, DEP visit survey | | | | Talas |
| 25 | 6/21 | Sat | | | Move from Talas oblast to Bishkek | | | | Bishkek |
| 26 | 6/22 | Sun | | | Summarizing and analyzing materials | | | | Bishkek |
| 27 | 6/23 | Mon | | | Private repair workshop survey at Bishkek city | | | | Bishkek |
| 28 | 6/24 | Tue | | | Private repair workshop survey at Bishkek city | | | | Bishkek |
| 29 | 6/25 | Wed | | | Private repair workshop survey at Bishkek city | | | | Bishkek |
| 30 | 6/26 | Thu | | | Summarizing and analyzing materials | | | | Bishkek |
| 31 | 6/27 | Fri | | | Summarizing and analyzing materials | | | | Bishkek |
| 32 | 6/28 | Sat | | | Internal meeting, Summarizing and analyzing materials | | | | Bishkek |
| 33 | 6/29 | Sun | NARITA (09:25) →<br>INCHEON (11:50) KE706<br>INCHEON (14:20) →<br>ULAANBAATAR (16:50)<br>KE5865 | | Internal meeting, Summarizing and analyzing materials | | | | Bishkek |
| 34 | 6/30 | Mon | | | Supplementary survey, Summarizing and analyzing materials | | | | Bishkek |
| 35 | 7/1 | Tue | | | Supplementary survey, Summarizing and analyzing materials | | | | Bishkek |
| 36 | 7/2 | Wed | | | Supplementary survey, Summarizing and analyzing materials | | | | Bishkek |
| 37 | 7/3 | Thu | | | Supplementary survey, Summarizing and analyzing materials | | | | Bishkek |
| 38 | 7/4 | Fri | | NARITA (22:30) → TK053 | Supplementary survey, Summarizing and analyzing materials | | | | Bishkek |
| 39 | 7/5 | Sat | ULAANBAATAR(11:05)→<br>BISHKEK (13:25) TK 343 | ISTANBUL (05:00) TK053<br>ISTANBUL (18:35) →　TK346 | Internal meeting, Summarizing and analyzing materials | | | | Bishkek |
| 40 | 7/6 | Sun | Internal meeting<br>Modifying M/D | BISHKEK (02:40) TK346<br>Internal meeting<br>Modifying M/D | Internal meeting | Internal meeting, Summarizing and analyzing materials | | | Bishkek |
| 41 | 7/7 | Mon | Meeting with JICA Kyrgyz office, if necessary<br>M/D discussion with MOTC | | | Summarizing and analyzing materials, Summarizing the survey report | | M/D discussion with MOTC | Bishkek |
| 42 | 7/8 | Tue | Signing on M/D<br>Report to JICA Kyrgyz office, if necessary | | | Summarizing and analyzing materials, Summarizing the survey report | | Signing on M/D | Bishkek |
| 43 | 7/9 | Wed | BISHKEK (06:40) →<br>ISTANBUL(09:30)<br>TK 349<br>ISTANBUL(17:10)→<br>TK 50 | Site visit to Chui Oblast | | Summarizing and analyzing materials, Summarizing the survey report | | Site visit to Chui Oblast | Bishkek |
| 44 | 7/10 | Thu | NARITA(10:25) | BISHKEK (06:40) →<br>ISTANBUL(09:30) TK 349<br>ISTANBUL(17:10)→<br>TK 50 | BISHKEK (08:55) HY780 →TASHKENT (21:05) HY527 → | | | | in the plane |
| 45 | 7/11 | Fri | | NARITA(10:25) | NARITA (08:55) | | | | |

## （２）Survey for explanation and discussion of Draft Preparatory Survey Report

| | | | JICA | | Consultants | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Team Leader<br>Nobuyuki TSUNEOKA | Planning Coordinator<br>Kota WAKABAYASHI | Chief Consultant/<br>Road Maintenance<br>Eqquipment Planner<br>Kiyohito KOBAYASHI | Equipment Planner/<br>O&M Planner<br>Hideaki BABA | Equipment Survey<br>Rasulbek ABDUKADIROV | Stay |
| 3 | 12/5 | Fri | | | | | Leaving NARITA | in the plane |
| 4 | 12/6 | Sat | Leaving Istanbul | Leaving NARITA | | | Arrive to Bishkek | in the plane |
| 5 | 12/7 | Sun | Arrive to Bishkek | Arrive to Bishkek | Leaving NARITA | | Summarizing the survey report | Bishkek |
| 6 | 12/8 | Mon | Site survey | | Arrive to Bishkek<br>Explaining the technical characteristics of equipment to MOTC engineers | | | Bishkek |
| 7 | 12/9 | Tue | Meeting at JICA office<br>Explanation of the draft final report to MOTC, Discussion with MOTC | | | | | Bishkek |
| 8 | 12/10 | Wed | M/D discussion with MOTC<br>Signing on M/D | | | | | Bishkek |
| 9 | 12/11 | Thu | Site survey<br>Visiti to Ministry of Finance: explaining the project content and obligations of Kyrgyz side | | | | | Bishkek |
| 10 | 12/12 | Fri | Meeting at JICA office and reporting<br>Meeting at Japan Embassy and reporting | | | Site survey | | Bishkek |
| 11 | 12/13 | Sat | Leaving Bishkek | | | | | Bishkek |
| 12 | 12/14 | Sun | Arrive to NARITA | | | | | in the plane |

# Attachment 3 List of Related Authorities

３． List of Related Authorities (interviewees)

（1） Ministry of Transport and Communications

| | |
|---|---|
| Mr. Uezbaev Ulan | Deputy Minister |
| Mr. MAMAEV Kubanychbek | Director of IPIG (Investment Projects Implementation Group) |
| Mr. ALYPSATAROV Melis | Director of Department of Automobile Roads |
| Ms. MILOVATSKAYA Nina | Chief Specialist of Department of Automobile Roads |
| Mr. EGEMBERDIEV Arstanbek | Head of the Division of Chief Mechanic and Purchasing of RMD (Road Maintenance Department) |
| Mr. MURATOV Alisher | Leading Specialist of the Division of Chief Mechanic and Purchasing of RMD |
| Mr. JUMAGULOV Anarbek | Deputy Head of PLUAD (Oblast Level Road Management Bureau) No.1 |
| Mr. ABDYLDABEKOV Tynychbek | Head of PLUAD No.3 |
| Mr. AIDARALIEV Abdimajit | Chief Mechanic of PLUAD No.3 |
| Mr. KUCHUKOV Kudaikul | Head of PLUAD No.4 |
| Mr. DYKANOV Imash | Deputy Head of PLUAD No.4 |
| Mr. KYDYRBAEV Kanatbek | Chief Engineer of PLUAD No.4 |
| Mr. OSMONALIEV Rustan | Head of PLUAD No.5 |
| Ms. SHAMURATALIEVA Mairam | Chief Mechanic of PLUAD No.5 |
| Mr. OROZBAEV Asylbek | Head of PLUAD No.6 |
| Mr. MAVLYANOV Nurdin | Deputy Head of PLUAD No.6 |
| Mr. ISMANOV Kamalbek | Chief Engineer of PLUAD No.6 |
| Mr. KURMANBEKOV Ulukbek | Head of OSI UAD (Osh – Sary Tash – Irkeshtam Road Maintenance Bureau) |
| Mr. ESENKULOV Abdimitalip | Deputy Head of OSI UAD |
| Mr. ULAROV Mukhtar | Chief Mechanic of OSI UAD |
| Mr. TOKOBAEV Kubanychbek | Head of DEP (Local Level Road Management Unit) No.8 |
| Mr. ASANBAEV Niyaz | Chief Engineer of DEP No.8 |
| Mr. DUISHEEV Kubanychbek | Chief Mechanic of DEP No.8 |
| Mr. DUISHENOV Kanatbek | Head of DEP No.19 |
| Mr. KUDAKEEV Baibolsun | Chief Engineer of DEP No.19 |
| Mr. RAIYMKULOV Ozgonbek | Chief Mechanic of DEP No.19 |
| Mr. TURDUKULOV Abdygany | Head of DEP No.21 |
| Mr. MAATKARIMOV Imash | Chief Mechanic of DEP No.21 |
| Mr. SAMAKOV Taalaibek | Chief Engineer of DEP No.35 |
| Mr. OMUROV Altynbek | Chief Mechanic of DEP No.35 |
| Mr. BALAHISHEV Sabir | Chief of Machine Center of DEP No.35 |
| Mr. CHEKIROV Nasyr | Chief of Asphalt Plant of DEP No.35 (in Barskoon) |
| Mr. KAMILOV Adysh | Head of DEPNo.45 |

| | |
|---|---|
| Mr. AKHMATOV Salmor | Chief Mechanic of DEP No.45 |
| Mr. ABDYKALYKOV Kamiljan | Head of DEP No.52 |
| Mr. JANSEITOV Almaz | Chief Engineer of DEP No.52 |
| Mr. AALIEV Jumakadyr | Head of DEP No.958 |
| Mr. TOROKULOV Medil | Chief Mechanic of DEP No.958 |

(2) Private Sector

| | |
|---|---|
| Mr. DYU Valentin | Director of "DorTransServis" (Bishkek) |
| Mr. GARAEV Marat | General Director of "StroiDorMashServis" (Bishkek) |
| Mr. BOGOMOLOV Boris | Mechanic of "StroiDorMashServis" |
| Mr. TULOBERDIEV Talant | General Director of "TURKUAZ" Bishkek Office |
| Mr. YUKSEL Ali | General Director of "BiStar" (Bishkek) |
| Mr. UNAL Maral | Mechanical Engineer of "BiStar" |
| Mr. SULTANALIEV Baktybek | Director of Engineering Center "Shakirt" of Machine Science Institute (Bishkek) |
| Mr. MIKHAILOV Andrei | Individual Entrepreneur (Workshop, Bishkek, Kudaibergen Market) |
| Mr. ALEMSKII Denis | Individual Entrepreneur (Workshop, Bishkek) |
| Mr. DYO Stanislav | Individual Entrepreneur (Workshop, Bishkek) |
| Mr. NESTEROV Sergei | Individual Entrepreneur (Workshop, Karabalta) |
| Mr. KORJOV Aleksandr | Individual Entrepreneur (Workshop, Karabalta) |
| Mr. SAMANCHIEV Kuban | Individual Entrepreneur (Workshop, Naryn) |
| Mr. KURBANOV Haidarali | Individual Entrepreneur (Workshop, Jalalabad) |
| Mr. AHMADJANOV Nematjan | Individual Entrepreneur (Workshop, Osh) |

Attachment 4 Minutes of Discussions (M/D)

4．Minutes of Discussions (M/D)

（1）Site Survey

**MINUTES OF DISCUSSIONS ON**
**THE PREPARATORY SURVEY OF**
**THE PROJECT FOR IMPROVEMENT OF WORKSHOPS FOR ROAD MAINTENANCE EQUIPMENT**
**IN KYRGYZ REPUBLIC**

In response to a request from the Government of Kyrgyz Republic, Japan International Cooperation Agency (hereinafter referred to as "JICA") in consultation with the Government of Japan decided to conduct a Preparatory Survey (hereinafter referred to as "the Survey") on the Project for Improvement of Workshops for Road Maintenance Equipment (hereinafter referred to as "the Project").

