2. 新規訓練コースのカリキュラム内容(合同調整委員会配布資料:英語版)

The Project for Capacity Building of the ALEMGENA Training and Testing Center of ERA

Joint Coordinating Committee No.1

Date : 24th February 2003 Venue : ERA Head Quarter

Agenda	а
--------	---

Agenda	
10:00 - 10:05	Welcome address by Mr Tesfamichael Nahusenay, General Manager, ERA
10:05 - 10:20	Objectives of The Project for Capacity Building of the ALEMGENA Training and Testing Center of ERA and Joint Coordinating Committee, and Progress of the project from the commencement to date by Hailu Chekun, Training and Testing Chief
10:20 - 11:00	Plan for the 2nd year of the Project - Training program, course schedule - Budget by Hailu Chekun, Training and Testing Chief by Japanese Experts
11:00 - 11:50	Discussion
11:50 - 12:00	Address by Mr. Junsaku Koizumi, the Leader of the Management Consultation Team





CONTENTS

- I Summary
 - 1. Summary of the Project
 - 2. Annual Training Plan
 - 3. Training Material
 - 4. Project Operation Schedule (4years)
 - 5. Monitoring Sheet

II Road Construction Equipment Management and Operation Course

- 1. Summary of Project Operation Schedule
- 2. Curriculum
 - 2-1 Dozer
 - 2-2 Loader
 - 2-3 Excavator
 - 2-4 Motor Grader
 - 2-5 Dump Truck
- 3. Lesson Plan
 - 3-1 Dozer
 - 3-2 Loader
 - 3-3 Excavator
 - 3-4 Motor Grader
 - 3-5 Dump Truck

III Road Construction Equipment Mechanics Course

- 1. Summary of Project Operation Schedule
- 2. Curriculum
- 3. Syllabus

IV Road Construction and Maintenance Supervision Course

- 1. Summary of Project Operation Schedule
- 2. Target Group
- 3. Curriculum
 - 3-1 Construction/Maintenance Superintendent I
 - 3-2 Construction/Maintenance Superintendent II
 - 3-3 Associate Engineer IV
 - 3-4 Associate Engineer V
 - 3-5 Associate Engineer VI
- 4. Syllabus
 - 4-1 Maintenance Superintendent I
 - 4-2 Maintenance Superintendent II
 - 4-3 Associate Engineer IV
 - 4-4 Associate Engineer V
 - 4-5 Associate Engineer VI

ANNEX Joint Coordinating Committee (Excerpt from Record of Discussion, 2001)

I Summary

- 1. Summary of the Project
- 2. Annual Training Plan
- 3. Training Material
- 4. Project Operation Schedule (Four Years)
- 5. Monitoring Sheet

The Project for Capacity Building of

the Alemgena Training and Testing Center of ERA

January 01, 2003

1. Project Goal etc.

(1) Goal

1) Project Purpose

The Project purpose is to enable the Alemgena Training and Testing Center of ERA (ATTC) to provide the target group (operators, mechanics, and supervisors) with proper training of MCM (Mechanized Construction Methods). A comparison of the present results of training at ATTC and the projected increase when the project goal achieved shows that the annual number of graduates can be expected to increase approximately three times.

2) Overall Goal

The overall goal is to strengthen qualitatively and quantitatively the Ethiopian human capacity of mechanized road construction and maintenance.

3) Ultimate Goal of Project, etc

The ultimate goal of the project is to facilitate Ethiopian Government's Road Sector Development Program (RSDP) made possible in cooperation with IDA, Japan, EU and other donors since September 1997 to improve the existing deteriorated road condition of the country. Even after completion of the RSDP, roads can continue to be maintained. Furthermore, increased

employment opportunities in the road construction field can be expected.

(2) Training Courses

Established in 1956 in cooperation with USAID, ATTC has since engaged in the training of ERA staff and staff of other organizations to become engineers and technicians who can carry out road construction and maintenance using present facilities and equipment. However, it is facing problems in upgrading its aged equipment, and offering re-training opportunities to its trainers so that they can keep up with the latest equipment operating and maintenance technology and modern construction management methods.

This Project aims to urgently develop human resources required for road construction, such as both qualitatively and quantitatively insufficient engineers and skill workers who bear the road construction work and the road maintenance work, by renewing training equipment and machinery which are granted by Japan, and by technical transfer to its trainers from the Japanese experts with a focus on operation and maintenance of the latest construction equipment and contract management of road construction and maintenance works, and further transfer from re-trained trainers to their trainees.

1) Road Construction Equipment Management and Operation Course (Equipment Operator Training)

ATTC is expected to train 2,000 equipment operator helpers who work in ERA, Regional Road Agencies (RRA), and private companies to become equipment operators, thus expanding "quantity", and re-train approximately 3,900 equipment operators in order to improve "quality" for meeting new machine operation and management requirements.

Dump truck operator course, bulldozer operator course, excavator operator course, motor grader operator course, loader operator course and roller operator course will be established.

2) Road Construction Equipment Mechanics Course (Equipment Mechanic Training)

There is a large need to train and re-train equipment mechanics who can appropriately maintain equipment and improve equipment operational efficiency (an estimated 20% the number of equipment operators are required). To meet this requirement, ATTC plans to update and enhance the current training course.

Beginning course, advanced course and management course will be established.

3) Road Construction and Maintenance Supervision of MCM Course (Supervisor Training)

As a policy of the Ethiopian government, road construction and maintenance will switch from a "direct management construction" to a "contracted construction". So supervisors will be required mainly for contract management. At least 3 supervisors per each construction site will qualify for the training and will be trained, which will be an upgrade and enhancement of the current course.

2. Number of graduates during project

Number of graduates during project

		<u> </u>				
	Year	2002	2003	2004	2005	2006
Project period	4 years		Projec	t Durat	ion	
Number of graduates	Annual numbers of graduates	Cum	ulative	numbe	r of gra	duates
	523	0	523	1,046	1,569	1,700
Equipment operators	315	0	315	630	945	1.024
Dump truck	(90)	(0)	(90)	(180)	(270)	(294)
Bulldozer	(45)	(0)	(45)	(90)	(135)	(146)
Excavator	(45)	(0)	(45)	(90)	(135)	(146)
Motor grader	(45)	(0)	(45)	(90)	(135)	(146)
Loader	(45)	(0)	(45)	(90)	(135)	(146)

Roller	(45)	(0)	(45)	(90)	(135)	(146)
Equipment Mechanic	136	0	136	272	408	442
Beginning course	(48)	(0)	(48)	(96)	(144)	(156)
Advanced course	(48)	(0)	(48)	(96)	(144)	(156)
Management course	(40)	(0)	(40)	(80)	(120)	(130)
Supervisor	72	(0)	72	144	216	234

3. Background

Roads and bridges in Ethiopia have deteriorated due to long civil wars and lack of maintenance. This is greatly hindering economic and social development, and particularly the transportation of goods, which is important in improving production efficiency in the agricultural sector. The bad roads conditions also adversely affected the progress of the Poverty Reduction Program

The Ethiopian Government has taken road sector improvement as one of its priority issues, and launched the Road Sector Development Program (RSDP) for 1997 to 2007) with support from International Development Association (IDA) and other donors. The program planned to improve federal roads in two stages: 4,192 kilometers in RSDP (I) from 1997 to 2002, and 9,774 kilometers in RSDP (II) from 2002 to 2007.

However, engineers and technicians who can take on road construction and maintenance work required to carry out this road development program are insufficient both quantitatively and qualitatively. The shortage particularly of equipment operators, equipment mechanics and supervisors, who will oversee the construction work, is a serious problem.

In response to sector needs the ERA has decided to strengthen the training capacity of the country's sole vocational training institute for mechanized construction methods (MCM), the Alemgena Training and Testing Center (ATTC), as a part of the RSDP, and urgently increase the necessary man power.

Number of graduates of ATTC

Number of graduate	3 01 /11			
Ethiopia Fiscal Year	FY1998	FY1999	FY2000	FYAverage
Training Course		,		
Road Construction Equipment Management	48	74	35	52
and Operation				
Road Construction Equipment Mechanics	45	57	61	54
Road Construction and Maintenance	45	18	96	53
Supervision of MCM				
Total	138	149	192	159

Source: JICA

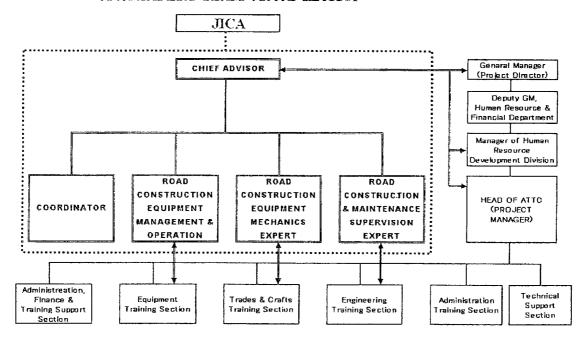
Courses relevant to the Project have been extracted

4. Organization Structure for Implementation

Ethiopian Roads Authorities, Alemgena Training and Testing Center (ATTC)

Project Director: General Manager of Ethiopian Roads Authority Project Manager: Head of Alemgena Training and Testing Center

JICA EXPERT TEAM ORGANIZATION



5. Input of Ethiopian Side

Counterparts and instructors, etc.
Land, buildings and facilities
Workshop, Laboratory
Running expenses

6. Input of Japanese side

0.3

Provision of Equipment About \$billion Yen (JFY 2001)

Road construction Equipment, Training Machines and tools, and teaching aid materials

Experts: 5 Long Term Experts

Chie adviser, Coordinator

Road Construction Equipment Management and Operation

Road Construction Equipment Mechanics

Road Construction and Maintenance Supervision of Mechanized

Construction Methods

Training Ethiopian Counterpart in Japan

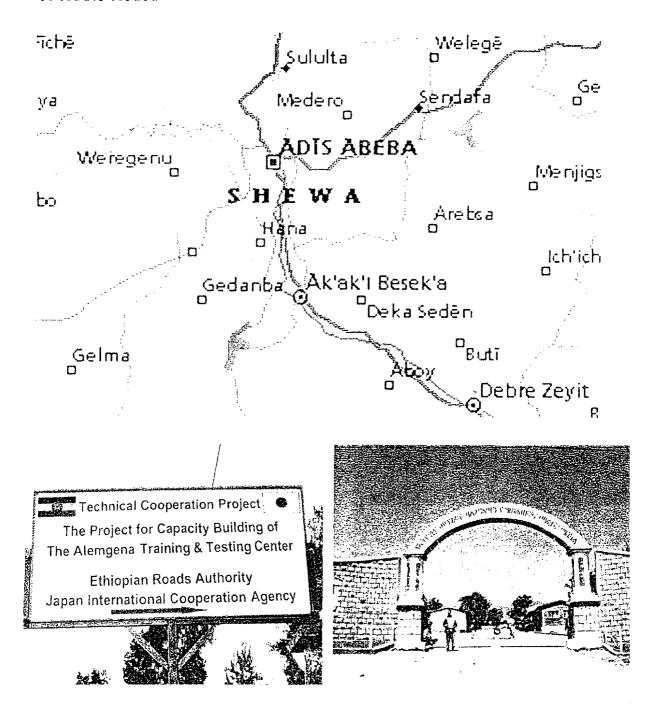


7. Term of the Project

April 1, 2002 (Monday) to March 31, 2006 (Friday)

8. Project Site

Alemgena Training and Testing Center, which is located in the suburbs, 20km of southwest of Addis Ababa



Annual Training Plan (2nd year)

Road Construction Equipment Management and Operation Course

Course Title	No. of Trainee	Duration	Remarks
		$01/04/03 \sim 30/05/03$	1 Dozer
Bulldozer	5 (15/year)	$01/09/03 \sim 31/10/03$	
		$01/12/03 \sim 30/01/04$	
		$01/04/03 \sim 30/05/03$	2 HEs
Excavator	10 (30/year)	$01/09/03 \sim 31/10/03$	
		$01/12/03 \sim 30/01/04$	<u> </u>
		$01/04/03 \sim 30/05/03$	2 WLs
Wheel Loader	10 (30/year)	$01/09/03 \sim 31/10/03$	
		$01/12/03 \sim 30/01/04$	
		$01/04/03 \sim 30/06/03$	2 MGs
Motor Grader	10 (30/year)	$01/09/03 \sim 28/11/03$	<u> </u>
		$01/01/04 \sim 31/03/04$	
		$01/05/03 \sim 31/05/03$	1 DTs
Dump Truck	10 (40/year)	$01/10/03 \sim 31/10/03$	
Dump Truck	10 (10/ year)	$01/01/04 \sim 31/01/04$	
······································		$01/03/04 \sim 31/03/04$	ļ
Total	145/year		

Road Construction Equipment Mechanics Course

Course Title	No. of Trainee	Duration	Remarks
		07/04/03~27/06/03	
Technician	24 (72/yaer)	04/08/03~17/10/03	
		01/12/03~20/02/04	
		02/06/03~25/07/03	
Specialist	12 (36/year)	06/10/03~28/11/03	
		02/02/04~26/03/04	
		04/08/03~22/08/03	
Management	10 (30/year)	01/12/03~19/12/03	
		01/03/04~19/03/04	
Total	138/year		

Road Construction and Maintenance Supervision of MCM Course

Course Title	No. of Trainee	Duration	Remarks
		01/04/03~04/06/03	
Supervisor	20 (80/year)	01/07/03~28/08/03	
Supervisor	20 (80/ year)	30/09/03~29/11/03	
		29/12/03~26/02/04	
Total	80/year		

ANNUAL TRAINING PLAN(2nd year)

	APR		MΑ	14		N	JU		AUG		SEP		OCT		NOV		DE(اخ			[‡] EB		MAR
	FIM	L	FIV	1 L	F \	1 L	FIM	l L	F M	LF	M	LF	М	L. F	<u> </u>	L	F M		FIN	1	F	Mil	. F	М
ad Construction	Fauinn	ent	Man.	agem	ent a	nd O	nerati	on C	Course															
		1	1									(B2)					i I I	(B	3)			-		
Bulldozer (B)		(B1) 	+				1				(02)	-			-	-			-	-			
								<u> </u>																
		(E1)			į				İ		(E2)						(E	3)					
Excavator (E)		-	1	1						Accession to						-			_	-	-			
		 		_	<u> </u>	-		+	 			-	 					+						-
110 (1)(12)		(W1	()							EQUALITY OF THE PARTY.		(W2)						(W	(3)		_			
Wheel Loader (W)										ļ														; ;
		1		- 		1					1 1		(M2)	_	+		-					(M3)		
Motor Grader (M)	-	-	- (1	M1)	-		4			and the same of th		~	(1417)		-		į					(1410)	_	
																		ļ						ļ
			(D	1000									(D2)					Ì	([3)				(D4)
Dump truck (D)				į	1	Ì						-	-								_		-	
		1		1							1 .							<u>i</u>	L_i			<u>i</u> _		<u> </u>
oad Construction	Equipr	nent	Mec	hanic	es Co	urse																		
			(T1)						(T2)								(T3)				
Technician (T)		+	_	-	-					-	11		+					!						
	 		-	_	1	-	-						+				-	-i	-					
					1 :			- 1	1 i i	- 1	i i	- 1	1 1	(S2)	1 1		1	1					(S3)	-
Smooialist (S)						((S1)	<u> </u>		.	1 1			(02,	1		1	1	! !	1		-		
Specialist (S)					-	()	S1)					-		1										į
Specialist (S)						(51)		(541)			-					(M2)				-		-	M2)
Specialist (S) Management (M)							51)		(M1)			-					(M2)			1				M3)
							51)		(M1)			•					(M2)						(M3)
Management (M)	and M	ainte	nana	20 50	porvi			`M C				•					(M2)						(M3)
	and M	1		ce Su	pervi				ourse								(M2)				(0.1)		(M3)
Management (M)	and M	1	enanc	ce Su	pervi									(C3)			(M2)				(C4)		(M3)

TRAINING MATERIAL

Road Construction Equipment Management and Operation Course

	Title / Contents	Current Status	Remarks
	Bulldozer Operation	Under making	
Textbook	Excavator Operation	Under making	
	Wheel Loader Operation	Under making	
	Motor Grader Operation	Under making	
	Roller Operation	Under making	
	Dump Truck Operation	Under making	
	Safety Operation	Plan is underway	
	Daily Maintenance	Plan is underway	
	Basic Operation of Bulldozer	Plan is underway	
Video	Basic Operation of Excavator	Plan is underway	
VIUGO	Basic Operation of Wheel Loader	Plan is underway	
	Basic Operation of Motor Grader	Plan is underway	
	Basic Operation of Roller	Plan is underway	
	Basic Operation of Dump Truck	Plan is underway	
	Bulldozer Operation	Plan is underway	
	Excavator Operation	Plan is underway	
Fransparency	Wheel Loader Operation	Plan is underway	
i ransparency	Motor Grader Operation	Plan is underway	
	Roller Operation	Plan is underway	
	Dump Truck Operation	Plan is underway	
Wall Chart	Construction Equipment	Completed	

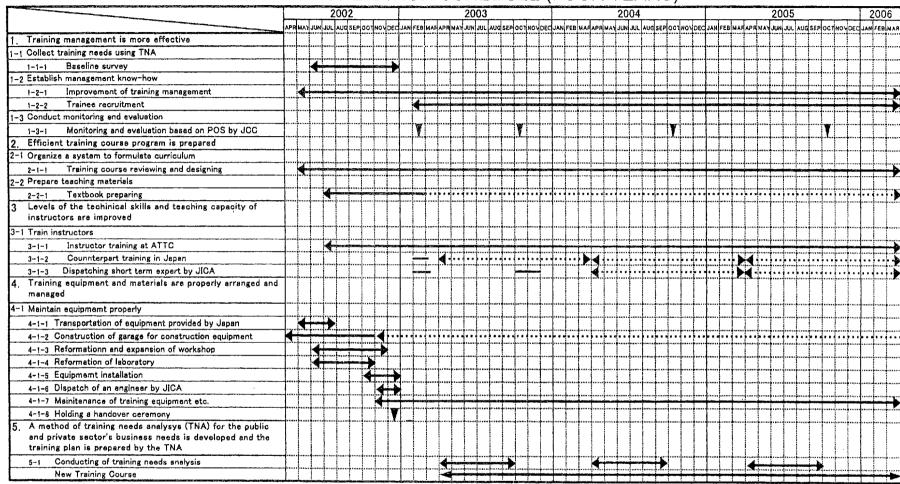
Road Construction Equipment Mechanics Course

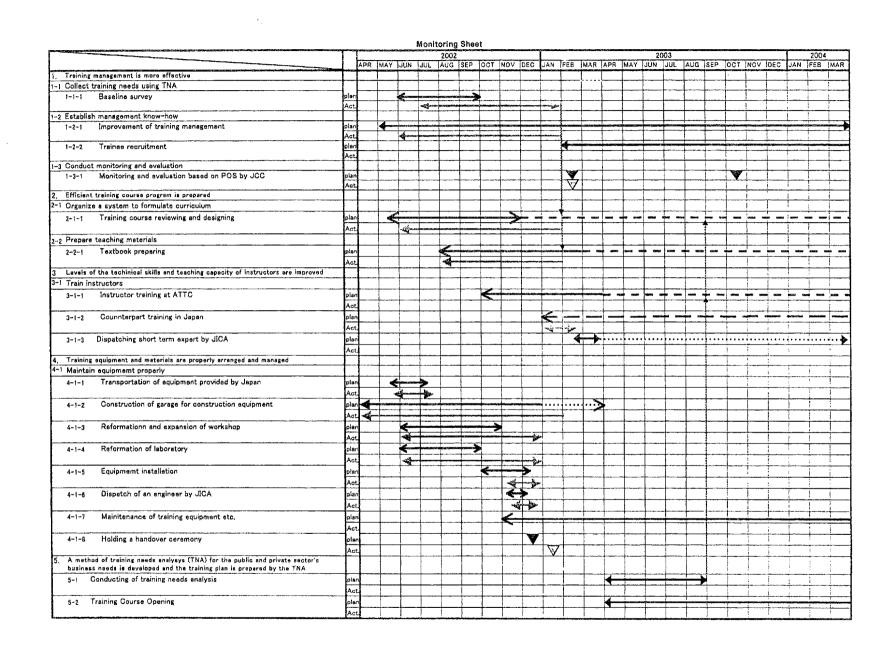
Modd Colls	didention Equipment Mechanics Cours	<u> </u>	
	Engine, automotive	Reviewing	
	Power train, automotive	will be reviewed	
	Chasis, automotive	Reviewing	
	Structure and function, Bulldozer	Under making	
	Structure and function, Motor grader	Plan is underway	
Textbook	Structure and function, Wheel loader	Plan is underway	
rextuduk	Structure and function, Hydraulic Excavator	Plan is underway	
	Hydraulics !	Under making	
	Hydraulics II	Plan is underway	
	Maintenannce	Completed	
	Testing and Adjustment (Trouble shooting)	Plan is underway	
	Workshop Management	Plan is underway	
Video		Plan is underway	
	Engine, automotive	Reviewing	
Transparency	Power train, automotive	will be reviewed	
	Chasis, automotive	Reviewing	
	Engine, automotive	0	
Slide	Power train, automotive	0	
	Chasis, automotive	0	
Actual thing		Plan is underway	

Road Construction and Maintenance Supervision of MCM Course

Textbook	Road Construction & equipment	Under making	
ECXUDOOK	Site management (Checking sheet)	Under making	
	Construction works Today in Japan (Volumel)	Purchased	
Video	Construction works Today in Japan (Volume2)	Purchased	
VICIO	Construction works Today in Japan (Volume3)	Purchased	
	Construction works Today in Japan (Volume4)	Purchased	
Transparency	Introduction of road construction	Under making	

PROJECT OPERATION SCHEDULE (FOUR YEARS)





II Road Construction Equipment Management and Operation Course

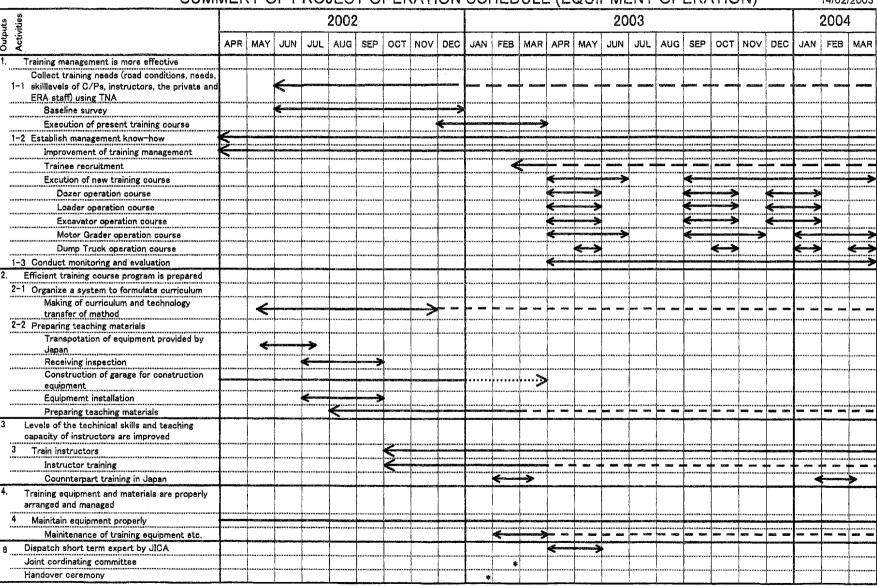
1. Summary of Project Operation Schedule

