

IRRIGATION DEPARTMENT
MINISTRY OF AGRICULTURE AND IRRIGATION
THE REPUBLIC OF THE UNION OF MYANMAR

**PREPARATORY SURVEY
FOR
THE PROJECT
FOR
REHABILITATION
OF IRRIGATION SYSTEMS**

**FINAL REPORT
(APPENDIXES)**

AUGUST 2014

**JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)**

SANYU CONSULTANTS INC., JAPAN

RD
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APPENDIX-I

IMPLEMENTATION ARRANGEMENT OF THE SURVEY

APPENDIX I: IMPLEMENTATION ARRANGEMENT OF THE SURVEY

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I.1.1 JICA TEAM MEMBERS

Mr. Kosei HASHIGUCHI	Team Leader / Irrigation Project Planning
Mr. Motoyoshi HIKASA	Co-leader / Irrigation Facilities Design1
Mr. Tsutomu SENDA	Irrigation Facilities Design2
Mr. Yoji SAWADA	Irrigation Facilities Design3
Mr. Itsuo KIHARA	Irrigation Facilities Design4
Mr. Yoji SAWADA	Construction Planning / Procurement
Mr. Mamoru SASA	Small Hydroelectric Generation
Mr. Shin-ichi ARAI	Equipment
Mr. Hironori TAKAHASHI	Farmland Consolidation (Design)
Mr. Nobutoshi EGUCHI	Farmland Consolidation (Monitoring)
Mr. Yoshinao ADACHI	Farming System
Mr. Ken KOZAI	Project Economic Analysis
Mr. Hideki ISHIKAWA	Environment and Social Consideration1
Mr. Yoji SAWADA	Project Cost Estimation
Mr. Nobutoshi EGUCHI	Farmers' Organization / Env. and Social Consideration2

I.1.2 COUNTERPART PERSONNEL

Irrigation Department (Head Office –Nay Pyi Taw-)

Mr. Kyaw Myint Hlaing	Director General
Mr. Tint Zaw	Deputy Director General
Mr. Tint Lwin	Director of Procurement Branch
Mr. Tun Kyaw Soe	Director of Mechanical Section
Mr. Soe Naing	Deputy Director of Mechanical Section

Irrigation Department (Nay Pyi Taw Office)

Mr. Soe Tint	Director
Mr. Saw Thet Khine Win	Assistant Director

Irrigation Department (Yangon Office)

Mr. Zaw Win Chit	Director of Inspection Branch
Mr. Minn Aung Than	Director of Design Branch (1)
Mr. Hla Phone Maw	Staff Officer of Design Branch (1)

Irrigation Department (Pyay Office)

Mr. Myint Htun Latt	Director of Construction (2)
Mr. Ko Ko Htay	Deputy Director of Construction (2)
Mr. Hla Win Myint	Assistant Director (1) of Construction (2)
Mr. Aung Moe Win	Assistant Director (3) of Construction (2)

Mr. Soe Aung	Deputy Director of Maintenance Division
Mr. Myint Thaug	Assistant Director (Pyay District) of Maintenance Division
Mr. Tin Maung Wai	Staff Officer of Construction (2)
Mr. Aung Kyaw Oo	Staff Officer of Construction (2)

AMD (Head Office -Nay Pyi Taw-)

Mr. Soe Hlaing	Director General
Mr. Aung Win	Deputy Director of Research and Technology Section ion (Project Manager)
Mr. Way Phyoo	Assistant Director of Director General Office
Mr. Zaw Zaw Htet	Project Officer for PRIS
Ms. Ei Ei Khin	Project Officer for 2KR Project

AMD (Bago West Region Office -Pyay-)

Mr. Wan Maung	Deputy Director
Mr. Khin Mg Kyaw	Assistance Director (Pyay District)
Mr. Aung Myo Lwin Oo	Township Officer (Pyay Township), Manager of No.30 Agricultural Mechanization Station)
Mr. Tin Ko	Township Officer (Paukkhaung Township), Manager of No. 58 Agricultural Mechanization Station)
Mr. Win Shwe	Township Officer (Nattalin Township), Manager of No. 45 Agricultural Mechanization Station)
Mr. Kyaw Kyaw Soe	Township Officer (Thegone Township) Manager of No. 94 Agricultural Mechanization Station)

AMD (Nay Pyi Taw Office)

Mr. Kyaw Soe	Deputy Director
Mr. Than Tun Aung	Assistant Director

SLRD (Nay Pyi Taw Office)

Mr. Zaw Min Aung	Deputy Director
Mr. Win Myint Oo	Assistant Director

DOA (Nay Pyi Taw Office)

Mr. Saw Sein Win	Deputy Director
Mr. Win Oo	Assistant Director

Cooperative Department

Mr. Khin Mg Win	Deputy Director
-----------------	-----------------

Nay Pyi Taw Council

Mr. Thein Nyunt	Chairman (Minister)
Mr. Myint Swe	Member (Deputer Minister)

Irrigation Technology Center (ITC) (Head Office –Bago-)

Mr. Zaw Min Htut

Director

Mr. Maung Maung Naing

Assistant Director

Irrigation Technology Center (ITC) (Pyay Office)

Ms. Myint Myint Sein

Staff Officer of Laboratory

Person-month Schedule: The Project for Rehabilitation of Irrigation Systems (PRIS)

	Expertise	Name	Organization	2013												2014								Person-month								
				Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Myanmar	Japan								
in Myanmar	Team Leader/ Irrigation Project Planning	Kosei HASHIGUCHI	Sanyu Consultants Inc.			■ (15)			■ (30)				■ (9)						■ (9)								2.10					
	Co-leader/ Irrigation Facilities Design 1	Motoyoshi HIKASA	Sanyu Consultants Inc.			■ (9)	■ (30)	■ (38)	■ (9)																			5.80				
	Irrigation Facilities Design 2	Tsutomu SENDA	Sanyu Consultants Inc.			■ (30)	■ (15)	■ (30)	■ (15)																			3.00				
	Irrigation Facilities Design 3	Yoji SAWADA	Sanyu Consultants Inc.																■ (27)	■ (33)	■ (15)							2.00				
	Irrigation Facilities Design 4	Itsuo KIHARA	Sanyu Consultants Inc.																■ (27)	■ (15)								1.40				
	Construction Planning/ Procurement	Yoji SAWADA	Sanyu Consultants Inc.							■ (6)	■ (6)																	2.00				
	Small Hydroelectric Generation	Mamoru SASA	Sanyu Consultants Inc.*1				■ (27)			■ (33)																		2.00				
	Equipment	Shin-ichi ARAI	Sanyu Consultants Inc.							■ (6)	■ (6)									■ (30)					■ (30)			4.00				
	Farmland Consolidation (Design)	Hironori TAKAHASHI	Sanyu Consultants Inc.				■ (45)													■ (36)								2.70				
	Farmland Consolidation (Monitoring)	Nobutoshi EGUCHI	Sanyu Consultants Inc.			■ (30)														■ (29)								1.97				
	Farming System	Yoshinao ADACHI	Sanyu Consultants Inc.				■ (45)																					1.50				
	Project Economic Analysis	Ken KOZAI	Sanyu Consultants Inc.								■ (45)																		1.50			
	Environment and Social Consideration 1	Hideki ISHIKAWA	Sanyu Consultants Inc.							■ (6)	■ (6)																		2.00			
	Project Cost Estimation	Yoji SAWADA	Sanyu Consultants Inc.				■ (30)	■ (45)																					2.50			
	Farmers' Organization / Env. and Social Consideration 2	Nobutoshi EGUCHI	Sanyu Consultants Inc.							■ (8)				■ (45)							■ (46)								4.03			
																														38.50		
in Japan	Team Leader/ Irrigation Project Planning	Kosei HASHIGUCHI	Sanyu Consultants Inc.					□ (3)					□ (9)																0.40			
	Irrigation Facilities Design 1	Motoyoshi HIKASA	Sanyu Consultants Inc.		□ (6)			□ (6)					□ (18)							□ (9)									1.30			
	Irrigation Facilities Design 2	Tsutomu SENDA	Sanyu Consultants Inc.				□ (15)	□ (15)			□ (30)																		2.00			
	Equipment	Shin-ichi ARAI	Sanyu Consultants Inc.														□ (15)				□ (15)								1.00			
																														Total	4.70	
Reports						▲ ICR			▲ PR				▲ DFR							▲ Draft Land Consolidation Manual								▲ FR				
Major Activities				Preparatory Work First Field Investigation First Home Work in Japan Draft Project Plan & Implementation Arrangement				Second Field Investigation Second Home Work in Japan Draft Final Report Preparation & Presentation Final Project Plan & Implementation Arrangement				Third Field Investigation Implementation of Farmland Consolidation Preparation of Procurement for Machineries Review of Design of NN and SN Irrigation Facilities																		Total	38.50	4.70
																															Grand Total	43.20

■ in Myanmar
□ in Japan

*1: Associate (J-power)

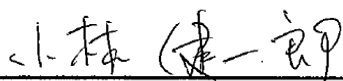
I.3 RECORD OF DISCUSSIONS FOR THE PROJECT

**MINUTES OF DISCUSSION
ON
PREPARATORY SURVEY
FOR
THE PROJECT FOR REHABILITATION OF IRRIGATION SYSTEMS
BETWEEN
JAPAN INTERNATIONAL COOPERATION AGENCY
AND
THE REPUBLIC OF THE UNION OF MYANMAR**

DATE: August 1st, 2012

PLACE: Yangon, Myanmar

1. The Japan International Cooperation Agency (hereinafter referred to as "JICA") Mission visited the Republic of the Union of Myanmar from July 27th to August 2nd, 2012 and had discussions on the draft Implementation Program of Preparatory Survey (hereinafter referred to as "the Survey") for the Project for Rehabilitation of Irrigation Systems (hereinafter referred to as "the Project") with officials of Ministry of Agriculture and Irrigation (hereinafter referred to as "MOAI").
2. JICA Mission and MOAI hereby agreed upon the draft Implementation Program of the Survey for the Project as per Annex-1, subject to the approval by the competent higher authorities of both sides. It should be noted that implementation of the Survey does not imply any decision or commitment by JICA to extend its loan for the Project at this stage.
3. JICA Mission and MOAI made the record of main points discussed as per Annex-2



Mr. Kenichiro Kobayashi
Director
Paddy Field Based Farming Area Division 1
Rural Development Department
Japan International Cooperation Agency



(for Director General)
U Tint Zaw
Deputy Director General
Irrigation Department
Ministry of Agriculture and Irrigation
The Republic of the Union of Myanmar

Annex-1

**IMPLEMENTATION PROGRAM
ON
PREPARATORY SURVEY
FOR
THE PROJECT FOR REHABILITATION OF IRRIGATION SYSTEMS**

1. Background

- (1) Myanmar is an agricultural country, and agriculture sector is the backbone of its economy. Agriculture sector contributes about 30% of GDP and employs about 60% of the labour force. The government which was inaugurated in March 2011 recognizes importance of development of agriculture sector in terms of national food security and poverty alleviation. Although it is indispensable for development of agriculture to construct and rehabilitate irrigation facilities, 18.1% of irrigation coverage of Myanmar in 2011 was lower than neighboring countries in ASEAN, and it was not able to reach planned coverage (25%) in 2000. Furthermore, it is found that irrigable area is declining in the existing irrigation facilities which become old and damaged.
- (2) Upon the above situation, Irrigation Department (hereinafter referred to as "ID") of MOAI is carrying out plan of construction and rehabilitation of irrigation facilities aiming to provide irrigation water systematically, in order to promote development of agriculture. ID has listed existing irrigation facilities needed urgent rehabilitation, however, the implementation of the plan is hindered due to shortage of sufficient budget and necessary equipment for the work.
- (3) Therefore, JICA was requested by ID to support rehabilitation of the irrigation facilities, and the rehabilitation project will be considered that West Bago Region (including Nawin area), where are expected to increase irrigable area, shall be targeted among existing irrigation facilities listed by ID.

2. Outline of the Projects subject to review by the Survey**(1) Objectives**

To increase agricultural production through recovery of the area of the irrigated land by rehabilitation of the irrigation systems, hereby contributing to food security and livelihood improvement of the people of the Republic of Union of Myanmar.

(2) Target Irrigation Systems and Location

No	Name	Location
1	Rehabilitation of North Nawin Irrigation System	Bago Region, Pyay District, Pyay Township
2	Rehabilitation of South Nawin Irrigation System	Bago Region, Pyay District, Pauk-Khaung Township

3	Rehabilitation of Wegyi Irrigation System	Bago Region, Pyay District, Paungde Township
4	Rehabilitation of Taung Nyo Irrigation System	Bago Region, Tharyarwaddy District, Nattalin Township
5	Establishment of model farms in Nay-Pyi-Taw District	Nay-Pyi-Taw District, Leway Township and Thiri Township

(3) Scopes of the Projects

The feasibility of the proposed projects would be examined within the Survey and the scopes of the Projects listed below would be revised or added as the result of the Survey.

1) Rehabilitation of main canals

- Shrub and grass cleaning works
- Canal bank Raising and Canal resectioning works
- Unsilting of Canal Bed
- Concrete lining works

2) Repairing of access road to dam

3) Repairing of Inspection Path and Non Inspection Path along the main canals

4) Repairing and Reconstruction of Check gates, DY gates and Weirs

5) Establishment of two (2) 10 to 20 ha scale of model farms in both North Nawin Irrigation System and South Nawin Irrigation System, and three (3) 100ha scale of model farms in Nay-Pyi-Taw District.

- Select suitable farm lands for establishment of model farms
- Designing of canal network, water management system, land consolidation, farm road, etc.
- Construction works, if all related authorities and land owners would accept.

6) Rehabilitation of Secondary canal

- Shrub and grass cleaning works
- Canal bank Raising and Canal resectioning works
- Unsilting of Canal Bed

7) Construction machineries for the Project

- Confirmation of the capacity of ID,
- Procuring machineries, if necessary

8) Consulting services

- Detail design, procurement assistance of civil works and equipment / facilities, supervision




and monitoring of the civil works,

- Capacity development for operation and maintenance (O&M),
- Capacity development for agricultural extension service.

(4) Implementation structure

Executing Agency:

Ministry of Agriculture and Irrigation (MOAI)

3. Terms of Reference of the Survey

TOR1: Review of policy and current situation

- 1-1 Review the latest agricultural policy and strategy in irrigation and water management sector,
- 1-2 Examine the current and future balance of supply and demand for agricultural products and fluctuations in prices of agricultural products in Myanmar,
- 1-3 Review data and information of agricultural and economic activities in the target area,
- 1-4 Review related on-going and committed projects supported by other donors in irrigation and water management sector and propose conceivable collaboration with the Project.

TOR2: Examination of the environmental and social consideration

- 2-1 Examine environmental and social considerations in accordance with relevant laws and rules in Myanmar, as well as the requirements of “JICA Guidelines for Environmental and Social Considerations” (April 2010) (hereinafter referred to as “JICA Guidelines”), identify any additional required procedures, and prepare an environmental checklist based on JICA Guidelines,
- 2-2 Support MOAI to prepare Environmental Impact Assessment Report (EIA) or other required environmental documents, if necessary,
- 2-3 Examine social consideration components (gender, assistance of the socially vulnerable, etc),
- 2-4 Propose monitoring form for environmental and social consideration including monitoring indicators and monitoring system,
- 2-5 Examine Myanmar laws, regulations and procedures of resettlement and land acquisition, study social and economic impact of local residents in the area of resettlement, and support MOAI to prepare Resettlement Action Plan (RAP) in accordance with the requirements of JICA guidelines in case that the residents to resettle are specified,
- 2-6 Examine the impact on cultural heritage and natural environment in the target area as



well as relevant laws and regulations for protection of cultural heritage and natural environment.

TOR3: Examination of the details of each project

- 3-1 Review the existing projects related documents and information in terms of reexamination of project scope, recalculation of water balance, etc.,
- 3-2 Estimate and evaluate the overall cost and the cost which is included in Japanese ODA loan,
- 3-3 Confirm a standard for setting up unit cost,
- 3-4 Prepare annual fund requirement,
- 3-5 Study consulting services necessary for the Project,
- 3-6 Propose implementation arrangements for the project,
- 3-7 Confirm technical and financial abilities of implementing agencies (MOAI and ID) and identify relevant organizations/groups/departments other than listed above as well as their responsibilities, if any,
- 3-8 Prepare procurement plan,
- 3-9 Study additional technical assistance or possibility of collaboration with technical cooperation projects and implementing agencies,
- 3-10 Prepare implementation schedule of the Project,
- 3-11 Confirm technical abilities for design and construction of local enterprises,
- 3-12 Review the baseline and target of qualitative and quantitative data for monitoring and identify operation and effect indicators,
- 3-13 Estimate Economic Internal Rate of Return (EIRR).

4. Implementation Framework of the Survey

(1) Survey team

JICA will select and dispatch a survey team (hereinafter referred to as “the Team”) to carry out the Survey.

The Team will include the following experts: (Tentative plan)

- Team Leader
- Irrigation and Drainage Civil Engineer and Planning Specialist
- Irrigation and Drainage Planning and Management Specialist
- Farming Specialist
- Economic and Financial Analysis Specialist
- Environmental and Social Consideration Specialist

The Team may engage local consultants, NGOs, and/or other supporting staff



(2) Implementation Schedule

- August 2012 - Discussion and confirmation of the Survey Implementation Program (including TOR), Signing of Minutes and Discussions,
- January 2013 - Commencement of the Survey, submission of Inception Report,
- March 2013 - Submission of Progress Report,
- July 2013 - Submission of Draft Final Report,
- August 2013 - Draft Final Report Mission,
- December 2013 - Submission of Final Report,

(3) Reports**(a) Reports to be prepared**

The Team will prepare and present the following reports in English.

(Following number of copies will be shared by JICA and the Myanmar side.)

Inception Report	: 40 copies (English)
Progress Report	: 40 copies (English)
Draft Final Report	: 40 copies (English)
Final Report (full version)	: 40 copies (English)
Final Report (Summary)	: 40 copies (English)

※ The Final Report may be disclosed to the public on request based on Japan's Law concerning Access to Information held by administrative organization. JICA will consult with Government of the Republic of the Union of Myanmar (hereinafter referred to as "GOM") and MOAI as to the contents and sections to be disclosed.

(4) Monitoring

The Team's work will be subject to periodic review by JICA staff. JICA staff will attend meetings between the Team and MOAI, and/or other organizations concerned during the implementation of the Survey as necessary.

5. Undertaking by MOAI and other organizations concerned

MOAI and other relevant organizations, will undertake to provide the followings in order to assist the implementation of the study services on schedule, through close co-operation with the authorities concerned within GOM:

- (1) To provide the Team with all available and relevant data, information and documents requested by the Team,



- (2) To assign counterpart personnel,
 - (3) To provide the Team with appropriate office space with necessary equipment and secretariat service, etc,
 - (4) To ensure issuance of travel permits necessary for the team members to conduct field survey,
 - (5) To ensure safety of the team members, if and when required,
 - (6) To assist the Team in making transportation arrangements,
 - (7) To assist the Team in medical services as needed,
 - (8) To assist the Team in customs clearance, exempt from any duties with respect to equipment, instruments, tools and other articles to be brought into and out of the Republic of the Union of Myanmar in connection with the implementation of the Survey,
 - (9) To assist the Team to obtain other privileges and benefits if necessary.
- Exemption from prosecution: GOM shall bear claims, if any arises, against the members of the Team resulting from, occurring in the course of, or otherwise connected with the discharge of their duties in implementation of the Survey, except when such claims arise from gross negligence or willful misconduct on the part of the member of the Team.

6. Others

The nature of the services to be rendered by the Team shall be exclusively advisory, with all decisions as to whether to accept or implement any recommendation(s) made or instruction(s) given in the course of the implementation of the Survey shall be the responsibility of GOM and other concerned agencies.

GOM through relevant agencies shall take, with their own responsibility, all the necessary measures for the utilization of the recommendations and outcomes of the Survey.



Annex-2**MAIN POINTS DISCUSSED****1. Schedule after the Survey**

Responding to MOAI's inquiry about the schedule after the Survey, JICA mission explained that there is a possibility to conclude Loan Agreement within the fiscal year 2013 if Government of Japan accepted and other steps would proceed smoothly.

2. Reimbursement

ID requested that the cost of rehabilitation works carried out starting from 1st August, 2012 in North Nawin and South Nawin irrigation systems should be retroactively reimbursed after stipulation of Loan Agreement, and JICA mission took note of it.

3. Cost of surveys

Both sides confirmed that the cost of the Survey is borne by JICA, while the Detail Design Survey is borne by GOM through the Project budget.

4. Machineries

MOAI proposed the needs of machineries for maintenance activities, particularly unsilting work. The needs of construction machineries are not so high since a lot of construction machineries would be provided by assistance from foreign countries. MOAI also proposed the needs of machineries and techniques for effective lining works.

5. Consulting Service

MOAI proposed to utilize its own human resources as much as possible for the Detail Design survey as well as supervision of project works so as to minimize the portion of consulting service fee of the Project. MOAI expected that international consultants would introduce new techniques and knowledge to the Project.

6. Office space and equipment for the Team

MOAI informed JICA mission that they would provide the Team with office space in Pyay District including necessary equipment (e.g. electricity, room, chairs and so on).



I.4 MINUTES OF MEETINGS CONCLUDED IN THE PROCESS OF THE PROJECT

No.	Title	Page
1	Minutes of Meeting on Inception Report	I-4-2
2	Minutes of Meeting on Progress Report	I-4-9
3	Minutes of Meeting on Draft Final Report	I-4-15
4	Minutes of Meeting on Draft Guidelines for Land Consolidation	I-4-19

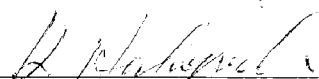
**MINUTES OF MEETING
ON
INCEPTION REPORT
ON
PREPARATORY SURVEY
FOR
THE PROJECT FOR REHABILITATION
OF IRRIGATION SYSTEMS
IN
THE REPUBLIC OF THE UNION OF MYANMAR**

**AGREED UPON BETWEEN
IRRIGATINO DEPARTMENT,
MINISTRY OF AGRICULTURE AND IRRIGATION
AND
JICA PREPARATORY SURVEY TEAM,
JAPAN INTERNATIONAL COOPERATION AGENCY**

Nay Pyi Taw, April 9, 2013



(for Director General)
U Tint Zaw,
Deputy Director General,
Irrigation Department,
Ministry of Agriculture and irrigation
(MOAI)



Mr. Kosei HASHIGUCHI
Team Leader
JICA Preparatory Survey Team,
Japan International Cooperation Agency
(JICA)

Series of discussions had been made between Japan International Cooperation Agency (JICA) and the Republic of the Union of Myanmar, and the discussions were concluded in the Minutes of Discussion on Preparatory Survey for the Project for Rehabilitation of Irrigation Systems signed on 1st August 2012 in Yangon. Based on the Minutes of Discussion, JICA has dispatched a team on 18th March 2013 headed by Mr. Kosei HASHIGUCHI, Sanyu Consultants Inc., for the execution of the Preparatory Survey (herein after referred to as "the Team", and accordingly the Team commenced series of surveys in Myanmar.

Based on the first-hand surveys conducted in late March 2013, the Team has prepared the Inception Report while JICA Headquarters has dispatched an advisory mission team for the Inception Report discussion (hereinafter referred to as "the Mission"), headed by Mr. Noriaki NAGATOMO, Deputy Director General and Group Director for Rural Development 1, Rural Development Department of JICA Headquarters. Accordingly, the presentation meeting for the Inception Report was held on 9th April 2013 at a conference room of Ministry of Agriculture and Irrigation inviting representatives from concerned departments under the Ministry.

At the commencement of the meeting, Mr. Nagatomo delivered an opening address, welcomed all the participants, and briefed on the event the Mission has met His Excellency the President of the Government of Myanmar in the morning of the same day, 9th April, during which H. E. President requested JICA to introduce Japanese experiences to Myanmar people. Mr. Nagatomo continued that Japan has accumulated successful experiences and also lesson-learned ones to date, whereby he on behalf of Japanese people is very much pleased to share all such experiences with the Myanmar people.

He further continued and explained about focal discussion points that the participants should concentrate during the meeting as follows;

1. Environment and social consideration for farmland consolidation in NPT (refer to Chapter in ICR 2.2.4), including an option of postponing the implementation for one-year.
2. Guidelines for planning, designing and construction of Model Farm suited for farm mechanization (ICR 2.1.4), including the process of consolidating farmers' consensus/ agreement.
3. Omission/ Minimizing of Detail Design (ICR 2.1.3): North and South Nawin schemes may be minimized (or omitted) for the detail design; however Wegyi and Taung Nyo schemes seem to need a detail design especially for the main canals.
4. Disbursement Management in Force-account Basis (ICR 2.1.1): Capacity for ID's institutional and also financial arrangement be sought.
5. Technical Aspect for Rehabilitation (ICR 2.2.1): Process of identifying the rehabilitation works and the proposed work contents briefed in the Inception Report can be agreed?
6. Overall Implementation Schedule: refer to a preliminary draft submitted together with the ICR, upon which ID's opinion/ thoughts are sought.

Then, Mr. Nagatomo introduced JICA side participants, and requested the Team to explain the contents of the Inception Report. The Team first requested the meeting participants to confirm hand-out materials delivered beforehand. The Team continued by explaining the preparatory surveys required for the rehabilitation project; study objectives, outputs and activities, which the Team is to conduct for the preparation of the rehabilitation projects of North-Nawin, South-Nawin, Wegyi, and Taung Nyo all located in West Bago region. Then, the Team explained about the present condition of the irrigation schemes and future projection upon project completion. The Team placed an emphasis upon necessity of detailed design for the main canals of Wegyi and Taung Nyo referring to his field observations.

The Team also explained farmland consolidation procedure to be undertaken under the Survey. The Team pointed out that 36% of the beneficiary households have farmland less than 1 acre according to the registration of

SLRD. Given this fact, the Team raised difficulty on the re-allocation of farmland plots to be arranged among beneficiary farmers and also stressed that consolidation of farmers' consensus/agreement would accordingly be a time-consuming work. The Team also raised an issue associated with land loss to be caused by the establishment of farm road, irrigation canals and drainages, reaching probably as much as 8% of the total beneficial area. The Team thus suggested allocating another one-year for the establishment of farmers' organization and to have mutual consensus amongst beneficiary farmers on the land loss as well as on the plot re-allocation.

After the explanation by the Team, Mr. Nagatomo suggested the participants to start discussions from the discussion point No.3, "Omission/Minimizing of Detail Design":

- 1) ID side conveyed its opinion on the discussion point No.3 that the rehabilitation plan prepared by ID for South Nawin and North Nawin schemes are necessary to be reviewed by the consultant; however, it should not take much time. The ID suggested that an engineer shall be employed for North Nawin and Wegyi rehabilitation projects, and another engineer shall be engaged for South Nawin and Taung Nyo rehabilitation projects. ID also requested JICA to carry out technical transfer through the project implementation, and raised a request that the detail design consultancy services are to be provided by grant aid.
- 2) The Mission replied that the present preparatory survey team should conduct review of the rehabilitation plans prepared by ID while detailed design required for implementation of the rehabilitation works cannot be undertaken under this preparatory survey. The Mission explained the contents of the survey activities which can be done and are supposed to be undertaken in this study. The Mission, referring to the Minutes of Discussion signed on 1st August 2012, further continued that the detail design should be carried out in loan stage according to the feasibility examination results, which come out of the present preparatory survey.
- 3) The Team added that the Team will review the ID prepared rehabilitation plan; however detailed design itself is difficult to carry out under this study. The Team will preliminary identify the locations and quantities of rehabilitation works by the end of June 2013, and upon confirmation by ID, the Team will finalize the rehabilitation works by the end of October 2013. It will be thus difficult for the Team to conduct detail design under the present study time-frame. The Team further pointed out that North and South Nawin irrigation schemes may be able to proceed to the rehabilitation works without detail design while Wegyi and Taung Nyo irrigation schemes will need detail design at least for the main canals taking into account the current heavily deteriorated conditions.
- 4) ID side replied that the concerned parties, JICA and ID, will discuss this issue including the consultant assignment at a later stage when the result of the current study has become available.

On the discussion point No.4, "Disbursement Management in Force-account Basis (ICR 2.1.1): Capacity for ID's institutional and also financial arrangement be sought":

- 5) The Mission started by saying, on the discussion point No.4, that JICA doesn't have enough experiences about force account system. The Mission first clarified what are eligible and what are not eligible for the disbursement by Yen loan project; eligible items are consulting services, materials/equipment, civil works, price escalation, physical contingencies while non-eligible items that the Myanmar side shall take responsibility are general administration, tax and duties, purchase of land & other real property, compensation and other indirect items. The Mission stressed that JICA needs to confirm capacity of Myanmar side in the field of not only human resources but also budgets allocation. The Mission continued that if other rehabilitation projects were commenced almost simultaneously, e.g. under Indian loan, ID would have to share human resources and budget with others, which could be a concern by JICA.
- 6) ID side replied that ID has to know necessary cost and human resources falling under the responsibility of Myanmar side in advance. According to the past practices, ID has to prepare draft budget requirement before October or November for the next financial year's allocation. The ID therefore requested JICA that

the requirement for Myanmar side should be identified and given to ID before ID starts preparing for the next year's budget. The Mission replied that JICA will inform ID of necessary rehabilitation cost and also the requirement for the Myanmar side before October.

- 7) The Mission mentioned that JICA has to monitor budget disbursement and such monitoring works shall be done with consulting services in order to confirm if a loan recipient practices proper procurement, accounting and disbursement in line with a Yen loan disbursement regulation. The Mission added that JICA's regulation requires Yen loan recipient government to provide evidences for budget disbursement which can bear third party's scrutiny. ID side answered that there is an ID regulation for disbursement control, in accordance with which ID conducts proper budget disbursement. A responsible in the Procurement Department further added that there are standard costs prescribed by Region in Myanmar, and ID always follows such standardized costs.
- 8) On the loan hired consultant responsible for monitoring the disbursement, ID side raised concern that the consultant should have dual tasks not only for disbursement monitoring but also for other fields, or s/he can hardly deserve as foreign loan hired expert in considering the fee paid out from the loan. The Mission commented that it is not sure at present how much workload is expected on such assignment; whereby both sides should decide at a later stage that such expert should undertake only the monitoring task or with other field.
- 9) ID further mentioned that ID may hesitate to pay an expensive consultancy fee to such task of monitoring only. ID requested that JICA discuss the issue with Construction Circle 2 in Pyay, and ID side further suggested assigning a quality control expert for construction works who should also conduct monitoring on the budget disbursement. The Mission replied that it is a common practice for international loan project to employ such disbursement monitoring expert. The Mission continued that further discussion should be made by examining the workloads on such assignment and also by referring to the arrangements to be made with other ministries in Myanmar for forthcoming prospective loan projects. ID side replied that ID agrees to have further discussions on this issue.
- 10) The Mission raised concern that there may have been a forced labor case in Myanmar wherein the government had forced people to work without payment. The Mission inquired if there are any means to confirm that such inappropriate labor arrangement shall not take place. ID replied that ID receives copy of ID-card of labors and individual signatures from the contractor engaged, and then ID pays the contractor according to the list submitted. ID further continued that in anyway the present democratic government can never do such forced labor case. In addition, there is already an ILO office in Myanmar, and therefore if such case should take place, the inflicted person(s) can appeal to the ILO office.
- 11) The Mission asked if ID can prepare for English documents for procurement and payment at least for the items and cost thereof. ID side replied that there is no problem to prepare English forms for the procurement/payment documents. A representative from JICA Myanmar office added that further details for disbursement shall also be discussed with a loan agreement mission, and ID has agreed to discuss about them with the loan agreement mission.

On the discussion point No.5, Technical Aspect for Rehabilitation (ICR 2.2.1): Process of identifying the rehabilitation works and the proposed work contents briefed in the Inception Report can be agreed?

- 12) ID raised question about lining materials for canal rehabilitation of the four projects whether the Team recommends brick lining or concrete lining. The Team replied that though canal lining method will be proposed in July, concrete lining would be suited at least for the Wegyi and Taung Nyo irrigation schemes taking into account the present heavily deteriorated conditions thereof. ID commented that concrete lining will be better than brick lining according to an opinion of H.E. deputy minister of MOAI.

On the discussion point No.1 & 2, Environment and social consideration for farm land consolidation in NPT

(refer to Chapter in ICR 2.2.4), including an option of postponing the implementation for one-year, and Guidelines for planning, designing and construction of Model Farm suited for farm mechanization (ICR 2.1.4), including the process of consolidating farmers' consensus/ agreement.

- 13) The Mission mentioned that JICA cannot start disbursing the budget for the farmland consolidation before obtaining permission from the Environmental and Social Consideration Supervision Division of JICA Headquarters. The Mission continued that social consideration is of very sensitive issue not only in JICA but also for international organizations, whereby JICA has to conduct due examination on social consideration. Prior to the commencement of farmland consolidation, JICA requires ID to agree with the beneficiary farmers on the issues of farmland re-allocation and also the loss to be caused by the construction of access roads and canals. ID side replied that if JICA develops the guideline including the aspect of such social consideration, ID will follow it and not make any problems on such issues. In this regard, ID agreed by saying that ID accept to postpone the implementation of farmland consolidation by one-year, during which all the pertinent issues will have to be solved.
- 14) On an inquiry by the Team asking if the beneficiary farmers have already agreed the loss of farmland to be caused by the construction of access road and canals, ID replied that ID obtained agreement from the farmers by having their signatures with a provisional loss ratio of 3-5%; however re-allocation area is not yet shown to them and accordingly SLRD should facilitate the farmers to agree on the land re-allocation. ID also introduced a story that Myanmar government expected the farmers to pay farmland consolidation cost to the government when ID had started farmland consolidation works. After that, however, the government announced it was not necessary for the farmers to bear such cost, and then the farmers started agreeing to implement farmland consolidation.
- 15) SLRD mentioned that ID completes the required construction works first, after which re-allocation of the plots comes on board. SLRD, therefore, commences the negotiation on the re-allocation of the plots with the beneficiary farmers upon the completion of the construction works, which in fact entails very much difficult to settle within a certain period of time. SLRD thus stressed that right after the completion of design of farmland consolidation, discussion with the farmers on the plot re-allocation should be started.
- 16) On the government owned land located within the target land consolidation area, the Team raised question if Nay Pyi Taw City Council, the owner of the land, can agree to surrender the land for the sake of the project. ID replied that ID has already discussed with the Director of Nay Pyi Taw City Council, and added that the council has already agreed to provide the land for the sake of the project free of charge though it is verbally. ID also referred to an example, for which NPT City Council had actually provided a land for the use of a project. ID thus stressed that there is no problem for the NPT City Council to provide the land for the sake of the target farmland consolidation project.
- 17) The Mission commented that JICA's guideline on environmental and social consideration is the same as those of the World Bank and Asian Development Bank. Those guidelines specify that if there is any loss of land due to a project, the project implementation body shall compensate it. The Mission continued that JICA has so far not known about the government owned land running along almost the centre of the project area, which occupies nearly the same area of acreage as the one to be lost by the construction of access road and canals. The Mission added that the fact will be discussed with Credit Risk Analysis & Environmental Review Department of JICA Headquarters if such government owned land can be used for the compensation to be incurred by the construction of access road and canals.
- 18) ID introduced that Myanmar renewed farm land law and it shows the necessity of payment for compensation by the project implementation organization if such organization occupies farmland. A representative from SLRD added that the law came in force in March 2012, and its regulations in August 2012. The Mission commented that before the payment of such compensation, land use right holder and its area should be clearly identified, and the Mission asked ID to provide examples having been done in

accordance with the new land law. ID replied that it is difficult for ID to show such example since the laws and regulations are quite new for them all.

- 19) The Mission commented that Japan has accumulated such experiences of establishing communal roads and canals by Land Improvement District (LID), which is the farmer organization in charge of managing farmland consolidation area. The Mission continued that the Ministry of Agriculture, Forestry and Fisheries (MAFF) is ready to share such experiences with Myanmar government. ID replied that ID agrees with it; namely, it is the time to organize farmer organization, and all farmers shall come to Nay Pyi Taw to see such pilot project engaging farmer organization.

Overall Implementation Schedule: refer to a preliminary draft submitted together with the ICR, upon which ID's opinion/ thoughts are sought.

- 20) The Team indicated that the Team is to submit study result (draft form) by the end of October 2013, and in parallel with the study execution and afterwards whereof, there are series of official procedures such as dispatch of JICA fact finding mission and appraisal mission, pledge by the government of Japan, loan agreement negotiation, exchange of note, and then loan agreement whereby its effectuation. The Team further continued those procedures are supposed to complete by the end of March 2014, and then consultant selection would start from as early as April 2014, and this selection procedure would take longer period of time than what is commonly expected, say about 10 months to 1 year. It is therefore expected that the project implementation would start from early 2015; with detailed design to be required, it could start from mid 2015, whereby project completion is expected to be in 2017 or 2018.
- 21) On what the Team explained in paragraph 20), ID commented that it takes too much time, and concerned parties should try to minimize as much as possible the project implementation period including the consultant selection or ID will have to provide necessary budget for the rehabilitation project by it own. ID further mentioned that there is no prescribed schedule to complete for the rehabilitation project; however both parties should consider the fact that most project plans under the present government cover till 2015 only, indicating that the completion in 2018 is too far from the present. ID also pointed out that ID has excluded the rehabilitation projects from other loan project(s) being processed, and will not put on the list of WB project, whereby requesting JICA to accelerate the project implementation.

Others discussed

- 22) The Mission said that water management is important after the implementation of farmland consolidation project; that is why water management expert is necessary for such project. For improvement of water distribution, PIM (participatory irrigation management) will play an important role. Japanese MAFF has accumulated much experience to date on such field especially on participatory water management. ID replied that ID may consider hiring water management expert; however ID cannot implement PIM immediately under the present condition because it takes time to educate farmers. In Myanmar, farmers do not contribute any construction for distribution canals. There are no rules and regulations about farmers' contribution to the distribution canal construction and maintenance. Myanmar government has not yet prepared such regulations on farmer contribution, whereby ID considers that introduction of PIM may be too early.



Participants to the Inception Report Presentation Meeting at MOAI, 9th April 2013**Irrigation Department (ID)**

1. U Tint Zaw	Deputy Director General, Irrigation Department
2. U Soe Myint Tun	Deputy Director General, Irrigation Department
3. U Min Tin Ko	Director, Irrigation Department
4. U Myint Tun Latt	Director, Con(2), Irrigation Department, Pyay
5. U Soe Tint	Director, Irrigation Department
6. U Tint Lwin	Director (Procurement), Irrigation Department
7. Daw Nu Nu Tin	Deputy Director, Irrigation Department
8. U Naing Win	Deputy Director, Irrigation Department
9. U Myint Kyein	Head of Engineer (Mechanical), Irrigation Department
10. U Aung Kyi	Assistant Director, Irrigation Department
11. U Soe Naing	Assistant Director (Mechanical), Irrigation Department
12. U Saw Thet Khine Win	Assistant Director, Irrigation Department
13. U Myint Thein	Assistant Director (Maintenance), Irrigation Department, Pyay
14. U Htay Aung Tint	Staff Officer, Irrigation Department
15. U Myaing	Staff Officer, Irrigation Department
16. U Lin Lin Soe	Staff Officer, Irrigation Department
17. U Myint Thuang	DAD, Irrigation Department
18. U Myo Aung	DAD, Irrigation Department

Concerned Departments

19. U Aung Hlaing	Deputy Director General, Department of Agricultural Planning
20. U Kyaw Nyein Aung	Director, Settlement and Land Records Department
21. Ms. Nilar Aung	Staff Officer, Department of Agriculture

JICA Mission (JICA Headquarters)

22. Mr. Noriaki NAGATOMO	Mission Leader, JICA HQs
23. Mr. Fumihiko SUZUKI	Deputy Director, Rural Development Department, JICA HQs
24. Mr. Manabu KASHIWABARA	Ministry of Agriculture, Forestry, and Fishery (MOAFF)

JICA Myanmar Office (JICA Myanmar)

25. Mr. Kyosuke INADA	Senior Representative, JICA Myanmar
26. Ms. Yoko YAMAZAKI	Project Formulation Advisor, JICA Myanmar

JICA Survey Team

27. Mr. Kosei HASHIGUCHI	Team Leader, JICA Survey Team
28. Dr. Motoyoshi HIKASA	Co Team Leader, JICA Survey Team
29. Mr. Nobutoshi EGUCHI	JICA Survey Team
30. Mr. Myo Zaw Shein	JICA Survey Team
31. Mr. Phyo Lin Tun	JICA Survey Team

**MINUTES OF MEETING
ON
PROGRESS REPORT
ON
PREPARATORY SURVEY
FOR
THE PROJECT FOR REHABILITATION
OF IRRIGATION SYSTEMS
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**AGREED UPON BETWEEN
IRRIGATION DEPARTMENT,
MINISTRY OF AGRICULTURE AND IRRIGATION
AND
JICA PREPARATORY SURVEY TEAM,
JAPAN INTERNATIONAL COOPERATION AGENCY**

Nay Pyi Taw, July 4, 2013



(for Director General)
U Tint Zaw,
Deputy Director General,
Irrigation Department,
Ministry of Agriculture and irrigation (MOAI)



for Mr. Kosei HASHIGUCHI
Team Leader,
Preparatory Survey Team,
Japan International Cooperation Agency
(JICA)

Based on a series of discussions between Japan International Cooperation Agency (JICA) and the Republic of the Union of Myanmar, the both parties agreed and signed the Minutes of Discussions on Preparatory Survey for the Project for Rehabilitation of Irrigation Systems dated 1st August 2012 in Yangon. Consequently, JICA dispatched a survey team (the Team) on 18th March 2013 headed by Mr. Kosei HASHIGUCHI, Sanyu Consultants Inc., for the execution of the Preparatory Survey, and accordingly the Team commenced surveys on the Project in Myanmar.