JICA sent the Preparatory Survey Team (hereinafter referred to as "the Team") to Kyrgyz Republic, headed by Mr. Fusato TANAKA, Director, Transportation and ICT Division 3, Economic Infrastructure Department of JICA from May 29th to July 11th, 2014.

The Team held a series of discussions with officials concerned of the Government of Kyrgyz Republic and conducted a field survey in the study area.

In the course of discussions and the field survey, both sides confirmed the main items described in the attached sheets.

Bishkek, July 8th, 2014

Fusato Tanaka
Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan

Ulan Uezbaev
Deputy Minister
Ministry of Transport and Communications,
Kyrgyz Republic



F.T.

## ATTACHMENT

1. Title of the Project

Both the Japanese and Kyrgyz sides confirmed that the title of the Project shall be "The Project for Improvement of Workshops for Road Maintenance Equipment".

2. Objective of the Project

Both sides confirmed that the objective of the Project is to improve the maintenance management of the road maintenance equipment under the jurisdiction of the Ministry of Transport and Communications (MOTC) by procuring maintenance equipment and tools for the road maintenance equipment.

3. Project Site

Both sides confirmed that the sites of the Project are as shown in Annex-1.

4. Responsible and Implementing Agency

4-1. The responsible organization is MOTC

4-2. The implementing organizations are Osh-SaryTash-Irkeshtam (OSI) Main Roads Management Unit (UAD), Oblast Level Roads Management Unit 1(PLUAD 1) for Chui Oblast, PLUAD 3 for Naryn Oblast, PLUAD 4 for Issyk-Kul Oblast, PLUAD 5 for Talas Oblast and PLUAD 6 for Jalal-Abad Oblast.

4-3. The organization chart of MOTC is as shown in Annex-2.

4-4. The organization charts of OSI UAD, PLUAD 1, PLUAD 3, PLUAD 4, PLUAD 5 and PLUAD 6 are as shown in Annex-3.

5. Items Requested by the Government of Kyrgyz Republic

5-1 As a result of discussions, the both sides confirmed that the items finally requested by the Government of Kyrgyz Republic are as follows:

(1) Maintenance Equipment and tools for Road Maintenance Equipment for each PLUAD/UAD,

* The final list of requested equipment and tools for road maintenance equipment is shown in Annex-4. Workshop establishment location, PLUAD/UAD which will manage the each workshop, and DEPs that will be eligible to the workshop are shown in the table below.

| Workshop establishment location | Under jurisdiction of PLUAD/UAD | DEPs that will be eligible to the workshop * |
|---|---|---|
| 958 | PLUAD1 | **42, 40, 43, 25, 28, 1, 958, 954,** 39, 34, 32, 9 |
| 8 | PLUAD3 | **14, 24, 8, 20, 15, 18,** 955, 41, 957 |
| 35 | PLUAD4 | **10, 7, 4, 11, 35, 3, 33** |
| 19 | PLUAD5 | **36, 19, 47, 6, 48, ,** |
| 52 | PLUAD6 | **27, 17, 12, 51, 50, 52, 31,** 22, 23, 30, 38 |
| 45 | OSI UAD | **37, 44, 21, 45, 959, 960, 16,** 956, 5, 26, 46, 2, 13 |

* The DEPs listed in boldface are under the jurisdiction of PLUADs/UADs described in the left column. The DEPs listed in ordinary character are not under the jurisdiction of PLUADs/UADs described in the left column.

(2) Spare Parts for the equipment and tools which are supposed to be procured in the project described in 5-1. (1), if necessary.

5-2 JICA will assess the appropriateness of the request and will report the findings to the Government of Japan. The final specifications and quantities of equipment and tools procured in the project shall be decided by the Japanese side and be described in the draft Preparatory Survey Report, which will be prepared around December 2014, in consideration of necessity, technical viability, sustainability, cost-effectiveness, and budget availability. The Kyrgyz side understood that all the requested items, therefore, may not be accepted as final components of the Project.

6. Japan's Grant Aid Scheme

6-1. The Kyrgyz side understands the Japan's Grant Aid scheme explained by the Team, as described in Annex-5 and Annex-6.

6-2. The Kyrgyz side will take the necessary measures, as described in Annex-7, to facilitate the smooth implementation of the Project, as a condition for the Japan's Grant Aid to be implemented, according to the existing agreement between the Government of Japan and the Government of Kyrgyz Republic.

7. Schedule of the Survey

7-1. JICA will prepare the draft Preparatory Survey Report in English and explain its contents to the Kyrgyz side around December 2014.

7-2. When the contents of the draft Preparatory Survey Report are accepted in principle by the Government of Kyrgyz Republic, JICA will complete the final report and send it to the Government of Kyrgyz Republic around April 2015.

8. Other Relevant Issues

8-1. The Kyrgyz side shall, at its own expense, provide the Team with the following items in cooperation with other organizations concerned:

(1) security-related information as well as measures to ensure the safety of the survey team;

(2) information as well as support in obtaining medical service;



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(3) data and information necessary for the Survey;
(4) counterpart personnel;
(5) credentials or identification cards if necessary;
(6) entry permits necessary for the survey team members to conduct field surveys;
(7) necessary arrangement for exemption of the taxes, duties, and any charges on equipment, machinery and other materials brought into Kyrgyz Republic for the implementation of the Survey; and
(8) support in obtaining other privileges and benefits if necessary.

8-2. The Kyrgyz side agreed to provide tax exemption for equipment and tools in the Project if implementation of the Project is approved by the Government of Japan.
(1) The Kyrgyz side agreed that customs duties, internal taxes and other fiscal levies which may be imposed in Kyrgyz Republic are exempted under mutual agreement of Exchange of Note (E/N).
(2) If any expenses stated above are caused by some reasons such as the delay of execution of tax exemption, the Kyrgyz side shall pay for it temporarily.

8-3. Maintenance equipment and tools for road maintenance equipment mentioned in Annex-4 are supposed to be installed at DEP45, DEP958, DEP8, DEP35, DEP19, DEP52. The layout planning of each equipment and tools will be shown in the draft Preparatory Survey Report after the study of the Team in Japan.

8-4. The Kyrgyz side shall secure enough budget and personnel necessary for operation and maintenance of the equipment and tools procured by the Project and for maintenance management of the road maintenance equipment through effective utilization of the equipment and tools procured by the Project after the completion of the Project.

8-5. The Kyrgyz side shall take all the necessary measures for the installation of maintenance equipment and tools at each of DEPs described in 5-1. (1) as follows:
1) DEP 45 for OSI UAD
- Repair of roofs
- Repair of interior and exterior walls
- Installation of windows and doors
- Set of light facility and power-supply facility
- Construction of dirt floor concrete for the space of washing machine

2) DEP 958 for PLUAD 1
- Repair of roofs
- Repair of interior and exterior walls
- Installation of windows and doors
- Set of light facility and power-supply facility
- Construction of dirt floor concrete for the space of washing machine

3) DEP 8 for PLUAD 3
- Repair of roofs

- Repair of interior and exterior walls
- Installation of windows and doors
- Set of light facility and power-supply facility
- Construction of dirt floor concrete for the space of washing machine

4) DEP 35 for PLUAD 4
- Repair of roofs
- Repair of interior and exterior walls
- Installation of windows and doors
- Set of light facility and power-supply facility
- Construction of dirt floor concrete for the space of washing machine

5) DEP 19 for PLUAD 5
- Repair of roofs
- Increasing the height of the roofs
- Repair of interior and exterior walls
- Installation of windows and doors
- Set of light facility and power-supply facility
- Construction of dirt floor concrete for the space of washing machine

6) DEP 52 for PLUAD 6
- Repair of roofs
- Repair of interior and exterior walls
- Installation of windows and doors
- Set of light facility and power-supply facility
- Construction of dirt floor concrete for the space of washing machine

8-6. Both sides agreed that the Kyrgyz side will make the renovation plan of each target workshop described in 8-5. by the end of November, 2014.

8-7. All the equipment and tools procured by the Project, except for lubrication trucks will be handed over from the Japanese side to the Kyrgyz side at each designated place, DEP45, DEP958, DEP8, DEP35, DEP19, DEP52. As for lubrication trucks, the Kyrgyz side shall take the responsibilities for the transportation of the equipment to the designated places from DEP 958.

9. Disclosure of Information

Both sides confirmed that the study results excluding the Project cost will be disclosed to the public after the completion of the Survey. All the study result including the Project cost will be disclosed to the public after the verification of all contracts for the Project by JICA are concluded.

10. Misconduct

If JICA receives information concerning suspected corrupt or fraudulent practices, the Government of Kyrgyz Republic shall take necessary measures in accordance with the Procurement Guidelines