2. Curriculum

- 2-1 Dozer
- 2-2 Loader
- 2-3 Excavator
- 2-4 Motor Grader
- 2-5 Dump Truck

3. Lesson Plan

- 3-1 Dozer
- 3-2 Loader
- 3-3 Excavator
- 3-4 Motor Grader
- 3-5 Dump Truck



NEW TRAINING COURSE (OPERATOR COURSE : DOZER)

		Revised		Remarks
Target of training		Skilful operater		
Training Capacity	5	Person/One training cours	e	
Training Period(Net days/Net hours)	2Mon	ths(45working days/213.5h	ours)	
Training times per year		3times/year		
Number of trainees per year		15persons/year (1 Dozer)		
Entry requirement		ERA's criteria		
	10th	grade complete and above	that	
		or		
	8th grade complete p	lus 1 year of experience in	Equipment operation	
		or		
	6th grade complete pi	us 2years of experience in	Equipment operation	
Textbook	In English and are hand	lout (C/P translate it from	English into Amharic)	
Language for lecture		Amharic and English		
Training fee		2631Birr/Course*Person		
Course composition (Curriculum)	Present training course	New Traini	ng course	
		Classroom lecture	Operation practice	
1. General idea of construction machinary		2.0Hours	(h/person)	
2. Outline of construction equipment and				
construction machanization		2.0Hours		
3. Basic knowledge of civil engineering		2.5Hours		
4. Construction materials and pavement		1.5Hours		
5. Fundamentals of engineering		3.0Hours		
6. Basic knowledge of machine structure				
Engine	×	2,5Hours		
Power train	×	1.5Hours		
Undercarriage	-	1.5Hours		
Hydrauric system		2.5Hours		
Fuel, lubricant and tire		2.0Hours		
7. Tools		1.5Hours		
8. General idea of Dozer	×	2.0Hours		
9. Structure and function of Dozer		4.0Hours		
10. Basic knowledge on construction work				
method and equipment operation	×			
Basic	×	4.0Hours	25.0 (5.0)Hours	
Excavating and digging	×	0.5Hours	50.0 (10.0)Hours	
Pusing around a corner	×	0.5Hours	10.0 (2.0)Hours	
Leveling and slopecutting	×	0.5Hours	50.0 (10.0)Hours	
Compacting	×	0.5Hours	10.0 (2.0)Hours	
Ripping	×	0.5Hours	10.0 (2.0)Hours	
Grubbing and stumping	х	0.5Hours	10.0 (2.0)Hours	
11. Maintenance	×	2.0Hours	5.0 (1.0)Hours	
12. Operation report		1,0Hours		
13. Machine cost and cycle time		3.0Hours		
14. Safety operation	×	2.0Hours		

NEW TRAINING COURSE (OPERATOR COURSE : LOADER)

		Revised		Remarks
Target of training		Skilful operater		
Training Capacity	5	Person/One training cours	e	
Training Period(Net days/Net hours)	2Morr	ths(42working days/198.0h	lours)	
Training times per year		3times/year		
Number of trainees per year	3	Opersons/year (2 Loaders	;)	
Entry requirement		ERA's criteria		
	10th	grade complete and above	that	
		or		
	8th grade complete p	lus 1 year of experience in	Equipment operation	
		or		
	6th grade complete pl	us 2years of experience in	Equipment operation	
Textbook	In English and are hand	fout (C/P translate it fron	n English into Amharic)	
Language for lecture		Amharic and English		
Training fee		1485Birr/Course*Person		
Course composition (Curriculum)	Present training course	New Traini	ng course	
		Classroom lecture	Operation practice	
General idea of construction machinary		2.0Hours	(h/person)	
2. Outline of construction equipment and				
construction mechanization		2.0Hours	<u></u>	
3. Basic knowledge of civil engineering		2.5Hours		
4. Construction materials and pavement		1.5Hours		
5. Fundamentals of engineering		3.0Hours		
6. Basic knowledge of machine structure				
Engine	x	2.5Hours		
Power train	×	1.5Hours		
Undercarriage		1.5Hours		
Hydrauric system		2.5Hours	1	
Fuel, lubricant and tire		2.0Hours		
7. Tools		1,5Hours		
8. General idea of Loader	×	2.0Hours		
Structure and function of Loader		4.0Hours		
10. Basic knowledge on construction work				
method and equipment operation	×			
Basic	×	4.0Hours	25.0 (5.0)Hours	
Leveling	×	0.5Hours	25.0 (5.0)Hours	
Loading	×	0.5Hours	25.0 (5.0)Hours	
Digging	×	0.5Hours	25.0 (5.0)Hours	
Dumping	×	0.5Hours	25.0 (5.0)Hours	
Hauling	×	0.5Hours	25.0 (5.0)Hours	
11. Maintenance	×	2.0Hours	5.0 (1.0)Hours	· · · · · · · · · · · · · · · · · · ·
12. Operation report		1.0Hours		
13. Machine cost and cycle time	ļl	3.0Hours		
14. Safety operation	<u> </u>	2.0Hours		

NEW TRAINING COURSE (OPERATOR COURSE : EXCAVATOR)

		Revised		Remarks
Target of training		Skilful operater		
Training Capacity	5	Person/One training cours	e	
Training Period(Net days/Net hours)	2Mon	ths(42working days/197.0)	nours)	
Training times per year		3times/year		
Number of trainees per year	30	persons/year (2 Excavato	rs)	
Entry requirement		ERA's criteria		
	10th	grade complete and above	that	
		or		
	8th grade complete p	lus 1year of experience in	Equipment operation	
		or		
	6th grade complete p	lus 2years of experience in	Equipment operation	
Textbook		iout (C/P translate it from		
anguage for lecture		Amharic and English		
Training fee		1650Birr/Course*Person		
Course composition (Curriculum)	Present training course	New Train	ing course	
•		Classroom lecture	Operation practice	
1. General idea of construction machinary		2.0Hours	(h/person)	
2. Outline of construction equipment and				
construction mechanization		2.0Hours		
3. Basic knowledge of civil engineering		2.5Hours		
4. Construction materials and pavement		1.5Hours		
5. Fundamentals of engineering		3.0Hours		
6. Basic knowledge of machine structure				
Engine	×	2.5Hours		
Power train	×	1.5Hours		
Undercarriage		1.5Hours		
Hydrauric system		2.5Hours		
Fuel, lubricant and tire		2.0Hours		
7. Tools		1.5Hours		
8. General idea of Excavator	×	2.0Hours		
9. Structure and function of Excavator		4.0Hours		
10. Basic knowledge on construction work				
method and equipment operation	×			
Basic	×	4.0Hours	25.0 (5.0)Hours	
Excavating	×	0.5Hours	75.0 (15.0)Hours	
Loading	×	0.5Hours	25.0 (5.0)Hours	
Bench cutting	×	0.5Hours	25.0 (5.0)Hours	
11. Maintenance	×	2.0Hours	5.0 (1.0)Hours	
12. Operation report		1.0Hours		
13. Machine cost and cycle time		3.0Hours		
14. Safety operation	×	2.0Hours		

NEW TRAINING COURSE (OPERATOR COURSE: MOTOR GRADER)

		Revised	7	Remarks
Target of training		Skilful operater		
Training Capacity	5	Person/One training cour:	se	
Training Period(Net days/Net hours)	3Mon	ths(69working days/324.0)	hours)	
Training times per year		3times/year		
Number of trainees per year	30pe	ersons/year (2 Motor Gra	ders)	
Entry requirement		ERA's criteria		
	10th	grade complete and above	that	
		or		
	8th grade complete p	olus 1 year of experience in	Equipment operation	
		or		
	6th grade complete p	lus 2years of experience in	Equipment operation	
Textbook		dout (C/P translate it from		
Language for lecture		Amharic and English		
Training fee		1421Birr/Course*Person		
Course composition (Curriculum)	Present training course	New Train	nr course	1 13
		Classroom lecture	Operation practice	
1. General idea of construction machinary		2.0Hours	(h/person)	· · · · · · · · · · · · · · · · · · ·
2. Outline of construction equipment and				
construction mechanization		2.0Hours		
3. Basic knowledge of civil engineering	1	2.5Hours		
4. Construction materials and pavement		1.5Hours		
5. Fundamentals of engineering		3.0Hours		
6. Basic knowledge of machine structure		2.01.42.10		
Engine	×	2.5Hours		
Power train	×	1,5Hours		
Undercarriage	 	1.5Hours		
Hydrauric system		2.5Hours		
Fuel, lubricant and tire		2.0Hours		
7. Tools	· · · · · · · · · · · · · · · · · · ·	1,5Hours		
8. General idea of Motor Grader	×	2.0Hours		
9. Structure and function of Motor Grader		4.0Hours		
10. Basic knowledge on construction work				
method and equipment operation	×			
Basic	×	4.0Hours	25.0 (5.0)Hours	· · · · · · · · · · · · · · · · · · ·
Leveling	×	0.5Hours	100.0 (20.0)Hours	
Ditching	×	0.5Hours	25.0 (5.0)Hours	
Bank cutting	×	0.5Hours	25.0 (5.0)Hours	
Mixing	×	0.5Hours	25.0 (5.0)Hours	
Spreading	×	0.5Hours	25.0 (5.0)Hours	
Slope cutting	×	0.5Hours	25.0 (5.0)Hours	
Scarifying	×	0.5Hours	25.0 (5.0)Hours	
11. Maintenance	×	2.0Hours	5,0 (1.0)Hours	
12. Operation report		1.0Hours		
13. Machine cost and cycle time		3.0Hours		
14. Safety operation	×	2.0Hours		

NEW TRAINING COURSE (OPERATOR COURSE : DUMP TRUCK)

		Revised		Remarks		
Target of training		Skilful operater				
Training Capacity	10	Person/One training cours	80			
Training Period(Net days/Net hours)	1 Mon	ths(24working days/116.5h	ours)			
Training times per year		4times/year				
Number of trainees per year	40p	ersons/year (1 Dump Tru	ck)			
Entry requirement		ERA's criteria				
•	10th grade complete	and above that plus 4th g	grade driving licence			
		or				
	8th grade complete pl	us 1 year of experience on	driving plus 4th grade			
		driving licence				
		or				
	6th grade complete plu	is 2years of experience on	driving plus 4th grade			
		driving licence				
Textbook	In English and are hand	lout (C/P translate it from	English into Amharic)			
Language for lecture		Amharic and English				
Training fee		250Birr/Course*Person				
Course composition (Curriculum)	Present training course	New Traini	ng course			
		Classroom lecture	Operation practice			
General idea of construction machinary		2.0Hours	(h/person)			
2. Outline of construction equipment and			1			
construction mechanization		2.0Hours				
3. Basic knowledge of civil engineering		2.5Hours				
4. Construction materials and pavement		1.5Hours				
5. Fundamentals of engineering		3.0Hours				
Basic knowledge of machine structure						
Engine	×	2.5Hours		· · · · · · · · · · · · · · · · · · ·		
Power train	×	1,5Hours				
Suspention system		1.5Hours				
Hydrauric system		2.5Hours				
Fuel, lubricant and tire		2.0Hours				
7. Tools		1.5Hours				
General idea of Dump Truck	×	2.0Hours				
9. Structure and function of Dump Truck		4.0Hours				
10. Basic knowledge on construction work						
method and equipment operation	×					
Basic	×	4.0Hours	10.0 (1.0)Hours			
Driving	×	0.5Hours	20.0 (2.0)Hours			
Loading and dumping	×	0,5Hours	40.0 (4.0)Hours			
11. Maintenance	×	2.0Hours	5.0 (0.5)Hours			
12. Operation report		1.0Hours				
13. Machine cost and cycle time		3.0Hours				
14. Safety operation	×	2.0Hours				



Lesson Plan : Dozer

Subject IL			10.			Ta 1. 1. 1. 1.			to .
	Lecture			Instructor	Training Material	Sub-subject	Contents of training	Training Goal	Remark
General idea of construction machinery	2.0	(h/person)	Class room	Ato, Wogayehu	Text book	History of construction equipment	Know the history of construction equipment	Get right knowledge about construction equipment	į.
			ļ			Classification of construction equipment	Know a kind of general construction equipment		
Outline of construction equipment and	2,0		Class room	Atc. Wogayehu	Text book	Characteristic of construction equipment	Understand a characteristic of construction equipment	Understand a characteristic of construction equipment	1
enstruction mechanization				ļ		Selection of construction equipment	Be able to choose construction equipment accord with site condition		
Basic knowledge of civil engineering	2.5			Ato, Wogayehu		fundamentals of soil and rock	Understand a characteristic and a property of soil and rock	Get necessary basic engineering works knowledge as an operator	
Construction materials and pavement	1,5		Class room	Ato. Wogayehu	Text book	fundamentals of cement concrete and pavement	Understand a characteristic and a property of	Get necessary basic road knowledge as an operator	1
			ļ	1		<u></u>	concrets pavement and asphalt pavement		
Fundamentals of engineering	3.0		Class room	Ato, Wogayehu	Text book	Mechanical engineering	Understand a basic matter of the dynamics and physics	Get necessary basic engineering knowledge as an operator	1
1	1		į.			Electrical engineering	Understand a basic matter of the electrical engineering		i
			<u> </u>			Machine element	Understand a basic matter of the machine element		
Basic knowledge of machine structure	2.5		Class room	Ato. Wogayahu	Text book, Video	Outline of engine	Understand an outline and a kind of engine	Get necessary basic engine knowledge as an operator	1
Engine	- 1			ľ		Intake and exhaust system	Understand each system of engine		
				1		Fuel system			1
1			1			Lublicant system			1
-			1			Cooling system			1
			<u> </u>		i	Electric system			
Basic knowledge of machine structure	1.5		Class room	Ato. Wogayehu	Text book	Outline of power train	Understand an outline and a kind of power train	Get necessary basic power train knowledge as an operator	1
Power train			1		l	Clutch system	Understand each system of power train		1
			Į.	į.	i	Transmission			1
			L	l	l	Differential			1.
Basic knowledge of machine structure	1.5		Class room	Ato. Wogayehu	Text book	Outline of undercarriage	Understand an outline and a kind of undercarriage	Get necessary basic undercarriage knowledge as an operator	
Underoarriage			L		l	Steering system	Understand each system of undercarriage		
Basic knowledge of machine structure	2.5		Class room	Ato. Wogayehu	Text book	Outline of hydraulic system	Understand an outline and a kind of hydraulic system	Get necessary basic hydraulic system knowledge as an operator	
Hydraulio system			ł	1	l	Pump	Understand each system of hydraulic system		1
				1		Cylinder	, , ,		1
1			1	Į		Motor			1
1			1	!		Valve			
Basic knowledge of machine structure	2.0		Class room	Ato, Wogayehu	Text book. Video	Lublicant	Understand a basic matter about lublicant	Get necessary basic lublicant, fuel and tire knowledge as an operator	T
Fuel, lubricent and tire					1	Fuel	Understand a basic matter about fuel		1
			1	1	1	Tire	Understand a basic matter about tire		1
Tools	0.5		Class room	Ato. Wogayehu	Text book	Tool	Understand a kind of tools and the direction for uses	Get necessary basic tool knowledge as an operator and can treat it properly	
	1.0			Ato, Wogayehu					1
General idea of Dozor	2.0	***************************************	Class room	Atc. Wogavehu	Text book, Scale model, Video	Outline of dozer	Understand an outline and a kind of dozer	Get right knowledge about dozer	T
Structure and function of Dozer	4.0				Text book, Scale model	Structure and function	Understand a structure and function of dozer	Get right knowledge about structure and function of dezer	
Basio knowledge on construction work	4.0		Class room	Ato, Wogavehu	Text book, Scale model	How to operate	Understand a basic matter from riding to moving of construction equipment	Be able to do effective construction equipment operation	(29L/h)
Basic operation		25.0 (5.0)	TPU site	Ato, Kebede	Dozer	Basic operation	Understand basic how to move construction equipment		
				Ato, Mihiref		Practice of basic operation	Practical training in basic operation		145L/pers
Basic knowledge on construction work	0.5		Class room	Ato, Wogayehu	Text book, Scale model	Excevating and digging operation	Understand excevating and digging operation	Understand excavating and digging, and can do it	7
Exevating and digging operation		50.0 (10.0)		Ato. Kebade	Dozer	Practice of excavating and digging operation	Practical training in excavating and digging operation		290L/pers
				Ato, Mihiref					1
Basic knowledge on construction work	0.5		Class room	Ato. Wogayehu	Text book, Soale model	Pushing around a corner operation	Understand pushing around a corner operation	Understand pushing around a corner, and can do it	
Pusing around a corner operation		10.0 (2.0)	TPU site	Ato. Kebede	Dozer	Practice of pushing around a corner operation	Practical training in pushing around a corner operation		58L/perso
during drouble is control opportune.		, , , , , , , , , , , , , , , , , , , ,	1	Ato. Mihiref					
Basio knowledge on construction work	0.5		Class room	Ato, Wogayehu	Text book, Scale model	Leveling and slopeoutting operation	Understand leveling and slopeoutting operation	Understand leveling and slopecutting, and can do it	
Leveling and slopecutting operation	0	50,0 (10.0)		Ato, Kebede	Dozer	Practice of leveling and slopecutting operation	Practical training in leveling and signeoutting operation		290L/pers
watering and			1	Ato. Mihiref	I	S S S S S S S S S S S S S S S S S S S			1
Basic knowledge on construction work	0.5		Class room	Ato. Wogayehu	Text book, Scale model	Compacting operation	Understand compacting operation	Understand compacting, and can do it	
Compacting operation	5	10.0 (2.0)	TPU site	Ato. Kebede	Dozer	Practice of compacting operation	Practical training in compacting operation		58L/perso
Sandan and a sandan			1	Ato, Mihlref	l				1
	0,5		Class room	Ato. Wogayehu	Text book, Scale model	Ripping operation	Understand ripping operation	Understand ripping, and can do it	
Resignation was a construction work		10.0 (2.0)	TPU site	Ato Kebede	Dozer	Practice of ripping operation	Practical training in ripping operation		56L/perso
	0,0		1 4 0104				And the state of t		30m/ pai 60
	0,0	10.0 (11.0)	l .						
Ripping operation			Clare man	Ato Worsyahu	Text book Scale model	On riding and stemping operation	independent mending and stronging operation	Understand enudding and stumping, and can do it	
Ripping operation Basio knowledge on construction work	0,5			Ato, Wogayehu	Text book, Scale model	Grudding and stumping operation	Understand grudding and stumping operation	Understand grudding and stumping, and can do it	581 /pers
Ripping operation Basio knowledge on construction work			Class room TPU site	Ato, Wogayehu Ato, Kebede	Text book, Scale model Dozer	Grudding and stumping operation Practice of grudding and stumping operation	Understand grudding and stumping operation Practical training in grudding and stumping operation	Understand grudding and stumping, and can do it	58L/pers
Basic knowledge on construction work Ripping operation Basic knowledge on construction work Grudding and stumping operation	0,5		TPU site	Ato, Wogayehu Ato, Kebede Ato, Mihiref	Dozer	Practice of grudding and stumping operation	Practical training in grudding and stumping operation		58L/pers
Ripping operation Basio knowledge on construction work Grudding and stumping operation		10.0 (2.0)	TPU site	Ato. Wogayehu Ato. Kebede Ato. Mihlref Ato. Wogayehu	Dozer Text book, Video	Practice of grudding and stumping operation Outline of maintenance	Practical training in grudding and stumping operation Understand necessity of maintenance	Understand grudding and stumping, and can do it Understand significance of maintenance, and can do it	58L/perso
Ripping operation Basio knowledge on construction work Grudding and stumping operation	0,5	10.0 (2.0)	TPU site	Ato, Wogayehu Ato, Kebede Ato, Mihlref Ato, Wogayehu Ato, Kebede	Dozer	Practice of grudding and stumping operation	Practical training in grudding and stumping operation		Total
Ripping operation Basic knowledge on construction work Grudding and stumping operation Meintenance	2.0	10.0 (2.0)	TPU site Class room TPU site	Ato, Wogayehu Ato, Kebede Ato, Mihlref Ato, Wogayehu Ato, Kebede Ato, Mihlref	Dozer Text book, Video Dozer	Practice of grudding and stemping operation Outline of maintenance Practice of maintenance	Practical training in grudding and stumping operation Understand necessity of maintenance Practical training in maintenance	Understand significance of maintenance, and can do it	+
Ripping operation Basio knowledge on construction work Grudding and stumping operation	0,5	10.0 (2.0)	TPU site Class room TPU site	Ato, Wogayehu Ato, Kebede Ato, Mihlref Ato, Wogayehu Ato, Kebede	Dozer Text book, Video Dozer	Practice of gruding and stumping operation Outline of maintenance Practice of maintenance Outline of operation report	Practical training in grudding and stumping operation Understand necessity of maintenance Practical training in maintenance Understand necessity of operation report		Total
Ripping operation Basic knowledge on construction work Grudding and stumping operation Maintenance Operation report	2.0	10.0 (2.0)	TPU site Class room TPU site Class room	Ato, Wogayehu Ato, Kebede Ato, Mihiref Ato, Wogayehu Ato, Kebade Ato, Mihiref Ato, Wogayehu	Dozer Text book, Video Dozer Text book	Practice of grudding and stemping operation Outline of maintenance Practice of maintenance Outline of operation report Method of operation report	Practical training in grudding and stumping operation Understand necessity of maintenance Practical training in maintenance Understand necessity of operation report Be able to write the operation report	Understand significance of maintenance, and can do it Understand significance of operation report, and can do it	Total
Ripping operation Basic knowledge on construction work Orudding and stumping operation Meintanance	2.0	10.0 (2.0)	TPU site Class room TPU site Class room	Ato, Wogayehu Ato, Kebede Ato, Mihlref Ato, Wogayehu Ato, Kebede Ato, Mihlref	Dozer Text book, Video Dozer	Practice of grudding and stemping operation Outline of maintenance Practice of maintenance Outline of operation report Method of operation report	Practical training in grudding and stumping operation Understand necessity of maintenance Practical training in maintenance Understand necessity of operation report Be able to write the operation recort. Understand a basic matter a bebut ovet	Understand significance of maintenance, and can do it	Total
Ripping operation Basic knowledge on construction work Grudding and stumping operation Maintenance Operation report	2.0	10.0 (2.0)	TPU site Class room TPU site Class room Class room	Ato. Wogayehu Ato. Kebede Ato. Mihiref Ato. Wogayehu Ato. Kebede Ato. Mihiref Ato. Wogayehu Ato. Wogayehu	Dozer Text book, Video Dozer Text book	Practice of grudding and stemping operation Outline of maintenance Practice of maintenance Outline of operation report Method of operation report	Practical training in grudding and stumping operation Understand necessity of maintenance Practical training in maintenance Understand necessity of operation report Be able to write the operation report	Understand significance of maintenance, and can do it Understand significance of operation report, and can do it	Total

