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I. Objectives.

A. CGSC was established in 1981 with the cooperation of the Government of Japan and having as objective the improvement of construction techniques for irrigation and drainage works in Indonesia.

Basing on the master plan of the Record of Discussion signed by both countries in February, 1981 activities of CGSC have been carried out comprising the following six items (Main and supporting activities) :

1. Monitoring for construction of irrigation and drainage works.
2. Standardization of cost estimation , construction method and construction management.
3. Training for irrigation and drainage engineers
(Numbers 1,2 and 3 are the main activities)
4. Collection, processing and distribution of technical data and information
5. Computer service
6. Laboratory tests

B. Technical cooperation by the Government of Japan provides the necessary guidance, advice and cooperation for promoting the above mentioned six items of activities.

Through such technical cooperation, transfer of technology to Indonesia will be an important matter and the effectiveness of establishing the CGSC should be improved as early as possible .

Dispatching of training experts is done to survey planning of irrigation and drainage engineers training, as part of the above six (6) items.

- C. To apply Japanese training methods to Indonesia directly, it would be necessary to consider the technical levels of both countries.

Staff in charge of training should understand the training methods prevailing in both Indonesia and Japan, and find out ways for conducting training in future.

For this purpose, two (2) surveys will be conducted during 1984/85 and 1985/86. A survey is presently being done for 1984/85.

Furthermore, it is important that CGSC staff be trained in Japan in order for them to understand present training conditions in Japan and preparations for such are now being made by both governments.

II. Outline of Survey

A. The survey was carried out in two (2) stages

1. Preliminary survey before dispatching of experts.

Survey items were sent to CGSC and most data collection was done by CGSC Staff, therefore, such data could be examined in Japan. As to uncollected data, most could be collected during the experts' stay in Indonesia.

2. Survey in Indonesia

Following survey has been carried out in Indonesia. Survey schedule and interviewers are shown in attached papers.

- a. Arrangement with CGSC Japanese Experts.
- b. Lecture on Training in Japan for CGSC staff.
- c. Arrangement with CGSC staff and DPW in charge of training.
- d. Field survey

1. Kedu Selatan Multipurpose Project, particularly at Wadas Lintang Irrigation Project.
2. Third (3rd) Regional Educational Training Center.

B. Contents of survey are as follows:

1. Existing conditions and planning of irrigation and drainage works.
2. Organization and engineers for irrigation and drainage works.
3. Organization of training and types of training
4. Training contents for irrigation and drainage engineers.

Basing on the results of this survey as compared with training in Japan, problems and discussion matters have been arranged.

Survey materials and materials on irrigation and drainage engineers training in Japan have been provided in the form of material papers.

III. Results of Survey

A. Agricultural land improvement works for irrigation and drainage works in Indonesia.

PELITA IV's (1984/85-1988/89) increase of food production and stable supply of food will occupy one important position in the policies of the Fourth National Five Years Development Plan of the Republic of Indonesia, started in 1984 and being another long term plan.

Therefore, promoting of site engineers and project managers engaged in irrigation and drainage work has become an urgent matter.

B. Organization and engineers for irrigation and drainage

There are many irrigation and drainage works under the Directorate General of Water Resources Development of the D.P.U. and the Regional Office of the Department of Public Works.

To carry out these works smoothly, many project organizations have been established consisting of Project Manager, Chief of General Affairs and Senior Supervisor under the Directorate of Irrigation, Directorate General of Water Resources.

There are now more than 15,000 engineers with the Directorate General of Water Resources, most of them graduating from Senior High School. It is especially these Senior High School graduate engineers who comprise about half the number of engineers with the Directorate General of Water Resources who are more or less thirty years old. It is an important matter to select many

excellent ones from among these engineers and to give them training.

C. Engineers training in Indonesia.

To train engineers, the Central Educational Training Center has been established by the D.P.U.

Through this center are conducted planning, execution and arrangement of short term training and field - training. Studying overseas and domestically have - been carried out particularly such training as conducted by six Regional Training Centers (Medan, Bandung, Yogyakarta, Surabaya, Ujung Pandang, Jakarta, being planned this year are directly connected with small, medium and simple projects and these trainings proved remarkably effective.

As from 1984, rock-fill dam Job Site Training (Wadaslintang Project) is being planned for realization. This training is considered as capable of - giving many benefits to dam engineers.

Furthermore, training conducted by the Audio Visual Training Center in Surabaya plays an important role in preparing text books and providing training for upper-level junior engineers.

D. Existing conditions of CGSC training.

From the viewpoint of existing conditions of irrigation and drainage in Indonesia, training by CGSC plays an important role.

As to construction management training, such will be carried out as a professional education. Characteristic of the training executed at CGSC is systematic training; from fundamental theory to laboratory practice.

From the viewpoint of utilization of training facilities and the contents of text books by experts, the training by CGSC may be considered as an effort to attain the necessary objectives and to step up from the following conditions.

1. Standardization of design and estimation of costs will differ depending on the area.
2. Small and simple constructions are designed using practical tables and graphs, rather than theory.

As above mentioned, concerning such training (theoretically) practically) of construction management situated between design and construction, it would be necessary to accumulate high level design techniques in Indonesia in future.

Through training provided by CGSC, middle level civil engineers and senior civil engineers have been trained, and as result of such training is the enlargement of these level engineers. Contents of the training are of the same level as simplified design criteria of high level in Japan.

E. Comparison of irrigation engineers in Indonesia and Japan.

There are two kinds of technical improvements in Japan: one is for the engineer himself, and the other is for the whole organization, and ~~their~~ countermeasures are different. For technical improvement of the engineer himself, such is done through daily works like technical extension by senior expert to junior expert, suitable personnel movement is important, and training is one that provides such assistance.

For technical improvement for the whole organization, efforts like expanding and creation of fruitful or specialized organization, computerization of works and standardization of techniques have been promoted with the cooperation of the technical power of engineers.

According to the evaluation of training, priority should be given to feedback of technical power to the organization as provided by the participant, rather, ^{than} testing the participant himself.

In Indonesia, training is a very important procedure for preparation of suitable engineers, and it is generally considered that technical power lies in the hands private engineers. In Japan, construction management techniques have so developed and have reached the stage of training for contractors engineers. Training in Japan gives priority to planning, design, administration and computerization.

IV. Future Tasks and Schedule for Training

A. Systemization and opening of technical power would allow more speedy extension and improvement. To take this direction, there are six items of CGSC activities, such as training and other.

It is necessary for us to clear the following items in order to carry out such activities.

1. Distribution of irrigation and drainage engineers (State, Province) classified by organization, age, position, school career.
2. Distribution of participants of each training course.
3. Contents of concrete works and technical level of engineers; (Contents of survey, design and supervision, and a sample of working results classified by state/nationally and Province).
4. Existing conditions of design, cost estimation and standardization throughout Indonesia.
5. Proposals and opinions for the engineer's training by projects (arrangement of evaluation)
6. ^{Futures} training schedule since 1985/1986 by DGWRD

B. It ^{would be} necessary to discuss the following items;

1. Planning of improved countermeasures for technical power (systemization for technical power and training of middle level engineers, etc.).
2. Planning of uniformity for standardization.
3. Scope of design, construction and management techniques and objectives, and leveling of CGSC training.

4. Training evaluation methods

(Not only results of tests but also how to utilize the techniques obtained from the training).

5. Unification of participants levels

(Selection method for unification of age and experience, etc.).

6. Relation with the contents of third countries training and domestic training.

(C) SCHEDULE

Final report on CGSC training curriculum will be prepared in 1985/1986, for this purpose following execution schedule is proposed.

I t e m	1984				1985							
	9	10	11	12	1	2	3	4	5	6	7	8
1. The 1st Survey (Japanese Expert)	█											
2. Training in Japan (CGSC Staff)			█									
3. Continuous Survey and Discussion by CGSC Staff				█	█	█	█					
4. To send above material to Japan					█	█	█					
5. The 2nd Survey (Japanese Expert) Preparing of Final Report									█	█		
6. Training in Japan (CGSC Staff)											█	
7. Confirmation of a Training Curriculum by CGSC Staff												█

SURVEY SCHEDULE FOR MR. AKIHIKO YASUDA IN INDONESIA

No.	Date	Day	Schedule	Meeting with
1.	1984.9.5.	Wed.	Tokyo to Jakarta	
2.	6	Thu.	National Holiday	
3.	7	Fri.	Courtesy call to Embassy of Japan	Mr. Ir. Sarwoko Deputy Director of DOI.
4.	8	Sat.	Meeting with CGSC staff	Dr. Hafied (CGSC Manager) Mr. Kaman (chief of Training Unit)
5.	9	Sun.	Day off	
6.	10	Mon.	Meeting with counterpart CGSC	
7.	11	Tue.	"	
8.	12	Wed.	Jakarta to Kedu Selatan	
9.	13	Thu.	Wadas Lintang Project	Mr. Mulyanto (Sub. Project Manager Wadaslintang)
10.	14.	Fri.	Third Regional Training Center	Ir. Darmo Kabat Chief of Regional Training Center III Jogjakarta
11.	15	Sat.	"	
12.	16	Sun.	Yogyakarta to Jakarta	
13.	17	Mon.	Meeting with counterparts and arrangement of materials	
14.	18	Tue	= ditto =	
15.	19	Wed	= ditto =	
16.	20	Thu	= ditto =	
17.	21	Fri	= ditto =	

No.	Date	Day	Schedule	Meeting with
18.	22	Sat.	Meeting at central Educational and Training Division, DGWRD.	Mr. Habibuddin (Chief of Ed. and Training Division, DGWRD.)
19.	23	Sun.	Day off	
20.	24	Mon.	Report making	
21.	25	Tue.	= ditto =	
22.	26	Wed.	Day off (Report Making)	
23.	27	Thu.	Report Making	
24.	28	Fri.	Report Making and meeting with Counterparts	
25.	29	Sat.	= ditto =	
26.	30	Sun.	Day off (Report Making)	
27.	1984.10.1.	Mon.	Report Making	
28.	2	Tue.	= ditto =	
29.	3	Wed.	= ditto =	
30.	4	Thu.	= ditto =	
31.	5	Fri.	= ditto =	
32.	6	Sat	= ditto =	
33.	7	Sun	Day off	
34.	8	Mon	Discussion for the report at CGSC	
35.	9	Tue	= ditto =	
36.	10	Wed	= ditto =	
37.	11	Thu	Report to DOI, JICA, Embassy of Japan	
38.	12	Fri	Jakarta to Tokyo	

M A T E R I A L S

I. IRRIGATION AND DRAINAGE WORKS AND
ENGINEERS IN INDONESIA

III. EXISTING CCNDITION OF TRAINING IN INDONESIA

III. TRAINING FOR IRRIGATION ENGINEERS IN JAPAN

I. Irrigation and Drainage Works and Engineers in Indonesia

1. Existing conditions of the works.

Paddy Field areas in Indonesia in 1981 are shown in the following Table 1

Table 1. Area of Paddy Fields (Ha)

Item	Irrigation Paddy Field	Swampy Paddy Field	Non-Irrigation Paddy Field	Total
Operated by DPU	3,599,857	471,410	-	4,071,267
Operated by Village	1,014,000	1,042,351	-	2,056,351
Other, under Farmers	-	-	2,086,836	2,086,386
Total	4,613,857	1,513,761	2,086,836	8,213,454

Source of Data : DOI, DGWRD
According to the 4th National Five Year Development Plan (Pelita IV) 1984/1985-1988/1989, it is estimated that the average yearly population will be increased 2%

Therefore the target for rice production increase is estimated 4%. For this reason, irrigation and drainage works occupy a high priority and following works are being planned.

Item	Area (Ha)
1. Rehabilitation and improvement of existing Irrigation Drainage facilities	360,000
2. Newly-established Irrigation and Drainage Facilities	600,000
3. Development of Tidal area	310,000
4. Swampy Paddy Field Reclamation	150,000
5. Development of Flood Control	500,000
Source Data : Repelita IV	

To attain the above objectives, the following works (Figure 1) have been continuously executed since the Third National Five Year Development Plan.

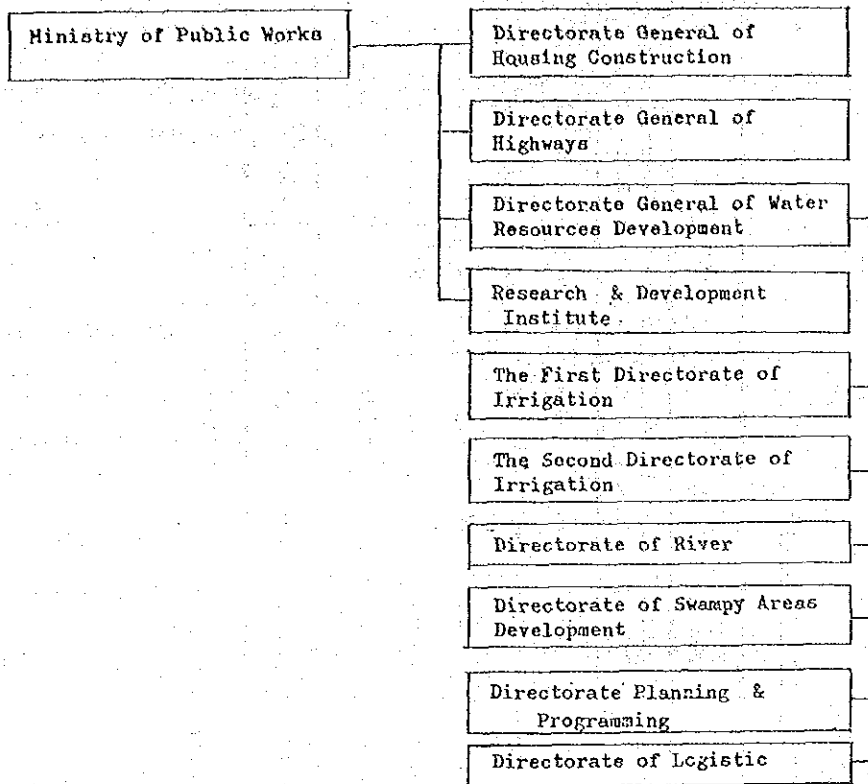
No. 1 Special Irrigation Works (National Projects)	32
2 Small and Medium Irrigation Works (Provincial Projects)	23
3 Simple Irrigation Works	
(Provincial Projects)	24
4 Irrigation Improvement Works	
(National and Provincial Projects)	8

Total	87

2. Execution Organization

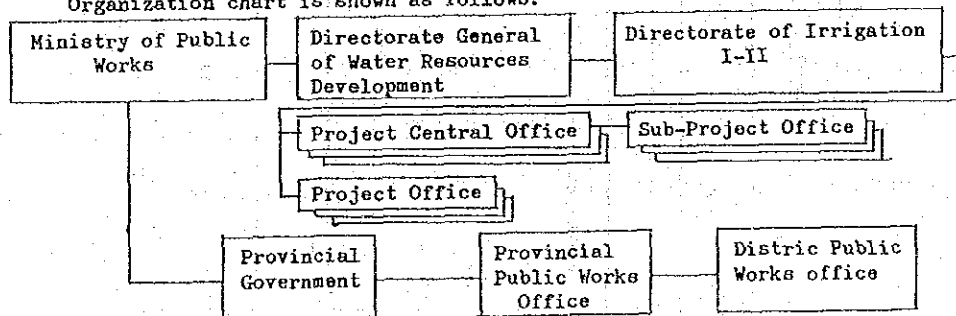
Organization structure of the Ministry of Public Works is shown hereunder.

Irrigation & Drainage Work are managed by Directorate of Irrigation I and DOI II of DGWRD



Acting as the project execution organization are the National Project Offices and the Provincial Public Works Offices.

Organization chart is shown as follows:



Provincial Public Works Offices has been subsidized and supported by the Ministry of Public Works mainly for small and medium scale Irrigation Works, and O & M of the facilities are managed by the Provincial Public Works Offices.

3. Number of Staff

The staff of the Directorate General of Water Resources Development numbers 21,352 persons as per April, 1981.

Following table shows project staff as classified by school career.

Project Finance Registered Staff Classified by School career as per January, 1981.

Table 3

Classification	Engineer	General Clerk	Total
University Graduate	31	5	36
Academy	39	13	52
Senior High School	843	410	1,253
Junior High School	107	218	325
Elementary School	544	-	544
Non-School	155	-	155
T o t a l	1,719	646	2,365

According to above table, engineers graduating from Senior High School occupy about a half of total engineers.

Remarks : This table shows the number of registered staff of each project under D.O.I.

Each project has several staff members from the another Directorate such as Rivers and other, but these staff members are not included in the table.

4. Educational System

School System and ratio of school attendance in Indonesia is shown as follows.

Age	6	12	15	18	21	23
School	Elementary School (compulsory education)	Junior High School	Technical High school	Senior High school	Academy	University
Year	6	3	3	5		
School Attendance Percentage	93.2%	27.9%	14.5%	2.2%		

Total population of Indonesia as per 1984 is 153,920,000

(Indonesian Statistics)

There are 41 National Universities with 276 Faculties, and the number of students are 196,000. Besides these, there are various private universities.

Each province has one or more universities. Among these the Institute of Technology Bandung, Airlangga University Surabaya and Gajah Mada University Yogyakarta are quite well known.

5. Employment and Promotion System

There are three classification of staff applicable to national public servants in Indonesia, i.e. regular officer, candidate for regular officer and temporary officer.

Employment classification testing is done according to school career.

These staff members are classified by 4 grades.

TABLE 4. EMPLOYMENT AND PROMOTION

Classification	Employment Test- ing	Temporary Staff (PP)	Candidate Staff (CP)	Regular Staff (PW)	Promotion (WT)
University	Jakarta/2 weeks test. Technology Pancasila Administration Management	III A 3 months	III A 6-12 months	III A 4 years	III A → IIIB → IIIC → IID → National → IVA, IVB, IVC, IVD 4years 4years 4years Promotion Testing Director or Sub-Director
Academy	Ditto	IIB 3 months	IIB 6-12 months	IIB → IIC 4 years 4 years	IIB → IIC → IID → Ditto Chief of section/ manager IIIA-IIIIB-IIIC- IIID
Senior High School	By Directorate Of Irrigation, Jakarta	IIA 3 months	IIA 6-12 months	IIA → IIB → IIC → IID 4 years 4 years 4 years	IIA → IIB → IIC → IID → Ditto 4years 4 years 4years IIIA-IIIIB-IIIC- IIID
Junior High School/ Elementary School	By each Project	IA	IA	IA → IB → IC → ID ID	IA → IB → IC → ID → Ditto IIA- IIB-IIC-ID

Remarks : Retirement Age

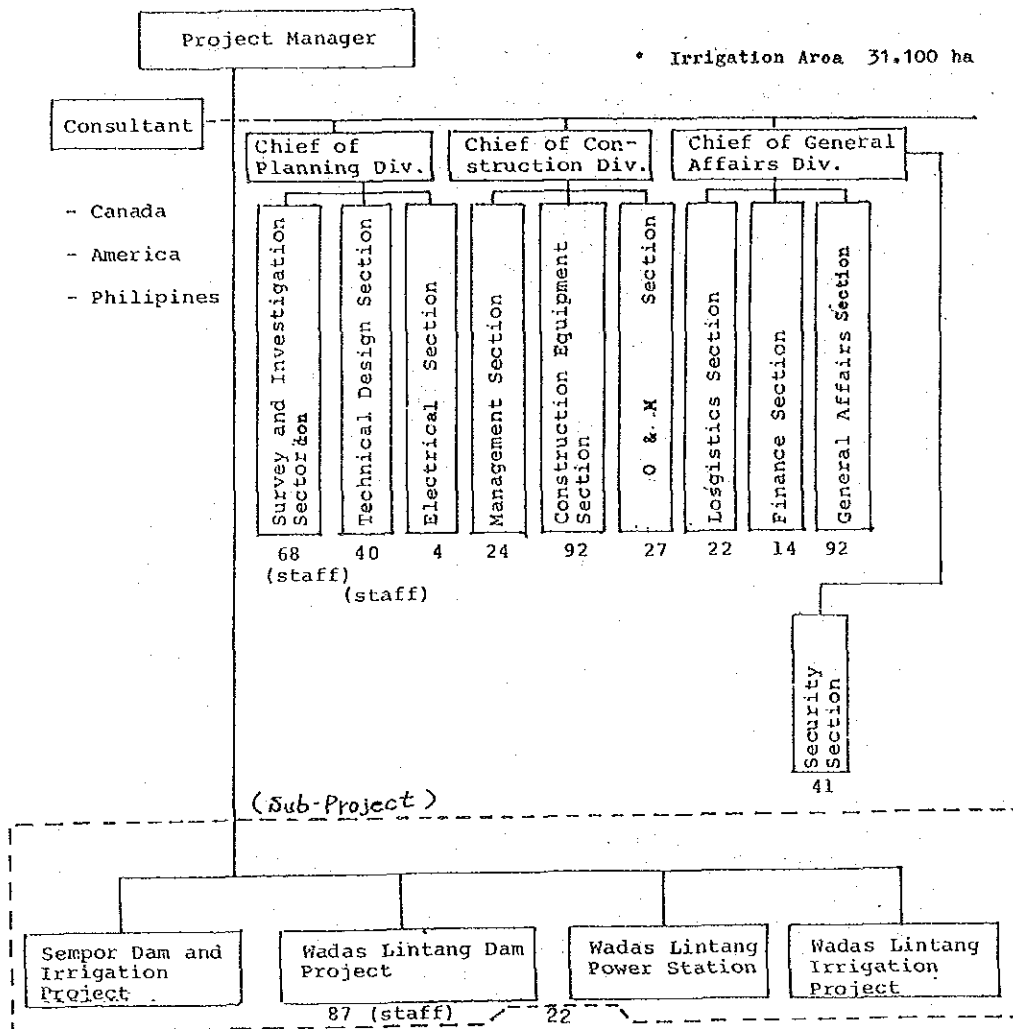
1. Civil servants with position beyond director - 60 years
Civil servants with position below sub-director-55 years
2. Part of regular staff below candidate is registered at the head office,
others are registered at each project.