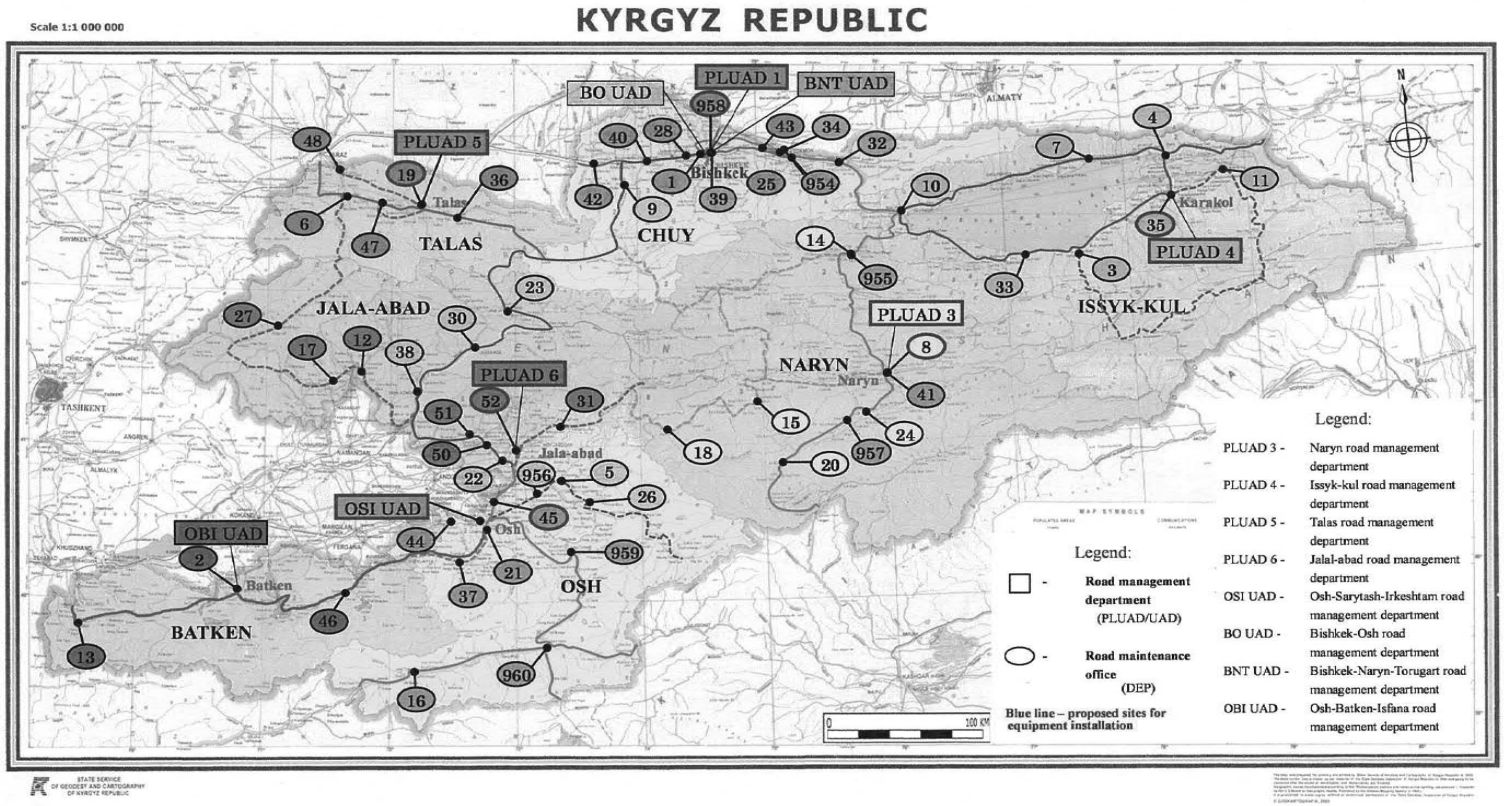
in the competition for, or in execution of, the contract funded by the Grant :

(1) to provide JICA with such information as JICA may reasonably request,including information related to any concerned official of the government and/or public organizations of Kyrgyz Republic ;

(2) not to treat unfairly or unfavorably the physical persons and juridical persons, that provide the information.

Annex-1: Project Site
Annex-2: Organization Chart of MOTC
Annex-3: Organization Chart of OSI UAD, PLUAD 1, PLUAD 3, PLUAD 4, PLUAD 5 and PLUAD 6
Annex-4: The Final List of Requested Equipment and tools
Annex-5: Japan's Grant Aid Scheme
Annex-6: Flowchart of Japan's Grant Aid Procedure
Annex-7: Major Undertakings to be taken by Each Government

Annex-1: Project Site

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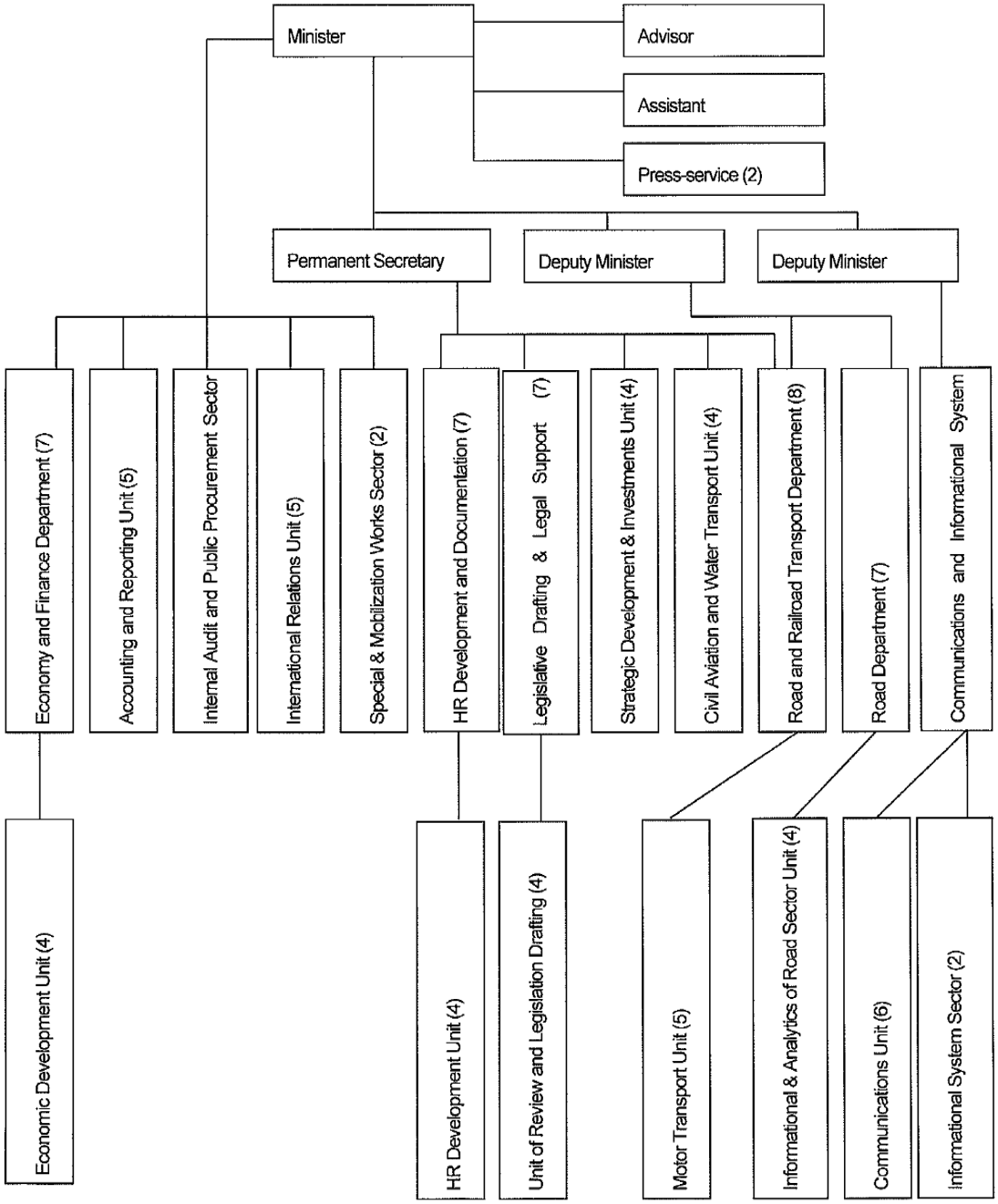
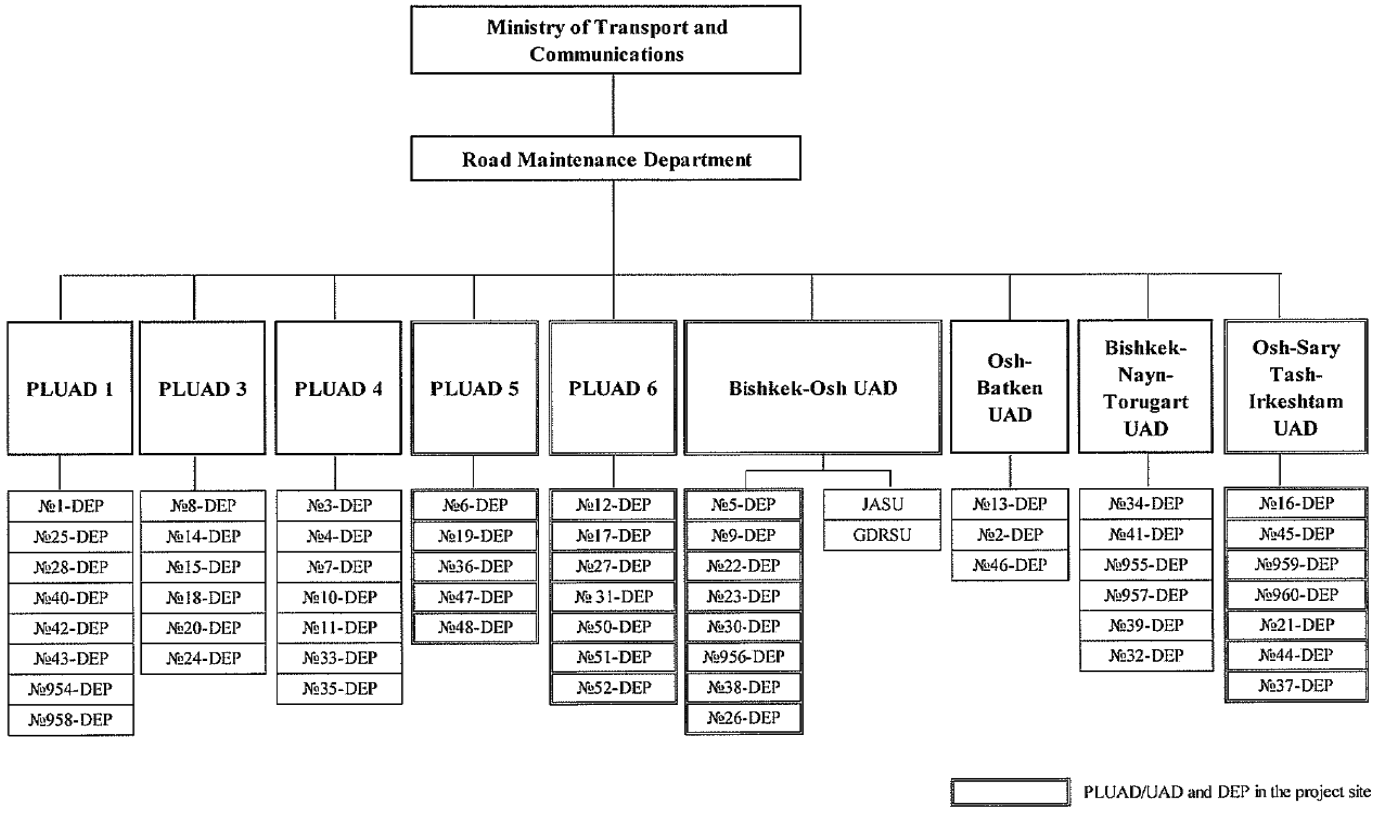
Annex-2: Organization Chart of MOTC