Lesson Plan : Loader

Lesson Plan : Loader									
Subject	Lecture	Practice	Venue	Instructor	Training Material	Sub-subject	Contents of training	Training Goal	Remark
General idea of construction machinery				Ato. Wogayehu	Text book	History of construction equipment	Know the history of construction equipment	Get right knowledge about construction equipment	
		L			L	Classification of construction equipment	Know a kind of general construction equipment		1
Outline of construction equipment and	2.0		Class room	Ato. Wogayehu	Text book	Cheracteristic of construction equipment	Understand a characteristic of construction equipment	Understand a characteristic of construction equipment	
construction mechanization						Selection of construction equipment	Be able to choose construction equipment accord with site condition		
Basic knowledge of civil engineering	2,5			Ato. Wogayehu		fundamentals of soil and rook	Understand a characteristic and a property of soil and rock	Get necessary basic engineering works knowledge as an operator	1
Construction materials and pavement	1.5	1	Class room	Ato. Wogayehu	Text book	fundamentals of coment concrete and pavement	Understand a characteristic and a property of	Get necessary basic road knowledge as an operator	1
	<u> </u>						concrete payement and asphalt payement		
Fundamentals of engineering	3.0		Class room	Ato, Wogayehu	Text book	Mechanical engineering	Understand a basic matter of the dynamics and physics	Get necessary basic engineering knowledge as an operator	
	1					Eleptrical engineering	Understand a basic matter of the electrical engineering		1
	·	ļ				Machine element	Understand a basic matter of the machine element		
Basic knowledge of machine structure	2.5	1	Class room	Ato. Wogayehu	Text book, Video	Outline of engine	Understand an outline and a kind of engine	Get necessary basic engine knowledge as an operator	•
Engine	}			1	1	Intaka and exhaust system	Understand each system of engine		
	1	1	1	i	1	Fuel system			
	1	1			i	Lublicant system			1
	ł	ŀ	1		į	Cooling system			
					<u> </u>	Electric system			
Basio knowledge of machine structure	1.5	1	Class room	Ato. Wogayehu	Text book	Outline of power train	Understand an outline and a kind of power train	Get necessary basic power train knowledge as an operator	
Power train		1	ı	İ		Clutch system	Understand each system of power train		
		l	ĺ	1	<u> </u>	Transmission			1
Barda karanta dan atau atau atau	 			1		Differential			
Basio knowledge of machine structure	1.5	1	Glass room	Ato. Wogayehu	Text book	Outline of undercarriage	Understand an outline and a kind of undercarriage	Get necessary basic undercarriage knowledge as an operator	1
Undercerriage	1	 		1		Steering system	Understand each system of underografiage		
Basio knowledge of machine structure	2.5	1	Glass room	Ato. Wogayehu	Text book	Outline of hydraulic system	Understand an outline and a kind of hydraulic system	Get necessary basic hydraulic system knowledge as an operator	
Hydraulio system		1		1]	Pump	Understand each system of hydraulic system		1
	ŀ			1	i	Cylinder			1
				1	1	Motor			1
			·	ļ.,		Valve			
Basic knowledge of machine structure	2.0	İ	Class room	Ato. Wogayehu	Text book, Video	Lublicant	Understand a basic matter about lubiloant	Get necessary basic lublicant, fuel and tire knowledge as an operator	1
Fuel, lubricant and tire	i	ŀ	1		1	Fuel	Understand a basic matter about fuel		1
Tools	0.5			-	 	Tire	Understand a basic matter about tire	<u> </u>	
LODIS	1.0			Ato. Wogayahu		Tool	Understand a kind of tools and the direction for uses	Get necessary basic tool knowledge as an operator and can treat it properly	1
General idea of Loader	2.0	· · · · · · · · · · · · · · · · · · ·		Ato Wogayehu	Text book, Scale model, Video	Outline of loader			
Structure and function of Loader	4.0		Class room	Ata Wassishi	Text book, Scale model	Structure and function	Understand an outline and a kind of loader	Get right knowledge about loader Get right knowledge about structure and function of loader	
Basic knowledge on construction work	4.0		Class room	Ato Wormson	Text book, Soale model	How to operate	Understand a structure and function of loader		(18L/h)
Basic operation	7.0		TPU site	Ate. Mitiku	Loader	Basic operation	Understand a basic matter from riding to moving of construction equipment Understand basic how to move construction equipment	Be able to do effective construction equipment operation	(IBL/N)
Day's operators	1	20.0 (0.0)	7770 3100	Ato. Beyene	Loudor	Practice of basic operation	Practical training in basic operation		90L/person
	1			Ata. Menigletu		raccos or basic operation	rraction training in pasic operation		JUL/ person
Basia knowledge on construction work	0.5	1	Class room		Text book, Scale model	Leveling operation	Understand leveling operation	Understand leveling, and can do it	
Leveling operation	1		TPU site	Ato. Mitiku	Loader	Practice of leveling operation	Practical training in leveling operation	Origin scalled leveling, and our significant	90L/persor
		1		Atc. Beyens		The state of the s	The state of the s		00L, po, 30,
		1	1	Atc. Manigistu	1			†	1
Basic knowledge on construction work	0.5	1	Class room		Text book, Scale model	Loading operation	Understand loading operation	Understand loading, and can do it	
Loading operation			TPU site	Ato, Mitlku	Loader	Practice of loading operation	Practical training in loading operation		90L/persor
				Ato. Beyene	1		The state of the s		, po. 00.
			.]	Ato. Manigistu					
Basic knowledge on construction work	0.5		Class room		Text book, Scale model	Digging operation	Understand digging operation	Understand digging, and can do it	
Digging operation		25.0 (5.0)	TPU site	Ata. Mitiku	Loader	Practice of digging operation	Practical training in digging operation		90L/person
		1	1	Ato. Beyone					,
	1			Ato, Menigiatu					
Basic knowledge on construction work	0.5	1	Class room	Ato. Wogayehu	Text book, Soale model	Dumping operation	Understand durping operation	Understand dumping, and can do it	
Dumping operation	1	25.0 (5.0)	TPU site	Ato. Mitiku	Loader	Practice of dumping operation	Practical training in dumping operation	· · · · · · · · · · · · · · · · · · ·	BOL/persor
	1	1	1	Ato. Beyene					1
		l	1	Ato, Merdeistu	l				1
Basic knowledge on construction work	0.5				Text book, Scale model	Hauling operation	Understand hading operation	Understand hauling, and can do it.	
Haufing operation	1	25.0 (5.0)	TPU site	Ato. Mitiku	Loader	Practice of Hauling operation	Practical training in hauling operation		BOL/persor
	1	[1	Ato. Beyone		1			1
	ļ	<u> </u>		Ato. Monigistu					
Maintenance	2.0		Class room			Outline of maintenance	Understand necessity of maintenance	Understand significance of maintenance, and can do it	1
		5.0 (1.0)	TPU site	Ato. Mitliku	Loader	Method of maintenance	Se able to do the maintenance(Dally, Monthly,)		1
	1	1	1	Ato. Beyene		Practice of maintenance	Practical training in maintenance		Total
				Ato, Menigistu		<u> </u>		<u> </u>	540L/perso
Operation report	1.0	1	Class room	Ato. Wogayehu	Text book	Outline of operation report	Understand necessity of operation report	Understand significance of operation report, and can do it	
	ļ	<u> </u>				Method of operation report	Be able to write the operation report		
Machine cost and cycle time	3.0		Class room	Ato. Wogayehu	Text book	Machine cost	Understand a basic matter about cost	Be able to make an effective construction equipment operative plan	1
		ļ	 	1		Cycle time	Understand a basic matter about cycle time	1	
Safety operation	2.0	1	Class room	Ato. Wogayehu	lext book, Video	Safety operating	Understand safe construction equipment operation	Be able to do safe construction equipment operation without accident	1
arety operation	2.0		Class room	Ato. Wogayehu	lext book, Video	Safety operating Causes of accidents	Understand safe construction equipment operation Understand a cause of accident	Be able to do safe construction equipment operation without accident	

Lesson Plan : Excavator

Lesson Plan : Excavator									
Subject	Lecture	Practice	Venue	Instructor	Training Material	Sub-subject	Contents of training	Training Goal	Remark
General idea of construction machinery			Class room	Ato. Wogayehu	Text book	History of construction equipment	Know the history of construction equipment	Get right knowledge about construction equipment	INSHIBIR
Outline of construction equipment and	2.0		Class room	Ato. Wogayehu	Text book	Classification of construction equipment Characteristic of construction equipment	Know a kind of general construction equipment Understand a pharacteristic of construction equipment	Understand a characteristic of construction equipment	
construction mechanization					I	Selection of construction equipment	Be able to choose construction equipment second with site condition		i
Basic knowledge of civil engineering	2.5		Class room	Ato. Wogayehu	Text book	fundamentals of soil and rock	Understand a characteristic and a property of soil and rock	Get necessary basic engineering works knowledge as an operator	
Construction materials and pavement	1.5			Ato. Wogayehu		fundamentals of cament concrete and payement	Understand a characteristic and a property of	Get necessary basic road knowledge as an operator	
				1			concrete payement and asphalt payement	and the second of the second o	1
Fundamentals of engineering	3.0		Class room	Ato. Wogsyehu	Text book	Mechanical engineering	Understand a basic matter of the dynamics and physics	Get necessary basic engineering knowledge as an operator	
i	1		1	i		Electrical engineering	Understand a basic matter of the electrical engineering		ì
Basic knowledge of machine structure	2.5		<u> </u>	 	ļ	Machine element	Understand a basic metter of the machine element		
Engine	2.5		Class room	Ato. Wogayahu	Text book, Video	Outline of engine	Understand an outline and a kind of engine	Gat necessary basic engine knowledge as an operator	1
crigine						Intake and exhaust system	Understand each system of engine		
						Fuel system			1
	1 1			İ		Lublicant system			
	1 1		ļ			Cooling system			i
						Electric system		I	1
Basic knowledge of machine structure	1.5		Class room	Ato. Wogayahu	Text book	Outline of power train	Understand an outline and a kind of power train	Get necessary basic power train knowledge as an operator	
Power train	1		ļ	1	1	Clutch system	Understand each system of power train	* * *	- 1
	1 1			1	į.	Transmission			i
	1					Differential)	
Basic knowledge of machine structure	1.5		Class room	Ato, Wogayehu	Text book	Outline of underparriage	Understand an outline and a kind of undercarriage	Gst necessary basic undergarriage knowledge as an operator	
Undercarriage	1 1					Steering system	Understand each system of underparriage	Case thousand a serie distribution to the second description	
Basic knowledge of machine structure	2,5		Class room	Ato. Wogayahu	Text book	Outline of hydraulic system	Understand an outline and a kind of hydraulic system	Get necessary basic hydraulic system knowledge as an operator	
Hydraulic system	1			, , , , , , , , , , , , , , , , , , , ,	TONG BOOK	Pump	Understand each system of hydrautic system	Case Hecospary sweets high scalle system Kilowiada as an operator	
•	i l		ì			Cylinder	Oriberatelia egon system of nyoratelo system		
	1 1			1	1	Motor		1	
	1 1			1	1	Valve			
Basic knowledge of machine structure	2.0		Clare saam	Ato. Wogeyehu	Text book, Video	Lublicant	 		
Fuel, lubricant and tire	1 50		CIOSS TOUR	ALD. WUSEYERIU	PAR BOOK, VIDEO		Understand a basic matter about lubicant	Get necessary basic lublicant, fuel and tire knowledge as an operator	1
Too, tablicant and the	1 1		1	ļ	1	Fuel Tire	Understand a basic matter about fuel		1
Tools	0.5		0		l		Understand a basic matter about tire		
,0018	1.0			Ato. Wogayehu Ato. Wogayehu		Tool	Understand a kind of tools and the direction for uses	Get necessary basic tool knowledge as an operator and can treat it properly	
General idea of Excavator	2.0		Class snow	Ato Womenin	Text book, Soale model, Video	Outlier of a second			
Structure and function of Expavator	4.0	····	Class room	Ata Misanualu	Text book, Sople model	Structure and function	Understand an outline and a kind of excevator	Get right knowledge about excevator	
Basic knowledge on construction work	4.0					How to operate	Understand a structure and function of excavator	Get right knowledge about structure and function of excavator	(00) 03
Basio operation	7.0	25.0 (5.0)		Ato, Kebede	Excavator	Basic operation	Understand a basic matter from riding to moving of construction equipment	Be able to do effective construction equipment operation	(20L/h)
	1	20.5 (0.5)		Ato Mitiku	EXCAVELO	Prectice of basic operation	Understand basic how to move construction equipment		
				Ato Bevene		Practice of pasic operation	Practical training in basic operation		100L/persi
Basic knowledge on construction work	0.5		Cl	Ata. Wagayehu	Text book. Scale model				
Exavating operation	0.0	75.0 (15.0)		Ato Kebede	Excevetor	Excavating operation	Understand excavating operation	Understand excavating, and can do it	
ENGRAPHS OPERADO	! !	70.0 (10.0)		Ato Mitiku	Excavator	Practice of excavating operation	Practical training in excavating operation	1	300L/persi
	t I				}				ĺ
Baalo knowledge on construction work	0.5	·····		Ato, Bayena Ato, Wogayehu	T-15-1 6-1	 	<u> </u>		
Loading operation	0.9	95 n (# n)	TPU site	Ato, Wogayenu Ato, Kebede	Text book, Scale model Excavator	Loading operation	Understand loading operation	Understand loading, and can do it	1
Contains obel actors	1 1	25.0 (0.0)		Ato Mitiku	Expavator	Practice of loading operation	Practical training in loading operation	†	100L/perse
	1 1			Ato.Beyene					
Basio knowledge on construction work	0.5					-	<u> </u>		
Sensh cutting operation	0.5	000 (00)			Text book, Scale model	Bench outting operation	Understand bench outting operation	Understand bench cutting, and can do It	
Senon cacang oppration	1 1	20.0 (0.0)		Ato. Kebede Ato.Mitiku	Excavator	Practice of bench outting operation	Practical training in bench outting operation		100L/pers
	1 1				1				1
Vaintenance	2.0		01	Atc.Beyene	l 	<u> </u>			 _
YISH INSI MI 100	2.0	E 0 /2 2	Class room		Text book, Video	Outline of maintenance	Understand necessity of maintenance	Understand significance of maintenance, and can do it	- 1
	1 1	5.0 (1.0)			Excevator	Method of maintenance	Be able to do the maintenance(Daily, Monthly,)		1
	1 !			Ato.Mitlku	ĺ	Practice of maintenance	Practical training in maintenance		Total
Samuel and a second	1			Ato.Bayene			ļ <u> </u>		600L/persi
Operation report	1.0		Class room	Ato. Wogayahu	Text book	Outline of operation report	Understand necessity of operation report	Understand significance of operation report, and can do it	
						Method of operation report	Se able to write the operation report		
Machine cost and cycle time	3.0		Class room	Ato. Wogayehu	Text book	Machine cost	Understand a basic matter about cost	Be able to make an effective construction equipment operative plan	
	11					Cycle time	Understand a basic matter about cycle time		
Safety operation	2.0		Class room	Ato Wognyebu	Text book, Video	Safety operating	Understand safe construction equipment operation	Be able to do safe construction equipment operation without accident	
	1 2.07		Order Court	TIED. TIDEUTOILE	TORC BOOK, TIGOR	Causes of accidents		to a apie to do sale construction equipment operation without accident	1

