APPENDIX 6

OTHER RELEVANT DATA

6-1 Field Survey Report

PREPARATORY SURVEY
FOR
THE PROJECT
FOR
UPGRADING ROAD MAINTENANCE EQUIPMENT
IN ADDIS ABABA CITY
IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

FIELD SURVEY REPORT

3rd April 2019

YACHIYO ENGINEERING CO., LTD.
TOKYO, JAPAN

Prepared and submitted by	Confirmed by
Mr. Isao Takahashi Chief Consultant Social and Economic Infrastructure Department International Division Yachiyo Engineering Co., Ltd. Tokyo, Japan	Mr. Moges Tibebu Director General Addis Ababa City Roads Authority The Federal Democratic Republic of Ethiopia

THE PROJECT FOR UPGRADING
ROAD MAINTENANCE EQUIPMENT

FIELD SURVEY REPORT

Preface

Based on the Minutes of Discussions agreed between Addis Ababa City Roads Authority (hereinafter referred to as "AACRA"), and JICA on 21st March 2019 (hereinafter referred to as "the Minutes of Discussions"), the Preparatory Survey Team (hereinafter referred to as "the Team") of the above captioned project conducted a field survey in the Federal Democratic Republic of Ethiopia (hereinafter referred to as "Ethiopia"). Moreover, the Team discussed details of proposed equipment with the concerned officials of AACRA from 22nd March to 3rd April.
As a result of the survey and discussion, the Team formulated details of following items.

1. Study of Development Plan in Addis Ababa City
2. Proposed Roads to be improved under the Project
3. Site Investigations on City Roads and AACRA's Facility
4. Study of Existing Equipment and Proposed Equipment
5. Delivery Points
6. Tentative Implementation Schedule
7. Soft Component (Technical Assistance)
8. Undertakings to be taken by Ethiopian Side
9. Other Issues

However, all the items and components described in this report will be decided after further studies in Japan and consultations with the concerned officials of the Government of Japan.

1. Study of Development Plan in Addis Ababa City

Addis Ababa City Planning Project Office (hereinafter referred to as "AACPPO") has formulated the Addis Ababa City Structure Plan (hereinafter referred to as "the Structure Plan") targeted from 2017 to 2027 in order to achieve comprehensive city development comprised of multiple sectors including Transport, Road, Municipal Services, Social Development and Environment, etc. In the road sector of this Structure Plan, city roads in Addis Ababa City are classified to 5 levels and the functions of each road type are described as Table1-1.

Table1-1: Classifications of Road Type in Addis Ababa City

Classification	Descriptions	Span (Planning Standard)	Right of Way
Principal Arterial Streets (PAS)	To carry through traffic, longer distance traffic, line haul public transport, primary freight and dangerous goods routes. PAS can either take the form of expressway (highways for fast moving traffic, freight or dangerous goods movement) and runs along the periphery and links major cities, or boulevard streets (an urban street inside a city for public transport route that links the city's major centers).	Every 2km	60m, 50m, 40m and 30m
Sub Arterial Streets (SAS)	To serve as connections between local areas and arterial roads, connections for through traffic between arterial roads, access to public transport, through movement of public transport, regional – local cycle movements (off road) and pedestrian movement.	Every 1km	30m and 25m
Collector Streets (CS)	To carry traffic having a trip end within the specific area, will provide direct access to properties, access to public transport, pedestrian movements and local cycle movement	Every 0.5km	20m and 15m
Local Streets (LS)	To provide direct access to properties; will be used for pedestrian and local cycle movements	150-300m	-

Source: Addis Ababa City Structure Plan (2017/2027)

In addition, the following facts as current road condition are described.

- The total roads of the city (of 7m width and above) are 3,731km.
- Out of these 1,807km (48.4%) is asphalted, 1,777km (47.63%) is gravel and 147km (4%) is cobblestone.
- There are currently around 214 roads of arterial level (PAS and SAS) that structure the city.
- The total length of the major roads (PAS, SAS and CS) constructed in the past ten years is about 468.63km.

- 38 major roads were proposed by the pervious city development plan to be built in the planning period.
- At present, the existing road density is below the universally accepted standard of 25%. Road density of the total built up area is about 13%.

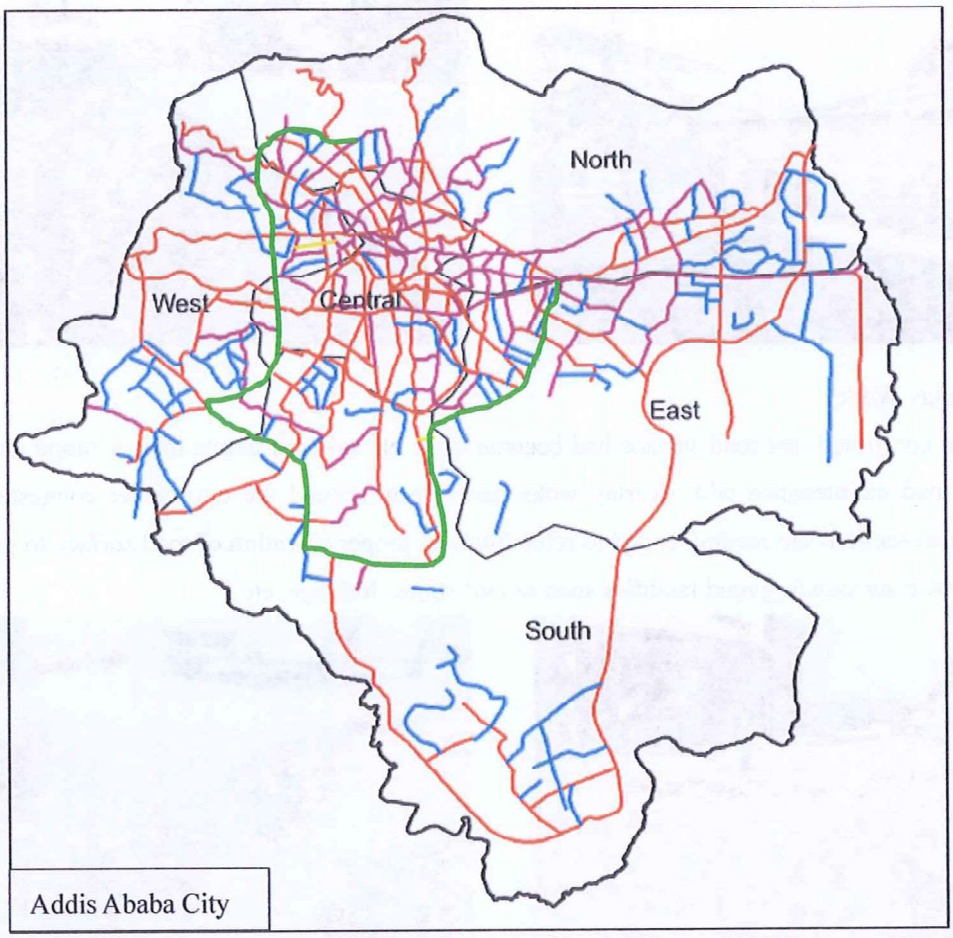
In this context, the Structure Plan states the following major goads to be achieved for future demands of city roads targeted until 2027.

- Increase road density from the existing 13% to 25%;
- Provide comfortable road infrastructure and related facilities to the elderly, children, persons with disability, cyclists and pedestrians;
- Dedicate 50-60% of the street area at centers located inside the existing ring road and identified sections along transit oriented development corridors for NMT (Non-Motorized Transport); and
- Provide a hierarchically organized street network with the necessary infrastructure.

The Team has confirmed that AACRA has been implementing road construction and maintenance in order to fulfill the abovementioned major goals as the responsible organization for city road management.

2. Proposed Roads to be improved under the Project

Proposed roads to be improved under the Project are shown as Figure2-1.



Road Class

- Ring Road (RR)
- Primary Arterial Streets (PAS)
- Sub Arterial Streets (SAS)
- Collector Streets (CS)
- Local Streets (LS)

Figure2-1: Proposed Roads Map

The Project goal by implementation of road maintenance works to be achieved by AACRA will be proposed by the Consultant. Such a goad will be referred in post-evaluation of the Project with quantitative effects to be scheduled for 3 years after handing over of Project equipment.

3. Site Investigations on City Roads and AACRA's Facility

(1) Asphalt Paving Work

The Team investigated the site of asphalt paving work on the Collector Street and confirmed that

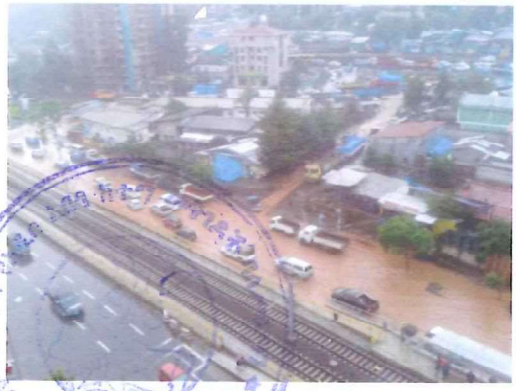
AACRA has been capable to execute road maintenance works using common and standard equipment for paving works such as a motor grader, vibratory roller, tire roller, and asphalt finisher.

(2) Overlay Work

The Team confirmed that road surface had become same elevation or above the curbstone along the road by road maintenance with overlay woks particularly around the city center congested with traffic. Such sections are recommended to rehabilitate in proper elevation of road surface to properly function with surrounding road facilities such as curbstone, drainage, etc.

(3) Drainage Issue

The Team observed drainage system with inadequate water flow capacity at many locations caused by sludge deposition. Therefore the equipment for rejecting sludge deposition is desirable.



(4) Workshop at Vehicles and Construction Machinery Administration and Maintenance Center

The Team confirmed the equipment at AMC (Vehicles and Construction Machinery Administration and Maintenance Center) and considered that the partial update of workshop equipment has to be proposed since most of equipment are aged, deteriorated and out of service while mechanics who belong to AMC have capable skills and knowledge to provide good/fair mechanical services.