6. Project Execution System and Engineers at Job Site

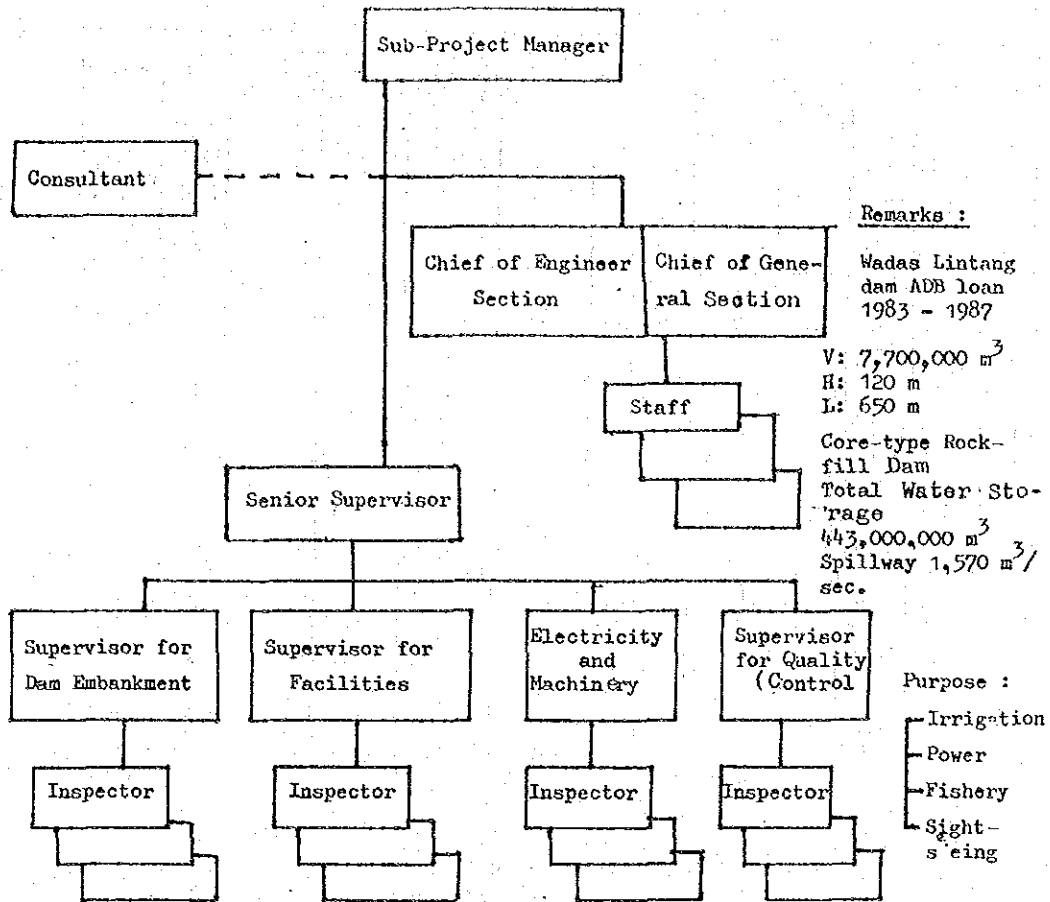
The following data, i.e. condition of project organization and engineers, have been collected from Kedu Selatan and Teluk Lada Irrigation Projects through observation:

1) Kedu Selatan Multi-Purpose Project

(1) Organization of Central Office as per November 1983



(2). Wadas Lintang Sub-Project (Kedu Selatan Branch Office)



(3). Total staff of Project as per August 1984.
 Total staff of Project including Sub Project numbers 616 persons, central office has about 430 persons, Sub Project has 190 persons, (Wadas Lintang Dam 27 persons).
 Table 4 shows staff as classified by school career (University, Academy, High School, Age and Status).

Table 5. Staff composition classified by school career, status and age

Classification		A . G E						Total	Remarks	
		19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44			45 - 52
University graduate	P N				1	7 (6)	14 (5)	1 (1)	23(12)	() Number of staff of central office
	C P				3 (3)	4 (2)	2 (1)		9 (6)	
	P P			1 (1)		1 (1)			2 (2)	
				1 (1)	4 (3)	12 (9)	16 (6)	1 (1)	34(20)	
Academy	P N				7	8	4		19	
	C P					4			4	
	P P				1	3			4	
					8	15	4		27	
High School	P N			11	94	51	18	5	179	
	C P			12	10	6			28	
	P P		7	24	15	3	1		50	
			7	47	119	60	19	5	257	
Total			7	48	131	87	39	6	318	

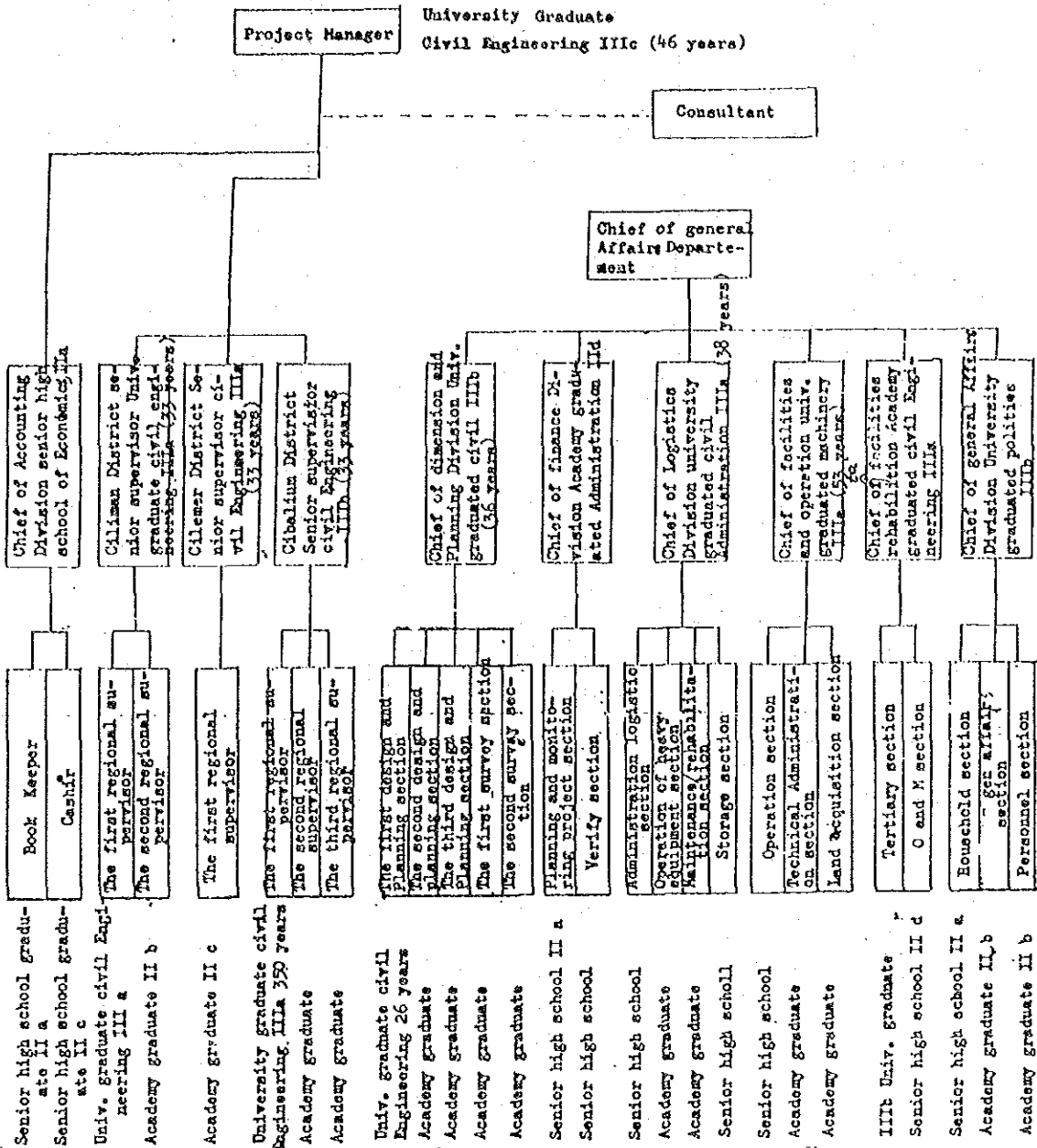
Above mentioned staff: 12 staff members are studying in domestics and foreign country : (4 staff members are university graduates)
 (2 staff members are academy graduates)
 (6 staff members are Senior High School graduates)

According to Table 4, Project Manager class is graduated from University with age of 41 - 42 (P.N.), Chief of Division and Senior Supervisor class are graduated from University with age of 38-47 (P.N.), Chief of Section class is graduated from University with age of 26 - 43 years (PN, CP, PP).

In case of High School graduate, most staff members are general Officer or Supervisors (PN, CP, PP).

2) TELUK LADA IRRIGATION PROJECT

(1). Office Organization



(2). Composition of the staff 1st August 1984

Total staff of the project are 269 (chief of the sectional division 38, general staff 231).

If all the staff is classified by school careers: University graduate 12, Academy graduate 21, Senior high school 129, Junior high school 20, Elementary school 84, others 3.

Table-6 Staff composition classified by school career, status and age.

Classification		- 19	20-24	A 25-29	G 30-34	e 35-39	40-44	45-53	Total	Remarks
University graduate	PN				3	1		3	7	
	CP			1		2			3	
	PP								0	
				1	3	3		3	10	
Academy graduate	PN				6	9		1	16	
	CP				1				1	
	PP			1	1				2	
				1	8	9		1	19	
Senior High School	PN			4	10	5		1	20	
	CP		1	6	3	1			11	
	PP		12	30	17	4	1		64	
			13	40	30	10	1	1	95	
Total			13	42	41	22	1	5	124	

According to the table, a staff member who is an university graduate has a position as the chief of division, with age of about 30 years. In case of staff member who is - graduated from academy has position would be chief of section with age of about 30 years. A few members of the staff have a position as chief of section but mostly staff members graduating from high school are holding general staff positions (design - and planning 24 persons, operator 7 persons, inspector 33 persons logistics staff 23 persons etc.)

II. Existing condition of the Training in Indonesia

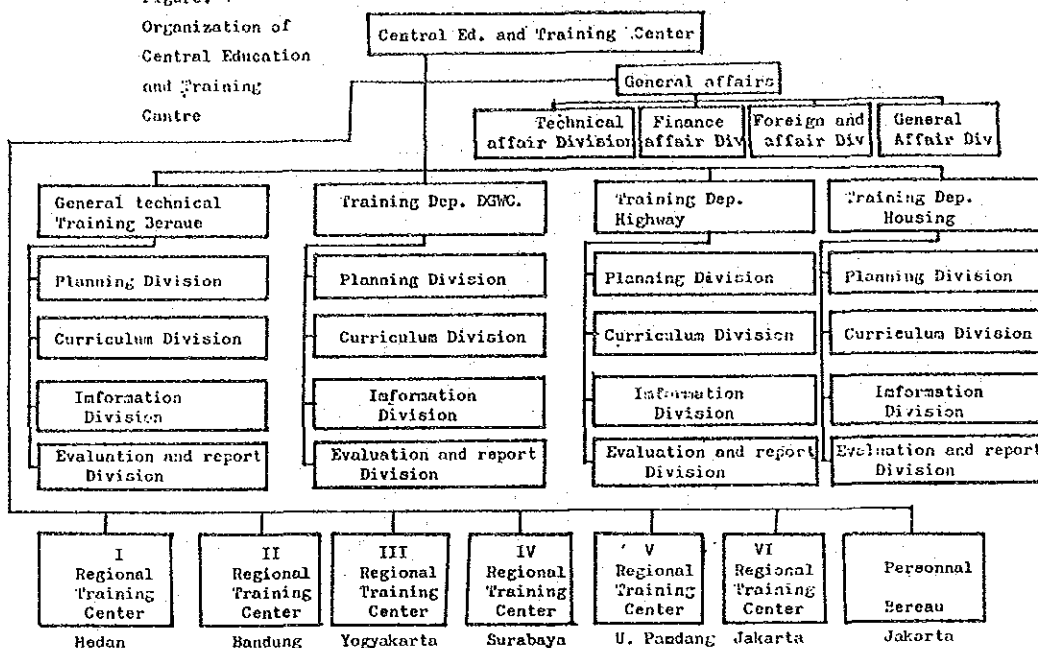
1. Organization for the Training Execution.

(1). Central education and Training Center.

There are three (3) Directorate general in D.P.U.
 Beside these, there is central education and Training Center.
 Following activities are carried out by the center in order the training necessary staffs for implementation of the works.

1. To guide the training by regional training center which is under organization in the center.
2. To arrange training of each organization which under D.P.U.
3. Other necessary planning and guidance of the training.
4. Implementation planning for training in domestic and foreign country.

Figure. 1
 Organization of
 Central Education
 and Training
 Centre

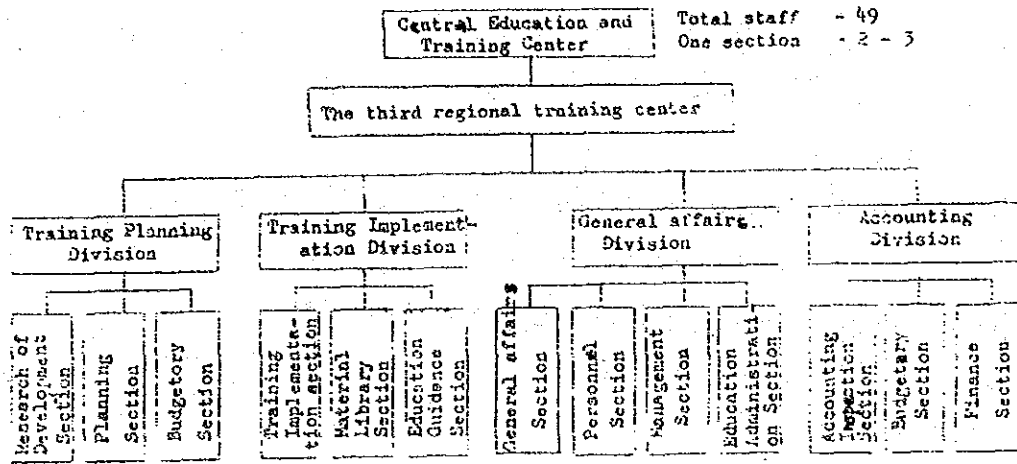


Covering area of regional training center will be should in figure 2 (the sizes training center is under planning). This organization is organized as in August 1984 and the regional training center will be new by established.

(2). The third regional training center

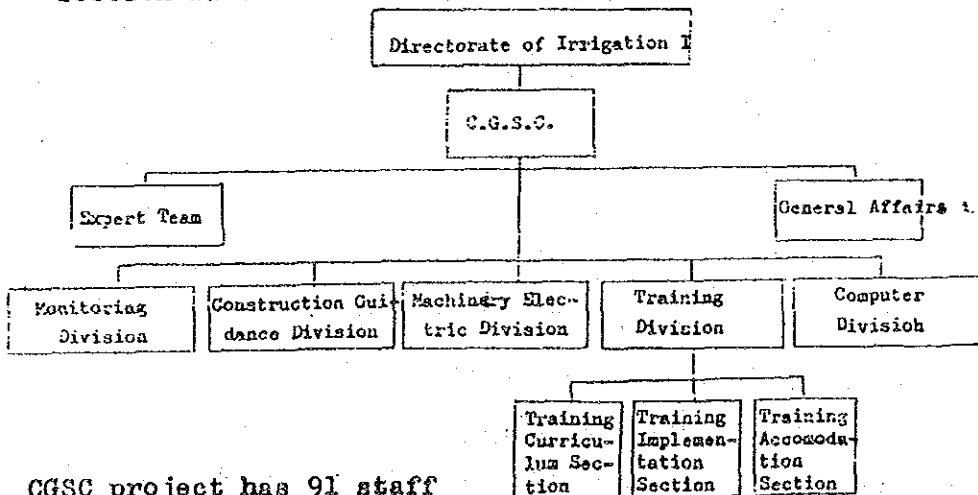
The survey team observed the third regional training center in Jakarta in order to observe actual conditions of regional training.

This center is saturated control part in Yogyakarta, which building used to be the head office of the DPU after the independence in the near future new by center will be established at the place (2 ha) which is about 7km from the central part of Yogyakarta. Present organization will be shown in following chart.



(3). CGSC

There are Junior Course (2 times a year), Senior Course 1 time a year in Construction Management Training at CGSC. As implementation organization for the training following Division and Section have been established



CGSC project has 91 staff

Training Division has 6 staff such as chief of division 1, chief of section 3, and general staff 2

2. Outline of Various kind of Training

(1) Kind of Training

In central education training center the following activities are carried out :

1. Training for management-General technical training department
2. Training for concrete item-Water resources, Highway, Housing, is conducted by Training Division of each Directorate General.
3. Others, training for regulation and law related training division.

Accordingly training division of Directorate General of Water Resources Development have executed the training on irrigation Sabo and River etc.

The training will be classified in the following three items :

1. University study course in domestic and foreign country
Doctor course (3 years), Columbia University in America, ITB. Bandung, IPB. Bogor, University of Diponegoro Semarang.
And other courses, Universities in Sri Lanka, Pakistan, Netherland, Canada, India .
2. Short training courses
Training at Regional Training Center-Irrigation and River.
Training of CGSC - Construction Management
Training at Sabo center in Yogyakarta - Sabo
Training at Audio Visual center Surabaya-Irrigation facilities and its management.
3. Job site Training
Rock fill dam (Wadaslintang) training Dam Construction Planning in Japan.
Training for Irrigation and Drainage shows as follows :

(2). Training at Regional Training center

- a. Training Program will be prepared by Training Division of each Directorate General, and training will be implemented according to policy of the head office.

Training planning for irrigation fields in 1984 is shown as follows :

Name of Training Center	Name of Course
1. Medan	-Mapping, O & M
2. Bandung	-Earthquake Engineering, Land Acquisition, Construction Supervision
3. Yogyakarta	-Mapping, Design and Drawing, O & M, Construction Supervision
4. Surabaya	-Construction Supervision, Mapping, Design and O & M
5. Ujung Pandang	-Mapping, Swampy Area Reclamation, O & M
6. Jakarta	-O & M, Construction Supervision (3 times) Mapping, Finance Management (4 times)

b. Training Planning

1. Objectives

Training of middle level engineers in Project

2. Contents

Training for Design, Drawing, Survey, Construction Supervision and Operation, etc. for small scale and simple irrigation works.

Training level equals academy level.