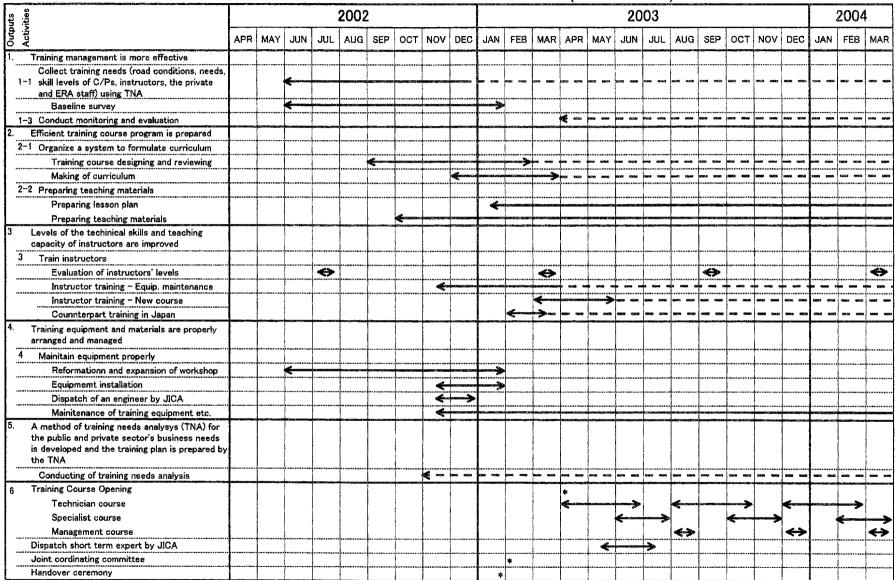
Lesson Plan : Motor Grader					,	,	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
	Lecture			Instructor	Training Material	Sub-subject	Contents of training	Training Goal	Remark
General idea of construction machinery	2,0	(h/person)	Class room	Ato, Wogayehu	Text book	History of construction equipment	Know the history of construction equipment	Get right knowledge about construction equipment	1
					L	Classification of construction equipment	Know a kind of general construction equipment		ļ
Outline of construction equipment and	2.0	, ,	Class room	Ato. Wogayehu	Text book	Characteristic of construction equipment	Understand a characteristic of construction equipment	Understand a characteristic of construction equipment	1
construction mechanization						Selection of construction equipment	Be able to choose construction equipment accord with site condition		1
Basio knowledge of civil engineering	2,5		Class room	Ato, Wogayahu	Text book	fundamentals of soil and rock	Understand a characteristic and a property of soil and rock	Get necessary basic engineering works knowledge as an operator	1
Construction materials and pavement	1.5	,		Ato, Wogayehu	Text book	fundamentals of coment concrete and pavement	Understand a characteristic and a property of	Get necessary basic road knowledge as an operator	
	1 !					,	concrete pavement and esphelt pavement	·	1
Fundamentals of engineering	3.0		Class room	Ato. Wogayehu	Text book	Mechanical engineering	Understand a basic matter of the dynamics and physics	Get necessary basic engineering knowledge as an operator	
	("	, '				Electrical engineering	Understand a basic matter of the electrical engineering		
	(/	, ,				Machine element	Understand a basic matter of the machine element		
Basic knowledge of machine structure	2.5		Class room	Ato, Wogayehu	Text book, Video	Outline of engine	Understand an outline and a kind of engine	Get necessary basic engine knowledge as an operator	
Engine	1 2.07	, ,	Cidas I Com	Aco. Hogayoria	TEXT BOOK, VIGO	Intake and exhaust system	Understand each system of engine	Cot incossally busic origine momente as an operator	
Litigatio	(/	1 '	1		i	Fuel system	Citable action by a certificity brighting		
	i '	1 '				Lublicant system			
	i i	i '						\	ł
	('	, ,				Cooling system			f
						Electric system	<u> </u>		
Basio knowledge of machine structure	1.5	, ,	Class room	Ato. Wogayahu	Text book	Outline of power train	Understand an outline and a kind of power train	Get necessary basic power train knowledge as an operator	Ī
Power train	(/	ι '	1	}		Clutch system	Understand each system of power train		l
	1 '	, ,				Transmission	\		1
		 '				Differential		<u> </u>	
Basic knowledge of machine structure	1.5	1	Class room	Ato. Wogayehu	Text book	Outline of undercarriage	Understand an outline and a kind of undercarriage	Get necessary basic undercarriage knowledge as an operator	1
Underganiage	/	L'			l	Steering system	Understand each system of undercarriage		
Basic knowledge of machine structure	2,5	1	Class room	Ato. Wogayehu	Text book	Outline of hydraulic system	Understand an outline and a kind of hydraulic system	Get necessary basic hydraulic system knowledge as an operator	
Hydraulic system	i "'	, ,				Pump	Understand each system of hydraulic system		1
,	(/	, ,	i i			Cylinder			1
	t '	, ,				Motor		1	ł
1	('	, ,				Valve			i i
Basio knowledge of machine structure	2.0		Class room	Ato Wagnyehu	Text book, Video	Lubioant	Understand a basic matter about lubilicant	Get necessary basic lublicant, fuel and tire knowledge as an operator	
Fuel, lubricant and tire	1	, ,	Ciago (COIII	rico, trogayora	TOXE COOK, VIGOO	Fuel	Understand a basic matter about fuel	det (too ontary and to tallound to to tallound the any operator	1
(upi, portonic and are	(/	, ,				Tire	Understand a basic matter about tire		1
Tools	0.5		01	Ato. Wogayehu	Total beat	Tool		Get necessary basic tool knowledge as an operator and cen treat it properly	+
10018	1.0	, ,				100	Understand a kind of tools and the direction for uses	Lest recessary basic coor knowledge as all operator and carr treat it properly	
General idea of Motor Grader	2.0			Ato. Wogayehu	Exercise Text book, Scale model, Video	A. Allanda Caratana and an		Get right knowledge about motor grader	
Structure and function of Motor Grader	4,0				Text book, Scale model	Structure and function	Understand an outline and a kind of motor grader	Get right knowledge about structure and function of motor grader	
Basio knowledge on construction work	4.0			Ato. Wogayehu	Text book, Spale model	How to operate	Understand a structure and function of motor grader	Be able to do effective construction equipment operation	(9.4L)
	4.0			Ato, Mihiref	Motor Grader		Understand a basic matter from riding to moving of construction equipment	De able to do enecuve construction equipment operation	(B.4L)
Basio operation	(/	25.0 (5.0)	IPU Brue		Motor urader	Basic operation	Understand basic how to move construction equipment		
	<u> </u>	·		Ato Menigistu		Practice of basic speration	Practical training in basic operation	· · · · · · · · · · · · · · · · · · ·	47L/perso
Basio knowledge on construction work	0,5	l		Ato. Wogeyehu	Text book. Scale model	Leveling operation	Understand leveling operation	Undarstand leveling, and oan do it	
Leveling operation	,			Ato, Mihiref	Motor Grader	Practice of leveling operation	Practical training in leveling operation		188L/pers
	1 1	100.0 (20.0)							ioor, bot a
		100.0 (20.0)		Ato, Menigiatu					, coc., por
	0.5		Class room	Ato, Menisistu Ato, Wosayehu	Text book, Scale model	Ditching operation	Understand ditching operation	Understand ditching, and cen do it	<u> </u>
	0.5		Class room TPU site	Ato, Menigiatu Ato, Wogayehu Ato, Mihiref	Text book, Scale model Motor Grader	Ditching operation Practice of ditching peration	Understand ditching operation Practical training in ditching operation	Understand ditching, and can do it	·
Basic knowledge on construction work Ditching operation	0.5		Class room TPU site	Ato, Menisiatu Ato, Wogayehu Ato, Mihiref Ato, Menisiatu	Motor Grader	Practice of ditching peration	Practical training in ditching operation		·
Ditching operation Basio knowledge on construction work	0.5	25.0 (5.0)	Class room TPU site Class room	Ato, Menigiatu Ato, Wogayehu Ato, Mihiref Ato, Menigiatu Ato, Wogayehu	Motor Grader Text book, Scale model	Practice of ditching peration Bank outling operation		Understand ditching, and can do it Understand bank cutting, and can do it	47L/perso
Ditching operation Basio knowledge on construction work	0.5		Class room TPU site Class room	Ato, Menigistu Ato, Wogayehu Ato, Mihiref Ato, Menigletu Ato, Wogayehu Ato, Mihiref	Motor Grader	Practice of ditching peration	Practical training in ditching operation		47L/perso
Ditching operation Basio knowledge on construction work Bank outling operation		25.0 (5.0) 25.0 (5.0)	Class room TPU site Class room	Ato, Menigistu Ato, Wogayehu Ato, Mihiref Ato, Menigletu Ato, Wogayehu Ato, Mihiref	Motor Grader Text book, Scale model	Practice of ditching peration Bank outling operation	Prectical training in ditching operation Understand bank outting operation	Understand bank cutting, and can do it	47L/perso
Ditching operation Basic knowledge on construction work Bank outling operation	0.5 0.5	25.0 (5.0) 25.0 (5.0)	Class room TPU site Class room TPU site	Ato, Menisiatu Ato, Wagayehu Ato, Mihiref Ato, Menisletu Ato, Wagayehu Ato, Mihiref Ato, Menisiatu Ato, Wagayehu	Motor Grader Text book, Scale model Motor Grader Text book, Scale model	Practice of ditching peration Bank outling operation	Prectical training in ditching operation Understand bank outting operation		47L/perso
Ditching operation Basic knowledge on construction work Bank outling operation Basic knowledge on construction work		25.0 (5.0) 25.0 (5.0)	Class room TPU site Class room TPU site	Ato, Menigiatu Ato, Wogayehu Ato, Miniref Ato, Menigiatu Ato, Winiref Ato, Menigiatu Ato, Wegayehu Ato, Wegayehu Ato, Wegayehu Ato, Miniref	Motor Grader Text book, Scale model Motor Grader	Practice of ditching peration Bank outling operation Practice of bank outling operation	Prectical training in ditching operation Understand bank cutting operation Prectical training in bank outting operation	Understand bank cutting, and can do it	47L/perso
Ditching operation Basic knowledge on construction work Bank outling operation Basic knowledge on construction work		25.0 (5.0) 25.0 (5.0)	Class room TPU site Class room TPU site Class room TPU site	Ato, Menigintu Ato, Wogayehu Ato, Mihiref Ato, Menigistu Ato, Mihiref Ato, Menigistu Ato, Mihiref Ato, Menigistu Ato, Menigistu	Motor Grader Text book, Scale model Motor Grader Text book, Scale model	Practice of ditching peration Bank outling operation Practice of bank outling operation Mixing operation	Prectical training in ditching operation Understand bank cutting operation Practical training in bank cutting operation Understand mixing operation	Understand bank cutting, and can do it	47L/perso
		25.0 (5.0) 25.0 (5.0)	Class room TPU site Class room TPU site Class room TPU site	Ato, Menigiatu Ato, Wogayehu Ato, Miniref Ato, Menigiatu Ato, Winiref Ato, Menigiatu Ato, Wegayehu Ato, Wegayehu Ato, Wegayehu Ato, Miniref	Motor Grader Text book, Scale model Motor Grader Text book, Scale model	Practice of ditching peration Bank outling operation Practice of bank outling operation Mixing operation	Prectical training in ditching operation Understand bank cutting operation Practical training in bank cutting operation Understand mixing operation	Understand bank cutting, and can do it	47L/perso
Ditching operation Basic knowledge on construction work Basic knowledge on construction work Mixing operation Basic knowledge on construction work	0.8	25.0 (5.0) 25.0 (5.0) 25.0 (5.0)	Class room TPU site Class room TPU site Class room TPU site	Ato, Menigintu Ato, Wogayehu Ato, Mihiref Ato, Menigistu Ato, Mihiref Ato, Menigistu Ato, Mihiref Ato, Menigistu Ato, Menigistu	Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader	Practice of ditching peration Bank outling operation Practice of bank outling operation Mixing operation Practice of mixing operation	Practical training in ditching operation Understand bank cutting operation Practical training in bank outting operation Understand mixing operation Practical training in mixing operation Understand spreading operation	Understand bank cutting, and can do it Understand mixing, and can do it	47L/perso 47L/perso 47L/perso
Ditching operation Basic knowledge on construction work Bank outling operation Basic knowledge on construction work Mixing operation	0.8	25.0 (5.0) 25.0 (5.0)	Class room TPU site Class room TPU site Class room TPU site	Ate, Menisintu Ate, Wogayehu Ate, Milhiref Ate, Menisintu Ate, Wogayehu Ate, Menisintu Ate, Menisintu Ate, Wegayehu Ate, Menisintu Ate, Wegayehu Ate, Menisintu Ate, Menisintu Ate, Menisintu Ate, Menisintu Ate, Milhiref Ate, Milhiref	Motor Grader Text book, Soale model Motor Grader Text book, Soale model Motor Grader Text book, Soale model Text book, Soale model	Practice of ditching peration Bank outling operation Practice of bank outling operation Mixing operation Practice of mixing operation Spreading operation	Prectical training in ditching operation Understand bank outting operation Prectical training in bank outting operation Understand mixing operation Prectical training in mixing operation	Understand bank cutting, and can do it Understand mixing, and can do it	47L/perso 47L/perso 47L/perso
Ditching operation Baero kinewladge on construction work Bank outling operation Baero kinewladge on construction work Mixing operation Baero knowledge on construction work Spreading operation	0.5	25.0 (5.0) 25.0 (5.0) 25.0 (5.0)	Class room TPU site Class room TPU site Class room TPU site Class room TPU site	Ato, Menisistu Ato, Wogayehu Ato, Wilhref Ato, Menisistu Ato, Wilhref Ato, Menisistu Ato, Wilhref Ato, Menisistu Ato, Wilhref Ato, Menisistu Ato, Wogayehu Ato, Milhref Ato, Menisistu Ato, Menisistu Ato, Menisistu Ato, Menisistu Ato, Menisistu Ato, Menisistu Ato, Menisistu	Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader	Practice of ditching peration Bark outling operation Practice of bank outling operation Mixing operation Practice of mixing operation Spreading operation Practice of spreading operation	Prectical training in ditahing operation Understand bank outting operation Prectical training in bank outting operation Understand mixing operation Prectical training in mixing operation Understand spreading operation Prectical training in expending operation	Understand bank cutting, and can do it Understand mixing, and can do it Understand spreading, and can do it	47L/perso
Ditching operation Basic knowledge on construction work Basic knowledge on construction work Mixing operation Basic knowledge on construction work Spreading operation Basic knowledge on construction work Spreading operation	0.8	25.0 (5.0) 25.0 (5.0) 25.0 (5.0) 25.0 (6.0)	Class room TPU site Class room TPU site . Class room TPU site Class room TPU site Class room	Atc. Menigistu Atc. Wogayehu Atc. Miniref Atc. Menigistu Atc. Miniref Atc. Miniref Atc. Menigistu Atc. Menigistu Atc. Menigistu Atc. Menigistu Atc. Menigistu Atc. Menigistu Atc. Menigistu Atc. Menigistu Atc. Menigistu Atc. Wogayehu Atc. Menigistu Atc. Wogayehu	Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model	Practice of ditching peration Bank outling operation Practice of bank outling operation Mixing operation Practice of mixing operation Spreading operation Practice of spreading operation Slope outling operation	Prectical training in ditching operation Understand bank outting operation Prectical training in bank outting operation Understand mixing operation Prectical training in mixing operation Understand spreading operation Prectical training in operation Prectical training in spreading operation Understand slope outting operation Understand slope outting operation	Understand bank cutting, and can do it Understand mixing, and can do it	47L/perso 47L/perso 47L/perso
Ditching operation Basic knowledge on construction work Basic knowledge on construction work Mixing operation Basic knowledge on construction work Spreading operation Basic knowledge on construction work Spreading operation	0.5	25.0 (5.0) 25.0 (5.0) 25.0 (5.0)	Class room TPU site Class room TPU site . Class room TPU site Class room TPU site Class room	Atc. Menigiatu Atc. Wegayehu Atc. Wilhiref Atc. Menigiatu Atc. Wegayehu Atc. Wegayehu Atc. Miningf Atc. Menigiatu Atc. Menigiatu Atc. Menigiatu Atc. Menigiatu Atc. Menigiatu Atc. Menigiatu Atc. Miningf Atc. Miningf Atc. Miningf Atc. Miningf Atc. Miningf Atc. Miningf Atc. Miningf Atc. Miningf Atc. Miningf Atc. Miningf Atc. Miningf Atc. Miningf	Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader	Practice of ditching peration Bark outling operation Practice of bank outling operation Mixing operation Practice of mixing operation Spreading operation Practice of spreading operation	Prectical training in ditahing operation Understand bank outting operation Prectical training in bank outting operation Understand mixing operation Prectical training in mixing operation Understand spreading operation Prectical training in expending operation	Understand bank cutting, and can do it Understand mixing, and can do it Understand spreading, and can do it	47L/perso 47L/perso 47L/perso 47L/perso
Ditching operation Basic knowledge on construction work Basic knowledge on construction work Mixing operation Basic knowledge on construction work Spreading operation Basic knowledge on construction work Spreading operation	0.5 0.5	25.0 (5.0) 25.0 (5.0) 25.0 (5.0) 25.0 (6.0)	Class room TPU aite Class room TPU site Class room TPU site Class room TPU site Class room TPU site	Atc. Menigiatu Atc. Wogayehu Atc. Milrief Atc. Menigiatu Atc. Miniref Atc. Menigiatu Atc. Miniref Atc. Menigiatu Atc. Miniref Atc. Menigiatu Atc. Miniref Atc. Menigiatu Atc. Miniref Atc. Menigiatu Atc. Miniref Atc. Menigiatu Atc. Miniref Atc. Miniref Atc. Miniref Atc. Miniref Atc. Miniref Atc. Miniref Atc. Miniref Atc. Miniref	Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader	Practice of ditching peration Bank outling operation Practice of bank outling operation Mixing operation Practice of mixing operation Soreading operation Soreading operation Slope outling operation Slope outling operation Practice of slope outling operation	Prectical training in ditching operation Understand bank cutting operation Prectical training in bank cutting operation Understand mixing operation Prectical training in mixing operation Understand spreading operation Prectical training in spreading operation Understand spreading operation Understand slope cutting operation Prectical training in alope outting operation	Understand bank cutting, and can do it Understand mixing, and can do it Understand spreading, and can do it Understand slope cutting, and can do it	47L/perso 47L/perso 47L/perso
Sitching operation Basic knowledge on construction work Basic knowledge on construction work Wixing operation Basic knowledge on construction work Spreading operation Basic knowledge on construction work Stope outling operation Basic knowledge on construction work Slope outling operation	0.5	25.0 (5.0) 25.0 (5.0) 25.0 (5.0) 25.0 (5.0) 25.0 (6.0)	Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site	Atc. Menigiatu Atc. Wogayehu Atc. Mihiref Atc. Menigiatu Atc. Mihiref Atc. Menigiatu Atc. Mihiref Atc. Menigiatu Atc. Wihiref Atc. Menigiatu Atc. Mihiref Atc. Menigiatu Atc. Wogayehu Atc. Mogayehu Atc. Mogayehu Atc. Wogayehu	Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model	Practice of ditching peration Bank outling operation Practice of bank outling operation Mixing operation Practice of mixing operation Spreading operation Spreading operation Stope outling operation Stope outling operation Scanffying operation Scanffying operation	Prectical training in ditching operation Understand bank cutting operation Prectical training in bank cutting operation Understand mixing operation Prectical training in mixing operation Understand spreading operation Understand spreading operation Understand elope cutting operation Understand elope cutting operation Prectical training in alope cutting operation Understand elope cutting operation Understand elopefying operation Understand elopefying operation	Understand bank cutting, and can do it Understand mixing, and can do it Understand spreading, and can do it	47L/perso 47L/perso 47L/perso 47L/perso
Ditching operation Basic knowledge on construction work Bank outling operation Basic knowledge on construction work Mixing operation Basic knowledge on construction work Spreading operation Basic knowledge on construction work Slope outling operation Basic knowledge on construction work	0.5 0.5	25.0 (5.0) 25.0 (5.0) 25.0 (5.0) 25.0 (5.0) 25.0 (6.0)	Class room TPU aite Class room TPU site Class room TPU site Class room TPU aite Class room TPU aite Class room TPU aite	Atc. Menigiatu Atc. Wogayehu Atc. Milrief Ato. Menigiatu Atc. Milrief Ato. Menigiatu Atc. Miniref Atc. Menigiatu Atc. Miniref Atc. Menigiatu Atc. Miniref Atc. Menigiatu Atc. Miniref Atc. Menigiatu Atc. Menigiatu Atc. Menigiatu Atc. Menigiatu Atc. Miniref Atc. Menigiatu Atc. Miniref Atc. Menigiatu Atc. Miniref Atc. Menigiatu Atc. Miniref Atc. Menigiatu Atc. Miniref	Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader	Practice of ditching peration Bank outling operation Practice of bank outling operation Mixing operation Practice of mixing operation Soreading operation Soreading operation Slope outling operation Slope outling operation Practice of slope outling operation	Prectical training in ditching operation Understand bank cutting operation Prectical training in bank cutting operation Understand mixing operation Prectical training in mixing operation Understand spreading operation Prectical training in spreading operation Understand spreading operation Understand slope cutting operation Prectical training in alope outting operation	Understand bank cutting, and can do it Understand mixing, and can do it Understand spreading, and can do it Understand slope cutting, and can do it	47L/perso 47L/perso 47L/perso 47L/perso
Ditching operation Basic knowledge on construction work Basic knowledge on construction work Mixing operation Basic knowledge on construction work Spreading operation Basic knowledge on construction work Slope outling operation Basic knowledge on construction work Slope outling operation	0.5 0.5 0.5	25.0 (5.0) 25.0 (5.0) 25.0 (5.0) 25.0 (6.0) 25.0 (6.0) 25.0 (5.0)	Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site	Ato, Menigistu Ato, Wegayehu Ato, Milirief Ato, Menigistu Ato, Milirief Ato, Menigistu Ato, Milirief Ato, Menigistu Ato, Menigistu Ato, Menigistu Ato, Menigistu Ato, Milirief Ato, Menigistu Ato, Milirief Ato, Menigistu Ato, Wegayehu Ato, Milirief Ato, Milirief Ato, Milirief Ato, Menigistu Ato, Wegayehu Ato, Milirief Ato, Menigistu Ato, Milirief Ato, Menigistu Ato, Milirief Ato, Menigistu	Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader	Practice of ditching peration Bank outling operation Practice of bank outling operation Mixing operation Practice of mixing operation Practice of mixing operation Practice of acqueeting operation Slope outling operation Practice of slope outling operation Soarffying operation Practice of acqueeting operation	Prectical training in ditching operation Understand bank cutting operation Prectical training in bank cutting operation Understand mixing operation Practical training in mixing operation Understand spreading operation Prectical training in spreading operation Understand slope cutting operation Practical training in alope cutting operation Understand slope cutting operation Understand slope cutting operation Practical training in alope cutting operation Understand scarifying operation Practical training in scanifying operation	Understand bank cutting, and can do it Understand mixing, and can do it Understand spreading, and can do it Understand slope cutting, and can do it Understand soarifying, and can do it	47L/perso 47L/perso 47L/perso 47L/perso
Ditching operation Basic knowledge on construction work Bank outling operation Basic knowledge on construction work Mixing operation Basic knowledge on construction work Spreading operation Basic knowledge on construction work Slope outling operation Basic knowledge on construction work	0.5 0.5	25.0 (5.0) 25.0 (5.0) 25.0 (5.0) 25.0 (6.0) 25.0 (5.0) 25.0 (5.0)	Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site	Ato, Menigistu Ato, Milrief Ato, Menigistu Ato, Milrief Ato, Menigistu Ato, Milrief Ato, Menigistu Ato, Milrief Ato, Menigistu Ato, Menigistu Ato, Menigistu Ato, Menigistu Ato, Menigistu Ato, Menigistu Ato, Menigistu Ato, Milrief Ato, Milrief	Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Text book, Scale model Text book, Video	Practice of ditching peration Bank outling operation Practice of bank outling operation Mixing operation Practice of mixing operation Spreading operation Practice of appreciation Siope outling operation Practice of slope outling operation Soarfying operation Practice of acertifying operation Outline of maintenance	Prectical training in ditching operation Understand bank cutting operation Prectical training in bank outting operation Understand mixing operation Prectical training in mixing operation Understand spreading operation Prectical training in spreading operation Understand elope outting operation Prectical training in elope outting operation Understand elope outting operation Prectical training in alope outting operation Understand examifying operation Practical training in scanifying operation Understand examifying operation Understand necessity of maintenance	Understand bank cutting, and can do it Understand mixing, and can do it Understand spreading, and can do it Understand slope cutting, and can do it	47L/perso 47L/perso 47L/perso 47L/perso 47L/perso
Ditching operation Basic knowledge on construction work Basic knowledge on construction work Mixing operation Basic knowledge on construction work Spreading operation Basic knowledge on construction work Slope outling operation Basic knowledge on construction work Slope outling operation	0.5 0.5 0.5	25.0 (5.0) 25.0 (5.0) 25.0 (5.0) 25.0 (6.0) 25.0 (5.0) 25.0 (5.0)	Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site	Ato, Menigistu Ato, Wigayehu Ato, Milhiref Ato, Menigistu Ato, Milhiref Ato, Menigistu Ato, Milhiref Ato, Menigistu Ato, Milhiref Ato, Menigistu Ato, Milhiref Ato, Menigistu Ato, Milhiref Ato, Menigistu Ato, Milhiref Ato, Menigistu Ato, Wigayehu Ato, Milhiref Ato, Menigistu Ato, Wigayehu Ato, Milhiref Ato, Menigistu Ato, Wogayehu Ato, Milhiref Ato, Menigistu Ato, Wogayehu Ato, Milhiref Ato, Menigistu Ato, Wogayehu Ato, Milhiref Ato, Mogayehu Ato, Milhiref	Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader	Practice of ditching peration Bank outling operation Practice of bank outling operation Mixing operation Practice of mixing operation Spreading operation Practice of appreading operation Slope outling operation Practice of siope outling operation Sourifying operation Practice of siope outling operation Practice of sarrifying operation Outline of maintenance Method of maintenance	Prectical training in ditching operation Understand bank outting operation Prectical training in bank outting operation Understand mixing operation Prectical training in mixing operation Understand spreading operation Prectical training in spreading operation Understand elope outting operation Understand elope outting operation Understand elope for in the prectical training in alope outting operation Understand eloping operation Practical training in somifying operation Understand eloping operation Understand eloping operation Understand necessity of maintenance Be able to do the maintenance(Daily, Monthly,···)	Understand bank cutting, and can do it Understand mixing, and can do it Understand spreading, and can do it Understand slope cutting, and can do it Understand soarifying, and can do it	47L/person 47L/person 47L/person 47L/person 47L/person 47L/person 47L/person
Basic knowledge on construction work Basic knowledge on construction work Basic knowledge on construction work Mixing operation Basic knowledge on construction work Spreading operation Basic knowledge on construction work Stope cutting operation Basic knowledge on construction work Scarifying operation Basic knowledge on construction work Scarifying operation	0.5 0.5 0.5	25.0 (5.0) 25.0 (5.0) 25.0 (6.0) 25.0 (6.0) 25.0 (5.0) 5.0 (1.0)	Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site	Ato, Menigistu Ato, Wilipref Ato, Milipref Ato, Milipref Ato, Miningf Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Milipref Ato, Menigistu Ato, Milipref Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Milipref Ato, Menigistu Ato, Milipref Ato, Miningf	Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader	Practice of ditching peration Bark outting operation Practice of bark outting operation Wixing operation Practice of mixing operation Spreading operation Practice of areading operation Slope outting operation Practice of slope outting operation Sourifying operation Practice of acarfying operation Outline of maintenance Method of maintenance Practice of maintenance	Prectical training in ditching operation Understand bank cutting operation Prectical training in bank outting operation Understand mixing operation Prectical training in mixing operation Understand spreading operation Understand spreading operation Prectical training in spreading operation Understand slope cutting operation Understand elope cutting operation Understand eloperation Practical training in slope outting operation Understand eloperation Practical training in scannifying operation Understand eloperation Practical principle in mixintersance Practical principle in mixintersance	Understand bank cutting, and can do it Understand mixing, and can do it Understand spreading, and can do it Understand slope cutting, and can do it Understand scarifying, and can do it Understand significance of maintenance, and can do it	47L/person 47L/person 47L/person 47L/person 47L/person 47L/person 47L/person
Basic knowledge on construction work Basic knowledge on construction work Basic knowledge on construction work Mixing operation Basic knowledge on construction work Spreading operation Basic knowledge on construction work Stope cutting operation Basic knowledge on construction work Scarifying operation Basic knowledge on construction work Scarifying operation	0.5 0.5 0.5	25.0 (5.0) 25.0 (5.0) 25.0 (6.0) 25.0 (6.0) 25.0 (5.0) 5.0 (1.0)	Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site	Ato, Menigistu Ato, Wigayehu Ato, Milhiref Ato, Menigistu Ato, Milhiref Ato, Menigistu Ato, Milhiref Ato, Menigistu Ato, Milhiref Ato, Menigistu Ato, Milhiref Ato, Menigistu Ato, Milhiref Ato, Menigistu Ato, Milhiref Ato, Menigistu Ato, Wigayehu Ato, Milhiref Ato, Menigistu Ato, Wigayehu Ato, Milhiref Ato, Menigistu Ato, Wogayehu Ato, Milhiref Ato, Menigistu Ato, Wogayehu Ato, Milhiref Ato, Menigistu Ato, Wogayehu Ato, Milhiref Ato, Mogayehu Ato, Milhiref	Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader	Practice of ditching peration Bark outling operation Practice of bark outling operation Mixing operation Practice of mixing operation Soreading operation Soreading operation Siope outling operation Slope outling operation Scarifying operation Practice of slope outling operation Scarifying operation Outline of existenance Method of maintenance Practice of maintenance Outline of operation report	Prectical training in ditching operation Understand bank outting operation Prectical training in bank outting operation Understand mixing operation Prectical training in mixing operation Understand spreading operation Prectical training in spreading operation Understand elope outting operation Understand elope outting operation Understand elope for in a lope outting operation Understand elope in a lope outting operation Understand elope in a lope outting operation Understand elope in a lope outting operation Practical training in scarifying operation Understand necessity of maintenance Be able to do the maintenance(Daily, Monthly,) Practical training in maintenance Understand necessity of partition report	Understand bank cutting, and can do it Understand mixing, and can do it Understand spreading, and can do it Understand slope cutting, and can do it Understand soarifying, and can do it	47L/perso 47L/perso 47L/perso 47L/perso 47L/perso Total
Basic knowledge on construction work Basic knowledge on construction work Basic knowledge on construction work Mixing operation Basic knowledge on construction work Spreading operation Basic knowledge on construction work Stope cutting operation Basic knowledge on construction work Scarifying operation Basic knowledge on construction work Scarifying operation	0.5 0.5 0.5 2.0	25.0 (5.0) 25.0 (5.0) 25.0 (5.0) 25.0 (6.0) 25.0 (6.0) 25.0 (5.0) 5.0 (1.0)	Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site	Ato, Menigistu Ato, Wilipref Ato, Milipref Ato, Milipref Ato, Miningf Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Milipref Ato, Menigistu Ato, Milipref Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Milipref Ato, Menigistu Ato, Milipref Ato, Miningf	Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader	Practice of ditaring peration Bark outting operation Practice of bark outting operation Wixing operation Practice of mixing operation Spreading operation Practice of areading operation Since outting operation Practice of sice outting operation Practice of sice outting operation Practice of sice outting operation Practice of acarifying operation Outline of maintenance Method of on maintenance Outline of operation report Method of operation report	Prectical training in ditching operation Understand bank cutting operation Prectical training in bank outting operation Understand mixing operation Prectical training in mixing operation Understand spreading operation Understand spreading operation Prectical training in spreading operation Understand slope cutting operation Understand elope cutting operation Understand eloperation Practical training in slope outting operation Understand eloperation Practical training in scannifying operation Understand eloperation Practical principle in mixintersance Practical principle in mixintersance	Understand bank cutting, and can do it Understand mixing, and can do it Understand spreading, and can do it Understand slope cutting, and can do it Understand scarifying, and can do it Understand scarifying, and can do it Understand significance of maintenance, and can do it Understand significance of operation report, and can do it	47L/perso 47L/perso 47L/perso 47L/perso 47L/perso Total
Ditching operation Basic knowledge on construction work Bark outling operation Basic knowledge on construction work Mixing operation Basic knowledge on construction work Spreading operation Basic knowledge on construction work Stope outling operation Basic knowledge on construction work Scarifying operation Maintenance Operation report	0.5 0.5 0.5	25.0 (5.0) 25.0 (5.0) 25.0 (5.0) 25.0 (6.0) 25.0 (6.0) 25.0 (5.0) 5.0 (1.0)	Class room TPU alte Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU class room TPU class room	Ato, Menigistu Ato, Wilipref Ato, Milipref Ato, Milipref Ato, Miningf Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Milipref Ato, Menigistu Ato, Milipref Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Miningf Ato, Menigistu Ato, Milipref Ato, Menigistu Ato, Milipref Ato, Miningf	Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Text book, Scale model Text book	Practice of ditching peration Bark outling operation Practice of bark outling operation Mixing operation Practice of mixing operation Soreading operation Soreading operation Siope outling operation Slope outling operation Scarifying operation Practice of slope outling operation Scarifying operation Outline of existenance Method of maintenance Practice of maintenance Outline of operation report	Prectical training in ditching operation Understand bank outting operation Prectical training in bank outting operation Understand mixing operation Prectical training in mixing operation Understand spreading operation Prectical training in spreading operation Understand elope outting operation Understand elope outting operation Understand elope for in a lope outting operation Understand elope in a lope outting operation Understand elope in a lope outting operation Understand elope in a lope outting operation Practical training in scarifying operation Understand necessity of maintenance Be able to do the maintenance(Daily, Monthly,) Practical training in maintenance Understand necessity of partition report	Understand bank cutting, and can do it Understand mixing, and can do it Understand spreading, and can do it Understand slope cutting, and can do it Understand scarifying, and can do it Understand significance of maintenance, and can do it	47L/perso 47L/perso 47L/perso 47L/perso 47L/perso Total
Ditching operation Basic knowledge on construction work Basic knowledge on construction work Mixing operation Basic knowledge on construction work Spreading operation Basic knowledge on construction work Slope outling operation Basic knowledge on construction work Slope outling operation	0.5 0.5 0.5 2.0	25.0 (5.0) 25.0 (5.0) 25.0 (5.0) 25.0 (6.0) 25.0 (6.0) 25.0 (5.0) 5.0 (1.0)	Class room TPU alte Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU site Class room TPU class room TPU class room	Ato, Menigistu Ato, Wilipref Ato, Milipref Ato, Milipref Ato, Mininglatu Ato, Milipref Ato, Menigistu Ato, Mininglatu Ato, Wagayehu Ato, Mininglatu Ato, Wagayehu Ato, Mininglatu Ato, Wagayehu Ato, Mininglatu Ato, Wagayehu	Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Text book, Scale model Text book	Practice of ditaring peration Bark outting operation Practice of bark outting operation Wixing operation Practice of mixing operation Spreading operation Practice of areading operation Since outting operation Practice of sice outting operation Practice of sice outting operation Practice of sice outting operation Practice of acarifying operation Outline of maintenance Method of on maintenance Outline of operation report Method of operation report	Prectical training in ditching operation Understand bank cutting operation Prectical training in bank cutting operation Understand mixing operation Prectical training in mixing operation Understand spreading operation Prectical training in mixing operation Understand spreading operation Prectical training in spreading operation Understand elope cutting operation Understand elope for the prectical training in scaling operation Understand elope for the prectical training in scaling operation Understand necessity of maintenance Be able to do the maintenance(Daily, Monthly,) Practical training in maintenance Understand necessity of praction report Be able to write the operation report Understand sealed materials about oest	Understand bank cutting, and can do it Understand mixing, and can do it Understand spreading, and can do it Understand slope cutting, and can do it Understand scarifying, and can do it Understand scarifying, and can do it Understand significance of maintenance, and can do it Understand significance of operation report, and can do it	47L/perso 47L/perso 47L/perso 47L/perso 47L/perso Total
Ditching operation Basic knowledge on construction work Bark outling operation Basic knowledge on construction work Mixing operation Basic knowledge on construction work Spreading operation Basic knowledge on construction work Stope outling operation Basic knowledge on construction work Scarifying operation Maintenance Operation report	0.5 0.5 0.5 2.0	25.0 (5.0) 25.0 (5.0) 25.0 (5.0) 25.0 (5.0) 25.0 (5.0) 25.0 (5.0) 5.0 (1.0)	Class room TPU aite Class room TPU aite Class room TPU aite Class room TPU aite Class room TPU aite Class room TPU aite Class room TPU aite Class room TPU aite Class room TPU aite Class room Class room Class room Class room	Ato, Menigistu Ato, Wilaref Ato, Milhiref Ato, Milhiref Ato, Menigletu Ato, Milhiref Ato, Menigletu Ato, Milhiref Ato, Menigletu Ato, Milhiref Ato, Menigletu Ato, Milhiref Ato, Menigletu Ato, Milhiref Ato, Menigletu Ato, Milhiref Ato, Menigletu Ato, Milhiref Ato, Menigletu Ato, Milhiref Ato, Menigletu Ato, Wilhiref Ato, Menigletu Ato, Wilhiref Ato, Menigletu Ato, Wogayehu Ato, Milhiref Ato, Menigletu Ato, Wogayehu Ato, Wogayehu Ato, Wogayehu Ato, Wogayehu Ato, Wogayehu	Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Motor Grader Text book, Scale model Text book, Scale model Text book	Practice of ditching peration Bank outling operation Practice of bank outling operation Mixing operation Practice of mixing operation Soreading operation Soreading operation Slope outling operation Slope outling operation Soarffying operation Soarffying operation Outline of maintenance Method of maintenance Practice of anothyping operation Outline of operation report Method of operation report Method of operation report Method of operation report Method of operation report Method of operation report Method of operation report Method of operation report	Prectical training in ditching operation Understand bank outting operation Prectical training in bank outting operation Understand mixing operation Prectical training in mixing operation Understand spreading operation Understand spreading operation Understand siope outting operation Understand siope outting operation Understand elope outting operation Understand econfifting operation Understand econfifting operation Understand econfifting operation Understand necessity of maintenance Be able to do the maintenance(Daily, Monthly,) Practical training in maintenance Understand necessity of operation report Be able to write the operation report	Understand bank cutting, and can do it Understand mixing, and can do it Understand spreading, and can do it Understand slope cutting, and can do it Understand scarifying, and can do it Understand scarifying, and can do it Understand significance of maintenance, and can do it Understand significance of operation report, and can do it	47L/perso 47L/perso 47L/perso 47L/perso 47L/perso