4. Study of Existing Equipment and Proposed Equipment

(1) Study of Existing Equipment

The Team studied an inventory of existing road maintenance equipment owned by AACRA with respective status, age, operational and mechanical conditions, etc. and summarized them as shown in Table4-1.

Table4-1: Existing Road Maintenance Equipment owned by AACRA

No.	Type of Machine	Year of Manufacture		Total Number	Machine Condition		
		before 2004	2005 and after	of Machines	In Operation	Under Repair	Unserviceable
1	Air Compressor	5	3	8	3	5	0
2	Asphalt Cutter	0	10	10	10	0	0
3	Asphalt Distributor	1	0	1	0	1	0
4	Asphalt Finisher	3	4	7	5	2	0
5	Asphalt Kettle	2	2	4	0	4	0
6	Backhoe Loader	2	3	5	3	2	0
7	Bulldozer	9	2	11	7	4	0
8	Combined Roller	6	0	6	0	6	0
9	Concrete Mixer	0	5	5	5	0	0
10	Dumper	4	4	8	3	5	0
11	Excavator (Crawler)	1	8	9	2	7	0
12	Excavator (wheel)	2	9	11	8	3	0
13	Farm Tractor	5	5	10	3	7	0
14	Fork Lift	0	1	1	1	0	0
15	Generator	3	6	9	3	3	3
16	High-pressure Cleaning Vehicle	1	0	1	0	1	0
17	Motor Grader	7	6	13	10	3	0
18	Road Broom	1	0	1	1	0	0
19	Road Marking Machine	3	3	6	3	0	3
20	Road Milling Machine	1	2	3	2	1	0
21	Slipform Paver	1	1	2	1	1	0
22	Tandem Roller	12	10	22	10	12	0
23	Trailer Mounted Water Tank	0	5	5	5	0	0
24	Tyre Roller	3	3	6	3	3	0
25	Wheel Loader	17	20	37	27	10	0
26	Agitator Truck	2	5	7	3	4	0
27	Boom Truck (Cab-back Crane)	2	4	6	4	2	0
28	Bus	4	0	4	2	2	0
29	Cargo Truck	7	5	12	5	7	0
30	Dump Truck	34	56	90	85	5	0
31	Fuel Tanker	2	4	6	2	1	3
32	Midi Bus	0	20	20	20	0	0
33	Mini Bus	5	19	24	18	6	0
34	Mobile Workshop	1	0	1	1	0	0
35	Pickup Truck	53	105	158	107	50	1
36	Semi Trailer	3	1	4	1	3	0
37	Station Wagon	7	12	19	16	3	0
38	Tractor Head	3	2	5	4	1	0
39	Truck Crane	1	0	1	1	0	0
40	Water Bowser (Tanker)	5	11	16	10	5	1
41	Asphalt Plant	1	3	4	3	0	1
42	Concrete Plant	0	1	1	1	0	0
43	Crushing & Screening Plant	1	0	1	0	1	0
	Total	220	360	580	398	170	12

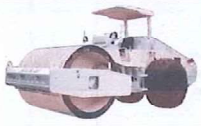
Moreover, the Team also studied ACCRA's workshop facilities and equipment and current management system of construction equipment to determine possible technical assistance for capacity development of AACRA's engineers and mechanics when needed.

(2) Proposed Equipment

Based on the requested equipment list attached in the Minutes of Discussions and further studies by the Team regarding existing equipment conditions, the Team and officials from AACRA had series of discussions to update the requested equipment and quantities. As a result of the discussions, the Team and AACRA agreed on the selection of listed equipment with its priority referred to the following Table 4-2.

Equipment prioritized as A : First priority
Equipment prioritized as B : Second priority
Equipment prioritized as C : Third priority

Table 4-2: Details of Proposed Equipment

No.	Name of Equipment		Specification	Quantity	Priority	Remarks
1	Wheel Loader		Bucket Capacity: (approx.) 3.0 m^3 Engine Output: (approx.) 140 kW Operation Weight: (approx.) 17~20 ton Max Dumping Clearance: (approx.) 3 m	3	A	Quantity of this equipment shall be adjusted according to the availability of the budget
2	Wheel Excavator		Bucket capacity: (approx.) 0.6 m^3 Engine Output: (approx.) 90 kW Max. Digging Depth: (approx.) 5 m Max. Cutting Height (approx.) 9 m Operation Weight: (approx.) 16 ton	4	A	Quantity of this equipment shall be adjusted according to the availability of the budget
3	Excavator		with Steel Crawler Operation Weight: (approx.) 5,000 kg Engine Output: (approx.) 21 kW Bucket Capacity: (approx.) 0.15 m^3	5	A	
4	Road Stabilizer		Operation Weight: (approx.) 22,000 kg Engine Output:(approx.) 370 kW Mixing Width: (approx.)200 m Mixing Depth:(approx.) 400 mm	1	A	
5	Sheep Foot Compactor		Operation Weight: (approx.) 13 ton Padfoot drum with removable smooth drum Engine Output: (approx.) 80 kW Vibration Power: (approx.) 245 kN Compaction Width: (approx.) 2,100 mm	5	A	Replaced with Item No.28, Combined Vibratory Roller (Flat Roll) Quantity of this equipment shall be adjusted according to the availability of the budget
6	Vibratory Tandem Roller		Operation Weight: (approx.) 4,000 kg Smooth Drum (front & rear) Vibration Power: (approx.) 26~34 kN Compaction Width: (approx.) 1,300 mm	5	A	
7	Tyre Roller		Operation Weight: 8 ~ 15 ton Engine Output: (approx.) 65 kW Travel speed: (approx.) 0 ~ 20 km/h Compaction Width: (approx.) 2,000 mm	3	A	
8	Water Truck		Payload: 10 ton, (10,000 lit) GVW: (approx.) 23 ton Engine Output: (approx.) 150 kW	3	A	

9	Dump Truck		with U-shape Vessel Payload: 14 ton Vessel Capacity. (approx.)14m^3 GVW: Max. 26 ton Engine Output: (approx.) 190 kW	10	A	
10	Boom Truck (Cab-back Crane)		Cargo Truck with 3 ton Telescopic Boom Crane Payload: (approx.) 10 ton Engine Output: (approx.) 190kW	3	A	Quantity of this equipment shall be adjusted according to the availability of the budget
11	Aerial Work Platform Vehicle		Max. Bucket Height: not less than 12 m Max. Bucket Capacity: not less than 200 kg Engine Output: (approx.) 110 kW	4	A	
12	High-pressure Drainage Cleaning Vehicle		Water Tank Capacity: (approx.) 6,000 lit. Pressure: 12 MPa Discharge rate: (approx.) 200 lit/min. Hose Length: (approx.) 80 m Engine Output: (approx.) 110 kW	3	A	
13	Vacuum Tank Truck		Tank Capacity: (approx.) 6500 lit. Suction System: Vacuum, with Vacuum Pump Dump type discharge system Vacuum Pump Discharge Rate: (approx.) 5.0 lit./rev. Max. Vacuum: (approx.) -95 kPa	3	A	
14	Bitumen Distributor		Capacity: 4000 lit., with sub-engine for asphalt pump Diesel Fuel Burner and Heater Splay width: (approx.) 3.6 m Hand Sprayer	3	A	Transporter, Heater & Sprayer for Cutback Asphalt (MC30, RC70, MC3000) Replaced with Item No. 38 Asphalt Kettle
15	Asphalt Burner (Torch)		Propane/LPG Gas burner	5	A	
16	Asphalt Cutter		Petrol Engine Driven Wet type Max. Cutting Depth: (approx.) 170 mm	5	A	
17	Asphalt Crack Sealer		Capacity (Kettle): (approx.) 60 lit. Petro engine driven, with propene/LPG gas burner	5	A	
18	Portable Air Compressor		Screw Type Air Flow rate: (approx.) 7.0 m^3/min. Air Pressure: (approx.) 7 Mpa Engine Output: (approx.)	4	A	
19	Hand Operated Jack Hammer		Weight: less than 20 kg bpm: (approx.) 1,000	5	A	
20	Portable Concrete Mixer (For mixing cold mix asphalt)		Diesel engine driven Capacity: 0.5 m^3	3	A	Making cold mix asphalt mixture at the site for filling up potholes. (Replaced with Mini Hot-mix Mixer)
21	Asphalt Plant		Batch Plant, Capacity: 80 ton/hr. Composition of the Plant Aggregate Hopper & Feeding System Dryer, Screen & Hot-bin System Weighing Unit & Mixing System Bag Filter Control unit Filler Supply System Asphalt Decanting System (for straight asphalt & cutback asphalt) Asphalt Supply System Heating and Flushing (cleaning) System for Asphalt Piping Generator	1	A	
22	Mobile Workshop		Cargo truck, equipped with telescopic boom 3 (t) crane and equipment and tools necessary to carry out service for construction machines Payload: (approx.) 7~10 ton	1	A	