3. Participant

Training participants shall be staff members of projects under National or Provincial Governments with more than two years experience and under 35 years of age.

Remarks - 1. Content of lecture for Yogyakarta Regional Education and Training Center III has been arranged well. Participants for the training here have been accepted not only the area covered but also from others parts in Indonesia.

Remarks - 2. For selection of participants, examination papers are sent through to the project office or the Provincial Government where participants will be selected.

4. Number of participants

One course - 25 persons

5. Training period

3.5 months

6. Lectures - Training Center staff (30%), DPU Staff

Provincial Public Works Staff, Project Manager, Chief of Divisions and Professors of Universities, etc.

7. Text books

Generally, text books for the training are prepared by the lecturers, and are printed by the Center.

Some of the training subjects are making use of DOI text books.

8. Curriculum

Design and drawing training - table 1

Survey training - table 2

Construction supervision training - table 3

C. Training implementation committee

In order to examine training subjects and training evaluation, the following committee has been established.

1. Water Resources - 10 members (mostly lecturers from the Center).

2. Road and Bridge-8 members (mostly lecturers, from the Center)
3. Housing-7 members (mostly lecturers from the Center)
4. Survey-6 members (mostly lecturers from the Center)

Contents of the training curriculum have been examined by the training implementation committee in accordance with progress of technical knowledge.

D. Training Evaluation

There are three types of Training Evaluation, as follows :

1. Participant evaluation by the Center

It is evaluated through three times (beginning, middle and final)examination by training implementation committee.

Participant passing the examination will receive a training completion certificate.

Participant failing to pass the examination will only receive an attendance certificate.

Besides the above mentioned, Report Making and Practice should be submitted.

2. Evaluation by each Project

Questionnaire is sent to Project in order to find out the effectiveness of the training to both the participant himself and the Project (about 30% to be answered).

3. Evaluation by participant

Questionnaires.

According to some ex-participants, training items are connected with their daily works and level of training is high. The training has attained its objectives.

Participants who have finished the training will be able design and supervise small scale construction works, such as canal, diversion works, by himself, using training text books (contents of design are all standardized figures and tables).

It is said that the level of training is highly evaluated.

E. Training Results

The training in Yogyakarta has been implemented since 1957.

Budget for the training is limited, therefore not all proposed training can be implemented.

In 1982, the training for Irrigation Design and Drawing could not be implemented. Following table shows implementation records in 1982.

Classification	Name of course	Participant who has passed	Remarks
Water Resources	River	50	Generally three times.
	Survey	26 (25), 25 (21)	
	Supervision	18 (17), 25 (21)	
Irrigation	Survey	14 (13)	Generally two times
	Supervision	31 (30)	
Road and Bridge	Survey	22 (21), 33 (31)	
	Design, Drawing	15 (14)	
	Supervision	28	
Housing Construction Civil Engineering	Design and Drawing	28 (26)	Generally four times
	Survey	71 (69), 20, 15 39 (35)	
Survey Supervision		54	

Irrigation course since 1976 has been executed as follows :

Classification	1976	1978	1979	1980	1981	1982
Survey	19 (17)	39 (35)	17	20	17	14 (13)
Supervision	18	23 (20)	18	22	18	31 (30)
Design and Drawing		46 (43)	17 (16)	23	21	

(3). Training at Sabo Center

Two years training course (degree in Japan can be obtained) and short course (four months, two to three times a year) are implemented in Yogyakarta.

Contents of curriculum is river and sabo, there is no relation with irrigation field but is necessary to be investigated.

(4). Training at Audio Visual Training Center

Three months training in operation and maintenance of irrigation facilities for engineers holding position at project staff level, is implemented in Surabaya.

Training contents is Audio Visual Education using slides, film, video, etc., one hundred sixty six items.

(5.) Training on Dam Construction in Japan

This training is started in this year 1984 to train experts of river engineering etc by DGWRD.

The schedule is as follows:

1. Period: September 28, to December 22, 1984.
2. Acceptance country : Japan
3. Participant : 15 persons (selected middle level engineers from each project
4. Content of training : Observation of Dam Construction site and the lecture
5. Participant's acceptance organization
 - JICA
 - Water Resources Development Public Corporation

(6.) Training on Rookfill Dam

Job site training which is carried out by DOI as Wadaslintang Project is planned to be started in 1984 and five times of the training will be planned in this year.

The contents of the first training will be shown as follows:

1. To train senior engineers on Dam Construction
2. Participants: Engineers from Dam Projects
(Project Site) Chief of Supervisor, Assistant Engineers, Sub Project Manager (under discussion).

From central office, Assistant for Design Engineers

3. Number of participants: 27
4. Training period ; October 25 to November 21, 1984
5. Lecturer : three chief instructors (under selection) foreign expert
three assistant lecturer (selection from Brantas, Bengawan Solo and PLN Project's Engineers)

6. Contents of the training :

- a. Soil
- b. Rock Seminar style
- c. Concrete

(three classes x 9 participants = 27 participants)

Following table 4 shows the curriculum such as experiment, practice to special theory.

Level of the training is very high

7. Accomodation : Dormitory of Wadaslintang project (under construction)

As to second to fifth job site training instructors will be selected by Indonesian side.

Detailed schedule for next year and future not decided yet.

3. TRAINING IN CGSC

(1) CGSC training has been executed in order to train engineers for irrigation and drainage techniques and its extension according to the establishment target of CGSC.

Contents of the training is to train high level supervisor in order to manage the construction.

There are two kind of courses such as junior and senior level.

Training curriculum is prepared by the CGSC project according to direction and guidance of Steering Committee.

(2) Training record and its schedule

Name of the training	Period	Number		Subject	Textbooks	Lecturer		Remarks
		National	Pro vince			CGSC	Others	
Junior course I	Aug.10-Sep.23, 1982	21	4	29	29	10	16	Two courses executed at the same time
II	Nov.8 -Dec.22, 1982	31	-	29	29	6	18	
III	Aug.2 -Sep.15, 1983	29	-	29	29	14	18	
IV	Aug.2 -Sep.15, 1983	-	29	29	29	14	18	
V-VI	Nov.8 -Dec.22, 1983	50	11	29	29	12	21	
VII	Aug.7 -Sep.20, 1984	35	1	29	29	14	14	
VII,IX	Nov.8 -Dec.22, 1984	(tentatively)						
Senior course I	Mar.14-Apr.12, 1983	32	-	39	29	7	27	
II	Mar.6 -Apr.4, 1984	28	-	39	29	5	22	
III	Jan.25-Feb.25, 1985	(tentatively)						

(3) Training Contents and methods

ITEM	JUNIOR COURSE	SENIOR COURSE	REMARKS
1. Objective	Training of construction Supervisor	Training of construction Supervisor	
2. Qualification of participant	<p>a. Field Supervisor</p> <p>b. Technical high school graduate or academy graduate</p> <p>c. Senior Graduate High school (experience more than 5 years for high school and 2 years for academy)</p> <p>d. National or Provincial Government Staff</p>	<p>a. Senior Supervisor of National or Provincial Project</p> <p>b. Candidate to be promoted to senior supervisor University graduate, more than 2 year, experience and academy graduate more than 5 years experience</p>	Participant should be engaged related project
3. Selection of Participant	Selected by project Manager	Selected by project manager	
4. Training period	6 (six) weeks	1 (one) month	
5. Number of participant	30 persons	30 persons	Target 35 persons
6. Training place	C.G.S.C.	C.G.S.C.	
7. Accomodation	CGSC's Dormitory 20rooms for 60 persons	CGSC's dormitory 20 rooms for 60 persons	
8. Lecturer's fee	Rp. 3,500 per session (45 minutes) for lecturer and Rp. 3,000 for assistant lecturer	Rp. 5,000 per session (45 minutes)	CGSC and 001 lecturers
9. Supported by CGSC	- Mail, daily allowance - Dormitory, text books - work costume, etc.	Ditto	

10. Travel allowance	CGSC or project	Ditto	
11. Curriculum and Lecturer	Table (5)	Table (6)	
12. Timetable	Table (7)	Table (8)	
13. Film	2 times in a week	Ditto	Film list table (7)
14. Slides	Most of the subjects make use of slides	Ditto	
15. Observation tour	Table (10) Four night&five days Central and West Java should be reported	Ditto Ditto	
16. Name of text books and lecturers	Table (11)	Table (12)	
17. Miscellaneous books	Table (13)	Table (13)	
18. Contents of Curriculum	Table (14)	Table (15)	
19. Language	Indonesian	Ditto	National Language

Remarks : As to training expenses, a special budget is provided by JICA

- (4) Level of text book are the same level as simplification of design criteria in Japan.
 As to soil test soil grading, soil compaction, farm ability and field earth works are carried out, as to hydraulic test, velocity of open canal orifice this chart, measurement of water head of pipe line, permeability test in field canal are carried out, as to concrete, grading test, compaction test, abrasion, mixing and strengthening tests are carried out.

(5). Evaluation of Training

1. Evaluation method of participants

Examination on supervision system.

Beginning and end of a training there are two times of examination for each two hours by a CGSC manager.

Report :

Field trip report prepared by each three groups.

Practise report prepared also by each group.

Discussion meeting for the field trip report.

Examination for the lectures

When end of a training both Junior and Senior course has examination for 11 subject, in multiple choice system for one day. Training level for Junior course is the medium between Senior Technical High School and Academy level. Training level for Senior is the medium between Academy and University level Table (16) shows examination subjects for Junior Course and Table (17) shows a sample of the examination.

Final Evaluation:

As to examination of the report and the lecture, the results of the examination shows as one to ten (ten is perfect point).

If average record of test is more than 5.6 ha can pass the examination. If a participant can not pass the examination, he cannot get acompleted certificate.

Table (18) shows a part of the evaluation table.

When the closing ceremony is held, the participant who has the highest examination point, number 2 and number 3 are announced to all attendants and all their training record are put in to computer and also training record will be sent to project manager.

2. Evaluation method by participant

To prepare a questionnaire on text books, dormitory, mail, schedule, lectures, environment condition etc. as 10 items, will be filled up by participant.

According to evaluation of the training by participant, contents of the training and text books are good enough to utilize for their projects, but some of them have requested to have a subject of computer.

3. Training evaluation by project site.

CGSC's staff visit to projects to have post evaluation of ex-participant. There are 18 areas for post Evaluation in 27 provinces in Indonesia, and until now projects in four areas have been finished to evaluate.

At present, the training of CGSC are highly evaluated by the projects.

4. Evaluation by DOI side.

Training report is examined by training steering committee, especially content of training curriculum is evaluated contents of the training is highly evaluated by DOI side

5. Evaluation by Mr. Ir. Habibudin Dipl. HE. (Chief of Training Division DGWRD)

Mr. Ir. Habibudin's evaluation for CGSC training, is as follows:

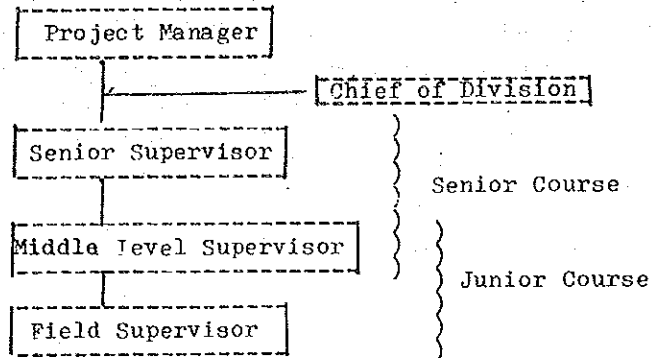
- Facilities, Lectures, etc. are high level.
- As to Senior course level it must be leveled up for the third countries training (1985, Domestic participants 10, foreign participants are 20 persons).
- Relationship between CGSC and another training center is arranged well. In the field of construction theory of compaction is enough but practical experience for compaction is shortage so it must be strengthened.

(6) Training Steering Committee and Training Implementation Committee.

Training Steering Committee		Training Implementation Committee	
Chairman	Deputy Minister in-charge of Irrigation	Advisor	Director of Irrigation I
Vice Chairman	Director of Irrigation	Ditto	Chief, the Construction Department, DCI
Members	1. Chief, of The Construction Department, DCI 2. Chief of Training Department, DGWRD 3. CGSC Manager	Ditto	Deputy Director General of DGWRD Manager of CGSC
Secretary	The Chief of Training Division	Chairman	Chief of Training Division
		Vice Chairmen	Chief Staff, CGSC
		Members	Chief of Computer Division
		Ditto	Chief of Construction-Guidance
		Ditto	Chief of Training Facilities Section
		Ditto	Chief Accounting Section
		Ditto	Chief Finance
		Secretary	Training Implementation Section

(7) Participant's Position

① Status of Participants



Generally participant's position are shown in above chart

② Classification of Participants

List of Participants of Junior course III and IV and Senior course II which have been executed 1953 is shown in table 19 and arrange detailed one is shown in table 20.

Table 20 Classification of Participant

		Junior Course III	Junior Course IV	Junior Course V	Junior Course VI	Senior Course II	Remarks
Classification of Project	NC	1	2	-	1	3	National Project
	NPC	23	1	30	7	25	National Central Office
	NBP	5	-	-	2	4	National Branch Office
	PC	-	25	-	19	-	Provincial Government
	PR	-	1	-	2	-	Provincial Branch Office
Position	S	5	24	4	18	4	Staff
	SP	13	1	17	6	1	Supervisor
	CS	10	7	9	7	15	Chief of the Section
	SS	-	-	-	-	12	Senior Supervisor
School Career	U	-	1	1	-	19	University Graduate
	A	9	14	6	10	13	Academy Graduate
	HS	20	14	23	21	-	High School
Age	40 -	-	1	1	2	1	Senior High School
	35 - 39	5	4	6	4	10	
	30 - 34	10	14	7	11	17	
	25 - 29	11	10	12	11	4	
	- 24	2	-	4	3	-	
	Average	(31)	(31)	(30)	(31)	(33)	
Status	PR	22	20	14	20	25	Regular Officer
	CP	-	-	4	3	-	Candidate Regular Officer
	PP	7	9	12	8	7	Temporary Officer
Total number of the Staff		29	29	30	31	32	

According to the table there are various of ages and status of the participants

(8) Desire on futures training by CGSC

As a training of CGSC, construction/supervision will be carried out continuously; but so far, there are some overlaped lectures. Therefore in the future, it is necessary to arranged for this problem. In the near future government of Indonesia is planning to prepare the third countries Training in Indonesia with cooperation by Government of Japan. Therefore text book of Senior course suitable for this training

Figure - 2 AREA COVERED BY REGIONAL TRAINING CENTER

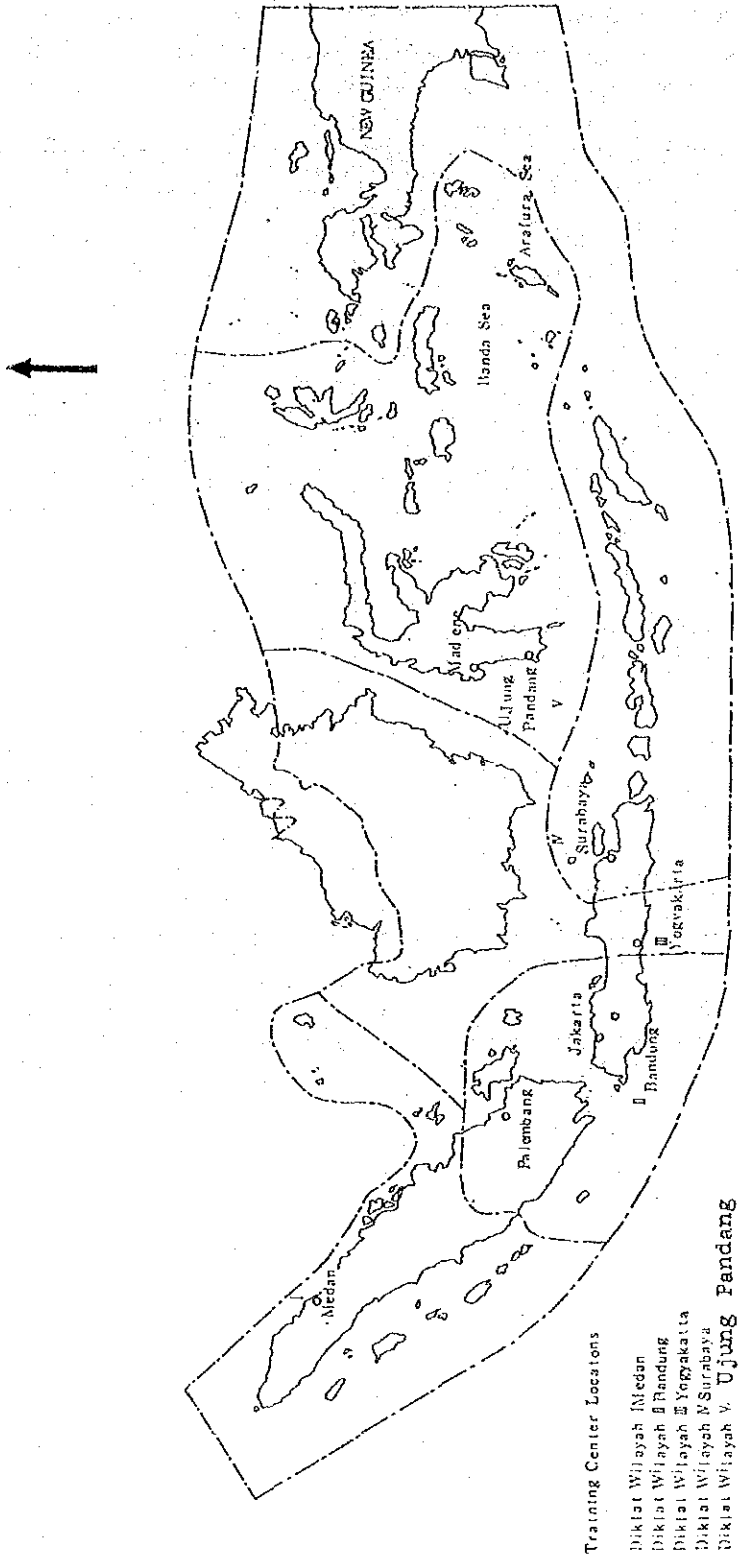


Table - 1 Design and drawing curriculum of The Third Regional Education and Training Center in Yogyakarta

CURRICULUM FOR "Drafting and Cost Estimate"

No	Subject	Period I 6 weeks	Period II 7 weeks	Amount
1	Mathematics :			
	a. Arithmetics	3	-	18
	b. Geometrics	3	-	18
2	Technical and Hand Drawing	6	-	36
3	Structural Mechanics	6	-	36
4	Construction Practices	4	-	24
5	Irrigation Engineering	4	-	24
6	Soil and Materials	2	-	12
7	Cost Estimate	6	6	78
8	Location and Construction Survey	4	-	24
9	Civil and Survey Drafting	6	2	50
10	Report Writing and Communication	-	4	28
11	Structural Design	-	16	112
12	Constructional Design	-	16	112
Total		44	44	572

Notes :

- 1 Session = 45 Minutes
- 1 Week = 44 Hours

Course Period :

- Effective = 13 Weeks
- First and final examination = 2 Weeks

Total = 15 Weeks ----- = 3,5 Months

Table - 2 Survey Training curriculum of The Third Regional Education and Training Center in Yogyakarta

**CURRICULUM FOR
SURVEYING AND MAPPING**

No	Subject	Class Period 6 Weeks		Field Period 9 Weeks	
		1 Week	Total	1 Week	Total
I	<u>MATHEMATICS</u>				
	a. Geometry	5	30		
	b. Trigonometry	5	30		
II	<u>SIMPLE IRRIGATION</u>				
	a. Construction	8	48		
	b. Exploitation	7	42		
III	<u>LAND SURVEYING</u>				
	a. Theory	10	60		
	b. Map Drawing	10	60		
IV	<u>FIELD PRACTICE</u>				
	a. Practice on Land Surveying			23	184
	b. Method and Application			22	176
Total		45	270	45	360
Grand Total					630
					hours

Remarks : 1 Session = 45 minutes
1 Week = 45 sessions

Duration : Effective = 14 Weeks
Examination = 1 Week

Total = 15 Weeks = 3,5 months

Table - 3 Construction Supervision Curriculum of The Third Regional Education and Training Center in Yogyakarta

CURRICULUM For " Construction Supervision Course

No	Subject	Classical Period 8 Weeks		Field Period 6 Weeks	
		1 Weeks	Amount	1 Weeks	Amount
1	Mathematics :				
	a. Arithmetics	3	24		
	b. Geometrics	3	24		
	c. Trigonometrics	3	24		
2	Technical Mechanics:				
	a. Construction of Technical Structures	3	24		
	b. Hydraulics of Irrigation Structures	3	24		
3	Land Survey :				
	a. Methods and Procedures	5	40		
	b. Knowledge of Equipment & Utilization	5	40		
4	Simple Irrigation Project:				
	a. Irrigation	10	30		
	b. To Draw of Irrigation	5	48		
	c. Plan and General Conditions and Management	4	32		
	d. Equipment and Materials	2	15		
5	Field Practice :				
	a. Construction Supervision			30	180
	b. Working Inspection			15	90
	Sub Total	47	376	45	270
					TOTAL 646

Notes : - 1 Session = 45 minutes
 - 1 week in period I = 47 Hours
 - 1 week in period II = 45 Hours
 - Course Period :
 - Effective = 14 weeks
 - Examination = 2 weeks
 16 weeks = 3,5 months

Classical = 376 sessions
 Practice = 270 sessions
 Amount = 646 sessions

1 Week = 47 sessions (class.)
 1 Week = 45 sessions (field practice)

Including time for daily testing and examination

Table - 4 Wadaslintang Training Curriculum

S O I L

Introduction

As outlined in the "Guidelines for Instructors" section, our intention in order of priority is to:

- 1) ensure the trainees grasp the fundamental concepts and facts related to working with soil
- 2) develop a "feel" for how soil fits into the dam construction cycle and learn skills for diagnosing and solving problems, and
- 3) cover as much territory as possible in the allotted time frame.