l asson	Plan	· Dumi	Truck

Lesson Plan : Dump Truck	II andress	Practice	Venue	Instructor	Training Material	Sub-subject	Contents of training	Training Goal	Remark
ublect				Atc. Wogayehu		History of construction equipment	Know the history of construction equipment	Get right knowledge about construction equipment	- It solves is
ieneral idea of construction machinery	2.1	(n/person)	Class room	Att. Wogayoru	I BAL DOOK	Classification of construction equipment	Know a kind of general construction equipment	and tillife to to the and a shade de tion was all code britain.	
			100	4. 10.	Text book	Characteristic of construction equipment	Understand a characteristic of construction equipment	Understand a characteristic of construction equipment	
Outline of construction equipment and	2.0	וי	Class room	Ato. Wogayahu	1 BXC BOOK			Origination a Crisis decertable of constant addition addition to	1
onstruction mechanization			 	ļ.,		Selection of construction equipment	Be able to phoose construction equipment accord with site condition	Out and the basis and a substitution will be be a second and an arranged as	
lasio knowledge of civil engineering	2.5			Atc. Wogayehu		fundamentals of soil and rook	Understand a characteristic and a property of soil and rook	Get necessary basic engineering works knowledge as an operator	
Construction materials and pavement	1.5	5	Class room	Ato. Wogayehu	Text book	fundamentals of coment concrete and pavement	Understand a characteristic and a property of	Get necessary basic road knowledge as an operator	1
			1				concrete payament and asphalt payament		
undamentals of engineering	3.0)	Class room	Ato. Wogayehu	Text book	Mechanical engineering	Understand a basic matter of the dynamics and physics	Get necessary basic engineering knowledge as an operator	
		1		1	İ	Electrical angineering	Understand a basic matter of the electrical engineering		
			1	1		Machine element	Understand a basic matter of the machine element		
Basic knowledge of machine structure	2.5	5	Class room	Ato. Wogayehu	Text book, Video	Outline of engine	Understand an outlins and a kind of engine	Get necessary basic engine knowledge as an operator	
instra		i				Intaka and exhaust system	Understand each system of engine	1	
		i		1	1	Fuel eystem			1
	1	1	ľ			Lublicant system			
	1	1	1		1	Cooling system			
		1	į.			Electric system			
Basic knowledge of machine structure	1.5		Class room	Ato. Wogayehu	Text book	Outline of power train	Understand an outline and a kind of power train	Get necessary basic power train knowledge as an operator	
	1 13	1	CIARS LODILI	CO. TOBEYORIU	1000	Glutch system	Understand each system of power train		
Power train	1		1		1	Transmission	Simulation of Action of Section (1)	†	
	1		1		1	Differential			
			1			Outline of undercarriage	Understand an outline and a kind of undercamage	Get necessary basic undercarriage knowledge as an operator	
Basic knowledge of machine structure	1.8	3	Class room	Ato. Wogayehu	I EXT DOOK			Car Hocestell A ment office celluste a howings we sit obstato.	
Underoamiage			1		<u> </u>	Steering system	Understand each system of undercarriage	Get necessary basic hydraulio system knowledge as an operator	
Basic knowledge of machine structure	2,1	5	Class room	Ato. Wogayehu	Text book	Outline of hydraulio system	Understand an outline and a kind of hydraulic system	List necessary basic nyarauto system knowledge as an operator	- 1
lydraulic system	1	ļ		1		Pump	Understand each system of hydraulic system		
		1				Cylinder			1
	1	i		1		Motor			i
	l	i	1		l	Valve			
Basic knowledge of machine structure	2.0	31	Class room	Ato, Wogayehu	Text book, Video	Lublicant	Understand a basic matter about lubiloant	Got necessary basic lublicant, fuel and tire knowledge as an operator	f
Fuel, lubricent and tire	1 -	1		1 -		Fuel	Understand a basic matter about fuel		1
1 001, 100110110 210 010	1		1	1		Tire	Understand a basic matter about tire		
Tools	0.0	1	Class room	Ato. Wogayehu	Text book	Tool	Understand a kind of tools and the direction for uses	Get necessary basic tool knowledge as an operator and can treat it properly	
10019	1.0		Workshop	Ato, Wogayehu	Exercise				1
General idea of Dump Truck	2,0		Class room	Ata Wagayahu	Text book, Soale model, Video	Outline of dump truck	Understand an outline and a kind of dump truck	Get right knowledge about dump truck	
Structure and function of Dump Truck	4,1		Class room	Ato Wogevehy	Text book, Spale model	Structure and function	Understand a structure and function of dump truck	Get right knowledge about structure and function of dump truck	
Basic knowledge on construction work	41		Class room	Ato Worsysty	Text book, Scale model	How to operate	Understand a basic matter from riding to moving of construction equipment	Be able to do effective construction equipment operation	(13L/h)
	7.		TPU site	Ato. Abera	Dump Truck	Basic operation	Understand basic how to move construction equipment		
Basic operation	l.	10.0 (1.0)	ILO NICE	Ato. Bekele	Dung Track	Practice of basic operation	Practical training in basic operation		13L/perso
			1	Ato, Kedir	1	Traceos of pasic operation	1 Tabubat danning in basic operation		1000
					Table Balancia	Driving operation	Understand driving operation	Understand driving, and can do it	
Basic knowledge on construction work	0.		Class room					Dissersement anyling, and carries to	28L/persor
Driving operation	1	20.0 (2.0)	TPU site	Ato. Abera	Dump Truck	Practice of driving operation	Practical training in driving operation		ZOL/ perso
	ļ	1	ľ	Ato. Bakels	1	1			1
			<u> </u>	Ato. Kedir	<u> </u>	<u> </u>			
Basio knowledge on construction work	D.			Ato. Wogayehu	Text book, Soale model	Loading and dumping operation	Understand loading and dumping operation	Understand loading and dumping, and can do it	1
Loading and dumping operation	t	40.0 (4.0)	TPU site	Ato. Abers	Dump Truck	Practice of loading and dumping operation	Practical training in leading and dumping operation	[52L/parso
	1	1	i	Ato, Bekele	1			· I	
	1	.1	L	Ato, Kedir	1				
Maintenance	2.	01	Class room	Ato, Wogayehu	Text book, Video	Outline of maintenance	Understand necessity of maintenance	Understand significance of maintenance, and can do it	1
Hillery street ton 10 m	i -		TPU site	Ato, Abera	Dump Truck	Method of maintenance	Be able to do the maintenance(Daily, Monthly,)		1
	1		1	Ato, Bekele		Practice of maintenance	Practical training in maintenance		Total
	1	1	i	Ato, Kedir					91L/perso
Operation report	1,	~	Cioes room	Ato. Wogayehu	Text book	Outline of operation report	Understand necessity of operation report	Understand significance of operation report, and can do it	
Obelahou teberr	- 1 "	١	Cinea 100m	Trico. Hogayorki	I DAG DOON	Method of operation report	Be able to write the operation report		1
		 	101	AA- Waren I	Taut back	Machine cost	Understand a basic matter about cost	Be able to make an effective construction equipment operative plan	-1
Machine cost and cycle time	3.	الا	Ulass room	Ato, Wogayehu	Text book	Cvole time	Understand a basic matter about ovole time	was as the strong and strong and strong strong strong strong biggs	1
			 	 	+ 11 1 104.			Be able to do safe construction equipment operation without accident	
Safety operation	2.	o j	Class room	Ata. Wagayehu	Text book, Video	Safety operating	Understand safe construction equipment operation	The sine to no early countricition administration mituality accides.	1
	1	i	1	1	1	Causes of accidents	Understand a cause of aggident	· ·	1



- 1. Summary of Project Operation Schedule
- 2. Curriculum
- 3. Syllabus



·		CURRICULUM -	EQUIPMENT MECHANICS			·
Trainees' Gualification			CURRENT Current Course	Technician Course (3 Months) Graduates of High school (10th	NEW Specialist Course (2 Months) * Graduates of "Technical	Management Course (3 Weeks) * Enrivolents to Mechanic
				grade) * Graduates of Technical/ Vocatoria school * Equivalents to Mechanic Junior, I, II, in ERA's job description	Cestrse [*] in ATTC * Equivalents to Mechanic III, IV in ERA's job description	formen in ERA's job description
Gourse Target				To be able to understand the basic structures and functions of the automotives' components, and be able to maintain construction machineries properly.	To be able to understand the structures and functions of construction machineries' components, and be able to perform the trouble-shooting and the preventive maintenance.	To be able to menage the workshop properly and effectively, and he able to design the maintenance planning and testing method.
Training Cepecity (Person/One training co Training Period Training Period (Net hours) Training Times per year Number of Trainess per year (Output)	ourse)		Not fixed According to instructions from ERA Head Office	24 3 months 360hr (L:180 P:180) 3 72	12 2 months 240hr (L:120 P:120) 3 38	10 3 weeks 90hr (3:60 P:30) 3 30
1 Fundamentals	(Basic)	General Idea of Construction Machinery Safety in the shop Points to kept in mind when Operation Hand tools & Shop Equipment Measuring Tools		L P 1.5 0 1.5 0 1 0 2 3 2 3	L P	Ł P L Lecture P: Practice
2 Engine	(Automotive)	Festeners Engine Fundamentals Uses of Engine		8 3		
		Types of Engine Construction of Engine Velves and Valve Trains Engine measurements and performance Automotive Engine Fuel		12 12	3 3	
		Automotive Evel system Automotive Exheust system Automotive Carburettors Gasoline Fuel Injection system Diesel Fuel Injection system Engine Biobrication system		24 24	9 9	
3 Power Train	(Automotive)	Engine Cooling system Conventional Ignition system Clutch		9 9	1.5 (.5	
		Transmission Final Orive Line Reer Aste & Differential		12 9 3 3 10 6	3 3 1.5 1.5 3 3	
4 Chassis	(Automotive)	Brake system Ar Brake system Steering system Automotive Suspension Tire & Wheels		10 9 6 6 6 6 3 3 6 3	3 3 3 3 1.5 1.5 1.5 (.5	
5 Structure & Function	(Construction Equipment)	Fuel system – D7G Air Inlet & Exhaust system – D7G Lufwication system – D7G Gooling system – D7G Basic Engine – D7G		6 6	3 3	
		Power Train - D7G Torque Gonverter - D7G Flywheel Clutch - D7G Transmission - D7G Steering Clutches, Brakes & Finel Drives - D7G Undercorriage - D7G		9 6	4.5 4.5	
		Hydraulic osotum -D7G Fuel system - GD611 Ar Inlat & Exhaust system - GD611 Lubrication system - GD611 Lubrication system - GD611		3 3	3 3	
		Cooking system = GD611 Basic Engine = GD611 Power Trein = GD611 Steering system = GD611 Steering system = GD611 Brake system = GD611 Hydraufic			3 3	
		Work Equipment - GD611 Fuel system - 938G Air Inlet & Exhaust system - 938G			4.5 4.5	
		Lubrication system - 938G Geoling system - 938G Basic Engine - 938G Torque Gonverter - 938G Transmission - 938G			3 3 1.5 1.5	
		Differential - 938G Hydraufic cystem - 938G Fuel system - 320C Air Inlet & Exhaust system - 320C Lubrication system - 320C			1.5 1.5	
		Cooling system = 320C Basic Engine = 320C Hydraulic system = 320C Tool Control system = 320C			7.5 7.5	
6 Hydraulics	(Construction Equipment)	Introduction Generation of Oil Hydraulic Power Hillization of Oil Hydraulic Power Trensmission of Oil Hydraulic Power Control of Oil Hydraulic Power Application of Oil Hydraulic Power		2 0 4 0 4 6	3 3 6 6	
7 Maintenance	(Construction Equipment)	Delly Maintenance Operation Report Maintenance Mayus Periodical Maintenance Work – DTG Periodical Maintenance Work – DGB1 Periodical Maintenance Work – SB81 Periodical Maintenance Work – 938C Periodical Maintenance Work – 338C Periodical Maintenance Work – TS200 Periodical Maintenance Work – TS200 Periodical Maintenance Work – TS200		1 0 1 0 1 0 3 3 3 3 3 3 3 3 3 3	1 0	; 0 1 0 1 0
					The second secon	1.5
8 Operation	(Construction Equipment)	Buildozer Wheel Looder Hydrautiin Excavator Moter Grader Roller		0 6 0 6 0 5 0 6		
8 Operation 9 Testing & Adjusting Trouble Shooting & Preventive Meintenence	(Construction Equipment) (Construction Equipment)	Buildozer Wheel Looder Wheel Looder Whotaulis Exawator Motor Grader Roller Engine - D7G Power Train - D7G Hydraulis system -07G Engine - G0611 Power Train - G0611 Hydraulis system - G0611 Engine - 938G Power Train - 938G Power Train - 938G Power Train - 938G Power Train - 938G Power Train - 938G		0 6	2 2 2 3 2 3 2 3 2 0 2 3 2 3 2 3 1 0 1 1.5 1 1.5 1 1.5 1 0 0	3 45 3 3 45 3 0 3 3 3 3 3 15 0 15 3 3 15 0
9 Testing & Adjusting Trouble Shooting & Preventive Maintanence	(Construction Equipment)	Buildozer Wheel Looder Hydradis Excewtor Motor Grader Roller Engine - D7G Power Train - D7G Hydradis system - D7G Dower Train - G851 Power Train - G851 Engine - 938G Hydradis system - 938G Hydradis system - 938G Engine - 230G		0 6 0 8 0 6 0 6	2 3 2 0 2 0 2 3 2 3 1 1.5 1 1.5	3 3 3 45 3 0 3 3 3 3 1.5 0 1.5 3 3 3
9 Testing & Adjusting Trouble Shooting		Buildozer Wheel Looder Wheel Looder Whydraulis Excawator Motor Grader Roller Engine - D7G Power Train - D7G Hydraulis system -07G Engine - G0611 Power Train - G0611 Hydraulis system -60611 Engine - 938G Power Train - 938C Power Train - 938C Hydraulis system -60610 Engine - 320C Engine - 320C Electrical system - 320C Electrical system - 320C Tool Control system - 320C		0 6	2 3 2 3 2 0 2 3 2 3 2 3 3 1 0 1 5 1 1 5 1 0	3 3 45 3 0 3 3 3 3 1.5 0 1.5 0

SYLLABUS - Mechanic - Technician Course

Subject	Hours Lecture Practice		Sub-Subject	Contents of Training	Training Goal	
	Total 180	Total 180				
General Idea of Construction Machinery	1.5	0	History & Tendency of MC Work	機械化施工の歴史と最近の傾向	Will be able to discuss the history and recent tendency of the heavy construction machineries.	
					By the end of this session, the trainees will be able to; 1. Understand the actual mechanization of construction industry started recently, and the introduction of construction machinery was in the latter half of 1940's.	
					2. Discuss the recent tendency of construction machinery; Larger scale and smaller scale machinery Improvement of traffic ability Improvement of comfortableness of cabin Improvement of safety Automation Improvement of counter-measures against noise and vibration	
			Crassification & Use of Construction Machinery	建設機械の程類と用途	Will be able to understand the kinds and applications of the heavy construction machineries.	
					By the end of this session, the trainees will be able to; 1. Discuss the kinds of many heavy construction machineries, and describe their purposes of usage. 2. Understand the application of many heavy construction machineries by watching VTR.	
					Understand the kinds and applications of the machineries which they handle in this workshop.	
Safety in the Shop	1.5	0	Shopwork and Safety Shop Hazards to Watch out for	Shop内の安全について 安全についてのDiscussion	Will be able to identify and list shop hazards due to various causes such as foulty working habits, working conditions, equipment defect and incorrect use of hand tools.	
			Fire Prevention	消火器の種類と使用法、設置場所	By the end of this session, the trainees will be able to 1. Identify types of fire extinguishers and the classification of fires. Powder, CO2, Foam, Water	
			Safety Rules	一般安全ルール	Discuss shop safety. Discuss shop layout. Discuss sfire prevention in the shop. List the safety rules.	
Points to kept in mind when Operation	1	0	Good Operator Causes of accidents General precaution for operation	建設機械操作上の諸注意 事故の原因 機械操作における一般注意事項	Will be able to observe the safety during the operation of the heavy construction machineries.	
			Safety hint	機械操作における安全の具体例	By the end of this session, the trainees will be able to; 1. Discuss the safety rules when operationg the heavy construction machineries. 2. Describe the major causes of the accidents.	
					Discuss the concrete examples of the dangers during operation.	