Based on the first-hand surveys conducted in late March 2013, the Team has prepared the Inception Report, with which a presentation meeting was held on 9th April 2013 at a conference room of Ministry of Agriculture and Irrigation (MOAI). Upon agreeing the contents of the Inception Report with MOAI, the Team has continued necessary surveys for further examining situation of the survey area and identifying issues for malfunction of the irrigation systems to be recovered by the Project in Pyay area in parallel with confirming farmland carry-out ownership with accurate acreage for the Zabuthiri model farmland consolidation area in Nay Pyi Taw.

The Team has formulated conceptual plans on the rehabilitation project for the four irrigation systems and also basic designs for the farmland consolidation, and thus summarized all these issues into a progress report prepared through April to June 2013. The presentation for the Progress Report was made on 4th July 2013 at the Headquarters of Irrigation Department (ID), MOAI. The presentation was commenced at 10:10 AM by Mr. Hashiguchi, having explained the results of surveys to date; 1) positioning of the project, 2) status of the survey area, 3) preliminary rehabilitation plan composed of facilities for rehabilitation and project benefit, and 4) model farmland consolidation.

After the explanation, U Tint Zaw, Deputy Director General of Irrigation Department expressed thanks to the explanation and appointed Director of Design (work 1), Director of Construction Division (2), and Deputy Director of Maintenance Division (Bago West) for giving comments on the report and the presentation. Discussions both sides had on the Progress Report are summarized as follows;

- 1) ID side commented on annual rainfall recorded at locations of North Nawin dam and Taung Nyo dam that northern side has usually less rainfall than southern side while the survey results show opposite. Therefore, ID side requested the Team to explain reasons on such adverse appearance. The Team replied that the Team also understands annual rainfall at northern side is usually less than that of southern side because northern side is close to the Central Dry Zone.

The Team has calculated the averages for the recent 10-year rainfall records at each dam site and depicted them in the Progress Report. Annual rainfalls at each dam site are actually not stable but fluctuate very much by year. This is one of the typical precipitation phenomenon in the Central Dry Zone and its vicinity areas, whereby it upholds the necessity of irrigation systems in this area. If long-time records were employed, it may have shown the rainfall condition as argued by ID side. The Team will examine the long term rainfall records and reflect it in the succeeding report.

- 2) ID side raised a question about maintenance works of the irrigation systems during construction period, indicating that if there is no maintenance on the irrigation systems during the rehabilitation work, irrigation systems will not function properly in the following irrigation period. ID side further stressed that this is why the maintenance works are necessary even during rehabilitation period, and if the maintenance work is not properly carried out, it may reduce farmers' profit in the following farming season.

The Team replied that maintenance work during the rehabilitation period is not considered under this survey for formulating the rehabilitation plan as ID side pointed out. Rehabilitation works will be commenced from upstream side and move to downstream side step by step, not partially at several locations in the irrigation system. An ID maintenance team can therefore carry out maintenance work at the midstream and downstream sides where rehabilitation works are not implemented at the first year of the Project. The maintenance team can then carry out maintenance works at, e.g. upstream side or downstream side, in the second Project year where rehabilitation is not conducted in that year.



- 3) ID side commented on storage capacity of dam reservoirs that ID designer usually designs to store up whole annual inflow at the dam point but North Nawin shows more than enough capacity than annual inflow while Wegyi shows less capacity than its annual inflow. ID side recommended checking long term inflow to confirm relationship between inflow and storage capacity of each dam reservoir. ID maintenance division will provide long term inflow records at a latter stage.

The Team replied that the Team understands ID design procedure to utilize whole annual inflow for irrigation purpose. In Japan, irrigation engineer usually decides a reservoir capacity by 10% probability of draught for irrigation purpose, so that reservoir capacity becomes approximately 70% or less than annual inflow, and then, when there is flood more than the probability, the surplus water inflow will spill-over almost every year. On the other hand, in African countries where arid and semi-arid climate prevails and data are not properly obtained, dam storage capacity is usually designed much more than the annual inflow to carry over stored water to the following year after having obtained a rich rainfall. North Nawin dam was designed by a consultant team from Yugoslavia and the consultant might have taken a design procedure similar to that of African countries because European consultants often work in African countries. In case of Wegyi dam reservoir, it was designed by ID and the Team will check the long term inflow data upon receiving them from the Maintenance Division of Bago West.

- 4) Irrigation Department commented on a chart showing the relationship between irrigation rate and annual rainfall that it is the first time to see such clear vision of necessity of irrigation by region and state; however, high irrigation rate in Ayeyarwaddy region makes the meeting participants confused because there are not so much dam irrigation systems in the area.

The Team replied that data of irrigation rate were obtained from SLRD, not from Irrigation Department, with an intention of showing the present situation of irrigable area by region and state, not by irrigation method. The Team thereby believes that its high irrigation ratio for the Ayeyarwaddy region must include pump irrigation systems, and in any case this chart can provide a clear vision in order to know the area where Myanmar government has to invest in irrigation works by region and state.

- 5) ID side commented on collapse of canal systems and operation on canal systems that the most of irrigation projects commence operation before construction completion for the irrigation canals. This is why there is no time to consider placing canal-linings and operation systems. It may cause some malfunction of irrigation systems. In addition to the rehabilitation of irrigation systems, drainage system improvement should also be included in the Project because it will decrease inundation of farmland leading to more benefit to the beneficiary farmers.

The Team replied that the Team has conducted questionnaire survey in the villages covered by the irrigation systems. There were some constraints on inundation indicated but it was not a major issue for their farming practices. Rain fall shortage and irrigation water shortage were the major concerns for the farmers. In addition to this fact, drainage system establishment requires much farmland acquisition for drainage canals. The target four irrigation systems have over 100,000 ha of farmland in total and therefore it is very difficult to include drainage system establishment in this Project because farmland size and shape are not uniform. If farmland consolidation were implemented, land shape and size would become uniform and easy to establish drainage system together with on-farm irrigation canals and also farm-road networks.

Then, ID side understood the situation of emphasizing irrigation supply. ID side further commented that such drainage system could be included in the second phase of the Project together with land consolidation, which was agreed by the Team. ID side continued comments on irrigation water supply; i.e., monitoring system will be required in order to operate irrigation system properly. In Kabaung irrigation system and Tonze irrigation system, for example, water quality monitoring systems were installed under OPEC loan, so that this Project should also consider installing some systems such as flow measuring structure equipped with instrument for water management, tube well for water quality measurement, etc. The Team will

consider the monitoring system as a part of rehabilitation and/or renovation components of the Project.

- 6) ID explained that project implementation was made by top down procedure during the former government regime. This led to farmers not interested in irrigation or irrigation systems because they were forced to produce crops that the government insisted. In fact, some farmers were afraid of introducing irrigation systems because they would be forced to plant summer paddy or sugarcane which usually did not bring about much profit to them. Farm gate price for summer paddy is in fact low in comparison with necessary cost. Summer paddy harvesting comes in June, and then a farmer has to pay higher labor cost than that of other seasons because the labors have to work under rainy condition with bad road accessibility until the targeted farmland. These unfavorable situations make farmers to grow black gram or other cash crops which promise farmers good income. This is the reason why there is necessity of farm road improvement, so that the labors can go to farmland easily.
- 7) ID side raised a question on small concrete plate placing on canal bed shown in the rehabilitation design example of a main canal. Instead of the small concrete plate placing, long span concrete placing should be good for canal flow and maintenance work avoiding weed growing.

The Team replied that the Team has also considered long span concrete placing in substitution for small concrete plate placing. However, Construction Division (2) is familiar with small concrete precast plate placing, so that they can carry out necessary works within a limited construction period without disturbing farming practices. If the Construction Division (2) has enough equipment to carry out long span concrete placing during the initial period of the Project implementation, during which to-be-procured equipment will not be still in the hand of Irrigation Department, the long span concrete placing is quite favorable for the main canal rehabilitation. The Team, upon confirmation with Construction Division (2), will propose such long span concrete placing.

- 8) ID side commented on machineries to be procured under the Project that the ID and Myanmar government prefer Japanese products rather than other country-made ones for not only this Project but also other loan funded projects. If ID/Myanmar government decides to borrow money under Japanese ODA loan, ID intends to purchase Japanese manufactured machineries, which should be an advantage or a preferred condition for a borrower country.

JICA Myanmar Office replied that JICA is very happy to hear such good reputation on Japanese products; however JICA has rules and regulation on ODA loan with an untied procurement to keep transparency under OECD members. This is why it is hardly applied to appoint Japanese products only.

The Team added to JICA Myanmar Office that the Team is to recommend machineries, for which Japanese manufacturers have much technical advantages than other countries such as a low-emission engine coupled with hybrid system. If ID side agrees to set machineries with such high specification in, it may be possible to procure Japanese products; however, it requires consultant procurement and the following tender procedure for selecting the contractor for the machinery supply. In any case, international tender bidding procedure takes time, and therefore ID side will need to arrange necessary machineries to proceed the rehabilitation works during this procedure period.

- 9) ID side replied that ID will be able to deploy some necessary machinery from other projects to this Project during the initial stage of rehabilitation work when the to-be-procured machineries are not yet ready. In order to minimize the period for consultant procurement and equipment procurement, ID side requests JICA to provide grant aid for the detail design consulting services on the Project and also so-called retro-active disbursement for the expenditures for the rehabilitation works.


JICA Myanmar Office replied that JICA internal discussion on the provision of grant aid for the detailed design has not yet been completed and it is still under examination. If decision is made by JICA, JICA will let ID know accordingly.

- 10) ID side commented that establishment of canal operation rule shall be included in this Project. Then, demonstration farm for black gram growing shall be one of the project components. In this regard, some farm machinery shall also be introduced under this Project.

The Team replied that operation rules, which are a part of water management, will be examined under the Survey and incorporated in the succeeding report together with an idea of establishing farmer water users association. Also, model farm will be included together with some essential agricultural machineries.

- 11) ID side commented on farmers' organization formulation that JICA procedure takes too much time in comparison with procedures that the ID has done to date in Nay Pyi Taw. There is one question why it takes such long time for this issue.

The Team replied that the Team will complete farmland re-plotting agreement amongst all the stakeholder farmers before the physical commencement of land consolidation works. ID's project implementation model is different from this procedure that ID implements farmland consolidation work first and SLRD arranges farmland re-plotting later. The arrangement by SLRD at a latter stage always takes time and there is much argument within the farmers accordingly. To avoid this situation, the Team will undertake the re-plotting arrangement first, followed by the physical construction.



Participants to the Inception Report Presentation Meeting at MOAI, 4th July 2013**Irrigation Department (ID)**

1. U Tint Zaw Deputy Director General, Irrigation Department
2. U Min Aung Than Director (Design and Press Section), Irrigation Department
3. U Myint Tun Latt Director, Con(2), Irrigation Department, Pyay
4. U Aung Bo Deputy Director (Planning), Irrigation Department
5. U Myint Thein Deputy Director (Maintenance), Irrigation Department, Pyay
6. U Myint Thuang Assistant Director (Maintenance), Irrigation Department, Pyay
7. U Aung Kyi Assistant Director (3), Con(2), Irrigation Department, Pyay
8. U Myaing Staff Officer, Con(2), Irrigation Department
9. U Zaw Myo Naing Staff Officer (Planning), Irrigation Department

JICA Myanmar Office (JICA Myanmar)

10. Ms. Yoko YAMAZAKI Project Formulation Advisor, JICA Myanmar

JICA Study Team

11. Mr. Kosei HASHIGUCHI Team Leader, JICA Study Team
12. Dr. Motoyoshi HIKASA Co Team Leader, JICA Study Team
13. Mr. Nobutoshi EGUCHI JICA Study Team
14. Ms. Nana NOGUCHI JICA Study Team
15. Mr. Myo Zaw Shein JICA Study Team
16. Mr. Phyto Lin Tun JICA Study Team



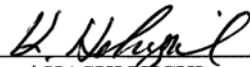
**MINUTES OF MEETING
ON
DRAFT FINAL REPORT
ON
PREPARATORY SURVEY
FOR
THE PROJECT FOR REHABILITATION
OF IRRIGATION SYSTEMS
IN
THE REPUBLIC OF THE UNION OF MYANMAR**

**AGREED UPON BETWEEN
IRRIGATION DEPARTMENT,
MINISTRY OF AGRICULTURE AND IRRIGATION
AND
JICA PREPARATORY SURVEY TEAM,
JAPAN INTERNATIONAL COOPERATION AGENCY**

Nay Pyi Taw, October 10, 2013



(for Director General)
U Tint Zaw,
Deputy Director General,
Irrigation Department,
Ministry of Agriculture and Irrigation
(MOAI)



Mr. Kosei HASHIGUCHI
Team Leader
JICA Preparatory Survey Team,
Japan International Cooperation Agency
(JICA)

Based on the series of discussions between Japan International Cooperation Agency (JICA) and the Republic of the Union of Myanmar, the both parties agreed and signed the Minutes of Discussions on Preparatory Survey for the Project for Rehabilitation of Irrigation Systems signed on 1st August 2012 in Yangon. Consequently, JICA dispatched a team on 18th March 2013 headed by Mr. Kosei HASHIGUCHI, Sanyu Consultants Inc., for the execution of the Preparatory Survey, and accordingly the Team commenced surveys on the project in Myanmar.

The Team, since the arrival in Myanmar, continued survey for grasping present situation of the survey area and identifying issues on malfunction of the irrigation systems to be rectified by the project in Pyay in parallel with confirmation on farmland carry-out ownership and exact acreage at Zabuthiri farmland consolidation area in Nay Pyi Taw. The Team had formulated conceptual plans on rehabilitation of the irrigation systems and basic designs of the farmland consolidation, and then summarized them into a progress report in June 2013. The presentation and discussion on the progress report were made on 4th July 2013 at Head Quarter of Irrigation Department.

Based on the discussions and knowledge exchange made during the progress report meeting, the Team has advanced in carrying out necessary surveys and examinations for the Project and those results were summarized in the Draft Final Report. After submission of the report from the Team to the Irrigation Department, a presentation meeting was held at the Head Office of Irrigation Department in Nay Pyi Taw on October 10, 2013. At the meeting, firstly, the Team explained rehabilitation summary, project planning, project evaluation, model farmland consolidation, conclusion, and recommendations. After explanation, U Tint Zaw, the Deputy Director General of Irrigation Department, expressed thanks to the explanation and appointed participants from Irrigation Department for giving comments on the report and the presentation:

The followings show summary of series of the discussions on the Draft Final Report.

- 1) ID side requested the Team to explain the details of concrete lining for main canals and quality of concrete to use for the main canal lining.

The Team replied that sandy foundation is dominant at the eastern side of Yangon – Pyay railway while silt-clay foundation does at the western side of railway. Due to such natural condition, east side sandy foundation is more likely to be eroded and collapsed by rain and water flow in the canal. To avoid such erosion and collapse, banks of canals shall be excavated and compacted well by machineries before concrete lining; however, this procedure will take time and it is considered for ID to employ this method. Then, it is recommended to remove loose surface soil at canal bank and compact it to keep smooth surface. If the surface of canal bank is not smooth, lining concrete cannot cover soil surface and it becomes a cause of water intrusion. If high water table is estimated at the back side of canal, weep holes shall be provided so as to reduce water pressure from the back side of lining.

The Team continued that there is only one issue on distribution canal. The point is whether mortar is placed properly between bricks or not. If volume and quality of the mortar are not enough, rain water or seepage comes into void space between bricks and push foundation soil out, then, erosion will begin. Such consideration and treatment shall be applied for sandy foundation area. As for silt and clay dominant area, high water content during rehabilitation will cause cracks in dry season. This is why dry condition shall be kept during the rehabilitation period, so that pumping and drainage at the rehabilitation site, ensuring the site dry, will have to be well considered.

- 2) ID side commented that ID has already been employing such method with procedure explained by the Team. This is why there is not so much problem for applying such construction procedure. Then, ID side raised a question whether there is any difference in slope stability between 1: 1.5 and 1: 1.25.

The Team replied that it cannot be said exactly without execution of stability analysis but there won't be any particular difference between slopes 1: 1.25 and 1: 1.5 especially for distribution canal which has canal bank of 1.0 – 1.5m in height. Only one issue is to prevent soil foundation from water intrusion, which may cause erosion. If loose soil is placed between foundation and lining, stability analysis will

result in a slope collapse.

- 3) ID said that ID wants to revise canal bank slope that no-lining canal bank slope is now 1: 1.5 while lining canal is designed at 1: 1.25. ID thinks that the lining canal shall also be of slope 1: 1.5, and in order to avoid any collapse and sliding, backfilling of soil shall carefully be examined and selected. Lining area shall be examined in order to reduce rehabilitation cost. In addition, ID side raised a question how many number of bridge and watering point for cattle are necessary.

The Team replied that the Team considers lining slope of 1:1.5 is acceptable. As for bridge and watering point for cattle, the Team has not yet conducted required study and it will be carried out during detailed design. Based on current condition, use of draft cattle is still dominant in the Project area, so that number of such facilities shall carefully be examined.

- 4) ID requested to explain detail procedures of steel pipe cutting and necessary excavation area of dam downstream slope for steel pipe replacement of North Nawin irrigation system. ID continued further questioning whether it is possible to conduct such steel pipe replacement work during rainy season or not. ID also asked the Team if there are any methods to replace the steel pipe without excavating dam downstream.

The Team replied that it is difficult to answer such question because detail design has not yet been done. The Team added that rehabilitation period shall be one month or little more than that when water level of reservoir becomes lowest. Detailed study is necessary to examine rehabilitation method of pipe replacement which includes study for necessity of dam downstream excavation.

- 5) ID inquired about possibility for integration of several drops along a canal to raise water head so as to generate hydropower as much as possible. Such arrangement will contribute to the expansion of rural electrification which is one of the important government policies.

The Team replied that such examination can be done in detail design but North Nawin and South Nawin are excluded for undertaking the detail design. Wegyi and Taung Nyo irrigation systems can be examined such integration of several numbers of drops.

- 6) ID commented that ID needs tender documents for the procurement of construction machineries as early as possible, and it should be ready in early 2014 in order to receive and use them from 2015.

The Team replied that ID shall request such necessity to JICA directly since the present Survey does not include the work.

- 7) As per North Nawin intake, ID considers intake gates are necessary to be rehabilitated.

The Team answered that the Team considers replacement of intake gates is not necessary, for which only No. 2 gate requires some rehabilitation works. The Team confirmed ID what kind of gate rehabilitation is considered, and the ID replied that rehabilitation of No. 2 gate is enough and rehabilitation is not necessary for other gates at this moment.

- 8) ID requested that JICA shall provide technical transfer of gate operation to ID staff.

The Team replied that Water Management Expert will be dispatched to Myanmar during detail design and construction supervision. As for gate operation, Hydro-mechanical Engineer will conduct technical transfer on gate operation.



Participants to the Draft Final Report Presentation Meeting at MOAI, 10th October 2013**Irrigation Department (ID)**

- | | |
|----------------------|---------------------------------------------------------------|
| 1. U Tint Zaw | Deputy Director General, Irrigation Department |
| 2. U Tint Lwin | Director, Procurement, Irrigation Department |
| 3. U Kyaw Zaw | Director, (Planning and Work), Irrigation Department |
| 4. U Myint Tun Latt | Director, Con(2), Irrigation Department |
| 5. Daw Aye Aye Myint | Director, Account, Irrigation Department |
| 6. U Shwe Hton | Deputy Director, Irrigation Department |
| 7. U Myint Thein | Deputy Director, Pyay, Irrigation Department |
| 8. U Soe Htun Aung | Assistant Director, Irrigation Department |
| 9. U Aung Kyi | Assistant Director, Con(2), Irrigation Department |
| 10. U Myint Thaug | Assistant Director, Con(2), Irrigation Department |
| 11. U Myo Aung | Assistant Director (Planning and Work), Irrigation Department |
| 12. U Aung Kyaw Oo | Staff Officer, Con(2), Irrigation Department |
| 13. U Zin Wai Phyo | Staff Officer, (Planning and Work), Irrigation Department |

JICA Survey Team

- | | |
|--------------------------|----------------------------------|
| 14. Mr. Kosei HASHIGUCHI | Team Leader, JICA Survey Team |
| 15. Dr. Motoyoshi HIKASA | Co Team Leader, JICA Survey Team |
| 16. Mr. Nobutoshi EGUCHI | JICA Survey Team |
| 17. Mr. Myo Zaw Shein | JICA Survey Team |
| 18. Mr. Phyo Lin Tun | JICA Survey Team |



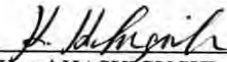

**MINUTES OF MEETING
ON
DRAFT GUIDELINES FOR LAND CONSOLIDATION
PREPARED UNDER
PREPARATORY SURVEY
FOR
THE PROJECT FOR REHABILITATION
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**AGREED UPON BETWEEN
IRRIGATION DEPARTMENT,
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AND
JICA PREPARATORY SURVEY TEAM,
JAPAN INTERNATIONAL COOPERATION AGENCY**

Nay Pyi Taw, May 6, 2014



(for Director General)
U Soe Myint Tun,
Deputy Director General,
Irrigation Department,
Ministry of Agriculture and irrigation
(MOAI)



Mr. Kosei HASHIGUCHI
Team Leader
JICA Preparatory Survey Team,
Japan International Cooperation Agency
(JICA)

Based on the series of discussions between Japan International Cooperation Agency (JICA) and the Republic of the Union of Myanmar, the both parties agreed and signed the Minutes of Discussions on Preparatory Survey for the Project for Rehabilitation of Irrigation Systems on August 1, 2012 in Yangon. Consequently, JICA dispatched a team on March 18, 2013 headed by Mr. Kosei HASHIGUCHI, Sanyu Consultants Inc., for the execution of the Preparatory Survey, and accordingly the Team commenced surveys required for the project formulation.

The Team has, aside from the formulation of rehabilitation plan for the target 4 irrigation systems located in Bago West, been implementing a model pilot project of farmland consolidation at Zabu Thiri township in Nay Pyi Taw since April 2013. The model farmland consolidation works have been completed at early May 2014, during which a lot of experiences and lessons have been accumulated. With the experiences and lessons, the Team has prepared for guidelines for implementing land consolidation project in Myanmar, and hence the presentation and discussion on the draft guidelines were made on May 6, 2014 at the Headquarters of Irrigation Department, Ministry of Agriculture and Irrigation.

At the meeting, firstly, the Team delivered outputs from the model consolidation project, and shared with the meeting participants the contents of the guidelines such as; rationale of land consolidation works, specific issues to tackle under land consolidation, social and environmental consideration, technical matters, and finally conclusion and recommendations. Also, some examples accumulated in Japan were presented. After the presentation, U Soe Myint Tun, the Deputy Director General of Irrigation Department, expressed thanks to JICA as well as the team members, and appointed participants for giving comments on the guidelines and also on the presentation. The followings show the summary of the discussions, questions and answers on the guidelines:

- 1) A participant from Agriculture Mechanization Department (AMD) asked the way of constructing access road from public farm road to the fields if it should be constructed by the government or the farmer themselves?

The JICA team replied that in Japan since the topographic condition is rather steeper than that of Myanmar, it is difficult for the farmers to construct the access road by themselves; thus in most cases the access roads are constructed as a part of the project. In Japan, beneficiary farmers are supposed to bear some percentage of the project cost in that they are to pay back over decade-years. Therefore, if they intend to reduce the project cost, they may request the government not to include the construction of access road, though it is a rare case. The decision whether or not to include access road should be made on consensus with the farmers.

- 2) A participant from Irrigation Department (ID) said that since land consolidation project has just started in Myanmar, there should be a difficulty of requesting the farmers to bear a part of the project cost at this moment.

In this sense, the JICA team is also with the above statement; since most of the Myanmar farmers are still subsistent farmers, they can hardly bear a part of the project cost and therefore the government should arrange the whole project cost, in cases, in collaboration with donors. In Japan, at the stage when the government embarked on such project, there was not enough budget available and therefore the government requested the beneficiary farmers to bear at least some percentage of the project cost.

- 3) A participant from ID asked what arrangement is made in Japan in operating and maintaining irrigation systems.

The JICA team replied that the government, in principle, manages operation and management cost only for the major facilities such as dam/reservoir and big scale of intake facilities, e.g. headworks while other facilities are placed under the responsibility of an association called Land Improvement District (LID) same as water user association (WUA) in other countries. The LID is a legally established organization, and it is in charge of operation, maintenance and management of the irrigation systems. The LID collects irrigation service fee while is used on the operation and maintenance of the irrigation system.

The Team further added that the LID had to operate and maintain their irrigation systems all out of the irrigation fee in the past; however, nowadays since many Japanese farmers are aged whereby there is a difficulty of well maintaining the irrigation systems, there comes some subsidy from the central government. In addition, the size of farm plot designed under land consolidation project has been changed; in the initial stage it used to be less than 1.0 ha (sometimes half acre only) while at latter stage of the land consolidation it has been enlarged to 2.5 acre (1.0 ha) or even 5 acre (2.0 ha) per plot. This is because with the farmers getting aged, there have been no/under-cultivated farm plots emerging, and therefore the government started collecting all these non/under-cultivated farm plots, with which a larger farm plot is arranged.

- 4) A participant from Cooperative Department (CD) questioned the unit in the graph showing the benefit of land consolidation.

The Team replied that it was estimated in terms of unit-acreage in one season, and the results came from 10-sample farm households residing just near the model pilot project area.

- 5) A participant from AMD questioned that the number of machineries means the number of machineries required for the construction which should be completed within 3 months or not. He further continued that AMD usually deploys 8 tractors and 15 tractors for 250 acre and 500 acre respectively for the consolidation work of ploughing and harrowing.

The JICA team replied that the numbers presented in the guidelines were estimated according to the requirement submitted by ID and AMD for the construction of the model pilot land consolidation project. The team will confirm again with the AMD for the tractors required not only for the ploughing and harrowing service carried out just before the cultivation but also for the consolidation work.

- 6) A participant from ID said that according to the guidelines, EIA should be carried out by ID/the government; however, if there is possibility or not for the Japanese government to support the EIA.

The JICA team replied that donor can support the process of EIA while the EIA itself should principally be carried out by the project implementer (ID, AMD, or the government). The team further added that since construction works required under land consolidation project are not big in the scale, there could be little requirement to measure air pollution, water pollution, noise level with sophisticated measurement devices, rather it could be accepted by monitoring complaints from nearby residents and conducting regular check up for the machineries, etc.

The JICA Team also added that there may be a discrepancy between the environmental regulation of the recipient country and that of the donors including the World Bank, Asian development Bank, etc. In this case, the recipient country should follow the guidelines prescribed by the donors as long as the recipient government is to utilize the donor fund.

- 7) A participant from ID stated that it is a good experience to have established a legally entitled farmer organization in the model pilot project area. The government, aside from the model pilot project, has carried out number of land consolidation projects, and the farmers around Nay Pyi Taw area tend to agree the implementation of farmland consolidation while there may be many farmers who are not willing to implement the project in rural areas. However, even in such case, with the evidence of benefits which were shown during the demonstration, the farmers could accept the land consolidation works, and thus assistances from Japanese side are further requested in other project areas.

The JICA team responded by saying as the benefits get known well to farmers, they start requesting the consolidation works. However, there may be still some farmers who are against such consolidation works. In this case, the point is that the ones who can persuade such farmers are the colleague farmers, e.g. village chairperson, village leaders, friend farmers, rather than the government officers. Even if such farmers may look persuaded to accept the consolidation project by the government officers, they may have different

thinking in mind. To amicably settle this situation, the colleague farmers should take the role of persuading such farmers, which in fact is the way of how Japanese farmers have been doing.

- 8) A participant from ID asked that he heard there are 2 types of organizations in Japan, e.g. water user association and cooperative union, and whether they are the same or different?

The JICA team replied that the two organizations are different each other. The water user association, called LID in Japan, is organized by beneficial area basis while the cooperative union established by activity basis. If a farmer is the beneficiary of an irrigation system, he/she **must** be the member of the LID while whether or not to join cooperative union is entirely on his/her will. Since most of the irrigation systems in Japan are operated by the farmer organization, LID, all the beneficiary farmers **must** be the member and pay the irrigation fee, which is utilized to operate and maintain the system.

- 9) A participant from CD suggested that the farmer organization established under the model pilot project is different from those organizations established and registered with the CD to date, and therefore the name of the organization, a Farmer Cooperative Organization, may be better changed.

The JICA team replied that since there is only the law at present specifying the establishment of the farmer cooperative organization; the team established the farmer organization with the law. There is a need of providing legal entity status to the established organization, with which the organization can be the official owner of the common properties which are the farm roads, irrigation and drainage canals. The team further continued that in order to avoid confusion, the organization could have been established as water user association if there were such law. The team therefore suggested that in near future there should be a law specifying the establishment of legally entitled water user association, which can be applied in land consolidation. In Japan, farmer can join both organizations, LID and union, though the former is a **must** if he/she is a beneficiary of the project.

- 10) Participants showed interest in the population cohort, and said we should promote farm mechanization given such population structure wherein the percentage of younger generation shows more less and less the number of population.

The JICA team explained that the population structure was established based on a survey carried out in Bago West but the trend is almost same as that of Nay Pyi Taw area. The team further suggested that in the coming 10-20 years, Myanmar agriculture is to face shortage of rural farmers, and in order to cope with this situation there should be farm mechanization which can keep intensified farming even with less number of farmers than the present. It is further suggested that in future the standard size of unit farm plot may be enlarged to 2 acres, two-fold bigger than the current standard of 1.0 acre. This situation has in fact taken place in Japan. In addition, farm mechanization in Japan had facilitated the movement of young population from rural areas to urban areas whereby industry sector has flourished thanks to the increased number of workers.

The Deputy Director General of ID thanked JICA and the team members for the dedicated works in the model pilot land consolidation project, and expressed that the Ministry is to utilize the results from the Japanese government assistances as much as possible, and closed the meeting.

Participants to the Draft Guidelines Presentation Meeting at MOAI, May 6, 2014**Ministry of Agriculture and Irrigation (MOAI)**

1. U Soe Myint Tun Deputy Director General, Irrigation Department (ID), MOAI
2. U Pale Maung Deputy Director General, Agricultural Mechanization Dept (AMD)
3. U Maung Ni Director, Department of Agricultural Planning (DAP)
4. U Tint Lwin Director, Irrigation Department (ID)
5. U Naing Win Director, Agricultural Mechanization Department (AMD)
6. U Myint Thein Director, Co-operative Department (CD)
7. Daw Aye Aye Hlaing Deputy Director (DD), Irrigation Department (ID)
8. U Soe Tun Aung Assistant Director (AD), Irrigation Department (ID)
9. U Saw Thet Khine Win Assistant Director (AD), Irrigation Department (ID)
10. Dr. Mu Mu Than Assistant Director (AD), Irrigation Department (ID)
11. U Aung Thiha Assistant Director (AD), Irrigation Department (ID)
12. U Aung Win Assistant Director (AD), Co-operative Department (CD)
13. U Wint Naing Staff Officer (SO), Irrigation Department (ID)
14. U Zeyar Oo Staff Officer (SO), Irrigation Department (ID)
15. U Zin Wai Phyo Staff Officer (SO), Irrigation Department (ID)
16. U Lin Lin Soe Staff Officer (SO), Irrigation Department (ID)

JICA Survey Team

17. Mr. Kosei HASHIGUCHI Team Leader, JICA Survey Team
18. Mr. Nobutoshi EGUCHI Member, (Land Consolidation), JICA Survey Team
19. Mr. Myo Zaw Shein National Staff, JICA Survey Team
20. Mr. Phyo Lin Tun National Staff, JICA Survey Team
21. Mr. Thein Soe Min National Staff, JICA Survey Team
22. Mr. Win Hein Tun National Staff, JICA Survey Team

APPENDIX-II

IRRIGATION AND DRAINAGE

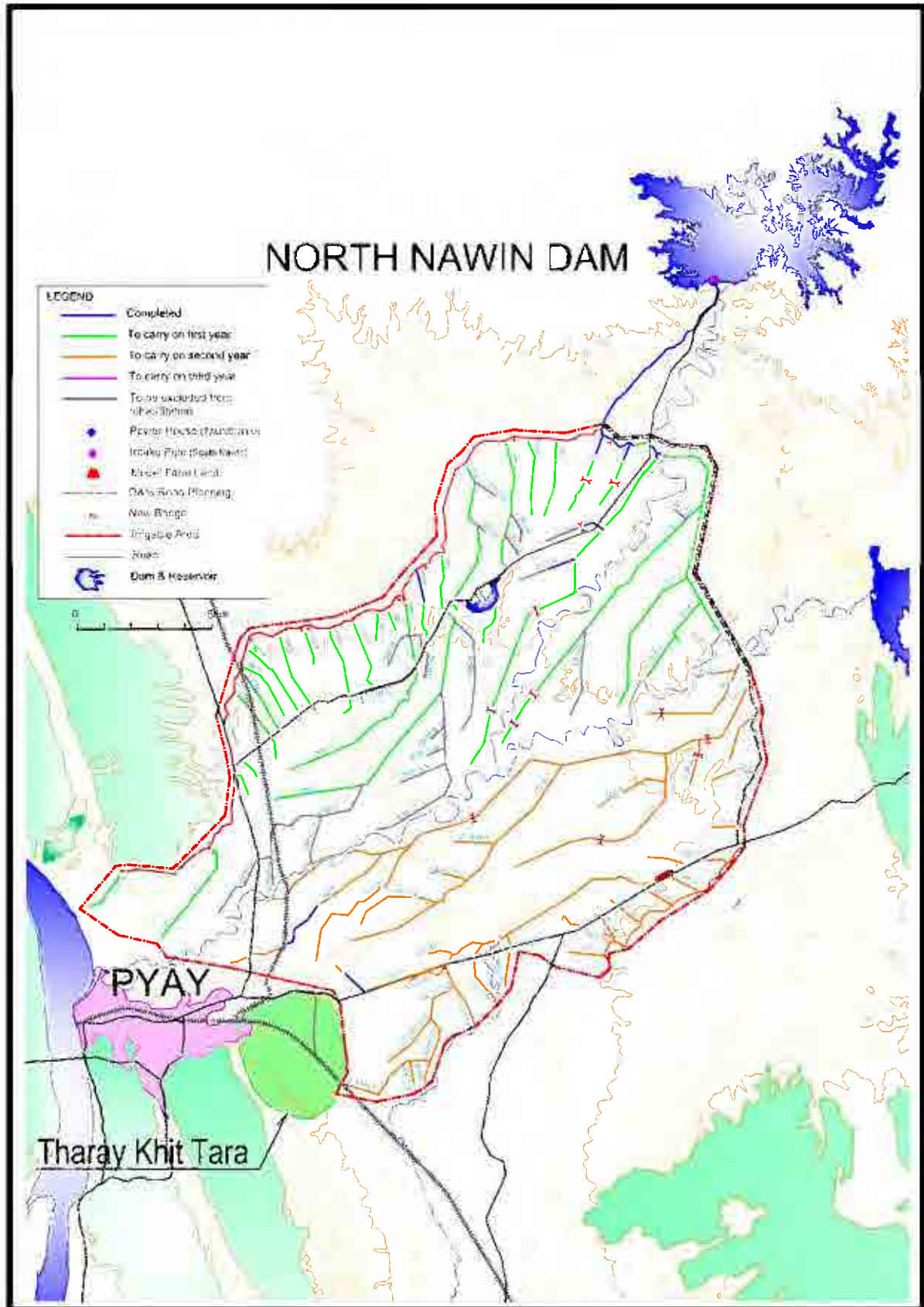
APPENDIX II: IRRIGATION AND DRAINAGE

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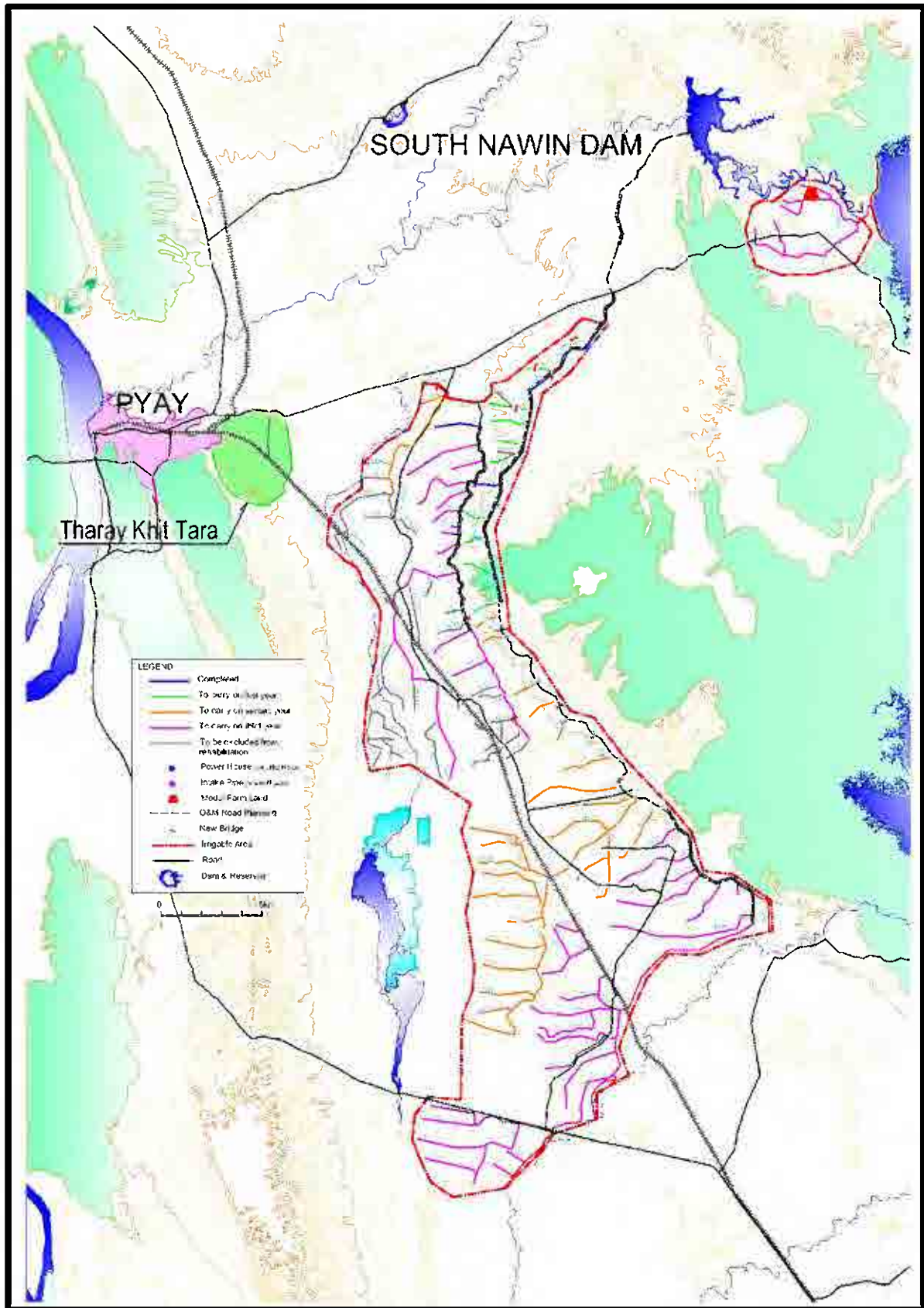
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II.1 Location Map of Irrigation Systems