Annex-3: Organization Chart of OSI UAD, PLUAD 1, PLUAD 3, PLUAD 4, PLUAD 5 and PLUAD 6



Annex-4: The Final List of Requested Equipment and tools

1. Chassis Repair Equipment and Tools

| No. | | Item | Specification | Sets | Qty's | Unit |
|---|---|---|---|---|---|---|
| 1- | 1 | Hydraulic shop press | 55ton & push tools | 6 | 1 | unit |
| | 2 | Gantry crane | 3 ton | | 1 | unit |
| | 3 | Sling chain, wire rope and nylon sling | - | | 1 | set |
| | 4 | Mobile work bench with vise | - | | 2 | units |
| | 5 | Mechanic tool set, Inch & MM | 144 items with cabinet | | 2 | sets |
| | 6 | Hydraulic garage jack | 10 ton capacity | | 2 | sets |
| | 7 | Puller set | 13 ton capacity | | 1 | set |
| | 8 | Blocking tool | 10, 20, 25ton, each 2 units | | 1 | set |
| | 9 | Air hose reel | 9mmx10m | | 2 | pcs. |
| | 10 | Grease gun with microhose | 400cc | | 2 | pcs. |
| | 11 | Oil drain | 77 liter | | 1 | pc. |
| | 12 | Parts rack, medium size | - | | 3 | pcs. |
| | 13 | Service creeper | - | | 2 | pcs. |
| | 14 | Air compressor | 7.5kW, 0.95 Mpa | | 1 | unit |
| | 15 | Air piping materials | - | | 1 | set |
| | 16 | Hydraulic pressure gauge set | 60MPa | | 2 | pcs. |
| | 17 | Flowmeter set | - | | 1 | set |
| | 18 | Cleaning pan,(S,M,L) | - | | 2 | sets |
| | 19 | Engine cleaning gun | - | | 1 | pc. |
| | 20 | Hand truck | 300kg capacity | | 1 | pc. |

2. Engine Repair Equipment and Tools

| No. | | Item | Specification | Sets | Qty's | Unit |
|---|---|---|---|---|---|---|
| 2- | 1 | Mobile floor crane | 1 ton capacity | 6 | 1 | unit |
| | 2 | Hand truck | 800kg capacity | | 1 | unit |
| | 3 | Mobile work bench with vise | - | | 1 | unit |
| | 4 | Jet parts cleaner | 350 lit/min | | 1 | unit |
| | 5 | Part cleaner | 140 liter | | 1 | pc. |
| | 6 | Air valve lapper with suction cap | - | | 1 | set |
| | 7 | Valve lapping compound, coarse & fine | - | | 20 | sets |
| | 8 | Mechanic tool set, Inch & MM | 144 items with cabinet | | 1 | set |
| | 9 | Spring pusher | - | | 2 | pcs. |
| | 10 | Valve lifter & compressor | - | | 2 | pcs. |
| | 11 | Cleaning pan,(S,M,L) | - | | 2 | sets |
| | 12 | Piston ring tool | 70-105/100-175mm | | 1 | set |
| | 13 | Piston ring compressor | 50-125/75-175mm | | 1 | set |
| | 14 | Air blow gun | - | | 2 | pcs. |
| | 15 | Nozzle cleaning kit | - | | 1 | set |
| | 16 | Double-face sledge hammer | 8LB | | 1 | pc. |
| | 17 | Nozzle tester | 500kg/cm2 | | 1 | pc. |
| | 18 | Cylinder gauge | 35-60, 50-100, 100-160mm | | 1 | set |
| | 19 | Dial indicator | 1/100 with magnet | | 1 | set |
| | 20 | Straight edge | 1000mm | | 1 | pc. |
| | 21 | Surface plate | 900x900x125mm | | 1 | pc. |
| | 22 | V' Block | 200x70x110mm | | 1 | pc. |
| | 23 | Torque wrench | 5-46, 20-130, 50-280, 100-700, 150-850 N-m (5 pcs.) | | 1 | set |
| | 24 | Outside micrometer caliper set | 0-150mm | | 1 | set |
| | 25 | Oil measure | Capacity 4 liter | | 2 | pcs. |
| | 26 | Parts rack for small Parts | - | | 1 | pc. |
| | 27 | Tool storage cabinet | - | | 1 | pc. |
| | 28 | Diesel fuel injection pump tester | - | 3 | 1 | unit |

3. Electric and Battery Service Equipment and Tools

| No. | | Item | Specification | Sets | Qty's | Unit |
|---|---|---|---|---|---|---|
| 3- | 1 | Digital circuit teste | - | 6 | 2 | pcs. |
| | 2 | Clamp tester | - | | 1 | pc. |
| | 3 | Electricians tool set | | | 2 | sets |
| | 4 | Mobile work bench with vise | - | | 1 | pc. |
| | 5 | Silicon quick charger | 100A | | 1 | pc. |
| | 6 | Battery and coolant tester | - | | 1 | pc. |
| | 7 | Battery service tools | Filler, syringe, booster cable | | 1 | set |
| | 8 | Electric soldering iron | 100 W | | 1 | pc. |

4. Tire & Brake Service Equipment and Tools

| No. | | Item | Specification | Sets | Qty's | Unit |
|---|---|---|---|---|---|---|
| 4- | 1 | Tire changer | 14"-26" | 6 | 1 | unit |
| | 2 | Hydraulic tire removing tool | - | | 1 | pc. |
| | 3 | Tire bead remover | Length 1.54m | | 1 | pc. |
| | 4 | Double-face sledge hammer | 6 & 10LB | | 2 | sets |
| | 5 | Tire lever | Different 5 size | | 1 | set |
| | 6 | Tire pressure gauge (S & L) | - | | 2 | sets |
| | 7 | Air chuck (S & L) | - | | 2 | sets |
| | 8 | Valve repair tool (S & L) | - | | 2 | sets |
| | 9 | Wheel nut wrench set | - | | 2 | sets |
| | 10 | Cold patch for tube repair | - | | 10 | pcs. |
| | 11 | Brake pipe flaring tool set | - | | 1 | set |
| | 12 | Portable brake compression tester set | - | | 1 | set |
| | 13 | Brake pipe nut wrench | - | | 1 | pc. |
| | 14 | Brake spring plier (S, M & L) | - | | 1 | set |
| | 15 | Wheel dolly | 750-1,430mm tire diameter | | 1 | unit |

5. Welding & Fabrication Equipment and Tools

| No. | | Item | Specification | Sets | Qty's | Unit |
|---|---|---|---|---|---|---|
| 5- | 1 | Diesel arc welder | 250A with accessories | 6 | 1 | unit |
| | 2 | Electrode drier for welding rod | 10kg cap. | | 1 | pc. |
| | 3 | Gas welder set | - | | 1 | set |
| | 4 | Mobile work bench with vise | - | | 1 | pc. |
| | 5 | Jet multiple chisel | - | | 1 | pc. |
| | 6 | Screw clamp | C Type, 100,150,200mm | | 2 | sets |
| | 7 | Screw clamp | L Type, 150,250,300mm | | 2 | sets |
| | 8 | Grip Plier | 40 & 45mm | | 2 | sets |
| | 9 | Double-face sledge hammer, | 2, 4 & 10LB | | 1 | set |
| | 10 | Adjustable hacksaw frame | - | | 1 | pc. |
| | 11 | Tinner scissors, | 3 different pattern | | 1 | set |
| | 12 | High-speed abrasive cut-off machine | 405mm | | 1 | pc. |
| | 13 | Disc sander | 100mm dia. | | 2 | pcs. |
| | 14 | Mini grinder | - | | 1 | pc. |
| | 15 | Iron anvil | Cast iron, 70 kg | | 1 | pc. |
| | 16 | Tong firing | Flat & Round | | 1 | pc. |
| | 17 | Electric soldering iron | 60, 200W | | 2 | sets |
| | 18 | Bar solder | 1 kg | | 1 | pc. |
| | 19 | Thread type solder with flux | - | | 1 | pc. |
| | 20 | Bench electric grinder | 205mm with pedestal | | 1 | pc. |
| | 21 | Cylinder carrier | - | | 1 | pc. |
| | 22 | Parts rack for small parts | - | | 1 | pc. |
| | 23 | Tool storage cabinet | - | | 1 | pc. |
| | 24 | Body puller set | Large | | 1 | set |
| | 25 | Body & fender tool set | | | 2 | sets |

6. Cleaning Equipment

| No. | | Item | Specification | Sets | Qty's | Unit |
|---|---|---|---|---|---|---|
| 6- | 1 | Hot water high pressure washer, | 900l/h, 10MPa | 6 | 1 | unit |