		·		Tachnician	
Hand Tools & Shop Equipment	2	3	Hand Tools	ハンドツールの種類、使用方法 及び、一般注意事項	Will be able to describe and list the basic hand tools and power tools used in the automotive shop.
			Power Tools & Shop Equipment	パワーツールの種類、使用方法	By the end of this session, the trainees will be able to 1. Explain the difference among the open end wrench, the box wrench and the combination wrench.
			your your a crop Equation	及び、一般注意事項	2. Explain the purpose of power tools which are operated by electric, pneumatic and hydraulic. 3. Demonstrate the correct way how to use power tools. 4. List the cutting tools used in the automotive shop. Chisels, Hacksaws, Files, Drills, Tap and Die 5. Describe the various kinds of screw driver.
Measuring Tools	2	3	Measuring Tools	計瀬器具の種類、使用方法 及び、一般注意事項	Will be able to describe the basic automotive-shop measuring tools and demonstrate how to use them. Thicness gauge Micrometer Dial indicator Venire calliper Small-hole gauge By the end of this session, the trainees will be able to 1. Measure components with different types of measuring tools. 2. Discuss the basic difference between the metric system and the US system.
Fastaners	2	3	Fasteners	締め具の種類、使用方法 及び、一般注意事項	Will be able to describe the various types of Fasteners that hold the automobile parts together such as; Bolts and Nuts Revets Snap ring Cotter pin Screw etc.
					By the end of this session, the trainees will be able to 1. List and explain the four ways that screw threads are described. 2. Explain how bolt heads are marked to indicate their strength. 3. Discuss six types of screw and bolt heads and the tools used with them. 4. Discuss snap rings and their uses. 5. Explain the purpose of keys and splines.
Engine Fundamentals	8	3	Atoms & Combustion	内燃機関シリンダ内の燃焼について	Will be able to describe atoms, chemical reactions combustions and the two rule -increase of pressure with increasing temperature and increase of temperrature with increasing pressure -and explaing how they work in the engine.
					By the end of this session, the trainees will be able to; 1. Explain what happens during combustion. 2. Discuss combustion of fuel in the engine. 3. Discuss expansion of solids and fluids with heat. 4. Explain why combustion is not ideal, or complete in the engine.
Uses of Engine			Internal Combustion Engines Engine Construction, fundamentals Engine Operation Valve Action	内燃機関 エンジンの基礎構造 エンジンの基本作動原理 バルブの作動	Will be able to describe internal combustion engine and explain the basic difference between spark ignition and diesel (compression ignition) engine and its operation.

	7	lechnician	
	Fly Wheel & Drive Plate	フライホイールとその機能	By the end of this session, the trainees will be able to: 1. Describe the two kinds of piston engine. 2. Describe how the crank shaft and connection rod change rotary motion to reciprocating motion. 3. Discuss the four piston strokes of a spark ignition engine and what happens in the engineduring each stroke. 4. Describe the four piston strokes of a compression-ignition engine and what happens in the engine during each stroke. 5. Explain how pushrod valve train works. 6. Discuss the flywheel and its function.
Types of Engine	Types of Engine	エンジンの種類(さまざまな分類)	Will be able to list the various ways in which engine are classified and explain what each classification means.
			By the end of this session, the trainees will be able to explain engine classified according to: 1. Number of cylinder 2. Arrangement of cylinder 3. Arrangement of valves 4. Type of cooling 5. Number of strokes per cylcle (two or four) 6. Type of fuel used 7. Method of ignition 8. Firing order 9. Raciprocating or rotary
Construction of Engine 12 12	Cylinder Block Cylinder Head Exhaust & Intake Mnifold Crankshaft Enigine Bearings Engine Mounts Connecting Rod Pistons & Piston Rings	シリンダブロックの構造と機能 シリンダヘッドの構造と機能 シリンダヘッドの構造と機能 分字ンクシャフトの構造と機能 エンジンペアリングの構造と機能 エンジンマウントの構造を機能 エンジンマウントの構造を機能 コネクチングロッドの構造と機能 ピストン、及びピストンリングの構造と機 能	Will be able to identify and name the parts of disassemble engine and discuss their contractions purpose and operation. By the end of this session, the trainees will be able to; 1. Discuss cylinder block & cylinder head and how they are made. 2. Explain the purpose and function of intake and exhaust manifolds, vibration dampers and flywheels. 3. Discuss crankshaft and how it is made. 4. Describe engine bearings, their function and how they are kibricated. 5. Discuss the construction, purpose, operation and lubrication of the connectiong rods. 6. Discuss the construction, purpose, operation and lubrication of the pistons and piston rings. 7. Explain the purpose of piston-expansion control and how it is achieved.
Valves and Valve Trains	Types of Valve Trains Driving the Camshaft Valves Valve Cooling Valve Seat Rocker Arms Valve Stem Oil Seals Valve Lifting Valve Timing	パルプトレーンの種類 カムシャフトの作動 パルブ パルブの冷却 パルブシート ロッカーアーム パルブステムのオイルシール パルブの作動 パルブタイミング	Will be able to discuss the purpose, construction and operation of engine valves. By the end of this session, the trainees will be able to; 1. Explain what valve timing means and how valves are timed for optimum economy and performance. 2. Describe the advantages, construction and operation of over head-camshaft engine. 3. Explain the purpose of hydraulic valve lifters and how they work. 4. Identify and name the parts in the valve trains and explain what they are for.
Engine measurements and performance	Terminology of Engine Power Friction Volumetric Efficiency	エンジン性能と関連用語 摩耗 容預効率	Will be able to define bore, stroke, piston displacement, compression, and volumetric efficiency.

-67-

l econocian

エンジンの機械効率、熱効率

By the end of this session, the trainees will be able to:

Engine Efficiency

		спуте стоетсу	エンシンの優権効率、熱効率	by the end of this session, the trainees will be able to; 1. Define work, energy, power and torque, and explain how they are measured and their importance to engine performance. 2. Define friction and list and explain the three kinds of friction. 3. Discuss the relation between brake horse power, indicated horse power and friction horse power.
Automotive Engine Fuel	24 24	Gasoline Diesel Engine Fuel	ガソリン ディーゼル燃料	Will be able to discuss the combustion and special characteristics of diesel & gasoline engine fuel and the purpose of the additives used in the fuel.
				By the end of this session, the trainees will be able to: 1. Explain volatility and octane ratings and why they are imporatant in gasoline. 2. Explain volatility, viscosity and cetane number of diesel fuel. 3. Describe knocking, detonation and preignition and explain what causes them and how they can be prevented.
Automotivs Fuel system		Air Cleaner Fuel pump Main Line Filter, Fuel Tank & Lines Factors Affecting the Fuel System	エアクリーナ 燃料ポンプ 燃料フィルタ、タンク、ラインズ 燃料システムに影響を及ぼす要因	Will be able to identiy and explain the operation and construction of the various fuel system components on the machinery. By the end of this session, the trainees will be able to: 1. List and describe the purpose, construction and operation of all components in the carburetted fuel system except the carburettor. 2. Explain the basic difference between the carburetted fuel system and the fuel injection system. 3. Explain the purpose and operation of teh mechanical & electrical operated fuel pump.
Automotive Exhaust system		Muffler Supercharger & Turbocharger	マフラ スーパーチャージャとターボチャージャ	Will be able to explain the purpose and operation of turbocharger and supercharger. By the end of this session, the trainees will be able to; 1. Describe the purpose and construction of muffler. 2. Explain the purpose of catalytic converter. 3. Explain the difference between turbocharger and supercharger.
Automotive Carburettors Gasoline Fuel Injection system		Introduction of Carburettors Types of Carburettors Float System (Circuit) Primary Low-Spees Circuit Main Metering System (High-Speed Circuit) Power System Acceleration - Pump System Choke System Carburettor Auxiliary Units Side Draft SU Carburettor Trouble Shooting of Fuel System Comparison between EFI and Carburettor Type of EFI System EFI Components (Port Injection) - L-EFI	キャブレータ キャブレータの種類 フロートシステム ブライマリロースピードサーキット メインメータリングシステム パワーシステム ポンプシステム キャブレータオーグジリアリユニット サイドドラフトSUキャブレータ 燃料システムのトラブルシュート EFIとキャブレータの比較 EFIコンポーネント	Will be able to explain and describe the operation & the difference between a fixed venture and variable venture carburettor. By the end of this session, the trainess will be able to; 1. List and describe the operation of the six systems in a fixed venture carburettor. 2. Explain how a variable venture carburettor works. 3. Identify the various visible carburettor components. 4. Examine disassembled carburettor and identify the major parts. Will be able to explain and describe the operation The function of electronic fuel injection system.

Throttle Body Injection

スロットルボディインジェクション

By the end of this session, the trainees will be able to:

- 1. Define injection value, function of ECU and sensors (signal).
- 2. Explain the two main types of electronic fuel injection system.
- 3. Locate the components of gasoline fuel injection system on various cars.
- 4. describe teh construction and operation of throttle body and port injection system.
- 5. Diagnose trouble in various gasoline fuel injection system.

Diesel Fuel Injection system

Diesel Fuel Injection
Distributor—type Injection Pump
Governors for Fuel Injection Pumps
Injection Nozzles & Injection Lines
Diesel Combustion Chamber

ディーゼル燃料インジェクション 分配型噴射ポンプ 燃料噴射ポンプのガバナ 噴射ノズルとライン ディーゼル燃焼室 Will be able to describe the four basic types of fuel injection pump used on automotive diesel engine.

By the end of this session, the trainees will be able to:

- 1. Explain the difference in operation between diesel (compression ignition) and gasoline (spark ignition) engine.
- 2. Locate the components of diesel engine fuel injection system on cars and explain how each component works.
- 3. Explain how to replace and time a fuel injection numo.
- 4. Diagnose and servise various automotive diesel engine fuel injection system.

Engine lubrication system 8 9 Purpose & Properties of Lubricating Oil 潤滑油の目的と特性 フィルポンプ Types of Lubricating System 潤滑システムの種類 Accessories of Lubrication System 潤滑システムの補助装置 Crankcase Ventilation (Emission Control) グランクケースのベンチレーション (エミッションコントロール)

Will be able to explainthe operation of the engine lubricating system..

By the end of this session, the trainees will be able to:

1. Describe six jobs performed by the engine oil.

- 2. Discuss the properties of good lubricating oil and the reasons for the
- Discuss the properties of good lubricating oil and the reasons for the additives that are put into it.
- 3. Explain the service ratings of lubricating oil.
- 4. Discuss possible troubles in the lubricating system and their causes and corrections.

Will be able to describe the operation of the two types of engine cooling

- 5. Change the engine oil and oil filter.
- 6. Servise the engine oil pan and oil pump.

Engine Cooling system

Coolants
Coolant Flow
Water Jackets
Radiators
Water Pumps
Fans
Thermostats
Radiator Caps
Draining the System
Air Cooling System (Direct Cooling)
Trouble Shooting of Cooling System

クーラント(冷却水) クーラント(冷却水) クーラントの流れ ウォータジャ ラジェータポンプ 冷却ファン サーモスタット ラジェーン 空冷システム

system.

By the end of this session, the trainees will be able to:

- 1. Explain the operation of the water pump.
- 2. Define variable speed fan.
- 3. Discuss the flow of coolant through the two types of automotive radiators.
- 4. Explain the operation of tah thermostat.
- 5. Explain the use of two values used in the radiator pressure cap.

Conventional Ignition system

Function of the Ignition System Ignition Coils Construction & Operation Ignition Distributor
Timing Advance
Operation of Condenser
Operation of Spark Plug

点火システムの機能 点火コイルの構造と作動 ディストリビュータ 進角装置 コンデンサの作動 スパークブラグの作動

クーリングシステムのトラブルシュート

Will be able to explain the operation of the contact point ignition system.

By the end of this session, the trainees will be able to:

- 1. Locate and identify the componets of the contact-point ignition system on various vehicles.
- 2. Explain the construction and operation of centrifugal- and vacuum-advance

-69-

Technician

Series Resistor of Ignition Coil

点火コイルと抵抗器

mechanisms.

- machanisms.

 3. Use the shop testers to check ignition system operation and components.

 4. Check and adjust ignition timing.

 5. Adjust on replace contact points.

 6. Remove and install ignition distributors.

Clutch	â	3	Engine Clutch Types of Clutches Function of Clutch Clutch Trouble Diagnosis Wet Type Clutch	クラッチ クラッチの種類 クラッチの機能 クラッチのトラブル診断 湿式クラッチ	By the end of this session, the trainees will be able to: 1. Explain the purpose of the clutch. 2. Describe the construction & operation of clutches. 3. List four types of clutch linkage. 4. Describe the operation of hydraulic clutch linkage. 5. Describe air over hydraulic clutch linkage. 6. Explain the clutch trouble diagnosis procedure. 7. Service the linkage. 8. Remove & Replace a clutch.			
Transmission	12	9	Operation & Construction Constant Mesh Type Transmission Trans Axla, Over Drive, FWD Planetary Gear System Gear Lubricants Transmission Troubla Diagnosis	トランスミッションの作動と構造 常時噛み合い式トランスミッション オーパードライブ、FWDその他装置 遊星簡単装置 ギア用ルブリカント トランスミッションのトラブル診断	By the end of this session, the trainees will be able to: 1. Discuss the purpose and operation of typical manual transmissions. 2. Describe how shifting is accomplished. 3. Describe the type of gear used in transmission. 4. Explain the purpose of over drive. 5. Discuss the transmission trouble diagnosis procedure. 6. Identify the proper type of lubricant that are added to the transmission.			
Final Drive Line	3	3	Types of Drive Line & Arrangements Types of Universal joints Types of Slip Joints	ドライブラインの種類 ユニバーサルジョイントの種類 スリップジョイントの種類	By the end of this session, the trainees will be able to: 1. Discuss the purpose of drive and propeller shaft. 2. List three common types of universal joint. 3. List two types of constant velocity drive shaft joints. 4. Discuss the tow common types od bracing. 5. List four types of drive arrangements.			
Rear Axle & Differential	10	6	Rear Axle Types of Axles Differential Types of Differentials	リヤアクスル アクスルの福類 ディファレンシャル ディファレンシャルの種類	By the end of this session, the trainees will be able to; 1. Describe the purpose & operation of differential. 2. List six types of differential. 3. List two types of axle housing. 4. Discuss the purpose of drive axle. 5. Explain the types of axle shaft.			
Brake system	10	9	Friction of Brake Drum Brake Master Cylinder Wheel Brake Mechanism Disk Brake Power Brake Parking Brake Brake Trouble Diagnosis Brake Testing & Servicing	ブレーキの摩擦 ドラムブレーキ マスターシリンダ ホイールブレーキのメカニズム ディスクブレーキ パワーブレーキ バーキングブレーキ ブレーキのトラブル診断 ブレーキのテストと修理	Will be able to understand the mechanism of the brake system and diagnose the basic troubles. By the end of this session, the trainees will be able to: 1. List the kinds and functions of the brake system. 2. Describe the construction and function of the components of the wheel brake system. 3. Describe the construction and function of the components of the disc brake system. 4. Describe the construction and function of the components of the parking brake system. 5. Explain the construction and operation of the master cylinder. 6. Discuss the typical troubles and trouble shooting of the brake system.			

				Technician				
Compressed Air or Pneumatic Brake system	6 6 Air Compressor Foot Valve Relay Valva Quick Release Valve Air Governor Pneumatic parking Brake Combi Brake (Maxi Brake) Bosch Compressed Air Pressure Regulat Air Compressor Charging & Unloading Mechanism Exhaust Brake		Foot Valve Relay Valva Quick Release Valve Air Governor Pneumatic parking Brake Combi Brake (Maxi Brake) Bosch Compressed Air Pressure Regulator Air Compressor Charging & Unloading Mechanism	エアコンプレッサ フートバルブ リレーバルブ イックリリースパルブ エアガバナ ニューマテックパーキングブレーキ コンピブレーキ エアブレッシャレギュレータ エアコンブレッサメカニズム 排気ブレーキ	Will be able to understand the air operation in the brake system, and deathe functions of related components. By the end of this session, the trainees will be able to: 1. Describe the mechanism and operation of the air compressor. 2. Describe the function and operation of the foot valve, relay valve and or release valve. 3. Explain the function and operation of the air governor. 4. Discuss the mechanism and operation of the pneumatic parking brake. 5. Discuss the mechanism and operation of the combi-brake. 6. Explain the function and operation of the air pressure regulater. 7. Describe the mechanism and operation of the exhaust brake.			
Steering system	6	â	Purpose and Operation of Steering Front End Geometry Types of Steering Power Steering Pump Steering, Suspension Service & Trouble Diagnosis	ステアリングの目的と作動 フロントエンドの機構 ステアリングの種類 パワーステアリングポンプ ステアリングとサスペンションのトラブル診	Will be able to understand the basic construction and operation of the steering mechanism. By the end of this session, the trainees will be able to; 11. Describe the kinds and functions of the steering mechanisms. 2. Describe the construction and function of the front end. 3. Describe the construction and operation of the steering mechanism. 4. Discuss the troubles and trouble shooting of the steering mechanism and the suspension.			
Automotive Suspension	3	3	Purpose & Operation of Spring Types of Spring Rear End Torque Shock Absorber Pneumatic Suspension	スプリングの目的と作動 スプリングの種類 リアエンド ショックアプソーパ ニューマチックサスペンション	Will be able to understand the construction and function of the suspession and shock absorber. By the end of this session, the trainees will be able to: 1. List the kinds and functions of the springs. 2. Describe the construction and function of the rear end. 3. Describe the construction and characteristics of the shock absorber. 4. Describe the construction and characteristics of the pneumatic suspension.			
Tire & Wheels	6	3	Purpose of Tires Tire Construction Types of Tires & Tubes Types of Tire Wear	タイヤの目的 タイヤの構造 タイヤとチューブの種類 タイヤ磨耗の種類	Will be able to understand the construction of the tire, and according to the kinds of tires, will be able to describe their purpose and characteristics. By the end of this session, the trainees will be able to: 1. Explain the construction of the tire, and its function. 2. Describe the kinds of tires and tubes, and their characteristics. 3. Explain the tire wear patterns, and their reasons.			
Fuel system - D7G	8	8	Fuel Flow Fule Injection Pump Fuel Injection Nozzle Fuel Transfer Pump Oil Flow for Fuel Pump & Governor Governor	燃料の流れ 燃料噴射ポンプ 燃料噴射ノズル 燃料・ランスファーポンプ 燃料・ランスファーポンプ 燃料ポンプ及びガバナの潤滑 ガバナ	Will be able to identify each component in the fuel system of D7G, and explain its function. By the end of this session, the trainees will be able to; 1. Explain the fuel flow in the fuel system, and name and explain its function of each component.			

		i echnician	
	Fuel Ratio Control	燃料レシオコントロール	 Describe how the fuel amount is metered in the fuel injection pump. Describe the operation of the valve in the fuel injection nozzle. Explain how the fuel is pressurized in the fuel transfer pump. Discuss the operation of the D7G governor and how it controls the amount of fuel. Explain the function of the governor servo. Explain the purpose of the dashpot. Discuss the purpose of the fuel ratio control.
Air Inlet & Exhaust system - D7G	Turbochager & Aftercooler Turbochager Cylinder Head & Valvas Valve Mechanism	ターボチャージャ及びアフタク―ラ ターボチャージャ シリンダヘッド及びパルブ パルブ機構	Will be able to identify each component in the air intake and exhaust system, and explain its function. By the end of this session, the trainees will be able to: 1. Describe the purpose and function of the aftercooler. 2. Describe the purpose and function of the turbochager. 3. Explain the lubrication flow for the turbochager. 4. Explain the operation of the valve mechanism.
Lubrication system - D7G	System Oil Flow	系統内のオイルの流れ	Will be able to understand the flow of the oil in the lubrication system, and identify major components and explain their purposes. By the end of this session, the trainees will be able to; 1. Discuss the oil flow which is transferred to lots of components through lots of lubrication passes. 2. Explain the purpose of the oil cooler bypass valve and the oil filter bypass valve. 3. Explain the oil flow when the angine oil is still cold, and its reason.
Cooling system - D7G	Coolant Flow Cooling System Components	系統内の冷却水の流れ 冷却系統の構成品	Will be able to understand the flow of the water in the cooling system, and identify major components and explain their purposes. By the end of this session, the trainees will be able to; 1. Discuss the water flow in the cooling system. 2. Explain the purpose of the water temperature regulater. 3. Explain the water flow when the engine coolant water is still cold, and its reason.
Basic Engine - D7G	Cylinder Block & Liners Pistons, Rings & Connecting Rods Crankshaft Vibration damper	シリンダブロックとライナ ピストン、リング及びコネクチングロッド クランクシャフト バイブレーションダンバ	Will be able to understand the basic components of the D7G engine, and make a comparison with those of the automobile engine. By the end of this session, the trainees will be able to: 1. Discuss the offset of installation of piston pin toward the piston, and the installation is of the full-float type. 2. Discuss the construction and function of the piston rings, and the D7G engine is equipped with the keystone type oil rings. 3. Discuss the direction of installation of the piston pin bearings, and its reason 4. Explain the purpose and construction of the vibration damper.
Power Train - D7G 9	6 General Information Hydraulic System, Power Shift Hydraulic pump Magnetic screen Oil filter Transmission oil cooler	概説 油圧システム(パワーシフト) 油圧ポンプ マグネチックスクリーン オイルフィルタ トランスミッションオイルクーラ	Will be able to understand the basic components of the D7G power trains, and describe their purposes and functions. By the end of this session, the trainees will be able to; 1. Discuss the oil flow in the system, and identify the related components. 2. Describe the purposes and functions of the components in the hydraulic

Technician

		1 D CHI II CHARI	
	Hydraulic System, Direct Drive	油圧システム(ダイレクトドライブ)	control system. 3. Explain the difference between the powershift system and the direct drive system.
Torque Converter - D7G	Torque Divider (Power Shift) Torque Converter Lubrication of Torque Divider	トルクディバイダの作動原理 トルクコンバータの作動原理 トルクディバイダの潤滑	Will be able to understand the constructions of the torque divider and the torque converter of the D7G, and describe their purposes and functions.
Flywheel Clutch - D7G	Flywheel Clutch (Direct Drive)	フライホイールクラッチ	By the end of this session, the trainees will be able to; 1. Discuss the operational principle of the torque divider. 2. Describe the operational principle of the planetary gear system. 3. Discuss the operational principle of the torque converter. 4. Explain the difference between the torque divider and the torque converter. 5. Explain the lubrication of the torque divider. 6. Explain the difference between the powershift system and the direct drive system.
Transmission - D7G	Transmission Hydraulic Controls (Power Shift)	トランスミッションの油圧コントロール	Will be able to understand the constructions of the transmission of the D7G, and describe its operation.
	Transmission (Power Shift) Gearshift & Interlock Mechanism (Direct Drive)	トランスミッション(パワーシフト) ギャシフト及びインターロック機構 (ダイレクトドライブ)	By the end of this session, the trainees will be able to: 1. Discuss the oil flow and its operation in the hydraulic control system.
	Transmission (Direct Drive)	トランスミッション(ダイレクトドライブ)	 Describe the purposes and function of the modulation valve and the pressure differential valve. Explain the function of the torque converter outlet relief valve. Explain the operation of the hydraulically actuated clutch of the planetary gear system in the power shift transmission. Discuss how the gear shifts are completed in the power shift transmission. Explain the difference between the powershift system and the direct drive system.
Steering Clutches, Brakes & Final Drives ~ D7G	Steering Clutches, Brake & Final Drives	ステアリングクラッチ、ブレーキ 及びファイナルドライブ	Will be able to understand the constructions of the steering clutch, brake and final drive of the D7G, and describe its operation.
	Hydraulic Control Valve for Steering Clutches	ステアリングクラッチの 油圧コントロールバルブ	By the end of this session, the trainess will be able to:
	Brake Relief Valve for Brake Cooling & Lubrication	ブレーキ	 Describe the construction and function of the steering clutch and brake. Describe the hydraulically actuated operation of engagement and release of the steering clutch and brake. Explain the function of the brake cooling and lubricating relief valve.
Undercarriage - D7G 2	3 Track Roller Frames Track Carrier Rollers Track Rollers Front Idlers	トラックローラフレーム トラックキャリアローラ トラックローラ フロントアイドラ	Will be able to understand the construction and function of each undercarriage components of the D7G. By the end of this session, the trainees will be able to:
	Recoil Springs & Mechanisms for Track Adjustment	リコイルスプリングと トラックアジャスタの,構造	Describe the construction and function of each undercarriage component. Describe the duo cone floating seals which seal the lubricant in rollers and idlans.