23	Container Workshop		Container store house, equipped with necessary tools and equipment for maintaining construction equipment.	1	A	
24	Tyre Changer		Hydraulically Operated Tyre Changer for Construction Equipment Rim Size: (approx.) 14" ~ 56"	2	A	
25	Portable Gantry Crane		with Manually Operated Chain Block and Geared Trolley Lifting Capacity: 5,000 kg Max. Lifting Height: (approx.) 4000 (mm)	2	A	
26	Wheel Dolly		Lifting Capacity: 500 kg Tyre Size: (approx.) 750 ~ 1,430 mm	2	A	
27	High Pressure Washer		Petrol Engine Driven Pressure: 14 Map Discharge capacity: 7 lit/min.	5	A	
28	Combined Vibratory Roller (Flat Roll)		Operation Weight: (approx.) 13 ton Pad foot drum with removable smooth drum Vibration Power: (approx.) 245 kN (25,000 kgf)) Vibration Power: (approx.) 245 kN Compaction Width: (approx.) 2,100 mm	5	B	Item No. 5 Sheep Foot Compactor can serve the purpose of this equipment.
29	Plate Compactor		Operation Weight: (approx.) 60 ~ 70 kg Centrifugal force: (approx.) 6~10 kN Vibrating plate size: (approx.) 550 × 350 (mm)	10	B	
30	Rammer		Petrol Engine Driven Weight: (approx.) 60~75 kg Impact Force: (approx.) 13 ~ 15 KEN Engine Output: (approx.) 1.5 kW	10	B	
31	Agitator Truck		Drum capacity: 8.0 m^3 Agitating: capacity: 5.0 m^3 Engine Output: (approx.) 190 kW	5	B	
32	Concrete Cutter		Petrol Engine Driven Wet type Max. Cutting Depth: (approx.) 170 mm Engine Output: (approx.) 2.5 kW	2	B	
33	Asphalt Finisher		Wheel type Paving width: (approx.) 2.0 ~ 7.0 m, Paving Thickness: (approx.) 10 ~ 150 mm Travel Speed: (approx.) 1.5 ~ 20 m/min. Hopper capacity: (approx.) 10,000 kg Engine Output: (approx.) 85 kW	2	B	
34	Slipform Curb Machine (Slipform Paver)		Paving Capacity Max. Width: (approx.) 6,000 mm Max. Thickness: (approx.) 400 mm To be capable of paving curbs and barriers	1	B	
35	Crushing & Screening Plant		Capacity: 100 ton/hr. <u>Composition of the Plant</u> Grizzly Hopper and Feeder Primary Crusher Screen Unit Secondary Crusher Belt Conveyors Control Unit Generator	1	B	
36	Drone for Bridge Inspection		To be confirmed	1	B	

37	Pipe Jacking Machine (Micro Tunnel Boring Machine)		Max. Drilling Length: not less than 100 m Auger Diameter: (approx.) 500 ~ 700 mm with necessary attachments and accessories	1	B	Before introducing this equipment (a type of plant), it is necessary to investigate and examine the site conditions (nature of soil, surrounding envelopments, construction methods, availability of materials, availability of after sale service etc.) and cost-effectiveness (operation rate) in details.
38	Asphalt Kettle		Tank Capacity: (approx.) 3000 lit. Direct heating type with diesel fuel burner Electric hoist for asphalt drum Electric asphalt transfer pump with heater Generator	3	C	Replaced by Bitumen Distributor
39	Pothole Patching Machine		Self-propelled Hopper Capacity: (approx.) 4,000 kg (for hot/cold asphalt mixture) Equipped with, Air Jet, Auger/Conveyor, Screed, Roller, Tack oil Sprayer	1	C	Work amount of this equipment is too small. This equipment is not suitable for pothole filling work to be carried out by AACRA.
40	Bridge Inspection Vehicle		Tobe confirmed	1	C	
41	Truck Mounted Concrete Pump		Pumping capacity: not less than 100 m^3/hr.	1	C	
42	Concrete Paver (Slipform Paver)		Paving width: (approx.) 2.0 ~ 7.0 m	1	C	
43	Concrete Plant		Batch Plant, Capacity: 60 ton/hr. Composition of the Plant Aggregate Hopper & Feeding System Turn Head for Sand and Aggregate Cement Silo with Screw Elevator Storage Bins Weighing Unit Mixing Unit Dust collector Control unit Water Tank Waste-water treatment system Generator	1	C	

After a through discussion, the both side reached agreement regarding some specific items as described below.

- Tunnel Boring Machine

The both side agreed to exclude this item in consideration of the alternative solution proposed by the Team to add the Vacuum Truck so that this machine can assist the High-pressure Drainage Cleaning Vehicle to be more capable and efficient in cleaning drainages. The Team suggested that discharge capacity of existing drainage system would be remarkably improved in periodic cleaning works by such combination of equipment.

- Drones

The both side agreed to exclude this item in consideration of needs of capacity development in bridge inspection methods, but not only procuring and using this item.

- Pothole Patching Machine

The Team explained that Pothole Patching Machine was considered capable for only pothole

patching works at limited small parts because of its specification.

As the alternative that enables AACRA to carry out patching works more efficiently, the Team proposed to supply an additional decanter for cutback asphalt to produce the cold-mix asphalt which can be stocked and distributed to road maintenance sites according to their needs meanwhile this is conventional and general method using trucks, compactor, etc., and AACRA agreed with this proposal.

5. Delivery Points

In the field survey, the Team discussed delivery points of proposed equipment with concerned officials from AACRA. As a result, the Team determined that following places were appropriate as delivery points for "Proper Use" of equipment procured under the Project.

Table 5-1: Delivery points

Proposed Equipment	Delivery Point
1. Road Maintenance Equipment including its spare parts	Vehicles and Construction Machinery Administration and Maintenance Center
2. Workshop Equipment	Ditto

The Team requested to prepare sufficient spaces and shelves in the store house to keep spare parts properly, and AACRA agreed.

6. Tentative Implementation Schedule

The tentative implementation schedule estimated by the Team is shown as Attachment-1. However, the schedule will be determined after further studies in Japan and consultations with the concerned officials of the Government of Japan.

7. Soft Component (Technical Assistance)

As a result of examination of AACRA's current capability as the executing agency, the Team has planned the following activities to be conducted as the Soft Component on and after the delivery of equipment.

a) Technical Guidance for Equipment Check-up, Diagnosis and Maintenance
b) Technical Guidance for Equipment Management System
c) Technical Guidance and Practical Training for Road Stabilizer

8. Undertakings to be taken by Ethiopian Side

In addition to undertakings by Ethiopian side described in the Minutes of Discussions, AACRA is required to undertake the following items.

- To develop parking lots and shelves in the store house at the delivery point for Project's equipment and spare parts,
- To prepare venues for a technical assistance, a budget and construction materials for a pilot works, appointing trainees from AACRA, etc. necessary to conduct the Soft Component, and
- To appoint adequate operators and mechanics for the Project's equipment and to appoint them to initial operation and maintenance training to be conducted by the supplier.

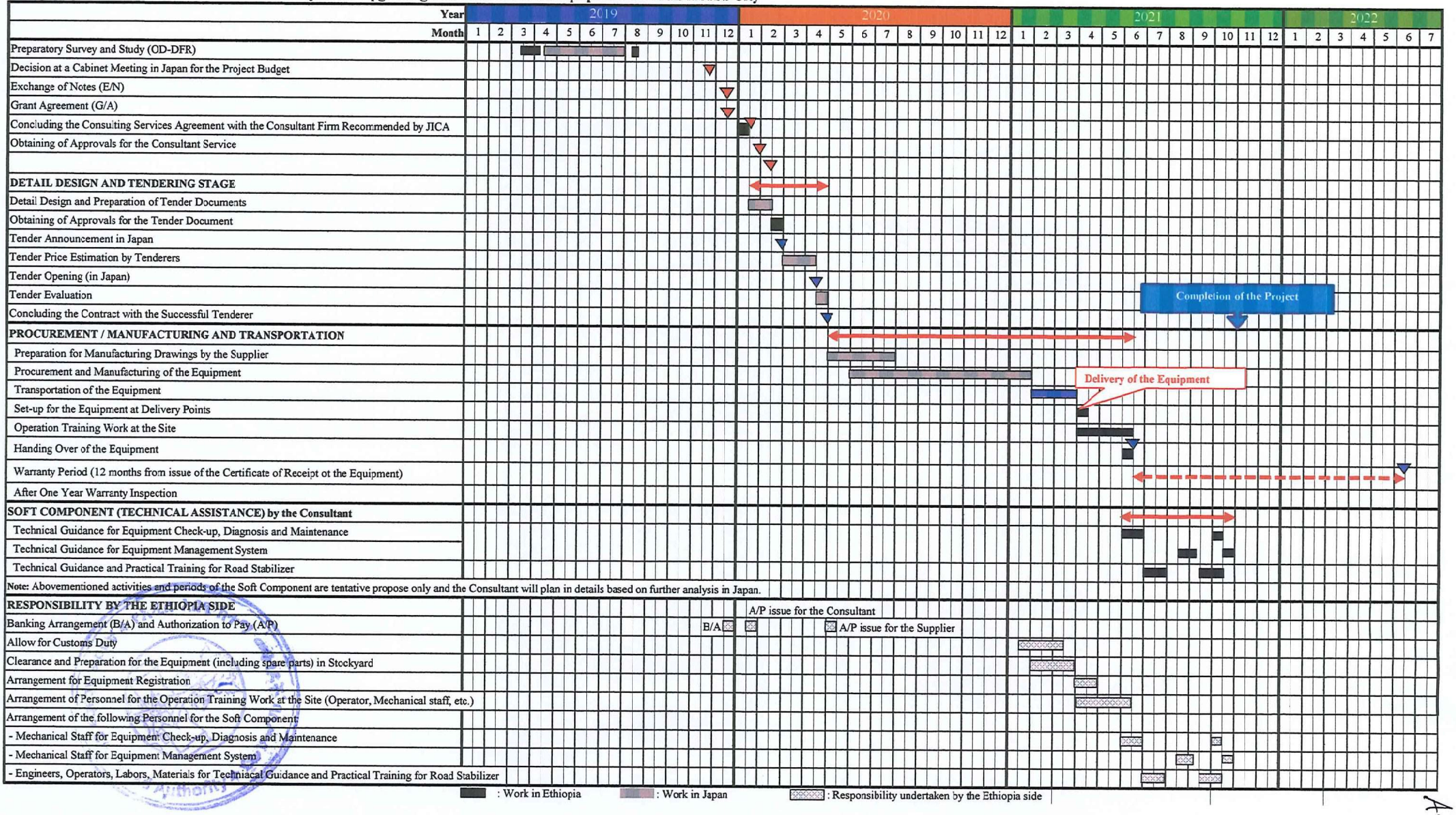
9. Other Issues, if any

END

Attachment-1 Tentative Implementation Schedule

3rd April, 2019

Tentative Implementation Schedule for the Project for Upgrading Road Maintenance Equipment in Addis Ababa City



Attachment-1

6-2 Report on Safety Management Seminar

THE PROJECT FOR UPGRADING ROAD MAINTENANCE
EQUIPMENT IN ADDIS ABABA CITY
IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

Report
On
Safety Management Seminar
And
Field Study

August 2019

Japan International Cooperation Agency (JICA)

Yachiyo Engineering Co., Ltd.