The instructor is responsible for pointing out how and where topics overlap. For example a discussion of foundation preparation will not only mention wetting and initial inspection on the first lift of core soil on rock but refer to scaling and dental work that will be covered in the rock and concrete seminars.

The syllabus outline and commentary format is intended to help the instructor define his objectives and the aspects trainees should understand under each topic heading.

<u>SOIL</u>	<u>COMMENTARY</u>
I. DEFINITION	Definition of soil as engineering material. Air and water are subject to some control. Why soils are defined in specifications and contract documents.
II. IDENTIFICATION	Nomenclature is important so that we can communicate. Standards & Systems continue to evolve. Unified Soil Classification system.
i. Field laboratory ID tests	Lab. tests will label and define characteristics. Observe soil testing equipment at Wadaslintang. Interpretation of typical sieve analysis plots etc.

ii, Full Laboratory tests

Briefly review purpose & procedures of tests required for design, triaxial, consolidation, etc.

Check list tests field engineer may require during construction and criteria for requesting. For example, sulfate soundness and ball mill tests to prove a new source of aggregate.

Key concept. - Accurate labelling allows engineer to research and solve or anticipate problems. Use probable presence of halloysite in Wadaslintang core material and impact of water of hydration in the field laboratory testing as example.

iii, Hand Sample ID

From prepared samples and field exercise trainees must be able to distinguish silt from clay and estimate whether a sample is close to optimum moisture content.

iv, Alluvial & Residual Soils

Visual ID of the two geomorphological types. Discussion of contract implications of soil grading to rock and borrow pit implication of soil type. Wadaslintang field for examples.

III ENGINEERING PROPERTIES

i, Permeability,

Permeability defines core and fill material. Discuss filter gradation specifications, natural, screened or crushed.

ii, Compressibility,

Compressibility defines compactive effort and Proctor Densities, Bulking and shrinkage between excavation and placement. Discuss contract implications.

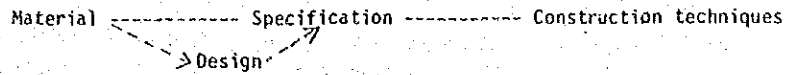
iii, Shear Strength

Simply review how shear strength and cohesion effect design.

Examine and discuss engineering properties of Wadaslintang residual soils (breccia and marl) and Wadaslintang aggregates.

Key concept

Construction material availability dictates
Design & Specification, which dictates Construction Practice



- | | | |
|-----|---|---|
| IV | THE ROLE OF WATER

Permeability Wet Season/
Dry Season, Borrow area
drainage, Placement pro-
cedures, Compaction | Trainees must appreciate that water is a most critical variable over which the engineer has some control.

Control water = Control Job

This is an excellent opportunity to test and review understanding of previous concepts.

Water is the common denominator that ties the above into a unit of engineering expertise. |
| V | INVESTIGATION DURING
CONSTRUCTION
- purpose
- equipment
- sampling &
testing | Wadaslintang borrow area is the example - Application of identification skills. |
| VI | PROVING BORROW AREAS,
BORROW AREA DEVELOPMENT
TECHNIQUES | Practical application of investigation knowledge -
Go into contract implication of adequate proven reserves, haul distance costs etc.

Give a assignment, such as decide which of two areas to develop. (to demonstrate grasp of concepts covered)
- haul distance, access, haulroad grade
- equipment circulation
- Back wall (design slope)
- Drainage
- Stripping etc. |
| VII | EXCAVATION
- Equipment
- Techniques | Wadaslintang example- evaluation of Contractor's procedures. |

VIII	PLACEMENT - Equipment - Techniques	Wadaslintang example - evaluation of Contractor's procedure
	i, on rock ii, around culverts iii, against vertical concrete iv, foundation & preparation	Wadaslintang example - cofferdam core against cut and cover diversion tunnel Foundation preparation for first lift, construction joints, scarification, aeration, dressing, camber
IX	COMPACTION i, theory ii, Equipment iii, Control and Monitoring Techniques.	Examine meeting compaction specification criteria from the view point of what variables does the engineer have some control. For example choice of equipment, lift size, weight of drums, number of passes, scheduling (drying or wetting), haulage equipment and others. Control techniques - sand cone, water balloon nuclear densometer and their limitations.

Key concept - All previous aspects lead to engineer's ultimate responsibility of accepting placed and compacted material.
 Go into consequences of inadequate compaction to reinforce the point.

R O C K

Introduction

As outlined in "Guidelines for Instructors" section, our intention in order of priority is to:

- 1) ensure the trainees grasp the fundamental Concepts and facts related to working with rock.
- 2) develop a "feel" for how rock fits into the dam construction cycle and learn skills for diagnosing and solving problems, and
- 3) cover as much territory as possible in the allotted time frame.

The instructor is responsible for pointing out how and where topics overlap. For example, a discussion of foundation preparation will not only mention scaling and cleaning of rock surfaces but dental concrete and critical placement of first soil lift that will be covered in the soil and concrete seminars.

The syllabus outline and commentary format is intended to help the instructor define his objectives and the aspects the engineers should understand under each topic heading.

<u>ROCK</u>	<u>COMMENTARY</u>
I DEFINITION	Definition of rock as engineering material, as a construction material. Why rock is defined in specifications and contract documents.
II GEOLOGICAL PROCESSES and GEOLOGY of INDONESIA	Rapid overview of geologic processes typical of Indonesia and relevant to dam construction. Volcanoes - Lava - Volcanic Soil. Faults active and inactive. Chemical weathering "Lateritization". Excellent examples of chemical weathering visible at Wadaslintang

- III ROLE of ROCK in
 DAM CONSTRUCTION
- Fill and Aggregate This is excellent opportunity to introduce concepts
 Excavation - Spillway and vocabulary.
 - Quarries Point out which aspects will be dealt with in de-
 - Tunnels tail during rock seminar.
 Foundations
- IV ENGINEERING PROPERTIES
 of INTACT ROCK
- i, uniaxial strength
 ii, permeability
 iii, aggregate
- Key concept - Rock is an engineering material.
 Engineering properties will dictate where it can
 and cannot be used. Examine Wadaslintang breccia &
 marl under hammer and hand lense (fresh & weathered).
 Examine Wadaslintang aggregate, develop intact proper-
 ties required in aggregate. Possible trip to Sempor
 laboratorium.
- V ENGINEERING PROPERTIES
 of MASSIVE ROCK
- Key concept - Rock mass behavior dependant on dis-
 continuities, intact properties secondary. Stress
 nomenclature : joints, bedding, contacts, shears,
 faults.
- i, Discontinuities Permeability, rippability, bulk density, foundation
 characteristics
- ii, Orientation of Blasting : Back walls in quarry and spillway, muck
 Discontinuities size, stabilization (rock bolts, shotcrete, etc.)
 Orientation of tunnels.
- VI EXCAVATION
- i, Ripping
 ii, Blasting
- Economics of ripping versus blasting
- Restrict Explosives to discussion of those used at
 Wadaslintang. Production blasts, Back Wall shear.
 Wadaslintang spillway to be dealt with in detail,
 good examples of back wall, overbreak, change in
 lithology, scaling. Evaluation of Contractor's
 methods.

VII	HAULING and PLACING	Equipment. Economics of Bulking Factors on contract documents. Relationship of muck size to lift size. Staging
VIII	COMPACTION i, Theory ii, Equipment iii, Monitoring & Control	Saturated and dry compaction. Limitations of present control testing techniques. Method specifications versus end product specifications.
IX	FOUNDATION PREPARATION	Scaling and washing, dental concrete, slush grouting. Stress hazards of improper preparation
X	GROUTING	

C O N C R E T E

Introduction

As outlined in the "Guidelines for Instructors" section, our intention in order of priority is to:

- 1) ensure the trainees grasp the fundamental concepts and facts related to working with concrete
- 2) develop a "feel" for how concrete fits into the dam construction cycle and learn skills for diagnosing and solving problems, and
- 3) cover as much territory as possible in the allotted time frame.

The instructor is responsible for pointing out how and where topics overlap. For example a discussion of foundation preparation will not only mention dental concrete and slush grouting, but wetting and initial inspection on the first lift of core soil on rock and refer to scaling, topics that will be covered in the rock and soil seminars.

The syllabus outline and commentary format is intended to help the instructor define his objectives and the aspects trainees should understand under each topic heading.

CONCRETE

COMMENTARY

I DEFINITION

Concrete defined - Why it is preferred construction material, principle engineering aspects, positive and negative features

II COMPONENTS

i, Aggregate

Coarse aggregate, fine aggregate, selection criteria, adverse properties.
Typical sieve profiles. Wadaslintang aggregate - stockpiling

ii, Portland Cement

Definition - storage, inspection

iii, Water

Criteria for acceptance

III	HYDRATION THEORY	Brief review - effect on curing
IV	ADMIXTURES	Set retarders, set accelerators, water reducers air entrainment etc. Develop air entrainment & admixture for hot weather concreting.
V	DESIGN MIX	Economics, meeting specifications, testing. Review mix design history at Wadaslintang. Briefly touch grout design & admixtures
VI	BATCHING	Equipment, quantities, turnaround time, stock-pile handling, weather effects. Develop vocabulary - workability, durability-strength- creep- weight, etc.
VII	TRANSPORTATION	Equipment - Typical problems, analyse Wadaslintang technique
VIII	PLACING & CONSOLIDATING	Equipment, techniques, joints - Develop typical problems - Testing at placement.
IX	FORMWORK, FALSEWORK & FOUNDATION PREPARATION	Key concept - Majority of construction failures. Contractor's flexibility versus specification tolerance - planning reinforcing steel - Problems of concrete on soil, or rock.
X	THE ROLE of PLANNING	Review engineer's duties with respect to overseeing coordination of batching, transportation and placing. Scheduling must be compatible with equipment available.
XI	CURING	Theory and practice, hot dry & hot wet weather concreting

- XII FINISHING, REPAIRING & FINAL ACCEPTANCE Develop contract implications of final acceptance. Criteria for deciding to replace or repair. Diagnosing procedures, problems and Testing procedures. Inspect concrete in place at site.
- XIII SPECIAL APPLICATIONS Rock grouting, contact grouting, slush grouting, equipment foundations, shotcreting, masonry.

WADASLINTANG SCHEDULE

Briefing on Program - Tour of Site Preparation of Material Translation of priority items by Assistant Instructors	Introduction to Program, Tour of Site - General review of Dams		
	SEMINAR GROUP A SOILS	SEMINAR GROUP B SOILS	SEMINAR GROUP C SOILS
	SEMINAR GROUP B ROCK	SEMINAR GROUP C ROCK	SEMINAR GROUP A ROCK
	SEMINAR GROUP C CONCRETE	SEMINAR GROUP A CONCRETE	SEMINAR GROUP B CONCRETE
General Review - Assessment of course - Evaluation			
Confidential trainee evaluation - Upgrading of course Material - Recommendations for continuing courses			

----- TRAINEES FOUR WEEKS ON SITE -----

----- INSTRUCTORS SIX WEEKS ON SITE -----

Table - 5 CGSC Junior course VII Training curriculum and Lecturers

JUNIOR VII					
Subjects, Time and Position of Lecturers					
No.	Name of Subject	Time (minute)			Position of Lecturer
		Theory	Lab. Practice	Field Practice	
1	2	3	4	5	6
A SUPPORTING SUBJECTS					
1	General Lecture of Irrigation	90	-	-	Director of Irrigation
2	Lecture of CGSC Mission	90	-	-	Project Manager
3	Works Healthy	135	-	-	Dr. Pemono Dahlan
4	Fundamentals of Irrigation	270	-	-	CS(DOI), CSU(CGSC)
5	Irrigation Structures	360	-	-	CS(DOI) Bandung
6	System of Irrigation Planning	360	-	-	CS (DOI) Bandung
7	Hydraulic and Practice	135	270	-	CSU (CGSC)
8	O & M of Irrigation Structures	90	-	-	CS (DOI) Jakarta
9	Acquintance of Computer	135	-	-	CU (CGSC)
B MAIN SUBJECTS					
1	Land Surveying	450	-	1260	CS(DOI Bandung), CSU
2	Materials	360	-	-	CSU (CGSC)
3	Soil Mechanics	450	720	360	CSU(CGSC), Expert
4	Technical Geology	360	-	-	CS (DOI) Bandung
5	Earth Works	540	-	-	
6	Masonry Works	360	-	-	CU(CGSC)
7	Concrete Works	450	720	-	Expert (CGSC), CSU
8	Gabion Works	270	-	-	CS (DOI) Jakarta
9	Wood and Iron Works	360	-	-	CS(DOI), CSU(CGSC)
10	Acquintance and Demonstration of heavy equipment for Earth Works	270	-	720	CSU6CGSC)
11	Dewatering Works	260	-	-	CS (DOI) Jakarta.
C MANAGEMENT					
1	System of Construction Supervision	1080	-	-	Project Manager, CU
2	Safety of Works	180	-	-	CS(DOI), CU (CGSC)
3	Contract and Plan	260	-	-	CU (CGSC)
4	Field Practice to Irrigation Project under construction	-	-	1755	CU (CGSC)
5	Discussion for 3 subjects:	360	-	-	- Dir. of Irrigation
	- Construction Supervision				- Project Manager
	- Project Management				Kali Progo Pr. Manager
	- Social aspect of the project				- Wonogiri Project - Manager
					- Staff of Dir. of Rive
6	Evaluation/ Test / Examination for 11 of Main Subjects	360	-	-	
		8055	1710	4025	

Note : 1 Session = 45 minutes

Table - 6 CGSC Senior Course II Training Curriculum and
The Lecturers

SENIOR II					
Subjects, Time and Position of Lecturers					
No	Name of Subjects	Time (minute)			Position of Lecturers
		Theory	Lab. Practice	Field Practice	
A SUPPORTING					
1	General Lecture of Irrigation	90	-	-	Director of Irrigation
2	Lecture of CGSC Mission	90	-	-	Project Manager
3	Lecture of Agrarian and Water Resources Law	270	-	-	CSD, CS (DGWRD)
4	Lecture of O & M	180	-	-	CSD (DOI)
B MAIN SUBJECT					
Technical :					
5	Irrigation and Structure	180	-	-	CS (DOI Bandung)
6	Land Surveying	180	-	450	CS(DOI Bandung)
7	Soil Mechanic	180	405	270	Deputy Ministry, PU
8	Rock Mechanic and Technical Geology	360	-	-	CS Bandung, CS DOIEdg.
9	Earth Works	180	-	-	Deputy Ministry
10	Masonry Works	135	-	-	Project Manager
11	Concrete Works	135	675	-	CS, Japanese expert, CSU
12	Gabion Works	180	-	-	CS (DOI)
13	Scaffolding	180	-	-	Contractor's staff
14	Dewatering and Cut Off	180	-	-	Bitto
15	Foundation and Pile	180	-	-	CSD Jatiluhur Project
16	Iron, Painting and Welding	180	-	-	Contractor's staff
17	Heavy Equipment	180	-	-	CSD (DGWRD), CU, CSU
C MANAGEMENT					
Construction Management :					
18	System of Program Supervision	180	-	-	CS (DOI)
19	System of Construction Supervision	810	-	-	CSD (DOI), CU
20	The Tasks of Field Supervisor	270	-	-	CU (CGSC)
Project Management :					
21	Project Management	270	-	-	CSD (DOI)
22	Safety and Health Works	180	-	-	CD, CSD
23	Communication	180	-	-	Institute of Education
D OTHERS					
1	Discussion	675	-	-	Director of Irrigation Project Manager CGSC
2	Field Practice:	-	-	1035	Project Manager
	- System of Construction Supervision				CU, Project Manager of
	- Project Management				Earthquake project
	- Social aspect				
Total		5395	1080	2025	

Note : 1 Session = 45 minutes

Table - 9 Film List

EACH FILM FOR 30 MINUTES.

IN JAPANESE LANGUAGE

1. PIPE LINES.
2. DEVELOPMENT OF IRRIGATION PROYER.
3. MIYAMA FILED TYPES DAM.
4. SINGKAWA DRAINAGE CONTROL SYSTEM
5. CONSTRUCTION RECORD DOCUMENT OF MURATA DAM
6. DEVELOPMENT OF NEWLY OF WATER RESOURCES
7. INTRODUCTION OF AGRICULTURE IRRIGATION PROJECT
8. TONE RIVERS (BIGGEST RIVER IN JAPAN)
9. WATER BEADWORKS
10. REGULATING POND

IN ENGLISH LANGUAGE.

1. GROWING RICE IN JAPAN
2. IRRIGATION AND DRAINAGE IN JAPAN.
3. AGRICULTURE AND WATER OF SOUTH EAST ASIA.

IN INDONESIAN LANGUAGE.

1. PROYEK IRIGASI KALI PROGO
2. PROYEK IRIGASI KEDU SELAPAN.
3. PROYEK IRIGASI WIDAS : I + II + III.
4. PROYEK IRIGASI TULUNG AGUNG : II + III.
5. PROYEK IRIGASI BRANTAS : I + II + III + IV.
6. PROYEK IRIGASI LOMBOK SELATAN.