Lachnician

Track

トラック

3. Explain the purpose of the low position and high position of the front idler.
4. Explain the construction of the track adjuster, and adjust the track tension.
5. Discuss the sealed and lubricated track, and its wear life.
6. Discuss the way to joint the track (Split link, Master link and shoe).

Hydraulic system -D7G	3	3	Control Valve for Blade Tilt Relief Valve for Tilt Circuit Control Valve for Blade Lift Relief Valve for Lift Circuit Quick-Drop Valve Pilot System Tilt Circuit Ripper Lift Circuit	ブレードチルトのコントロールパルブ チルト回路のリリーフパルブ ブレードリフトのコントロールパルブ リフト回路のリリーフパルブ クイックドロップパルブ パイロットシステム チルト回路 リッパリフト回路	Will be able to identify the major components and describe their function in the D7G hydraulic control system. And also, understand the operation of each component hydraulically actuated. By the end of this session, the trainees will be able to: 1. Discuss the hydraulic operation and function of the blade tift circuit and control valve. 2. Discuss the hydraulic operation and function of the blade lift circuit and control valve. 3. Discuss the hydraulic operation and function of the ripper lift circuit and control valve. 4. Explain the purpose and operation of the Quick drop valve. 5. Discuss the ripper lower operation when the engine is dead.
Introduction of Oil Hydraulic Power	Ž	0	History of Hydraulics Hydrodynamics vs Hydrostatics Flow, Pressure & Force	油圧の歴史 流体力学と静水力学 流量、圧力、力	Will be able to understand the basic principle related to hydrodynamics and hydrostatics.
					By the end of this session, the trainees will be able to; 1. Describe the principle of Pascal. 2. Calculate the relationship between Flow, Pressure and Force.
Generation of Oil Hydraulic Power	4	0	Gear Pump Vane Pump Piston Pump Screw Pump	ギヤボンブ ベーンボンブ ピストンポンブ ねじボンブ	Will be able to understand the construction and characteristics of the hydraulic oil pumps By the end of this session, the trainees will be able to; 1. List the kinds of hydraulic oil pumps. 2. Describe the characteristics of each hydraulic oil pump.
Utilization of Oil Hydraulic Power	4	6	Hydaulic Cylinder Hydraulic Motor	油圧シリンダ 油圧モータ	Will be able to understand the construction and characteristics of the hydraulic cylinder, hydraulic motor and other accessories.
					By the end of this session, the trainees will be able to; 1. List the kinds of hydraulic cylinders. 2. Describe the construction and operation of hydraulic cylinders. 3. Describe the construction and operation of hydraulic motors.
Transmission of Oil Hydraulic Power	· · · · · · · · · · · · · · · · · · ·	·	High Pressure Hose Metal Fitting	高圧ホース メタルフィッチング	Will be able to understand the construction and characteristics of the hydraulic hose and metal fitting.
					By the and of this sassion, the trainees will be able to; 1. List the kinds of hydraulic hoses. 2. Describe the construction and functions of metal fittings.
Control of Oil Hydraulic Power			Valve Classification Pressure Controls Flow Controls	バルブの種類 圧力制御 流量制御	Will be able to understand the construction and functions of hydraulic control valves.

Directional Controls

方向制御

By the end of this session, the trainees will be able to:

1. List the kinds of basic hydraulic control valves.

- 2. Describe the construction and operation of the pressure control valve.
- 3. Describe the construction and operation of the flow control valve.
- 4. Describe the construction and operation of the Directional control valve.

Application of Oil Hydraulic Power		***************************************	Graphical Symbol Elementary Hydraulic Circuit Hydraulic Circuit Diagram Terminology related to Flow. Pressure & Pump	グラフィカルシンボル 基本油任回路 油任回路図 油任関連用語	Will be able to understand the graphical symbols and the elementary hydraulic circuit diagram. By the end of this session, the trainees will be able to; 1. Understand basic graphical symbols. 2. Understand the terminology related to flow, pressure and pump. 3. Explain the oil flow and its purpose of the elementary hydraulic circuit. 4. Discuss the oil flow and the operations of the valves and accessories according to the hydraulic circuit diagram.
Daily Maintenance	1	0	Essantials of Ordinary Maintenace Record of Running and Maintenace	日常、定期メンテナンスの基本 運転及びメンテナンスの配録	By the end of this session, the trainees will be able to: 1. Understand the proper contents of ordinary maintenance, and its importance. 2. Keep a record of running and maintenance information.
Operation Report	1	0	Use and importance of Operation Report Contents and Types of Operation Reports	連転記録の利用、重要性 連転記録の内容、種類	By the end of this session, the trainers will be able to; 1. Understand the importance of operation report. 2. Keep a record of operational information.
Maintenance Manual Periodical Maintenance Work - D7G Periodical Maintenance Work - G0811 Periodical Maintenance Work - 938G Periodical Maintenance Work - 320C Periodical Maintenance Work - TS200 Preventive Maintenance	1 3 3 3 3 3	0 3 3 3 3 3 0	Contents of Maintenance Manual Periodical Maintenance Work Periodical Maintenance Work Periodical Maintenance Work Periodical Maintenance Work Periodical Maintenance Work Some Reminders for Preventive Maintenance	メンテナンスマニュアルの内容 定期メンテナンス作業 定期メンテナンス作業 定期メンテナンス作業 定期メンテナンス作業 定期メンテナンス作業 予防整備のための助言	Will be able to describe and do the proper maintenance work of the heavy construction machineries. By the end of this session, the trainees will be able to; 1. Understand what are written in the Maintenance Manual. 2. Describe and do the proper maintenance work of the Bulldozer, Moter Grader, Wheel Loader, Hydraulic Excavator and Tire Roller according to the Maintenance Manual. 3. Understand the importance of preventive maintenance.
Operation of Bulldozer Operation of Wheel Loader Operation of Hydraulic Excavator Operation of Moter Grader Operation of Roller	0 0 0	6 8 8 6	Operation of Buildozer Operation of Wheel Loader Operation of Hydraulic Excavator Operation of Moter Grader Operation of Roller	運転操作 運転操作 運転操作 運転操作 運転操作	Will be able to operate the Buildozer, Moter Grader, Wheel Loader. Hydraulic Excavator and Tire Roller properly according to the Operational Manual.
Lubricant	3	3	Introduction of Lubricants Engine Oil Classification & Identification of Engine Oil Gear Oil Classification & Identification of Gear Oil Grease	潤滑油について エンジンオイル エンジンオイルの分類 ギヤオイル ギヤオイルの分類 グリース	Will be able to describe the classification and characteristics of the lubricants. By the end of this session, the trainees will be able to; 1. Describe the classification and identification of the engine oil. 2. Describe the classification and identification of the gear oil. 3. Describe the classification and identification of the grease.
Evaluation Test	3	3		Maria de la companya de la companya de la companya de la companya de la companya de la companya de la companya	

-75-

IV Road Construction and Maintenance Supervision Course

- 1. Summary of Project Operation Schedule
- 2. Target Group
- 3. Curriculum
 - 3-1 Construction/Maintenance Superintendent I
 - 3-2 Construction/Maintenance Superintendent II
 - 3-3 Associate Engineer IV
 - 3-4 Associate Engineer V
 - 3-5 Associate Engineer VI

4. Syllabus

- 4-1 Maintenance Superintendent I
- 4-2 Maintenance Superintendent II
- 4-3 Associate Engineer IV
- 4-4 Associate Engineer V
- 4-5 Associate Engineer VI

SUMMERY OF PROJECT OPERATION SCHEDULE (Road construction & maintena 10/28/2002 2002 2003 2004 APR | MAY - JUN | JUL : AUG - SEP - OCT : NOV : DEC JAN FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP OCT | NOV DEC JAN : FEB | MAR Training management is more effective Collect training needs (road conditions, 1-1 needs, skilllevels of C/Ps, instructors, the private and ERA staff) using TNA Baseline survey 1-2 Establish mnagement know-how Improvement of training management Trainee recruitment Publicity work 1-3 Conduct monitoring and evaluation Efficient training course program is prepared 2-1 Organize a system to formulate curriculum Training course designing and reviewing 2-2 Preparing teaching materials Preparing teaching materials Levels of the techinical skills and teaching capacity of instructors are improved 3 Train instructors Instructor training Counnterpart training in Japan Training equipment and materials are properly arranged and managed Mainitain equipment properly Construction of garage for construction Reformationn and expansion of workshop Reformation of laboratory Equipment installation Dispatch of an engineer by JICA Mainitenance of training equipment etc. A method of training needs analysys (TNA) for the public and private sector's business needs is developed and the training plan is prepared by the TNA Conducting of training needs analysis Training Course Opening Dispatch short term expert by JICA Joint cordinating committee Handover ceremony Sittedule at official vacation

Target Group

- Construction / Maintenance Superintendent I
- Construction / Maintenance Superintendent II
- Associate Engineer IV
- Associate Engineer V
- Associate Engineer VI

Construction / Maintenance Superintendent I

ſ	Present			Revised			Remarks
Target of					.,		
training	Be able to operate at the site			ditto			
Training							
Capacity	Person/One training course			Person/One training course			
Training Period	Net Days			Net Days			
	Net Hours			Net Hours			
Training times	,			times (vans			
per year	times/year			times/year			
Number of							
trainees per				7 per year			
year (Output) Entry	per year			/ per year			
requirement	ERA's criteria			Diploma or more			
Textbook	ETAC 3 OTTO 14			In English and are handout			
Language for							
lecture				English Amharic			
Course							
composition							
(Curriculum)	Construction Inspection	class	site	Road Construction		site	
	Earthwork Inspection			Asphalt road construction	32		
	Inspection of Untreated Material		ļ	Gravel road construction	20	26.	
	Aggregate Construction Inspection	ļ	ļ	Structures construction	20		
	Asphalt Plant Inspection		l	Material production	12	20	
	Asphalt Concrete Roadway Inspection		Ì	On a d Maintanana		}	
	and Bituminous Treatment	ļ	<u> </u>	Road Maintenance Asphalt road maintenance	40	12	
	Minor Drainage Structure Inspection			Gravel road maintenance	20	16	
	Major Drainage Structure Inspection	 		Structures maintenance	30	14	
	Soils Testing Aggregate Testing	 -	<u> </u>	Material production	18	⊢∸	
		 		Site Management	1		
	Cement Testing				9		
	Concrete Testing		_	Contract Management	9	8	
	Bitumen Testing			Ontline of Site Management Construction Method	53		
	Testing of Steel and Metals Testing of Miscellaneous Materials	 		Schedule control	5	32	
	Nuclear Density gauge Operation			Inspection of works	18		
	Construction Work Methods			Cast control	5		
	Introduction to Construction		 -	Safety control	9		
	Construction Mathematics			Dersy device	+		
	Plan Reading & Specifications	<u> </u>			7		
	Construction Equipment						
	Construction Surveying	Ī ,					
	Excavation				ļ		
	Embankment Construction	L					
	Minor Drainage Structure	ļ				ļ	
	Construction of Bridges		<u> </u>		-	ļ	
	Subgrade Construction				+	 	
	Base Construction	<u> </u>					
	Quarry Rock and Select Material Produc	tion	ļ <u>-</u>				
	Crusher and Screeing Plant Operation				+	 -	
	Asphalt Plant Operation		-		+	 	
	Asphalt Plant Treatment Asphalt Paving				+		
	Blasting	-			1	 	
	Roadway Signing and Marking	 	—		1		
	Maintenance Work Methods						
	Maintenance Mathematics	-			†		
	Work Site Safety		-				
	Bituminous Surface Repair	 	l				
	Shoulder Maintenance	1					
	Drainage Maintenance						
	Bridge Maintenance						
	Earth/Gravel Road Maintenance					 	
	Base Failire Repair				 	<u> </u>	
	Saling Asphalt Surface					 	
	Sign/Marker Repair		 		 	 	L
	Pead Coast 7, Material	5.2	104		4300	148	L

Construction / Maintenance Superintendent $\ \ \mathbb{I}$

	Present			Revised			Remarks
Target of	() Cook				-		
training	Be able to operate at the site			ditto			ĺ
Training	De able to operate at the see						
Capacity	Person/One training course			Person/One training course			
	Net Dave			Net Days			
Training Period	Net Hours			Net Hours			
Training times	110013			1700 1700 1700 1700 1700 1700 1700 1700			
per year	times/year			times/year			i L
Number of	Clines/ year			times/year			
F							i I
trainees per				,			
year (Output)	per year			7 per year			
Entry	50.4			5: 4			
requirement	ERA's criteria			Diploma or more			ļ
Textbook.				In English and are handout			
Language for							, I
lecture		,		English.Amharic		,	
Course			ł				:
composition			}				
(Curriculum)	Construction Inspection	class	site	Road Construction		site	·
	Earthwork Inspection	<u> </u>		Asphalt road construction	26	14	
	Inspection of Untreated Material		L	Gravel road construction	20	14	
	Aggregate Construction Inspection			Structures construction	26	14	
	Asphalt Plant Inspection			Material production	26	4	
	Asphalt Concrete Roadway Inspection						
[and Bituminous Treatment	1	-	Road Maintenance	1_		
	Minor Drainage Structure Inspection	Ī ——		Asphalt road maintenance	22	3.1	
	Major Drainage Structure Inspection			Gravel road maintenance	16	4	
	Soils Testing	i		Structures maintenance	16	12	
	Aggregate Testing			Material production	34	22	
	Cement Testing			Site Management			
	Ochiche resentg	 -		Ore management	+		
	Concrete Testing			Contract Management	9		ł
	Bitumen Testing	-	-	Outline of Site Management	1 9	10	
} 	Testing of Steel and Metals	 -	-	Construction Method	57	40	
		 		Schedula control	4		
	Testing of Miscellaneous Materials				+		
	Nuclear Density gauge Operation			Inspection of works	18		
	Construction Work Methods	<u> </u>		Cost control	4	Ĺ	
	Introduction to Construction	<u></u> .		Safety control	9		
	Construction Mathematics				<u> </u>		L
	Plan Reading & Specifications	L				L!	
	Construction Equipment						
	Construction Surveying				l		
	Excavation						
	Embankment Construction						
	Minor Drainage Structure						
	Construction of Bridges						
	Subgrade Construction						
	Base Construction						
	Quarry Rock and Select Material Produc	tion			T		
	Crusher and Screeing Plant Operation	21911			1		
	Asphalt Plant Operation				† —		
	Asphalt Plant Treatment				 		
	Asphalt Plant Treatment Asphalt Paving				 	 	
···	Blasting				+		
					 	- 	
	Roadway Signing and Marking				 		
	Maintenance Work Methods				<u> </u>		
	Maintenance Mathematics				1	↓	
	Work Site Safety				I		
	Bituminous Surface Repair						
	Shoulder Maintenance]					
	Drainage Maintenance		7			I	
	Bridge Maintenance						
	Earth/Gravel Road Maintenance						
	Base Failire Repair		$\neg \neg$				
	Saling Asphalt Surface						
	Sign/Marker Repair						
	Road Const & Material	52	104		296	152	
					الننسا		

Associate Engineer IV

Person/One training course Net Days Net Hours times/year per year A's criteria Instruction Inspection Chwork Inspection Dection of Untreated Material Pregate Construction Inspection Halt Plant Inspection Halt Concrete Roadway Inspection Bituminous Treatment Or Drainage Structure Inspection Or Drainage Structure Inspection	class	site	ditto Person/One training course Net Days Net Hours times/year 8 per year Diploma or more In English and are handout English Amharic Highway Surveying Routing Surveying		site	
Person/One training course Net Days Net Hours Itimes/year per year A's criteria Instruction Inspection Chwork Inspection Dection of Untreated Material Pregate Construction Inspection Halt Plant Inspection Halt Concrete Roadway Inspection Bituminous Treatment Or Drainage Structure Inspection	Class	site	Person/One training course Net Days Net Hours times/year 8 per year Diploma or more In English and are handout English Amharic Highway Surveying		site	
Net Days Net Hours times/year per year A's criteria Instruction Inspection Chwork Inspection Dection of Untreated Material regate Construction Inspection halt Plant Inspection halt Concrete Roadway Inspection Bituminous Treatment or Drainage Structure Inspection	Class	site	Net Days Net Hours times/year 8 per year Diploma or more In English and are handout English Amharic Highway Surveying		site	
Net Days Net Hours times/year per year A's criteria Instruction Inspection Chwork Inspection Dection of Untreated Material regate Construction Inspection halt Plant Inspection halt Concrete Roadway Inspection Bituminous Treatment or Drainage Structure Inspection	class	site	Net Days Net Hours times/year 8 per year Diploma or more In English and are handout English Amharic Highway Surveying		site	
Net Hours times/year per year A's criteria Instruction Inspection Chwork Inspection Dection of Untreated Material Pregate Construction Inspection Halt Plant Inspection Halt Concrete Roadway Inspection Bituminous Treatment De Drainage Structure Inspection	class	site	Net Hours times/year 8 per year Diploma or more In English and are handout English Amharic Highway Surveying		site	
per year A's criteria Instruction Inspection class	site	times/year 8 per year Diploma or more In English and are handout English Amharic Highway Surveying		site		
per year A's criteria Instruction Inspection Inspection Inspection Inspection of Untreated Material Inspection Inspection Inspection Institution Inspection Inspection Inspection Inspection Inspection Inspection Inspection Inspection Inspection	Class	site	8 per year Diploma or more In English and are handout English Amharic Highway Surveying		site	
per year A's criteria Instruction Inspection Inspection Inspection Inspection of Untreated Material Inspection Inspection Inspection Institution Inspection Inspection Inspection Inspection Inspection Inspection Inspection Inspection Inspection	class	site	8 per year Diploma or more In English and are handout English Amharic Highway Surveying		site	
Instruction Inspection Chwork Inspection Section of Untreated Material regate Construction Inspection Halt Plant Inspection Halt Concrete Roadway Inspection Bituminous Treatment or Drainage Structure Inspection	class	site	Diploma or more In English and are handout English Amharic Highway Surveying		site	
Instruction Inspection Chwork Inspection Section of Untreated Material regate Construction Inspection Halt Plant Inspection Halt Concrete Roadway Inspection Bituminous Treatment or Drainage Structure Inspection	class	site	Diploma or more In English and are handout English Amharic Highway Surveying		site	
Instruction Inspection Chwork Inspection Section of Untreated Material regate Construction Inspection Halt Plant Inspection Halt Concrete Roadway Inspection Bituminous Treatment or Drainage Structure Inspection	class	site	Diploma or more In English and are handout English Amharic Highway Surveying		site	
nstruction Inspection hwork Inspection section of Untreated Material regate Construction Inspection halt Plant Inspection halt Concrete Roadway Inspection Bituminous Treatment or Drainage Structure Inspection	class	site	In English and are handout English Amharic Highway Surveying		site	
nstruction Inspection hwork Inspection section of Untreated Material regate Construction Inspection halt Plant Inspection halt Concrete Roadway Inspection Bituminous Treatment or Drainage Structure Inspection	class	site	In English and are handout English Amharic Highway Surveying		site	
hwork Inspection rection of Untreated Material regate Construction Inspection halt Plant Inspection halt Concrete Roadway Inspection Bituminous Treatment or Drainage Structure Inspection	class	site	English Amharic Highway Surveying		site	
hwork Inspection rection of Untreated Material regate Construction Inspection halt Plant Inspection halt Concrete Roadway Inspection Bituminous Treatment or Drainage Structure Inspection	class	site	Highway Surveying		site	
hwork Inspection rection of Untreated Material regate Construction Inspection halt Plant Inspection halt Concrete Roadway Inspection Bituminous Treatment or Drainage Structure Inspection	class	site	Highway Surveying		site	
hwork Inspection rection of Untreated Material regate Construction Inspection halt Plant Inspection halt Concrete Roadway Inspection Bituminous Treatment or Drainage Structure Inspection	class	site			site	
hwork Inspection rection of Untreated Material regate Construction Inspection halt Plant Inspection halt Concrete Roadway Inspection Bituminous Treatment or Drainage Structure Inspection	class	site			site	I
hwork Inspection rection of Untreated Material regate Construction Inspection halt Plant Inspection halt Concrete Roadway Inspection Bituminous Treatment or Drainage Structure Inspection	Class	SILE			SILC	
rection of Untreated Material regate Construction Inspection halt Plant Inspection halt Concrete Roadway Inspection Bituminous Treatment or Drainage Structure Inspection				33	42	
regate Construction Inspection halt Plant Inspection halt Concrete Roadway Inspection Bituminous Treatment or Drainage Structure Inspection			Construction Surveying	33	42	
halt Plant Inspection halt Concrete Roadway Inspection Bituminous Treatment or Drainage Structure Inspection			<u> </u>		1	
halt Concrete Roadway Inspection Bituminous Treatment or Drainage Structure Inspection			Highway Drafting	66	84	
Bituminous Treatment or Drainage Structure Inspection		 	Road Design	100		
or Drainage Structure Inspection			Construction Supervision			
<u> </u>			Road Maintenance / Construction	38	38	<u> </u>
or Drainage Structure Inspection			<u></u>		30	
			Highway Material Testing		84	
s Testing			Soil and Construction Materials	66	54	
regate Testing			Site Management		<u> </u>	
nent Testing			Contract Management	- 7	ļ <u>.</u>	
crete Testing			Outline of Site Management	7	12	
men Testing			Construction Method	42	52	
ting of Steel and Metals			Schedule control	4	<u> </u>	
ting of Miscellaneous Materials			Inspection of works	14	<u> </u>	
lear Density gauge Operation			Cost control			
nstruction Work Methods			Safety control	7		
aduction to Construction						
struction Mathematics						
Reading & Specifications						
struction Equipment					L	
struction Surveying						
avation						
ankment Construction						
or Orainage Structure						
struction of Bridges						
				_	<u> </u>	
c Construction					 	
	tion				L	
sher and Screeing Plant Operation						
halt Plant Operation						
halt Plant Treatment						<u></u>
nalt Paving						
ting						
				 		
itenance Mathematics						
				-		
				-		
ılder Maintenance						
		-				
					-	
~						
				7,4,	75.4	
s s s s s s s s s s s s s s s s s s s	distion to Construction truction Mathematics Reading & Specifications truction Equipment truction Surveying vation inkment Construction Orainage Structure truction of Bridges rade Construction Construction Construction Ty Rock and Select Material Production for and Screeing Plant Operation alt Plant Operation alt Plant Treatment alt Paving ing way Signing and Marking internance Work Methods chance Mathematics Site Safety innous Surface Repair	direction to Construction truction Mathematics Reading & Specifications truction Equipment truction Surveying vation inkment Construction Orainage Structure truction of Bridges rade Construction Construction Construction Ty Rock and Select Material Production incer and Screeng Plant Operation alt Plant Operation alt Plant Treatment alt Paving ing way Signing and Marking intenance Work Methods chance Mathematics Site Safety innois Surface Repair der Maintenance age Maintenance of Maintenance Coravel Road Maintenance Failire Repair (Asphalt Surface Marker Repair	direction to Construction truction Mathematics Reading & Specifications truction Equipment truction Surveying vation inkment Construction Oralinage Structure truction of Bridges rade Construction Construction Construction Ty Rock and Select Material Production iner and Screeing Plant Operation alt Plant Operation alt Plant Treatment alt Paving ing way Signing and Marking intenance Work Methods enance Mathematics Site Safety innous Surface Repair der Maintenance der Maintenance der Maintenance Cravel Road Maintenance Faibre Repair (Asphalt Surface Marker Repair	diction to Construction truction Mathematics Reading & Specifications truction Equipment truction Surveying varion requipment truction Surveying varion requipment Construction Orainage Structure truction of Bridges rade Construction Construction Construction requipment	direction to Construction truction Mathematics Reading & Specifications truction Equipment truction Surveying vation onkment Construction Orainage Structure truction of Bridges rade Construction Construction Ty Rock and Select Material Production ner and Screeing Plant Operation alt Plant Operation alt Plant Treatment alt Paving ing vay Signing and Marking oranance Work Methods enance Mathematics Site Safety innous Surface Repair der Maintenance e Maintenance e Maintenance c Marker Repair (Asphalt Surface Marker Repair	direction to Construction truction Mathematics Reading & Specifications truction Equipment truction Surveying varion Inkment Construction Orainage Structure truction of Bridges rade Construction Construction Ty Rock and Select Material Production Inter and Screeing Plant Operation alt Plant Treatment alt Plant Treatment alt Paving Ing Ing Ing Ing Ing Ing Ing Ing Ing I