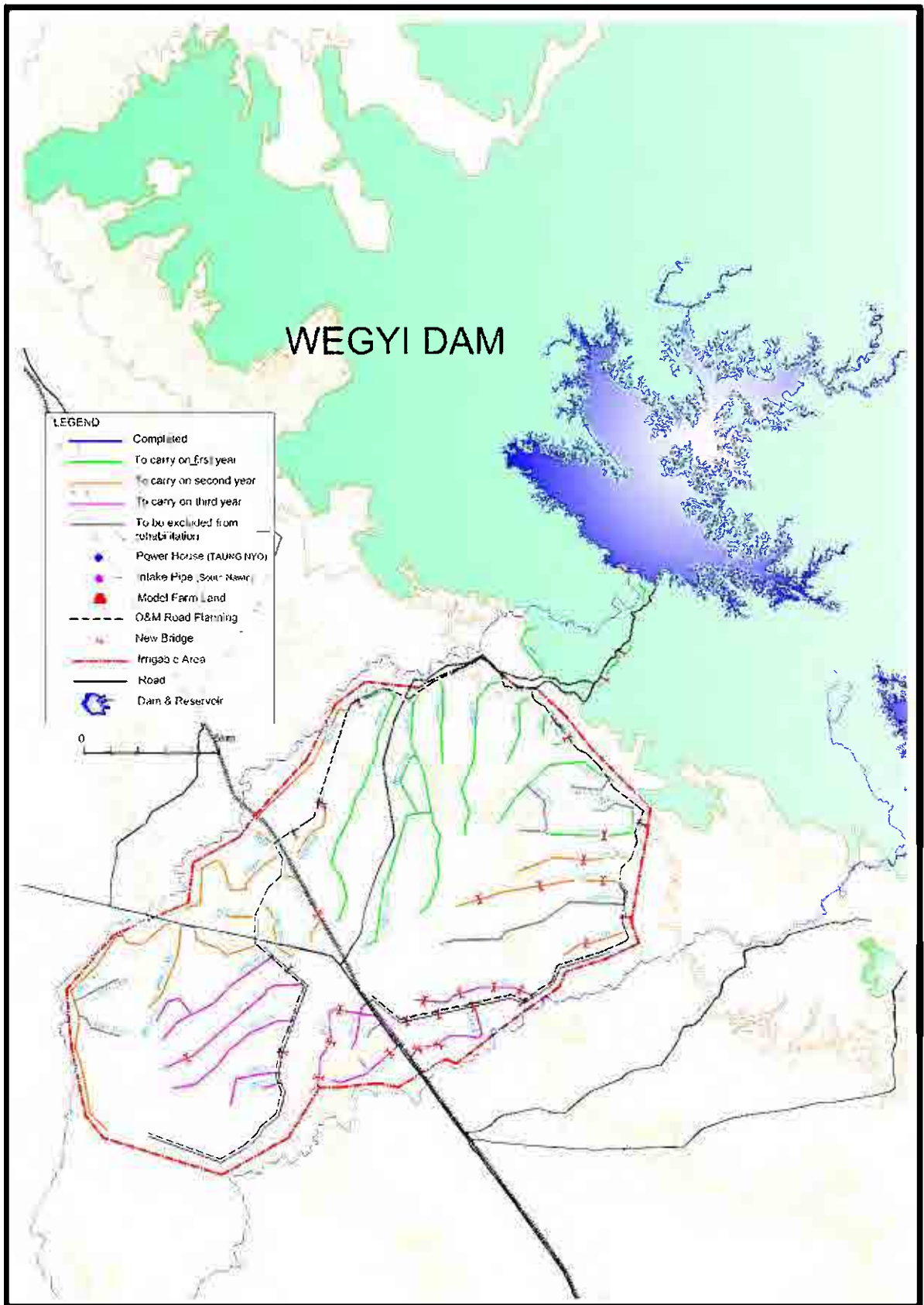
II.1.1 Location Map of North Nawin Irrigation System



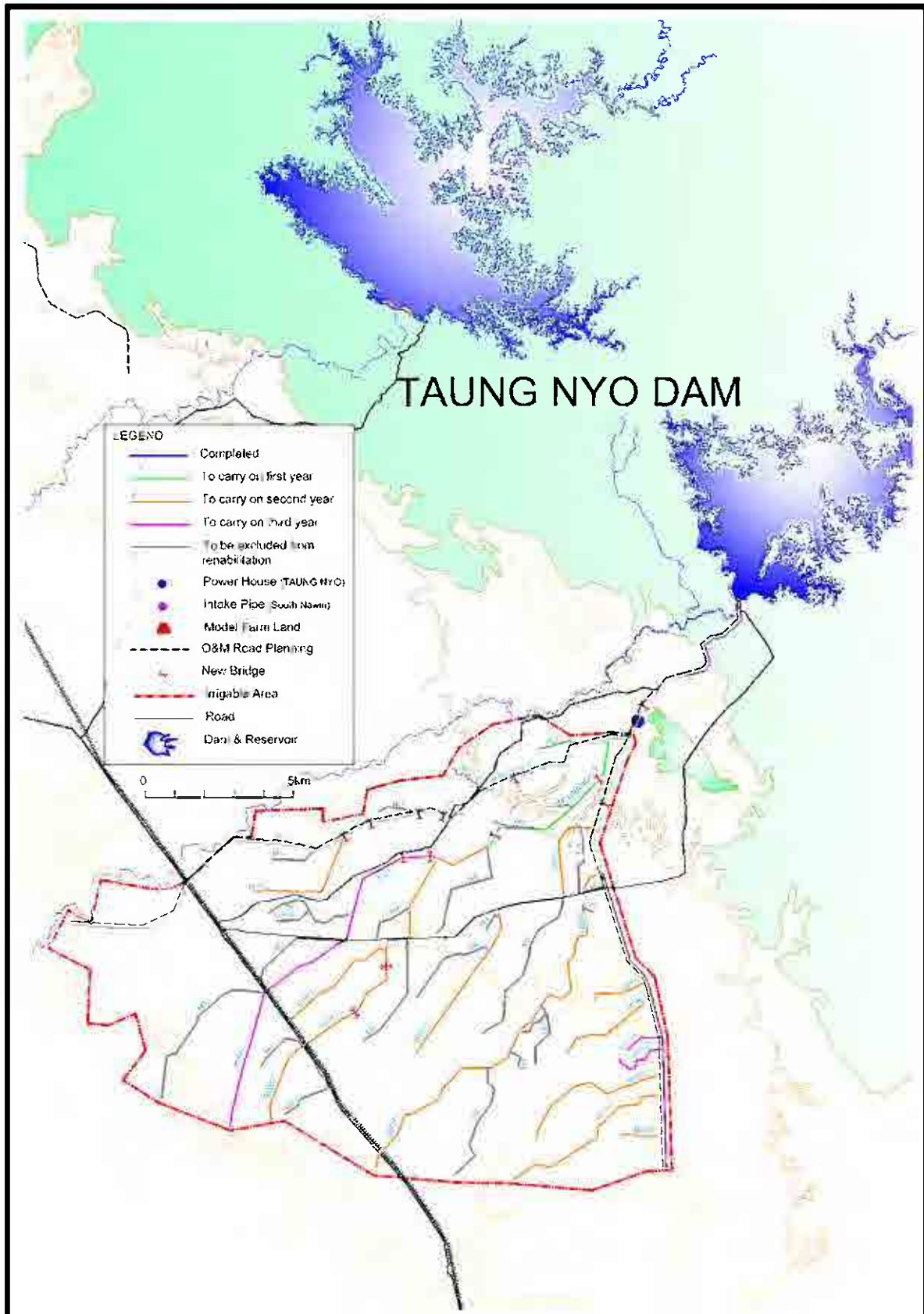
II.1.2 Location Map of South Nawin Irrigation System



II.1.3 Location Map of Wegyi Irrigation System



II.1.4 Location Map of Taung Nyo Irrigation System



II.2 Examination on Irrigation Water Requirement for Paddy

In designing the rehabilitation of North and South Nawin Irrigation Systems, following unit water requirement for monsoon paddy is applied according to the discussions hereunder:

Table 2.1 Recommended Design Value for Irrigation Demand in North and South Nawin Projects

Category	Value	Remarks
Main Canal Discharge	1.0 l/sec/ha	Employed in examining the whole irrigation system capacity. Peak discharge shall partially be applied in preparation stage.
Distribution Canal Discharge	2.0 l/sec/ha	Employed in examining the capacity of each distribution canal which is operated on rotational basis.
Minimum Discharge for Distribution Canal	0.85 l/sec/ha	Employed in examining the capacity of each distribution canal which requires continuous water supply without rotation

Source: JICA Survey Team (2014)

II.2.1 Crop Water Requirement and Irrigation Demand in General

According to FAO (1986)¹, 'crop water requirement' is defined as the depth (or amount) of water needed to meet the water loss through evapo-transpiration. This theory is based on Penman equation² to calculate evaporation from an open water surface through combination of several factors such as daily mean temperature, wind speed, relative humidity, and solar radiation. If field measurements of these factors are not available, calculation of crop water requirement has to be estimated by other means.

FAO (1986) first provided an approximate water requirement, and further FAO (1992)³ introduced approximate average value of net crop water requirement though it may seem to be larger in comparison with others. Several studies have been conducted to examine actual irrigation demand and some useful results are available. The following table shows those paddy water requirements reported by different researchers and organizations including the ones provided by FAO:

Table 2.2 Available Information on Paddy Water Requirement and Irrigation Demand

Author(s)	Values and explanations
FAO (1992)	1.5 l/sec/ha for net water requirement (gross requirement: 3.0 l/sec/ha)
FAO (1986)	8.4mm/day – 17.4mm/day (1 l/sec/ha – 2 l/sec/ha)
Tabbal et al (1981) ⁴	Peak Gross Demand: 1.5 l/sec/ha; pre-saturation, 1.0 l/sec/ha; crop growth in Philippines
JIID (1998) ⁵ , Maurice (2005) ⁶	Tegal curve, 1 l/sec/ha for 150ha, 0.8 l/sec/ha for over 700ha of command area in Indonesia
H. Tanji et al (2010) ⁷	4 – 5 mm/day (0.46-0.58 l/sec/ha for net requirement, 0.92-1.16 l/sec/ha for gross) in Cambodia
Maina M. M. (2012) ⁸	1.5-4.1mm/day (0.17 – 0.47 l/sec/ha for net requirement, 0.34 – 0.94 l/sec/ha for gross requirement) in Malaysia

Note: some figures in the table are calculated from the original reports, and gross irrigation demands are calculated by using irrigation efficiency of 50%.

As it is shown in the table, paddy water requirement has wide range from 0.17 l/sec/ha to 1.5 l/sec/ha in net, about 5 times difference between the smallest and the largest one. As the results, gross paddy irrigation demands can be calculated and they have a range from 0.34 l/sec/ha to 3.0 l/sec/ha. For calculation of gross paddy water requirement, the following formula is applied.

¹ FAO (1986). Irrigation Water Management: Irrigation Water Needs. Rome

² Penman, H.L. (1948): Natural evaporation from open water, bare soil and grass. Proc. Roy. Soc. London A(194)

³ FAO (1992). Irrigation Water Management: Training Manual No. 6 - Scheme Irrigation Water Needs and Supply

⁴ Tabbal, D.F. & Wickham, T.H. (1981). Effects of location and water shortages in an irrigated area. IRRI.

⁵ Japan Institute of Irrigation and Drainage (JIID) (1998). 100 articles for overseas development cooperation

⁶ Maurice William Ertsen (2005). Emergence of an engineering irrigation design approach in the Netherlands East Indies and its legacy 1830–1990

⁷ H. Tanji, Hirohide Kin, Shintaro Kobayashi (2010). The Paddy Water Demand Paradox: Can you solve it?

⁸ Maina M. M. et al (2012). Evaluation of Field Measurements and Estimated Rice Crop Water Requirements. PAWEES 2012 International Conference

Paddy Irrigation Demand = Paddy Water Requirement X 100 e

Where, e: irrigation scheme efficiency (50% in FAO, 2002)

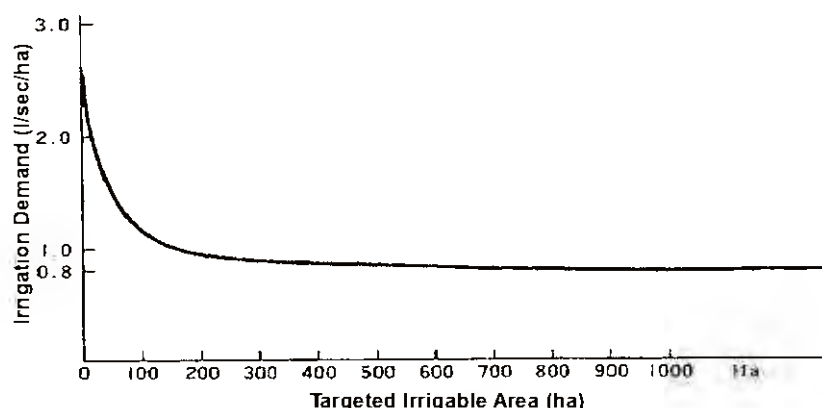


Figure 2.1 Tegal Curve for Irrigation Demand Designing

Source: Japan Institute of Irrigation and Drainage (1998)

General water requirement of paddy cultivation for worldwide is explained in FAO (1992) and FAO (1986) and it ranges from 1.0 l/sec/ha to 3.0 l/sec/ha while the studies on irrigation demand of paddy carried out in Southeast Asia in Table 1 show somewhat low value ranging from 0.34 l/sec/ha to 1.5 l/sec/ha.

There are also some common irrigation demand values for the purpose of irrigation planning in different cases:

Table 2.3 Common Value for Irrigation Requirement

Case	Irrigation Requirement	
Peak Irrigation Demand and/or Pre-saturation	20mm/day (2.31 l/sec/ha)	17.3mm/day (2 l/sec/ha)
Rice Growth Irrigation Demand	10mm/day (1.16 l/sec/ha)	8.6mm/day (1 l/sec/ha)

Source: JIID (1998), FAO (2002)⁹

II.2.2 Review of Irrigation Demand

This section reviews irrigation demand presented in the original design for North Nawin Irrigation System and South Nawin Irrigation System¹⁰. Table 2 shows irrigation demand of each canal for different irrigation blocks in North Nawin Project based on calculation of existing available data. It is noted that the irrigation demand in North Nain Irrigation System differs by each irrigation block and it ranges from 0.36 l/sec/ha in CR-10 as the minimum value to 2.09 l/sec/ha in CR-18 as the maximum value. North Nawin Irrigation System primarily aimed at irrigating UPLAND crops such as cotton and sesame with various cropping pattern. This is why unit irrigation demand differs by irrigation block.

South Nawin Irrigation System was designed primarily to cultivate monsoon paddy in its command area. Design discharge for distribution canal (irrigation block) was set at 2.424 l/sec/ha while the main canal discharge was designed at 1.405 l/sec/ha. Discharge design for the distribution canals had considered covering the peak discharge required for land preparation known as period between pre-saturation stage and ponding stage before the nursery stage.

⁹ FAO (2002). Sustainable rice production for food security. Proceedings of the 20th Session of the International Rice Commission, Bangkok, Thailand, 23-26 July 2002

¹⁰ Note that for Wegyi and Tanug Nyo Irrigation Systems, irrigation demand will be examined during detail design stage of those systems.

Table 2.4 Existing Irrigation Design for North Nawin Irrigation System

Canal	Irrigable area (ha)	Discharge (m ³ /s)	Irrigation Demand (mm/s/ha)	Irrigation Demand (l/sec/ha)
CR-1	312.4	0.198	5.48	0.63
CR-2	156.0	0.132	7.31	0.85
CR-3	597.2	0.437	6.32	0.73
CR-4	611.2	0.532	7.52	0.87
CR-5	3,045.6	2.170	6.16	0.71
CR-6	154.4	0.132	7.39	0.85
CR-7	977.6	0.700	6.19	0.72
CR-8	48.0	0.066	11.88	1.38
CR-9	49.6	0.046	8.01	0.93
CR-10	258.8	0.092	3.07	0.36
CR-11	206.8	0.119	4.97	0.58
CR-12	91.2	0.046	4.36	0.50
CR-13	264.8	0.145	4.73	0.55
CR-14	190.4	0.092	4.17	0.48
CR-15	87.2	0.092	9.12	1.06
CR-16	139.2	0.119	7.39	0.85
CR-17	49.6	0.046	8.01	0.93
CR-18	231.6	0.484	18.06	2.09
CL-1	257.2	0.138	4.64	0.54
CL-2	248.0	0.092	3.21	0.37
CL-3	1,930.0	1.126	5.04	0.58
CL-4	1,259.2	1.148	7.88	0.91
CL-5	709.6	0.528	6.43	0.74
CL-6	476.4	0.308	5.59	0.65
CL-7	223.6	0.462	17.85	2.07
CL-8	6,747.6	4.534	5.81	0.67
CL-9	40.8	0.066	13.98	1.62
CL-10	149.6	0.132	7.62	0.88
CL-11	140.0	0.132	8.15	0.94
CL-12	332.0	0.159	4.14	0.48
CL-13	3,612.4	2.397	5.73	0.66
CL-14	90.4	0.093	8.89	1.03
CL-15	143.6	0.093	5.60	0.65
CL-16	212.0	0.119	4.85	0.56
CL-17	84.4	0.066	6.76	0.78
CL-18	2,454.0	1.620	5.70	0.66
CL-19	176.8	0.132	6.45	0.75
CL-20	545.2	0.330	5.23	0.61
CL-21	139.6	0.132	8.17	0.95
CL-22	309.6	0.198	5.53	0.64
CL-23	88.0	0.066	6.48	0.75
CL-24	156.0	0.066	3.66	0.42
CL-25	57.6	0.066	9.90	1.15
CL-26	165.6	0.132	6.89	0.80
CL-27	3,173.6	2.388	6.50	0.75
CL-28	158.0	0.092	5.03	0.58
CL-29	198.8	0.138	6.00	0.69
CL-30	156.4	0.092	5.08	0.59
CL-31	232.0	0.138	5.14	0.59
CL-32	171.2	0.119	6.01	0.70
CL-33	87.6	0.046	4.54	0.53
CL-34	243.2	0.155	5.51	0.64
CL-35	258.0	0.119	3.99	0.46
CL-36	145.6	0.092	5.46	0.63

Source: North Nawin Feasibility Study Report

Maruyama and Tanji (1997)¹¹ discussed well about necessity of irrigation according to rice growth stages. The most needed period of irrigation is the initial deep ponding period and irrigation requirement of this stage is set as the peak irrigation discharge for distribution canal. The design concept of South Nawin Irrigation System aims at irrigating monsoon paddy for the whole command

¹¹ Maruyama, T and K K. Tanji (1997). Physical and Chemical processes of soil related to paddy drainage. 99-101.

area while North Nawin Irrigation System targeted upland crop cultivation. The design irrigation demand calculated for South Nawin Project seems to be a bit conservative and/or safety side in comparison with the common value of irrigation requirement and study results carried out in Southeast Asia as aforementioned. The design water demand prepared for North Nawin Project needs to be revised for the sake of monsoon paddy cultivation because a primary crop in the irrigation area is paddy nowadays.

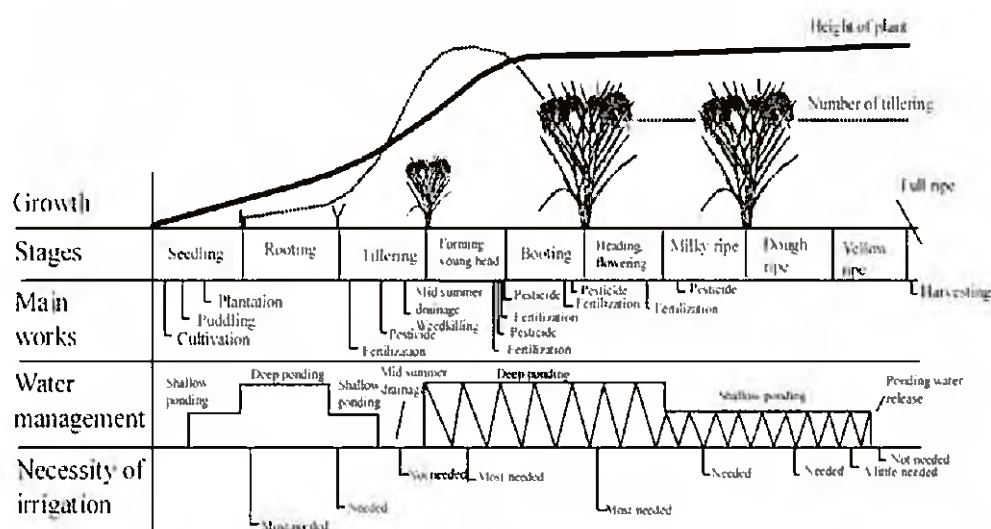


Figure 2.2 Rice Growth, Agricultural Works and Water Management

Source: Maruyama and Tanji (1997)

II.2.3 Irrigation Demand for Irrigation System Rehabilitation

Supplemental irrigation is required for the North Nawin Irrigation System and South Nawin Irrigation System to support monsoon paddy cultivation during the rainy season. This is why it doesn't need to supply a full water demand for paddy growth by irrigation. Theoretical irrigation demand calculation sometimes would result in presenting larger value in comparison with actual crop water consumption as aforementioned.

Common value of irrigation requirement for paddy cultivation has been applied to many irrigation schemes for irrigation planning and it is acknowledged as reliable value. The smaller values of common irrigation demand can be considered to be applicable as the design value of irrigation requirement for the 2 irrigation systems, namely, 2 l/sec/ha for peak irrigation demand and 1 l/sec/ha for rice growth irrigation demand. In addition to this design approach, it shall also be considered that actual irrigation requirement would be smaller than these values in consideration of the recent studies as aforementioned.

The irrigation demand of 0.8 l/sec/ha shown in Tegal curve indicates an irrigation demand for the area wider than 700ha but it shall be increased a bit because North Nawin irrigation system is located at the southern edge of the Central Dry Zone. Thus, 0.05 l/sec/ha is added to 0.8 l/sec/ha and thus 0.85 l/sec/ha is recommended for minimum value for the supplemental irrigation.

It is therefore that the following table summarizes the design discharge in gross term applied in planning the rehabilitation of the 2 irrigation systems; North Nawin and South Nawin:

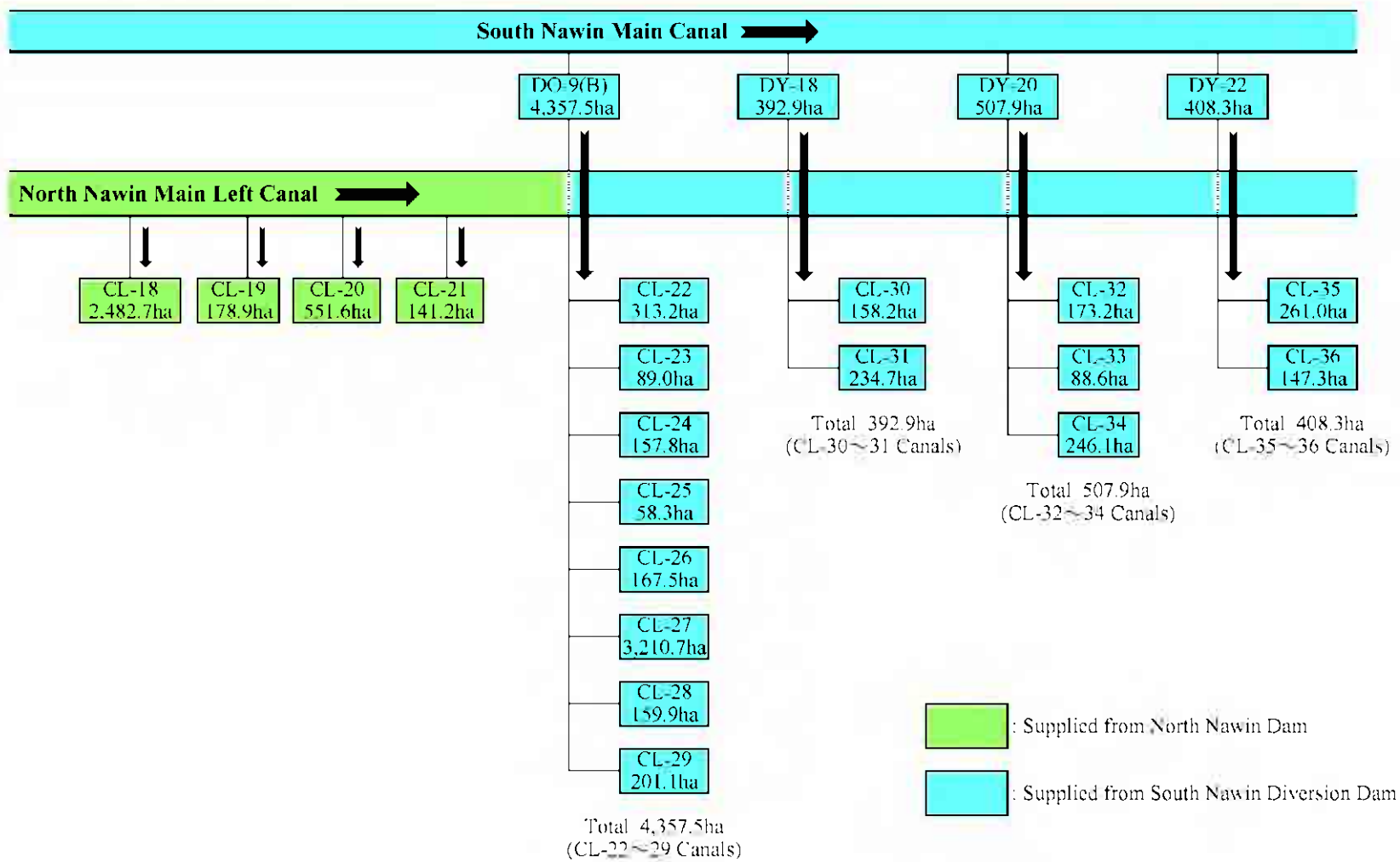
Table 2.5 Recommendable Design Value for Irrigation Demand in North and South Nawin Projects

Category	Value	Remarks
Main Canal Discharge	1.0 l/sec/ha	Employed in examining the whole irrigation system capacity. Peak discharge shall partially be applied in preparation stage.
Distribution Canal Discharge	2.0 l/sec/ha	Employed in examining the capacity of each distribution canal which is operated on rotational basis.
Minimum Discharge for Distribution Canal	0.85 l/sec/ha	Employed in examining the capacity of each distribution canal which requires continuous water supply without rotation

II.3 Schematic Diagram of Irrigation Systems

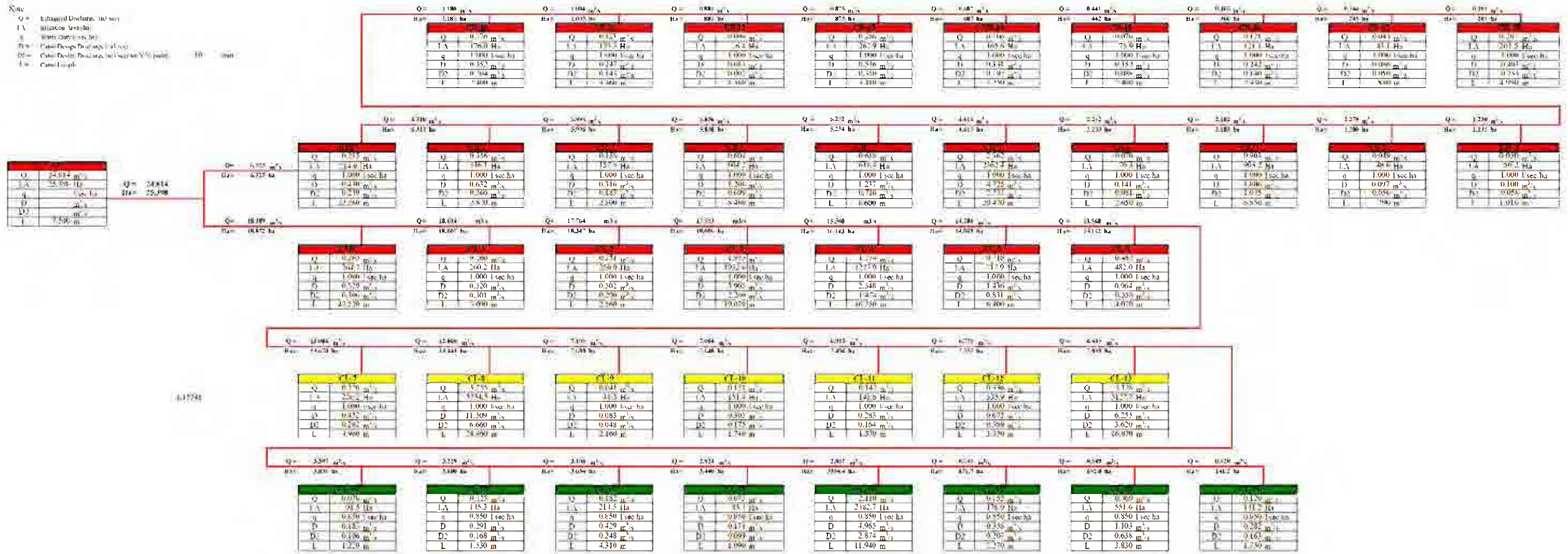
II.3.1 Link Canal Network between North and South Nawin Irrigation Systems

Link Canal Network between South and North Nawin Irrigation Systems



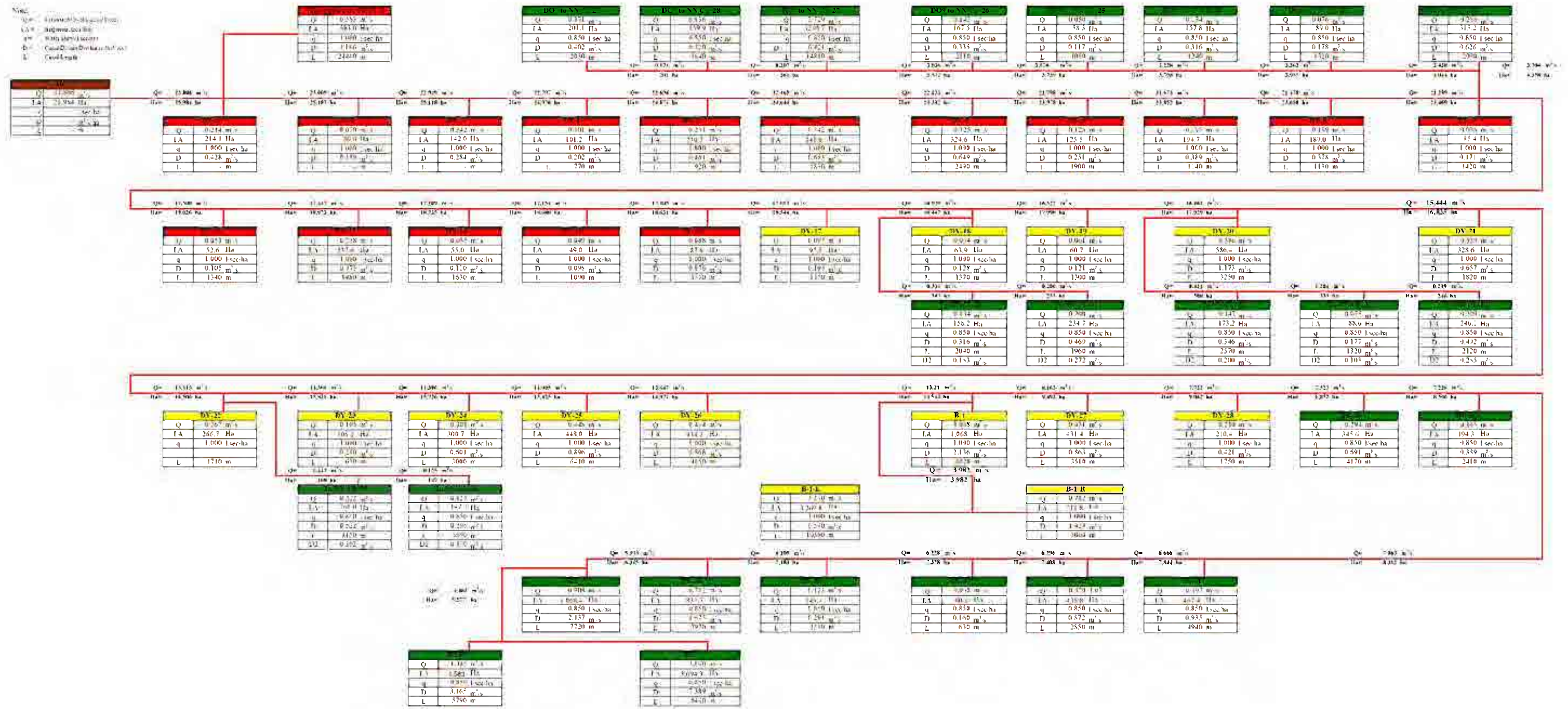
II.3.2 Schematic Diagram of North Nawin Irrigation System

PROJECT FOR REHABILITATION OF IRRIGATION SYSTEM
SCHEMATIC DIAGRAM OF NORTH NAWIN DAM PROJECT CANAL SYSTEM
PEAK WATER REQUIREMENT OF MONSOON PADDY



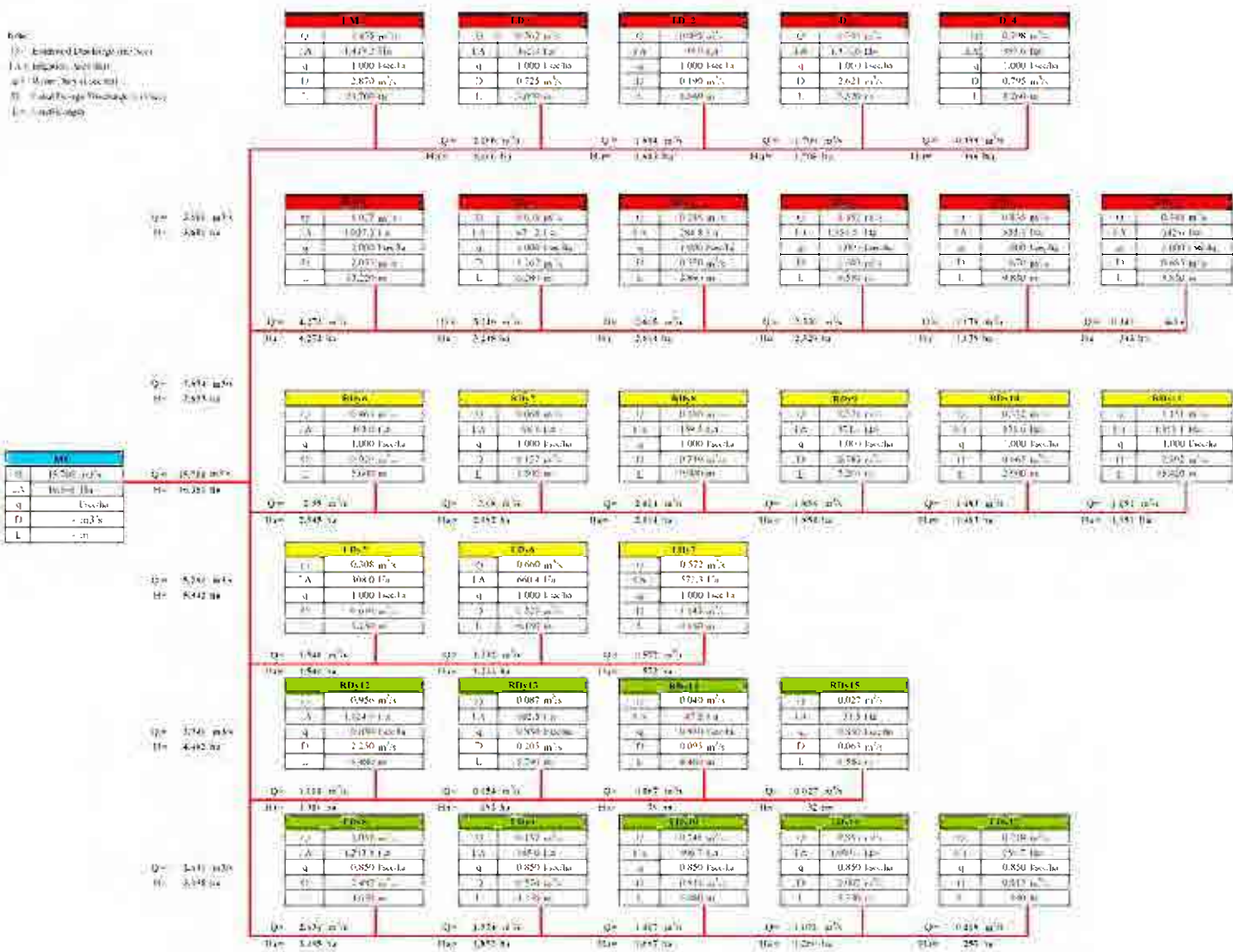
II.3.3 Schematic Diagram of South Nawin Irrigation System

PROJECT FOR REHABILITATION OF IRRIGATION SYSTEM
SCHEMATIC DIAGRAM OF SOUTH NAWIN DAM PROJECT CANAL SYSTEM
PEAK WATER REQUIREMENT OF MONSOON PADDY



II.3.4 Schematic Diagram of Wegyi Irrigation System

PROJECT FOR REHABILITATION OF IRRIGATION SYSTEM
SCHEMATIC DIAGRAM OF WEGYI DAM PROJECT CANAL SYSTEM
PEAK WATER REQUIREMENT OF MONSOON PADDY



II.4 Discharge Capacity of Canal

II.4.1 Discharge Capacity of North Nawin Irrigation System

North Nawin Irrigation System (1/6)

Revised discharges are based on the Schematic Diagram of North Nawin Dam Project Canal System (Peak water requirement of Monsoon Paddy)

Canal Discharge (Q) = A × V

where: A = Cross-section areas of canal

V = Mean velocity at section

$V_{max} = 1.0m/s$ for lining canal, $0.3m/s$ for earth canal

Mean velocity $V = R^{2/3} / n$

where: R = Hydraulic Radius (=A/P) where P = wetted perimeter

S = Canal bed slope (hydraulic gradient)

n = Manning's coefficient of roughness

brick lining n = 0.016

earth lining n = 0.025

Canal Type 1 = earth canal, 2 = brick lining canal

H = height of canal (earth canal) or height of lining (lining canal)

Freeboard of Canal

$Fb = d/3 + hv - 0.05$

Fb = Freeboard (m)

d = water depth at design discharge (m)

hv = velocity head (m)

Canal Name	Discharge		Canal Type	Canal Dimensions (Original)										Canal Dimensions (Revised)										H-h	Judge	Freeboard	
	Original (m ³ /s)	Revised (m ³ /s)		B (m)	h (m)	H (m)	S	A (m ²)	P (m)	R (m)	n	V (m/s)	Q ₁ (m ³ /s)	hh (m)	A (m ²)	P (m)	R (m)	n	V (m/s)	Q ₂ (m ³ /s)	hh-h (m)	H-h (m)	Fb (m)				
Main Canal	22900	24814	2	4.8	2.438	2.43	0.000	19.32	12.68	1.52	0.016	1.17	22.67	2.55	20.56	13.04	1.48	0.016	1.20	24.63	0.11	OK	0.19	0.25			
MRC-1	2250	6310	2	1.219	1.270	1.473	1.111	3.36	3.28	0.67	0.016	1.44	5.14	1.30	3.20	3.38	0.69	0.016	1.46	5.40	0.03	OK	0.17	0.22			
MRC-2	2200	5994	2	1.219	1.245	1.473	1.111	3.44	3.20	0.66	0.016	1.43	4.97	1.37	3.56	3.3	0.67	0.016	1.44	5.14	0.03	OK	0.20	0.22			
MRC-3	2070	4836	2	1.219	1.219	1.473	1.111	3.34	3.1	0.65	0.016	1.41	4.72	1.28	3.48	3.22	0.67	0.016	1.43	4.97	0.03	OK	0.22	0.22			
MRC-4	490	9232	2	1.219	1.499	1.778	3.333	4.63	6.01	0.77	0.016	0.91	2.22	1.4	4.84	6.18	0.79	0.016	0.92	4.47	0.04	OK	0.24	0.17			
MRC-5	404	4614	2	1.219	1.372	1.575	3.333	4.02	4.61	0.72	0.016	0.87	3.49	1.45	4.40	5.86	0.72	0.016	0.89	3.35	0.08	OK	0.12	0.16			
MRC-6	870	2242	2	0.914	1.092	1.321	3.333	2.49	4.41	0.56	0.016	0.74	1.84	1.11	2.56	4.47	0.57	0.016	0.78	0.91	0.02	OK	0.21	0.13			
MRC-7	180	2182	2	0.914	1.067	1.270	3.333	2.40	4.47	0.55	0.016	0.73	1.75	1.10	2.42	4.43	0.57	0.016	0.78	0.87	0.03	OK	0.17	0.13			
MRC-8	1060	1779	2	0.914	0.838	1.016	3.333	1.64	3.60	0.46	0.016	0.64	1.06	0.83	1.68	3.63	0.46	0.016	0.65	1.09	0.01	OK	0.17	0.11			
MRC-9	0.970	1.230	2	0.914	0.813	0.965	3.333	1.57	3.57	0.45	0.016	0.63	0.99	0.84	1.65	3.60	0.46	0.016	0.64	1.06	0.03	OK	0.13	0.11			
MRC-10	0.970	1.180	2	0.914	0.813	0.965	3.333	1.57	3.57	0.45	0.016	0.63	0.99	0.83	1.59	3.54	0.45	0.016	0.64	1.01	0.01	OK	0.15	0.11			
MRC-11	0.900	1.004	2	0.914	0.78	0.965	3.333	1.49	3.43	0.44	0.016	0.62	0.93	0.76	1.47	3.35	0.42	0.016	0.61	0.86	-0.03	OK	0.21	0.23			
MRC-12	0.800	0.881	2	0.914	0.737	0.914	3.333	1.35	3.27	0.41	0.016	0.60	0.81	0.71	1.38	3.19	0.40	0.016	0.59	0.75	-0.03	OK	0.20	0.19			
MRC-13	0.70	0.875	2	0.914	0.7	0.914	3.333	1.35	3.27	0.41	0.016	0.60	0.81	0.71	1.38	3.19	0.40	0.016	0.59	0.75	-0.03	OK	0.20	0.19			
MRC-14	0.60	0.60	2	0.610	0.62	0.813	3.333	1.19	3.07	0.39	0.016	0.58	0.69	0.61	0.97	2.75	0.35	0.016	0.54	0.57	-0.09	OK	0.14	0.10			
MRC-15	0.620	0.44	2	0.610	0.737	0.914	3.333	1.19	3.07	0.43	0.016	0.57	0.64	0.78	0.77	2.47	0.31	0.016	0.50	0.29	0.16	OK	0.23	0.09			
MRC-16	0.590	0.365	2	0.610	0.717	0.914	3.333	1.19	3.07	0.35	0.016	0.57	0.64	0.82	0.85	2.27	0.29	0.016	0.47	0.27	0.22	OK	0.29	0.09			
MRC-17	0.480	0.244	2	0.610	0.711	0.813	3.333	1.07	2.89	0.37	0.016	0.56	0.59	0.43	0.49	1.99	0.24	0.016	0.43	0.23	0.28	OK	0.38	0.08			
MRC-18	0.480	0.201	2	0.610	0.447	0.610	3.333	0.84	2.07	0.26	0.016	0.52	0.40	0.27	0.26	1.47	0.17	0.016	0.40	0.18	0.19	OK	0.34	0.09			