Table - 10 Observation Trip

F I E L D T R I P

NO.	COURSE	PROJECT OF OBSERVATION	PARTICIPANTS
1.	Senior II March 6- April 4, 1983	1. Hydro Power Saguling Project March 29, 1984 2. Directorate of Water Research March 30 and 31, 1984	32 Persons
2.	Junior III August 2-September 15, 1983	1. Serayu Irrigation Project September 5-September 6, 1983 2. Kedu Selatan Multipurpose Project September 7-September 9, 1983	29 Persons
3.	Junior IV	1. Pemali Comal Irrigation Project August 29-August 30, 1983 2. Jratun Seluna Project August 31-September 2, 1983	29 Persons
4.	Junior V Nopember 8 -Desember 22, 1983	1. Prosida Cirebon- Rentang Desember 5-Desember 6, 1983	30 Persons
5.	Junior VI Nopember 8-Desember 22, 1983	1. Gunung Galunggung Project Desember 5-Desember 6, 1983 2. Citanduy Project Desember 7- Desember 9, 1983	31 Persons

Table - 11 Junior Training Course Text Books

TEXT BOOKS FOR CGSC JUNIOR COURSES III, IV, V AND VI AND VII

NO.	TITLE OF TEXT BOOK	PAGES	AUTHOR/LECTURER	POSITION
1	2	3	4	5
1.	Dasar-Dasar Irigasi (Fundamentals of Irrigation)	24	Ir. Kurnadi Niti Sasmita	Chief of Section Sub Dit. Rehabilitation DOI
2	Perencanaan Irigasi (Irrigation Planning)	28	Lukman Ridwan BIE MSc.	Staff of Planning Bureau
3	Ilmu Bangunan Air (Hydraulic Structure)	52	Drs. Moh. Syah Bie	Staff of Sub.Dit. Technical Planning
4	Ilmu Ukur Tanah (Surveying)	45	Ir. E.N.Sumardi	Staff of Sub.Dit. O & N DOI
5	Ilmu Bahan (Material)	46	Ir. Bagio Sutadi Dip.HE	Staff of Jatiluhur Project
6	Mekanika Tanah (Soil Mechanics)	39	Ir. Rafnila Affan	Chief of Sub.Unit of Soil and Material Laboratory CGSC
7	Geologi (Geology)	48	Ir. Sumaryono Abd. Madjid	Staff of Sub.Dit. Technical Planning DOI
8	Pelaksanaan Pekerjaan Tanah (Earth Works)	19	Soetomo BIE	Chief of Section Sub.Dit.Guidance and Operation II DOI
9	Pelaksanaan Pekerjaan Pasangan (Masonry with Mortar Works)	79	Ir. H.M. Thahir Dip. HE	Project Manager CGSC
10	Pelaksanaan Pekerjaan Beton (Concrete Works)	18	Ir. Rafnila Affan	Chief of Sub.Unit of Soil and Material Laboratory CGSC
11	Pelaksanaan Pekerjaan Bronjong (Gabion Works)	47	Soenarto BIE	Staff of Sub.Dit. Guidance and Operation II Doi
12	Pelaksanaan Pekerjaan Kayu dan Besi (Timber and Iron Works)		Ir. Sihono	Chief of Section Sub. Dit. Rehabilitation DOI

TEXT BOOKS FOR CGSC JUNIOR COURSES III, IV, V AND VI AND VII

NO.	TITLE OF TEXT BOOK	PAGES	AUTHOR/LECTURER	POSITION
1	2	3	4	5
13	Pengenalan dan Peragaan Alat-Alat Berat Untuk Pekerjaan Tanah (Introduction and Demonstration of Heavy Equipments for Earth Works)	50	Ir. Soetikno	Chief of Section Directorate of Logistics
14	Pelaksanaan Pekerjaan pengeringan (Dewatering Works)	46	A. Sihombing BIE	Chief of Section Sub Dit. Guidance and Operation I DOI
15	Tata Cara Pengawasan (Supervision System)	121	C.G.S.C. Staff	
16	Keselamatan dan Kesehatan Kerja (Working Safety and Health)	41	Budhiarto SH	Chief of Personell DGWD
17	Kontrak dan Bestek (Contract and Plan)	115	Sabirin Chaniago BIE	Chief of Construct-ion Guidance Unit CGSC
18	Pengukuran Uit-Zat (Staking Out)	17	Ir. Priyatna	Staff of Sub.Dit. Technical Planning DOI
19	Buku Lapangan:Dasar-Dasar Pengawasan Konstruksi (Field Book Fundamental of Construction)	59	C.G.S.C.	
20	Pedoman Percobaan di Laboratorium Beton (Guide to Experiment in Concrete Laboratory)	26	Ir. Rafnila Affan	Chief of Sub. Unit of Soil and Material Laboratory CGSC
21	Pedoman Percobaan Lab. Mekanika Tanah (Guide to Experiment of Soil Mechanics)	88	Ir. Rafnila Affan	-ditto-
22	Pedoman Pelayanan pada Pintu Pengambilan (Guide to Operate of Intake Gate)		Ir.H.M. Thahir Dip.HE	Project Manager of CGSC

TEXT BOOKS FOR CCSC JUNIOR COURSES III, IV, V AND VI AND VII

NO	TITLE OF TEXT BOOK	PAGES	AUTHOR/LECTURER	POSITION
1	2	3	4	5
23	Alat-Alat Percobaan Lab. Asfalt (Testing Apparatus Laboratory (Asphalt))		C.G.S.C.	
24	- Ditto - (Concrete)		C.G.S.C.	
25	- Ditto - (Soil)		C.G.S.C.	
26	Konstruksi untuk Fill Dam (Construction of Fill Dam)			
27	Rencana Konstruksi untuk Bendungan Beton (Construction Plan for Concrete Dam)			
28	Hidrolika (Hydraulics)	85	Ir. H. Ismail Hassan	Chief of Sub.Unit of Hydraulics Laboratory CCSC
29	Discharge Measurements Method			

Table - 12 Senior Training Course Text Books

TEXT BOOKS FOR SENIOR COURSE II

NO.	TITLE OF TEXT BOOK	PAGES	AUTHOR/LECTURER	POSITION
1	2	3	4	5
1.	Pengertian dan System Peraturan Bidang Agraria (The Meaning and System of Regulation of Agrarian Law)	43	Tjindra Parma Wignyoprayitno SH	Chief of Section of Law DGHWD
2	Irigasi dan Bangunan Air (Irrigation and Hydraulic Structure)	31	Ir. Fritz Hutasoit	Chief of Section Sub. Dit. Technical Planning
3	Geologi Teknik dan Batuan (Technical Geology and Rocks)	44	Ir. Giovani Wiyarto	Chief of Section Sub. Dit. Technical Planning
4	Management Proyek (Project Management)	20	Ir. Sukadaryanto	Chief of Sub. Dit. O & M Dit. of Irrigation
5	Urgency of Compression for Rock/Soil in Geotechnical Inverstigation	29	Ir. Agus P. Broto- dihardjo MSc.	Chief of Section Dit. of Water Research
6	Prinsip-Prinsip Mekanika Batuan (The Principles of Rock Mechanics)	22	-Ditto-	- Ditto-
7	Pedoman Pengecekan dan Pengukuran Fotogrametris (Guidance for Checking of Measurement and Photogrammetris Mapping)	17	Sub. Directorate of Technical Planning	-
8	A.V. 1941	237	Regulation for Water Resources Development	-
9	Pelaksanaan Pekerjaan Beton (Construction of Concrete Works)	46	Ir. Meryono Sukarnen	Chief of Section of Research and Development Dep. PU.
10.	Buku Lapangan Dasar-Dasar Konstruksi (Field Book: Fundamentals of Construction)	59	C.G.S.C.	-
11	Pelaksanaan Pengeringan Bangunan Pengelak Banjir (Deversion and Cut off)	20	Ir. Suyono Sosro- darsono	Minister of PU
12	Pelaksanaan Pekerjaan Beton (concrete Works)	18	Ir. Rafaila Affan	Chief of Sub. Unit of Soil and Material Laboratory CGSC

TEXT BOOKS FOR SENIOR COURSE II

NO. 1	TITLE OF TEXT BOOK 2	PAGES 3	AUTHOR/LECTURER 4	POSITION 5
13	Beton (Concrete)	70	Ir. Rafnila Affan	Chief of Sub.Unit of Soil and Material Laboratory CGSC.
14	Pelaksanaan Pekerjaan Pasangan (Mansonry Works)	79	Ir. H.M. Thahir Dipl. HE	Project Manager CGSC
15	Pedoman Penyelidikan Geologi Teknik dan Mekanika Tanah untuk Perencanaan Teknis (The Guidance for Technical Geology and Soil Mechanics Survey for Design)	55	Ir. Giovani Wiyarto Ir. Toto Sugiarto	Chief of Section Sub. Dit. of Technical Planning
16	The Guidance System for Equipment Use (Minister of PU Decision No762/KPTS/1983)	79	-	-
17	Pelaksanaan Pekerjaan Bronjong (Gabion Works)	42	Soenarto BIE	Chief of Section Dit. of Irrigation
18	Keselamatan dan Kesehatan Kerja (Labor Safety and Health)	41	Budhiarto SH	Chief of Law DGWRD
19	Karakteristik Logam Ferrons, Hubungannya dengan Proses Pengelasan dan Pengecatan dalam Pembuatan Produk Pintu Air. (The Character of Ferrous Metals, Its Relation to Wel- ding and Paint in The Process to Make Intakegate	51	Ir. M. Hatta Ilham	Bharata Company
20	The Guidance for Irrigation Project Design	198	Sub.Dit. Technical Planning Dit. of Irrigation	
21	Mekanika Tanah dan Aliran Air dalam Tanah Soil Mechanic and Water flow in the Ground	37	Ir. Soemargo Soemaatmadja Dip HE	Deputy Minister of Roads and Bridges
22	Tinjauan Tentang Stabilitas Lereng. (Observation for Slanting Stability)	105	- Ditto -	- Ditto-

TEXT BOOKS FOR SENIOR COURSE II

NO.	TITLE OF TEXT BOOK	PAGES	AUTHOR/LECTURER	POSITION
1	2	3	4	5
23	Fondasi dan Pemancangan (Fondation and Pile)	41	Ir. Sri Hernowo	Jatiluhur Irrigation Project
24	Perancah dan Cetakan (Scaffolding)	78	Ir. Sugiyanto MSc.	PT Hutama Karya
25	Dasar-Dasar Komunikasi dan Permasalahan (The Basic Communication Knowledge and Problem)	26	Drs. Bratanata Bc. K.	Pusdiklat
26	Manual Kepegawaian (Manual for Officials)	54	Directorate General of Water Resources	
27	Pengantar Praktikum Tanah (The Principles for Soil Practice)	20	Ir. Rafnila Affan	Chief of Sub. Unit Soil and Material Laboratory CGSC
28	Proses dan permasalahan Pembebasan Tanah dalam Penyelenggaraan Pembangunan Proyek-Proyek Pengairan (Process and Problem of Land for Irrigation Project Construction)	21	Tjindra Parma- Wignyoprayitno	Chief of Section of Law DGWRD
29	Pedoman Percobaan Laborato- rium Tanah (Guidance for Laboratory Test of Soil Mechanic)	88	Ir. Rafnila Affan	Chief of Sub Unit of Soil and Material Laboratory CGSC
30	Pelaksanaan Pekerjaan Pengeringan (Dewatering Works)	46	A. Sihombing BIE	Chief of Section III Sub.Dit.PP Dit. Irrigation
31	Mekanika Tanah (Soil Mechanic, Part I & II)	55	Ir. Y.B. Soemargo Soemaatmadja Dip. HE	Deputy of Minister P.U. Of Road and Bridges
32	Network Planning	21	Ir. Haryono Sukar- nen	Chief of Section of Research and Develop- ment Centre P.U.

TEXT BOOKS FOR SENIOR COURSE II

NO.	TITLE OF TEXT BOOK	PAGES	AUTHOR/LECTURER	POSITION
1	2	3	4	5
33	Tanah (Earth)	107	Ir. Rafnila Affan	Chief of Sub. Unit of Soil and Material Laboratory CGSC.
34	Running Test at Way Semangka Project	31	DPU Lampung Province	
35	Pengantar Praktikum Beton (The Principle for Concrete Practice)	13	Ir. Rafnila Affan	Chief of Sub. Unit of Soil and Material Laboratory.
36	Mekanika Tanah, Geoteknik, Perkembangan Penetrometer dalam Interpretasi Hasil Uji Coba dan Predikabi Kemampuan Tanah Soil Mechanic (Geotechnique) the Growth of Penetrometre in Interpretation of the Results of Testing and Soil Ability Prediction	93	Ir. Soemargo Soemaatmadja Dip. HE	Deputy Minister PU of Roads and Bridges
37	Pedoman Pengawasan Pelaksana- an Proyek The System for Irrigation Project Construction	121	C.G.S.C.	
38	Hidrolika (Hydraulics)	85	Ir. H. Ismail Hassan	Chief of Sub. Unit of Hydraulic Labo- ratory CGSC
39	Pedoman Percobaan Lab. Hidro- lika Guidance for Hydraulic Labo- ratory Test.	53	CGSC	

Table - 13 Miscellaneous Training Books

R E F E R E N C E B O O K S

(TRANSLATED BY JICA AND COMPILED BY JAPANESE EXPERTS)

1982/1983 and 1983/1984

NO.	TITLE OF TEXT BOOK	KIND OF TRANSLATION	PAGES
1	TECHNICAL TERMS ON LAND IMPROVEMENT	Japanese-English- Indonesian	140
2	EARTH WORKS	Japanese-English	39
3	SURVEYING	Japanese-English	42
4	CONTRACT WORKS SUPERVISION REGULATION OF INSPECTION REGULATIONS)) Indonesian-English)	106
5	DIMENSION CONTROL	Japanese- English	17
6	INTRODUCTION OF HYDRAULIC LABORATORY IN CGSC	Japanese-English	25
7	PERCOBAAN HIDROLIKA UNTUK LABORATORIUM (HYDRAULIC TEST)	English-Indonesian	106
8	TECHNICAL TERMS ON LAND IMPROVEMENT	English-Indonesian- Romaji-Japanese	67
9	TATA CARA PENGAWASAN PELAKSANAAN PEKERJAAN PROYEK IRIGASI	Indonesian-English	108
10	TRAINING TEXT BOOK OF GATES	Japanese-English	269
11	EXECUTION PLANNING OF ENGINEERING- WORKS BY CONSTRUCTION EQUIPMENT	Japanese-English	64
12	DIRECT MANAGEMENT OF CONSTRUCTION EQUIPMENT	Japanese- English	91
13	INSPECTION ARRANGEMENT AND CONSTRUCTION INSPECTION STANDARD OF PUMP AND GATES	Japanese-English	44

REFERENCE BOOKS

(TRANSLATED BY JICA AND COMPILED BY JAPANESE EXPERTS)

1982/1983 and 1983/1984

NO.	TITLE OF TEXT BOOK	KIND OF TRANSLATION	PAGES
14	PLANNING OF FILL TYPE DAM CONSTRUCTION PLAN OF FILL INCIDENTS OF FILL TYPE DAM SOIL MECHANICS CONTROL OF HEAT GENERATION CONSTRUCTION PLAN OF CONCRETE DAM	Japanese- English) Japanese- English) Japanese- English) Japanese- English) Japanese- English) Japanese- English)	247
15	HYDRAULIC STUDY IN INDONESIA	English - Indonesian	244
16	HYDRAULIC MONOGRAPH	English - Indonesian	73
17	HYDRAULIC MEASUREMENT	English - Indonesian	78
18	DOCUMENTARY FILM BOOKS	Japanese-Indonesian	246
19	TECHNICAL TERMS ON LAND IMPROVEMENT SECTION	English -Indonesian	177
20	GENERAL SPECIFICATION FOR CONSTRUCTION	Indonesian-English	255
21	SAMPLE OF STANDARD COMPUTING METHOD	Japanese-Indonesian	
22	PUMP PLANNING MANUAL	Japanese-English	132
23	TRAINING TEST BOOK OF PUMP	Japanese-English	239
24	DASAR PENYUSUNAN ANGGARAN	Indonesian-English	356
25	ANGGARAN DAN BORONGAN BANGUNAN	Indonesian-English	198

R E F E R E N C E B O O K S
 (TRANSLATED BY JICA AND COMPILED BY JAPANESE EXPERTS)
 1982/1983 and 1983/1984

NO.	TITLE OF TEXT BOOK	KIND OF TRANSLATION	PAGES
26	HYDRAULIC MODEL TEST	Japanese - English	99
27	INDOOR HYDRAULIC TEST OPERATION AT CGSC	Japanese - English	3
28	PROGRAMMING FOR IRRIGATION ENGINEERING - PART I	Japanese - English- Indonesian	134
29	PROGRAMMING FOR IRRIGATION Engineering - Part II	Japanese - English Indonesian	163
30	ASPHALT TESTING METHOD	Japanese - English - Indonesian	145
31	PRESTRESSED CONCRETE STANDARDIZATION	Japanese - English - Indonesian	121
32	SOIL	Japanese - English	44
33	ASPHALT MATERIAL COMPOUND DESIGN	Japanese - English- Indonesian	69
34	CIVIL ENGINEERING WORKS (Inspection Technical Standardization)	Japanese - English	17
35	CIVIL ENGINEERING WORKS (Common Specification)	Japanese - English	197
36	QUALITY CONTROL	Japanese - English	63
37	PROCESS CONTROL BY NETWORK	Japanese - English	64
38	CONTRACT OF CIVIL ENGINEERING WORKS BY MAFF	Japanese - English	21
39	QUALITY CONTROL	Japanese - English	110

Table - 14 Junior Training Course Curriculum

LIST OF CURRICULUM AND SYLLABUS
FOR JUNIOR SUPERVISION TRAINING
COURSE

NO	Curriculum	Syllabus
1	2	3
1	General Principle of <u>Irrigation</u>	<ul style="list-style-type: none"> - General Explanation about main task of Directorate of Irrigation. - The Relation of Fuctional Organization between Directorate of Irrigation and Irrigation Project. - General Explanation of Irrigation Project classification.
2	Organization of Education and Training <u>DGWRD.</u>	<ul style="list-style-type: none"> - Explanation of relation between DGWRD's Education and Training with Dep. of Public Work. - Relation between DGWRD's Education and Training and CGSC.
3	Organization Structure and Water Resources Law.	<ul style="list-style-type: none"> - General Explanation about organization Structure of DGWRD. - The Bagkround of the Law No. 11 about Water Resources , 1974 and it Explanation. - Explanation of another Law that is related with Water resources.
4	<u>CGSC's Mission</u>	<ul style="list-style-type: none"> - The Background of CGSC. - Explanation of Organization CGSC - Duties of CGSC.
5	<u>Work Savety</u>	<ul style="list-style-type: none"> - Explanation about regulation of Work Savety. - Explanation about Emergency helping. - The manner of fire preventive, accident and electrical danger.

6 : Reporting System

: Explanation about reporting of reporting guidance and construction supervision of irrigation-projects.

- Meaning and the objective of supervision and report.
- Target and object of supervision and report.
- Supervision body and reporting system.
- Task and authorities supervision.
- Degree of supervision and its authorities.
- The other responsibilities.
- Supervision facilities.
The kinds of facilities
Facilities for every supervision.
- Checking for working activities.
- Construction with force account.
- Reporting of Technical machine.
 - Reporting system of works by using heavy equipments.
 - Relation of reporting using heavy equipment with civil-engineering.
- Monitoring of construction works progress.
 - Monitoring system
 - The important of monitoring in working execution.
 - Some examples of monitoring.
Computerize in monitoring.

- 7 : Hydraulics I : -General Meaning of Hydraulic
-Unit / Dimension
-Characteristic of liquid
-Hydrostatic
-Hydrodynamic and the basic of flow.
- 8 : Hydraulics II : -Open canal and pipe
-General meaning of canal
-Kinds of open canal and pipe.
-The form of hydraulic and criteria.
Water Gate :
General explanation of using gate in irrigation canal.
- kinds of gates.
- Sediment transport
- Main factor that has to be analysed in pre design of irrigation structure.
- The kinds of sedimentation
- Influence of water structure to sediment flow.
- The terms that consider to sediment.
- The system of survey and it prevent.
- 9 : Irrigation / the Basic of Water resources. : - The principle of Irrigation
- The definition of Water resources.
- Meaning of Water resources.
- Water Resources for irrigation.
- Irrigation method and section.
- Irrigation works in Indonesia.
- Relation between land and water.
- Consumptive use of water and other problems.
- Execution of irrigation, time and amount.

10 : Hydrology / Drainage

- Efficiency of irrigation water.
- Drainage for irrigation
- Irrigation Design
 - General meaning of irrigation design.
 - General condition for new irrigation.
 - The planning of irrigation space.
 - Completely of irrigation network, :
 - Reservoir.
 - Weir
 - Intake
 - Deversion structure.
 -
 -
 - The conditions for design.
- General principle of Hydrology.
- Hydrological cycle
- History of hydrology
- Hydrology in civil engineering.
- Hydrology and design of irrigation structure.
- Climate and hydrology.
- Temperature, its measurement, wet-survey, evaporation survey, transpiration survey, flood survey.
- Determination of river water on the basis of rainfall.
- Rational method.
- Rainfall intensity
- Rain of plan

- Melchrer method
 - Weduwen method
 - Hospers method
 - Unity hydrograph method
 - Hydrograph component and Unity
- Some importance thing for Field-supervisor:
- Water supply survey with Current-meter.
 - Somethings that has to know in in hydrological matters at field.
 - Drainage principle and application.
 - Practical Planning.

11. : Soil Mechanic and Geology:

General characteristic of soil.:

- The basic composition of soil.
- The basic Terms.
- The simple formula.
- Laboratory practice.

The system to classify of soil.

- Kinds of soil
- The system to determined of grain.
- The method for field survey / lab. survey.

Explanation about borinz source, taking the penetration example.