7. Machining Equipment and Tools

| No. | | Item | Specification | Sets | Qty's | Unit |
|---|---|---|---|---|---|---|
| | 1 | Bench drill press | 13mm | | 1 | pc. |
| | 2 | Straight Shank Twist Drill Set | – | | 2 | sets |
| | 3 | Mechanic tool set | – | | 1 | set |
| | 4 | Bench electric grinder | 205mm with pedestal | | 1 | unit |
| | 5 | Surface Plate | 900x900x125mm | | 1 | pc. |
| | 6 | V' Block | 200x70x110mm | | 2 | pcs. |
| | 7 | Parts rack open type | – | | 4 | pcs. |
| | 8 | Parts rack with drawer | – | | 2 | pcs. |
| | 9 | Torque wrench | 10–120, 40–320, 100–700, 100–850, 100–1,000 N-m (5 kinds) | | 1 | set |
| | 10 | Magnetic Base | – | | 1 | pc. |
| | 11 | Dial Indicator | 0–50mm, 1/100 | | 1 | pc. |
| | 12 | Square | 150x100, 300x200mm | | 1 | set |
| | 13 | V' Block (S & L) | – | | 1 | set |
| | 14 | Steel compass | 150mm | | 1 | pc. |
| | 15 | Firm joint caliper (IN & OUT) | 150 & 300mm | | 1 | set |
| | 16 | Straight rule | 300 & 1000mm | | 1 | set |
| | 17 | Straight edge | 300 & 1000mm | | 1 | set |
| | 18 | Measuring Tape | 2m | | 1 | set |
| | 19 | Iron bench level | 150 & 600mm | | 1 | set |
| | 20 | Hand tachometer | 0–10,000rpm | | 2 | pcs. |
| | 21 | Stop watch | – | | 2 | pcs. |
| | 22 | Socket wrench set | 3/8"sq. metric | | 2 | pcs. |
| | 23 | Socket wrench set | 3/8"sq. inch | | 2 | pcs. |
| | 24 | Socket wrench set | 1"sq. metric | | 2 | pcs. |
| | 25 | Socket wrench set | 1"sq. inch | | 2 | pcs. |
| | 26 | Double offset box wrench | 27x30–35x41mm | | 2 | sets |
| | 27 | Open end wrench | Double head 27x30 – 46x50mm | | 2 | sets |
| | 28 | Open end wrench | Single 30 – 60mm | | 2 | sets |
| | 29 | Solderless terminal kit | – | | 2 | sets |
| | 30 | Adjustable pipe wrench | 200, 600, 900mm | | 1 | set |
| | 31 | Chain wrench | For 12–50, 26–170mm dia. | | 1 | set |
| 7– | 32 | Hammer | Ball peen (350,650,1100g)<br>Sledge(6,10,12LB)<br>Plastic (500g), Test (250g)<br>Copper (450g), Wooden (60mm dia.) | 6 | 1 | set |
| | 33 | Flat chisel set | 4 pcs./set | | 1 | set |
| | 34 | Tinner scissors | 3 different pattern | | 1 | set |
| | 35 | Screw plate (Tap & Dies ) Set | M3 to M20 | | 1 | set |
| | 36 | Electric soldering iron | 60, 100, 200W | | 1 | set |
| | 37 | Thread type solder with flux | – | | 4 | pcs. |
| | 38 | Bar solder | 1 kg | | 4 | pcs. |
| | 39 | Portable hydraulic jack | 50ton | | 2 | pcs. |
| | 40 | Portable hydraulic jack | 30ton | | 2 | pcs. |
| | 41 | Air impact wrench | 1/2" sq. | | 1 | pc. |
| | 42 | Air impact wrench | 3/4" sq. | | 2 | pcs. |
| | 43 | Air impact wrench | 1 sq. | | 2 | pcs. |
| | 44 | Impact socket | 1/2"sq. 8 – 32mm | | 2 | sets |
| | 45 | Impact socket | 3/4"sq. 19 – 46mm | | 2 | sets |
| | 46 | Impact socket | 1"sq. 32 – 50mm | | 2 | sets |
| | 47 | Air hose | 6, 9, 12mm (10m length) | | 6 | sets |
| | 48 | Quick connector | Socket & Plug (1/4", 3/8", 1/2") | | 6 | sets |
| | 49 | Electric drill | 13mm | | 1 | pc. |
| | 50 | Straight Shank Twist Drill Set | – | | 2 | sets |
| | 51 | Mini grinder | – | | 1 | pc. |
| | 52 | Electric cord reel | 30m | | 2 | pcs. |
| | 53 | Garage lamp | – | | 2 | pcs. |
| | 54 | Flood lamp | 500W | | 2 | pcs. |
| | 55 | Lever block | 0.75 ton | | 1 | pc. |
| | 56 | Lever block | 1.5 ton | | 1 | pc. |
| | 57 | Spray gun | Suction type | | 2 | pcs. |
| | 58 | Suction Type Container | 1000cc | | 2 | pcs. |
| | 59 | Hydraulic hand pump | – | | 1 | pc. |
| | 60 | Hydraulic puller | 50 ton | | 1 | pc. |
| | 61 | Hydraulic puller | 30 ton | | 1 | pc. |

8.Lubrication Truck

| No. | | Item | Specification | Sets | Qty's | Unit |
|---|---|---|---|---|---|---|
| 8- | 1 | Lubrication Truck | 4WD, Aluminum van body<br>Equipped with: Oil drum & pump,<br>Grease deum & pump,<br>Water tank & pump, Compressor | 6 | 1 | unit |

Annex-5: Japan's Grant Aid Scheme

## JAPAN'S GRANT AID

The Government of Japan (hereinafter referred to as "the GOJ") is implementing the organizational reforms to improve the quality of ODA operations, and as a part of this realignment, a new JICA law was entered into effect on October 1, 2008. Based on this law and the decision of the GOJ, JICA has become the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

The Grant Aid is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

### 1. Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures:

・Preparatory Survey

- The Survey conducted by JICA

・Appraisal &Approval

-Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet

・Authority for Determining Implementation

-The Notes exchanged between the GOJ and a recipient country

・Grant Agreement (hereinafter referred to as "the G/A")

-Agreement concluded between JICA and a recipient country

・Implementation

-Implementation of the Project on the basis of the G/A

### 2. Preparatory Survey

(1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.



- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of a outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Outline Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

**3. Japan's Grant Aid Scheme**

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes(hereinafter referred to as "the E/N") will be singed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex-7.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use properly and effectively the facilities constructed and the equipment purchased under the Grant Aid, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant Aid.

(7) "Export and Re-export"

The products purchased under the Grant Aid should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

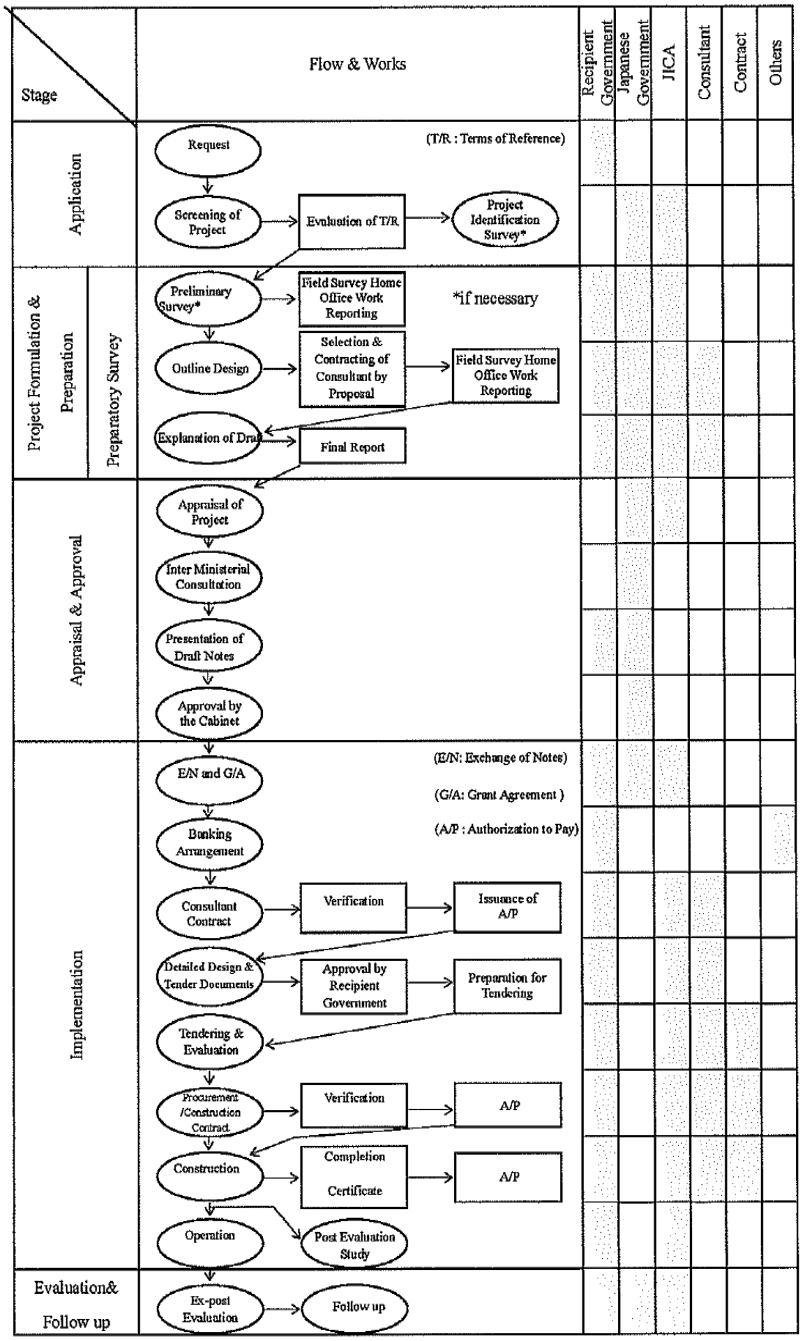
(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA socio-environmental guidelines.

Annex-6: Flowchart of Japan's Grant Aid Procedure



Annex-7: Major Undertakings to be taken by Each Government

| No. | Items | To be covered by Grant Aid | To be covered by Recipient Side |
|---|---|---|---|
| 1 | To ensure prompt customs clearance of the products and to assist internal transportation of the products in the recipient country. | | |
| | 1) Marine (Air) transportation of the Products from Japan to the recipient country | ● | |
| | 2) Internal transportation from the port of disembarkation to the project site | (●) | (●) |
| 2 | To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services be exempted. | | ● |
| 3 | To accord Japanese physical persons and / or physical persons of third countries whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work | | ● |
| 4 | To ensure that the products will be maintained and used properly and effectively for the implementation of the Project | | ● |
| 5 | To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project | | ● |
| 6 | To bear the following commissions paid to the Japanese bank for banking services based upon the B/A | | |
| | 1) Advising commission of A/P | | ● |
| | 2) Payment commission | | ● |
| 7 | To give due environmental and social consideration in the implementation of the Project. | | ● |

(B/A : Banking Arrangement, A/P : Authorization to pay)

（２） Survey for explanation and discussion of Draft Preparatory Survey Report

**MINUTES OF DISCUSSIONS ON**
**THE PREPARATORY SURVEY OF**
**THE PROJECT FOR IMPROVEMENT OF WORKSHOPS FOR ROAD MAINTENANCE EQUIPMENT IN THE KYRGYZ REPUBLIC**
**(Explanation of Draft Final Report)**

On the basis of the discussions and field survey in the Kyrgyz Republic in May, June and July 2014, and the subsequent technical examination of the results in Japan, Japan International Cooperation Agency (hereinafter referred to as "JICA") prepared a draft Preparatory Survey Report on the Project for Improvement of Workshops for Road Maintenance Equipment (hereinafter referred to as "the Project").

JICA sent the Preparatory Survey Team (hereinafter referred to as "the Team") to the Kyrgyz Republic, headed by Mr. Nobuyuki Tsuneoka, Senior Advisor of JICA, to explain to and consult with officials concerned of the Government of the Kyrgyz Republic (hereinafter referred to as "GOKR") on the contents of the draft Preparatory Survey Report from December 6th to 13th, 2014.

As a result of discussions, the both sides confirmed the main items described in the attached sheets.

Bishkek, December 10th, 2014

Ulan Uezbaev
Deputy Minister
Ministry of Transport and Communications
The Kyrgyz Republic

Nobuyuki Tsuneoka
Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan

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## ATTACHMENT

1. Components of the Draft Preparatory Survey Report

   The Kyrgyz side, represented by MOTC, agreed and accepted the contents of the Draft Preparatory Survey Report including draft technical specifications of equipment explained by the Team. The list of equipment to be procured is indicated in Annex-1, together with the information on the DEPs where the workshops are established, PLUAD/UAD which will manage each workshop, and DEPs which will use each workshop.