Main Canal : H-h > Fb OK, H-hh > 20cm OK

North Nawin Irrigation System (2/6)

Canal Name	Discharge			Canal Type	Canal Dimensions (Original)										Canal Dimensions (Revised)										H-h	Judge	Freeboard	
	Original (m ³ /s)	D (m)	D ² (m ² /s)		B (m)	h (m)	H (m)	S	A (m ²)	P (m)	R (m)	n	V (m/s)	Q ₁ (m ³ /s)	hh (m)	A (m ²)	P (m)	R (m)	n	V (m/s)	Q ₂ (m ³ /s)	hh-h (m)	H-h (m)	Fb (m)				
Distribution Canal																												
CR-1	0.198	0.632	0.366	2	0.305	0.240	0.406	0.26	0.12	0.14	0.016	1.22	0.19	0.25	0.24	0.26	0.17	0.016	1.26	0.2	0.09	NG	0.08	0.19				
CR-2	0.132	0.716	0.183	2	0.305	0.229	0.356	2.70	0.14	0.04	0.016	0.98	0.13	0.27	0.17	1.17	0.15	0.016	1.07	0.18	0.04	NG	0.09	0.12				
CR-3	0.427	1.202	0.699	2	0.305	0.381	0.508	2.17	0.30	0.57	0.016	1.43	0.42	0.48	0.53	1.84	0.24	0.016	1.67	0.70	0.10	NG	0.03	0.21				
CR-3A	0.066			2	0.305	0.178	0.300	2.94	0.09	0.87	0.016	0.82	0.08	There is no change of Discharge														
CR-3B	0.056			2	0.305	0.203	0.346	667	0.11	0.96	0.016	0.59	0.00	There is no change of Discharge														
CR-4	0.572	1.227	0.716	2	0.305	0.408	0.660	4.55	0.48	1.93	0.016	1.16	0.55	0.47	0.58	1.13	0.17	0.016	1.23	0.71	0.06	NG	0.09	0.16				
CR-4-A	0.066			2	0.305	0.157	0.300	2.72	0.08	0.79	0.016	0.87	0.00	There is no change of Discharge														
CR-4-B	0.066			2	0.305	0.152	0.300	2.40	0.08	0.79	0.016	0.82	0.00	There is no change of Discharge														
CR-5	2.110	4.725	2.334	2	1.270	0.991	1.600	1.66	2.44	4.39	0.55	0.016	1.03	2.57	1.12	2.93	4.80	0.61	0.016	1.10	3.73	0.12	OK	0.48	0.17			
CR-5A	0.198			2	0.305	0.381	0.508	3.13	0.33	1.68	0.20	0.025	0.77	0.00	There is no change of Discharge													
CR-5B	0.534			2	0.610	0.610	0.813	7.69	0.93	2.81	0.33	0.025	0.69	0.54	There is no change of Discharge													
CR-5B-1	0.066			2	0.305	0.229	0.406	3.70	0.14	1.13	0.13	0.025	0.54	0.08	There is no change of Discharge													
CR-5B-2	0.066			2	0.305	0.230	0.406	667	0.17	1.21	0.14	0.025	0.47	0.00	There is no change of Discharge													
CR-5B-3	0.264			2	0.305	0.400	0.406	2.44	0.36	1.5	0.21	0.025	0.90	0.12	There is no change of Discharge													
CR-5C	0.696			2	0.910	0.864	1.016	3.333	1.90	4.07	0.47	0.025	0.47	0.30	There is no change of Discharge													
CR-5C-1	0.198			2	0.305	0.432	0.539	3.26	0.41	1.86	0.22	0.025	0.64	0.16	There is no change of Discharge													
CR-5C-2	0.066			2	0.305	0.370	0.508	2.500	0.32	1.64	0.19	0.025	0.77	0.09	There is no change of Discharge													
CR-6	0.132	0.141	0.081	2	0.305	0.229	0.406	2.63	0.14	1.04	0.13	0.016	0.99	0.13	0.18	0.10	0.88	0.11	0.016	0.88	0.08	-0.05	OK	0.23	0.10			
CR-7	0.500	1.806	1.043	2	0.610	0.183	0.660	2.17	0.59	2.15	0.21	0.016	1.18	1.04	0.19	0.60	2.18	0.28	0.016	1.19	1.07	0.01	OK	0.17	0.23			
CR-7A	0.066			2	0.305	0.229	0.406	4.35	0.15	1.13	0.13	0.025	0.50	0.07	There is no change of Discharge													
CR-7B	0.066			2	0.305	0.310	0.457	1.240	0.23	1.39	0.16	0.025	0.54	0.03	There is no change of Discharge													
CR-7C	0.066			2	0.305	0.229	0.356	5.47	0.15	1.13	0.13	0.025	0.56	0.00	There is no change of Discharge													
CR-8	0.066	0.09	0.056	2	0.305	0.330	0.508	5.000	0.24	1.36	0.11	0.016	0.38	0.00	0.21	0.21	1.30	0.17	0.016	0.27	0.05	-0.02	OK	0.20	0.07			
CR-9	0.046	0.190	0.058	2	0.305	0.127	0.300	137	0.06	0.71	0.08	0.016	1.01	0.06	0.13	0.06	0.22	0.08	0.016	1.03	0.06	0.00	OK	0.17	0.11			
CR-10	0.09	0.327	0.204	2	0.305	0.150	0.300	105	0.07	0.9	0.09	0.016	1.26	0.09	0.23	0.13	1.04	0.13	0.016	1.57	0.21	0.08	NG	0.07	0.19			
CR-11	0.119	0.247	0.143	2	0.305	0.203	0.356	1.99	0.17	0.96	0.13	0.016	1.20	0.14	0.21	0.12	0.98	0.12	0.0									

North Nawin Irrigation System (3/6)

Canal Name	Discharge		Canal Dimensions Original											Canal Dimensions (Revised)											Freeboard	
	Original (m³/s)	Revised (m³/s)	Canal Type	B (m)	L (m)	H (m)	S	A (m)	P (m)	R (m)	n	V (m/s)	Q1 (m³/s)	hh (m)	A (m²)	P (m)	R (m)	n	V (m/s)	Q2 (m³/s)	hh-h (m)	Judge	H-hh (m)	Fb (m)		
Main Canal																										
MLC-1	17.540	18.289	2	2.438	1.946	2.235	3.333	9.55	8.70	1.00	0.016	1.82	17.40	1.98	9.71	8.77	1.00	0.016	1.96	19.03	0.02	OK	0.26	0.14		
MLC-2	17.540	17.64	2	2.438	1.946	2.235	3.333	9.55	8.70	1.00	0.016	1.82	17.40	1.96	9.58	8.71	1.00	0.016	1.95	18.64	0.00	OK	0.18	0.14		
MLC-3	17.540	17.413	2	2.438	1.946	2.235	3.333	9.55	8.70	1.00	0.016	1.82	17.40	1.99	9.41	8.68	1.00	0.016	1.94	18.43	-0.01	OK	0.29	0.14		
MLC-4	16.280	15.560	2	1.924	1.702	2.032	3.000	6.21	6.97	0.89	0.016	1.49	16.1	1.68	6.09	6.99	0.88	0.016	2.74	16.70	-0.02	OK	0.58	0.22		
MLC-5	14.820	14.286	2	1.829	1.651	1.930	3.000	4.92	6.83	0.87	0.016	1.45	15.1	1.63	5.81	6.74	0.86	0.016	2.70	15.67	-0.02	OK	0.40	0.20		
MLC-6	14.820	13.468	2	3.048	2.032	2.235	3.333	11.35	9.55	1.19	0.016	1.30	14.7	2.08	11.75	9.70	1.21	0.016	1.29	14.11	0.05	OK	0.16	0.24		
MLC-7	13.900	13.886	2	3.048	2.032	2.388	3.333	11.35	9.55	1.19	0.016	1.21	13.8	2.05	11.90	9.61	1.20	0.016	1.38	14.68	0.02	OK	0.14	0.24		
MLC-8	13.380	12.860	2	3.048	2.007	2.337	3.333	11.14	9.47	1.18	0.016	1.21	13.5	2.03	11.74	9.42	1.19	0.016	1.27	14.40	0.02	OK	0.11	0.21		
MLC-9	8.840	7.705	2	1.829	1.903	2.144	3.333	8.02	9.1	1.01	0.016	1.09	8.75	1.80	7.34	7.99	0.97	0.016	1.06	7.77	-0.11	OK	0.38	0.20		
MLC-10	8.820	7.064	2	1.829	1.903	2.144	3.333	8.01	9.1	1.01	0.016	1.09	8.75	1.79	7.38	7.96	0.96	0.016	1.06	6.8	-0.17	CK	0.39	0.20		
MLC-11	8.800	6.912	2	1.829	1.880	2.134	3.333	7.5	8.4	1.00	0.016	1.08	8.31	1.77	7.79	7.92	0.95	0.016	1.05	5.1	-0.11	OK	0.36	0.19		
MLC-12	8.180	6.721	2	1.829	1.844	2.134	3.333	6.9	7.6	0.99	0.016	1.08	8.21	1.75	7.03	7.43	0.95	0.016	1.04	3.3	-0.10	OK	0.38	0.19		
MLC-13	8.370	6.435	2	1.829	1.844	2.134	3.333	6.9	7.6	0.99	0.016	1.08	8.21	1.71	6.78	7.30	0.95	0.016	1.03	6.99	-0.14	OK	0.41	0.19		
MLC-14	9.940	7.307	2	1.829	1.844	2.134	3.333	6.9	7.6	0.99	0.016	1.08	8.21	1.18	3.90	6.60	0.70	0.016	0.85	3.31	-0.6	OK	0.95	0.15		
MLC-15	9.900	7.229	2	1.829	1.849	1.829	3.333	5.25	6.19	0.86	0.016	0.98	5.71	1.1	3.85	5.57	0.69	0.016	0.85	3.26	-0.38	OK	0.66	0.15		
MLC-16	8.940	5.106	2	1.829	1.549	1.829	3.333	5.63	6.79	0.36	0.016	0.98	5.71	1.14	3.71	5.48	0.68	0.016	0.82	3.10	-0.41	OK	0.69	0.14		
MLC-17	8.710	9.24	2	1.829	1.524	1.78	3.333	5.69	6.1	0.35	0.016	0.97	5.71	1.12	3.62	5.41	0.67	0.016	0.83	2.99	-0.40	OK	0.66	0.14		
MLC-18	8.640	2.651	2	1.829	1.099	1.78	3.333	5.55	6.62	0.34	0.016	0.96	5.74	1.11	3.57	5.38	0.66	0.016	0.82	2.94	-0.79	OK	0.67	0.14		
MLC-19	8.090	0.741	2	1.829	1.194	1.524	3.333	4.47	5.97	0.74	0.016	0.89	5.98	0.84	1.37	3.36	0.38	0.016	0.87	0.77	-0.6	OK	0.98	0.09		
MLC-20	9.910	0.889	2	1.829	1.170	1.524	3.333	4.14	6.89	0.74	0.016	0.88	5.83	0.47	1.14	3.33	0.34	0.016	0.85	0.60	-0.80	OK	1.05	0.09		
MLC-21	5.570	0.120	2	1.924	1.295	1.524	3.333	4.07	5.67	0.72	0.016	0.87	5.84	0.20	0.55	2.16	0.16	0.016	0.82	0.12	1.10	OK	1.12	0.07		
MLC-22	5.570		2	1.924	1.295	1.524	3.333	4.07	5.67	0.72	0.016	0.87	5.84													
MLC-23	5.580		2	1.924	1.244	1.473	3.333	3.83	5.41	0.70	0.016	0.85	5.66													
MLC-24	5.580		2	1.924	1.244	1.473	3.333	3.83	5.41	0.70	0.016	0.85	5.66													
MLC-25	5.200		2	1.924	1.244	1.473	3.333	3.83	5.41	0.70	0.016	0.85	5.66													
MLC-26	5.080		2	1.924	1.210	1.422	3.333	3.72	5.43	0.68	0.016	0.84	5.55													
MLC-27	3.010		2	1.924	1.194	1.422	3.333	3.61	5.34	0.67	0.016	0.82	5.09													
MLC-28	0.810		2	0.914	0.711	0.664	3.333	1.28	3.19	0.40	0.016	0.59	0.76													
MLC-29	0.300		2	0.914	0.686	0.813	3.333	1.71	3.11	0.38	0.016	0.58	0.70													
MLC-30	0.620		2	0.914	0.652	0.62	3.333	1.08	2.95	0.37	0.016	0.56	0.60													
MLC-31	0.500		2	0.914	0.584	0.67	3.333	0.96	2.78	0.35	0.016	0.55	0.51													
MLC-32	0.410		2	0.610	0.610	0.62	3.333	0.84	2.66	0.33	0.016	0.51	0.42													
MLC-33	0.370		2	0.610	0.533	0.660	3.333	0.68	2.37	0.29	0.016	0.48	0.33													
MLC-34	0.390		2	0.610	0.508	0.660	3.333	0.65	2.24	0.28	0.016	0.47	0.29													
MLC-35	0.100		2	0.610	0.381	0.559	3.333	0.44	1.83	0.23	0.016	0.40	0.17													

There is no change of Discharge

○ Main Canal H-hh > Fb ○K H-hh > 70cm ○K

North Nawin Irrigation System (4/6)

Canal Name	Discharge			Canal Dimensions Original											Canal Dimension (Revised)											Freeboard	
	Original (m³/s)	D (m)	D² (m²)	Canal Type	B (m)	L (m)	H (m)	S	A (m)	P (m)	R (m)	n	V (m/s)	Q1 (m³/s)	hh (m)	A (m²)	P (m)	R (m)	n	V (m/s)	Q2 (m³/s)	hh-h (m)	Judge	H-hh (m)	Fb (m)		
Distribution Canal																											
CL-1	0.138	0.320	0.34	2	0.304	0.483	0.381	3.000	0.44	1.84	0.24	0.016	0.31	0.15	0.66	0.75	2.42	0.31	0.016	0.40	0.30	0.18	NG	-0.18	0.09		
CL-2	0.092	0.502	0.290	2	0.304	0.78	0.370	1.48	0.09	0.87	0.11	0.016	1.17	0.11	0.29	0.19	1.25	0.16	0.016	0.51	0.29	0.11	NG	0.48	0.18		
CL-3	0.126	0.995	0.60	2	1.220	0.408	0.660	2331	0.94	2.85	0.33	0.016	1.96	1.84	0.72	1.53	3.82	0.43	0.016	2.34	3.88	0.21	NG	-0.06	0.37		
CL-1-A	0.133			2	0.304	0.36	0.08	5.56	0.30	1.59	0.19	0.025	0.70	0.21													
CL-1-B	0.132			2	0.304	0.300	0.487	3.87	0.33	1.39	0.16	0.025	0.79	0.18													
CL-A	0.066			2	0.304	0.406	0.549	1.420	0.37	1.77	0.21	0.025	0.45	0.17													
CL-B	0.132			2	0.304	0.300	0.457	3.7	0.33	1.39	0.16	0.025	0.84	0.19													
CL-C	0.066			2	0.304	0.406	0.549	1.000	0.37	1.77	0.21	0.025	0.25	0.09													
CL-4	1.446	2.948	1.474	2	0.914	1.219	1.422	3.000	3.34	3.31	0.63	0.025	0.52	1.74	1.08	2.45	4.37	0.56	0.016	0.60	1.4	0.14	OK	0.34	0.12		
CL-5	0.528	1.436	0.631	2	0.610	0.610	0.62	7.14	0.93	2.81	0.33	0.025	0.89	0.83	0.57	2.47	0.51	0.016	1.03	0.84	-0.03	OK	0.18	0.14			
CL-6	0.308	0.964	0.545	2	0.610	0.549	0.711	1.667	0.81	2.62	0.31	0.025	0.46	0.44	0.59	0.79	2.50	0.52	0.016	0.71	0.5	0.02	OK	0.17	0.11		
CL-6A	0.132			2	0.304	0.300	0.457	3.45	0.33	1.39	0.16	0.025	0.80	0.18													
CL-7	0.462	0.452	0.262	2	0.610	0.62	0.914	3																			

North Nawin Irrigation System (5/6)

Canal Name	Discharge			Canal Dimensions (Original)											Canal Dimensions (Revised)											Freeboard	
	Original (m ³ /s)	D (m)	D ₂ (m)	Type	B (m)	h (m)	H (m)	S	A (m ²)	P (m)	R (m)	n	V (m/s)	Q ₁ (m ³ /s)	hh (m)	A (m)	P (m)	R (m)	n	V (m/s)	Q ₂ (m ³ /s)	hh-h (m)	Judge	H-hh (m)	Fb (m)		
CL 1	2.39	6.24	3.620	?	1.19	0.61	0.864	43	1.65	1.66	0.48	0.016	1.77	2.92	0.8	1.94	1.94	0.49	0.016	1.57	3.62	0.00	NG	0.01	0.2		
CL 1A	0.194			?	0.30	0.47	0.610	833	0.42	1.95	0.21	0.025	0.65	0.30													
CL 1A-1	0.066			?	0.30	0.432	0.599	2,000	0.41	1.86	0.22	0.025	0.26	0.11													
CL 1-B	0.132			?	0.30	0.406	0.599	1,000	0.37	1.77	0.21	0.025	0.46	0.21													
CL 13C	0.198			?	0.610	0.584	0.62	5,000	0.8	2.72	0.32	0.025	0.33	0.19													
CL 13D	0.304			?	0.914	1.219	1.422	3,333	3.34	3.31	0.63	0.025	0.64	0.13													
CL 13D-1	0.64			?	0.610	0.47	0.610	437	0.39	1.26	0.26	0.025	0.98	0.38													
CL 13D-2	0.916			?	0.610	0.41	0.864	1,111	1.19	2.17	0.38	0.025	0.78	0.93													
CL 13D-3a	0.132			?	0.30	0.432	0.610	1,079	0.41	1.86	0.22	0.025	0.48	0.20													
CL 13D-3b	0.066			?	0.30	0.370	0.457	1,000	0.26	1.50	0.18	0.025	0.40	0.13													
CL 13D-3c	0.066			?	0.30	0.279	0.457	1,000	0.20	1.31	0.15	0.025	0.45	0.09													
CL 13E	0.066			?	0.30	0.381	0.599	1,315	0.33	1.68	0.20	0.025	0.30	0.10													
CL 14	0.193	0.187	0.106	?	0.30	0.207	0.356	294	0.11	0.96	0.12	0.016	0.88	0.10	0.21	0.72	0.98	0.12	0.016	0.96	0.11	0.01	OK	0.14	0.10		
CL 15	0.193	0.291	0.168	?	0.30	0.207	0.356	200	0.11	0.96	0.12	0.016	0.92	0.10	0.26	0.76	1.14	0.14	0.016	1.04	0.17	0.06	OK	0.10	0.12		
CL 16	0.119	0.29	0.248	?	0.30	0.432	0.610	5,000	0.36	1.69	0.22	0.016	0.32	0.12	0.61	0.65	2.36	0.29	0.016	0.39	0.25	0.18	NG	0.00	0.09		
CL 17	0.066	0.174	0.099	?	0.30	0.127	0.207	240	0.06	0.71	0.08	0.016	0.78	0.04	0.20	0.11	0.95	0.12	0.016	0.95	0.11	0.07	OK	0.10	0.11		
CL 18	0.620	4.96*	2.874	?	0.914	0.675	0.817	315	1.08	2.95	0.37	0.016	1.76	1.91	0.78	1.47	1.41	0.43	0.016	1.96	2.85	0.14	NG	0.01	0.25		
CL 18A	0.132			?	0.30	0.406	0.599	1,240	0.37	1.77	0.21	0.025	0.30	0.19													
CL 18B	0.066			?	0.30	0.279	0.457	667	0.17	1.22	0.14	0.025	0.53	0.09													
CL 18C	0.066			?	0.30	0.279	0.457	2,000	0.20	1.31	0.15	0.025	0.37	0.11													
CL 18D	0.066			?	0.30	0.300	0.457	1,111	0.23	1.39	0.16	0.025	0.45	0.10													
CL 18E	0.528			?	0.610	0.41	0.864	1,666	1.19	2.17	0.38	0.025	0.64	0.76													
CL 18E-1	0.132			?	0.30	0.406	0.599	909	0.37	1.77	0.21	0.025	0.59	0.12													
CL 18F	0.132			?	0.30	0.300	0.457	315	0.23	1.39	0.16	0.025	0.37	0.19													
CL 18G	0.132			?	0.30	0.181	0.307	909	0.33	1.68	0.20	0.025	0.37	0.19													
CL 18G-1	0.066			?	0.30	0.136	0.207	2,000	0.10	1.39	0.19	0.025	0.37	0.11													
CL 19	0.132	0.258	0.207	?	0.30	0.207	0.356	208	0.11	0.96	0.12	0.016	1.05	0.13	0.27	0.37	1.17	0.18	0.016	1.21	0.21	0.07	OK	0.09	0.14		
CL 20	0.320	1.103	0.618	?	0.610	0.346	0.406	240	0.37	1.77	0.21	0.016	1.42	0.33	0.39	0.43	1.56	0.23	0.016	1.49	0.64	0.03	OK	0.12	0.18		
CL 21	0.132	0.282	0.165	?	0.30	0.279	0.457	5,000	0.16	1.12	0.14	0.016	0.24	0.04	0.20	0.47	1.91	0.24	0.016	0.32	0.16	0.25	NG	-0.09	0.08		
CL 22	0.198	0.426	0.257	?	0.610	0.279	0.406	200	0.24	1.42	0.17	0.016	1.33	0.31	0.28	0.36	1.49	0.18	0.016	1.39	0.26	0.02	OK	0.13	0.16		
CL 23	0.066	0.178	0.103	?	0.30	0.178	0.356	120	0.09	0.81	0.11	0.016	1.29	0.12	0.16	0.08	0.87	0.10	0.016	1.27	0.10	-0.03	OK	0.20	0.13		
CL 24	0.066	0.318	0.183	?	0.30	0.127	0.207	315	0.06	0.71	0.08	0.016	1.27	0.07	0.20	0.11	0.95	0.12	0.016	1.61	0.18	0.07	OK	0.10	0.19		
CL 25	0.066	0.117	0.067	?	0.30	0.127	0.207	120	0.06	0.71	0.08	0.016	1.08	0.06	0.13	0.06	0.72	0.08	0.016	1.09	0.07	0.00	OK	0.11	0.12		
CL 26	0.132	0.258	0.194	?	0.30	0.207	0.356	175	0.11	0.96	0.12	0.016	1.34	0.15	0.27	0.14	1.04	0.13	0.016	1.44	0.20	0.03	OK	0.13	0.17		

○ Distribution Canal H-hh > Fb ○ OK H-hh > 10cm ○ OK

North Nawin Irrigation System (6/6)

Canal Name	Discharge			Canal Dimensions (Original)											Canal Dimensions (Revised)											Freeboard	
	Original (m ³ /s)	D (m)	D ₂ (m)	Type	B (m)	h (m)	H (m)	S	A (m ²)	P (m)	R (m)	n	V (m/s)	Q ₁ (m ³ /s)	hh (m)	A (m)	P (m)	R (m)	n	V (m/s)	Q ₂ (m ³ /s)	hh-h (m)	Judge	H-hh (m)	Fb (m)		
CL 27	2.388	6.241	3.14	?	1.219	0.63	0.817	175	1.28	2.25	0.29	0.016	2.53	3.23	0.68	1.43	1.40	0.42	0.016	2.63	3.14	0.07	NG	0.13	0.44		
CL 27-A	0.066			?	0.30	0.142	0.207	307	0.08	0.78	0.10	0.016	0.78	0.06													
CL 27-B	0.198			?	0.30	0.432	0.610	769	0.43	1.95	0.21	0.025	0.68	0.31													
CL 27-C	0.066			?	0.30	0.432	0.599	2,000	0.41	1.86	0.22	0.025	0.26	0.11													
CL 27-D	0.816			?	0.914	0.889	1.067	384	2.00	4.12	0.39	0.025	0.33	1.15													
CL 27-D-1	0.066			?	0.30	0.300	0.457	1,240	0.23	1.39	0.16	0.025	0.42	0.10													
CL 27-D-2	0.132			?	0.30	0.406	0.599	1,111	0.37	1.77	0.21	0.025	0.37	0.20													
CL 27-D-3	0.359			?	0.610	0.599	0.711	1,111	0.81	2.63	0.31	0.025	0.68	0.68													
CL 27-D-3a	0.132			?	0.30	0.330	0.457	385	0.26	1.50	0.18	0.025	0.30	0.21													
CL 27-D-3b	0.066			?	0.30	0.279	0.457	556	0.17	1.22	0.14	0.025	0.58	0.10													
CL 27-E	0.066			?	0.30	0.330	0.457	1,479	0.26	1.50	0.18	0.025	0.47	0.11													
CL 27-F	0.198			?	0.610	0.584	0.62	5,000	0.87	2.72	0.32	0.025	0.33	0.29													
CL 27-G	0.192			?	0.30	0.483	0.610	1,000	0.30	2.03	0.21	0.025	0.63	0.31													
CL 28	0.092	0.120	0.185	?	0.30	0.142	0.207	147	0.08	0.79	0.10	0.016	1.09	0.08													
CL 29	0.178	0.402	0.233	?	0.30	0.203	0.356	164	0.17	0.96	0.12	0.016	1.18	0.13													
CL 30	0.092	0.316	0.183	?	0.30	0.127	0.207	91	0.08	0.79	0.10	0.016	1.37	0.10	0.21	0.72	0.98	0.12	0.016	1.01	0.10	0.06	NG	0.09	0.19</		

II.4.2 Discharge Capacity of South Nawin Irrigation System

South Nawin Irrigation System (1/3)

Revised discharges are based on the Schematic Diagram of South Nawin Dam Project Canal System (Peak water requirement of Monsoon Gaddi)

Canal Discharge (Q) = A·V

where A = Cross-section area of canal

V = Mean velocity at section

V_{max} = 1.5 (m/s for lining canal), 1.0 (m/s for earth canal)

Mean velocity (V) = R^{2/3} · S^{1/2} / n

where R = Hydraulic Radius = A/P (where P = Wetted parameter)

S = Canal bed slope (hydraulic gradient)

n = Manning's coefficient of roughness

brick lining n=0.016

earth lining n=0.025

Canal Type (earth canal / brick lining canal)

H = height of canal (earth canal) or height of lining (lining canal)

Freeboard of Canal

Fb = 0.05d-hv = 0.05 ~ 0.15

Fb Freeboard (m)

d = water depth at design discharge (m)

hv = velocity head (m)

Canal Name	Discharge		Canal Dimensions (Original)										Canal Dimensions (Revised)										Freeboard		
	Original (m ³ /s)	Revised (m ³ /s)	Canal Type	B (m)	h (m)	H (m)	S	A (m ²)	P (m)	R (m)	n	V (m/s)	Q ₁ (m ³ /s)	hh (m)	A (m ²)	P (m)	R (m)	n	V (m/s)	Q ₂ (m ³ /s)	hh-h (m)	Judge	H-hh (m)	Fb (m)	
Main Canal																									
Main Canal-A	32.88	23.806	2	6.200	2.910	2.250	599	28.63	15.51	1.85	0.015	1.15	32.94	2.91	29.03	15.61	1.86	0.0160	1.08	31.48	0.05	OK	0.51	0.26	
Main Canal-B	32.88	23.009	2	5.300	2.200	3.550	600	29.76	15.54	1.97	0.016	1.11	32.90	3.13	28.81	15.37	1.88	0.0160	1.09	31.72	0.05	OK	0.42	0.21	
Main Canal-C	32.88	22.939	2	5.300	2.200	3.550	600	29.76	15.54	1.97	0.016	1.11	32.90	3.13	28.81	15.37	1.88	0.0160	1.09	31.72	0.05	OK	0.42	0.21	
Main Canal-D	32.88	22.979	2	5.300	2.200	3.550	600	29.76	15.54	1.97	0.016	1.11	32.90	3.12	28.70	15.28	1.88	0.0160	1.09	31.72	0.08	OK	0.43	0.21	
Main Canal-E	32.88	22.696	2	5.300	2.200	3.550	600	29.76	15.54	1.97	0.016	1.11	32.90	3.13	28.87	15.25	1.87	0.0160	1.09	31.72	0.09	OK	0.44	0.21	
Main Canal-F	32.88	22.465	2	5.300	2.200	3.550	600	29.76	15.54	1.97	0.016	1.11	32.90	3.10	28.44	15.22	1.87	0.0160	1.09	30.94	0.10	OK	0.45	0.21	
Main Canal-G	32.88	22.465	2	5.300	2.200	3.550	600	29.76	15.54	1.97	0.016	1.11	32.90	3.10	28.44	15.22	1.87	0.0160	1.09	30.94	0.10	OK	0.45	0.21	
Main Canal-H	32.88	22.122	2	5.300	2.200	3.550	600	29.76	15.54	1.97	0.016	1.11	32.90	3.09	28.31	15.19	1.86	0.0160	1.09	30.74	0.11	OK	0.46	0.25	

Main Canal : H-hh > Fb : OK, H-hh > 20cm : OK

South Nawin Irrigation System (2/3)

Canal Name	Discharge		Canal Dimension (Original)										Canal Dimension (Revised)										Freeboard		
	Original (m ³ /s)	Revised (m ³ /s)	Canal Type	B (m)	h (m)	H (m)	S	A (m ²)	P (m)	R (m)	n	V (m/s)	Q ₁ (m ³ /s)	hh (m)	A (m ²)	P (m)	R (m)	n	V (m/s)	Q ₂ (m ³ /s)	hh-h (m)	Judge	H-hh (m)	Fb (m)	
Distribution Canal																									
DY-A		0.428	2	0.300	0.600	0.914	8667	0.62	1.22	0.23	0.016	0.49	0.28	0.65	0.81	1.28	0.24	0.016	0.51	0.42	0.04	OK	0.26	0.10	
DY-B		0.139	2	0.300		0.914	2400				0.016			0.37	0.32	1.48	0.23	0.016	0.44	0.14	0.37	OK	0.54	0.08	
DY-C		0.284	2	0.300		0.610	1324				0.016			0.48	0.43	1.84	0.24	0.016	0.65	0.28	0.48	OK	0.13	0.10	
DY-1	0.250	0.202	2	0.300	0.450	0.650	1600	0.39	1.74	0.22	0.016	0.27	0.22	0.46	0.40	1.77	0.23	0.016	0.58	0.22	0.04	OK	0.19	0.09	
DY-2	0.260	0.461	2	0.300	0.370	0.550	750	0.23	1.48	0.19	0.016	0.24	0.21	0.43	0.21	2.00	0.26	0.016	0.92	0.47	0.16	NG	0.02	0.12	
DY-2-1	0.170		2	0.300	0.370	0.550	2000	0.23	1.48	0.19	0.016	0.46	0.13												
DY-2-2	0.070		2	0.300	0.360		750	0.16	1.13	0.14	0.016	0.63	0.10												
DY-3	0.269	0.682	2	0.300	0.530	0.700	500	0.51	2.00	0.28	0.016	1.13	0.57	0.57	0.38	2.12	0.27	0.016	1.11	0.68	0.04	OK	0.42	0.15	
DY-3-1	0.126		2	0.300	0.380	0.550	660	0.18	1.70	0.15	0.016	0.73	0.13												
DY-3-2	0.140		2	0.300	0.430	0.650	2000	0.26	1.68	0.21	0.016	0.41	0.15												
DY-4	0.300	0.649	2	0.300	0.430	0.550	760	0.26	1.68	0.21	0.016	0.83	0.31	0.90	0.64	2.22	0.28	0.016	1.07	0.65	0.17	NG	0.02	0.12	
DY-5-1	0.291		2	0.300	0.490	0.750	3000	0.61	2.19	0.28	0.016	0.49	0.30												
DY-6	0.376	0.251	2	0.300	0.450	0.650	500	0.39	1.74	0.22	0.016	1.03	0.40	0.37	0.28	1.48	0.19	0.016	0.9	0.16	0.08	OK	0.28	0.11	
DY-7	0.420	0.389	2	0.300	0.440	0.650	400	0.37	1.71	0.22	0.016	1.14	0.22	0.43	0.46	1.68	0.23	0.016	1.12	0.40	0.04	OK	0.22	0.14	
DY-8	0.228	0.278	2	0.300	0.710	0.300	300	0.21	1.29	0.10	0.016	1.09	0.22	0.29	0.21	1.85	0.20	0.016	1.22	0.38	0.08	OK	0.11	0.12	
DY-8-1	0.120		2	0.300	0.400		8823	0.46	1.90	0.24	0.016	0.26	0.12												
DY-9(A)	0.269	0.171	2	0.300	0.340	0.550	300	0.25	1.39	0.18	0.016	1.14	0.28	0.27	0.17	1.16	0.25	0.016	1.01	0.17	0.07	OK	0.28	0.12	
DY-9(B)	2.074	2.074	2	1.219	0.830	1.676	400	1.87	3.43	0.48	0.016	1.92	3.60	1.22	3.24	5.12	0.67	0.016	2.25	7.86	0.39	OK	0.46	0.39	
DY-10	0.215	0.108	2	0.300	0.480	0.650	300	0.39	1.74	0.22	0.016	1.03	0.40	0.25	0.14	1.70	0.24	0.016	0.74	0.11	0.20	OK	0.40	0.09	
DY-12	0.244	0.473	2	0.300	0.310	0.400	300	0.21	1.29	0.16	0.016	1.09	0.22	0.43	0.16	1.68	0.23	0.016	1.29	0.47	0.12	NG	0.07	0.16	
DY-14	0.230	0.216	2	0.300	0.310	0.400	300	0.21	1.29	0.16	0.016	1.09	0.22	0.22	0.13	1.90	0.15	0.016	0.69	0.11	0.09	OK	0.28	0.10	
DY-15	0.250	0.096	2	0.300	0.310	0.350	300	0.21	1.29	0.16	0.016	1.09	0.22	0.21	0.12	4.97	0.12	0.016	0.89	0.10	0.10	OK	0.34	0.10	
DY-16	0.213	0.126	2	0.300	0.400	0.300	300	0.20	1.26	0.16	0.016	1.07	0.22	0.28	0.18	1.20	0.25	0.016	1.02	0.19	0.04	OK	0.22	0.12	
DY-17	0.270	0.194	2	0.300	0.400	0.300	653	0.27	1.58	0.20	0.016	0.84	0.27	0.32	0.26	1.42	0.18	0.016	0.8	0.20	0.04	OK	0.22	0.10	
DY-18	0.391	0.128	2	0.300	0.390	0.550	300	0.31	1.53	0.20	0.016	1.23	0.28	0.20	0.26	1.6	0.16	0.016	1.07	0.22	0.09	OK	0.25	0.12	
DY-19	0.150	0.121	2	0.200	0.550	0.650	8662	0.54	2.06	0.26	0.016	0.28	0.13	0.20	0.46	1.90	0.24	0.016	0.26	0.12	0.05	OK	0.15	0.08	
DY-20	0.456	1.172	2	0.400	0.450	0.300	500	0.43	1.84	0.24	0.016	1.01	0.46	0.69	0.27	1.61	0.22	0.016	1.25	1.14	0.10	OK	0.11	0.18	
DY-21	0.227	0.657	2	0.600	0.360	0.300	600	0.3	2.39	0.20	0.016	1.14	0.81	0.50	0.61	1.20	0.25	0.016	1.09	0.67	0.06	OK	0.30	0.14	
DY-22	0.660	0.532	2	0.500	0.300	0.300	500	0.36	2.10	0.27	0.016	1.16	0.65	0.45	0.48	1.91	0.25	0.016	1.10	0.53	0.05	OK	0.25	0.12	
DY-23	0.280	0.210	2	0.300	0.340	0.400	302	0.25	1.39	0.18	0.016	1.14	0.28	0.20	0.20	1.6	0.16	0.016	1.06	0.22	0.04	OK	0.10	0.12	
DY-24	0.151	0.601	2	0.500	0.550	0.300	500	0.65	2.26	0.29	0.016	1.22	0.80	0.50	0.46	2.10	0.27	0.016	1.16	0.65	0.04	OK	0.30	0.14	
DY-25	1.160	0.896	2	0.610	0.650	0.300	324	0.88	2.63	0.34	0.016	1.32	1.16	0.96	0.71	2.40	0.23	0.016	1.24	0.91	0.07	OK	0.14	0.16	
DY-26	1.100	0.868	2	0.610	0.670	0.300	255	0.97	2.75	0.35	0.016	1.13	1.10	0.91	0.64	2.24	0.23	0.016	0.98	0.62	0.16	OK	0.19		

South Nawin Irrigation System (3/3)

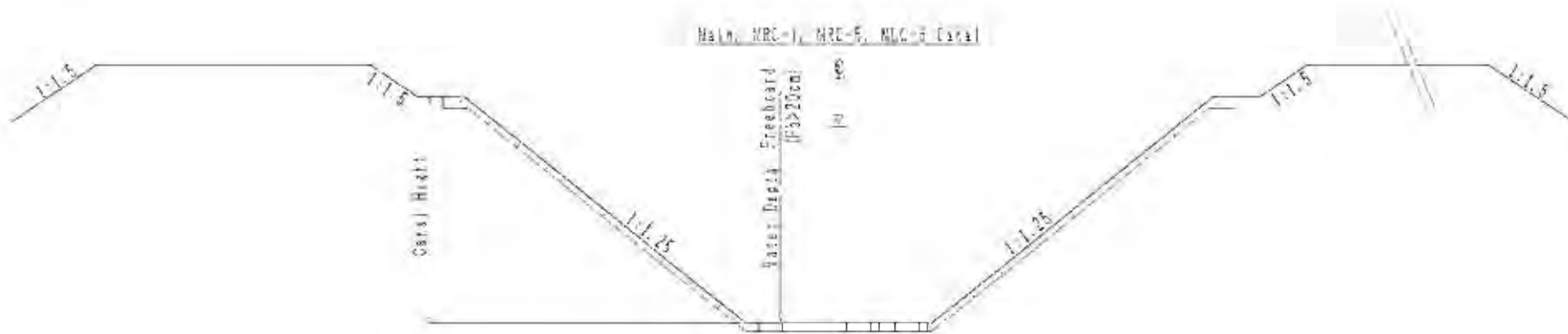
Canal Name	Discharge		Canal Type	Canal Dimensions (Original)										Canal Dimensions (Revised)										Freeboard	
	Original (m ³ /s)	Revised (m ³ /s)		B (m)	h (m)	H (m)	S	A (m ²)	P (m)	R (m)	n	V (m/s)	Q1 (m ³ /s)	hh (m)	A (m ²)	P (m)	R (m)	n	V (m/s)	Q2 (m ³ /s)	hh-h (m)	Judge	H-hh (m)	Fb (m)	
DY-27	1.217	0.863	2	0.700	0.700	1.000	800	1.10	2.94	0.38	0.016	1.15	1.27	0.60	0.87	2.62	0.33	0.016	1.06	0.92	0.10	OK	0.40	0.14	
DY-28	0.555	0.421	2	0.400	0.500	0.700	500	0.51	2.00	0.26	0.015	1.13	0.88	0.49	0.50	1.97	0.25	0.016	1.12	0.55	0.01	OK	0.21	0.14	
DY-29	0.442	0.691	2	0.600	0.600	0.900	600	0.81	2.52	0.32	0.016	1.20	0.97	0.52	0.65	2.26	0.29	0.016	1.11	0.72	0.08	OK	0.38	0.14	
DY-30	0.590	0.389	2	0.400	0.550	0.750	500	0.60	2.16	0.28	0.016	1.19	0.71	0.46	0.45	1.87	0.24	0.016	1.08	0.48	0.09	OK	0.29	0.13	
DY-31	0.980	0.925	2	0.600	0.640	0.800	770	0.90	2.65	0.34	0.016	1.09	0.98	0.63	0.87	2.62	0.33	0.016	1.08	0.95	0.01	OK	0.17	0.14	
DY-32	1.070	0.872	2	0.600	0.670	0.700	98	0.96	2.74	0.35	0.016	1.10	1.06	0.51	0.83	2.55	0.33	0.016	1.05	0.87	0.06	NG	0.09	0.14	
DY-33	0.710	0.160	2	0.300	0.300	0.400	318	0.20	1.26	0.16	0.016	1.04	0.21	0.27	0.17	1.16	0.15	0.016	0.98	0.17	0.03	OK	0.13	0.11	
DY-34	2.100	1.675	2	1.010	0.850	0.900	1011	1.76	3.73	0.47	0.016	1.19	2.10	0.76	1.48	3.44	0.43	0.016	1.12	1.68	0.09	OK	0.14	0.15	
DY-35	0.360	0.291	2	0.500	0.670	0.750	572	0.90	2.64	0.34	0.016	0.40	0.36	0.62	0.79	2.48	0.32	0.016	0.38	0.30	0.05	OK	0.13	0.09	
B-2	12.095	8.395	2	4.400	1.990	1.850	3000	10.16	9.49	1.07	0.016	1.19	12.13	1.02	8.79	7.66	0.76	0.016	0.95	8.48	0.57	OK	0.83	0.15	
B-2-R	3.960	3.165	2	1.500	1.750	2.050	8000	6.45	7.10	0.91	0.016	0.66	4.23	1.52	5.22	6.40	0.82	0.016	0.61	3.19	0.22	OK	0.52	0.15	
B-2-L	7.746	7.389	2	3.500	1.510	1.850	3000	8.14	8.33	0.98	0.016	1.12	9.14	1.25	7.00	7.82	0.90	0.016	1.06	7.42	0.16	OK	0.50	0.17	

-- Distribution Canal H-hh > Fb -- OK H-hh > 10cm -- OK

II.5 Rehabilitation Plan for Canals

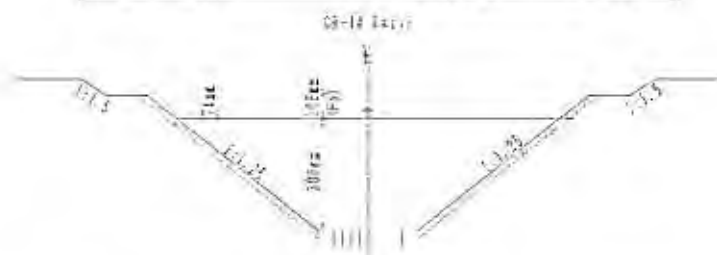
II.5.1 Rehabilitation Plan for Canals of North Nawin Irrigation System

The height of freeboard is higher than canal height in the some portions of Main Canal, Main Right Canal (MRC) and Main Left Canal (MLC). But berm height is higher than freeboard. Therefore, Main Canal, MRC and MLC don't need raising of Canals.