Contents

Introduction

Safety Management Seminar and the subsequent Field Study on Machine Safety were conducted on 27th and 28th August 2019 under THE PROJECT FOR UPGRADING ROAD MAINTENANCE EQUIPMENT IN ADDIS ABABA CITY IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA in cooperation between Japan International Cooperation Agency (JICA) and Addis Ababa City Roads Authority (AACRA).

This is to report on the Safety Management Seminar and the Field Study.

1. Safety Management Seminar

1.1 Venue :

GION HOTEL

1.2 Program

Date: 27th August 2019

Time Schedule actually executed

8:30 Registration

9:30 Opening Address by Eng. Moges Tibebu Director General Addis Ababa City Roads Authority and Mr. Takeshi Matsuyama Senior Representative JICA Ethiopia Office

9:40 Safety Seminar Vol. 1-1 : "The Guidance for the Management of Safety for Construction Works in Japanese ODA Projects" presented by Mr. Koji Masuda Yachiyo Engineering Co., Ltd

10:45 Break

11:00 Safety Seminar Vol. 1-2 : The Guidance for the Management of Safety for Construction Works in Japanese ODA Projects" presented by Mr. Koji Masuda Yachiyo Engineering Co., Ltd

12:00 Lunch

13:00 Safety Seminar Vol .2 : "Exercise KY" in group works. 3 groups out of 14 groups in total gave presentation to the audience for the results of KY exercise.

14:15 Safety Seminar Vol. 3 : "Prevention of Machine Accidents (Excavator, Crane)" presented by Mr. Koji Masuda Yachiyo Engineering Co., Ltd

15:15 Question and Answer, Questionnaire Investigation

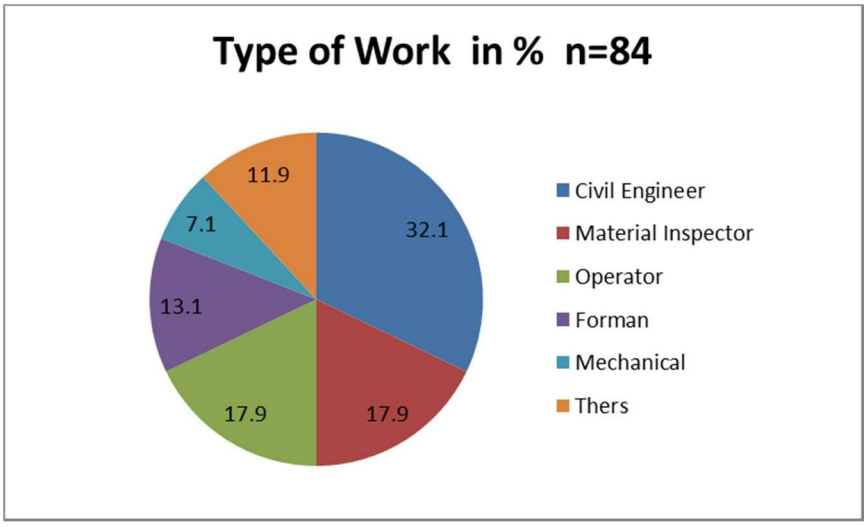
15:45 Closing Address

Program distributed at the seminar is provided in ATTACHMENT 1.

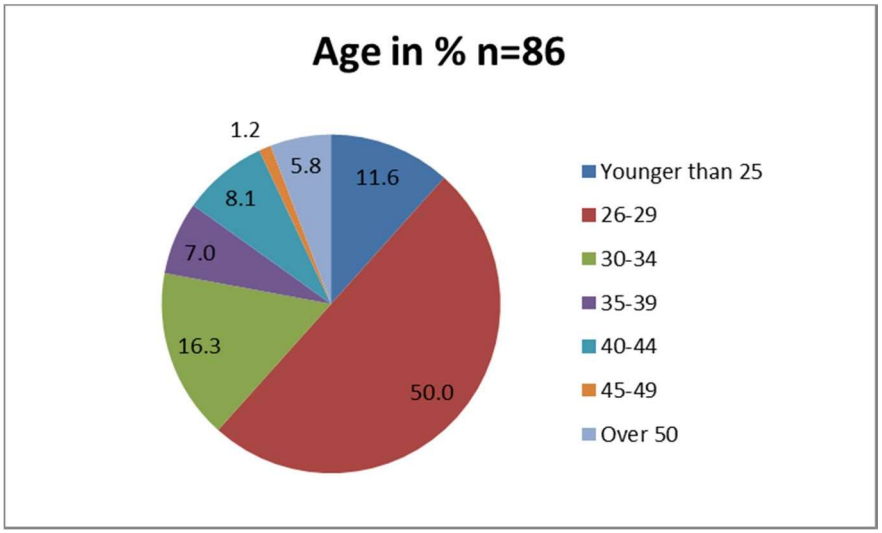
1.3 Participants

136 persons participated in the seminar. Name list of participants along with Department and Position is provided in ATTACHMENT 2. Attendance sheet signed by the participants is also provided in ATTACHMENT 3.

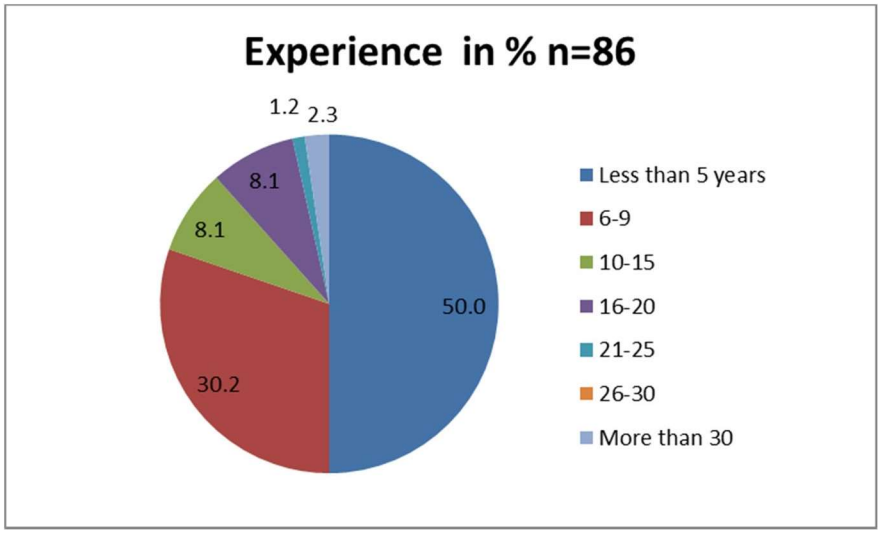
1) Breakdown of participants in terms of "Type of Work" (based on questionnaire investigation)



2) Breakdown of participants in terms of " Age" (based on questionnaire investigation)



3) Breakdown of participants in terms of “Experience” (based on questionnaire investigation)



1.4 Summary of Questionnaire Investigation

At the end of the seminar, questionnaire investigation on the seminar was conducted by giving questionnaires shown below.

92 participants out of 136 (ratio of answer is 68%) submitted the answer.

Questionnaire on Safety Management Seminar in AACRA
On 27/8/2019

Age : .....
Position /Type of Work : .....
Experience : .....

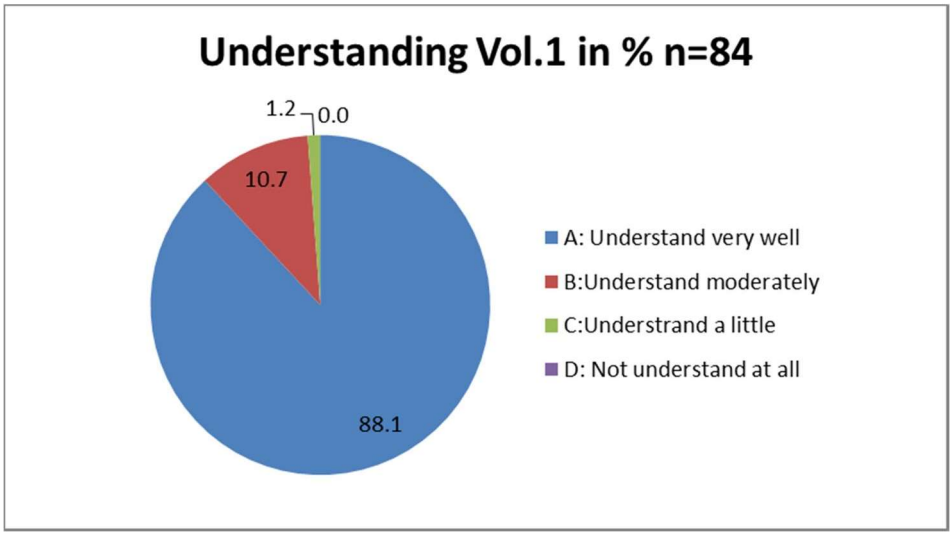
No.	Questionnaires
I	Did you understand the seminar? Please select one out of 4 answers below.
	Seminar Part 1(10:15-12:00) : Safety Guidance 1. Understand very well 3. Understand a little (with many questions) 2. Understand moderately (with some questions) 4. Not understand at all
	Seminar Part 2(13:00-13:50) : Practice of KY Activity 1. Understand very well 3. Understand a little (with many questions) 2. Understand moderately (with some questions) 4. Not understand at all
	Seminar Part 3(14:00-15:10) : Prevention of Machine Accidents 1. Understand very well 3. Understand a little (with many questions) 2. Understand moderately (with some questions) 4. Not understand at all
II	Do you want to learn more about Safety? 1. YES 2. NO
III	What subjects about Safety do you want to learn more, or are you interested in?
IV	Please write your opinion about the seminar if any.

Thank you for your cooperation.

(1) Question I:" Did you understand the seminar? Please select one out of 4 answers below".

a) Vol.1 :"The Guidance for the Management of Safety for Construction Works in Japanese ODA Projects"

84/92 answered.



b) Vol.2 "Exercise KY" in group works.

136 participants were separated into 14 groups to exercise "KY activity". Being given a sample construction condition, participants found out hidden dangers in implementing the works and decided measures to be taken in order to prevent possible accidents by discussing in the group.