2. Cost Estimation for the Project

   2-1. The Team explained to the Kyrgyz side the rough estimate of the Project Cost described in Annex-2; however, the final Project Cost described in the Exchange of Note (hereinafter referred to as "E/N") would be appraised by the Government of Japan (hereinafter referred to as "GOJ").

   2-2. The both sides further confirmed that the Project Cost in Annex-2, and the specifications of equipment in the Draft Preparatory Survey Report should be confidential and should never be duplicated and/or disclosed to any third parties until all the contracts for the Project are concluded.

3. Validity of the Previous Minutes of Discussions

   The both sides confirmed that all the agreements in the Minutes of Discussions of the preceding Preparatory Survey signed on July 8th, 2014 should continue to be valid unless information is updated by the draft Preparatory Survey Report.

4. Japan's Grant Aid Scheme

   The Kyrgyz side fully understood the scheme of the Japan's Grant Aid and the necessary measures to be undertaken by the Kyrgyz side as explained by the Team in the Minutes of Discussions signed on July 8th, 2014.

5. Undertakings of the Kyrgyz Side

   The Kyrgyz side promised to execute the undertakings below in time, duly understanding the possibilities of the suspension / termination of this grant financial assistance if there are violations on the undertakings.

   5-1 . Administrative Arrangements

   1) Commission for Banking Arrangement (B/A) and Authorization to Pay (A/P)
   2) The Team explained that the customs duties, internal taxes and other fiscal levies, imposed in the Kyrgyz Republic with respect to the purchase of the products and the services should be exempted in accordance with the regulations of E/N and G/A to be signed between the two governments. The Kyrgyz side confirmed that the customs duties, internal taxes and other fiscal levies, imposed in the Kyrgyz Republic with respect to the purchase of the products and the services should be exempted after G/A is concluded. In case the exemption procedure is not processed in a timely manner, the both sides agreed all tentative payments under the Project would be temporarily owed by the Kyrgyz side.

3) Securing the enough budget for the renovation of target six(6) workshops and taking all the necessary measures for the installation of maintenance equipment and tools at each workshop.
4) 10(ten) persons at each workshop have to be assigned described as 6.2) before the start-up and operation training.
5) MOTC will ensure the allocation of budget in accordance with the existing budget on the corresponding years. The MOTC side promised to report to the JICA Kyrgyz office after approval of the budget. If the budget cannot be prepared in time and/or appropriately, there is a possibility that the Project might be suspended / terminated.
6) All the equipment and tools procured by the Project, except for lubrication trucks will be handed over from the Japanese side to the Kyrgyz side at each designated place, DEP958, DEP8, DEP35, DEP19, DEP52 and DEP45. As for lubrication trucks, the Kyrgyz side shall take the responsibilities for the transportation of the equipment to the designated places from DEP 958.

5-2 . Civil Works

1) Renovation of the workshops in the Minutes of Discussions signed on July 8th, 2014 is to be completed within 11(eleven) months after E/N is concluded. Renovation is implemented following the renovation plan shown in Annex-3.
2) Contract for the renovation of the each workshop is to be concluded within 3(three) months after E/N is concluded and the MOTC is required to report it to the JICA Kyrgyz Office by letter.

6. Maintenance and Utilization of the Equipment

6-1 . The Kyrgyz side shall secure enough budget and personnel necessary as shown below tables for operation and maintenance of the equipment procured by the Project.

1) Necessary budget for operation and maintenance of the equipment procured by the Project is estimated as follows:

| Items | Necessary budget(million som) |
|---|---|
| 1. Operation of the equipment (for procurement of fuel and oil) | 1.75 |
| 2. Operation of the equipment (for procurement of spare parts) | 0.95 |
| 3. Personnel cost | 5.76 |
| Total | 8.46 |

2) 10(ten) persons at each workshop are necessary for operation and maintenance of the road maintenance equipment. They will have the responsibilities to manage each equipment and tools as shown below table.

| Items | Number of personnel |
|---|---|
| 1. Chassis Repair Equipment and Tools | 3※ |
| 2. Engine Repair Equipment and Tools | 2 |
| 3. Electric and Battery Service Equipment and Tools | 1 |
| 4. Tire & Brake Service Equipment and Tools | |
| 5. Welding & Fabrication Equipment and Tools | 1 |
| 6. Cleaning Equipment | |
| 7. Machining Equipment and Tools | 1 |
| 8. Lubrication Truck | 2 |
| Total | 10 |

※Combines 4. Tire & Brake Service Equipment and Tools and 6. Cleaning Equipment

6-2. The Kyrgyz side shall secure necessary budget for operation and maintenance of the road maintenance equipment, and it is estimated about 106 million som.

6-3. The Kyrgyz side shall secure necessary budget for road maintenance.

7. Schedule of the Study

JICA will complete the final Preparatory Survey Report in English, in accordance with the confirmed items and send it to the Government of the Kyrgyz Republic around April 2015, and tentative schedule of the Project is shown in Annex-4.

8. Disclosure

The both sides confirmed that the study results excluding the Project cost estimation will be disclosed to the public after completion of the Preparatory Survey. All the study results including the Project cost will be disclosed to the public after all the contracts for the Project are concluded.

Annex-1: List of Equipment to be Procured
Annex-2: Project Cost Estimation
Annex-3: Renovation plan of the workshops
Annex-4: Tentative Project Implementation Schedule

Annex-1: List of Equipment to be Procured

## LIST OF EQUIPMENT TO BE PROCURED

The equipment to be procured by the Project will be handed over to and managed by 1) Oblast Level Roads Management Unit 1(PLUAD1) for Chui Oblast, 2) PLUAD 3 for Naryn Oblast, 3) PLUAD 4 for Issyk-Kul Oblast, 4) PLUAD 5 for Talas Oblast, 5) PLUAD 6 for Jalal-Abad Oblast and 5) Osh-SaryTash-Irkeshtam (OSI) Main Roads Management Unit (UAD).

| Workshop establishment location | Under jurisdiction of PLUAD/UAD | DEPs that will be eligible to the workshop * |
|---|---|---|
| 958 | PLUAD1 | **42, 40, 43, 25, 28, 1, 958, 954,** 39, 34, 32, 9 |
| 8 | PLUAD3 | **14, 24, 8, 20, 15, 18,** 955, 41, 957 |
| 35 | PLUAD4 | **10, 7, 4, 11, 35, 3, 33** |
| 19 | PLUAD5 | **36, 19, 47, 6, 48, ,** |
| 52 | PLUAD6 | **27, 17, 12, 51, 50, 52, 31,** 22, 23, 30, 38 |
| 45 | OSI UAD | **37, 44, 21, 45, 959, 960, 16,** 956, 5, 26, 46, 2, 13 |

* The DEPs listed in boldface are under the jurisdiction of PLUADs/UADs described in the left column. The DEPs listed in ordinary character are not under the jurisdiction of PLUADs/UADs described in the left column.

The number of each equipment and tools procured for each PLUAD/UAD respectively is as follows;

| 1. Chassis Repair Equipment and Tools | | | | | | |
|---|---|---|---|---|---|---|
| No. | | Item | Specification | Sets | Qty's | Unit |
| 1- | 1 | Hydraulic shop press | 55ton & push tools | 6 | 1 | unit |
| | 2 | Gantry crane | 3 ton | | 1 | unit |
| | 3 | Sling chain, wire rope and nylon sling | – | | 1 | set |
| | 4 | Mobile work bench with vise | – | | 2 | units |
| | 5 | Mechanic tool set, Inch & MM | 144 items with cabinet | | 2 | sets |
| | 6 | Hydraulic garage jack | 10 ton capacity | | 2 | sets |
| | 7 | Puller set | 13 ton capacity | | 1 | set |
| | 8 | Blocking tool | 10, 20, 25ton, each 2 units | | 1 | set |
| | 9 | Air hose reel | 9mmx10m | | 2 | pcs. |
| | 10 | Grease gun with microhose | 400cc | | 2 | pcs. |
| | 11 | Oil drain | 77 liter | | 1 | pc. |
| | 12 | Parts rack, medium size | – | | 3 | pcs. |
| | 13 | Service creeper | – | | 2 | pcs. |
| | 14 | Air compressor | 7.5kW, 0.95 Mpa | | 1 | unit |
| | 15 | Air piping materials | – | | 1 | set |
| | 16 | Hydraulic pressure gauge set | 60MPa | | 2 | pcs. |
| | 17 | Flowmeter set | – | | 1 | set |
| | 18 | Cleaning pan,(S,M,L) | – | | 2 | sets |
| | 19 | Engine cleaning gun | – | | 1 | pc. |
| | 20 | Hand truck | 300kg capacity | | 1 | pc. |

| 2. Engine Repair Equipment and Tools | | | | | | |
|---|---|---|---|---|---|---|
| No. | | Item | Specification | Sets | Qty's | Unit |
| 2- | 1 | Mobile floor crane | 1 ton capacity | 6 | 1 | unit |
| | 2 | Hand truck | 800kg capacity | | 1 | unit |
| | 3 | Mobile work bench with vise | - | | 1 | unit |
| | 4 | Jet parts cleaner | 350 lit/min | | 1 | unit |
| | 5 | Part cleaner | 140 liter | | 1 | pc. |
| | 6 | Air valve lapper with suction cap | - | | 1 | set |
| | 7 | Valve lapping compound, coarse & fine | - | | 20 | sets |
| | 8 | Mechanic tool set, Inch & MM | 144 items with cabinet | | 1 | set |
| | 9 | Spring pusher | - | | 2 | pcs. |
| | 10 | Valve lifter & compressor | - | | 2 | pcs. |
| | 11 | Cleaning pan,(S,M,L) | - | | 2 | sets |
| | 12 | Piston ring tool | 70-105/100-175mm | | 1 | set |
| | 13 | Piston ring compressor | 50-125/75-175mm | | 1 | set |
| | 14 | Air blow gun | - | | 2 | pcs. |
| | 15 | Nozzle cleaning kit | - | | 1 | set |
| | 16 | Double-face sledge hammer | 8LB | | 1 | pc. |
| | 17 | Nozzle tester | 500kg/cm2 | | 1 | pc. |
| | 18 | Cylinder gauge | 35-60, 50-100, 100-160mm | | 1 | set |
| | 19 | Dial indicator | 1/100 with magnet | | 1 | set |
| | 20 | Straight edge | 1000mm | | 1 | pc. |
| | 21 | Surface plate | 900x900x125mm | | 1 | pc. |
| | 22 | V' Block | 200x70x110mm | | 1 | pc. |
| | 23 | Torque wrench | 5-46, 20-130, 50-280, 100-700, 150-850 N-m (5 pcs.) | | 1 | set |
| | 24 | Outside micrometer caliper set | 0-150mm | | 1 | set |
| | 25 | Oil measure | Capacity 4 liter | | 2 | pcs. |
| | 26 | Parts rack for small Parts | - | | 1 | pc. |
| | 27 | Tool storage cabinet | - | | 1 | pc. |
| | 28 | Diesel fuel injection pump tester | - | 3* | 1 | unit |
| | | | | *Only for Chui, Osh and Naryn oblast | | |