- Solidity of soil.
- The dripping water under ground.

- 12 : Technology of Concrete : - The explanation about, how to plan concrete economical mixed but strong.
- The importance of technical-specification.
 - Supervision and inspection.
 - The authority of inspector.
 - Some importance terms.
 - How to select and determined of concrete.
 - The materials for concrete including agregate.
 - Test in Laboratory.
- 13 : The Structure of Hydrology - Main structure.
- Constant Weir.
 - Moving Weir.
 - Temporary Weir and free intake.
 - Diversion structure.
 - Completely structure.
 - Syphon
 - Gorong-gorong (
 -
 -
 - Tunnel
 - Bridge
 - Supply instrument.
 - Irrigation canal:
 - General meaning of irrigation canal.
 - General formula.
 - Dam, and general meaning.
 - Kinds of Dam
 - Othes, : Pump etc.

- 14 : Construction : General meaning about the basic of construction.
- Planning of construction.
 - The arrangement of execution schedule.
 - The arrangement of building-place.
 - Contract and Plan.
 - Explanation about Decision of Minister of P.U.No. 307/1980.
 - The system of giving works.
 - Explanation about general-bid, limited bid and direct order.
 - System of evaluation.
 - System to arrangement of contract, firstly, plac.
- 15 : Supervision of Works : The Diary book of Direction.
Arrangement of finishing work
Official report of work.
- 16 : Machinery construction : Making acquaintance of equipment
Explanation about operation of equipment.
Maintenance.
Demonstration of equipment in field.
- 17 : Land Survey : Mapping, - The meaning of map
The meaning of datum, map projection, coordinate system.
Kinds of map

- Knowledge of Equipments :
 - Equipment for distances survey.
 - Waterpas
 - Theodolite
 - Accurate of instrument
 - The basic of Survey :
 - Horizontal survey
 - Vertical survey
 - Situation mapping.
 - The basic of data evaluation.
 - Calculation of horizontal/vertical position.
 - Survey
 - Penyajian data :
 - Describe of map
 - Completely of map
 - Inspection of map
 - The stage of inspection
 - Inspection in field.
- 18 : The Growth of Tertiary Network : The function of Tertiary network.
 Standard of planning criteria and development of Tertiary network.
 O & M of Tertiary network
 The procedure of giving the water network to tertiary block to the farmer who use the water.
- 19 : General principle of O & M : The meaning of O & M
 Relation between O & M
 The important of O & M in agriculture production improvement

The important of farmers group in using irrigation and irrigation committees.

- Operation
- Water supply and need of irrigation water.
- System of water flow
- Efficiency
- Arrangement and updating of plan and plan of water sharing.
- Monitoring and data collecting fo operation.
- Operation of Structures.
- Maintenance;
- Scope.
- Character and kinds of maintenance.
- Maintenance of canal structure, gate, embankment, etc.

- 20 : Japanese Expert Team : - Irrigation and Drainage in Japan.
Special lecture
- 21 : Test and Evaluation : To be determined after.
- 22 : Field Trip/Study Tour : Observation to Irrigation project that under construction.
- 23 : Roundtable Talk/ Discussion. : Discussion about theories and practice.
-

Table * 15 Senior Training Course Curriculum

7. LIST OF SYLLABUS FOR TRAINING OF SENIOR SUPERVISOR

No.	Curriculum	Syllabus
1	2	3
1.	General Lecture of Irrigation	-General Explanation about the Main Task of Directorate of Irrigation. - The Relation of Fuctional Organization between Directorate of Irrigation and Irrigation Project. - General Explanation of Irrigation Project Classification.
2.	General Lecture of Education and Training:	2.1. The Main Tasks of CGSC Project - The Backround of CGSC Project. - Explanation of Organization Structure of CGSC - Acquaintance of Computer, Word-processor, Microphoto and Laboratory etc. 2.2. The Main Tasks of the Center of Education and Training, DGRD
3.	General Lecture of Water Resources and Agrarian Law : - Water Resources - Agrarian	3.1. The Basic of Organizations and Administration of Water Resources in Indonesian Water User The Law No. 11/ 1974 " No. 5/ 1974 State Regulation No. 22/1982 " 23/1982 3.2. The Law No. 5/1960 - The Law No. 5/1967 - S.R. No. 10/1961 - S.R. No. 33/1970 - Regulation of Internal Affair No. 15/ 1975.
4.	Lecture about O & M Irrigation	- General Explanation about O & M of Irrigation.

-
- The other things that related with O & M
 - Short explanation about :
 - The instrument for water supply.
 - Deversion structure.
 - Tertiary Box or Quarter.
 - Bag of mud
 - Execution of try out of trial run
 - Using the maintenance period as the the stage to O & M.
5. : Irrigation and it Structure
- Preface
 - Technique of Irrigation
 - Irrigation Structure and it canals
 - Irrigation planning in general.
 - Explanation of Design for each irrigation and canal that emphasize
 - The kinds of structure for for water supply count.
 - Supporting execution in construction stage for the big water structure.
6. : Land Survey
- Preface
 - Explanation of mapping and measurement related with irrigation.
 - Determined of basic point of survey.
 - Situation survey
 - Horizontal and Vertical survey for irrigation canal
 - The system of survey in each of execution for evaluated working progress of canals and structures.
 - Field practice about using of instruments (water pas, theodolith, IDM and palntable, etc.)

- 7 : Soil Mechanic
- Preface
 - Explanation about kinds of foundations
 - Settlement
 - Waterflow under ground
 - Slanting stability
 - Laboratory practice:
 - Soil classification
 - Grain size analysis (mechanical & hydrometer method)
 - Coefficient permeability
 - Water content determination.
 - CBR Test
 - Triaxial test
- 8 : Rock Mechanic and Technical Geology
- Explanation about relation of technical geology and civil engineering.
 - Rock acquaintance
 - Principle of Rock mechanic
 - Explanation about Geologist report and it implementation on the field.
 - Earthquake
- 9 : Soil Construction
- Preparation Works
 - Earth works for Irrigation works.
 - The kinds of earth works.
 - The kinds of soil
 - Working Method
 - Basic for determined of stability in earth work.
 - Transation join with irrigation
 - The equipment that used for earth-works.
 - The quqlity of materials/working-efforts.
 - Completion works.

- 10 : Works of Masonry and Concrete
- Preparation Works
 - Masonry Works for irrigation structure
 - Kinds of Masonry works of each kinds of rock.
 - The kinds of mix materials
 - Materials quality
 - Scattering and plester.
 - Concrete :
 - Preparation Works
 - Concrete works for irrigation works.
 - Kinds of concrete
 - Kinds of materials and condition
 - Working method
 - Materials quality
 - Testing of concrete
 - Completion works, and strength of concrete
 - Laboratory Practice
 - Strength test
 - Physical test
 - Mechanical test
- 11 : Construction of Gabion
- Preparation works
 - Gabion works for irrigation
 - Kinds of gabion
 - Kinds of materials for gabion works
 - Working Method
 - Materials quality for gabion works
 - System for take of gabion
- 12 : Scaffolding
- Preparation Works
 - Scaffolding works for irrigation
 - Kinds of scaffolding
 - Kinds of materials for Scaffolding
 - Working method
 - Quality of effort
 - Completion works

1	:	2	:	3
13	:	Deversion and Cut Off	-	<ul style="list-style-type: none"> Preparation Works Dewatering, deversion & Cut Off in execution of irrigation works Kinds of works Kinds of materials that use Working Method Working effort quqlity Completion works
14	:	Iron Construction, Painting and Welder	-	<ul style="list-style-type: none"> Preparation Works Iron works, Painting and Welder in irrigation works. Kinds of works Kinds of materials for works Working Method Quality of materials Completion works.
15	:	Heavy Equipment	-	<ul style="list-style-type: none"> Preparation Works The works that need heavy equipment Kinds of equipment used. Working method Quality of working effort Completion works.
16	:	Foundation and Pile	-	<ul style="list-style-type: none"> Preparation works Foundation and Pile works in irrigation works Kinds of works. Kinds of materials used Working method Quality of materials. Completion works.
17	:	System of programme controle	-	<ul style="list-style-type: none"> Main principal of execution project programme.

- The basic of execution Programme
 - Kinds of programme and parts
 - The steps of programme controle
 - Relation of part of a programme and it execution
 - The controle of programme that necessary.
 - Relation between controller of part of the programme in execution.
 - Critical activities in execution
 - Controle on critical activities
 - When the manager involve ?
 - Administration of programme controle in execution.
 - The example of programme controle.
- 18 : System of Working Cont- : - General explanation of guidance
role : role : controle in irrigation project
execution.
- Purpose and the objective of controle
 - The target and controle object.
 - Controlling bodies
 - The step of controle and his authorities.
 - Other responsibilities.
 - Controlling facilities.
 - Kinds of facilities.
 - Facility for each controlling.
 - Inspection and police warrant.
 - General explanation about reporting guidance of working execution in irrigation project
 - The meaning and objective of reporting

- Target of Reporting
- Reporting administration
- Kinds of reporting
- Example form for reporting
- Execution of reporting arrangement of working progress and reporting archives.
- Monitoring
- Necessity of Monitoring in controle of execution
- Example of monitoring
- Computerized in monitoring.

- 19 : Project Management - Management of project controle of irrigation projects
- The principle of management meaning.
- Necessity of Supervisor in management-system.
- Manager and it relation in controle.
- Implementation of project management in construction management.
- System of Decision making
- Evaluation System

- 20 : Savety and Heal- - Explanation of Regulation of Savety and
thy of Works Healthy work.
- Explanation aboutemergency accident.
- System of Preventive.:
- Fire, - accident in field, Electrical accident.

- 21 : Communication relation
- The meaning^v among people
- The factors that influence of relation.
- The elements of reletion.
- The otherconsideration in relation.

Table : 16. JUNIOR TRAINING COURSE EXAMINATION SUBJECT.

SCHEDULE OF EXAMINATION
THE VII JUNIOR CONSTRUCTION SUPERVISION

Date : Tuesday , Sept 18, 1984
 Hour : 08.00 - 15.00 West Ind Time.
 Place : Auditorium C G S C. Project.

No.	Hour	Item	Remark
1.	08.00 - 08.20	Land Surveying	Multiple Choice.
2.	08.20 - 08.50	Soil Mechanics	- ditto -
3.	08.50 - 09.25	Earth work	- ditto -
	09.25 - 09.45	Rest	
4.	09.45 - 10.10	Concrete Construction	- ditto -
5.	10.10 - 10.30	Construction Machinery for earth work	- ditto -
	10.30 - 11.00	Break	
6.	11.00 - 11.20	Dewatering work	- ditto -
7.	11.20 - 11.40	Gabion work	- ditto -
8.	11.40 - 12.00	Masonry work	- ditto -
	12.00 - 13.30	Lunch	
9.	13.30 - 13.50	Construction material	- ditto -
10.	13.50 - 14.25	Geology	- ditto -
11.	14.25 - 15.00	Iron & wood Construction	- ditto -

Note :

- All participants should be present 15 minutes before starting time
- Schedule could be changed if necessary

Table - 17 Junior Training Course Sample Examination

S O I L :

(1). Classification of soil :

- (a). Clay, sand, gravel.
- (b). Clay, sand, gravel, boulder.
- (c). Clay, sand.

(2). # 200 sieve:

- (a). 0.074 mm.
- (b). 0.74 mm.
- (c). 7.4 mm.

(3). Group symbols for unified classification :

(GW, GP, GM, PT).

- (a). Engineering classification of soil material.
- (b). " of states of soil consistency.
- (c). " of soil strength.

(4). OMC condition of material :

- (a). Optimum water content (γ_{owc}).
- (b). Dry density condition (γ_d).
- (c). Wet (γ_w),

(5). Coefficient of permeability :

- (a). Clay $K == 1 \times 10^{-3}$
- (b). Sand $K == 1 \times 10^{-3}$
- (c). Gravel $K == 1 \times 10^{-3}$

(6). Selection of small dam type :

- (a). Homogeneous type.
- (b). Surface seeping type.
- (c). Zoned type.

- (7). Treatment of seepage water in embankment foundation :
- (a). Installation of vertical drainage pipe.
 - (b). Disperse of seepage water
 - (c). Mortar placing.
- (8). Impermeability of material ($K = 1 \times 10^{-5}$):
- (a). Clay
 - (b). Sand
 - (c). Gravel.
- (9). Fine material in impermeability material :
- (a). Fine material (No : 200) 0 - 5 % over.
 - (b). " " 10 - 15 % over.
 - (c). " " 30 - 50 % over.
- (10). Filter material ($K = 1 \times 10^{-3}$) :
- (a). Fine material (No : 200) 5 % under.
 - (b). " " 10 % under.
 - (c). " " 20 % under.
- (11). Factor of stability analysis of embankment :
- (a). Sand ϕ .
 - (b). Plastic limit.
 - (c). Density.
- (12). Stock p. ling yard :
- (a). Blend of embankment material.
 - (b). Stock of construction material.
 - (c). Stock of embankment material.
- (13). Dental concrete :
- (a). Fill of the open joint of the foundation.
 - (b). Hand of the structures foundation.
 - (c). Back filling concrete.

(14). Direction of compaction equipment travel :

- (a). Parallel with dam axis.
- (b). Right angle with axis.
- (c). Parallel and right angle with dam axis.

(15). Consolidation grout :

- (a). Consolidation of embankment foundation.
- (b). Water slope of embankment foundation.
- (c). Providing of piping water.

(16). Quality control of core zone material :

- (a). O.M.C. \pm 5 %.
- (b). " \pm 10 %.
- (c). " \pm 15 %.

(17). Placing thickness of core zone :

- (a). 15 - 30
- (b). 30 - 50
- (c). 50 - 80.

C O N C R E T E

(1). Cement and admixture

(1). Cement will be piled up in the cement storage as follow number bags.

- (a). Not more than 8 bags.
- (b). Not more than 13 bags.
- (c). Not more than 26 bags.

(2). Water - reducing admixture (W.R.A) take as follow effect.

- (a). Air - entraining effect.
- (b). Water reducing.
- (c). Increase of compression strength.

(2). Aggregate

(3). S.S.D condition of aggregate

- (a). Dry condition of aggregate
- (b). Saturated surface dry condition
- (c). Surface saturated condition

(4). F.M of fine aggregate will be well gradation as follow limit.

- (a). 3.1 - 6.0
- (b). 2.3 - 3.1
- (c). 6.0 - 8.0

(5). Max size of fine aggregate is limited

- (a). 3 mm
- (b). 5 mm
- (c). 20 mm

(6). Shape of coarse aggregate will be good condition as follow.

- (a). Flat shape
- (b). Round shape
- (c). Sharp shape

(3). Mortar and Concrete.

(7). Mortar concrete of materials.

- (a). Cement, water.
- (b). Cement, sand, water.
- (c). Cement, sand, aggregate.

(8). Water cement ratio (W/C) will be decided under the following substance

- (a). Concrete strength and durability.
- (b). Slump.
- (c). Workability.

(9). Slump will decide as follow substance.

- (a). Consistence of concrete.
(workability).
- (b). Air content.
- (c). Cement content.

(4). Construction.

(10). Treatment of laitance.

- (a). Remove of laitance.
- (b). Keep of laitance.
- (c). Keep of water curing.

(11). Cold joint will be formed.

- (a). At the time of rain fall or equipment breakdown.
- (b). At the time of cold weather condition.
- (c). At the urgently concrete work.

(12). Green cutting operation

- (a). Exclude the laitance.
- (b). Repair on the damaged concrete.
- (c). Water curing.

(13). How long days after placing concrete water curing will be done

- (a). At least (minimum) 1 day.
- (b). At least (minimum) 5 days.
- (c). At least (minimum) 10 days.

(14). Concrete shall be placed after concrete mixing.

- (a). Within 1.8 hours.
- (b). Within 2.0 hours.
- (c). Within 3.0 hours.

(15). Placing concrete shall be placed under temperature condition.

- (a). Low temperature of fresh concrete.
- (b). High temperature of fresh concrete.
- (c). Either will do

Table - 18 Junior Training Course Evaluation Table

FORM : TR-18
LEMBAR KE : 01

*****LATIHAN PEGAWAS LAPANGAN K.G.VI TH. 8/7/64 DI P.P.K.P.I.*****

DAFTAR NILAI PELAJARAN-PELAJARAN YANG DIUJIKAN DI PPPKI.

NO	NAMA	PLJ1.	PLJ2.	PLJ3.	PLJ4.	PLJ5.	PLJ6.	PLJ7.	PLJ8.	PLJ9.	PLJ10.	PLJ11.	RPT	PLP	NILAI RATA-RATA
1	ASLIM B.	8.0	10.0	6.7	8.0	3.0	8.5	7.3	5.0	7.3	4.0	7.0	6.4	7.1	6.8 HAMPIR BAIK
2	LUHUT BANJARNAHOR.	7.3	9.3	10.0	2.0	5.0	6.3	10.0	7.5	5.0	4.0	5.0	6.7	7.1	6.9 HAMPIR BAIK
3	RUSLAN HARZAK.	6.7	9.3	8.0	7.3	4.5	6.9	8.0	3.0	3.3	3.7	7.0	6.1	6.5	6.3
4	HASHALDI.	10.0	7.3	8.7	7.3	4.0	5.6	9.3	7.5	4.7	5.7	4.0	6.4	6.5	6.5
5	AMINUDIN WR.	4.7	6.7	3.3	6.7	3.5	6.9	9.3	5.0	6.0	4.0	6.0	5.6	6.5	6.0
6	NGADIPAN S.	6.0	6.7	9.3	2.0	2.5	7.5	9.3	4.0	3.3	6.0	5.0	6.1	6.8	6.5
7	HUSNI R.	5.3	6.7	4.0	6.7	2.5	7.5	9.3	4.0	1.7	4.0	6.0	5.2	6.8	6.0
8	SHOFA MUCI. SUTOPO BE.	8.7	8.7	10.0	8.7	3.5	7.5	10.0	3.5	6.7	4.7	7.0	7.2	7.1	7.2 HAMPIR BAIK
9	SUMARSONO. TAUFIK SF.	4.7	6.7	8.7	8.0	2.5	4.4	10.0	4.0	1.7	4.0	5.0	5.6	7.1	6.3
10	MINTO.	5.3	10.0	9.3	8.7	2.5	8.1	9.3	4.0	3.3	2.7	5.0	6.2	6.7	6.5
11	MUKONO.	6.7	10.0	3.3	8.0	4.0	7.5	9.3	7.5	5.0	3.3	5.0	6.0	6.3	6.2
12	SUHARIYANTO.	5.3	10.0	9.3	8.0	2.5	8.8	9.3	4.0	3.3	4.7	5.0	6.4	7.1	6.8 HAMPIR BAIK
13	SUPANDI BE.	7.3	9.3	10.0	9.3	4.5	5.6	10.0	3.5	5.0	4.7	8.0	7.0	7.0	7.0 HAMPIR BAIK
14	SOEDARTO BIE.	4.0	6.7	8.7	6.0	4.0	6.3	8.7	4.5	5.0	2.0	5.0	5.5	6.7	6.1
15	B. ARI MULYANTO.	6.7	9.3	9.3	2.0	4.5	8.8	10.0	3.0	6.7	4.0	5.0	6.8	7.2	7.0 HAMPIR BAIK
16	A. HASARUDDIN BE.	10.0	9.3	10.0	8.0	4.0	8.1	10.0	4.5	5.0	5.3	8.0	7.5	7.5	7.5 NOMOR-I.
17	B. HAINGGOLAN BE.	9.3	9.3	10.0	8.0	4.0	8.8	10.0	4.0	5.0	4.0	9.0	7.4	7.4	7.4 NOMOR-II.
18	ABDUL AZIZ.	6.0	6.7	8.7	8.0	2.0	6.3	10.0	4.0	1.7	2.7	3.0	5.4	7.0	6.2
19	SISWANTO.	9.3	8.7	9.3	2.0	4.0	8.1	10.0	3.5	5.0	4.0	6.0	6.9	6.6	6.8 HAMPIR BAIK
20	STACHLI S.	4.7	6.0	6.0	4.7	3.0	6.9	9.3	4.0	3.3	2.0	4.0	6.1	7.0	5.5
21	TAJUDDIN NOOR.	6.7	9.3	10.0	6.7	3.0	6.9	10.0	4.0	3.3	4.7	6.0	6.4	7.0	6.7 HAMPIR BAIK
22	KASNO.	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
23	HARYONO BE.	7.3	8.7	8.0	6.7	3.5	8.1	10.0	3.5	5.0	4.7	6.0	6.0	7.0	6.5
24	TUKIRUN HARSIDJO BE.	8.0	10.0	10.0	8.0	3.0	7.5	10.0	4.5	5.0	4.0	8.0	7.1	7.3	7.2 HAMPIR BAIK
25	SUDARSIN BE.	8.7	10.0	10.0	8.0	4.0	8.1	9.3	4.5	4.3	2.7	7.0	6.9	7.2	7.1 HAMPIR BAIK
26	WARDJERORO BE.	8.7	10.0	9.3	8.0	4.0	8.8	10.0	3.5	1.7	4.0	7.0	6.8	7.0	6.9 HAMPIR BAIK
27	YAYAN KUSYAMA.	8.7	9.3	8.7	8.0	3.5	8.8	10.0	4.0	5.0	3.3	7.0	6.9	7.5	7.2 HAMPIR BAIK
28	KUSRIYADI.	6.0	8.7	9.3	7.3	3.0	8.1	9.3	3.5	3.3	4.7	5.0	6.2	7.2	6.7 HAMPIR BAIK
29	BAMBANG PURNOMO BSC.	6.0	9.3	9.3	8.7	4.0	7.5	10.0	3.5	6.7	4.0	7.0	6.9	7.1	7.0 HAMPIR BAIK
30	SUGIYARNO.	8.0	8.7	9.3	2.7	2.5	8.1	10.0	4.5	4.7	4.7	9.0	7.3	7.3	7.3 NOMOR-III.
31	MUIN DAPI.	5.3	8.7	9.3	2.0	3.0	8.2	10.0	5.0	5.0	4.0	6.0	6.6	7.1	6.9 HAMPIR BAIK

NILAI RATA-RATA
TIAP MATA-PELAJARAN : 6.8 8.4 8.3 7.5 3.3 7.3 9.3 3.8 4.0 3.9 5.7

CATATAN : PLJ1 : ILMU UKUR TANAH.
PLJ2 : ILMU GAHAR.
PLJ3 : Mekanika Tanah.
PLJ4 : GEOLOGI.
PLJ5 : PELAKSANAAN PEKERJAAN TANAH.
PLJ6 : PELAKSANAAN PEKERJAAN PASANGPUN.
PLJ7 : PELAKSANAAN PEKERJAAN DETOP.
PLJ8 : PELAKSANAAN PEKERJAAN BUKHJONG.
PLJ9 : PELAKSANAAN HESI DAM KAYU.
PLJ10 : PENGENALAN DAM BERAGAN PLAI-ALAT ALAT UNTUK PEKERJAAN TANAH.
PLJ11 : PELAKSANAAN PEKERJAAN PELJERINGAN.
RPT : NILAI RATA-RATA PELAJARAN TEORI.
RLP : NILAI RATA-RATA PRAKTIKUM.