Hydraulic Calculation of CR-14

Design Condition (Canal Section)			
(1) Manning's Coefficient of Roughness (n)	0.016 (Block Lining)		
(2) Canal Bed Width (B)	0.705 m	1.00 ft	
(3) Canal Slope (side slope) (m)	1.25		
(4) Canal bed slope (S)	0.47		
(5) Uniform flow depth (h)	0.586 m	1.90 ft	
(6) Canal height (H)	0.586 m	1.25 ft	
(7) Freeboard (Fb)	0.074 m	0.24 ft	
(8) Bottom height (Bh)	0.201 m	0.67 ft	
(9) Fb = H - Bh	0.277 m	0.91 ft	
Result of Calculation			
(10) Cross-section area of canal (A)	0.210 m ²	2.26 sq-ft	
(11) Wetted Perimeter (P)	1.285 m	4.22 ft	
(12) Hydraulic Radius (R)	0.164 m	0.54 ft	
(13) Mean velocity (V)	0.917 m/sec	2.99 ft/sec	
(14) Friction loss (hf) (m)	0.188 m	0.62 ft	
(15) Canal Discharge (Q)	0.191 m ³ /sec	6.89 cu-ft/sec	



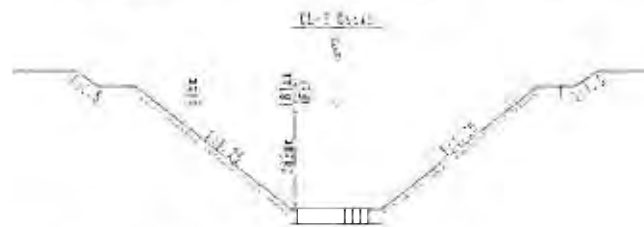
Hydraulic Calculation of CI-1

Design Condition (Canal Section)			
(1) Manning's Coefficient of Roughness (n)	0.016 (Block Lining)		
(2) Canal Bed Width (B)	0.205 m	1.00 ft	
(3) Canal slope (side slope) (m)	1.25		
(4) Canal bed slope (S)	5.000		
(5) Uniform flow depth (h)	0.660 m	2.17 ft	
(6) Canal height (H)	0.781 m	1.25 ft	
(7) Freeboard (Fb)	0.279 m	0.92 ft	
(8) Bottom height (Bh)	0.203 m	0.67 ft	
(9) Fb = H - Bh	0.076 m	0.25 ft	
Result of Calculation			
(10) Cross-section area of canal (A)	0.746 m ²	8.62 sq-ft	
(11) Wetted Perimeter (P)	2.418 m	7.93 ft	
(12) Hydraulic Radius (R)	0.308 m	1.01 ft	
(13) Mean velocity (V)	0.403 m/sec	1.33 ft/sec	
(14) Friction loss (hf) (m)	0.099 m	0.33 ft	
(15) Canal Discharge (Q)	0.201 m ³ /sec	10.75 cu-ft/sec	



Hydraulic Calculation of CI-2

Design Condition (Canal Section)			
(1) Manning's Coefficient of Roughness (n)	0.016 (Block Lining)		
(2) Canal Bed Width (B)	0.307 m	1.01 ft	
(3) Canal Slope (side slope) (m)	1.25		
(4) Canal bed slope (S)	0.47		
(5) Uniform flow depth (h)	0.228 m	0.75 ft	
(6) Canal height (H)	0.228 m	0.75 ft	
(7) Freeboard (Fb)	0.040 m	0.13 ft	
(8) Bottom height (Bh)	0.201 m	0.67 ft	
(9) Fb = H - Bh	0.241 m	0.79 ft	
Result of Calculation			
(10) Cross-section area of canal (A)	0.032 m ²	2.92 sq-ft	
(11) Wetted Perimeter (P)	1.286 m	4.22 ft	
(12) Hydraulic Radius (R)	0.025 m	0.82 ft	
(13) Mean velocity (V)	1.511 m/sec	4.97 ft/sec	
(14) Friction loss (hf) (m)	0.081 m	0.27 ft	
(15) Canal Discharge (Q)	0.020 m ³ /sec	0.71 cu-ft/sec	



Hydraulic Calculation of CI-3

Design Condition (Canal Section)			
(1) Manning's Coefficient of Roughness (n)	0.016 (Block Lining)		
(2) Canal Bed Width (B)	0.226 m	1.01 ft	
(3) Canal Slope (side slope) (m)	1.25		
(4) Canal bed slope (S)	0.51		
(5) Uniform flow depth (h)	0.471 m	1.55 ft	
(6) Canal height (H)	0.513 m	1.69 ft	
(7) Freeboard (Fb)	0.044 m	0.14 ft	
(8) Bottom height (Bh)	0.203 m	0.67 ft	
(9) Fb = H - Bh	0.271 m	0.89 ft	
Result of Calculation			
(10) Cross-section area of canal (A)	0.591 m ²	6.37 sq-ft	
(11) Wetted Perimeter (P)	2.437 m	7.99 ft	
(12) Hydraulic Radius (R)	0.242 m	0.79 ft	
(13) Mean velocity (V)	2.072 m/sec	6.80 ft/sec	
(14) Friction loss (hf) (m)	0.297 m	0.98 ft	
(15) Canal Discharge (Q)	1.224 m ³ /sec	43.75 cu-ft/sec	



Hydraulic Calculation of CI-8

Design Condition (Canal Section)		
(1) Manning's Coefficient of Roughness (n)	0.016	(Bank-Lined)
(2) Canal Bed Width (B)	1.524 m	5.00 ft
(3) Canal Slope Gradient (1:m)	1:25	
(4) Canal Bed slope (S)	0.01	
(5) Design Flow Depth (d)	1.316 m	4.32 ft
(6) Canal High (H)	1.272 m	4.17 ft
(7) Freeboard (Fb)	0.076 m	0.25 ft
(8) Bank Elevation (Ba)	0.203 m	0.67 ft
(9) Fb + Ba	0.279 m	0.92 ft
Result of Calculation		
(10) Cross-section area of canal (A)	4.170 m ²	44.54 sq-ft
(11) Wetted Perimeter (P)	4.747 m	15.58 ft
(12) Hydraulic Radius (R)	0.727 m	2.39 ft
(13) Mean velocity (V)	1.275 m/sec	4.18 ft/sec
(14) Freeboard (Fb) = 0.076 (hr) (0.05)	0.246 m	0.81 ft
(15) Canal Discharge (Q)	6.641 m ³ /sec	23.10 cfs (cfs)



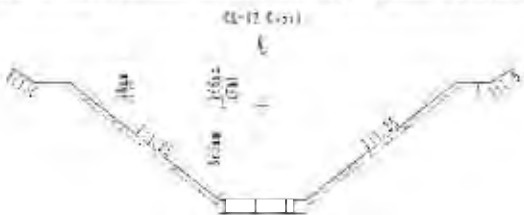
Hydraulic Calculation of CI-13

Design Condition (Canal Section)		
(1) Manning's Coefficient of Roughness (n)	0.016	(Bank-Lined)
(2) Canal Bed Width (B)	1.219 m	4.00 ft
(3) Canal Slope Gradient (1:m)	1:25	
(4) Canal Bed slope (S)	0.01	
(5) Design Flow Depth (d)	0.850 m	2.79 ft
(6) Canal High (H)	0.868 m	2.85 ft
(7) Freeboard (Fb)	0.014 m	0.05 ft
(8) Bank High (Ba)	0.202 m	0.67 ft
(9) Fb + Ba	0.217 m	0.71 ft
Result of Calculation		
(10) Cross-section area of canal (A)	0.950 m ²	10.35 sq-ft
(11) Wetted Perimeter (P)	1.940 m	6.37 ft
(12) Hydraulic Radius (R)	0.492 m	1.62 ft
(13) Mean velocity (V)	0.68 m/sec	2.23 ft/sec
(14) Freeboard (Fb) = 0.014 (hr) (0.05)	0.170 m	0.56 ft
(15) Canal Discharge (Q)	1.622 m ³ /sec	57.96 cfs (cfs)



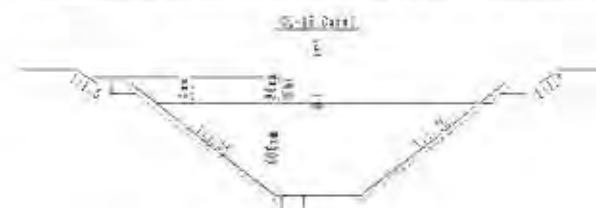
Hydraulic Calculation of CI-12

Design Condition (Canal Section)		
(1) Manning's Coefficient of Roughness (n)	0.016	(Bank-Lined)
(2) Canal Bed Width (B)	0.305 m	1.00 ft
(3) Canal Slope Gradient (1:m)	1:25	
(4) Canal Bed slope (S)	0.01	
(5) Design Flow Depth (d)	0.305 m	1.00 ft
(6) Canal High (H)	0.31 m	1.02 ft
(7) Freeboard (Fb)	0.015 m	0.05 ft
(8) Bank Elevation (Ba)	0.203 m	0.67 ft
(9) Fb + Ba	0.218 m	0.71 ft
Result of Calculation		
(10) Cross-section area of canal (A)	0.232 m ²	2.51 sq-ft
(11) Wetted Perimeter (P)	1.115 m	3.67 ft
(12) Hydraulic Radius (R)	0.190 m	0.62 ft
(13) Mean velocity (V)	1.350 m/sec	4.43 ft/sec
(14) Freeboard (Fb) = 0.015 (hr) (0.05)	0.165 m	0.54 ft
(15) Canal Discharge (Q)	0.311 m ³ /sec	11.05 cfs (cfs)



Hydraulic Calculation of CI-16

Design Condition (Canal Section)		
(1) Manning's Coefficient of Roughness (n)	0.016	(Bank-Lined)
(2) Canal Bed Width (B)	0.905 m	3.00 ft
(3) Canal Slope Gradient (1:m)	1:25	
(4) Canal Bed slope (S)	0.01	
(5) Design Flow Depth (d)	0.600 m	1.97 ft
(6) Canal High (H)	0.610 m	2.00 ft
(7) Freeboard (Fb)	0.004 m	0.01 ft
(8) Bank High (Ba)	0.203 m	0.67 ft
(9) Fb + Ba	0.207 m	0.68 ft
Result of Calculation		
(10) Cross-section area of canal (A)	0.644 m ²	6.92 sq-ft
(11) Wetted Perimeter (P)	2.245 m	7.37 ft
(12) Hydraulic Radius (R)	0.287 m	0.94 ft
(13) Mean velocity (V)	0.585 m/sec	1.93 ft/sec
(14) Freeboard (Fb) = 0.004 (hr) (0.05)	0.088 m	0.29 ft
(15) Canal Discharge (Q)	0.248 m ³ /sec	8.76 cfs (cfs)



Hydraulic Calculation of CL-18

Design Condition (Canal Section)		
(1) Manning's Coefficient of Roughness (n)	0.016	(Brick Lining)
(2) Canal Bed Width (B)	0.914 m	3.00 ft
(3) Canal Slope Gradient (1:m)	1:25	
(4) Canal bed slope (1:1)	5:1	
(5) Uniform Flow Depth (d)	0.719 m	2.36 ft
(6) Canal Height (H)	0.813 m	2.67 ft
(7) Freeboard (Fb)	0.094 m	0.31 ft
(8) Storm Height (Hs)	0.293 m	0.97 ft
(9) Fb + Hs	0.277 m	0.91 ft
Result of Calculation		
(10) Cross-section area of canal (A)	0.371 m ²	15.51 sq-ft
(11) Wetted Perimeter (P)	3.008 m	11.18 ft
(12) Hydraulic Radius (R)	0.122 m	1.12 ft
(13) Mean velocity (V)	1.057 m/sec	3.47 ft/sec
(14) Freeboard (Fb) = 0.5(d) + 0.05	0.364 m	1.20 ft
(15) Canal Discharge (Q)	2.078 m ³ /sec	102.79 cu-ft/sec



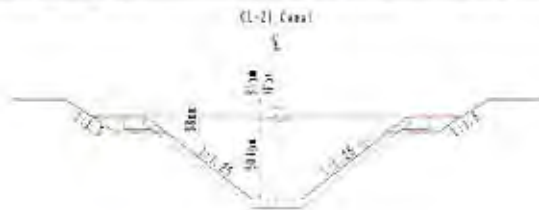
Hydraulic Calculation of CL-27

Design Condition (Canal Section)		
(1) Manning's Coefficient of Roughness (n)	0.016	(Brick Lining)
(2) Canal Bed Width (B)	1.219 m	4.00 ft
(3) Canal Slope Gradient (1:m)	1:25	
(4) Canal bed slope (1:1)	5:1	
(5) Uniform Flow Depth (d)	0.482 m	1.58 ft
(6) Canal Height (H)	0.513 m	1.68 ft
(7) Freeboard (Fb)	0.138 m	0.45 ft
(8) Storm Height (Hs)	0.293 m	0.97 ft
(9) Fb + Hs	0.134 m	0.44 ft
Result of Calculation		
(10) Cross-section area of canal (A)	1.413 m ²	15.19 sq-ft
(11) Wetted Perimeter (P)	5.401 m	17.74 ft
(12) Hydraulic Radius (R)	0.415 m	1.36 ft
(13) Mean velocity (V)	2.628 m/sec	8.64 ft/sec
(14) Freeboard (Fb) = 0.5(d) + 0.05	0.437 m	1.43 ft
(15) Canal Discharge (Q)	3.711 m ³ /sec	132.60 cu-ft/sec



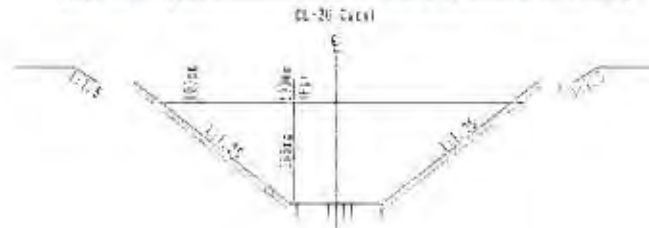
Hydraulic Calculation of CL-21

Design Condition (Canal Section)		
(1) Manning's Coefficient of Roughness (n)	0.016	(Brick Lining)
(2) Canal Bed Width (B)	0.965 m	3.17 ft
(3) Canal Slope Gradient (1:m)	1:25	
(4) Canal bed slope (1:1)	5:1	
(5) Uniform Flow Depth (d)	0.598 m	1.96 ft
(6) Canal Height (H)	0.496 m	1.63 ft
(7) Freeboard (Fb)	0.098 m	0.32 ft
(8) Storm Height (Hs)	0.293 m	0.97 ft
(9) Fb + Hs	0.195 m	0.64 ft
Result of Calculation		
(10) Cross-section area of canal (A)	0.271 m ²	9.87 sq-ft
(11) Wetted Perimeter (P)	1.919 m	6.30 ft
(12) Hydraulic Radius (R)	0.246 m	0.81 ft
(13) Mean velocity (V)	0.547 m/sec	1.80 ft/sec
(14) Freeboard (Fb) = 0.5(d) + 0.05	0.301 m	0.99 ft
(15) Canal Discharge (Q)	0.164 m ³ /sec	5.56 cu-ft/sec



Hydraulic Calculation of CL-30

Design Condition (Canal Section)		
(1) Manning's Coefficient of Roughness (n)	0.016	(Brick Lining)
(2) Canal Bed Width (B)	0.305 m	1.00 ft
(3) Canal Slope Gradient (1:m)	1:25	
(4) Canal bed slope (1:1)	5:1	
(5) Uniform Flow Depth (d)	0.205 m	0.67 ft
(6) Canal Height (H)	0.405 m	1.33 ft
(7) Freeboard (Fb)	0.101 m	0.33 ft
(8) Storm Height (Hs)	0.193 m	0.63 ft
(9) Fb + Hs	0.193 m	0.63 ft
Result of Calculation		
(10) Cross-section area of canal (A)	0.115 m ²	1.26 sq-ft
(11) Wetted Perimeter (P)	0.961 m	3.15 ft
(12) Hydraulic Radius (R)	0.126 m	0.79 ft
(13) Mean velocity (V)	1.594 m/sec	5.23 ft/sec
(14) Freeboard (Fb) = 0.5(d) + 0.05	0.196 m	0.64 ft
(15) Canal Discharge (Q)	0.183 m ³ /sec	6.51 cu-ft/sec



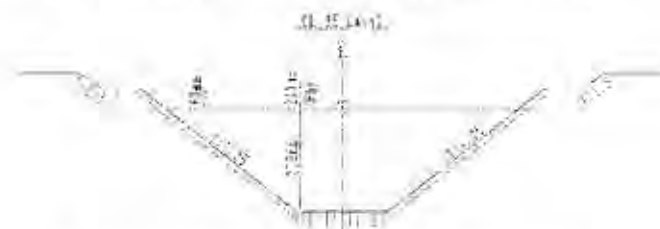
Hydraulic Calculation of CI-32

Design Condition Canal Section		
(1) Manning's Coefficient of Roughness (n)	0.015 (Bank Channel)	
(2) Canal Bed Width (B)	0.00 m	0.00 ft
(3) Canal Side Slope (1:n)	1:2.5	
(4) Canal Bed Slope (1:m)	1:200	
(5) Maximum Flow Depth (h)	0.275 m	0.90 ft
(6) Canal High (H)	0.356 m	1.17 ft
(7) Top bank (EB)	0.83 m	2.72 ft
(8) Design High (HB)	0.567 m	1.86 ft
(9) Top of SB	0.21 m	0.69 ft
Result of Calculation		
(10) Cross-sectional area of canal (A)	0.175 m ²	0.63 sq-ft
(11) Wetted Perimeter (P)	3.04 m	9.97 ft
(12) Hydraulic Radius (R)	0.057 m	0.187 ft
(13) Mean velocity (V)	0.721 m/sec	2.367 ft/sec
(14) Discharge (Q) = A x V (m ³ /sec)	0.127 m ³ /sec	4.52 cfs
(15) Canal Exchange (%)	0.262 m ³ /day	0.14 ac-ft/day



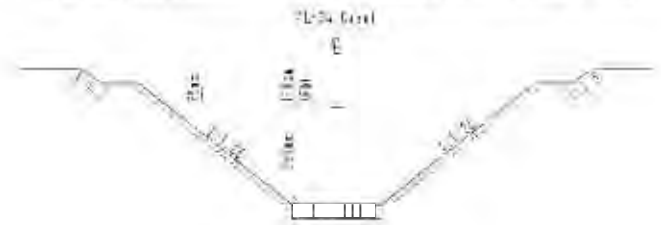
Hydraulic Calculation of CI-35

Design Condition Canal Section		
(1) Manning's Coefficient of Roughness (n)	0.015 (Bank Channel)	
(2) Canal Bed Width (B)	0.00 m	0.00 ft
(3) Canal Side Slope (1:n)	1:2.5	
(4) Canal Bed Slope (1:m)	1:200	
(5) Maximum Flow Depth (h)	0.475 m	1.56 ft
(6) Canal High (H)	0.76 m	2.49 ft
(7) Top bank (EB)	0.83 m	2.72 ft
(8) Design High (HB)	0.20 m	0.65 ft
(9) Top of SB	0.20 m	0.65 ft
Result of Calculation		
(10) Cross-sectional area of canal (A)	0.176 m ²	0.63 sq-ft
(11) Wetted Perimeter (P)	3.179 m	10.43 ft
(12) Hydraulic Radius (R)	0.055 m	0.180 ft
(13) Mean velocity (V)	1.291 m/sec	4.237 ft/sec
(14) Discharge (Q) = A x V (m ³ /sec)	0.228 m ³ /sec	8.10 cfs
(15) Canal Exchange (%)	0.562 m ³ /day	0.32 ac-ft/day



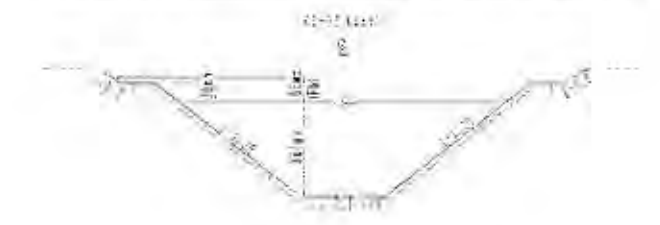
Hydraulic Calculation of CI-34

Design Condition Canal Section		
(1) Manning's Coefficient of Roughness (n)	0.015 (Bank Channel)	
(2) Canal Bed Width (B)	0.00 m	0.00 ft
(3) Canal Side Slope (1:n)	1:2.5	
(4) Canal Bed Slope (1:m)	1:200	
(5) Maximum Flow Depth (h)	0.211 m	0.69 ft
(6) Canal High (H)	0.336 m	1.10 ft
(7) Top bank (EB)	0.83 m	2.72 ft
(8) Design High (HB)	0.267 m	0.87 ft
(9) Top of SB	0.268 m	0.88 ft
Result of Calculation		
(10) Cross-sectional area of canal (A)	0.044 m ²	0.16 sq-ft
(11) Wetted Perimeter (P)	3.237 m	10.62 ft
(12) Hydraulic Radius (R)	0.014 m	0.046 ft
(13) Mean velocity (V)	3.866 m/sec	12.684 ft/sec
(14) Discharge (Q) = A x V (m ³ /sec)	0.170 m ³ /sec	0.60 cfs
(15) Canal Exchange (%)	0.110 m ³ /day	0.06 ac-ft/day



Hydraulic Calculation of CI-36

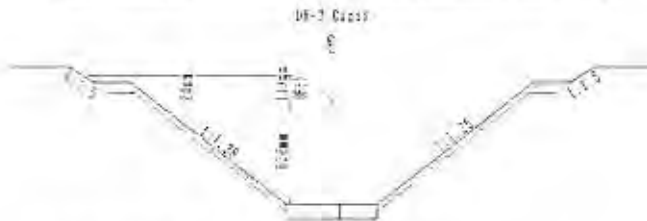
Design Condition Canal Section		
(1) Manning's Coefficient of Roughness (n)	0.015 (Bank Channel)	
(2) Canal Bed Width (B)	0.00 m	0.00 ft
(3) Canal Side Slope (1:n)	1:2.5	
(4) Canal Bed Slope (1:m)	1:200	
(5) Maximum Flow Depth (h)	0.300 m	0.98 ft
(6) Canal High (H)	0.46 m	1.51 ft
(7) Top bank (EB)	0.83 m	2.72 ft
(8) Design High (HB)	0.40 m	1.31 ft
(9) Top of SB	0.225 m	0.74 ft
Result of Calculation		
(10) Cross-sectional area of canal (A)	0.134 m ²	0.47 sq-ft
(11) Wetted Perimeter (P)	3.441 m	11.29 ft
(12) Hydraulic Radius (R)	0.039 m	0.128 ft
(13) Mean velocity (V)	0.967 m/sec	3.174 ft/sec
(14) Discharge (Q) = A x V (m ³ /sec)	0.129 m ³ /sec	0.45 cfs
(15) Canal Exchange (%)	0.120 m ³ /day	0.07 ac-ft/day



11.5.2 Rehabilitation Plan for Canals of South Nawin Irrigation System

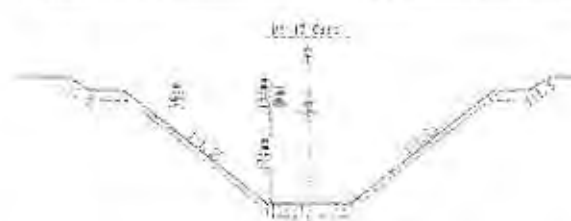
Hydraulic Calculation of DY-2

Design Condition (Canal Section)		
(1) Manning's Coefficient of Roughness (n)	0.030 (Rustic Earth)	
(2) Canal bed Width (B)	0.900 m	0.900 ft
(3) Canal Slope Gradient (S)	1:25	
(4) Canal bed slope (S _b)	2.00	
(5) External Flow Depth (d)	0.520 m	1.71 ft
(6) Canal bed (d _b)	0.550 m	1.80 ft
(7) Freeboard (fb)	0.024 m	0.08 ft
(8) Bed Height (B _H)	0.205 m	0.67 ft
(9) B + B _H	0.225 m	0.74 ft
Result of Calculation		
(10) Cross-sectional area of canal (A _c)	0.307 m ²	3.62 sq-ft
(11) Wetted Perimeter (P _w)	1.926 m	6.30 ft
(12) Hydraulic Radius (R _H)	0.158 m	0.52 ft
(13) Mean velocity (V _m)	0.910 m/sec	3.00 ft/sec
(14) Freeboard (fb) = 0.024m = 0.08ft	0.149 m	0.49 ft
(15) Canal Discharge (Q _c)	0.481 m ³ /sec	0.40 cu-ft/sec



Hydraulic Calculation of DY-12

Design Condition (Canal Section)		
(1) Manning's Coefficient of Roughness (n)	0.030 (Rustic Earth)	
(2) Canal bed Width (B)	0.900 m	0.900 ft
(3) Canal Slope Gradient (S)	1:25	
(4) Canal bed slope (S _b)	2.00	
(5) External Flow Depth (d)	0.434 m	1.42 ft
(6) Canal bed (d _b)	0.500 m	1.64 ft
(7) Freeboard (fb)	0.025 m	0.22 ft
(8) Bed Height (B _H)	0.205 m	0.67 ft
(9) B + B _H	0.205 m	0.68 ft
Result of Calculation		
(10) Cross-sectional area of canal (A _c)	0.219 m ²	2.03 sq-ft
(11) Wetted Perimeter (P _w)	1.408 m	5.54 ft
(12) Hydraulic Radius (R _H)	0.156 m	0.51 ft
(13) Mean velocity (V _m)	1.299 m/sec	4.27 ft/sec
(14) Freeboard (fb) = 0.025m = 0.08ft	0.158 m	0.52 ft
(15) Canal Discharge (Q _c)	0.279 m ³ /sec	0.40 cu-ft/sec



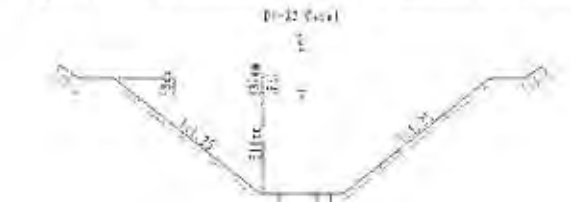
Hydraulic Calculation of DY-5

Design Condition (Canal Section)		
(1) Manning's Coefficient of Roughness (n)	0.030 (Rustic Earth)	
(2) Canal bed Width (B)	0.900 m	0.900 ft
(3) Canal Slope Gradient (S)	1:25	
(4) Canal bed slope (S _b)	2.00	
(5) External Flow Depth (d)	0.607 m	1.99 ft
(6) Canal bed (d _b)	0.550 m	1.80 ft
(7) Freeboard (fb)	0.025 m	0.18 ft
(8) Bed Height (B _H)	0.205 m	0.67 ft
(9) B + B _H	0.140 m	0.49 ft
Result of Calculation		
(10) Cross-sectional area of canal (A _c)	0.657 m ²	6.63 sq-ft
(11) Wetted Perimeter (P _w)	2.751 m	9.02 ft
(12) Hydraulic Radius (R _H)	0.239 m	0.79 ft
(13) Mean velocity (V _m)	1.015 m/sec	3.35 ft/sec
(14) Freeboard (fb) = 0.025m = 0.08ft	0.158 m	0.44 ft
(15) Canal Discharge (Q _c)	0.670 m ³ /sec	23.21 cu-ft/sec

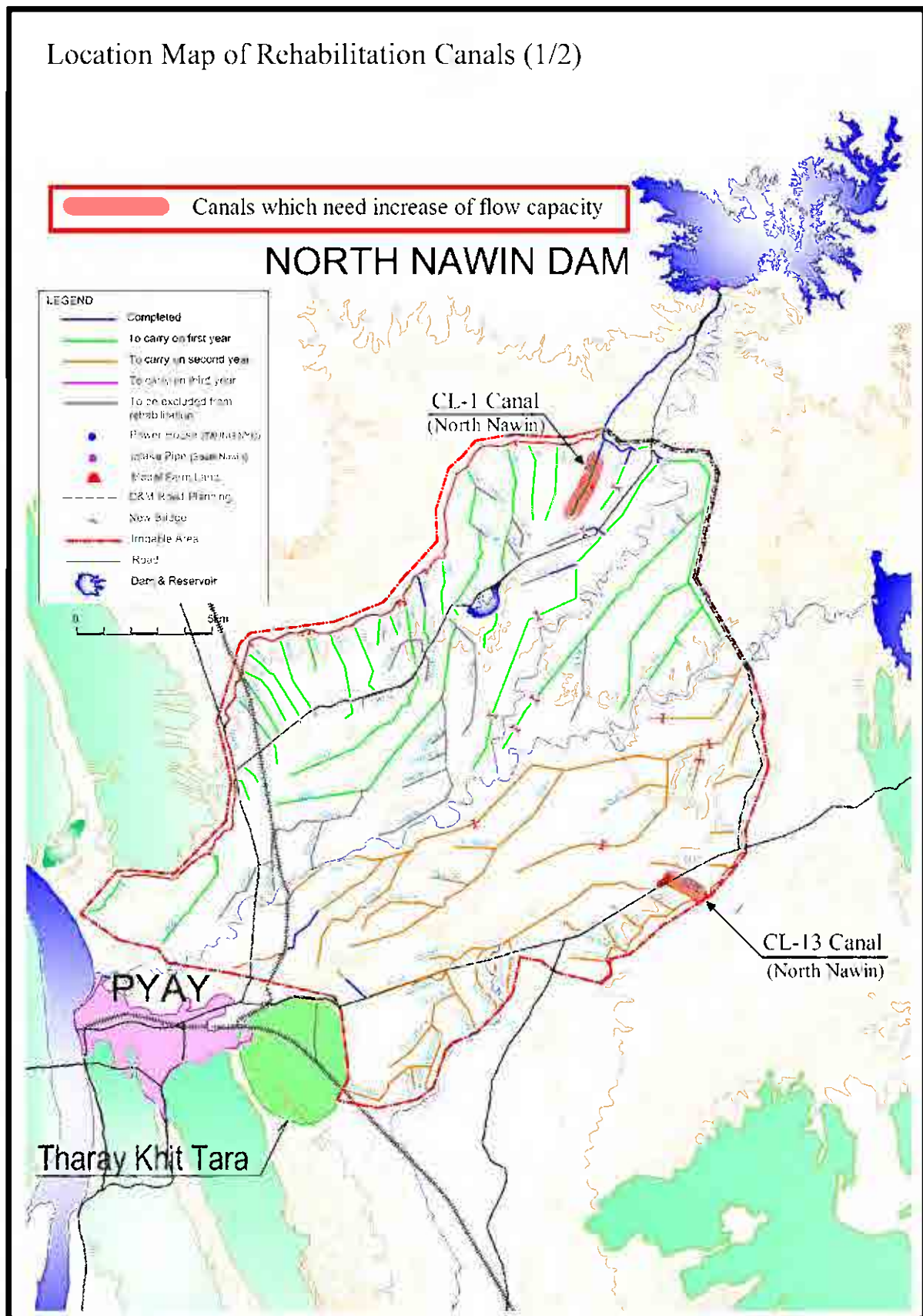


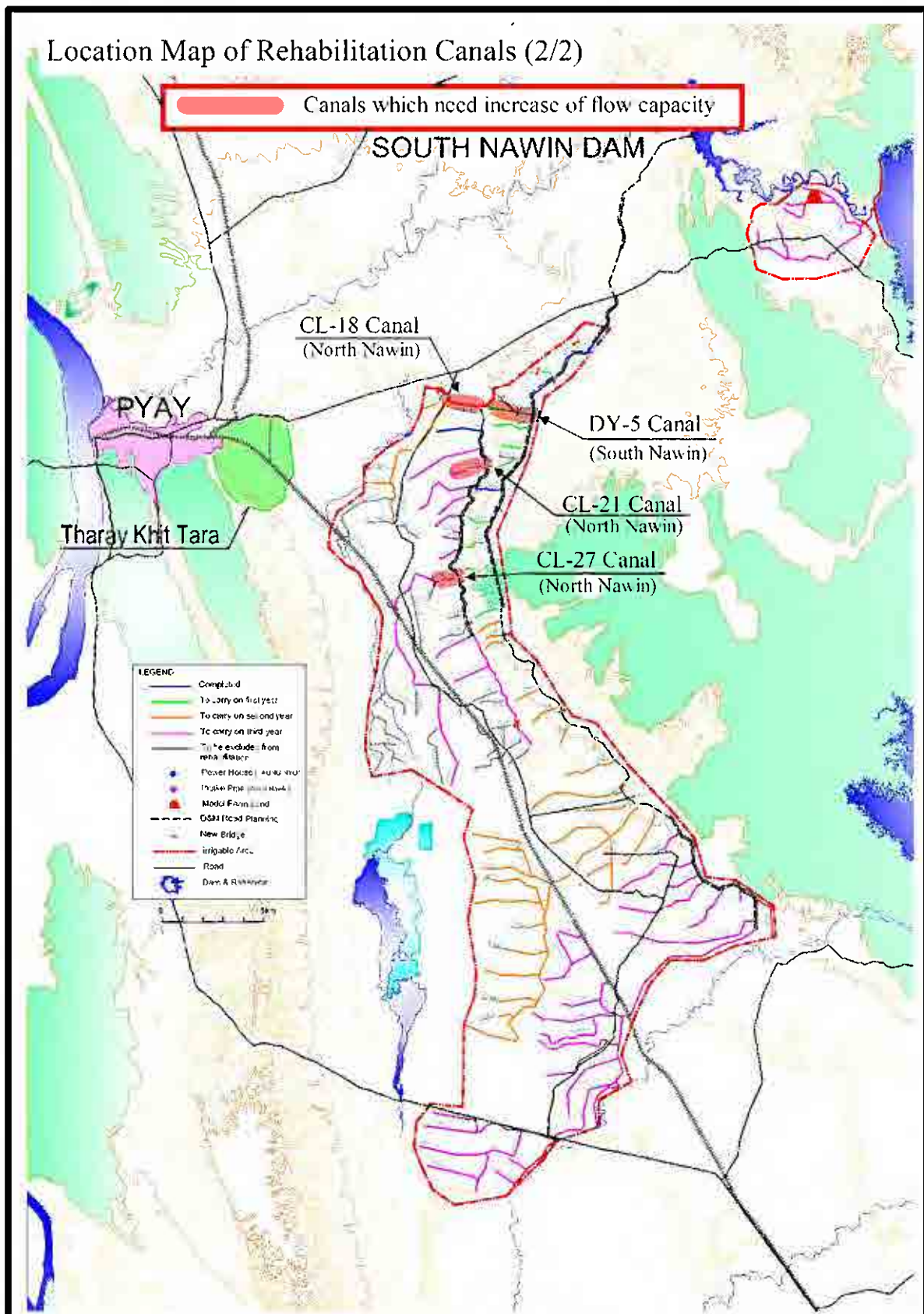
Hydraulic Calculation of DY-32

Design Condition (Canal Section)		
(1) Manning's Coefficient of Roughness (n)	0.030 (Rustic Earth)	
(2) Canal bed Width (B)	0.900 m	0.900 ft
(3) Canal Slope Gradient (S)	1:25	
(4) Canal bed slope (S _b)	2.00	
(5) External Flow Depth (d)	0.135 m	0.44 ft
(6) Canal bed (d _b)	0.200 m	0.66 ft
(7) Freeboard (fb)	0.025 m	0.20 ft
(8) Bed Height (B _H)	0.205 m	0.67 ft
(9) B + B _H	0.202 m	0.66 ft
Result of Calculation		
(10) Cross-sectional area of canal (A _c)	0.141 m ²	1.50 sq-ft
(11) Wetted Perimeter (P _w)	0.756 m	2.48 ft
(12) Hydraulic Radius (R _H)	0.186 m	0.61 ft
(13) Mean velocity (V _m)	1.045 m/sec	3.44 ft/sec
(14) Freeboard (fb) = 0.025m = 0.08ft	0.157 m	0.51 ft
(15) Canal Discharge (Q _c)	0.147 m ³ /sec	0.10 cu-ft/sec