| 3. Electric and Battery Service Equipment and Tools | | | | | | |
|---|---|---|---|---|---|---|
| No. | | Item | Specification | Sets | Qty's | Unit |
| 3- | 1 | Digital circuit teste | - | 6 | 2 | pcs. |
| | 2 | Clamp tester | - | | 1 | pc. |
| | 3 | Electricians tool set | | | 2 | sets |
| | 4 | Mobile work bench with vise | - | | 1 | pc. |
| | 5 | Silicon quick charger | 100A | | 1 | pc. |
| | 6 | Battery and coolant tester | - | | 1 | pc. |
| | 7 | Battery service tools | Filler, syringe, booster cable | | 1 | set |
| | 8 | Electric soldering iron | 100 W | | 1 | pc. |

| 4. Tire & Brake Service Equipment and Tools | | | | | | |
|---|---|---|---|---|---|---|
| No. | | Item | Specification | Sets | Qty's | Unit |
| 4- | 1 | Tire changer | 14"-26" | 6 | 1 | unit |
| | 2 | Hydraulic tire removing tool | - | | 1 | pc. |
| | 3 | Tire bead remover | Length 1.54m | | 1 | pc. |
| | 4 | Double-face sledge hammer | 6 & 10LB | | 2 | sets |
| | 5 | Tire lever | Different 5 size | | 1 | set |
| | 6 | Tire pressure gauge (S & L) | - | | 2 | sets |
| | 7 | Air chuck (S & L) | - | | 2 | sets |
| | 8 | Valve repair tool (S & L) | - | | 2 | sets |
| | 9 | Wheel nut wrench set | - | | 2 | sets |
| | 10 | Cold patch for tube repair | - | | 10 | pcs. |
| | 11 | Brake pipe flaring tool set | - | | 1 | set |
| | 12 | Portable brake compression tester set | - | | 1 | set |
| | 13 | Brake pipe nut wrench | - | | 1 | pc. |
| | 14 | Brake spring plier (S, M & L) | - | | 1 | set |
| | 15 | Wheel dolly | 750-1,430mm tire diameter | | 1 | unit |

| 5. Welding & Fabrication Equipment and Tools | | | | | | |
|---|---|---|---|---|---|---|
| No. | | Item | Specification | Sets | Qty's | Unit |
| 5- | 1 | Diesel arc welder | 250A with accessories | 6 | 1 | unit |
| | 2 | Electrode drier for welding rod | 10kg cap. | | 1 | pc. |
| | 3 | Gas welder set | - | | 1 | set |
| | 4 | Mobile work bench with vise | - | | 1 | pc. |
| | 5 | Jet multiple chisel | - | | 1 | pc. |
| | 6 | Screw clamp | C Type, 100,150,200mm | | 2 | sets |
| | 7 | Screw clamp | L Type, 150,250,300mm | | 2 | sets |
| | 8 | Grip Plier | 40 & 45mm | | 2 | sets |
| | 9 | Double-face sledge hammer, | 2, 4 & 10LB | | 1 | set |
| | 10 | Adjustable hacksaw frame | - | | 1 | pc. |
| | 11 | Tinner scissors, | 3 different pattern | | 1 | set |
| | 12 | High-speed abrasive cut-off machine | 405mm | | 1 | pc. |
| | 13 | Disc sander | 100mm dia. | | 2 | pcs. |
| | 14 | Mini grinder | - | | 1 | pc. |
| | 15 | Iron anvil | Cast iron, 70 kg | | 1 | pc. |
| | 16 | Tong firing | Flat & Round | | 1 | pc. |
| | 17 | Electric soldering iron | 60, 200W | | 2 | sets |
| | 18 | Bar solder | 1 kg | | 1 | pc. |
| | 19 | Thread type solder with flux | - | | 1 | pc. |
| | 20 | Bench electric grinder | 205mm with pedestal | | 1 | pc. |
| | 21 | Cylinder carrier | - | | 1 | pc. |
| | 22 | Parts rack for small parts | - | | 1 | pc. |
| | 23 | Tool storage cabinet | - | | 1 | pc. |
| | 24 | Body puller set | Large | | 1 | set |
| | 25 | Body & fender tool set | | | 2 | sets |

| 6. Cleaning Equipment | | | | | | |
|---|---|---|---|---|---|---|
| No. | | Item | Specification | Sets | Qty's | Unit |
| 6- | 1 | Hot water high pressure washer, | 900l/h, 10MPa | 6 | 1 | unit |

| 7. Machining Equipment and Tools | | | | | | |
|---|---|---|---|---|---|---|
| No. | | Item | Specification | Sets | Qty's | Unit |
| 7- | 1 | Bench drill press | 13mm | 6 | 1 | pc. |
| | 2 | Straight Shank Twist Drill Set | – | | 2 | sets |
| | 3 | Mechanic tool set | – | | 1 | set |
| | 4 | Bench electric grinder | 205mm with pedestal | | 1 | unit |
| | 5 | Surface Plate | 900x900x125mm | | 1 | pc. |
| | 6 | V' Block | 200x70x110mm | | 2 | pcs. |
| | 7 | Parts rack open type | – | | 4 | pcs. |
| | 8 | Parts rack with drawer | – | | 2 | pcs. |
| | 9 | Torque wrench | 10–120, 40–320, 100–700, 100–850, 100–1,000 N-m (5 kinds) | | 1 | set |
| | 10 | Magnetic Base | – | | 1 | pc. |
| | 11 | Dial Indicator | 0–50mm, 1/100 | | 1 | pc. |
| | 12 | Square | 150x100, 300x200mm | | 1 | set |
| | 13 | V' Block (S & L) | – | | 1 | set |
| | 14 | Steel compass | 150mm | | 1 | pc. |
| | 15 | Firm joint caliper (IN & OUT) | 150 & 300mm | | 1 | set |
| | 16 | Straight rule | 300 & 1000mm | | 1 | set |
| | 17 | Straight edge | 300 & 1000mm | | 1 | set |
| | 18 | Measuring Tape | 2m | | 1 | set |
| | 19 | Iron bench level | 150 & 600mm | | 1 | set |
| | 20 | Hand tachometer | 0–10,000rpm | | 2 | pcs. |
| | 21 | Stop watch | – | | 2 | pcs. |
| | 22 | Socket wrench set | 3/8"sq. metric | | 2 | pcs. |
| | 23 | Socket wrench set | 3/8"sq. inch | | 2 | pcs. |
| | 24 | Socket wrench set | 1"sq. metric | | 2 | pcs. |
| | 25 | Socket wrench set | 1"sq. inch | | 2 | pcs. |
| | 26 | Double offset box wrench | 27x30–35x41mm | | 2 | sets |
| | 27 | Open end wrench | Double head 27x30 – 46x50mm | | 2 | sets |
| | 28 | Open end wrench | Single 30 – 60mm | | 2 | sets |
| | 29 | Solderless terminal kit | – | | 2 | sets |
| | 30 | Adjustable pipe wrench | 200, 600, 900mm | | 1 | set |
| | 31 | Chain wrench | For 12–50, 26–170mm dia. | | 1 | set |
| | 32 | Hammer | Ball peen (350,650,1100g)<br>Sledge(6,10,12LB)<br>Plastic (500g), Test (250g)<br>Copper (450g), Wooden (60mm dia.) | | 1 | set |
| | 33 | Flat chisel set | 4 pcs./set | | 1 | set |
| | 34 | Tinner scissors | 3 different pattern | | 1 | set |
| | 35 | Screw plate (Tap & Dies ) Set | M3 to M20 | | 1 | set |
| | 36 | Electric soldering iron | 60, 100, 200W | | 1 | set |
| | 37 | Thread type solder with flux | – | | 4 | pcs. |
| | 38 | Bar solder | 1 kg | | 4 | pcs. |
| | 39 | Portable hydraulic jack | 50ton | | 2 | pcs. |
| | 40 | Portable hydraulic jack | 30ton | | 2 | pcs. |
| | 41 | Air impact wrench | 1/2" sq. | | 1 | pc. |
| | 42 | Air impact wrench | 3/4" sq. | | 2 | pcs. |
| | 43 | Air impact wrench | 1 sq. | | 2 | pcs. |
| | 44 | Impact socket | 1/2"sq. 8 – 32mm | | 2 | sets |
| | 45 | Impact socket | 3/4"sq. 19 – 46mm | | 2 | sets |
| | 46 | Impact socket | 1"sq. 32 – 50mm | | 2 | sets |
| | 47 | Air hose | 6, 9, 12mm (10m length) | | 6 | sets |
| | 48 | Quick connector | Socket & Plug (1/4", 3/8", 1/2") | | 6 | sets |
| | 49 | Electric drill | 13mm | | 1 | pc. |
| | 50 | Straight Shank Twist Drill Set | – | | 2 | sets |
| | 51 | Mini grinder | – | | 1 | pc. |
| | 52 | Electric cord reel | 30m | | 2 | pcs. |
| | 53 | Garage lamp | – | | 2 | pcs. |
| | 54 | Flood lamp | 500W | | 2 | pcs. |
| | 55 | Lever block | 0.75 ton | | 1 | pc. |
| | 56 | Lever block | 1.5 ton | | 1 | pc. |
| | 57 | Spray gun | Suction type | | 2 | pcs. |
| | 58 | Suction Type Container | 1000cc | | 2 | pcs. |
| | 59 | Hydraulic hand pump | – | | 1 | pc. |
| | 60 | Hydraulic puller | 50 ton | | 1 | pc. |
| | 61 | Hydraulic puller | 30 ton | | 1 | pc. |

| 8.Lubrication Truck | | | | | | |
|---|---|---|---|---|---|---|
| No. | | Item | Specification | Sets | Qty's | Unit |
| 8- | 1 | Lubrication Truck | 4WD, Aluminum van body<br>Equipped with: Oil drum & pump,<br>Grease deum & pump,<br>Water tank & pump, Compressor | 6 | 1 | unit |