NILAI RATA-RATA 9.6-10.0 : 0 ORANG.
NILAI RATA-RATA 8.6-9.5 : 0 ORANG.
NILAI RATA-RATA 7.6-8.5 : 0 ORANG.
NILAI RATA-RATA 6.6-7.5 : 18 ORANG.
NILAI RATA-RATA 5.6-6.5 : 11 ORANG.
NILAI RATA-RATA 4.6-5.5 : 1 ORANG.
NILAI RATA-RATA 3.6-4.5 : 0 ORANG.
NILAI RATA-RATA <3.6 : 1 ORANG.

PERGIKUT UJIAN : 31 ORANG.

DAFTAR NILAI PELAJARAN-PELAJARAN YANG DIUJIKAN DI PENPI.

NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	RPT	RLP	RLB	NILAI RATA-2
1	ARIEF BUDIANTO BE.	5.0	2.7	6.9	4.0	5.5	7.3	5.0	8.0	6.0	2.0	5.0	4.0		5.1	6.2	7.5	6.5
2	IR. T. SURYANSHAN TR.	7.0	3.3	8.5	8.0	8.0	8.0	8.8	9.0	5.0	5.0	4.0	6.0		6.7	6.2	7.0	6.8
3	IR. POSMANAH SIRAIT.	10.0	5.3	8.5	7.5	5.0	8.7	7.5	9.0	7.0	5.0	5.0	6.0		5.9	6.8	7.0	6.9
4	PARDOMAN GULTOM BIE.	7.0	4.7	7.7	6.5	5.5	10.0	10.0	9.0	7.0	5.0	6.0	6.0		6.9	6.8	7.5	7.1
5	CHAIRIL NASUTION BE.	6.0	5.3	5.4	8.5	8.5	9.7	8.2	10.0	4.0	6.0	4.0	8.0		6.9	6.8	7.5	6.9
6	IR. SUMANANG.	9.0	5.3	9.2	8.0	8.0	9.3	10.0	8.0	7.0	4.0	6.0	5.0		7.4	6.2	6.5	6.9
7	ARRIL THAYER BE.	9.0	4.7	8.5	8.0	7.0	8.7	8.8	9.0	7.0	4.0	2.0	4.0		6.7	6.5	7.0	6.7
8	IR. KASIRAN SIPANGKAR.	8.0	7.3	8.5	4.0	5.0	8.7	10.0	9.0	7.0	3.0	2.0	7.0		6.4	6.8	7.0	6.7
9	IR. ZAINAL SALEH	8.0	7.3	8.5	4.0	7.0	9.3	8.8	7.0	2.0	3.0	5.0	7.0		6.4	7.0	6.5	6.6
10	IR. B. MUDRIK.	8.0	8.0	7.7	7.5	8.5	9.3	8.8	9.0	7.0	5.0	5.0	7.0		7.6	6.3	7.0	7.1
11	SUGENG HERMANTO.	9.0	6.7	3.8	8.5	7.5	8.7	10.0	10.0	7.0	4.0	5.0	6.0		7.2	6.8	7.0	7.0
12	SURYANTO BE.	9.0	6.7	7.7	8.5	6.0	9.3	8.8	8.0	8.0	3.0	4.0	6.0		7.1	7.2	7.0	7.1
13	WINARJONO BE.	8.0	4.7	7.7	7.0	7.0	8.7	5.0	9.0	7.0	6.0	4.0	4.0		6.5	6.8	7.0	6.8
14	SUPARYONO BE.	7.0	5.3	7.7	8.5	7.0	8.7	8.2	8.0	9.0	3.0	1.0	5.0		7.0	6.8	7.0	6.9
15	PARDI BE.	8.0	2.7	8.5	6.0	4.5	9.3	8.8	8.0	9.0	7.0	4.0	4.0		6.7	6.8	7.0	6.8
16	SUBARJI BE.	8.0	6.0	5.4	7.5	7.0	8.7	8.8	9.0	7.0	6.0	2.0	5.0		6.7	6.8	7.0	6.8
17	IR. SARDIJAH.	7.0	6.0	6.9	7.0	8.5	9.3	10.0	9.0	7.0	6.0	3.0	8.0		7.3	7.0	7.0	7.1
18	IR. HARI BUDIARSO.	5.0	4.7	9.2	6.5	8.5	9.3	10.0	9.0	8.0	8.0	7.0	7.0		7.1	7.0	7.5	7.4
19	IR. AJIE PRAMUDYA.	8.0	6.0	6.2	7.0	7.0	8.0	8.8	7.0	8.0	5.0	4.0	7.0		6.2	6.8	7.0	6.9
20	IR. M. S. R. U. R. I.	7.0	6.0	7.7	8.5	8.5	9.3	8.8	9.0	5.0	7.0	5.0	5.0		7.3	6.5	7.0	6.9
21	IR. SUBEKI DIPL. HE.	7.0	5.3	8.5	5.5	4.0	8.7	6.3	8.0	5.0	8.0	5.0	4.0		6.3	7.0	7.5	6.9
22	DRS. BENYAMIN KARAMU.	8.0	4.7	6.9	6.0	7.5	9.3	8.8	3.0	9.0	9.0	3.0	4.0		7.1	6.7	7.0	6.6
23	M. S. I. D. I. BE.	8.0	5.3	9.2	5.0	6.5	8.0	10.0	8.0	8.0	2.0	4.0	8.0		7.2	6.8	7.0	7.0
24	IR. M. HARIO MUIH.	8.0	6.0	9.2	8.0	4.5	8.0	10.0	9.0	9.0	6.0	6.0	5.0		7.6	6.8	7.0	7.1
25	ALIS NAWI BE.	8.0	5.3	3.8	7.5	4.5	8.2	3.8	3.0	9.0	5.0	4.0	7.0		5.8	6.8	7.0	6.5
26	IR. M. IDRUS OMPU.	7.0	5.3	5.4	8.0	5.0	9.3	10.0	8.0	6.0	4.0	3.0	4.0		6.3	6.8	7.0	6.7
27	IR. MOGIJANTORO DIPL. HE.	8.0	4.7	8.5	7.0	6.0	9.3	10.0	8.0	6.0	3.0	4.0	8.0		6.9	6.8	7.0	6.9
28	AUSTINUS SUKANTO RE.	5.0	4.7	6.2	6.5	5.5	8.0	8.8	7.0	9.0	4.0	3.0	5.0		6.1	6.7	7.0	6.6
29	IR. SUPRIWANDONO.	4.0	6.0	6.9	7.5	8.0	6.7	8.8	9.0	7.0	7.0	4.0	7.0		6.8	6.5	6.5	6.6
30	BANGANG RATHOKO BE.	8.0	6.0	7.7	9.0	9.0	6.7	8.8	5.0	8.0	5.0	7.0	8.0		7.4	6.5	7.0	7.0
31	RURHAN YUSUF BE.	6.0	6.0	7.7	7.0	6.0	9.3	8.8	9.0	8.0	5.0	4.0	6.0		6.9	6.7	7.5	7.0
32	IR. YR. WIDIYOKO.	8.0	8.0	8.5	9.0	8.5	8.0	10.0	9.0	8.0	4.0	4.0	8.0		7.9	6.8	7.0	7.2

NILAI RATA-RATA
TIAP MATA-PELAJARAN : 7.4 5.5 7.5 7.2 6.8 2.7 8.5 8.0 7.1 5.2 4.2 6.0

CATATAN :
1 : IRIGASI DAN RAHUNAH AIR.
2 : ILMU UKUP TANAH.
3 : MEKANIKA TANAH.
4 : MEKANIKA BATUAN & GEOLOGI TEKNIK.
5 : KONSTRUKSI UJON.
6 : KONSTRUKSI UJONJONG.
7 : PERANCANG DAN CIYAKAR.
8 : PENGKIRAN/DEVERSIOR PAR CUT OFF.
9 : PEKERJAAN PESI, PENGCEATAU DAN PELUGELASAN.
10 : KONSTRUKSI PONDASI / PEMERANGAN.
11 : KONSTRUKSI PEKERJAAN PASANGAN.
12 : ALAT-ALAT BESAR.
13 : PERALATAN LABORATORIUM.
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11 : KONSTRUKSI PEKERJAAN PASANGAN.
12 : ALAT-ALAT BESAR.
13 : PERALATAN LABORATORIUM.
14 : PERALATAN LABORATORIUM.

PENGIKUT UJIAN : 32 ORANG.
RPT : NILAI RATA-RATA PELAJARAN TIURI
RLP : NILAI RATA-RATA PRAKTEK LAPANGAN
RLB : NILAI RATA-RATA PRAKTEK LABORATORIUM

Table - 19 List of Participants

Classification of Participant in
1983 - 1984 Fiscal Year.
(Junior Course III)

NO	Classification of Project	Position	School	Age	Official Status	Remarks
1.	NPC	CS	A	29	PP	
2.	NPC	S	SH	26	PP	
3.	NPC	CS	SH	28	PN	
4.	NPC	SP	SH	24	PP	
5.	NPC	S	SH	31	PN	
6.	NPC	SP	SH	27	PP	
7.	NPC	SP	SH	24	PP	
8.	NPC	CS	SH	37	PN	
9.	NPC	SP	SH	25	PP	
10.	NPC	CS	SH	33	PN	
11.	NPC	SP	SH	30	PN	
12.	NPC	SP	SH	36	PN	
13.	NPC	S	SH	27	PN	
14.	NPC	CS	A	34	PN	
15.	NPC	CS	A	33	PN	
16.	NPC	CS	A	36	PH	
17.	NPC	S	SH	25	PN	
18.	NPC	CS	A	34	PN	
19.	NPC	CS	A	29	PN	
20.	NPC	CS	SH	36	PN	
21.	NSP	SP	A	37	PN	
22.	NC	S	A	35	PN	
23.	NSP	S	A	30	PN	
24.	NSP	SP	SH	32	PN	
25.	NSP	SP	SH	28	PP	
26.	NSP	SP	SH	33	PN	
27.	NPC	SP	SH	28	PN	
28.	NPC	SP	SH	33	PN	
29.	NPC	SP	SH	29	PN	

NOTE : S = STAFF. 102
SP = SUPERVISOR.
CS = CHIEF OF SECTION.

Classification of Participant in
1983 - 1984 Fiscal Year:
(Junior IV)

NO	Classification of Project	Position	School	Age	Official Status	Remarks
1.	PC	S	SH	25	PP	
2.	PC	CS	SH	39	PN	
3.	PC	CS	SH	33	PN	
4.	PC	S	A	28	PP	
5.	PC	S	A	30	PP	
6.	PC	CS	A	31	PN	
7.	PC	CS	A	38	PN	
8.	PC	S	SH	30	PN	
9.	PC	S	U	26	PN	
10.	PC	S	A	40	PN	
11.	PC	S	SH	26	PP	
12.	PC	S	A	34	PN	
13.	PR	S	SH	35	PN	
14.	PC	S	SH	27	PP	
15.	PC	SP	A	31	PN	
16.	PC	CS	A	32	PN	
17.	PC	S	SH	29	PN	
18.	PC	S	SH	27	PP	
19.	PC	S	A	30	PP	
20.	PC	S	SH	29	PP	
21.	PC	S	A	30	PN	
22.	PC	S	SH	30	PN	
23.	PC	S	SH	26	PP	
24.	PC	S	A	33	PN	
25.	PC	S	SH	29	PN	
26.	NC	CS	A	30	PN	
27.	NC	S	A	37	PN	
28.	PC	CS	A	31	PN	
29.	NPC	S	SH	30	PN	

NOTE : S = STAFF.
 SP = SUPERVISOR.
 CS = CHIEF OF SECTION.

Classification of Participant
in 1983 - 1984 Fiscal Year
(Junior V).

NO	Classification of Project	Position	School	Age	Official Status	Remarks
1.	NPC	SP	A	31	PN	
2.	NPC	SP	SH	26	PP	
3.	NPC	SP	SH	24	PP	
4.	NPC	S	SH	21	PP	
5.	NPC	SP	A	30	PN	
6.	NPC	CS	A	37	PN	
7.	NPC	SP	SH	33	PN	
8.	NPC	SP	SH	35	PN	
9.	NPC	CS	A	26	CPN	
10.	NPC	S	SH	27	PP	
11.	NPC	SP	SH	34	PN	
12.	NPC	SP	SH	29	PP	
13.	NPC	CS	SH	39	PN	
14.	NPC	SP	SH	29	CPN	
15.	NPC	SP	SH	30	PP	
16.	NPC	SP	SH	26	PP	
17.	NPC	SP	SH	26	PP	
18.	NPC	SP	SH	25	PN	
19.	NPC	CS	SH	27	PP	
20.	NPC	S	U	36	PP	
21.	NPC	SP	SH	24	PP	
22.	NPC	CS	A	32	PN	
23.	NPC	CS	SH	37	PN	
24.	NPC	CS	A	28	CPN	
25.	NPC	S	SH	24	PP	
26.	NPC	SP	SH	30	PN	
27.	NPC	SP	SH	39	PN	
28.	NPC	SP	SH	29	PN	
29.	NPC	CS	SH	46	PN	
30.	NPC	CS	SH	29	CPN	

NOTE : S = STAFF.
SP = SUPERVISOR.
CS = CHIEF OF SECTION.

in 1983 - 1984 Fiscal Year
(Junior VI).

NO	Classification of Project	Position	School	Age	Official Status	Remarks
1.	PR	S	SH	39	PN	
2.	PC	S	SH	23	PP	
3.	PC	SP	SH	47	PN	
4.	PC	S	SH	28	PP	
5.	PC	S	SH	25	CPN	
6.	PC	SP	SH	34	PN	
7.	NPC	S	SH	32	PN	
8.	PC	S	A	29	PN	
9.	PC	S	SH	31	PN	
10.	PC	S	SH	29	PN	
11.	PC	S	SH	30	PN	
12.	PC	S	SH	28	PN	
13.	PC	S	SH	25	PP	
14.	PC	S	A	24	PP	
15.	PC	CS	A	30	PN	
16.	PC	CS	SH	51	PN	
17.	PC	S	SH	28	PN	
18.	PC	S	SH	25	PP	
19.	PC	S	A	32	PN	
20.	PC	CS	A	38	PN	
21.	NC	S	A	29	PN	
22.	NPC	CS	A	30	PN	
23.	NSP	S	SH	29	PP	
24.	NSP	SP	SH	31	PN	
25.	NPC	CS	A	33	CPN	
26.	NPC	SP	SH	31	PP	
27.	NPC	CS	A	38	PN	
28.	NPC	CS	A	37	PN	
29.	NPC	SP	SH	29	CPN	
30.	PC	S	SH	34	PN	
31.	PR	SP	SH	24	PP	

NOTE : S = STAFF.
 SP = SUPERVISOR.
 CS = CHIEF OF SECTION.

Classification of Participant in
1983 - 1984 Fiscal Year
(Senior II).

NO	Classification of Project	Position	School	Age	Official Status	Remarks
1.	NPC	SS	A	31	PN	
2.	NPC	SS	U	30	PN	
3.	NPC	CS	U	32	PP	
4.	NPC	S	A	26	PP	
5.	NPC	S	A	29	PN	
6.	NPC	CS	U	36	PP	
7.	NPC	SS	A	31	PN	
8.	NPC	SS	U	30	PN	
9.	NPC	CS	U	34	PN	
10.	NPC	SS	U	33	PN	
11.	NPC	CS	U	33	PN	
12.	NSP	CS	U	32	PN	
13.	NSP	SS	U	35	PN	
14.	NC	CS	A	32	PN	
15.	NC	S	A	34	PN	
16.	NC	S	A	37	PN	
17.	NPC	CS	A	33	PN	
18.	NPC	SS	U	40	PN	
19.	NPC	CS	U	32	PP	
20.	NPC	SP	U	33	PP	
21.	NPC	CS	U	28	PP	
22.	NSP	CS	U	39	PN	
23.	NPC	CS	U	36	PN	
24.	NPC	SS	A	34	PN	
25.	NPC	CS	U	39	PN	
26.	NSP	CS	A	38	PN	
27.	NPC	CS	U	33	PP	
28.	NPC	SS	U	36	PN	
29.	NPC	CS	A	30	PN	
30.	NPC	SS	U	35	PN	
31.	NPC	SS	A	29	PN	
32.	NPC	SS	A	36	PN	

NOTE : S = STAFF.
 SS = SENIOR SUPERVISOR, = CHIEF OF SUPERVISOR.
 SP = SUPERVISOR. 106
 CS = CHIEF OF SECTION.

III. IRRIGATION ENGINEER'S EDUCATION IN JAPAN

1. Existing condition of Engineers

(1.) Irrigation and drainage works in Japan can be divided into

4 types of groups

- a. Activities by the State
- b. Activities by the Public Corporations
- c. Activities by the Provincial Governments
- d. Activities for regional land improvement

Planning and construction of big scale and important irrigation and drainage facilities are mainly carried out by those mentioned in a, b and c.

(2.) Therefore irrigation and drainage engineers in Japan are basically arranged as in Table 1.

Table 1 Arrangement of Engineers

Name of Organization	Number of Place	Engineers	Remarks
Ministry of Agriculture, Forestry and Fisheries	-Head Office	1	Regional Agricultural Administration Offices x 7
	-Regional Office	9	
		197	

Technical Service Center for Agricultural Land Improvement	7	} 3.301	Office for develop-
- Projects	abt. 200		ment in Hokaido
			Office for develop-
			ment in Okinawa
T O T A L		3.498	
Public corporations and agencies		} 957	Public corporations
			for development of
			water resources.
- Head Office	2	}	Japan agricultural
- Branch Office	-		land development
T O T A L		957	Agency
Prefectural Government			
- Head Office	47	} 10.298	
- Branch Offices	498		
T O T A L		10.298	

Generally, exchange/transfer of personnel is executed within a standard period of 2 to 5 years, among the **Ministry** of agriculture, forestry and fisheries.