Sample work for KY exercise

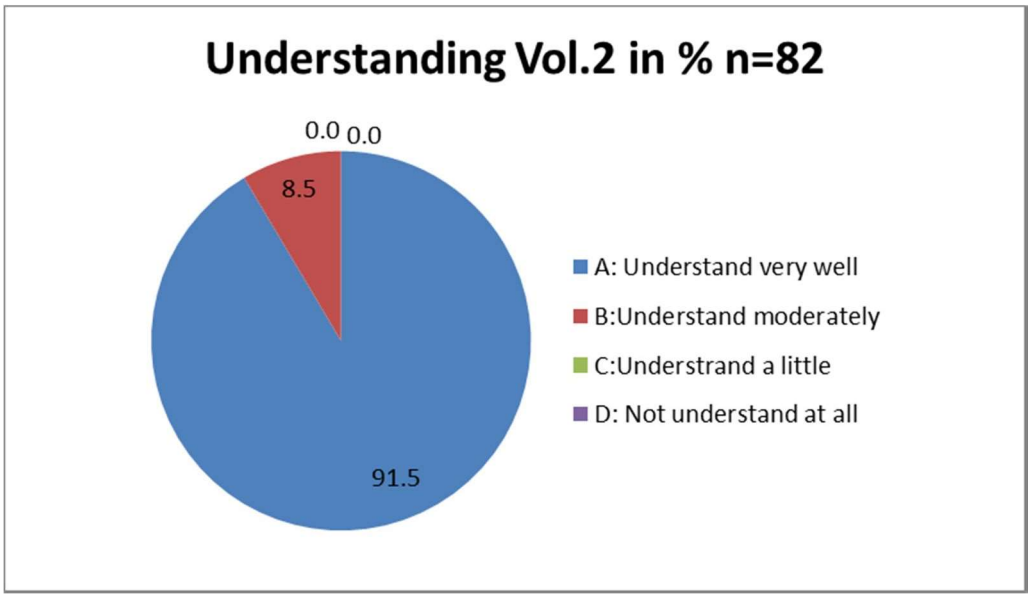
(Construction of Side Ditches within the existing road)

3 groups gave the presentation for the results of KY activity . A sample KY is shown in the table.

Sample of the KY activity

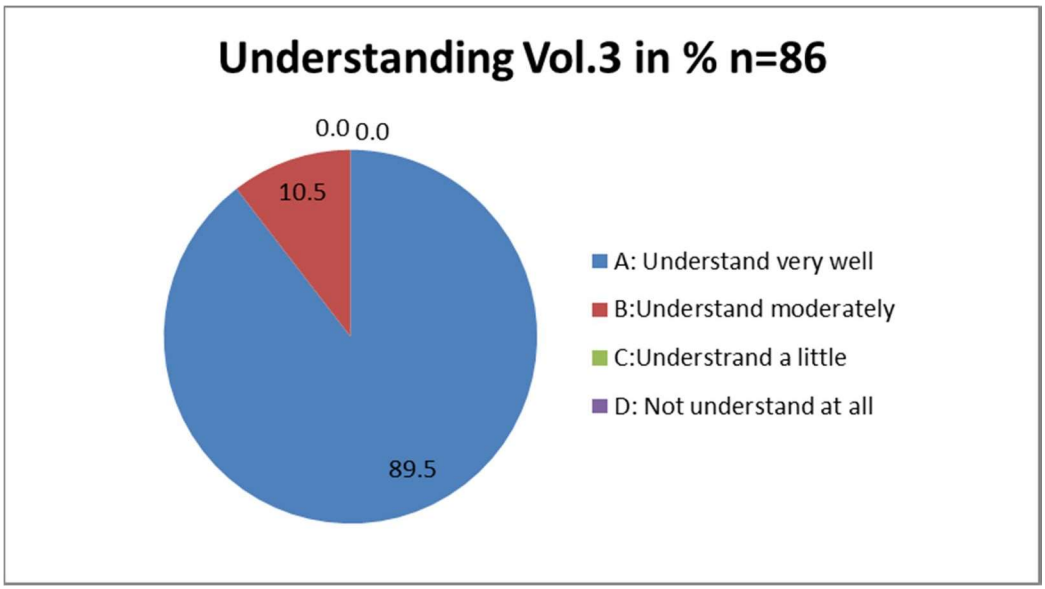
No.	Hidden Dangers	Prevention Measures
1	Facilities and trees standing adjacent to the excavation area may fall down to hit people or vehicle	・Remove obstacles before hand
		・Support facilities before excavation
2	Construction vehicle may hit pedestrian, traffic and facilities	・Install safety barriers to keep out
		・Allocate Flagmen to control passengers and traffic
3	Construction vehicle may hit worker	・Keep out of equipment working area
		・Indicate equipment working area by color cone
4	Pedestrian may fall down into excavated area	・Install safety barriers to keep out
		・Allocate Flagmen to control passengers and traffic
		・Install lighting at night
5	Worker may be hit by traffic	・Sufficient working area by controlling traffic
		・Prohibit workers to get out of the working area
6	Traffic vehicle may fall down into excavation area	・Install Safety Barriers
		・Install precaution sign boards for traffic
		・Install lighting at night
7	Underground utilities may be damaged	・Check under ground utilities by trial pits beforehand
		・If there are underground utilities which obstacle the works, consult with the relevant company
8	Over hung cable may be damaged by construction vehicles	・Remind operator of the over hanging cable
		・Install limit indication tape for operator to recognize easily
		・Protect or relocate the cable

82/92 answered.



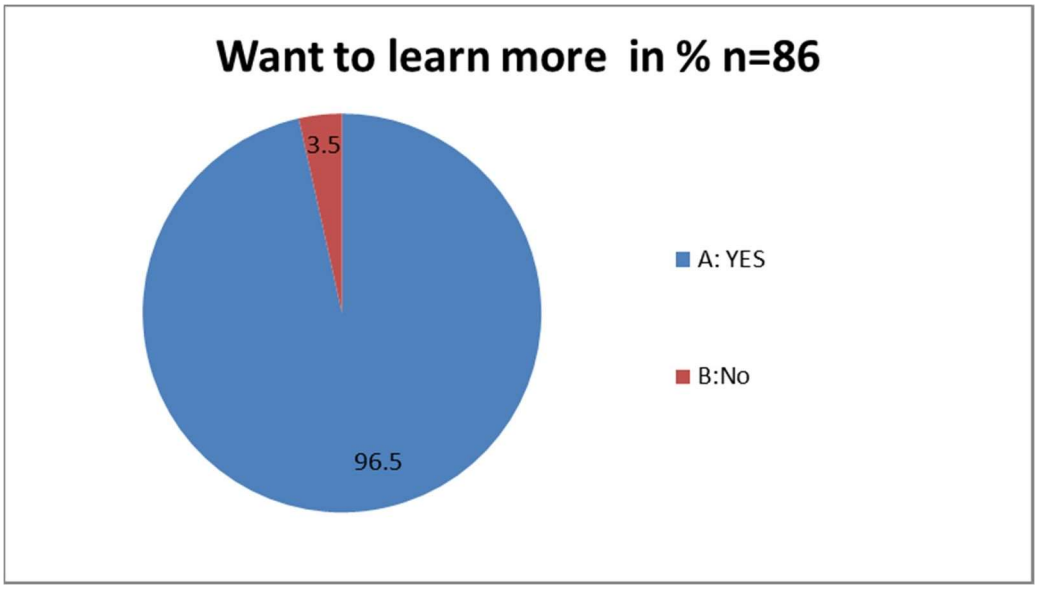
c) Vol. 3 “Prevention of Machine Accidents (Excavator, Crane)”

86/92 answered.



(2) Question II “Do you want to learn more about Safety?”

86/92 answered.



(3) Question III “What subjects about Safety do you want to learn more, or are you interested in?”

Multiple answers are allowed.

No.	Want to learn more about	N
1	Safety Management System and Plan	18
2	Safety of Machine Works	13
3	KY Activity	11
4	All about Safety	8
5	Safety Law	5
6	Safety Materials and Facilities	5
7	Construction Management	5
8	PDCA (KAIZEN)	4
9	5S	4
10	Road Maintenance	3
11	Cost for Safety	1
12	Safety in Electricity Work	1
13	Public Safety	1
14	Fish Bone Method	1
15	First Aid	1

(4) Question IV Please write your opinion about the seminar if any.

90/92 answered. Multiple answers are allowed.

No.	Opinions	N	% of 90
1	Very good seminar, Happy to attend the seminar, Learned a lot on Safety etc.	83	92.2
2	The seminar must be continued, Need more opportunities	43	47.8
3	Time for the seminar was too short	11	12.2
4	The contents are very important	9	10.0
5	Need to promote worker's Safety awareness	5	5.6
6	The manual can be applied to Safety Management	1	
7	Time for KY practice was too short	1	
8	We had little knowledge on Safety	1	
9	Senior staffs need to attend the seminar	1	
10	Encouraged	1	

2. Field Study

2.1 Venue

AACRA Own Force Road Maintenance Project Lot-1 site

2.2 Program

Date : 28th August 2019

Time Schedule actually executed

9:00 Registration

9:30 Safety on Excavator Works

10:30 Safety on Crane Works

11:30 Closing

2.3 Participants

96 persons out of 136 participants who attended the Safety Management Seminar held on 27th August 2019 participated in the Field Study. The attendance sheet signed by the participants is available in ATTACHMENT 3.

2.4 Contents and Results

Safety operations and instruction in using excavator, crane and lifting wire were given according to Safety Check Lists which are available in “Safety Management Manual”.