Associate Engineer V

	Present			Revised			Remarks
Target of							
training	Be able to operate at the site			ditto			
Training							
Capacity	Person/One training course			Person/One training course			
Training Period	Net Days			Net Days Net Hours			
	Net Hours			Net Hours			
Training times	tiones (vigas			times/year			
per year Number of	times/year			tines/year			
trainees per							
year (Outout)	per year			7 per year			
Entry	per year			7.5.			
requirement	ERA's criteria			Diploma or more			
Textbook				In English and are handout			
Language for							
lecture				English,Amharic			
Course					1		
composition				Winter Communication			
(Curriculum)	Construction Inspection	class	site	Highway Surveying		site	
	Earthwork Inspection	 	\vdash	Routing Surveying Construction Surveying	74 42	52	
-	Inspection of Untreated Material	 			+ 42	32	
	Aggregate Construction Inspection		 	Highway Drafting	82	30	
	Asphalt Plant Inspection Asphalt Concrete Roadway Inspection	 	-	Road Design	- 6%		
	Asphalt Concrete Roadway Inspection and Bituminous Treatment	}		Construction Supervision			
	Minor Drainage Structure Inspection	-	1	Road maintenance/Construction	70	42	
			1	Highway Material Testing	1		
	Major Drainage Structure Inspection Soils Testing	├	 	Material Inspection	28	28	
		 		Site Management	1		
	Aggregate Testing Cement Testing	 	├	Contract Management	6	 	
	Gement resting	-	\vdash	Contract transagement			
	Concrete Testing		1	Outline of Site Management	6	7	
	Bitumen Testing			Construction Method	38	29	
	Testing of Steel and Metals			Schedule control	3		
	Testing of Miscellaneous Materials			Inspection of works	14	ļ	
	,	1				İ	
	Nuclear Density gauge Operation	ļ	ļ	Cost control	3		
	Construction Work Methods	<u> </u>	<u> </u>	Safety control	6	<u> </u>	
	Introduction to Construction	<u> </u>	L			L	
	Construction Mathematics	ļ	<u> </u>			ļ	
	Plan Reading & Specifications	 	 				
	Construction Equipment	 			+-		
	Construction Surveying Excavation				+		
	Embankment Construction	 	 				
	Minor Drainage Structure	t	1		1		
	Construction of Bridges	1					
	Subgrade Construction				L		
	Base Construction				4	<u> </u>	
	Quarry Rock and Select Material Produc	tion	L_				L
	Crusher and Screeing Plant Operation				_		
	Asphalt Plant Operation		<u> </u>			<u> </u>	
	Asphalt Plant Treatment		 			<u> </u>	<u> </u>
	Asphalt Paving						
	Blasting		ļ		+		
	Roadway Signing and Marking		 		+	-	
	Maintenance Work Methods	<u> </u>	}			-	L
	Maintenance Mathematics	 					
	Work Site Safety Bituminous Surface Repair		 				
	Shoulder Maintenance		 		1		
	Drainage Maintenance	 			1		
	Bridge Maintenance	†					
	Earth/Gravel Road Maintenance	<u> </u>	 				
	Base Failire Repair	I	<u> </u>				
	Saling Asphalt Surface						
	Sign/Marker Repair						
	Read Coast & Material	52	104		372	188	

Associate Engineer VI

	Present			Revised			Remarks
Target of							
training	Be able to operate at the site			ditto			
Training				Bassa /Oss teninina sauras			
Capacity	Person/One training course Net Days			Person/One training course Net Days			
Training Period	Net Hours			Net Hours			
Training times	Hechous						
per year	times/year			times/year			
Number of							
trainees per							
year (Output)	per year			8 per year			
Entry							
requirement	ERA's criteria			Diploma or more In English and are handout			
Textbook Language for				th English and are handout			L
lecture				English,Amharic			
Course		Γ	T			Γ	
composition			1				
(Curriculum)	Construction Inspection	class	site	Road Surveying and design		site	
	Earthwork Inspection			Surveying supervision	60		
	Inspection of Untreated Material			Design supervision	52		<u> </u>
	Aggregate Construction Inspection	ļ	<u> </u>	Road Construction	1.0	L	
ļ	Asphalt Plant Inspection	 	 	Construction supervision	72	40	<u></u>
	Asphalt Concrete Roadway Inspection			Material Testion			
	and Bituminous Treatment Minor Drainage Structure Inspection	1		Material Testing Supervision of material investigation	68	44	<u> </u>
		-		Site Management	- 00	<u> </u>	<u></u>
	Major Drainage Structure Inspection Soils Testing	 		Contract Management	6		
	Aggregate Testing	-		Outline of Site Management	6	6	
	Cement Testing	1		Construction Method	40	26	
	Concrete Testing			Schedule control	4		
	Bitumen Testing		ļ	Inspection of works	14		
	Testing of Steel and Metals			Cost control	6		
	Testing of Miscollaneous Materials			Safety control	- 0		
	Nuclear Density gauge Operation		1				
	Construction Work Methods						
	Introduction to Construction				1		
	Construction Mathematics				†		
	Plan Reading & Specifications						
	Construction Equipment						
	Construction Surveying	<u> </u>			<u> </u>	ļ	
	Excavation		ļ		<u> </u>		
	Embankment Construction	-			-		
	Minor Drainage Structure Construction of Bridges				 		<u> </u>
	Construction of Bridges Subgrade Construction	 	<u> </u>		1-		
	Base Construction						
	Quarry Rock and Select Material Produc	tion					
	Crusher and Screeing Plant Operation	T					
	Asphalt Plant Operation						
	Asphalt Plant Treatment						
	Asphalt Paving				<u> </u>		L
	Blasting	ļ			ļ	<u> </u>	
	Roadway Signing and Marking				 		
,	Maintenance Work Methods		ļ		 		
	Maintenance Mathematics	-					
	Work Site Safety Bituminous Surface Repair	-			 		
	Shoulder Maintenance				 		
	Drainage Maintenance				†		
	Bridge Maintenance		·		1		
	Earth/Gravel Road Maintenance						
	Base Failire Repair						
	Saling Applialt Surface						
	Sign/Marker Repair						
	Road Court & Material	52	104		1332	116	

Syllabus

(Construction / Maintenance Superintendent I)

		(00		on / Maintenance	Superintendent 1)		
Item ,	Subject		urs Practice	Sub-subject	Contents of training	Training Goal	How to evaluate
Road	d Construction	Lecture	Practice				
	Asphalt road construction	32	20	· Materials selection & testing	operation, equipment, mix, type, alignment, controls, and records.	· Obtain an activity operation supervisor in road construction	Test
	Gravel road construction	20	26	Surveying (alignment) of roads Supervision &			
	Structures construction	20					
	Material production	12	20				
TOT	AL	84	66				
Roa	d Maintenance						
7	Asphalt road maintenance	40	12	· Asphalt surface base, shoulders drainage repairs	· Introduce the techniques of road maintenance & bridge.	· Obtain an activity operation supervisor	Test
	Gravel road maintenance	20		Ditto but gravel read	How to coordinate and supervise maintenance works.		
	Structures maintenance	30	14	· Bridge maintenance	· Transfer records and how to plan the execution of works		
	Material production	18		· Coordination of the activities			
TOT	AL	108	42				

(Construction / Maintenance Superintendent I)

item	Subject	Hour		Sub-subject	Contents of training	Training Goal	How to evaluate
Site	Management	Lecture P	ractice			Training Goal	riow to evaluate
<u> </u>	Contract Management	9			Familiarize contract administration in the road sector	Obtain an activity operation supervisor in road construction	
	Outline of Site Management	9		Explanation of importance of Construction Management			
			3		Site visit		
	Construction Method	53		Explanation of Planning	Understanding about planning	Trainees can understand how to plan the eathwork schedule.	Test
			32	Explanation of how to enter the Checking sheet	Uuderstanding how to enter the checking sheet.	Trainces can use checking sheet by myself	
	Schedule control	5		Explanation of schedule control	Understanding about schedule control	Trainees can understand schedule control.	Test
	Inspection of works	18		Explanation of inspection of works	Understanding about inspection of works	Trainees can understand inspection of works	Test
	Cost control	5		Explanation of cost management	Understanding about cost control.	Trainees can understand cost control.	Test
	Safety control	9		Explanation of safety management	Understanding about safety management	Trainees can understand safety control.	Test
TOT	AL	103	40				
Gran	d Total	300	148				

Syllabus

(Construction / Maintenance Superintendent II)

Item	Subject	Hot Lecture	urs Practice	Sub-subject	Contents of training	Training Goal	How to evaluate
Ros	ad Construction						
	Asphalt road construction			· Coordination & Supervision of Earthwork construction	· Introduce scheduling of material, labor and equipment	To obtain a highly skilled sub- professional contraction	Test
	Gravel road construction	20	14	· Same but Asphalt overlay construction	· Introduce soil test results & alternate recommendations	supervisor.	Project assignment
	Structures construction	26	14	· Same but material production	· How to check the correct interpretation of plans and profiles		
	Material production	26	4	· Same but structure construction	· How to mange material, labor and equipment an operation of a project		
TO	TAL	98	46				

(Construction / Maintenance Superintendent II)

ltem	Subject	Hours Lecture Pract	tice	Sub-subject	Contents of training	Training Goal	How to evaluat
Ros	ad Maintenance		<u> </u>		· ·		
	Asphalt road maintenance	22		· Coordination and supervision of asphalt road maintenance	planning & control of road	skilled sub- professional contraction	Test
	Gravel road maintenance	16	4	· Same but gravel road maintenance	· How to schedule labor, material and equipment utilization		Project assignment
	Structures maintenance	16	12	· Same but drainage structures maintenance	Prioritization of works. Introduction to management of equipment, material & labor on maintenance activities. Introduction to safety of work site		
	Material production	34		 Same but material production for maintenance Soil testing 			
TO	TAL	88	56				

(Construction / Maintenance Superintendent II)

Item	Subject	Hoi		Sub-subject	Contents of training	Training Goal	How to evaluate
1,0111	Subject	Lecture	Practice	Sub subject	Odificence of cramming	Training Goar	
Site	e Management						
	Contract Management	9			 Familiarize contract administration in the road sector 	 Obtain an activity operation supervisor in road construction 	
	Outline of Site Management	9		Explanation of importance of Construction Management			
		:	10		Site visit		
	Construction Method	57		Explanation of Planning	Understanding about planning	Trainees can understand how to plan the eathwork schedule.	Test
			40	Explanation of how to enter the Checking sheet	Uuderstanding how to enter the checking sheet.	Trainees can use checking sheet by myself	
	Schedule control	4		Explanation of schedule control	Understanding about schedule control	Trainees can understand schedule control.	Test
	Inspection of works	18		Explanation of inspection of works	Understanding about inspection of works	Trainees can understand inspection of works	Test
	Cost control	4		Explanation of cost management	Understanding about cost control.	Trainees can understand cost control.	Test
	Safety control	9		Explanation of safety management	Understanding about safety management	Trainees can understand safety control.	Test
TC	TAL	110	50)			
Gra	and Total	296	152				

Syllabus

(Associate Engineer IV)

ltem	Subject	Hou		Sub-subject	Contents of training	Training Goal	How to evaluate
item		Lecture	Practice	Sub subject	Outrettes of training	Training Goal	110W to evaluate
Hig.	hway Surveying						
	Routing Surveying	33	42	· Route selection	· Explain types of Surveying	· Be able to select a route	Test (theoretical
				Reconnaissance Traversing Topographic survey	· Horizontal curve · Vertical curve	 Prepare surveying data Coordinate works of party Calculate necessary elements of curves 	Test (Practical) Project assignment
				Horizontal Alignment Vertical Alignment Cross-sections Drainage survey	 X-Sections Topography Photogrammerty interpretation 		
	Construction Surveying	33	42	· Prepare or Interpret designs drawings and plans (setting out)	· How to set out based on surveying data.	 Be able to correctly perform setting out according to surveying data 	Test (theoretica
				· Structural plans · Interpret field records	(Plan profile x -section)	· Be able to sketch the hard copy	Test (practical) Projects assign
				 Transit book Grade book Level book Cross-section Drainage 	· Staking	· Using all instruments to state down on ground · To coordinate	
TC	DTAL	66	84				

	ł	
(2	2
<		2
	1	

ltem	Subject	Hours		(Associate Engi		T O .	
	1	Lecture Pr	actice	Sub subject	Contents of training	Training Goal	How to evaluate
Hig	hway Drafting						
	Road Design	66	84	 Design a route and prepare a plan, profile and cross—section from surveying data manually or by use of CAD. Photogrammetry 	 Explain how to design a road (profile) based on road safety design standard Train CAD 	· Be able to select and design a route · Be able to produce a	· Test (both practical & theoretical)
						complete road design manually or computer aided	
				· Plotting in generals (traverse, topography, profile, cross-section etc)	· How to aerial photos / Interpret		
TC	TAL	66	84				
Col	nstruction Superv	ision			<u> </u>		
	Road Maintenance /Construction	38	38	· Supervision / inspection of road construction	· Explain the major items of the road construction to be reconciled	· Site supervisor	· Test (both practical & theoretical)
				· Preparation of bill of quantity	· Method of quality work	· Quality supervisor	
TC	TAL	38	38				

(Associate Engineer IV)

ltem	Subject	Hot	ırs	Cubanhiaat	Contanto of training	Tarining Cool	
icem	300,600	Lecture	Practice	Sub-subject	Contents of training	Training Goal	How to evaluate
Site	e Management				·		
	Contract Management	7			 Familiarize contract administration in the road sector 	Obtain an activity operation supervisor in road construction	
,	Outline of Site Management	7		Explanation of importance of Construction Management			
	Construction Method	42	12	Explanation of Planning	Site visit Understanding about planning	Trainees can understand how to plan the eathwork schedule.	Test
			52	Explanation of how to enter the Checking sheet	Uuderstanding how to enter the checking sheet.	Trainees can use checking sheet by myself	
j	Schedule control	. 4		Explanation of schedule control	Understanding about schedule control	Trainees can understand schedule control.	Test
	Inspection of works	14		Explanation of inspection of works	Understanding about inspection of works	Trainees can understand inspection of works	Test
	Cost control	4		Explanation of cost management	Understanding about cost control.	Trainees can understand cost control.	Test
	Safety control	7		Explanation of safety management	Understanding about safety management	Trainees can understand safety control.	Test
TC	TAL	85	64				
Gra	ind Total	321	354				

(Associate Engineer IV)

Item	Subject	Hou Lecture	urs Practice	Sub-subject	Contents of training	Training Goal	How to evaluate
Hig	hway Material Te	sting					
	Soil and Construction Materials	66	84	· Properties · Application · Testing · Writing specification · Inspection of works	 Explain properties of soils Explain applications of soils & materials Explain uses of tests conduct Clarify how to write specifications 	property of soils	· Test (both practical & theoretical)
TC	TAL	66	84				

Syllabus

(Associate Engineer V)

	Culina	Но	urs	(7/3300late Lingillet		- · · · · · ·	How to evaluate
ltem	Subject	Lecture	Practice	Sub-subject	Contents of training	Training Goal	
Hig	ghway Surveying						
	Routing Surveying	32		Coordination of route surveying (Design, control, alignment, etc)	How to coordinate	Route surveying Coordination	Test
		21		Supervise Surveying works (topography, traversing leveling, etc)	⊕ Transit	Supervision of surveying work	
		21		Summarize reports & data	⊕ Level		
					● Total station works		
					How to evaluate works of route surveying (data collection)		
	Construction Surveying	42	52	Highway plans	Clarify how to realize works	Be an assistant engineer in construction surveying	Test
				Structural Plans	Make clear how to coordinate the works	To obtain a surveying coordinator in the field	
				Field records (transit, level, grade, x-section books etc)	Exercise examples		
				Surveying operation Structure staking	Execute model projects		
				Computations	4		
T	DTAL	116	52				

-94-

				(Associate Enginee	er V)		
Item	Subject	Hour Lecture F		Sub-subject	Contents of training	Training Goal	How to evaluate
Hig	thway Drafting					-	
	Road Design	30	30	 Coordination of road design works manually or by CAD 	Based on a standard specification perform design of a road. (Speed, lane width, shoulder, slopes, sight distance, etc)	Road design and drafting coordinator	Test
		22		· Supervision or inspection or road design works	· How to check the correctness of designs	Road design works inspector or supervisor	
		30		· Designs of curves super elevation, widening, etc			
TC)TAL	82	30				
Co	nstruction Supervi	sion					
	Road maintenance/Construction	12		· Supervision of works (Overview of earthwork operation, Asphalt, structure, etc.	· Checking road alignment, proper material usage	Supervision of works	· Test
		12	18		· Quality control	Inspector of works	· Practical
		12	12	Preparation of work programs	· Checking work progress	Assistant Engineer	· Assignment
		12	12	· Preparation or reports	Taking measurements		
		22					
TC	DTAL	70	42				

(Associate Engineer V)

tem	Subject	Hours		Sub-subject	Contents of training	Training Goal	How to evaluate
em		Lecture Pra	ctice		ab sadycoc		
Sit	e Management						
	Contract Management	6			 Familiarize contract administration in the road sector 	Obtain an activity operation supervisor in road construction	
	Outline of Site Management	6	1	Explanation of importance of Construction Management			
			7		Site visit		
	Construction Method	38		Explanation of Planning	Understanding about planning	Trainees can understand how to plan the eathwork	Test
				Explanation of how to enter the Checking sheet	Uuderstanding how to enter the checking sheet.	Trainees can use checking sheet by myself	
	Schedule control	3		Explanation of schedule control	Understanding about schedule control	Trainees can understand schedule	Test
	Inspection of works	14		Explanation of inspection of works	Understanding about inspection of works	Trainees can understand	Test
	Cost control	3		Explanation of cost management	Understanding about cost control.	Trainees can understand cost	Test
	Safety control	6		Explanation of safety management	Understanding about safety management	Trainees can understand safety	Test
T	OTAL	76	36				
Gr	and Total	372	188				

(Associate Engineer V)

ltem	Subject		urs Practice	Sub-subject	Contents of training	Training Goal	How to evaluate
Hie	ghway Material Tes		Fractice				<u> </u>
	Material Inspection	28	28	· Coordination of lab testing	· Analyze test results	· Lab supervisor	Test (both practical &
				· Inspection of field	Reconcile test results with standards & give recommendations	· Material inspector	theoretical)
				· Soil investigation on old or new roads	Prepare reports and manuals on materials	· Assistant expert	
					· How to make a soil infestation		
TC	DTAL	28	28				

Syllabus

(Associate Engineer VI)

(Associate Liighteer VI)										
ltem	Subject	Hot	ırs Practice	Sub-subject	Contents of training	Training Goal	How to evaluate			
Ros	ad Surveying and d		Fractice			I				
	Surveying supervision	60		Route surveying supervision Construction surveying supervision	How to coordinate and lead surveying works	To Obtain a road surveying & design group leader	Test			
	Design supervision	52		Supervision of design of roadsPhotogrammetryCAD supervision	● How to coordinate and lead road design works					
TC	TAL	112	0							
Ros	ad Construction									
	Construction supervision	72	40	· Asphalt road contraction Planning Programming	· Explain techniques of planning and programming of a road construction	· To obtain a contraction supervisor	Test			
				· Gravel road constriction Planning Programming	· Ditto but for gravel road					
TC	TAL	72	40							

(Associate Engineer VI)

Item	Subject	Hou Lecture		Sub-subject	Contents of training	Training Goal	How to evaluate
Site	e Management						
	Contract Management	6			Familiarize contract administration in the road sector	Obtain an activity operation supervisor in road construction	
	Outline of Site Management	6	-	Explanation of importance of Construction Management			
			6		Site visit		
	Construction Method	40		Explanation of Planning	Understanding about planning	Trainees can understand how to plan the eathwork schedule.	Test
			26	Explanation of how to enter the Checking sheet	Uuderstanding how to enter the checking sheet.	Trainees can use checking sheet by myself	
	Schedule control	4		Explanation of schedule control	Understanding about schedule control	Trainees can understand schedule control.	Test
	Inspection of works	14		Explanation of inspection of works	Understanding about inspection of works	Trainees can understand inspection of works	Test
	Cost control	4		Explanation of cost management	Understanding about cost control.	Trainees can understand cost control.	
	Safety control	6		Explanation of safety management	Understanding about safety management	Trainees can understand safety control.	Test
TC	TAL .	80	32				
Gra	and Total	332	116				

(Associate Engineer VI)

ltem	Subject		urs Practice	Sub-subject	Contents of training	Training Goal	How to evaluate				
Mai	Material Testing										
	Supervision of material investigation	68	44	Exploration of materials	Train how to make a study on construction soils leading a group	Expert in soil investigation inspector of works	Test				
			-	Material Testing	How to provide re commendations on test results and lead material researches	To obtain lab expert					
TO	TAL	68	44								

ANNEX VII JOINT COORDINATING COMMITTEE (JCC)

1. Functions

JCC will meet at least once a year or whenever the necessity arises in order to fulfill the following functions:

- (1) To formulate the annual work plan of the Project;
- (2) To review the progress of the annual work plan;
- (3) To review and exchange opinions on major issues that may arise during the implementation of the Project;
- (4) To discuss any other issue(s) pertinent to the smooth implementation of the Project.

2. Composition

- (1) Chairperson: General Manager of the Ethiopian Roads Authority
- (2) Members of the Ethiopian side: Representative of;
 - Ministry of Economic Development & Cooperation,
 - Ethiopian Roads Authority,
 - The private road construction companies, and equipment dealers.
 - Other personnel to be designated by the chairperson, if necessary.
- (3) Members of the Japanese side:
 - Chief Advisor,
 - Coordinator,
 - Experts,
 - Representative(s) of the JICA Ethiopia Office,
 - Other personnel concerned, to be assigned by JICA, if necessary.

Note: Official(s) of the Embassy of Japan in the Federal Democratic Republic of Ethiopia may attend as observer(s)