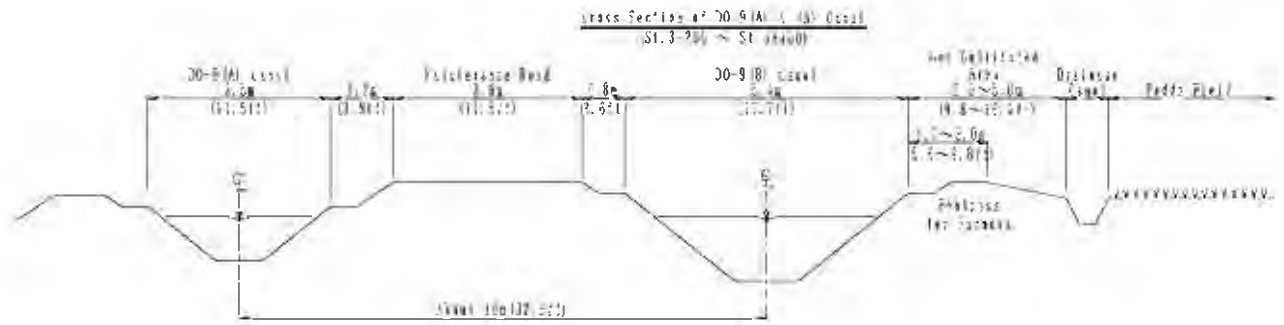


II.5.3 Location Map of Rehabilitation Canals

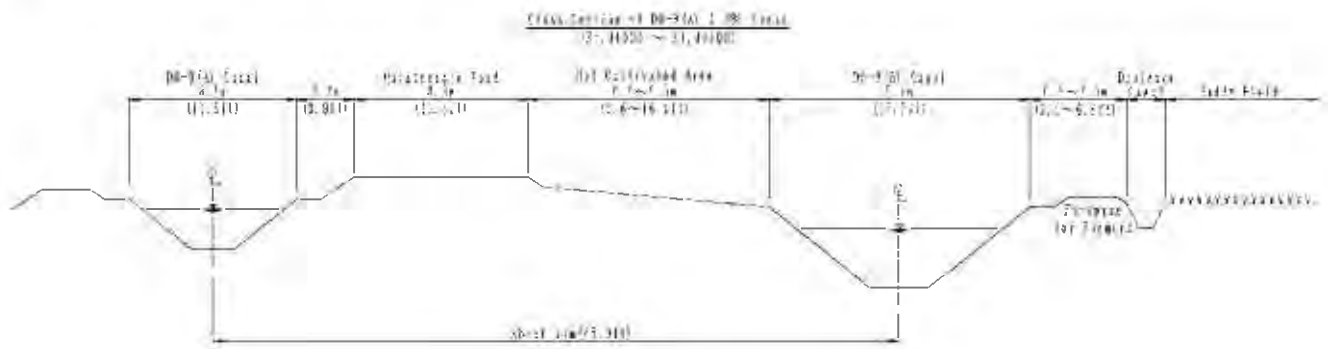




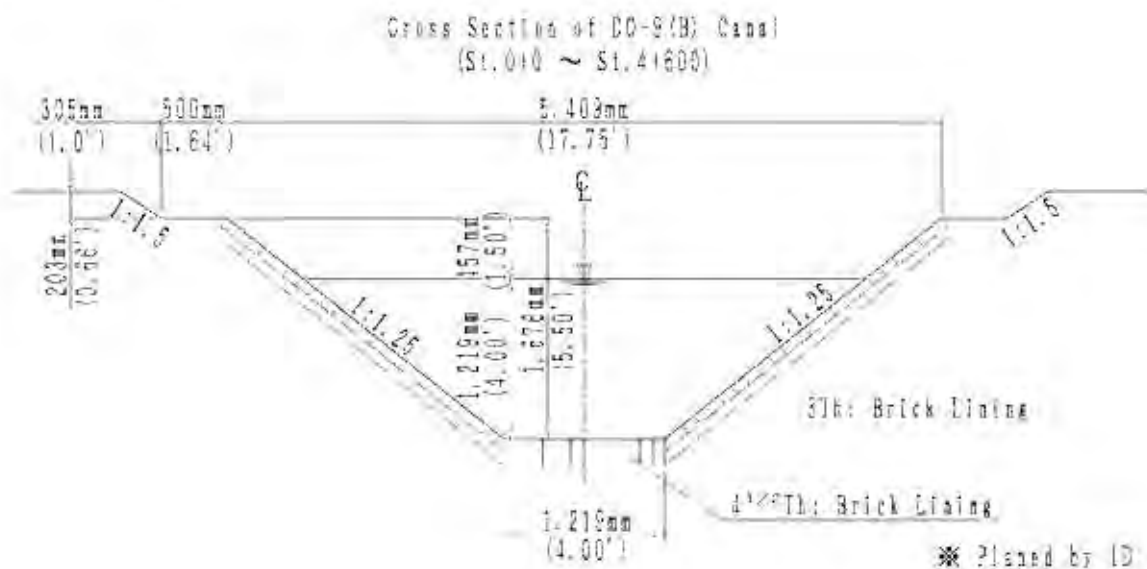
2) St. 3+200 ~ St.3+400



3) St.4+300 ~ St. 4+600



(2) Rehabilitation Plan of DO-9(B) Canal (Cross Section)



II.6.3 Hydraulic Calculation for DO-9(B) Canal

(1) Design Condition

1) Canal Discharge: $Q = A * V$

Q; Canal discharge (m^3/s)

A; Cross-section areas of canal (m^2)

V; Mean velocity (m/sec)

2) Mean velocity: $V = 1/n * R^{2/3} * I^{1/2}$

n; Manning's Coefficient of Roughness

Concrete: $n=0.015$

Brick Lining: $n=0.016$

Earth Lining: $n=0.025$

R; Hydraulic Radius = A/P (m)

P; Wetted Perimeter (m)

I; Canal bed slope (Hydraulic gradient); Rehabilitation Plan of ID

✓ St.0+0 ~ St.2+700; $I_1 = 1/400$

✓ St.2+700 ~ St.4+600; $I_2 = 1/333$

Canal Bed Slope of DO-9(B)

Station No.	Distance (ft)	Design Bed Level (ft)	Subtraction of Bed Level (ft)	Canal Bed Slope (I=1/s)
0 + 0		175.39		
0 + 485	485	174.19	1.20	s = 404
0 + 485	0	168.19	6.00	Drop
0 + 988	503	166.94	1.25	s = 402
0 + 988	0	162.94	4.00	Drop
1 + 369	381	161.95	0.99	s = 385
1 + 369	0	157.95	4.00	Drop
1 + 828	459	156.82	1.13	s = 406
1 + 828	0	152.82	4.00	Drop
2 + 700	872	150.63	2.19	s = 398
2 + 700	0	147.13	3.50	Drop
3 + 668	968	144.23	2.90	s = 334
3 + 668	0	140.73	3.50	Drop
4 + 0	332	139.72	1.01	s = 329
4 + 0	0	136.22	3.50	Drop
4 + 0	600	134.42	1.80	s = 333
4 + 600				

Note: Planned by ID (2014)

(2) Canal Discharge

1) Result of Hydraulic Calculation

Canal Name	Station No.	Canal Discharge	Remarks
DO-9(B)	St.0+0 ~ St.2+700	7.864m ³ /sec(280.86cu-ft/sec)	Annex 1
DO-9(B)	St.2+700 ~ St.4+600	8.619m ³ /sec(307.82cu-ft/sec)	Annex 1
DO-9(B)	In case of Canal bed slope=1/1000	4.974m ³ /sec(177.64cu-ft/sec)	Annex 2
DO-9(A)		1.872m ³ /sec(66.86cu-ft sec)	Annex 3

2) Irrigable Area of DO-9(B)

Canal Name	Irrigable Area	
CL-22	313.2 ha	773.33 Acre
CL-23	89.0 ha	219.75 Acre
CL-24	157.8 ha	389.63 Acre
CL-25	58.3 ha	143.95 Acre
CL-26	167.5 ha	413.58 Acre
CL-27	3,210.7 ha	7,927.65 Acre
CL-28	159.9 ha	394.81 Acre
CL-29	201.1 ha	496.54 Acre
Total	4,357.5 ha	10,759.26 Acre

3) Unit Water Requirement (Water Duty)

Canal Name	Station No.	Canal Discharge	Irrigable Area	Unit Water Requirement
DO-9(B)	St.0+0 ~ St.2+700	7.864m ³ /sec (280.86cu-ft sec)	4357.5ha (10,759.26Acre)	1.805 (liter/sec ha) ↓ 1cu-ft/sec = 38.303Acre
DO-9(B)	St.2+700 ~ St.4+600	8.619m ³ /sec (307.82cu-ft sec)	4357.5ha (10,759.26Acre)	1.978(liter/sec ha) ↓ 1cu-ft/sec = 34.953Acre
DO-9(B)	In case of canal bed slope=1/1,000	4.974m ³ /sec (177.64cu-ft sec)	4357.5ha (10,759.26Acre)	1.141(liter/sec ha) ↓ 1cu-ft/sec = 60.590Acre
Discharge Capacity of DO-9(A): In case of Summer Paddy				
DO-9(A)		1.872m ³ /sec (66.86cu-ft sec)	1,353.6ha (3,342.22Acre) for Summer Paddy	1.383(liter/sec ha) ↓ 1cu-ft/sec = 50Acre

- **Summer Paddy; 1cu-ft/sec = 50Acre (ID's standard)**
- **Monsoon Paddy; 1cu-ft/sec = 110Acre (ID's standard)**
- **Beans (Black gram, etc.) ; 1cu-ft/sec = 180Acre (ID's standard)**

II.6.4 Study of Hydraulic Calculation

(1) Canal Discharge Capacity of DO-9(B)

DO-9(B) Canal will be able to supply irrigation water for Summer Paddy to all irrigation area, if the Rehabilitation works will be completed.

In case of the canal bed slope is 1/1000, the discharge capacity is enough for Monsoon Paddy.

(2) Canal Discharge Capacity of DO-9(A)

DO-9(A) Canal has the discharge capacity for 1,354ha (3,342Acre) Summer Paddy, if the Rehabilitation works will be completed. DO-9(A) Canal can be secondary canal of DO-9(B).

(3) Maximum Allowable Velocity of DO-9(B)

Flow velocity is 2.578m/sec (8.46ft/sec) from St.2+700 to St.4+600. According to Japanese standard, maximum allowable velocity is 2.5m/sec (8.2ft/sec) at the concrete block work (wet masonry). Canal bed slope should be same as upstream (St.0+0 to St.2+700; $i=1/400$) or more gently to prevent the slope failure.

Annex 1. Hydraulic Calculation of DO-9(B)

(1) Uniform Flow Depth (Manning Formula) : SL.000 – SL.2#700

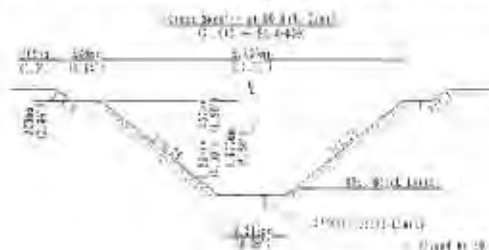
Design Condition (Canal Section)	
(1) Manning's Coefficient of Roughness (n) =	0.030 (Bridgk. lining)
(2) Canal bed width (B) =	3.200 m = 4.00 ft
(3) Canal slope (inclination) (1:m) =	1:20
(4) Canal bed slope (S) =	4‰
(5) Uniform Flow Depth (d) =	1.204 m = 3.95 ft
(6) Freeboard (FB) =	0.457 m = 1.50 ft

Result of Calculation	
(1) Cross-section area of canal (A) =	3.343 m ² = 35.95 sq.ft.
(2) Wetted Perimeter (P) =	5.122 m = 16.81 ft
(3) Hydraulic Radius (R) =	0.653 m = 2.14 ft
(4) Mean velocity (V) =	2.352 m/sec = 7.72 ft/sec
(5) Freeboard (FB) = 0.554 (0.005 + 0.13) =	0.393 = 0.465 m = 1.29 = 1.02 ft
(6) Canal Discharge (Q) =	7.861 m ³ /sec = 280.80 cfs @ 90%

(2) Uniform Flow Depth (Manning Formula) : Sr.21700 – Sr.41600

Design Condition (Canal Section)	
(1) Manning's Coefficient of Roughness (n) =	0.030 (Bridgk. Lining)
(2) Canal bed width (B) =	3.200 m = 4.00 ft
(3) Canal slope (inclination) (1:m) =	1:25
(4) Canal bed slope (S) =	3.33
(5) Uniform Flow Depth (d) =	1.219 m = 3.99 ft
(6) Freeboard (FB) =	0.457 m = 1.50 ft

Result of Calculation	
(1) Cross-section area of canal (A) =	3.343 m ² = 35.95 sq.ft.
(2) Wetted Perimeter (P) =	5.122 m = 16.81 ft
(3) Hydraulic Radius (R) =	0.653 m = 2.14 ft
(4) Mean velocity (V) =	2.378 m/sec = 7.80 ft/sec
(5) Freeboard (FB) = 0.554 (0.005 + 0.13) =	0.428 = 1.80 ft
(6) Canal Discharge (Q) =	8.049 m ³ /sec = 287.52 cfs @ 90%



Annex 2. Hydraulic Calculation of DO-9(B): Test Calculation

(1) Uniform Flow Depth (Manning Formula) : SL.000 – SL.41600

Design Condition (Canal Section)	
(1) Manning's Coefficient of Roughness (n) =	0.030 (Bridgk. Lining)
(2) Canal bed width (B) =	3.200 m = 4.00 ft
(3) Canal slope (inclination) (1:m) =	1:25
(4) Canal bed slope (S) =	3.33
(5) Uniform Flow Depth (d) =	1.219 m = 3.99 ft
(6) Freeboard (FB) =	0.457 m = 1.50 ft

Result of Calculation	
(1) Cross-section area of canal (A) =	3.343 m ² = 35.95 sq.ft.
(2) Wetted Perimeter (P) =	5.122 m = 16.81 ft
(3) Hydraulic Radius (R) =	0.653 m = 2.14 ft
(4) Mean velocity (V) =	3.468 m/sec = 11.38 ft/sec
(5) Freeboard (FB) = 0.554 (0.005 + 0.13) =	0.724 = 0.924 m = 0.71 = 1.06 ft
(6) Canal Discharge (Q) =	11.774 m ³ /sec = 417.04 cfs @ 90%

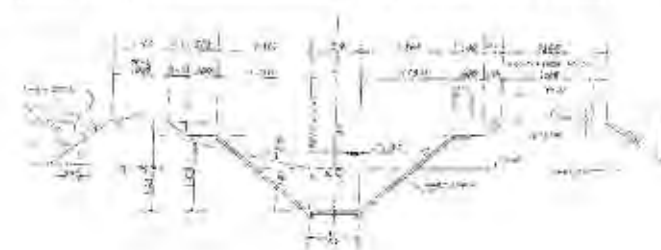


Annex 3. Hydraulic Calculation of DO-9(A)

(1) Uniform Flow Depth (Manning Formula)

Design Condition (Canal Section)	
(1) Manning's Coefficient of Roughness (n) =	0.030 (Bridgk. lining)
(2) Canal bed width (B) =	0.900 m = 2.95 ft
(3) Canal slope (inclination) (1:m) =	1:25
(4) Canal bed slope (S) =	1.00‰
(5) Uniform Flow Depth (d) =	0.830 m = 2.72 ft
(6) Freeboard (FB) =	0.200 m = 0.66 ft

Result of Calculation	
(1) Cross-section area of canal (A) =	1.608 m ² = 17.28 sq.ft.
(2) Wetted Perimeter (P) =	2.327 m = 7.63 ft
(3) Hydraulic Radius (R) =	0.692 m = 2.27 ft
(4) Mean velocity (V) =	1.164 m/sec = 3.82 ft/sec
(5) Freeboard (FB) = 0.554 (0.005 + 0.13) =	0.366 = 0.261 m = 0.23 = 0.75 ft
(6) Canal Discharge (Q) =	1.875 m ³ /sec = 66.50 cfs @ 90%



II.7 Issue and Recommendation

II.7.1 General

(1) Water Management Plan

Water control system or water management system is very important subject as well as rehabilitation of irrigation system because it is so much difficult to supply irrigation water to the end of canal without water control system. Accordingly, it is recommended to analyze and establish the water management system before completion of the rehabilitation works considering the following items:

- Confirmation of planned water discharge in each canals,
- Confirmation of check water level in the canals,
- Analysis of relation of gate opening and water level at regulators and farm turnouts,
- Confirmation of cropping patten in rotational irrigation areas,
- Establishment of rotational irrigation system,
- Establishment of water delivery system,
- Establishment annual water delivery plan,
- Establishment of gate operation criteria,
- Other necessary matters.

(2) Operation and Maintenance Manual of Irrigation Systems

To prevent deterioration of canal and its facilities and to supply irrigation water properly in the irrigable areas, operation and maintenance manual shall be prepared before completion of the rehabilitation works. The operation manual relates with the water management plan and it should include the following items:

- Cropping patterns in the each rotational irrigation areas,
- Establishment of water supply system,
- Decision of discharge in main canals and distribution canals by weekly basis including intake of reservoir dam,
- Establishment of operation rules of check gates, head regulator's gates and turnout gates,
- Establishment of the maintenance plan of irrigation canal, its facilities and operation roads by quarterly basis.

II.7.2 Recommendation for North Nawin Irrigation System

(1) Drainage Plan

Drainage water of South Nawin Irrigation System is dammed up by Main Left Canal (MLC) of North Nawin Irrigation System and this drainage water makes ponding. As a result, ponding

damages to farm land along the MLC. Site survey should be conducted to grasp this situation. And Drainage Plan should be established based on the site survey.

(2) Canal Facilities

1) Syphon (Main Left Canal, RD9+300ft)

Water leakage from canal and high permeability of soil causes piping around syphon. Some measures are considered against the piping as follows:

- Cutoff wall should be constructed at the upper portion of the syphon.
- Lining of canal should be change to concrete lining from brick lining at the upper portion of the syphon (about 30m).

Safety fence should be put around the inlet of syphon to protect resident from falling down.

2) Syphon (CL-30 Canal)

Syphon is exposed and broken by riverbed degradation of creek. This section should be box culvert because the creek flows under syphon structure.

II.7.3 Recommendation for South Nawin Irrigation System

(1) Water Leakage from Canal

There are some ponds at the toe of slope along the canal embankments. It seems that canal water leakage makes these ponds. It is recommended to conduct soil permeability test of the soils around the target areas. In case the soils are high permeability, Canal lining should be change to concrete lining from brick lining at the leakage portion.

(2) Inlet Structure of Link Canal for CL-8 Canal

Existing inlet structure of CL-8 consists of 20 pipes as a syphon. It is difficult to control irrigation water under existing structure. Therefore, inlet structure should be change to head regulator.

II.8 Aide Memoire on Examination of Canal Flow Capacity for North Nawin and
South Nawin Irrigation Systems

Aide Memoire on Examination of Canal Flow Capacity for North Nawin and South Nawin Irrigation Systems

A meeting was held on May 23, 2024 from 8:00 to 9:00AM at the Guest House of Irrigation Department, Pyay Office, concerning the Examination of Canal Flow Capacity for North Nawin and South Nawin Irrigation Systems with the following participants:

1. Irrigation Department (Yangon Office)
 - Mr. Minn Aung Han Director of Design Branch(1), Lower Myanmar
 - Mr. Hla Phone Maw Staff Officer of Design Branch(1), Lower Myanmar
2. Irrigation Department (Pyay Office)
 - Mr. Myint Htun Latt Director of Construction(2)
 - Mr. Aung Moe Win Assistant Director(3) of Construction(2), South Nawin
 - Mr. San Thein Staff Officer of Construction(2), South Nawin
 - Mr. Win Kyaing Staff Officer of Construction(2), North Nawin
 - Mr. Tin Maung Wai Staff Officer of Construction(2)
 - Mr. Aung Kyaw Oo Staff Officer of Construction(2)
3. Sanyu Consultants Inc.
 - Mr. Yoji Sawada Project Operation Division No.3, International Department, SCI

Following are the matters discussed and agreed upon among the participant parties:

- 1) On the cross section of DO-9(B) Canal, it was confirmed that the present cross section of the canal has enough capacity to discharge the required irrigation water for the irrigable area of 10,759.26 acre (4,357.5 ha); namely, the present sectional area can accommodate a flow volume of 4,974m³/sec even with 1/1,000 longitudinal gradient while the irrigation water requirement for monsoon paddy is estimated at 3,704 m³/sec (4,357.5ha × 0.850 liter/sec/ha=3,703.9liter/sec=3,704m³/sec) based on the unit water requirement proposed by SCI (see the table below).

The both parties have therefore confirmed that the cross sections of the DO-9(B) canal can be rehabilitated according to the ID rehabilitation plan, which does not accompany widening of the sections (widening of the sections for DO-9(B) is not required).

Category	Value	Remarks
Main Canal Discharge	1.0 l/sec/ha	Employed in examining the whole irrigation system capacity. Peak discharge shall partially be applied in preparation stage.
Distribution Canal Discharge	2.0 l/sec/ha	Employed in examining the capacity of each distribution canal which is operated on rotational basis.
Minimum Discharge for Distribution Canal	0.85 l/sec/ha	Employed in examining the capacity of each distribution canal which requires continuous water supply without rotation.

- 2) Further on the On the cross section of DO-9(B) Canal, the actual present gradient is estimated at 1/400, and with this 1/400 longitudinal gradient, the present section can discharge 1,805 liter/sec/ha, equivalent to "1cu-ft/sec = 38,303 acre". In comparison with the ID's standard for unit water requirement shown below; this capacity can

irrigate even summer paddy over whole area of 10,759.26 acre (4,357.5 ha) commanded by the DO-9(B) Canal. This means that no widening of the sections for DO-9(B) Canal is required.

- Summer Paddy: "1cu-ft/sec = 50acre" (ID's standard), equivalent to 1.383 l/sec/ha
- Monsoon Paddy: "1cu-ft/sec = 110acre" (ID's standard), equiv. to 0.629 l/sec/ha
- Beans (Black gram, etc.) : "1cu-ft/sec = 180acre" (ID's standard), 0.384 l/sec/ha

- 3) On the longitudinal slope of DO-9(B) Canal, the slope is set at 1/400 in the section of St.0 + 0ft (St.0m) to St.2 + 700ft (St.823m) while there is a steeper reach with 1/333 in the section of St.2 + 700ft (St.823m) to St.4 + 600ft (St.1,402m). Sanyu Consultants recommends ID to change the longitudinal slope of the steeper lower reach to 1/400 since faster flow velocity will cause erosion in the canal slope. ID will examine the longitudinal slope to be set at 1/400 in the whole longitudinal section.
- 4) On the Unit Water Requirement of North Nawin & South Nawin Irrigation Systems, Sanyu Consultants Inc. is to submit ID the report of how the design unit water requirement was estimated (refer to the Attachment-3). In response, ID will inform Sanyu Consultants of the Unit Water Requirement of Wegyi Irrigation System, which was designed by ID itself.
- 5) Concerning the Discharge Capacity of Distributary Canals of North Nawin & South Nawin Irrigation Systems, some canals were found not to have enough discharge capacity, and hence these canal sections need widening causing expansion towards both sides of the canal or otherwise raising of the embankment. JICA, on the other hand, would not accept the widening of canals, which results in procuring new LAND to be occupied by the widened canal. Therefore, Sanyu Consultants recommends ID of vertically topping up the road with a help of vertically cumulated bricks and/or utilizing berm (step) areas of the canals so that the canal section could accommodate necessary discharge of the flow (for the modification of canal section, refer to the attached drawings). ID agreed on that measure.
- 6) On the communication onwards, Mr. Sawada and the CP in charge, Mr. Aung Kyaw Oo, will correspond through e-mail.

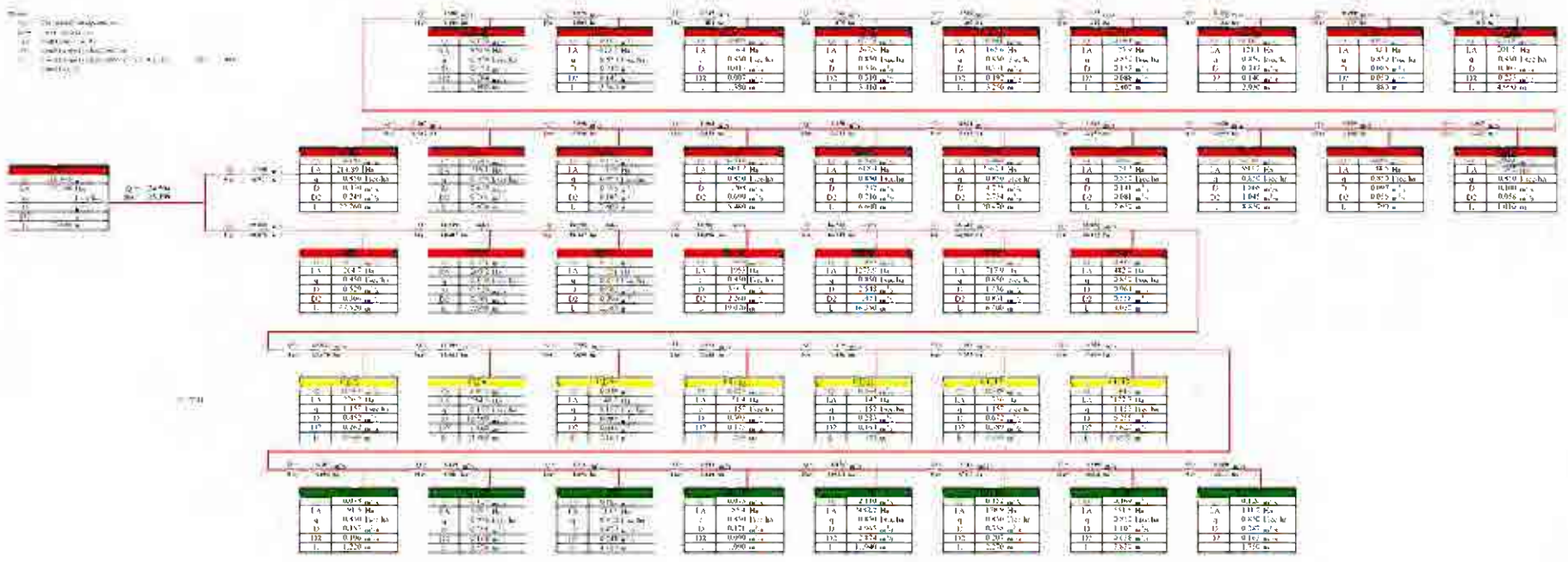
Attachments:

1. Schematic Diagram of Irrigation Network with Design Irrigation Demand
2. Outline Drawings for Rehabilitation of Canals with Calculation
3. Brief Report of Examination on Irrigation Water Requirement for Paddy

Prepared by Yoji SAWADA, SCI

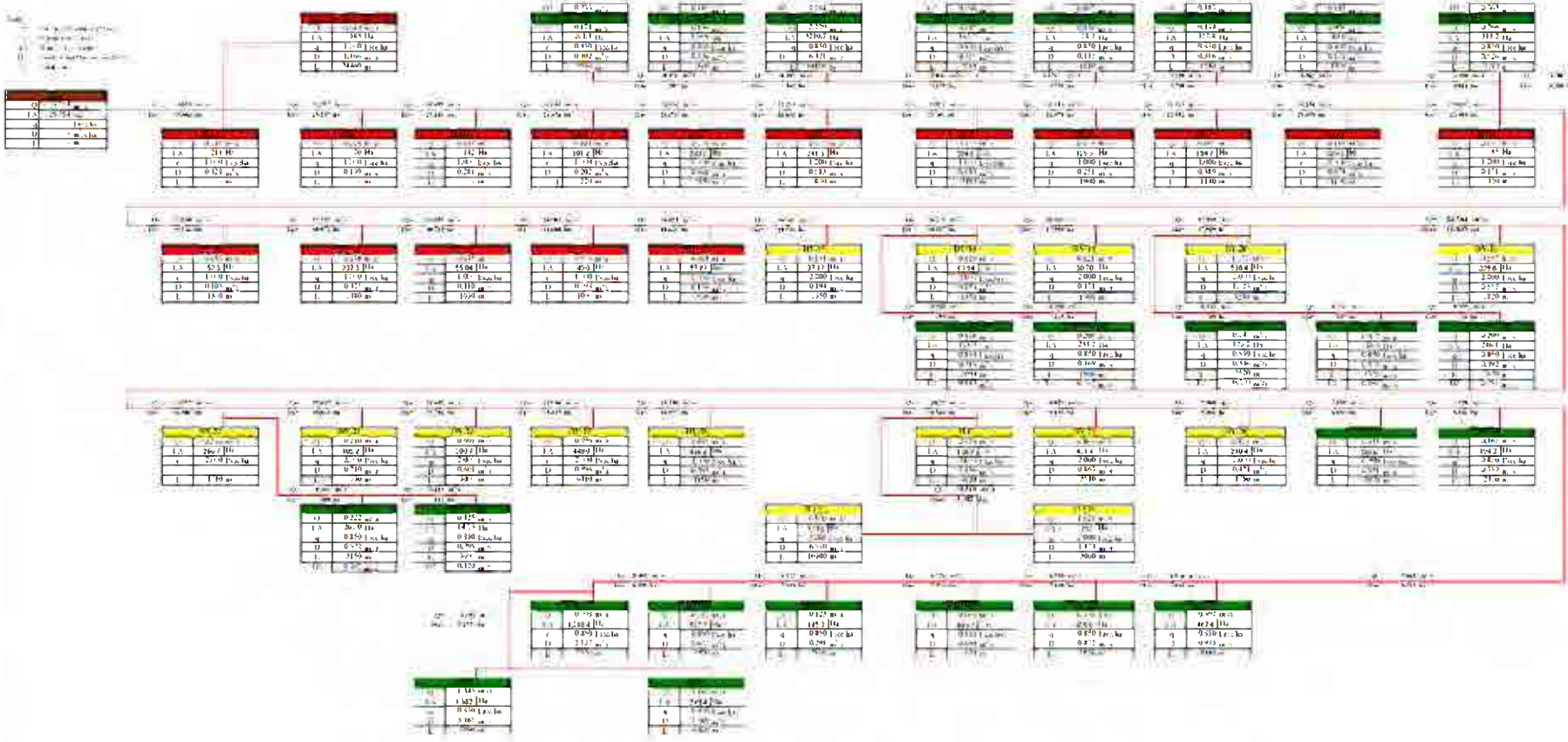
END

Attachment I. Schematic Diagram of Irrigation Network with Design Irrigation Demand (1/2)
PROJECT FOR REHABILITATION OF IRRIGATION SYSTEM
SCHEMATIC DIAGRAM OF NORTH SAWIN DAM PROJECT CANAL SYSTEM
PEAK WATER REQUIREMENT OF MONSOON PADDY



Attachment 1. Schematic Diagram of Irrigation Network with Design Irrigation Demand (2/2)

PROJECT FOR REHABILITATION OF IRRIGATION SYSTEM
SCHEMATIC DIAGRAM OF SOUTH NAWIN DAM PROJECT CANAL SYSTEM
PEAK WATER REQUIREMENT OF MONSOON PADDY



Attachment 2. Outline Drawings for Rehabilitation of Canals with Calculatio (1/3)

Rehabilitation Plan A

Condition;

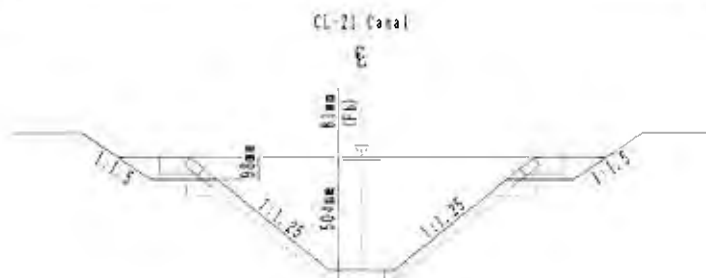
- > Canal High (H) < Uniform Flow Depth (d)
- > Canal High (H) + Berm Height (BH) > Uniform Flow Depth (d) + Freeboard (f)

Hydraulic Calculation of CL-21 (North Nawin Irrigation System)

(1) Uniform Flow Depth (Manning Formula)

Design Condition (Canal Section)	
(1) Manning's Coefficient of Roughness (n) =	0.016 (Brick Lining)
(2) Canal Bed Width (B) =	0.305 m = 1.00 ft
(3) Canal Slope Gradient (1 m) =	1.25
(4) Canal bed slope (1%) =	5.000
(5) Uniform Flow Depth (d) =	0.504 m = 1.65 ft
(6) Canal High (H) =	0.406 m = 1.33 ft
(7) Freeboard (Fb) =	-0.098 m = -0.32 ft
(8) Berm Height (Bh) =	0.203 m = 0.67 ft
(9) Fb + Bh =	0.105 m = 0.34 ft

Result of Calculation	
(10) Cross-section areas of canal (A) =	0.471 m ² = 5.07 sq-ft
(11) Wetted Perimeter (P) =	1.918 m = 6.29 ft
(12) Hydraulic Radius (R) =	0.246 m = 0.81 ft
(13) Mean velocity (V) =	0.347 m/sec = 1.14 ft/sec
(14) Freeboard (Fb) = 0.05d + hv = (0.05-0.15) =	0.081 - 0.181 m = 0.27 - 0.59 ft
(15) Canal Discharge (Q) =	0.163 m ³ /sec = 5.82 cu-ft/sec
Judgement: (9) > (14) → OK	



Hydraulic Calculation of DY-5 (South Nawin Irrigation System)

(1) Uniform Flow Depth (Manning Formula)

Design Condition (Canal Section)	
(1) Manning's Coefficient of Roughness (n) =	0.016 (Brick Lining)
(2) Canal Bed Width (B) =	0.300 m = 0.98 ft
(3) Canal Slope Gradient (1 m) =	1.25
(4) Canal bed slope (1%) =	7.00
(5) Uniform Flow Depth (d) =	0.603 m = 1.98 ft
(6) Canal High (H) =	0.550 m = 1.80 ft
(7) Freeboard (Fb) =	-0.053 m = -0.17 ft
(8) Berm Height (Bh) =	0.203 m = 0.67 ft
(9) Fb + Bh =	0.150 m = 0.49 ft

Result of Calculation	
(10) Cross-section areas of canal (A) =	0.635 m ² = 6.83 sq-ft
(11) Wetted Perimeter (P) =	2.231 m = 7.32 ft
(12) Hydraulic Radius (R) =	0.285 m = 0.94 ft
(13) Mean velocity (V) =	1.023 m/sec = 3.36 ft/sec
(14) Freeboard (Fb) = 0.05d + hv = (0.05-0.15) =	0.081 - 0.181 m = 0.27 - 0.59 ft
(15) Canal Discharge (Q) =	0.650 m ³ /sec = 23.21 cu-ft/sec
Judgement: (9) > (14) → OK	



Attachment 2. Outline Drawings for Rehabilitation of Canals with Calculation (2/3)

Rehabilitation Plan B

Condition:

$$\text{Canal High (H)} - \text{Berm High (BH)} < \text{Uniform Flow Depth (d)} + \text{Freeboard (Fb)}$$

Hydraulic Calculation of CL-1 (North Nawin Irrigation System)

(1) Uniform Flow Depth (Manning Formula)

Design Condition (Canal Section)		
(1) Manning's Coefficient of Roughness (n)	0.016	(Brick Lining)
(2) Canal Bed Width (B)	0.305 m	1.00 ft
(3) Canal Slope Gradient (1:n)	1:25	
(4) Canal bed slope (1:D)	5:1000	
(5) Uniform Flow Depth (d)	0.600 m	2.00 ft
(6) Canal Height (H)	0.381 m	1.25 ft
(7) Freeboard (Fb)	-0.279 m	-0.92 ft
(8) Berm Height (BH)	0.203 m	0.67 ft
(9) Fb - BH	-0.076 m	-0.25 ft

Result of Calculation		
(10) Cross-section areas of canal (A)	0.746 m ²	8.92 sq-ft
(11) Wetted Perimeter (P)	2.418 m	7.93 ft
(12) Hydraulic Radius (R)	0.308 m	1.01 ft
(13) Mean velocity (V)	0.403 m/sec	1.32 ft/sec
(14) Freeboard (Fb) = 0.05d - hv + (0.05 - 0.13)	0.091 m	0.30 ft
(15) Canal Discharge (Q)	0.301 m ³ /sec	10.75 cu-ft/sec
Judgement: (9) < (14) = NG		

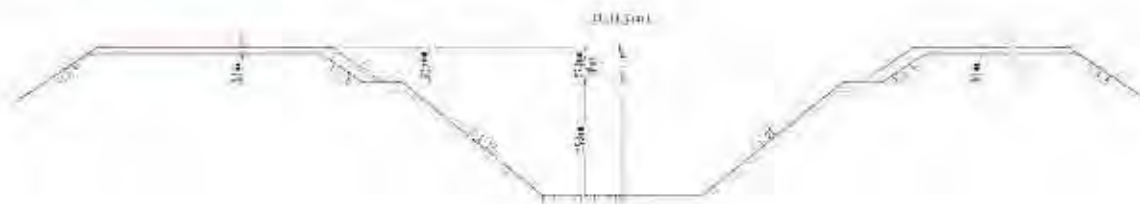


Hydraulic Calculation of CL-13 (North Nawin Irrigation System)

(1) Uniform Flow Depth (Manning Formula)

Design Condition (Canal Section)		
(1) Manning's Coefficient of Roughness (n)	0.016	(Brick Lining)
(2) Canal Bed Width (B)	1.219 m	4.00 ft
(3) Canal Slope Gradient (1:n)	1:25	
(4) Canal bed slope (1:D)	4:55	
(5) Uniform Flow Depth (d)	0.850 m	2.79 ft
(6) Canal Height (H)	0.864 m	2.84 ft
(7) Freeboard (Fb)	0.014 m	0.05 ft
(8) Berm Height (BH)	0.203 m	0.67 ft
(9) Fb - BH	-0.212 m	-0.71 ft

Result of Calculation		
(10) Cross-section areas of canal (A)	1.939 m ²	20.85 sq-ft
(11) Wetted Perimeter (P)	3.711 m	12.02 ft
(12) Hydraulic Radius (R)	0.492 m	1.61 ft
(13) Mean velocity (V)	1.868 m/sec	6.15 ft/sec
(14) Freeboard (Fb) = 0.05d - hv + (0.05 - 0.13)	0.270 m	0.89 ft
(15) Canal Discharge (Q)	3.622 m ³ /sec	129.36 cu-ft/sec
Judgement: (9) < (14) = NG		



Attachment 2. Outline Drawings for Rehabilitation of Canals with Calculatio (3/3)

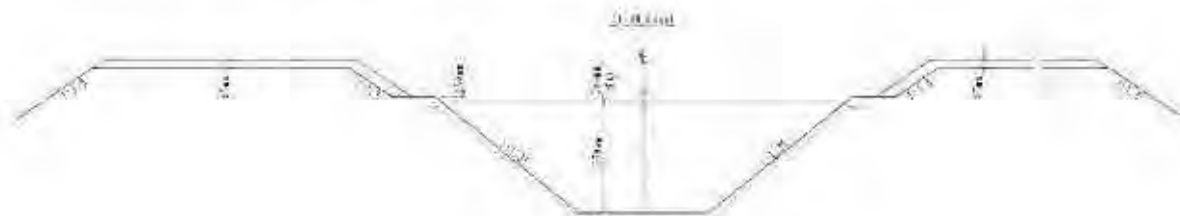
Rehabilitation Plan B

Hydraulic Calculation of CL-18 (North Nawin Irrigation System)

(1) Uniform Flow Depth (Manning Formula)

Design Condition (Canal Section)		
(1) Manning's Coefficient of Roughness (n)	0.016	(Brick Lining)
(2) Canal Bed Width (B)	0.714 m	3.00 ft
(3) Canal Slope Gradient (1:m)	1:25	
(4) Canal bed slope (1:H)	333	
(5) Uniform Flow Depth (d)	0.179 m	2.56 ft
(6) Canal High (H)	0.813 m	2.67 ft
(7) Freeboard (Fb)	0.031 m	0.11 ft
(8) Barrn High (Bh)	0.203 m	0.67 ft
(9) Fb + Bh	0.237 m	0.78 ft

Result of Calculation		
(10) Cross-section area of canal (A)	1.171 m ²	43.82 sq-ft
(11) Wetted Perimeter (P)	3.408 m	11.18 ft
(12) Hydraulic Radius (R)	0.432 m	1.42 ft
(13) Mean velocity (V)	1.957 m/sec	6.42 ft/sec
(14) Freeboard (Fb) = 0.05d (0.05 < 0.15)	0.284 m	0.93 = 1.26 ft
(15) Canal Discharge (Q)	2.879 m ³ /sec	102.82 cu-ft/sec
Judgement: (9) < (14) → NG		



Hydraulic Calculation of CL-27 (North Nawin Irrigation System)

(1) Uniform Flow Depth (Manning Formula)

Design Condition (Canal Section)		
(1) Manning's Coefficient of Roughness (n)	0.016	(Brick Lining)
(2) Canal Bed Width (B)	0.219 m	4.00 ft
(3) Canal Slope Gradient (1:m)	1:25	
(4) Canal bed slope (1:H)	175	
(5) Uniform Flow Depth (d)	0.482 m	2.24 ft
(6) Canal High (H)	0.813 m	2.67 ft
(7) Freeboard (Fb)	0.131 m	0.43 ft
(8) Barrn High (Bh)	0.203 m	0.67 ft
(9) Fb + Bh	0.334 m	1.10 ft

Result of Calculation		
(10) Cross-section area of canal (A)	1.413 m ²	15.19 sq-ft
(11) Wetted Perimeter (P)	3.403 m	11.16 ft
(12) Hydraulic Radius (R)	0.415 m	1.36 ft
(13) Mean velocity (V)	2.628 m/sec	8.62 ft/sec
(14) Freeboard (Fb) = 0.05d (0.05 < 0.15)	0.437 m	1.43 = 1.78 ft
(15) Canal Discharge (Q)	3.714 m ³ /sec	132.64 cu-ft/sec
Judgement: (9) < (14) → NG		



Attachment 3. Brief Report of Examination on Irrigation Water Requirement for Paddy

1. Irrigation Water Demand for Paddy

1.1 Crop Water Need and Irrigation Demand in General

According to FAO (1986)¹, a crop water need is defined as the depth (or amount) of water needed to meet the water loss through evapotranspiration. This theory is based on Penman equation² to calculate evaporation from an open water surface through combination of several factors such as daily mean temperature, wind speed, relative humidity, and solar radiation. If field measurements of these factors are not available, calculation of crop water has to be estimated by other means.

FAO (1992)³ introduces approximate average value of net crop water need but it seems to be large value in comparison with actual water demand. Several studies have been conducted to examine actual irrigation demand and some useful results are available. The following table shows a paddy water need reported by different researchers and organizations.

Table 1. Available Information on Paddy Water Need and Irrigation Demand

Author(s)	Values and explanations
FAO (1992)	1.5 l/sec/ha for net water need; (gross need: 3.0 l/sec/ha)
FAO (1986)	8.4mm/day – 17.4mm/day (1 l/sec/ha – 2 l/sec/ha)
Tabal et al (1981) ⁴	Peak Gross Demand: 1.5 l/sec/ha; pre-saturation, 1.0 l/sec/ha; crop growth
JIID (1998) ⁵ , Maurice (2005) ⁶	Tegal curve; 1 l/sec/ha for 150ha, 0.8 l/sec/ha for over 700ha of command area
H. Tanji et al (2010) ⁷	4 - 5 mm/day (0.46-0.58 l/sec/ha for net need, 0.92-1.16 l/sec/ha for gross)
Maina M. M. (2012) ⁸	1.5-4.1mm/day (0.17 - 0.47 l/sec/ha for net need, 0.34 – 0.94 l/sec/ha for gross need)

Note: some figures in the table are calculated from the original reports, and irrigation demands are calculated by using irrigation efficiency of 50%.