Equipment used for the Field Study ;

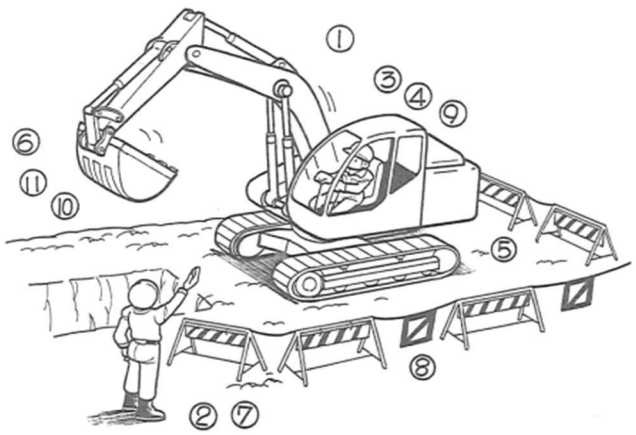
① Excavator : Wheel type , Capacity Safety :1.2 m^3 , Made in Sverige (VOLVO)

② Cab Back Crane : Capacity 8t, Made in China

The contents and the results are shown in the tables below.

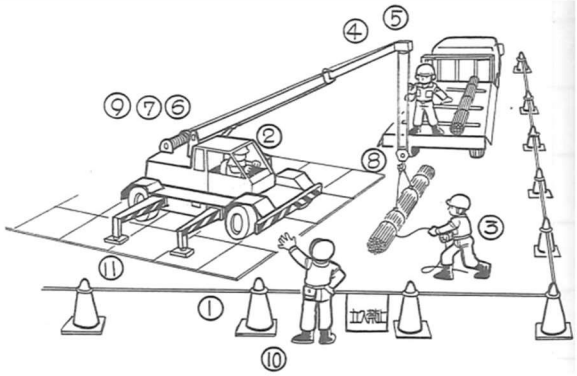
Field Study on Safety Works of Excavator

No	Item	Check Items	Check Result	
			○/×/-	Description
3-1	Common	① Working plan for the equipment is prepared		
		・Name, type and capacity of equipment		
		・Transportation of equipment		
		・Working method and sequence		
		② Equipment check list		
		・Periodical check sheets	△	1.Periodical maintenance regulated by law : Not applicable 2.Periodical maintenance every 250 hours by AACRA: Certificate of maintenance to be issued and kept in the equipment
		・Pre-operation check sheets	△	1. Daily pre-operation check is conducted by operator 2. Records of daily pre-operation check to be kept in the equipment
		③ Allocate flagman and give predetermined sign	-	They understand
		④ Equipment is not used for wrong purposes	△	1. The excavator is equipped with hook for lifting material 2. However, wire stopper was removed from hook 3. The operator understand the capacity of the excavator
		⑤ Qualified operator operate equipment	○	1. The operator is qualified by license
		⑥ No one ride on equipment except side seat	-	They understand
		⑦ Operator turns off engine when leaving equipment	-	They understand
		⑧ Operator remove key when leaving equipment	-	It is recommended that the key is always connected with trousers belt by string
	Excavator	① No one working within turning area of excavator	-	They understand that "Paper and Stone sign" is given each other when entering the equipment working area
		② Keep-out barrier is installed around working area	-	Color Cones are installed around the working area of excavator
		③ No over-hung excavation	-	They understand
		④ Direction of caterpillar is proper when excavating	-	Excavator demonstrated
		⑤ Excavator is working on stable ground	-	They understand



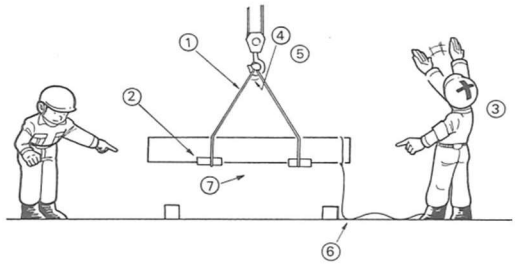
Field Study on Safety Works of Crane

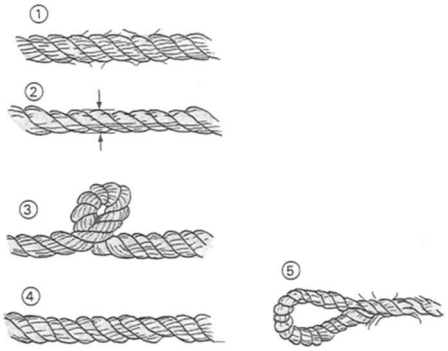
No	Item	Check Items	Check Result	
			○/×/-	Description
3-2	Common	① Working plan for the equipment is prepared		
		・Name, type and capacity of equipment		
		・Transportation of equipment		
		・Working method and sequence		
		② Equipment check list		
		Periodical check sheets	△	1.Periodical maintenance regulated by law : Not applicable 2.Periodical maintenance monthly by AACRA: Certificate of maintenance to be issued and kept in the equipment
		・Pre-operation check sheets	△	1. Daily pre-operation check is conducted by operator 2. Records of daily pre-operation check to be kept in the equipment
		③ Allocate flagman and give predetermined sign	-	They understand
		④ Equipment is not used for wrong purposes	-	
		⑤ Qualified operator operate equipment	○	1. The operator is qualified by license
		⑥ No one ride on equipment except side seat	-	They understand
		⑦ Operator turns off engine when leaving equipment	-	They understand
		⑧ Operator remove key when leaving equipment	-	It is recommended that the key is always connected with trousers belt by string
	Crane	① Working under instruction of working leader	-	They understand
		② Flagman is allocated	-	They understand
		③ Signs are standardized and given properly	×	Signs are not standardized
		④ Capacity of crane is sufficient for the works	○	Operator understand how to check the capacity
		⑤ Equipped with Anti over-winding device working properly	×	1. The care is not equipped with anti-over winding device
		⑥ Equipped with Stopper device on hook	×	1. Wire stopper was broken 2. They understand the necessity of Wire stopper
		⑦ Equipped with Automatic stop device working properly against over loading	×	1. The care is not equipped with Automatic stop device when over loading
		⑧ Outrigger is set on firm ground or steel plate in case of soft ground	×	1. Timber is used for base plate of outrigger 2. Steel plate with more than 10mm thick is to be used
		⑨ Outrigger is fully extended	-	They understand
		⑩ Keep-out barrier is installed around working area	-	Color Cones are installed around the working area of crane
		⑪ No one is under lifted material	-	They understand
		⑫ Maximum capacity is indicated	×	1. Capacity is not indicated 2. Weight of hook is not indicated



Field Study on Safety Works of Lifting Wire

No	Item	Check Items	Check Result	
			○/×/-	Description
3-3	Wiring for lift	① Type and size of wire are appropriate		Lifting material practice was not done
		② Use soft material such as rubber between wire and material at sharp angle		
		③ Qualified person prepare wiring for lift		
		④ Lifting angle of wire is less than 60 degree		
		⑤ Single wire is not used for lifting material		
		⑥ Leading rope is used when lifting long materials		
		⑦ Checking stability of materials when lifting up from the ground		
	Steel Wire	① More than 10% of element wires are not broken	×	Elements of wire are broken
		② Diameter of wire is not reduced more than 7%	×	Deformed
		③ Wire is not twisted	×	Twisted intentionally
		④ Wire is not seriously deformed and rusted	×	Deformed seriously at hook
		⑤ Wire at hook is not seriously deformed and broken	×	Connection of wire is not sufficient





3. Summary

3.1 Safety Management Seminar

(1) Participants

Participants consist mainly of Civil Engineers 32%, Material Inspectors 18% and Forman 18% which covers approximately 70% of total participants. Participants under 29 years old cover 66% of total participants, and Participants who have experience of less than 9 years cover 80% of total participants.

(2) Degree of understanding

Most of participants answered " Understand very well", and few participants answered "Understand a little" or "Not understand at all" in questionnaires. Degree of understanding in Vol.1 : "The Guidance for the Management of Safety for Construction Works in Japanese ODA Projects" is relatively low in comparison with the other subjects,

(3) Motivation

Most of all (97%) answered "want to learn more about Safety". It reveals that they have very high motivation.

(4) Interesting subjects

Subjects which participants are more interested in are Safety Management System and Plan, Safety of Machine Work, KY activity, Safety Law, Safety Facilities and Materials, PDCA(KAIZEN) and 5S in this order.

(5) Opinions

Most of all (92%) are satisfied with the seminar. On the other hand, approximately 50% of participants consider the necessity of continuous seminar. It is considered that the time of the seminar might have been too short for them to deepen their understanding.
It is interesting that a participant has an opinion that more senior officers should have the seminar.

3.2 Field Study

In the field study, equipment was used for practical training on Safety Machine Work according to Safety Check List.
"Seeing is believing". The practical training deepened their understandings.
In addition, there found much to be desired to improve machine safety as the results of the field study.

4. Considerations

It is told that Ethiopian people values “Safety (Human Life)”.

However, it seems that they are still seeking how to establish “Safety” systematically in construction works.

Observing their dedication in the seminar, I believe that the seminar will be a cue to establish their own Culture of Safety.

ATTACHMENT 1 :

Program

THE PROJECT FOR UPGRADING ROAD MAINTENANCE EQUIPMENT
IN ADDIS ABABA CITY
IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

Safety Management Seminar

Program

1st day: 27th August, 2019

8:30- 9:00	Registration
9:00- 9:15	Opening Address by Eng. Moges Tibebu Director General Addis Ababa City Roads Authority Opening Address by Mr. Takeshi Matsuyama Senior Representative JICA Ethiopia Office
9:15-10:30	Safety Seminar Vol.1-1 "The Guidance for the Management of Safety for Construction Works in Japanese ODA Projects" Presenter: Koji MASUDA
10:30- 10:40	Break
10:40- 12:00	Safety Seminar Vol.1-2
12:00- 13:00	Lunch Break
13:00- 13:50	Safety Seminar Vol.2 "Exercise KY" in group works Presenter: Koji MASUDA
13:50-14:00	Break
14:00-15:10	Safety Seminar Vol.3 "Prevention of Machine Accidents (Excavator, Crane)" Presenter: Koji MASUDA
15:10-15:25	Discussions
15:25-15:30	Closing Address

2nd day: 28st August, 2019

9:30-12:00	Field Exercise Demonstration with Construction Equipment Safety Measures Discussions, etc.