The same case happens also in the public corporation institutes and provincial government offices. With the existence of personal exchange, the following technical improvement can be expected :

- a, Technical know-how can be transferred to each level of **engineers**.
- b, Technical know-how can be **extended** to every group/organization level.

(3). When we next observe the utilization of **engineers** at

the ministry of agriculture, forestry and fisheries, lately, it is shown in Table 2

Table 2 Employment condition of Engineers

Status	Number	Remarks
Primary level	40 - 50 per year	Basically graduated from Technical High School
Middle level	20 - 30 per year	Basically Junior College Graduated
Upper level	20 - 30 per year	Basically University graduated

In connection with the total amount of engineers employed at the ministry of agriculture, forestry and fisheries no considerable change can be observed, so that when personal recruitment each year is estimated at 90 - 100 persons, the duration of engineers to be employed would become about 30 - 40 years.

2. Training Countermeasures for Engineers

(1.) Irrigation and drainage works in Japan, has been developed in accordance with the development in technology and the changing of the agricultural village society can be observed to head into an advance and varied level.

As an example utilization of new technical methods, analization by calculation machines Computer, the development of new activities, facilities for agricultural villages etc.

To tackle such mentioned matters, technological improvement is required and the following matters have been paid by Ministry of Agridulture, Forestry and Fisheries.

a. Improvement of technical ability for all engineers including leaders

b. Improvement of technical ability on the organization level.

For point a, efforts are required from each engineers, for example: Studying magazines, papers daily research and study etc. on irrigation and drainage techniques.

Besides what is mentioned above, it will explained as regards the implementation polcey for those by Ministry of Agriculture, and Forestry and Fisheries.

(2.) To improve the techniques on a engineers private level, the following matters have been carried out:

a. Job site training : represent technical guidance from the officer in charge to the lower levels through daily duties. By executing the above, improvement of technical skill will be reached.

b. Training : Represent lectures, training, discussions etc. which is carried out by bringing together engineers from the head office or regions who have almost the same capabilities.

In this way distribution and new technical guidance can be carried out centrally and effectively.

c. Field study meetings

To give reports and discussion and the like periodically or not on technical matters, new techniques and workshop in the field. In this case technical distribution will give quick result.

d. Effective transfer of personnel

Through personnel transfer the engineers will improve and gain much experience. In this way engineers can be upgraded in order that they acquire sufficient skill and experience.

e. Others (factory visits, study in foreign countries etc)

(3) To improve techniques on organizational level the following matters have been carried out :

a. Education in organizing skills

Technical distribution in accordance with planned technical improvement with guidance from the respective instances.

a1. Investigation on technology testing place, experimental station

a2. Development and extension of practical techniques

Technical service centre for agricultural Land improvement

a3. Inspection, planning and consultancy schemes consultant

a4. Expansion and development of new systems and management on technical construction constructors

a5. Building maintenance regional land improvement

b. Electrification of duties.

For effort in irrigation and drainage technic (the executing instances) and respective instances, to improve the technical standard and efficiency of duties by utilizing electrification/computerization in calculation.

Especially in the field of planning, scheduling, calculation and implementation thereof on a big scale.

c. Standardization of planning, scheduling and development.

To carry out standardization for planning, scheduling, construction, instruction on development management etc.

Besides, to submit data for consideration through development and arrangements of material in planning and scheduling.

3. Training Situation

(1). Guidance of engineers in Japan like explained afore should be carried out as a whole, in order that the training will represent a part of it and to keep in mind that by executing the whole system only then the quick development of engineers can be reached.

(2). In Japan, much work is carried out by utilizing only a small number of engineers.

Although they are in the training period, the duties the instances are carried out as usually.

While a officer in charge is not present as he is undergoing training an other officer will be in his

place. In this case the results of training will not only be left by the participants but also by other officers. In this way the training participants will usually circulate the training- and reports material after they return to their respective place of duty.

- (3) Considering the above matters it can be said that the training results are quite successful and by carrying out such a training and its program in a right way the aim of it can effectively be reached.

In Japan, although they are restricted to their field duties, training is actively held and its contents will be explained hereunder.

4. Types of Training and Implementation System

- (1). Training of engineers in the irrigation and drainage by Ministry of Agriculture, Forestry and Fisheries can be divided into 6 groups.

a. Training for new officers.

Is carried out to give basic knowledge on administration, entrepreneur system etc, to all the officers in the upper- and middle

b. Management training

Is executed to the direct the knowledge and capabilities necessary to manage and plan an enterprise with the object as a manager.

c. Training for

Is carried out to distribute knowledge on new technology and quality improvement by giving basic know-how and training on technical irrigation channels to technicians of the government, public corporations and provincial instances.

d. Training in electronic calculation systems.

Is conducted to train the expert technicians by giving knowledge on electronic/computerized equipment and its utilization to technicians from the government departments, public corporations and provincial instances.

e. Training on ~~Construction management~~ **Techniques**

Is carried out to improve the quality by transferring basic training on the application of implementing management on development to the technicians employed with the government departments, public corporation and provincial instances.

f. Training in machinery facilities.

Is executed to give expert knowledge to those who are in connection with machinery facilities (pumps, electrical etc), on duty in the technical field for the government departments, public corporations and provincial instances.

(2) The six kinds of training is divided into basic, intermediate courses, in accordance with requirements.

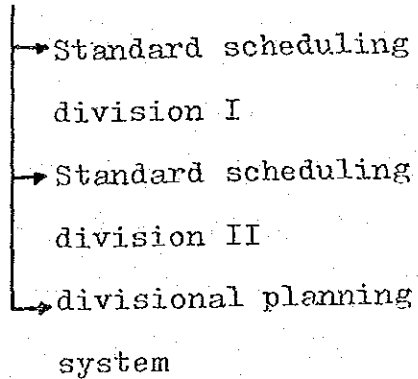
This is to convey technology on a large scale and to train the expert technicians in an efficient way.

There will be 3 instances in charge with the implementation thereof, e.g. the technical service centre for agricultural land improvement which carry out training in the regions; the office for improvement of the structure in the agricultural, forestry and fisheries field which carry out training in the centrum; and a place for testing purpose of civil agriculture.

This inter-relationship is as indicated (table 3).

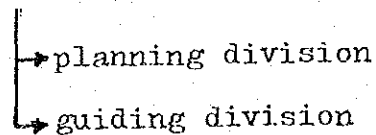
(3) The training responsibilities for each instance are as follows :

a. The office for improving the structure of agriculture, fisheries (TOKYO). → The group for standard scheduling, planning room, development section
 - Deputy of section



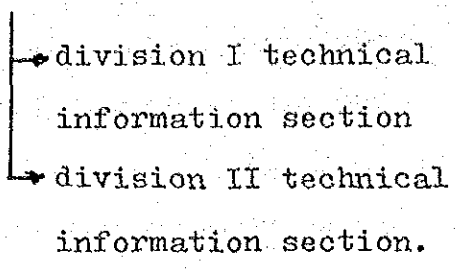
→ Planning group of scheduling section building division.

- Deputy of section



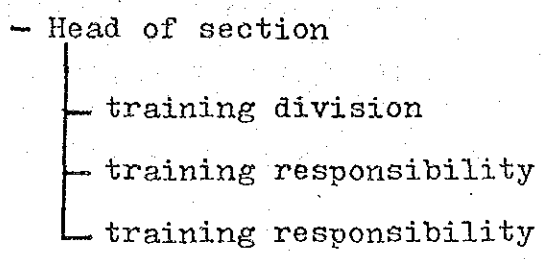
b. Technical Service centre for agricul- → Technical information section
 - Head of section

tural land improvement
(placed all over the country)



c. Testing place for civil
agriculture

→ Training section, scheduling related room.



5. Outline of Training

- (1). When we arrange in great lines each training for the year 1984, it becomes like (table 4).
- (2). When indicating the implementation period for each training in the year 1984, it becomes like (table 5).
- (3). As it will be difficult to indicate all the details of the curriculum for each training and its lecturer we will limit it to the following training session.
 - (table 6) Contents of general technical training.
 - (table 7) Curriculum of management for technical training (basic level).
 - (table 8) Curriculum of management for technical training (intermediate level).
 - (table 9) Contents of management for technical training (advanced level).
- (4). The implementation of each training, on planning and

administrative work to be executed is as follows :

- a. Determination of training level to draw a curriculum and assign the lecturer etc.

This is carried out at each instance, also for the mutual arrangement is determined at a meeting of training officers from all over the country.

At that time for training to be executed by the technical service centre for agricultural land improvement should be in accordance with the national standard, therefore a standard curriculum should be proposed which is prepared by the office of structural improvement for agricultural, forestry and fisheries.

- b. Determination of training participants

Training, which is required to be followed becomes a responsibility (training for newly appointed officers etc) and will be done by instruction.

Other training which represent a priority is the wish of the participants. Also when there occurs a surplus/shortage in the total of participants then this should be divided on the basis of regulation.

- c. Training Budget

The honorarium for giving training to officers other than those from the department of agriculture, forestry and fisheries, should be paid by the respective instances.

Transportation expences for participants from the govern-

ment departments are on account of the implementing instance , and for participants from public corporations or provincial offices on account of the respective instances where they work.

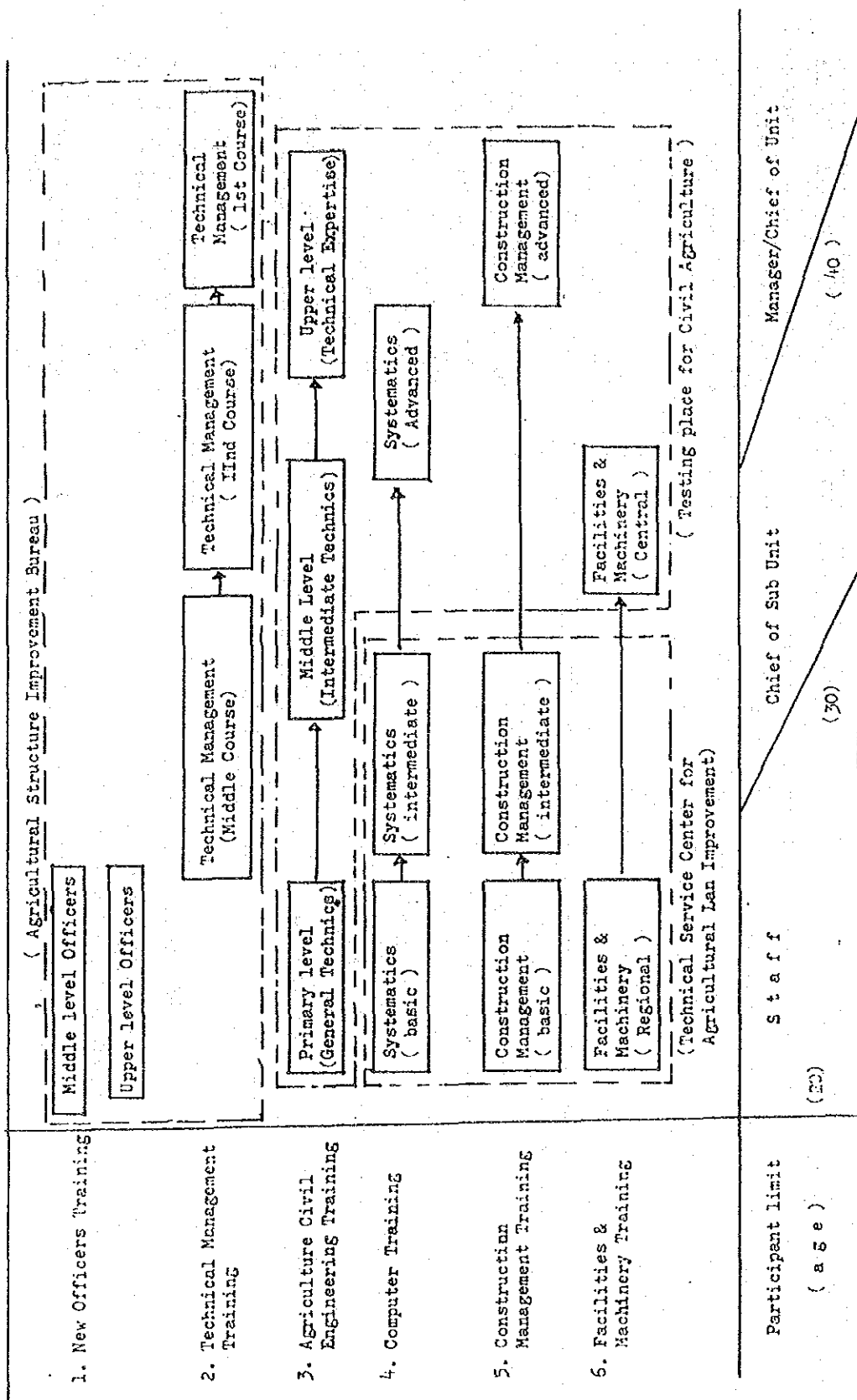
As to the books, there is a possibility to gather these expences from the participants.

d. Training Evaluation Method.

When training is carried out on a long term basis, testing procedures, training implementation, training, statements, discussions, opinions etc. Should be assigned.

For short- term/medium training periods, reports statement discussions and opinions should be assigned. This all is being executed with the aim to improve the function of training, checking, understanding etc, which are to be utilized in considering future curriculae.

Table 3 Training System



TA BLE 4. TRAINING OUTLINE

TRAINING	PURPOSE	TIME	TOTAL PARTICIPANT	PLACE	ACCOMMODATION	REQUIREMENT	TRAINING CONTENTS
Middle Officials	Administrative know-how : Managing method for future managers	6 days	1 x 27 pers.	TOKYO	Hotel	All middle class officers of last year. (only government officials)	Lecture on regulations, organization, budget and long-term plan.
Upper Officials	awareness of Japanese agriculture problems and giving administrative knowledge	6 days	1 x	TOKYO	Dormitory	all upper class officials of this year (only government officials)	Lecture on regulations, arrangements, budget and sectional management
Technical management (middle course)	Knowledge of administration problems and consideration on enterprise management methods	6 days	1 x 31 pers	TOKYO	Hotel	Upper officials already serving 4 years (government officials)	Lecture, reports, discussion on administrative work, enterprise management, etc.
Technical Management (II nd Course)	Lessons in knowledge of enterprise management to leader.	6 days	1 x 45 pers.	TOKYO	Hotel	Sectional head or government branch head, public corporation of 2 yrs service	Lecture, discussion on budget, enterprise management, agricultural development and administrative work

Technical management (1st Course)	Lessons in enterprice management and administrative work to head of enterprice office	6days 1 x	22 pers	TOKYO	Hotel	Head of Gov-ernment office or public cor-poration of 2 yrs service	Lecture, discussion on budget, enterprice management, duty agricultural administration
General Technics	Improvement of quality by giving basic knowledge and application	abt. 5 months	40 pers	Testing place for civil agri-culture	Dormitory	After 3 yrs Graduation of High school under 27 yrs basic personnel (gov-ernment official, public corp, provin-cial office.	Lecture, training of testing plan on mathematics, hydraulics, applied technology for technical irri-gation outlets.
Intermediate Technics	Improvement of quality and education of awareness through technical assistance and applied systems.	30 days	45 pers. 1 x	Testing place for civil agri-culture	Dormitory	Middle class officials with 5 yrs after univ. Graduation or High School Graduate, 9 yrs service (Gov. official public corp, provin-cial office.	Lecture, technical investigation discussion on theoretical planning, technical analization, etc.
Technical Expertise	Distribution of new techniques at each lecture and leader education	10 days	45 pers. 1 x	Testing place for civil agri-culture	Dormitory	Sectional head, divisional head, 32-47 yrs (gov. offic, public corp, provin-cial officials)	Lecture on management. I. River consultancy, II. Irrigation, III. Fill dam, IV. placing of pump.
Electronics Computer system (basic course)	Lessons in basic computer technics 1. Theory course 2. Practical Course	1.6days 2.3days	148 pers	Technical service centre	Dormitory	Government official, public corp, provincial officials, not yet followed this training	1. Lecture, discussions, computer concept and fortran system. 2. Programming training.

Electronic computer system (Intermediate course)	Lessons in applied computer techniques and education for middle class computer technicians,	13 days	1 x 7 places	56 pers.	Technical service center.	Dormitory	1st course Graduate	Lecture, discussion on system planning, value analysis, hardware, basic
Electronic computer system (advanced course)	Education of technicians for analyzing and planning by computer.	60 days	2 x 7 places	12 pers.	Technical service center.	Dormitory	Middle course Graduate or equal technical knowledge.	Lecture on system and training on problems.
Construction Management (Basic course)	Lessons in basic knowledge on work management	6 days	1-2 x 7 places	74 pers.	Technical service center	Dormitory	Government workers, public corp, provincial offices	Lecture and training on land dynamics and concrete techniques
Construction Management (Intermediate course)	Lessons in applied science on work management	6 days	1 x 1-2 x 7 places	72 pers.	Technical service center	Dormitory	Sectional head of government official, public corp. prov. office or 1st course Graduate	Lecture, training reports on provincial planning, work and quality management

Construction management (advanced course)	Lessons in knowledge on management and teaching to Ist/middle course	11 days	1 x	45 pers	Testing civil agri-culture	Dormitory	Technical Staff, Head of section, 30-45 yrs, (Gov. official, public corp. prov. office	Lecture, discussion on statistics, checking and management.
Facilities & Machinery (Regional)	Lesson in basic knowledge on planning, management and machine operation.	6 days	1-2 x	52 pers	Technical service centre	Dormitory	Gov. office, public, corp prov. office and caretaker of machine facilities	Lecture on gate pump, engines etc
Facilities & Machinery (central)	Guidance for technical leader by giving technical expertise for machinery facilities	33 days	1 x	12 pers.	Testing civil agri-culture	Dormitory	Gov. office, public, corp. prov. office & Division Head for machine facilities	Lecture, field training on planning, work on machinery facilities

Table 5 Schedule of Training MONTH

EXECUTING DEPARTMENT TRAINING COURSE	COURSE SECTION	MONTH																		
		4	5	6	7	8	9	10	11	12	1	2	3							
Office for Improvement of structure forestry & fisheries.	Middle Officers																			
	Upper Officers																			
	Technical Management																			
	Technical Management																			
	Technical Management																			
	General Technicians																			
	General Technicians																			
	Middle Technicians																			
	Middle Technicians																			
	Technical Experts																			
Testing place for civil agriculture.	Technical Experts																			
	Technical Experts																			
	Technical Experts																			
	Technical Experts																			
	Computer system																			
	Computer system																			
	Computer system																			
	Computer system																			
	Computer system																			
	Computer system																			
Technical Service Centre for agricultural land improvement	Machine Facilities																			
	Machine Facilities																			
	Machine Facilities																			
	Machine Facilities																			
	Machine Facilities																			
	Machine Facilities																			
	Machine Facilities																			
	Machine Facilities																			
	Machine Facilities																			
	Machine Facilities																			

(T A B L E - 6)

CONTENTS OF GENERAL TECHNICAL TRAINING COURSE

CONTENTS OF THE GENERAL TECHNICAL TRAINING COURSE

1. PURPOSE In order to foster the first class engineers to be capable engineers, We instruct them in basic subjects and technical knowledges.
2. Trainees (1) High school graduates or the men acknowledged to have learned the same level scholarship of highschool graduates Also they must have more than three years experience on the work and be less than 27 years old.

 (2) The officials who works in Agricultural Structure Improvement Bureau. Regional Administration Office. Institute of Agriculture Engineering. Hokkaido Development Agency. Okinawa Development Agency. prefectures and public corporation are qualified to be trainees.
3. Capacity 40
4. Term 5 Months
5. Curriculum (1) Purpose
 - (1) Reeducation of the trainees on basic subjects of agriculture engineering (mathematics, statistics, hydraulics etc.)
 - (2) Acquirement of basic technics (irrigation soil mechanics, structure mechanics, concrete mechanics etc.)
 - (3) Learning of practical technics (facilities mechanics, machinery, construction, etc.)