As it is shown in the table, paddy water need has wide range from 0.17 l/sec/ha to 1.5 l/sec/ha, about 5 times difference between the smallest one and the largest one. For irrigation planning, paddy water need requires to be converted to paddy irrigation demand, which can be calculated as follows.

$$\text{Paddy Irrigation Demand} = \text{Paddy Water Need} \times 100/e$$

Where, e: irrigation scheme efficiency (50% in FAO (2002))

Thus, paddy irrigation demand can be calculated and it has a range from 0.34 l/sec/ha to 3.0 l/sec/ha. Among those values, there are some useful information based on experiences and

¹ FAO (1986). Irrigation Water Management: Irrigation Water Needs. Rome

² Penman, H.L. (1948). Natural evaporation from open water, bare soil and grass. Proc. Roy. Soc. London A(194)

³ FAO (1992). Irrigation Water Management: Training Manual No. 6 - Scheme Irrigation Water Needs and Supply

⁴ Tabal, D.F. & Wickham, T.H. (1981). Effects of location and water shortages in an irrigated area, IRR1

⁵ Japan Institute of Irrigation and Drainage (JIID) (1998). 100 articles for overseas development cooperation

⁶ Maurice William Litsen (2005). Emergence of an engineering irrigation design approach in the Netherlands East Indies and its legacy 1830 – 1990

⁷ H. Tanji, Hirohide Kiri, Shintaro Kobayashi (2010). The Paddy Water Demand Paradox: Can you solve it?

⁸ Maina M. M. et al (2012). Evaluation of Field Measurements and Estimated Rice Crop Water Requirements. PAWELS 2012 International Conference

field observation in Southeast Asia such as Taba¹ et al (1981). Maurice (2005) explained simplified irrigation design method formulated in Netherland colonial period and it ranges from 0.8l/sec/ha to 1.0l/sec/ha in plain area. Tanji (2010) studied actual field paddy water need at Cambodian flood plain and Maina (2012) examined actual field paddy water need in consideration of rainfall in Malaysia where obtained effective rainfall of 689.9mm during field observation of paddy cultivation period

Based on those knowledge and experiences, actual irrigation demand for paddy will range in Southeast Asia from 0.67l/sec to 1.5l/sec/ha.

1.2 Review of Irrigation Demand

This section describes irrigation demand of existing design for North Nawin Irrigation System and South Nawin Irrigation System. As for Wegyi and Tanug Nyo Irrigation Systems, irrigation demand will be examined during detail design stage of those systems.

Table 2 shows irrigation demand of each canal for different irrigation blocks in North Nawin Project based on calculation of existing data. It is noted that the irrigation demand in North Nain Irrigation System was designed with different water requirements for each irrigation block and it ranges from 0.36l/sec/ha in CR-10 as the minimum value to 2.09l/sec/ha in CR-18 as the maximum value. The original irrigation design of North Nawin Irrigation System primarily aimed to irrigate upland crops such as cotton and sesame with various cropping pattern. This is why unit irrigation demand has wide range.

South Nawin Irrigation System was designed for cultivation of paddy in its command area. Design discharge for distribution canal (irrigation block) is 2.424l/sec/ha while the main canal discharge is 1.405l/sec/ha. Discharge design for distribution canal aimed to cover the peak discharge for land preparation known as period between pre-saturation stage and ponding stage before nursery stage.

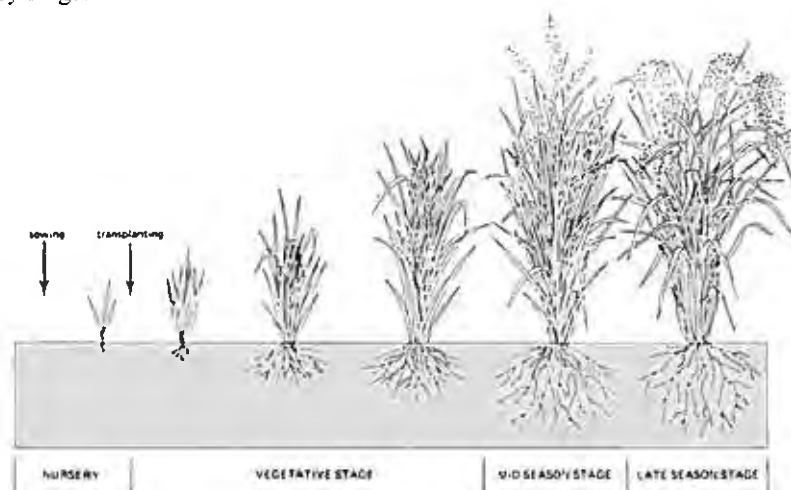


Figure 1. Rice Growth Stage

Source: FAO (1989)⁹

⁹ FAO (1989), Irrigation Water Management: Irrigation Scheduling

Table 2. Existing Irrigation Design for North Nawin Irrigation System

Canal	Irrigable area (ha)	Discharge (m ³ /s)	Irrigation Demand (mm/s/ha)	Irrigation Demand (l/sec/ha)
CR-1	312.4	0.198	5.48	0.63
CR-2	156.0	0.132	7.31	0.85
CR-3	597.2	0.437	6.32	0.73
CR-4	611.2	0.532	7.52	0.87
CR-5	3,045.6	2.170	6.16	0.71
CR-6	154.4	0.132	7.39	0.85
CR-7	977.6	0.700	6.19	0.72
CR-8	48.0	0.066	11.88	1.38
CR-9	49.6	0.046	8.01	0.93
CR-10	258.8	0.092	3.07	0.36
CR-11	206.8	0.119	4.97	0.58
CR-12	91.2	0.046	4.36	0.50
CR-13	264.8	0.145	4.73	0.55
CR-14	190.4	0.092	4.17	0.48
CR-15	87.2	0.092	9.12	1.06
CR-16	139.2	0.119	7.39	0.85
CR-17	49.6	0.046	8.01	0.93
CR-18	231.6	0.484	18.06	2.09
CL-1	257.2	0.138	4.64	0.54
CL-2	248.0	0.092	3.21	0.37
CL-3	1,930.0	1.126	5.04	0.58
CL-4	1,259.2	1.148	7.88	0.91
CL-5	709.6	0.528	6.43	0.74
CL-6	476.4	0.308	5.59	0.65
CL-7	223.6	0.462	17.85	2.07
CL-8	6,747.6	4.534	5.81	0.67
CL-9	40.8	0.066	13.98	1.62
CL-10	149.6	0.132	7.62	0.88
CL-11	140.0	0.132	8.15	0.94
CL-12	332.0	0.159	4.14	0.48
CL-13	3,612.4	2.397	5.73	0.66
CL-14	90.4	0.093	8.89	1.03
CL-15	143.6	0.093	5.60	0.65
CL-16	212.0	0.119	4.85	0.56
CL-17	84.4	0.066	6.76	0.78
CL-18	2,454.0	1.620	5.70	0.66
CL-19	176.8	0.132	6.45	0.75
CL-20	545.2	0.330	5.23	0.61
CL-21	139.6	0.132	8.17	0.95
CL-22	309.6	0.198	5.53	0.64
CL-23	88.0	0.066	6.48	0.75
CL-24	156.0	0.066	3.66	0.42
CL-25	57.6	0.066	9.90	1.15
CL-26	165.6	0.132	6.89	0.80
CL-27	3,173.6	2.388	6.50	0.75
CL-28	158.0	0.092	5.03	0.58
CL-29	198.8	0.138	6.00	0.69
CL-30	156.4	0.092	5.08	0.59
CL-31	232.0	0.138	5.14	0.59
CL-32	171.2	0.119	6.01	0.70
CL-33	87.6	0.046	4.54	0.53
CL-34	243.2	0.155	5.51	0.64
CL-35	258.0	0.119	3.99	0.46
CL-36	145.6	0.092	5.46	0.63

Source: North Nawin Feasibility Study Report

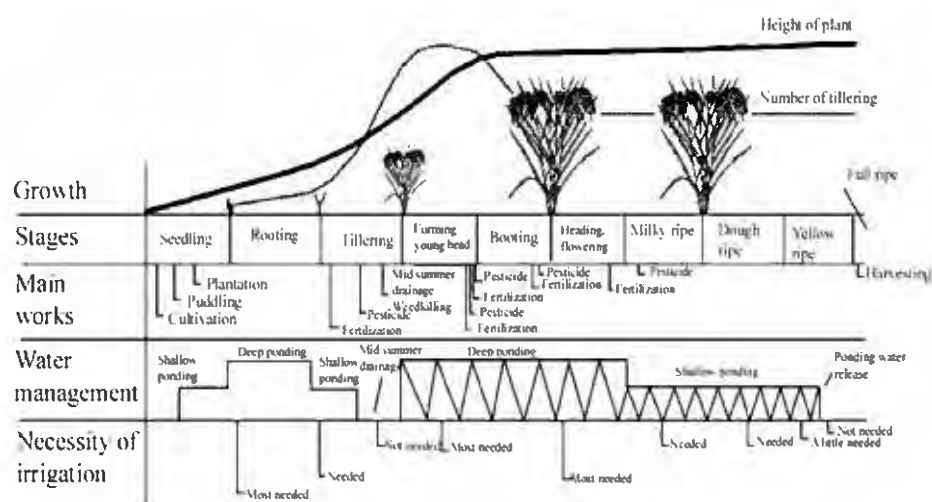


Figure 2. Rice Growth, Agricultural Works and Water Management

Source: Maruyama and Tanji (1997)

Maruyama and Tanji (1997)¹⁰ explain well about necessity of irrigation according to rice growth stages. The most needed period of irrigation is the initial deep ponding period and irrigation requirement of this stage is set as the peak irrigation discharge for distribution canal. The design concept of South Nawin Irrigation System aims paddy irrigation for whole command area while North Nawin Irrigation System considers upland crop cultivation; however, the value of irrigation demand was taken a bit conservative and/or safety side.

1.3 Irrigation Demand for Irrigation System Rehabilitation

Design of supplemental irrigation is required in North Nawin Irrigation System and South Nawin Irrigation System for monsoon paddy cultivation during rainy season before implementation of irrigation system rehabilitation. Theoretical irrigation demand calculation sometimes results large value in comparison with actual crop water consumption as aforementioned. There are some common irrigation demand values for irrigation planning in different cases.

Table 3. Common Value for Irrigation Requirement

Case	Irrigation Requirement	
Peak Irrigation Demand and/or Pre-saturation	20mm/day (2.31l/sec/ha),	17.3mm/day (2l/sec/ha)
Rice growth Irrigation Demand	10mm/day (1.16l/sec/ha),	8.6mm/day (1l/sec/ha)

Source: JIID (1998), FAO (2002)¹¹

The purpose of irrigation for 2 irrigation systems is to supply supplemental irrigation water for paddy cultivation, but not full supply of irrigation water. This is why smaller values of common irrigation requirement are applicable as the design value of irrigation requirement for rehabilitation project, namely 2l/sec/ha for peak irrigation demand and 1l/sec/ha for rice growth

¹⁰ Maruyama, T and K K. Tanji (1997). Physical and Chemical processes of soil related to paddy drainage, 99-101

¹¹ FAO (2002). Sustainable rice production for food security. Proceedings of the 20th Session of the International Rice Commission Bangkok, Thailand, 23-26 July 2002

irrigation demand. In addition to this design approach, it also shall be considered that actual irrigation requirement would be smaller than these values in consideration of the recent studies as aforementioned.

The values studied by Maina (2012) can be considered reflecting actual situation but it is too risky to use these values for irrigation design because uncertain rainfall phenomena are reported around the project area in recent years. As JIID (1998) and Maurice (2005) introduced, Tegal curve is one of convenient methods assuming irrigation requirement for wide area such as North Nawin and South Nawin Irrigation Projects. Tegal curve suggests that 0.8l/sec/ha of irrigation demand can be applied to the area wider than 700ha but it shall be increased a bit because North Nawin irrigation system is located at the southern edge of a central dry zone. Thus, 0.05l/sec/ha is added to Tegal curve value and 0.85l/sec/ha is recommendable for minimum value for supplemental irrigation demand.

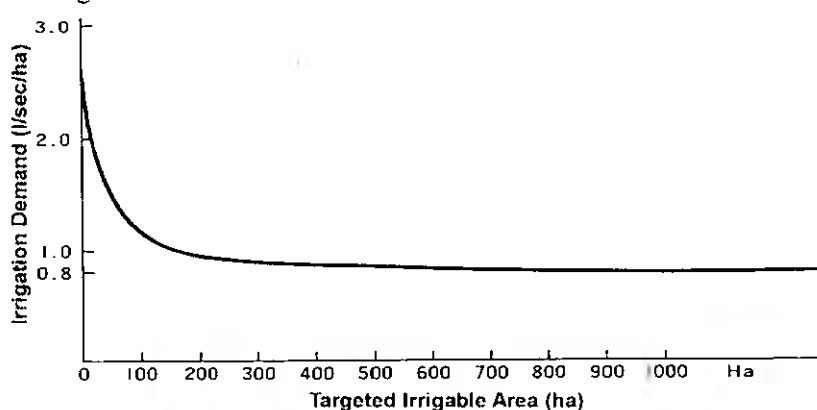


Figure 3. Tegal Curve for Irrigation Demand Designing

Source: Japan Institute of Irrigation and Drainage (1998)

The following table summarizes discussions in this section.

Table 4. Recommendable Design Value for Irrigation Demand in North and South Nawin Projects

Category	Value	Remarks
Main Canal Discharge	1.0l/sec/ha	To examine a whole irrigation system capacity. Peak discharge shall be partially applied in preparation stage.
Distribution Canal Discharge	2.0l/sec/ha	To examine each distribution canal capacity which can consider rotation irrigation
Minimum Discharge	0.85l/sec/ha	To examine each distribution canal capacity which requires continuous water supply without rotation

APPENDIX-III

COST ESTIMATION

APPENDIX III: COST ESTIMATION

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CHAPTER 1 PROJECT COST

CHAPTER 1 PROJECT COST

1.1 Project Cost for North Nawin Irrigation System

Construction year	Name of Canal	Project Cost (Kyats)		
		FC _{※1}	LC _{※2}	Total
1st Year	M.R.C	617.487	643.364	1,260.851
	CR - 1	1.460	10.802	12.262
	CR - 2	1.633	12.386	14.019
	CR - 3	10.744	45.226	55.971
	CR3A	18.122	18.058	36.179
	CR3B	20.304	20.242	40.545
	CR - 4	6.384	33.205	39.589
	CR4 A	22.024	21.522	43.546
	CR4 B	6.953	7.246	14.199
	CR - 5	33.646	202.608	236.254
	CR - 5 A	103.139	101.145	204.284
	CR - 5 B	199.510	189.285	388.795
	CR - 5 B1	12.593	12.756	25.348
	CR - 5 B2	25.359	24.970	50.329
	CR - 5 B3	99.841	98.808	198.649
	CR - 5 C	315.512	313.115	628.627
	CR - 5 C1	28.162	28.367	56.529
	CR - 5 C2	81.119	76.462	157.581
	CR - 6	36.118	45.905	82.023
	CR - 7	197.658	224.128	421.785
	CR-7 A	34.437	33.719	68.156
	CR-7 B	24.672	24.047	48.719
	CR-7 C	27.153	28.295	55.448
	CR - 8	13.146	16.411	29.557
	CR - 9	16.172	20.222	36.394
	CR - 10	34.910	43.760	78.670
	CR - 11	43.414	56.104	99.517
	CR - 12	21.163	26.528	47.692
	CR - 13	77.314	83.242	160.556
	CR - 14	44.173	55.988	100.160
	CR - 15	32.689	41.549	74.238
	CR - 16	39.914	50.563	90.477
	CR - 17	19.273	24.711	43.983
	CR - 17-A	120.321	151.229	271.550
	CR - 17-B	18.233	23.492	41.725
	CR - 17-C	27.606	35.239	62.844
	CR - 18	214.571	238.689	453.261
	CR - 18-A	15.861	20.494	36.355
	CR - 18-B	16.744	19.326	36.069
	CR - 18-C	59.609	77.460	137.068
	M.L.C	366.946	319.103	686.049
	CL - 1	64.959	68.739	133.698
CL - 2	56.283	60.019	116.302	
CL - 3	676.880	736.953	1,413.833	
CL - 3-A	20.488	21.940	42.427	
CL - 3-B	15.512	17.296	32.807	
CL - 4	836.364	1,038.961	1,875.325	
CL - 4-A	40.902	40.433	81.334	
CL - 4-B	132.075	127.424	259.499	
CL - 5	285.950	291.337	577.287	
CL - 6	151.474	152.498	303.973	
CL - 6-A	38.015	40.528	78.543	
Sub-Total	5,424.986	6,115.895	11,540.881	

Construction year	Name of Canal	Project Cost (Kyats)		
		FC _{※1}	LC _{※2}	Total
2nd Year	M.L.C	1,100.577	1,024.527	2,125.104
	CL - 7	9.041	8.862	17.903
	CL - 7-A	7.409	6.012	13.421
	CL - 9	3.067	5.422	8.488
	CL - 10	2.880	4.868	7.748
	CL - 11	2.744	4.339	7.083
	CL - 12	11.356	12.503	23.860
	CL - 13	162.264	150.210	312.474
	CL - 13-A	24.046	22.864	46.911
	CL - 13-A1	20.033	19.135	39.168
	CL - 13-B	19.755	20.378	40.133
	CL - 13-C	5.615	9.886	15.501
	CL - 13-D	12.715	16.718	29.433
	CL - 13-D1	3.552	7.987	11.539
	CL - 13-D2	12.909	24.554	37.463
	CL - 13-D2A	6.548	8.931	15.479
	CL - 13-D2B	9.406	10.906	20.312
	CL - 13-D2C	6.940	8.636	15.577
	CL - 14	22.937	20.755	43.692
	CL - 15	28.764	28.275	57.039
CL - 16	22.671	21.974	44.645	
CL - 16-A	30.604	27.763	58.367	
CL - 17	22.649	20.839	43.488	
Sub-Total	1,548.483	1,486.345	3,034.828	
3rd Year	M.L.C	539.659	499.403	1,039.063
	M.L.C	221.704	227.886	449.590
	Sub-Total	761.363	727.289	1,488.652

Total Project Cost (Kyats)	
Rehabilitation for Canal (1st year)	11,540.881
Rehabilitation for Canal (2nd year)	3,034.828
Rehabilitation for Canal (3rd year)	1,488.652
Maintenance Road (Main Canal)	465.405
Access of North Nawin	716.394
Maintenance Road (Distribution Canal)	339.292
Pipe and Intake gates Installation (North NawinDam)	400.000
Total	17,985.452

※1 FC : Foreign Currency Portion

※2 LC : Local Currency Portion

1.2 Project Cost for South Nawin Irrigation System

Construction year	Name of Canal	Project Cost (Kyats)			
		FC※1	LC※2	Total	
1st Year	Main Canal	578.883	537.537	1,116.420	
	DY-1	18.020	19.569	37.589	
	DY-2	19.808	21.069	40.877	
	DY-2-1	22.761	23.898	46.658	
	DY-2-2	16.336	17.528	33.864	
	DY-3	36.814	40.643	77.457	
	DY-3-1	31.179	30.350	61.530	
	DY-3-2	35.098	33.343	68.441	
	DY-5	84.266	76.759	161.025	
	DY-5-1	58.860	52.677	111.537	
	DY-6	41.451	39.884	81.334	
	DY-7	25.578	26.154	51.731	
	DY-8	25.185	25.685	50.870	
	DY-8-1	28.161	28.508	56.669	
	DY-9	85.974	86.711	172.686	
	DY-9-A	13.889	17.680	31.568	
	DY-9-B	41.989	41.383	83.371	
	DY-10	30.753	30.471	61.224	
	DY-11	1.984	5.438	7.423	
	DY-12	29.069	29.397	58.466	
DY-13	1.984	5.438	7.423		
DY-14	23.175	23.859	47.034		
DY-15	23.249	24.149	47.398		
DY-16	29.961	29.853	59.814		
	Sub-Total	1,304.429	1,267.980	2,572.409	
2nd Year	Main Canal	993.210	726.457	1,719.666	
	DY-17	36.958	34.760	71.718	
	DY-18	66.608	66.994	133.603	
	DY-19	32.886	33.949	66.835	
	DY-20	96.120	89.538	185.658	
	DY-21	109.727	57.619	167.346	
	DY-22	48.799	48.026	96.824	
	DY-23	13.801	15.151	28.952	
	DY-24	74.717	64.801	139.518	
	DY-25	125.721	106.563	232.284	
	DY-26	116.985	99.077	216.063	
	DY-27	103.661	88.119	191.780	
	B1	404.783	283.640	688.423	
	B1-R	651.596	474.196	1,125.792	
	B1-L	126.817	92.480	219.297	
	CL - 8	421.757	318.960	740.717	
	CL - 8-A	14.346	18.271	32.617	
	CL - 8-B	22.572	24.312	46.885	
	CL - 8-B1	10.400	9.627	20.027	
	CL - 8-C	14.660	13.988	28.647	
	CL - 8-C1	3.184	4.100	7.284	
	CL - 8-C2	3.747	4.672	8.419	
	CL - 8-C3	8.727	8.876	17.602	
	CL - 8-D	11.504	11.266	22.770	
	CL - 8-E	13.175	12.792	25.967	
	CL - 18	99.318	90.756	190.074	
	CL - 18-A	12.169	11.198	23.367	
	CL - 18-B	16.028	13.521	29.549	
	CL-18-C	8.410	8.186	16.596	
	CL-18-sub	1.242	3.599	4.840	
	CL-18-D	8.645	7.885	16.530	
	CL-18-E	20.304	20.965	41.269	
	CL-18-E1	15.937	14.175	30.111	
	CL-18-E2	0.473	1.872	2.345	
	CL-18-F	26.595	20.829	47.424	
	CL-18-G	23.086	18.766	41.852	
	CL-18-G1	15.835	13.935	29.770	
	CL-19	55.714	46.577	102.291	
		Sub-Total	3,830.215	2,980.498	6,810.713

Construction year	Name of Canal	Project Cost (Kyats)		
		FC※1	LC※2	Total
3rd Year	Main Canal	491.175	372.558	863.733
	DY-28	45.878	47.293	93.170
	DY-29	87.004	81.983	168.987
	DY-30	67.597	66.053	133.650
	DY-31	151.988	141.013	293.001
	DY-31-1	1.992	5.592	7.585
	DY-32	93.476	87.679	181.155
	DY-33	14.816	17.347	32.163
	DY-34	325.560	273.546	599.106
	DY-35	79.525	72.388	151.913
	B2	585.601	405.855	991.456
	B2-R	527.652	338.657	866.309
	B2-L	366.970	273.573	640.542
	PKM	101.834	88.381	190.215
	PK1	207.713	182.601	390.314
	PK1-1	28.256	28.368	56.624
	PK2	68.038	66.548	134.586
	PK2-1	16.490	17.502	33.991
	PK3	32.023	31.404	63.427
	CL - 20	98.465	82.465	180.930
	CL - 21	48.325	39.652	87.977
	CL - 22	81.481	68.116	149.596
	CL - 23	40.544	33.690	74.234
	CL - 24	31.649	26.804	58.453
	CL - 24-A	34.639	26.849	61.488
	CL - 25	39.192	31.394	70.587
	CL - 26	49.671	41.944	91.614
	CL - 27	251.429	255.036	506.465
	CL - 27-A	9.638	11.177	20.815
	CL - 27-B	20.033	26.839	46.872
	CL - 27-C	1.320	3.820	5.140
	CL - 27-D	115.615	139.799	255.414
	CL - 27-D1	2.803	9.710	12.513
	CL - 27-D2	4.483	17.314	21.797
CL - 27-E	3.235	10.407	13.642	
CL-28	11.817	14.046	25.862	
CL-29	51.289	47.883	99.172	
CL-30	54.664	57.257	111.921	
CL-31	40.612	46.382	86.994	
CL-32	46.503	47.330	93.833	
CL-33	1.188	5.310	6.498	
CL-34	1.893	8.174	10.067	
CL-34-A	43.340	44.767	88.107	
	Sub-Total	4,377.412	3,694.504	8,071.916

Total Project Cost (Kyats)	
Rehabilitation for Canal (1st year)	2,572.409
Rehabilitation for Canal (2nd year)	6,810.713
Rehabilitation for Canal (3rd year)	8,071.916
Maintenance Road (Main Canal)	1,842.142
Maintenance Road (Distribution Canal)	45.239
Total	19,342.419

※1 FC : Foreign Currency Portion

※2 LC : Local Currency Portion

1.3 Project Cost for Wegyi Irrigation System

Construction year	Name of Canal	Project Cost (Kyats)			Total Project Cost (Kyats)		
		FC ^{※1}	LC ^{※2}	Total			
1st Year	Main Canal	2,125.535	2,116.011	4,241.547	Rehabilitation for Canal (1st year)	16,943.158	
	MC-DO	165.071	112.920	277.991	Rehabilitation for Canal (2nd year)	13,800.355	
	RMC (1st yr.)	1,742.186	1,205.323	2,947.510	Rehabilitation for Canal (3rd year)	12,362.333	
	RDY-1	457.791	322.627	780.418	Maintenance Road (Main Canal)	1,954.243	
	RDY-1-1	113.481	87.065	200.546	Maintenance Road (Distribution Canal)	409.685	
	RDY-1-2	52.199	37.281	89.479	Total	45,469.775	
	RDY-1-3	64.504	47.287	111.791	※1 FC : Foreign Currency Portion		
	RDY-2	231.111	167.741	398.852	※2 LC : Local Currency Portion		
	RDY-3	723.806	547.953	1,271.758			
	RDY-3-M1	62.991	43.753	106.744			
	RDY-3-M2	173.998	130.115	304.113			
	RDY-3-M3	109.353	80.096	189.449			
	RDY-4	201.155	146.396	347.551			
	RDY-4-1	72.371	53.665	126.036			
	RDY-5	202.708	150.235	352.943			
	RDY-5 to B2	431.856	335.526	767.382			
	LMC	1,166.873	876.408	2,043.281			
	LDY-1	189.589	137.998	327.587			
	LDY-2	102.680	65.525	168.205			
	LDY-2-1	115.013	84.369	199.382			
	LDY-3	401.701	298.993	700.694			
	LDY-3-1	89.043	61.110	150.153			
	LDY-3-2	122.831	88.127	210.958			
	LDY-4	295.499	215.714	511.213			
	LDY-4-1	71.068	46.506	117.574			
	Sub-Total	9,484.413	7,458.744	16,943.158			
	2nd Year	RMC	1,869.056	1,280.199	3,149.255		
		RMC-DO	205.601	146.510	352.110		
RDY-6		355.303	263.350	618.653			
RDY-6-A		116.623	82.348	198.971			
RDY-7		105.357	70.952	176.310			
RDY-8		714.769	544.556	1,259.324			
RDY-9		230.155	169.002	399.157			
RDY-10		186.260	133.719	319.979			
RDY-11		1,345.151	1,039.021	2,384.172			
RDY-11-1		207.247	156.798	364.044			
RDY-11-2		71.435	54.539	125.974			
RDY-11-3		83.718	62.885	146.603			
LMC (2nd yr.)		643.377	445.185	1,088.562			
LDY-5		256.414	186.522	442.935			
LDY-6		445.315	337.779	783.094			
LDY-6-A		861.065	657.633	1,518.698			
LDY-7		273.179	199.334	472.513			
Sub-Total	7,970.024	5,830.331	13,800.355				
3rd Year	RMC	1,401.760	959.769	2,361.529			
	RDY-11-A	301.581	223.439	525.020			
	RDY-11-A-1	185.842	139.500	325.341			
	RDY-12	603.924	458.846	1,062.769			
	RDY-13	386.359	296.578	682.936			
	RDY-14	261.516	193.251	454.768			
	RDY-15	115.255	79.512	194.767			
	RDY-16	401.564	302.912	704.476			
	RDY-18	190.538	138.286	328.824			
	LMC (3rd yr.)	1,790.651	1,239.010	3,029.662			
	LDY-8	317.914	239.582	557.496			
	LDY-9	271.164	197.411	468.575			
	LDY-10	327.082	241.426	568.508			
	LDY-10-1	77.367	53.755	131.122			
	LDY-10-2	38.143	20.496	58.639			
	LDY-10-3	59.552	38.635	98.187			
	LDY11	343.427	255.956	599.383			
LDY12	125.777	84.556	210.332				
Sub-Total	7,199.415	5,162.918	12,362.333				

1.4 Project Cost for Taung Nyo Irrigation System

Construction year	Name of Canal	Project Cost (Kyats)		
		FC※1	LC※2	Total
1st Year	Main Canal	2,169.953	1,604.281	3,774.234
	Branch A	1,323.860	962.214	2,286.074
	Branch B	1,126.161	815.365	1,941.526
	Sub-Total	4,619.974	3,381.860	8,001.834
2nd Year	Main Canal	0.000	0.000	0.000
	Branch B	442.380	339.863	782.243
	MDY-1	577.768	481.841	1,059.609
	MDY-2	849.259	679.890	1,529.149
	MDY-3	85.388	99.767	185.156
	MDY-4	201.530	190.028	391.558
	MDY-7	240.896	218.040	458.935
	MDY-8	225.789	210.151	435.939
	MDY-9	136.712	140.196	276.907
	ADY-1	1,329.967	1,052.155	2,382.123
	ADY-2	510.035	420.915	930.951
	BDY-2	220.333	200.441	420.774
	BDY-3	661.830	542.172	1,204.002
Sub-Total	5,481.887	4,575.458	10,057.345	
3rd Year	Main Canal	2,267.258	1,650.698	3,917.956
	MDY-5	60.021	79.200	139.221
	MDY-6	85.688	98.805	184.492
	BDY-1	1,129.961	896.980	2,026.941
	Sub-Total	3,542.928	2,725.683	6,268.610

Total Project Cost (Kyats)	
Rehabilitation for Canal (1st year)	8,001.834
Rehabilitation for Canal (2nd year)	10,057.345
Rehabilitation for Canal (3rd year)	6,268.610
Maintenance Road (Main Canal)	1,509.679
Maintenance Road (Distribution Canal)	335.843
Total	26,173.311

※1 FC : Foreign Currency Portion

※2 LC : Local Currency Portion

CHAPTER 2 QUANTITY FOR IRRIGATION SYSTEMS

CHAPTER 2 QUANTITY FOR IRRIGATION SYSTEMS

2.1 Quantity for North Nawin Irrigation System

2.1.1 Quantity for Main Canal (1/2)

Name of work	Unit	Quantity
		Total
1. Preparatory Works		
1 - 1. Survey and Profile Works	sect	0.000
1 - 2. Temporary Camps & Stores	unit	0.000
1 - 3. Temporary Barracks (2 units, 4 units, etc.)	unit	0.000
1 - 4. Temporary Latrines	unit	0.000
1 - 5. Making Stock Pile Yards	unit	0.000
1 - 6. Labor Transporting Works	item	0.000
1 - 7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas		
1 - 7 - 1. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas (by Manual)	%sq-ft	0.000
1 - 7 - 2. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas (by Department Machine)	acres	0.000
2. Earth Works		
2 - 1. Canal Bank Raising and Canal Resectioning Works		
2 - 1 - 1. Canal Bank Raising Work (by Department Machine)	sud	0.000
2 - 1 - 2. Canal Resectioning Work (by Department Machine)	sud	0.000
2 - 1 - 3. Canal Resectioning Work (by Blasting (at Rock Portion))	sud	0.000
2 - 1 - 4. Canal Resectioning Work (by Manual)	sud	0.000
2 - 2. Earth Work Filling into Canal Section and Inner Side Slop		
2 - 2 - 1. Earth Work Filling into Canal Section and Inner Side Slop (by Manual)	sud	0.000
2 - 2 - 2. Earth Work Filling into Canal Section and Inner Side Slop (by Department Machine)	sud	0.000
2 - 3. G.C (Gravelly Clay) Filling and Compacting Works in Canal Section and Inner Slope		
2 - 3 - 1. G.C Filling and Compacting Works in Canal Section and Inner Slope (by Manual)	sud	0.000
2 - 3 - 2. G.C Filling and Compacting Works in Canal Section and Inner Slope (by Department Machine)	sud	0.000
2 - 4. Making of Temporary Coffe Dam for Necessary of Work		
2 - 4 - 1. Making of Temporary Coffe Dam for Necessary of Work (by Manual)	sud	0.000
2 - 4 - 2. Making of Temporary Coffe Dam for Necessary of Work (by Department Machine)	sud	0.000
2 - 5. Earth Work Excavation for Bed Kerb & Compartment and Copping (by Manual)	sud	0.000
2 - 6. Earth Work in Dressing (by Manual)	sud	0.000
2 - 7. Earth Work in Base Stripping 3"thick (by Manual)	sud	0.000
2 - 8. Unsilting of Main Canal		
2 - 8 - 1. Unsilting of Main Canal (by Manual)	sud	0.000
2 - 8 - 2. Unsilting of Main Canal (by Department Machine)	sud	0.000
3. Repairing and Construction of Linings Works		
3 - 1. Brick Lining Work		
3 - 1 - 1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed	%sq-ft	0.000
3 - 1 - 2. Making of Ring Bund with Sand Bags	%sq-ft	0.000
3 - 1 - 3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)	%sq-ft	0.000
3 - 1 - 4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)	%sq-ft	0.000
3 - 1 - 5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick)	%sq-ft	0.000
3 - 1 - 6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)	%sq-ft	0.000
3 - 1 - 7. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete	sud	0.000
3 - 1 - 8. 3"thick Sand Filling under Brick Lining	sud	0.000
3 - 1 - 9. Pointing Work (with 1:3 Cement Mortar)	%sq-ft	0.000
3 - 2. Concreting Works		
3 - 2 - 1. 1:3:6 Cement Concrete Work for Canal Bed Kerb	sud	0.000
3 - 2 - 2. 1:3:6 Cement Concrete Work for Canal Copping	sud	0.000
3 - 2 - 3. Timber Shuttering Formworks	sud	0.000
3 - 3. Concrete Lining Work		
3 - 3 - 1. Concrete Lining Work (with1:3:6 Cement Concrete)	sud	0.000
3 - 4. Related Works for Concreting such as Earth Work Excavation , Timber Shuttering for Forn Work etc;		
3 - 4 - 1. Timber Shuttering Formwork for Concreting	%sq-ft	0.000
3 - 4 - 2. Brick Work with 1:3 Cement Mortar for Compartment (with Clay Brick)	sud	0.000

2.1.1 Quantity for Main Canal (2/2)

Name of work	Unit	Quantity
		Total
3 - 4 - 3. Brick Work with 1:3 Cement Mortar for Compartment (with Cement Brick)	sud	0.000
3 - 4 - 4. Brick Work (1:3) Cement Mortar (with Clay Brick)	sud	0.000
3 - 4 - 5. Brick Work (1:3) Cement Mortar (with Cement Brick)	sud	0.000
4. Repairing & Reconstruction of Canal Structures		
4 - 1. Re-Construction of Structures		
4 - 1 - 1. Construction of Drop	unit	0.000
4 - 1 - 2. Construction of Head Regulator	unit	0.000
4 - 1 - 3. Construction of Drain Box Culvert	unit	0.000
4 - 1 - 4. Construction of Road Crossing and Bridge	unit	0.000
4 - 1 - 5. Construction of Syphon Protection	unit	0.000
4 - 1 - 6. Construction of Course-Way	unit	0.000
4 - 1 - 7. Construction of Box Culverts (Cross Drain Culverts)	unit	0.000
4 - 2. Repairing of structures		
4 - 2 - 1. Drop	unit	0.000
4 - 2 - 2. Head Regulator	unit	0.000
4 - 2 - 3. Drain Box Culvert	unit	0.000
4 - 2 - 4. Road Crossing and Bridge	unit	0.000
4 - 2 - 5. Syphon	unit	0.000
4 - 2 - 6. Repairing of Course-Way	unit	0.000
4 - 2 - 7. Repairing of Box Culverts (Cross Drain Culverts)	unit	0.000
4 - 2 - 8. Repairing of Conduit Gate and Assembly	item	0.000
4 - 2 - 9. Repairing of Canal Gate Leaf, Frame & Gear Assembly	item	0.000
4 - 2 - 10. Repairing of Canal Structures	item	0.000
5. Road Works		
5 - 1. G.C (Gravelly Clay) Laying Work		
5 - 1 - 1. G.C Laying and Spreading Works of Canal Inspection Path	sud	0.000
5 - 1 - 2. G.C Laying and Spreading works of Canal Non Inspection Path	sud	0.000
5 - 2. Concrete Paving Work		
5 - 2 - 1. Mixing only Cement Concrete (1:2:4) with (0.5"to 0.75") Gauge Stone Chippings on River Shingle	sud	2,140.710
5 - 2 - 2. Mixing only Cement Concrete (1:3:6) with (0.5"to 0.75") Gauge Stone Chippings on River Shingle	sud	1,427.150
5 - 2 - 3. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)	sud	3,567.860
5 - 2 - 4. Timber Shuttering Formworks	%sq-ft	1,001.610
5 - 2 - 5. Reinforcing Bar Preparation and Assembly	CWT	1,760.950
5 - 2 - 6. Sodding	%sq-ft	3,913.980
6. Repairing and Construction of Permanent Buildings		
6 - 1. Repairing and Construction of Building (Gust House, Meeting Hall, Office,etc.)	item	0.000
7. Other Related Works		
7 - 1. Repairing of Heavy Machines	job	0.000
7 - 2. Repairing of Motor Vehicles , Water Pumps and Generators	item	0.000
7 - 3. Repairing Charges for Equipments	item	0.000
7 - 4. Earth Works for Drainage Canal (by Department Machine)	sud	0.000
7 - 5. Management of Construction Materials and Equipment		
7 - 5 - 1. Shifting of Materials from Temporary Stock-pile to Work Site	item	0.000
7 - 5 - 2. Transporting of Materials from Quarry to Stock-pile	item	0.000
7 - 5 - 3. Transporting and Shifting of Heavy Machines	item	0.000
7 - 5 - 4. Loading and Unloading Charges of Materials	item	0.000
7 - 6. Water Pump for Dewatering Works	day	0.000
7 - 7. Welfare Charges for Labor		
7 - 7 - 1. Temporary Hut Material	item	0.000
7 - 7 - 2. Hnee Thatch	item	0.000
7 - 7 - 3. Bamboo	item	0.000
7 - 7 - 4. Transporting for Labor Necessary of Works	mile	0.000
7 - 8. Labor Charges for Day & Night Watchman, Helper, Checker and General Works	M/D	0.000
7 - 9. Camps Facilities (Lighting, Water Supply,etc.)	gal	0.000
7 - 10. Making Data Boards and Sign Boards	item	0.000
7 - 11. Estimating, Copying, Photo Recording and stationary Charges, etc;	item	0.000
7 - 12. Miscellaneous	item	0.000