Annex-2: Project Cost Estimation

CONFIDENTIAL

**PROJECT COST ESTIMATION**

1. Cost Borne by the Government of Japan

Confidential

2. Cost Borne by the Government of Kyrgyz

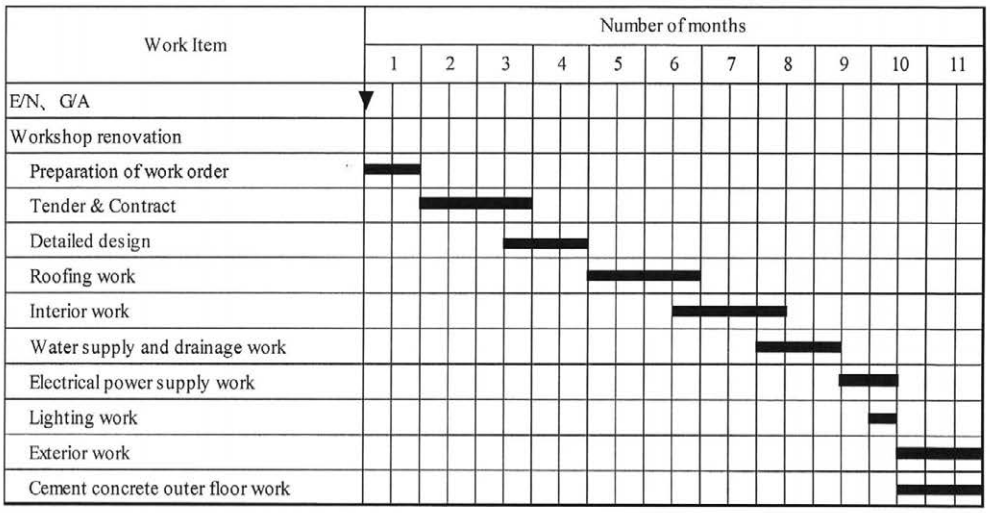
| Cost Items | Cost Estimation | |
|---|---|---|
| | Thousand Som | Thousand Yen |
| Banking Commission for B/A and A/P | 156 | 300 |
| Renovation for the each target workshop | 19,370 | 37,580 |
| Total | 19,526 | 37,880 |

3. Conditions of Cost Estimation

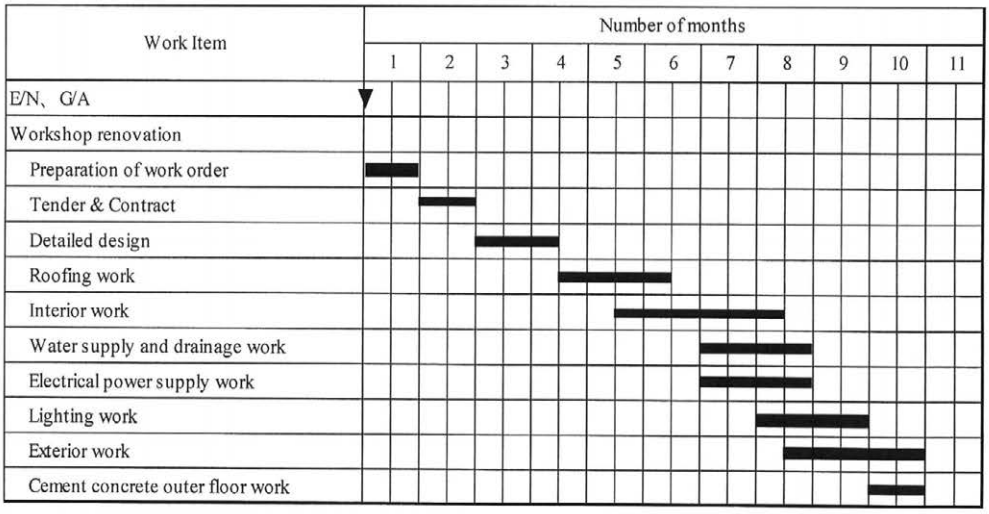
- Estimated timing: June, 2014
- Exchange rates: US$1.00 = JPY 103.16
  US$1.00 = SOM 53.18
- Others: The project is implemented in accordance with the system of Japan's Grant Aid. The above cost estimation does not assure the ceiling cost on the E/N and shall be reviewed by GOJ before signing of the E/N between the both Governments.

Annex-3: Renovation plan of each workshop

1) DEP958




2) DEP8



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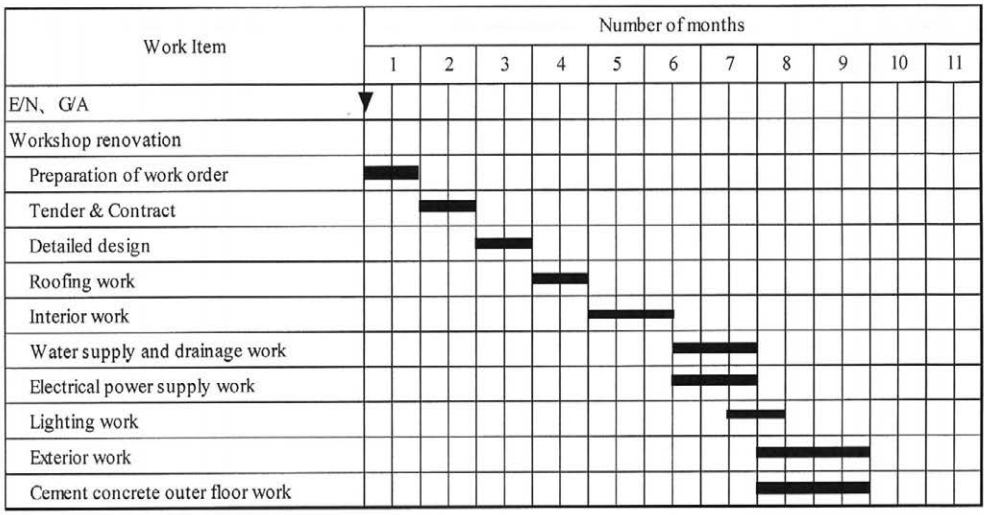
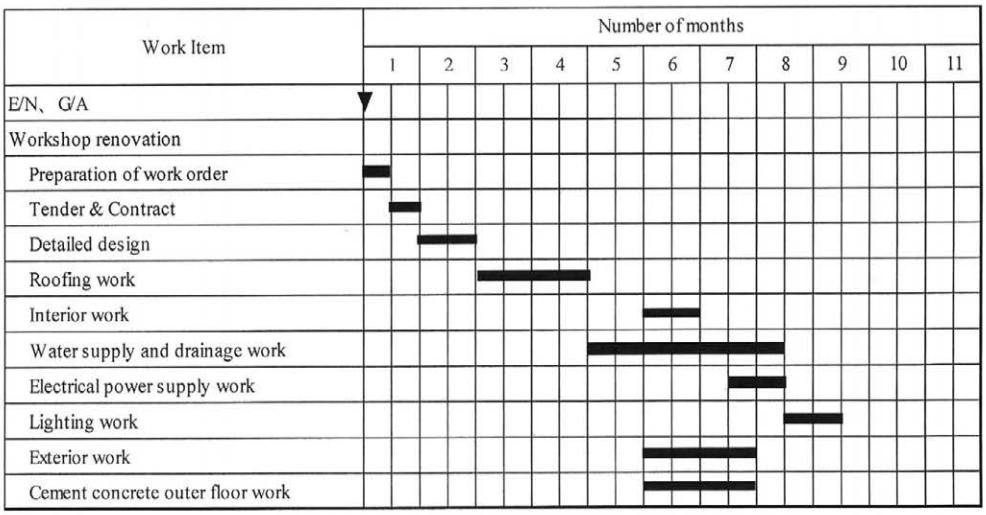



4) DEP19



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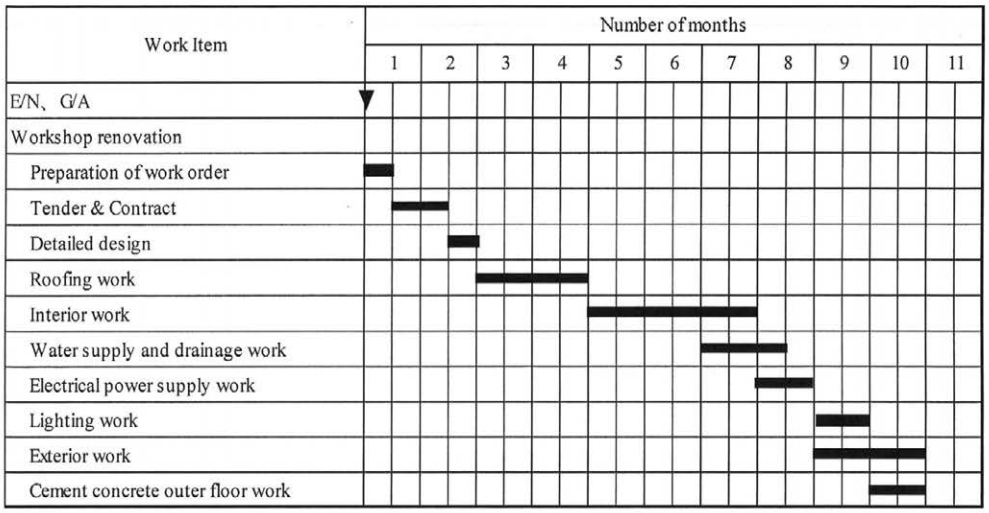
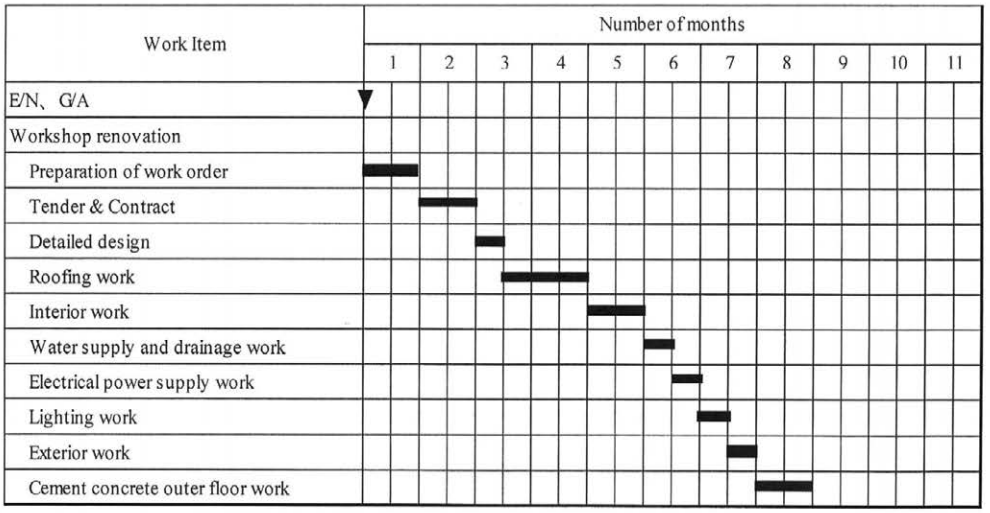



6) DEP45



Annex-4: Tentative Project Implementation Schedule