Prepared by YACHIYO ENGINEERING CO., LTD., JAPAN

ATTACHMENT 2 :

Participants Divided according to Department of AACRA

Safety Management Seminar (2019.08.27-28) Participants

No	Division	Department	No	Name	Position
1	Engineering Operation	1. Own Force Road Maintenance Directorate	1	Getachew Molla	Electrician
			2	Anwar Husen	Electrician
			3	Geto Gebre	Electrician
			4	Elyas Alemu	Construction Foreman
			5	Solomon Tsegaye	Electrician
		2. Own Force Road Maintenance Project Lot-1	1	Hailu Gobeze	Foreman
			2	Emnet Tasew	Foreman
			3	Simon Getachew	Civil Engineer
			4	Zelalem Tesfaye	Junior Civil Engineer
			5	Mesfin Endale	Foreman
			6	Lamesgin Eliyas	Junior Civil Engineer
			7	Ermiyas asfaw	Material Inspector
			8	Ayele Endashaw	Material Inspector
			9	Demise Derese	Material Inspector
			10	Tonja tolba	Machinery assistance
			11	G/tsadikan G/silasse	Data collector
			12	Ermiya Aschalew	Material Inspector
			13	Mesfin Asefa	Construction Foreman
			14	Kasahun Abere	Data collector
			15	Alemayehu Sintayehu	Material Inspector
			16	Wubitu Admasu	Construction Foreman
			17	Haregewoin Tesema	Construction Foreman
			18	Meseret Mare	Labour work
			19	Habtamu Chewaka	Building work
			20	Hailemariam Bekele	
			21	Yitbarek Zerihun	
			22	Tesfa Gebriel Tsega	
			23	Efrem Tadese	
			24	Eshetu Deme	
			25	Solomon Tesfaye	
			26	Daniel workineh	
			27	Teshager Gedamu	
			28	Solomon Mamo	
			29	Abebaw Alemneh	
			30	Kirubel Bekele	
			32	Hinsenu Lema	
			33	Shewangizaw G/michel	
			34	Abiy Feredenigus	
			35	Ermiyas Solomon	
			36	Halima Tesfahun	
			37	Seid Mola	
			38	Nebiyu Daniel	
			39	Minishu Beka	Team leader

Safety Management Seminar (2019.08.27-28) Participants

No	Division	Department	No	Name	Position
		3. Own Force Road Maintenance Project Lot-2	1	Biruk Hiruy	Construction Foreman
			2	Tekeste Amera	Construction Foreman
			3	Yohenes Gonfa	Structural Forman
			4	Ashenafi Benti	Material Inspector
			5	Tewodros Zebene	Junior Civil engineer
			6	Hailemariam Abate	Junior Civil engineer
			7	Nigatu Alemu	Construction Foreman
			8	Adis Birhanu	Material Inspector
			9	Mohammednur Shermole	Data collector
			10	Bilisuma Beyecha	Junior Civil engineer
			11	Getnet Desalegn	Material Inspector
			12	Girma Negash	Director
		4. Machinery supply, Maintenance and Administration Directorate	1	Hailemeskel Chala	Equipment maint. Team leader
			2	Moges Dereje	Mechanical eng.
			3	Habtamu Kebede	Mechanical eng
			4	Semere Desalegn	Equipment maintenance Forman
			5	Yehenew Getenet	Equipment maintenance Forman
			6	Tesfaw Gobena	Plant maintenance Forman
			7	Yared Seyum	Equipment admn. A/team leader
			8	Tadele Mekonnen	
			9	Getahun Asefa	
			10	Biruk Fikru	
			11	Mikiyas abera	
			12	Meaza Girma	
			13	Sosina Mersha	

Safety Management Seminar (2019.08.27-28) Participants

No	Division	Department	No	Name	Position
		5. Own Force Road Construction Directorate	1	Matnael Endalemahu	Team leader
			2	Semira Jemal	Junior Civil engineer
			3	Abraham Amare	Junior Civil engineer
			4	Zebene Ababu	Junior Civil engineer
			5	Mulugeta Gebre	Junior Civil engineer
			6	Hirut Mengesha	
			7	Dawit Tsegaye	
			8	Tesfaye Asnake	
		6. Own Force Road Construction Directorate lot-1	1	Solomon Tefera	Mechanical Engineer
			2	Mesfin Kebede	Equip.Adm.& Maint.Team Leader
			3	Kasahun Yitayih	Civil Engineer
			4	Henok Denekew	Civil Engineer
			5	Kebede Matiwos	Civil Engineer
			6	Solomon Birhane	Civil Engineer
			7	Meles Hailu	Civil Engineer
			8	Mohammed Worku	Civil Engineer
			9	Kidus Melaku	Civil Engineer
		7. Own Force Road Construction Directorate lot-2	1	Adissu Yergu	Project Manager
			2	Melaku Muniye	Engineering service Team Leader
			3	Tekuam Berhane	Work Execution Team Leader
			4	Tesfaye arega	Equip. Maintenance Team Leader
			5	Fesha Sebehat	Mechanic
			6	Mulatu Lema	Mechanical Engineer
			7	Samuel Abera	Site Engineer
			8	Sintayehu Amare	Site Engineer
			9	Bekele Tilahun	
		8. Own Force Road Construction Directorate lot-3	1	Worku Asres	
			2	Mulugeta yemanebirhan	
			3	Wasihun Yimer	
			4	Biruk Mamo	
			5	Zewdu Ayele	
			6	Ayele mihret	
			7	Menor Tefera	
			8	Adugna Tufa	
			9	Debesay Deme	
		9. Own Force Road Construction Directorate lot-4	1	Behaylu Lisanu	Construction Foreman
			2	Emawayish Mulugeta	Structural Foreman
			3	Michel Mulugeta	Structural Foreman
			4	Tesfaye Asnake	Construction foreman
			5	Kaleab Goremes	Structural Foreman
		10. Occupational Health & safety Team	1	Belina Tamiru	Senior Occupational Health & Safety Expert
		11.Construction Input Production & Supply Project Directorate	1	Tajuden Kasaye	
			2	Asmamaw Alemayehu	
			3	Hailu Kifle	

Safety Management Seminar (2019.08.27-28) Participants

No	Division	Department	No	Name	Position
2	Engineering Regulatory	12.Research, Technology Transfer and Laboratory Directorate	1	Samuel Ambaw	Junior Civil Engineer IX
			2	Meles Wudineh	Technician VIII
			3	Erimias Abate	Technician VIII
		13. Road Con. & Main. Design Revision Implementation Directorate	1	Milate Silasse Ayele	Surveyor
			2	Mahilet Worash	Surveyor
3	Road Asset Administration	14.Road Asset Data Base Mgt Directorate	1	Abel Wube	Civil Engineer
			2	Yihenew Getachew	Senior GIS Expert
		15.South A.A Road Asset Directorate	1	Hafetom Lijalem	Junior Civil Engineer
			2	Girma Shewa	Junior Civil Engineer
		16.North A.A Road Asset Mgt Directorate	1	Biniyam Wendimkun	Material Inspector
			2	Fikadu Kidanemariyam	Material Inspector
			3	Mulualem Shiferaw	Material Inspector
		17.Central A.A Road Asset Mgt Directorate	1	Tewodros Dessie	Material Inspector
			2	Abdurazak Shafi	Material Inspector
			3	Mensur Megersa	Material Inspector
		18.East A.A Road Asset Mgt Directorate	1	Kidane Beyene	Material Inspector
			2	Erkyhun Lemma	Material Inspector
			3	Frealem Lemma	Civil Engineer
		19.West A.A Road Asset Mgt Directorate	1	Adonay T/haymanot	Junior Civil Engineer
4	General Director	20.Quality Assurance Safety Inspection Directorate	1	Israel Wubishet	Civil Engineer
			2	Ayantu Mitiku	Junior Civil Engineer
5	Support	21.Human Resource and Facility Management Directorate	1	Hulumyifer Zemete	HR Adm. Team leader
		22. Communication Affairs Directorate	1	Getnet Tsegaye	
			2	Mengistu Yayeh	
			3	Workliul abrar	
			4	Eyob Bekele	

ATTACHMENT 3 :

Attendance Sheets Signed by participants

Safety Management Seminar (2019.08.27-28) Participants Attendance

No	Name	Department	21/12/2011 E.C		22/12/2011	Remark
			Morning	Afternoon	Morning	
1	Mulatu Lemma	lot 7 - 2 Rd (Construction)				
2	Hailemariam Bekele	LM-1 (Maintenance)				
3	Abebaywork Alebe	JICA				
4	Tefera eAsnake	[illegible]				
5	HAILU [illegible]	AACRA [illegible]				
6	EMMET TASEW	AACRA lot 1 [illegible]				
7	Lamesgn Elias	AACR Lot 1 Mentenance				
8	KIDANE BEYENE	AACRA WEST Roadasset				
9	ERKYHUN LEMMA	AACRA " "				
10	Frealem Lemma	" " "				
11	Yitbarek Zerihun	AACRA Road Mainten				
12	Ashenafi Benti	AACRA Road main				
13	Yihenew Getnet	AACRA [illegible]				
14	Zelalem Tesfay	AACRA Maintenance				
15	Mohammed Worku	AACRA Road con lot-1				
16	Solomon Tefera	lot 1 project office				
17	TEWODROS DESSIE	AARA Road cd lot [illegible]				
18	Solomon Tsegu	" [illegible]				
19	Michael Mulugeta	Lot 4 Structure Forman				
20	Addis Birhan	lot 2 matrial [illegible]				
21	Melaku Monze	Lot 2 Road Construction				

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(2) 2/7

Safety Management Seminar (2019.08.27-28) Participants Attendance

No	Name	Department	21/12/2011 E.C		22/12/2011	Remark
			Morning	Afternoon	Morning	
1	Tadele makonnen	[illegible]	[signature]	[signature]	[signature]	
2	Gezahun Assfa	"	[signature]	[signature]	[signature]	
3	Bekele Tilahun	[illegible]	[signature]	[signature]	[signature]	
4	[illegible]	"	[signature]	[signature]	[signature]	
5	Fisseha SEBHAT	[illegible]	[signature]	[signature]	[signature]	
6	Mesfin ENDAL	[illegible]	[signature]	[signature]	[signature]	
7	Muluken Yemanebrehan	[illegible]	[signature]	[signature]	[signature]	
8	Washiun Yimer	[illegible]	[signature]	[signature]	[signature]	
9	Zebene Abebu	[illegible]	[signature]	[signature]	[signature]	
10	Mulugeta Gebre	Own Force Road construction	[signature]	[signature]	[signature]	
11 / [illegible]	[illegible]	[illegible]	[signature]	[signature]	[signature]	
12 / 15	Kebede Mathewos	[illegible]	[signature]	[signature]	[signature]	
13 / 16	KIDUS MELAKU	" "	[signature]	[signature]	[signature]	
14 / 17	[illegible] Berere	[illegible]	[signature]	[signature]		
15 / 18	Moges Derese	[illegible]	[signature]	[signature]	[signature]	
16 / 19	Semere Dessalegn	[illegible]	[signature]	[signature]		
17 / 20	Tesfamichael Bela	[illegible]	[signature]	[signature]		
18 / 21	Menot Dereke	[illegible]	[signature]	[signature]	[signature]	
19 / 22	Efrak MAMO	[illegible]	[signature]	[signature]	[signature]	
20 / 23	Tesfaye Hreza	" " project Equipment	[signature]	[signature]	[signature]	
21 / 24	Mulualem Shiferaw	[illegible]	[signature]	[signature]	[signature]	

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③ 3/7

Safety Management Seminar (2019.08.27-28) Participants Attendance

No	Name	Department	21/12/2011 E.C Morning	21/12/2011 E.C Afternoon	22/12/2011 Morning	Remark
1	Zeudu Ayele	[illegible]	(signed)	(signed)	(signed)	
2	Ephrem Tadesse	[illegible]	(signed)	(signed)	(signed)	
3	Ayele Endeshaw	[illegible]	(signed)	(signed)	(signed)	
4	Elmias Solomon.	" "	(signed)	(signed)	(signed)	
5	Samuel Abera	[illegible]	(signed)	(signed)		
6	Israel [illegible]	Quality Assurance	(signed)	(signed)	(signed)	
7	Semira Jemal	[illegible]	(signed)	(signed)	(signed)	
8	Ayele Mihret	[illegible]	(signed)	(signed)		
9	Tonjo Tolba	[illegible]	(signed)	(signed)	(signed)	
10	Eshetu Deme	[illegible]	(signed)	(signed)	(signed)	
11	Melesse Hailu	lot one / Road cost.	(signed)	(signed)	(signed)	
12	Ermiyas Aschale	lot one (mentenence)	(signed)	(signed)		
13	Abdurazak Shifa	Central Road Asset.	(signed)	(signed)	(signed)	
14	Solomon Tosduko	[illegible]	(signed)	(signed)		
15	Getnet Tsegaye	Communication	(signed)	(signed)		
16	Habtamu Kebede	[illegible]	(signed)	(signed)	(signed)	
17	Kassahun Yitayih	[illegible] -1	(signed)	(signed)	(signed)	
18	Mengistu [illegible]	[illegible]	(signed)	(signed)		
19	Abrham Amare	[illegible]	(signed)	(signed)	(signed)	
20	Biniyam wendmkun	[illegible]	(signed)	(signed)	(signed)	
21	[illegible] Kebede	AACRA HRD	(signed)	(signed)		

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Safety Management Seminar (2019.08.27-28) Participants Attendance

No	Name	Department	21/12/2011 E.C		22/12/2011	Remark
			Morning	Afternoon	Morning	
1	Werkinel Abrie	Communication	[signed]	[signed]		
2	DANIEL WORKOK	[illegible]	[signed]			
3	GETNET DESALGNE	[illegible] lot 2	[signed]	[signed]	[signed]	
4	Merese Mulneh	Labratory	[signed]	[signed]		
5	Solomon Birhane	Road construction lot-1	[signed]	[signed]	[signed]	
6	Beline Tamiru	Operator	[signed]	[signed]	[signed]	
7	Mensur Megersa	Road Asset	[signed]	[signed]	[signed]	
8	Fikadu Kmorikem	Road Asset	[signed]	[signed]	[signed]	
9	Menor Tefera	Road construction lot1	[signed]	[signed]	[signed]	
10	Adugna Tufa	Road Cons/lot1	[signed]	[signed]	[signed]	
11	Getachew Molla	Road Managment	[signed]	[signed]	[signed]	
12	Tessaw Gobena	mentenance dep-	[signed]	[signed]	[signed]	
13	Nigatu Alemu	Mantence (lot 2)	[signed]	[signed]		
14	Simon Getachew	Maintenance (lot 1) Control Eng	[signed]	[signed]		
15	Teshager Gudam	Road maintenance lot 1	[signed]			
16	Solomon Mamo	Road maintenance MT	[signed]	[signed]	[signed]	
17	Ayantu Mitiku	Quality Assurance		[signed]		
18	TAJUDEEN KASSAYE SEID	[illegible]	[signed]	[signed]		
19	[illegible]	[illegible]	[signed]	[signed]	[signed]	
20	[illegible]	[illegible]	[signed]	[signed]	[signed]	
21	[illegible]	[illegible]	[signed]	[signed]		

Safety Management Seminar (2019.08.27-28) Participants Attendance

No	Name	Department	21/12/2011 E.C		22/12/2011	Remark
			Morning	Afternoon	Morning	
1	Kassahun Abebe	Data [illegible]	[signature]	[signature]	[signature]	
2	Mesfin Asefa	Asphalt mintenance	[signature]	[signature]	[signature]	
3	Wubeu Ademsu	[illegible] 1	[signature]	[signature]	[signature]	
4	Kaleab Goremis	[illegible] 10 & 4	[signature]	[signature]	[signature]	
5	Emawayis Mulugeta	lot 4	[signature]	[signature]	[signature]	
6	Biruk Fikru Alemu	[illegible] mantenance Team	[signature]	[signature]	[signature]	
7	Yihenew Getachew Admassu	RAM & PB	[signature]	[signature]		
8	Addisu Yirgu	HARRA lot-2 PM	[signature]			
9	Yohannes Gonfa	Gelawe	[signature]	[signature]	[signature]	
10	Tekeste Amon	mantenance lot 2	[signature]	[signature]	[signature]	
11	Girma Shema	South RAM	[signature]	[signature]	[signature]	
12	Bilisuma Beyecha	Road Maintenance	[signature]	[signature]	[signature]	
13	Amikas Abate	Labratori	[signature]	[signature]		
14	Burma Alesoth	Road maintenance	[signature]			
15	Elias Alemu	" "	[signature]	[signature]	[signature]	
16	Milaete Selasei Ateu	Di [illegible]	[signature]	[signature]	[signature]	
17	Halima Tesfahun	Road mentenance	[signature]	[signature]	[signature]	
18	Seid Muluwe	Road mantenance	[signature]	[signature]		
19	Alebjau Daniel	Rodde mentenance	[signature]	[signature]	[signature]	
20	Haregwoin Tessema	Rodde mentenance	[signature]	[signature]	[signature]	
21	Minyishu Beka	lot-1 maintenance	[signature]	[signature]	[signature]	

Safety Management Seminar (2019.08.27-28) Participants Attendance

No	Name	Department	21/12/2011 E.C Morning	21/12/2011 E.C Afternoon	22/12/2011 Morning	Remark
1 ~~25~~	Alemayehu Sentayehu	[illegible]	[signature]	[signature]	[signature]	[signature]
2 ~~26~~	Getu Gebre	[illegible]	[signature]	[signature]	[signature]	[signature]
3 ~~27~~	Yared Seyoum	[illegible]	[signature]	[signature]	[signature]	
4 ~~28~~	Kirubel Kebede	[illegible]	[signature]	[signature]	[signature]	
5 ~~29~~	Tekuam Birhane	Enforce Road Constr	[signature]	[signature]	[signature]	
6 ~~30~~	Tewodros Kebene	[illegible]	[signature]	[signature]	[signature]	
7 ~~31~~	Habtamu Chemeke	Diverse Maintenance Lot I	[signature]	[signature]	[signature]	
8 ~~32~~	MOHAMMEDNUR Shamalo	Maintenance Lot 2	[signature]	[signature]	[signature]	
9 ~~33~~	Haylom Ljalem	[illegible] RAM	[signature]	[signature]	[signature]	
10 ~~34~~	Mingizat Abera	[illegible]	[signature]	[signature]		
11 ~~35~~	H/mariam Abebe	Maintenance L-2	[signature]	[signature]	[signature]	
12 ~~36~~	Hussamu Lamma	Road maintenance	[signature]	[signature]	[signature]	
13	Shewangizaw G/Michael	ACRA	[signature]	[signature]	[signature]	
14	Abiy Feredenifus	Maintenance	[signature]			

Safety Management Seminar (2019.08.27-28) Participants Attendance

No	Name	Department	21/12/2011 E.C		22/12/2011	Remark
			Morning	Afternoon	Morning	
1	Sintayehu Amare	Construction Lot-2				
2	Anwar Hussien	[illegible]				
3	[illegible]	[illegible]				
4	[illegible]	[illegible]				
5	Almaz Alemayehu	[illegible]				
6	[illegible]	[illegible]				
7	[illegible]	[illegible]				
8	[illegible]	[illegible]				
9	[illegible]	[illegible]				
10	[illegible]	[illegible]				
11	[illegible]	[illegible]				
12	[illegible]	[illegible]				
13	[illegible]	[illegible]				
14	[illegible]	[illegible]				
15	[illegible]	[illegible]				
16	Samuel Ambaw	[illegible]				
17	Adonay T/mariam	[illegible]				

ATTACHMENT 4 :

Photos

Photo(1/2)

【Safety Management Seminar 27th August 2019】

Photo1：Opening Address by AACRA

Photo2：Opening Address by JICA Ethiopia Office

Photo3：Safety Management Seminar①

Photo4：Safety Management Seminar②

Photo 5：KY Exercise Group Work

Photo 6： Presentation of KY Exercise

Photo（2/2）

【Field Study 28th August 2019】

Photo 7： Meeting before Field Study

Photo 8：Safety on Excavator Works①

Photo 9：Safety on Excavator Works②

Photo 10：Safety on Crane Works①

Photo 11：Safety on Crane Works②

Photo 12：Safety on Crane Works③