2.1.2 Quantity for Distribution Canal (1/6)

Name of work	Unit	Quantity																										
		MRC	CR 1	CR 2	CR 3	CR 3 A	CR 3 B	CR 4	CR 4 A	CR 4 B	CR 5	CR 5 A	CR 5 B	CR 5 B1	CR 5 B2	CR 5 B3	CR 5 C	CR 5 C1	CR 5 C2	CR 6	CR 7	CR 7 A	CR 7 B	CR 7 C	CR 8	CR 9	CR 10	CR 11
8. Preparatory Works																												
8 - 1. Survey and Profile Works	sect	2,430.00	308.00	306.00	928.00	114.00	86.00	722.00	130.00	40.00	2,239.00	484.00	780.00	79.00	160.00	707.00	966.00	199.00	452.00	290.00	968.00	218.00	146.00	222.00	86.00	110.00	262.00	367.00
8 - 2. Temporary Camps & Stores	unit	3.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8 - 3. Temporary Barracks (2 units, 4 units, etc.)	unit																											
8 - 4. Temporary Latrines	unit																											
8 - 5. Making Stock Pile Yards	unit																											
8 - 6. Labor Transporting Works	item		90.00	90.00	247.00	40.00	45.00	243.00	45.00	13.00	1,635.00	166.00	405.00	27.00	67.00	247.00	675.00	67.00	157.00	180.00	652.00	67.00	45.00	90.00	67.00	76.00		247.00
8 - 7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas																												
8 - 7 - 1. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas along the DY Canal (by Manual)	%sqft	32,800.00	1,757.50	2,208.00	5,013.00	686.40	517.40	5,629.00	781.40	242.80	26,864.40	2,904.00	4,678.00	475.20	961.00	4,245.20	5,797.40	1,193.20	2,714.00	1,742.00	8,712.00	1,309.40	876.40	1,330.60	517.00	665.00	1,573.00	2,207.00
8 - 7 - 2. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas along the DY Canal (by Department Machine)	acres																											
9. Earth Works																												
9 - 1. Canal Resectioning Work																												
9 - 1 - 1. Canal Resectioning Work (by Manual)	sud		925.00	1,150.00	2,785.00	411.84	465.66	2,706.00	468.84	145.68	18,259.00	1,742.40	4,210.20	285.12	576.60	2,547.12	6,956.88	715.92	1,628.40	2,178.00	7,260.00	785.64	525.84	798.36	646.00	831.00	1,966.00	2,758.00
9 - 1 - 2. Canal Resectioning Work (by Department Machine)	sud																											
9 - 2. Unsilting of Distributary Canals																												
9 - 2 - 1. Unsilting of Distributary Canals (by Manual)	sud	14,124.00	231.25	230.00	974.75	27.88	84.08	757.75	31.74	9.86	4,995.00	190.50	760.17	19.30	39.04	172.46	2,119.67	48.47	110.26	348.00	1,160.00	53.19	35.60	54.06	103.00	133.00	314.00	440.00
9 - 2 - 2. Unsilting of Distributary Canals (by Department Machine)	sud																											
9 - 3. Earth Work in Dressing (by Manual)	sud																											
9 - 4. Earth Work in Base Stripping (by Manual)	sud																											
10. Repairing of Linings Work																												
10 - 1. Repairing Works of Brick Lining																												
10 - 1 - 1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed	%sq-ft																											
10 - 1 - 2. 3"thick Sand Filling under Brick Lining	sud	1,868.00				64.18	73.47		79.31	24.64		354.29	739.12	44.43	89.85	345.98	1,151.51	97.25	297.18	119.00	399.00	122.43	88.95	103.12	35.00	45.00	108.00	15.00
10 - 1 - 3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)	%sq-ft	2,839.46																										
10 - 1 - 4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)	%sq-ft					34.32	51.74		39.07	12.14		290.40	467.80	23.76	48.05	212.26	869.61	59.66	135.70	87.12	580.08	65.47	43.82	26.53	25.87	33.26	78.67	110.35
10 - 1 - 5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick)	%sq-ft	0.00																										
10 - 1 - 6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)	%sq-ft					153.75	190.40		200.04	62.15		836.35	2,020.89	106.44	215.26	747.15	3,153.78	210.00	781.63	261.36	1,742.40	293.30	224.36	212.90	77.61	99.78	236.00	331.00
10 - 1 - 7. (1:3:6) C.C (Cement Concrete) work for Copping & Bed Kerb	%sq-ft	364.50				34.32	25.87		39.07	12.14		145.20	233.90	23.76	48.05	212.26	289.87	59.66	135.70	65.34	217.80	65.47	43.82	66.53	19.40	24.94	59.00	82.76
10 - 1 - 8. Pointing Work (with 1:3 cement mortar)	%sq-ft																											
10 - 1 - 9. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete	%sq-ft																											
10 - 2. G.C (Gravelly Clay) Filling Inner Slope	%cu-ft																											
10 - 3. Brick Work in (1:3) Cement Mortar																												
10 - 3 - 1. Brick Work in (1:3) Cement Mortar (With Clay Brick)	%cu-ft																											
10 - 3 - 2. Brick Work in (1:3) Cement Mortar (With Cement Brick)	%cu-ft																											
10 - 4. Timber Shuttering form Work	%sq-ft	364.50				34.32	25.87		39.07	12.14		145.20	233.90	23.76	48.05	212.26	289.87	59.66	135.70	87.12	290.40	65.47	43.82	66.53	25.87	33.26	78.67	110.35
11. Repairing & Reconstruction of Canal Structures																												
11 - 1. Re-Construction of Structures																												
11 - 1 - 1. Drop	unit																											
11 - 1 - 2. Head Regulator	unit																											
11 - 1 - 3. Drain Box Culvert	unit																											
11 - 1 - 4. Road Crossing and Bridge	unit																											

2.1.2 Quantity for Distribution Canal (2/6)

Name of work	Unit	Quantity																										
		MRC	CR 1	CR 2	CR 3	CR 3 A	CR 3 B	CR 4	CR 4 A	CR 4 B	CR 5	CR 5 A	CR 5 B	CR 5 B1	CR 5 B2	CR 5 B3	CR 5 C	CR 5 C1	CR 5 C2	CR 6	CR 7	CR 7 A	CR 7 B	CR 7 C	CR 8	CR 9	CR 10	CR 11
11 - 1 - 5. Syphon	unit																											
11 - 1 - 6. Turn Out	unit																											
11 - 2. Repairing of Structures																												
11 - 2 - 1. Drop	unit	10.00																										
11 - 2 - 2. Head Regulator	unit	5.00																										
11 - 2 - 3. Drain Box Culvert	unit	2.00																										
11 - 2 - 4. Road Crossing and Bridge	unit	5.00																										
11 - 2 - 5. Syphon	unit	5.00																										
11 - 2 - 6. Turn Out	unit	5.00																										
11 - 3. Repairing of Canal Gate Leaf, Frame & Gear Assembly	item				16.00			16.00			16.00										32.00				16.00	16.00	16.00	16.00
12 Road Work																												
12 - 1. G.C (Gravelly Clay) Laying Work																												
12 - 1 - 1. G.C Laying and Spreading Work for DY Canal Inspection Path	sud	0.00				0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00				
12 - 1 - 2. G.C Laying and Spreading Work for DY Canal Non Inspection Path	sud																											
12 - 2. Concrete Paving Work																												
12 - 2 - 1. Mixing only Cement Concrete (1:2:4) with (0.5"to 0.75") Gauge Stone Chippings on River Shingle	sud																											
12 - 2 - 2. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)	sud																											
12 - 2 - 3. Timber Shuttering Formworks	sud																											
12 - 2 - 4. Reinforcing Bar Preparation and Assembly	CWT																											
13 Repairing and Construction of Permanent Buildings																												
13 - 1. Repairing and Construction of Building (Bin Thar Quarter, Office, etc.)	item				1.00						2.00	1.00				1.00												
14 Other Related Works																												
14 - 1. Repairing of Motor Vehicles , Water Pumps and Generators	item																											
14 - 2 Earth Work for Drainage Canal																												
14 - 2 - 1. Earth Work for Drainage Canal (by Manual)	sud																											
14 - 2 - 2. Earth Work for Drainage Canal (by Department Machine)	sud																											
14 - 3. Management of Construction Materials and Equipment																												
14 - 3 - 1. Shifting of Materials from Temporary Stock-pile to Work Site	item																											
14 - 3 - 2. Transporting of Materials from Quarry to Stock-pile	item		90.00	90.00	248.00	41.00	45.00	243.00	45.00	14.00	1,635.00	167.00	405.00	27.00	68.00	248.00	675.00	68.00	158.00	180.00	653.00	68.00	45.00	90.00	68.00	77.00	180.00	90.00
14 - 3 - 3. Transporting and Shifting of Heavy Machines	item																											
14 - 3 - 4. Loading and Unloading Charges of Materials	item	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
14 - 4 Dewatering Works																												
14 - 4 - 1. Water Pump for Dewatering Works	day																											
14 - 5 Welfare Charges for Labor																												
14 - 5 - 1. Hnee Thatch	item		270.00	367.00	816.00	128.00	145.00	793.00	145.00	45.00	5,349.00	540.00	1,310.00	90.00	180.00	790.00	2,160.00	225.00	505.00	638.00	2,127.00	245.00	165.00	250.00	190.00	243.00	576.00	808.00
14 - 5 - 2. Bamboo	item		81.00	107.00	245.00	38.00	46.00	238.00	44.00	14.00	1,605.00	162.00	393.00	27.00	54.00	237.00	648.00	75.00	152.00	191.00	638.00	74.00	50.00	75.00	57.00	73.00	173.00	242.00
14 - 6. Labor Charges for Day & Night Watchman, Helper, Checker and General Works	M/D		45.00	65.00	140.00	20.00	25.00	140.00	25.00	8.00	93.00	90.00	220.00	15.00	30.00	135.00	365.00	40.00	85.00	110.00	370.00	40.00	30.00	40.00	35.00	40.00	100.00	140.00
14 - 7. Camps Facilities (Lighting, Water Supply, etc.)	gal		2.00	2.00	6.00	1.00	1.00	6.00	1.00	1.00	4.00	4.00	9.00	1.00	2.00	6.00	15.00	2.00	4.00	4.00	15.00	2.00	1.00	2.00	2.00	2.00	4.00	6.00
14 - 8. Making Data Boards and Sign Boards	item	12.00	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50
14 - 9. Estimating, Copying, Photo Recording and Stationary Charges, etc;	item	20.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
14 - 10. Miscellaneous	item																											

2.1.2 Quantity for Distribution Canal (3/6)

Name of work	Unit	Quantity																										
		CR 12	CR 13	CR 14	CR 15	CR 16	CR 17	CR 17 A	CR 17 B	CR 17 C	CR 18	CR 18 A	CR 18 B	CR 18 C	M.L.C(RD 0to37500)	CL 1	CL 2	CL 3	CL 3 A	CL 3 B	CL 4	CL 4 A	CL 4 B	CL 5	CL 6	CL 6 A	M.L.C(RD37 500to97276)	CL 7
8. Preparatory Works																												
8 - 1. Survey and Profile Works	sect	151.00	373.00	355.00	262.00	320.00	154.00	968.00	146.00	221.00	1,029.00	126.00	96.00	531.00	833.00	338.00	280.00	2,085.00	115.00	86.00	1,788.00	130.00	40.00	700.00	445.00	188.00	1,994.00	534.00
8 - 2. Temporary Camps & Stores	unit	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.00					1.00	3.00	1.00	1.00	3.00	1.00	1.00	3.00	1.00
8 - 3. Temporary Barracks (2 units, 4 units, etc.)	unit																											
8 - 4. Temporary Latrines	unit																											
8 - 5. Making Stock Pile Yards	unit																											
8 - 6. Labor Transporting Works	item	90.00	247.00	225.00	180.00	225.00	90.00	652.00	90.00	135.00	675.00	90.00	67.00	360.00	1,552.00					36.00	4,185.00	54.00	22.00	270.00	180.00	67.00	819.00	581.00
8 - 7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas																												
8 - 7 - 1. Clearing of the Working Areas along the DY Canal (by Manual)	%sqft	908.00	2,799.00	2,133.00	1,573.00	1,921.00	929.00	5,808.00	876.00	1,330.00	6,177.00	760.00	580.00	3,185.00	6,250.00	2,030.00	1,680.00	22,518.00	690.00	520.00	19,314.00	780.00	240.00	4,200.00	2,670.00	1,130.00	17,933.00	4,800.00
8 - 7 - 2. Clearing of the Working Areas along the DY Canal (by Department Machine)	acres																										16.50	
9. Earth Works																												
9 - 1. Canal Resectioning Work																												
9 - 1 - 1. Canal Resectioning Work (by Manual)	sud	1,135.00	2,799.00	2,663.00	1,966.00	2,402.00	1,136.00	7,260.00	1,095.00	1,663.00	7,722.00	950.00	726.00	3,981.00		1,827.00	1,678.32	39,406.50	517.50	390.00	46,353.60	585.00	180.00	3,150.00	2,002.50	847.50		
9 - 1 - 2. Canal Resectioning Work (by Department Machine)	sud													17,500.00													28,692.00	2,400.00
9 - 2. Unsilting of Distributary Canals																												
9 - 2 - 1. Unsilting of Distributary Canals (by Manual)	sud	181.00	447.00	426.00	314.00	383.00	185.00	1,160.00	175.00	265.00	1,234.00	152.00	116.00	636.00	4,150.00	291.82	241.92		204.00	156.00	12,071.25	156.00	1,320.00	3,622.50	1,468.50	226.00		
9 - 2 - 2. Unsilting of Distributary Canals (by Department Machine)	sud																10,789.87										25,106.00	1,920.00
9 - 3. Earth Work in Dressing (by Manual)	sud																										28,692.00	
9 - 4. Earth Work in Base Stripping (by Manual)	sud																										10,850.00	
10. Repairing of Linings Work																												
10 - 1. Repairing Works of Brick Lining																												
10 - 1 - 1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed	%sq-ft																											
10 - 1 - 2. 3"thick Sand Filling under Brick Lining	sud	62.00	266.00	146.00	108.00	132.00	63.00	399.00	60.00	91.00	733.00	52.00	40.00	21.00	716.00	177.62	147.00	2,064.15	78.00	52.00	2,733.47	113.49	480.00	997.50	500.62	132.49	3,920.00	
10 - 1 - 3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)	%sq-ft													1,467.80													2,009.00	
10 - 1 - 4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)	%sq-ft	45.40	223.92	106.55	78.67	96.09	46.45	290.40	43.82	66.52	617.76	38.01	89.04	159.25		101.50	84.00	2,502.00	68.00	52.00	2,682.50	78.00	360.00	840.00	400.50	113.00		
10 - 1 - 5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick)	%sq-ft													0.00													0.00	
10 - 1 - 6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)	%sq-ft	136.20	671.76	319.65	236.00	288.28	139.35	871.20	131.46	199.56	1,853.28	114.00	87.12	477.75		406.00	336.00	4,503.60	136.00	104.00	7,178.37	297.96	1,315.20	2,730.00	1,335.00	303.97		
10 - 1 - 7. (1:3:6) C.C (Cement Concrete) work for Copping & Bed Kerb	%sq-ft	34.05	83.97	79.91	59.00	72.06	34.83	217.80	32.86	49.89	231.66	28.50	21.78	119.43	250.00	101.50	84.00	625.50	34.00	26.00	536.50	39.00	120.00	210.00	133.50	56.50	175.00	
10 - 1 - 8. Pointing Work (with 1:3 cement mortar)	%sq-ft																										3,334.00	
10 - 1 - 9. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete	%sq-ft																											
10 - 2 G.C (Gravelly Clay) Filling Inner Slope	%cu-ft													1,250.00	203.00	168.00	2,251.80	68.00	52.00	3,589.18	148.98	657.60	1,365.00	667.50	515.98	293.00		
10 - 3 Brick Work in (1:3) Cement Mortar																												
10 - 3 - 1. Brick Work in (1:3) Cement Mortar (With Clay Brick)	%cu-ft																											
10 - 3 - 2. Brick Work in (1:3) Cement Mortar (With Cement Brick)	%cu-ft																											
10 - 4. Timber Shuttering form Work	%sq-ft	45.40	111.96	106.55	78.67	96.09	46.45	290.40	43.82	66.52	308.88	38.01	29.04	159.25	250.00	101.50	84.00	625.50	34.00	26.00	536.50	39.00	120.00	210.00	133.50	56.50	175.00	
11. Repairing & Reconstruction of Canal Structures																												
11 - 1. Re-Construction of Structures																												
11 - 1 - 1. Drop	unit																											
11 - 1 - 2. Head Regulator	unit																											
11 - 1 - 3. Drain Box Culvert	unit																											
11 - 1 - 4. Road Crossing and Bridge	unit																											

2.1.2 Quantity for Distribution Canal (4/6)

Name of work	Unit	Quantity																										
		CR 12	CR 13	CR 14	CR 15	CR 16	CR 17	CR 17 A	CR 17 B	CR 17 C	CR 18	CR 18 A	CR 18 B	CR 18 C	M.L.C(RD 0to37500)	CL 1	CL 2	CL 3	CL 3 A	CL 3 B	CL 4	CL 4 A	CL 4 B	CL 5	CL 6	CL 6 A	M.L.C(RD37 500to97276)	CL 7
11 - 1 - 5. Syphon	unit																											
11 - 1 - 6. Turn Out	unit																											
11 - 2. Repairing of Structures																												
11 - 2 - 1. Drop	unit													10.00														7.00
11 - 2 - 2. Head Regulator	unit													15.00			6.00				10.00							15.00
11 - 2 - 3. Drain Box Culvert	unit													2.00			4.00				4.00			1.00				2.00
11 - 2 - 4. Road Crossing and Bridge	unit													3.00			4.00				4.00			1.00	1.00			7.00
11 - 2 - 5. Syphon	unit													2.00														2.00
11 - 2 - 6. Turn Out	unit													5.00	3.00	3.00	13.00				20.00			3.00	3.00			15.00
11 - 3. Repairing of Canal Gate Leaf, Frame & Gear Assembly	item	16.00	16.00												68.00	68.00	170.00				68.00	68.00		68.00	68.00			96.00
12 Road Work																												
12 - 1. G.C (Gravelly Clay) Laying Work																												
12 - 1 - 1. G.C Laying and Spreading Work for DY Canal Inspection Path	sud													0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12 - 1 - 2. G.C Laying and Spreading Work for DY Canal Non Inspection Path	sud																											
12 - 2. Concrete Paving Work																												
12 - 2 - 1. Mixing only Cement Concrete (1:2:4) with (0.5"to 0.75") Gauge Stone Chippings on River Shingle	sud																											
12 - 2 - 2. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)	sud																											
12 - 2 - 3. Timber Shuttering Formworks	sud																											
12 - 2 - 4. Reinforcing Bar Preparation and Assembly	CWT																											
13 Repairing and Construction of Permanent Buildings																												
13 - 1. Repairing and Construction of Building (Bin Thar Quarter, Office, etc.)	item									2.00				1.00							1.00		1.00					4.00
14 Other Related Works																												
14 - 1. Repairing of Motor Vehicles , Water Pumps and Generators	item																											
14 - 2 Earth Work for Drainage Canal																												
14 - 2 - 1. Earth Work for Drainage Canal (by Manual)	sud																											
14 - 2 - 2. Earth Work for Drainage Canal (by Department Machine)	sud																											
14 - 3. Management of Construction Materials and Equipment																												
14 - 3 - 1. Shifting of Materials from Temporary Stock-pile to Work Site	item																											
14 - 3 - 2. Transporting of Materials from Quarry to Stock-pile	item	90.00	248.00	225.00	180.00	225.00	90.00	653.00	90.00	135.00	675.00	90.00	68.00	360.00	1,553.00	315.00	315.00	7,101.00	90.00	36.00	4,185.00	54.00	23.00	270.00	180.00	68.00	819.00	581.00
14 - 3 - 3. Transporting and Shifting of Heavy Machines	item																											
14 - 3 - 4. Loading and Unloading Charges of Materials	item	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
14 - 4 Dewatering Works																												
14 - 4 - 1. Water Pump for Dewatering Works	day																											1,067.00
14 - 5 Welfare Charges for Labor																												
14 - 5 - 1. Hnee Thatch	item	333.00	820.00	780.00	576.00	704.00	333.00	2,127.00	321.00	487.00	2,262.00	278.00	213.00	1,166.00	5,127.00	535.00	492.00	11,545.00	152.00	114.00	13,580.00	171.00	53.00	923.00	587.00	248.00	2,684.00	1,917.00
14 - 5 - 2. Bamboo	item	100.00	246.00	243.00	175.00	211.00	100.00	638.00	96.00	146.00	679.00	83.00	64.00	350.00	1,538.00	177.00	162.00	3,810.00	50.00	34.00	4,074.00	51.00	16.00	277.00	176.00	74.00	805.00	575.00
14 - 6. Labor Charges for Day & Night Watchman, Helper, Checker and General Works	M/D	60.00	145.00	135.00	100.00	120.00	60.00	370.00	55.00	85.00	395.00	50.00	35.00	200.00	895.00	95.00	85.00	2,015.00	25.00	20.00	2,370.00	30.00	10.00	160.00	100.00	45.00	104.00	130.00
14 - 7. Camps Facilities (Lighting, Water Supply, etc.)	gal	2.00	6.00	5.00	4.00	5.00	2.00	15.00	2.00	3.00	16.00	2.00	2.00	8.00	40.00	4.00	4.00	82.00	1.00	1.00	96.00	1.00	1.00	6.00	4.00	2.00	133.00	48.00
14 - 8. Making Data Boards and Sign Boards	item	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	12.00					7.50	7.50	7.50	7.50	7.50	7.50	7.50	12.00	7.50
14 - 9. Estimating, Copying, Photo Recording and Stationary Charges, etc;	item	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5.00					1.00	1.00	1.00	1.00	1.00	1.00	1.00	5.00	1.00
14 - 10. Miscellaneous	item																											

2.2 Quantity for South Nawin Irrigation System

2.2.1 Quantity for Main Canal (1/2)

Name of work	Unit	Quantity			
		Main Canal (1st year)	Main Canal (2nd year)	Main Canal (3rd year)	Total
1. Preparatory Works					
1 - 1. Survey and Profile Works	sect	667.000			667.000
1 - 2. Temporary Camps & Stores	unit				0.000
1 - 3. Temporary Barracks (2 units, 4 units, etc.)	unit				0.000
1 - 4. Temporary Latrines	unit				0.000
1 - 5. Making Stock Pile Yards	unit				0.000
1 - 6. Labor Transporting Works	item				0.000
1 - 7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas					
1 - 7 - 1. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas (by Manual)	%sq-ft	6,000.000			6,000.000
1 - 7 - 2. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas (by Department Machine)	acres				0.000
2. Earth Works					
2 - 1. Canal Bank Raising and Canal Resectioning Works					
2 - 1 - 1. Canal Bank Raising Work (by Department Machine)	sud				0.000
2 - 1 - 2. Canal Resectioning Work (by Department Machine)	sud				0.000
2 - 1 - 3. Canal Resectioning Work (by Blasting (at Rock Portion))	sud				0.000
2 - 1 - 4. Canal Resectioning Work (by Manual)	sud				0.000
2 - 2. Earth Work Filling into Canal Section and Inner Side Slop					
2 - 2 - 1. Earth Work Filling into Canal Section and Inner Side Slop (by Manual)	sud				0.000
2 - 2 - 2. Earth Work Filling into Canal Section and Inner Side Slop (by Department Machine)	sud			37.000	37.000
2 - 3. G.C (Gravelly Clay) Filling and Compacting Works in Canal Section and Inner Slope					
2 - 3 - 1. G.C Filling and Compacting Works in Canal Section and Inner Slope (by Manual)	sud	3,116.000	84.000		3,200.000
2 - 3 - 2. G.C Filling and Compacting Works in Canal Section and Inner Slope (by Department Machine)	sud				0.000
2 - 4. Making of Temporary Coffler Dam for Necessary of Work					
2 - 4 - 1. Making of Temporary Coffler Dam for Necessary of Work (by Manual)	sud				0.000
2 - 4 - 2. Making of Temporary Coffler Dam for Necessary of Work (by Department Machine)	sud				0.000
2 - 5. Earth Work Excavation for Bed Kerb & Compartment and Copping (by Manual)					
2 - 5. Earth Work in Dressing (by Manual)	sud	473.000			473.000
2 - 6. Earth Work in Base Stripping 3"thick (by Manual)	sud				0.000
2 - 7. Earth Work in Base Stripping 3"thick (by Manual)	sud				0.000
2 - 8. Unsiltng of Main Canal					
2 - 8 - 1. Unsiltng of Main Canal (by Manual)	sud	7,482.000			7,482.000
2 - 8 - 2. Unsiltng of Main Canal (by Department Machine)	sud				0.000
3. Repairing and Construction of Linings Works					
3 - 1. Brick Lining Work					
3 - 1 - 1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed	%sq-ft				0.000
3 - 1 - 2. Making of Ring Bund with Sand Bags	%sq-ft				0.000
3 - 1 - 3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)	%sq-ft				0.000
3 - 1 - 4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)	%sq-ft	0.000	0.000	0.000	0.000
3 - 1 - 5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick)	%sq-ft				0.000
3 - 1 - 6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)	%sq-ft	0.000	0.000	0.000	0.000
3 - 1 - 7. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete	sud				0.000
3 - 1 - 8. 3"thick Sand Filling under Brick Lining	sud	2,581.000	3,079.000	1,375.000	7,035.000
3 - 1 - 9. Pointing Work (with 1:3 Cement Mortar)	%sq-ft				0.000
3 - 2. Concreting Works					
3 - 2 - 1. 1:3:6 Cement Concrete Work for Canal Bed Kerb	sud	234.000	373.000	389.000	996.000
3 - 2 - 2. 1:3:6 Cement Concrete Work for Canal Copping	sud				0.000
3 - 2 - 3. Timber Shuttering Formworks	sud	0.000	0.000	0.000	0.000
3 - 3. Concrete Lining Work					
3 - 3 - 1. Concrete Lining Work (with 1:3:6 Cement Concrete)	sud	2,728.140	5,077.850	2,317.730	10,123.720
3 - 4. Related Works for Concreting such as Earth Work Excavation , Timber Shuttering for Forn Work etc;					
3 - 4 - 1. Timber Shuttering Formwork for Concreting	%sq-ft	216.000	468.000	320.000	1,004.000
3 - 4 - 2. Brick Work with 1:3 Cement Mortar for Compartment (with Clay Brick)	sud				0.000

2.2.1 Quantity for Main Canal (2/2)

Name of work	Unit	Quantity			
		Main Canal (1st year)	Main Canal (2nd year)	Main Canal (3rd year)	Total
3 - 4 - 3. Brick Work with 1:3 Cement Mortar for Compartment (with Cement Brick)	sud				0.000
3 - 4 - 4. Brick Work (1:3) Cement Mortar (with Clay Brick)	sud				0.000
3 - 4 - 5. Brick Work (1:3) Cement Mortar (with Cement Brick)	sud	132.000	285.000	148.000	565.000
4. Repairing & Reconstruction of Canal Structures					
4 - 1. Re-Construction of Structures					
4 - 1 - 1. Construction of Drop	unit				0.000
4 - 1 - 2. Construction of Head Regulator	unit				0.000
4 - 1 - 3. Construction of Drain Box Culvert	unit				0.000
4 - 1 - 4. Construction of Road Crossing and Bridge	unit				0.000
4 - 1 - 5. Construction of Syphon Protection	unit				0.000
4 - 1 - 6. Construction of Course-Way	unit				0.000
4 - 1 - 7. Construction of Box Culverts (Cross Drain Culverts)	unit				0.000
4 - 2. Repairing of structures					
4 - 2 - 1. Drop	unit				0.000
4 - 2 - 2. Head Regulator	unit				0.000
4 - 2 - 3. Drain Box Culvert	unit				0.000
4 - 2 - 4. Road Crossing and Bridge	unit				0.000
4 - 2 - 5. Syphon	unit				0.000
4 - 2 - 6. Repairing of Course-Way	unit				0.000
4 - 2 - 7. Repairing of Box Culverts (Cross Drain Culverts)	unit				0.000
4 - 2 - 8. Repairing of Conduit Gate and Assembly	item				0.000
4 - 2 - 9. Repairing of Canal Gate Leaf, Frame & Gear Assembly	item				0.000
4 - 2 - 10. Repairing of Canal Structures	item				0.000
5. Road Works					
5 - 1. G.C (Gravelly Clay) Laying Work					
5 - 1 - 1. G.C Laying and Spreading Works of Canal Inspection Path	sud				0.000
5 - 1 - 2. G.C Laying and Spreading works of Canal Non Inspection Path	sud				0.000
5 - 2. Concrete Paving Work					
5 - 2 - 1. Mixing only Cement Concrete (1:2:4) with (0.5"to 0.75") Gauge Stone Chippings on River Shingle	sud				3,214.290
5 - 2 - 2. Mixing only Cement Concrete (1:3:6) with (0.5"to 0.75") Gauge Stone Chippings on River Shingle	sud				2,142.870
5 - 2 - 3. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)	sud				5,357.160
5 - 2 - 4. Timber Shuttering Formworks	%sq-ft				1,741.920
5 - 2 - 5. Reinforcing Bar Preparation and Assembly	CWT				2,577.000
5 - 2 - 6. Sodding	%sq-ft				8,387.100
6. Repairing and Construction of Permanent Buildings					
6 - 1. Repairing and Construction of Building (Gust House, Meeting Hall, Office,etc.)	item				0.000
7. Other Related Works					
7 - 1. Repairing of Heavy Machines	job				0.000
7 - 2. Repairing of Motor Vehicles , Water Pumps and Generators	item				0.000
7 - 3. Repairing Charges for Equipments	item				0.000
7 - 4. Earth Works for Drainage Canal (by Department Machine)	sud				0.000
7 - 5. Management of Construction Materials and Equipment					
7 - 5 - 1. Shifting of Materials from Temporary Stock-pile to Work Site	item				0.000
7 - 5 - 2. Transporting of Materials from Quarry to Stock-pile	item				0.000
7 - 5 - 3. Transporting and Shifting of Heavy Machines	item				0.000
7 - 5 - 4. Loading and Unloading Charges of Materials	item				0.000
7 - 6. Water Pump for Dewatering Works	day	64.000	96.000	64.000	224.000
7 - 7. Welfare Charges for Labor					
7 - 7 - 1. Temporary Hut Material	item				0.000
7 - 7 - 2. Hnee Thatch	item	11,000.000	16,000.000	15,000.000	42,000.000
7 - 7 - 3. Bamboo	item	3,300.000	4,800.000	3,500.000	11,600.000
7 - 7 - 4. Transporting for Labor Necessary of Works	mile				0.000
7 - 8. Labor Charges for Day & Night Watchman, Helper, Checker and General Works	M/D	5,600.000	6,000.000	7,500.000	19,100.000
7 - 9. Camps Facilities (Lighting, Water Supply,etc.)	gal	120.000	180.000	120.000	420.000
7 - 10. Making Data Boards and Sign Boards	item				0.000
7 - 11. Estimating, Copying, Photo Recording and stationary Charges, etc;	item	20.000	20.000	20.000	60.000
7 - 12. Miscellaneous	item				0.000

2.2.2 Quantity for Distribution Canal (1/8)

Name of work	Unit	Quantity																											
		DY1	DY2	DY2-1	DY2-2	DY 3	DY 3-1	DY 3-2	DY 5	DY 5-1	DY 6	DY 7	DY 8	DY 8-1	DY 9	DY 9-A	DY 9-B	DY 10	DY 11	DY 12	DY 13	DY 14	DY 15	DY 16	DY 17	DY 18	DY 19	DY 20	DY 21
8. Preparatory Works																													
8 - 1. Survey and Profile Works	sect	85.00	100.00	130.00	60.00	198.00	128.00	171.00	432.00	167.00	208.00	125.00	123.00	155.00	155.00	124.00	156.00	147.00		162.00		115.00	120.00	168.00	212.00	317.00	143.00	356.00	199.00
8 - 2. Temporary Camps & Stores	unit																												
8 - 3. Temporary Barracks (2 units, 4 units, etc.)	unit																												
8 - 4. Temporary Latrines	unit																												
8 - 5. Making Stock Pile Yards	unit																												
8 - 6. Labor Transporting Works	item																												
8 - 7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas																													
8 - 7 - 1. Clearing of the Working Areas along the DY Canal (by Manual)	%sq-ft	510.00	600.00	781.00	359.00	1,190.00	771.00	1,025.00	2,590.00	1,003.00	1,250.00	750.00	740.00	929.00	1,674.00	1,112.00	1,398.00	880.00		873.00		690.00	648.00	900.00	1,143.00	1,378.00	134.00	1,881.00	1,093.00
8 - 7 - 2. Clearing of the Working Areas along the DY Canal (by Department Machine)	acres																												1,093.00
9. Earth Works																													
9 - 1. Canal Resectioning Work																													
9 - 1 - 1. Canal Resectioning Work (by Manual)	sud					893.00																							
9 - 1 - 2. Canal Resectioning Work (by Department Machine)	sud	230.00	360.00	469.00	356.00		578.00	768.00	1,943.00	752.00	750.00	337.00	444.00	558.00	1,395.00	667.00	838.00	528.00		436.00		518.00	324.00	750.00	572.00	2,454.00	1,364.00	5,463.00	2,753.00
9 - 2. Unsilting of Distributary Canals																													
9 - 2 - 1. Unsilting of Distributary Canals (by Manual)	sud	57.00	68.00	88.00	40.00	134.00	87.00	115.00	291.00	113.00	141.00	84.00	83.00	104.00	1,186.00	37.00	140.00	99.00		109.00		78.00	81.00	113.00					
9 - 2 - 2. Unsilting of Distributary Canals (by Department Machine)	sud																								143.00	214.00	96.00	240.00	194.00
9 - 3. Earth Work in Dressing (by Manual)	sud																												
9 - 4. Earth Work in Base Stripping (by Manual)	sud																												
10. Repairing of Linings Work																													
10 - 1. Repairing Works of Brick Lining																													
10 - 1 - 1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed	%sq-ft																												
10 - 1 - 2. 3"thick Sand Filling under Brick Lining	sud	47.00	51.00	72.00	31.00	101.00	66.00	95.00	240.00	93.00	116.00	69.00	69.00	86.00	337.00	100.00	325.00	86.00		75.00		60.00	61.00	75.00	95.00	147.00	72.00	241.00	142.00
10 - 1 - 3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)	%sq-ft																												
10 - 1 - 4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)	%sq-ft	26.00	30.00	39.00	18.00	60.00	38.00	51.00	130.00	50.00	63.00	38.00	37.00	46.00	279.00	37.00	94.00	44.00		49.00		35.00	36.00	50.00	64.00	95.00	43.00	107.00	119.00
10 - 1 - 5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick)	%sq-ft																												
10 - 1 - 6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)	%sq-ft	159.00	170.00	170.00	170.00	336.00	336.00	336.00	809.00	809.00	389.00	234.00	230.00	230.00	667.00	81.00	256.00	292.00		246.00		202.00	204.00	250.00	317.00	480.00	241.00	836.00	436.00
10 - 1 - 7. (1:3:6) C.C (Cement Concrete) work for Copping & Bed Kerb	%sq-ft	26.00	30.00	39.00	18.00	60.00	39.00	51.00	130.00	50.00	63.00	38.00	37.00	47.00	93.00		46.00	44.00		49.00		35.00	36.00	50.00	64.00	143.00	64.00	160.00	90.00
10 - 1 - 8. Pointing Work (with 1:3 cement mortar)	%sq-ft																												
10 - 1 - 9. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete	%sq-ft																												
10 - 2 G.C (Gravelly Clay) Filling Inner Slope	%cu-ft	80.00	85.00	85.00	85.00	168.00	168.00	168.00	404.00	404.00	195.00	117.00	115.00	115.00	334.00	81.00	256.00	146.00		123.00		101.00	102.00	125.00	159.00	369.00	185.00	643.00	336.00
10 - 3 Brick Work in (1:3) Cement Mortar																													
10 - 3 - 1. Brick Work in (1:3) Cement Mortar (With Clay Brick)	%cu-ft																												
10 - 3 - 2. Brick Work in (1:3) Cement Mortar (With Cement Brick)	%cu-ft	3.00	3.00	3.00	3.00	6.00	7.00	7.00	16.00	15.00	8.00	5.00	4.00	4.00	13.00	3.00	10.00	6.00		5.00		4.00	4.00	5.00	6.00	9.00	5.00	16.00	8.00
10 - 4. Timber Shuttering form Work	%sq-ft	26.00	30.00	39.00	18.00	60.00	39.00	51.00	130.00	50.00	63.00	38.00	37.00	46.00	93.00	37.00	46.00	44.00		49.00		35.00	36.00	50.00	64.00	380.00	171.00	427.00	239.00
11. Repairing & Reconstruction of Canal Structures																													
11 - 1. Re-Construction of Structures																													
11 - 1 - 1. Drop	unit																												
11 - 1 - 2. Head Regulator	unit																												
11 - 1 - 3. Drain Box Culvert	unit																												
11 - 1 - 4. Road Crossing and Bridge	unit																												

2.2.2 Quantity for Distribution Canal (2/8)

Name of work	Unit	Quantity																											
		DY1	DY2	DY2-1	DY2-2	DY 3	DY 3-1	DY 3-2	DY 5	DY 5-1	DY 6	DY 7	DY 8	DY 8-1	DY 9	DY 9-A	DY 9-B	DY 10	DY 11	DY 12	DY 13	DY 14	DY 15	DY 16	DY 17	DY 18	DY 19	DY 20	DY 21
11 - 1 - 5. Syphon	unit																												
11 - 1 - 6. Turn Out	unit																												
11 - 2. Repairing of Structures																													
11 - 2 - 1. Drop	unit																												
11 - 2 - 2. Head Regulator	unit																												
11 - 2 - 3. Drain Box Culvert	unit																												
11 - 2 - 4. Road Crossing and Bridge	unit																												
11 - 2 - 5. Syphon	unit																												
11 - 2 - 6. Turn Out	unit																												
11 - 3. Repairing of Canal Gate Leaf, Frame & Gear Assembly	item																												
12 Road Work																													
12 - 1. G.C (Gravelly Clay) Laying Work																													
12 - 1 - 1. G.C Laying and Spreading Work for DY Canal Inspection Path	sud																												
12 - 1 - 2. G.C Laying and Spreading Work for DY Canal Non Inspection Path	sud	0.00	0.00			0.00			0.00		0.00	0.00	0.00		0.00			0.00		0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12 - 2. Concrete Paving Work																													
12 - 2 - 1. Mixing only Cement Concrete (1:2:4) with (0.5"to 0.75") Gauge Stone Chippings on River Shingle	sud																												
12 - 2 - 2. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)	sud																												
12 - 2 - 3. Timber Shuttering Formworks	sud																												
12 - 2 - 4. Reinforcing Bar Preparation and Assembly	CWT																												
13 Repairing and Construction of Permanent Buildings																													
13 - 1. Repairing and Construction of Building (Bin Thar Quarter, Office, etc.)	item																												
14 Other Related Works																													
14 - 1. Repairing of Motor Vehicles , Water Pumps and Generators	item																												
14 - 2 Earth Work for Drainage Canal																													
14 - 2 - 1. Earth Work for Drainage Canal (by Manual)	sud																												
14 - 2 - 2. Earth Work for Drainage Canal (by Department Machine)	sud																												
14 - 3. Management of Construction Materials and Equipment																													
14 - 3 - 1. Shifting of Materials from Temporary Stock-pile to Work Site	item																												
14 - 3 - 2. Transporting of Materials from Quarry to Stock-pile	item																												
14 - 3 - 3. Transporting and Shifting of Heavy Machines	item																												
14 - 3 - 4. Loading and Unloading Charges of Materials	item																												
14 - 4 Dewatering Works																													
14 - 4 - 1. Water Pump for Dewatering Works	day	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00
14 - 5 Welfare Charges for Labor																													
14 - 5 - 1. Hnee Thatch	item	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00
14 - 5 - 2. Bamboo	item	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	1,250.00	1,250.00	1,250.00	1,250.00	1,250.00
14 - 6. Labor Charges for Day & Night Watchman, Helper, Checker and General Works	M/D	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00
14 - 7. Camps Facilities (Lighting, Water Supply, etc.)	gal	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
14 - 8. Making Data Boards and Sign Boards	item																												
14 - 9. Estimating, Copying, Photo Recording and Stationary Charges, etc;	item	1.00																											
14 - 10. Miscellaneous	item																												

2.2.2 Quantity for Distribution Canal (3/8)

Name of work	Unit	Quantity																												
		DY 22	DY 23	DY 24	DY 25	DY 26	DY 27	DY 28	DY 29	DY 30	DY 31	DY 31-1	DY 32	DY 33	DY 34	DY 35	B1	B1-R	B1-L	B2	B2-R	B2-L	PKM	PK1	PK1-1	PK2	PK2-1	PK3	CL 8	
8. Preparatory Works																														
8 - 1. Survey and Profile Works	sect	187.00	70.00	328.00	508.00	455.00	383.00	196.00	294.00	264.00	539.00		312.00	67.00	872.00	275.00					833.00			337.00	821.00	212.00	476.00	120.00	212.00	2,667.00
8 - 2. Temporary Camps & Stores	unit																												3.00	
8 - 3. Temporary Barracks (2 units, 4 units, etc.)	unit																													
8 - 4. Temporary Latrines	unit																													
8 - 5. Making Stock Pile Yards	unit																													
8 - 6. Labor Transporting Works	item																												5,832.00	
8 - 7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas																														
8 - 7 - 1. Clearing of the Working Areas along the DY Canal (by Manual)	%sq-ft	892.00	216.00	1,316.00	2,219.00	2,043.00	1,787.00	837.51	1,663.00	1,317.00	2,960.00		1,763.00	261.00	6,367.00	1,526.00							3,026.00	7,381.00	1,900.00	4,277.00	1,077.00	1,901.00	24,000.00	
8 - 7 - 2. Clearing of the Working Areas along the DY Canal (by Department Machine)	acres																													
9. Earth Works																														
9 - 1. Canal Resectioning Work																														
9 - 1 - 1. Canal Resectioning Work (by Manual)	sud																													
9 - 1 - 2. Canal Resectioning Work (by Department Machine)	sud	2,157.00	249.00	1,144.00	1,460.00	1,609.00	1,353.00	1,040.00	3,419.00	2,516.00	6,001.00		3,617.00	331.00	16,544.00	3,191.00	24,317.00	28,181.00	11,040.00	25,128.00	48,482.00	14,093.00	2,118.00	3,691.00	950.00	2,138.00	539.00	950.00	24,000.00	
9 - 2. Unsilting of Distributary Canals																														
9 - 2 - 1. Unsilting of Distributary Canals (by Manual)	sud																													
9 - 2 - 2. Unsilting of Distributary Canals (by Department Machine)	sud	162.00	46.00	284.00	494.00	443.00	407.00	150.00	283.00	203.00	519.00		304.00	45.00	1,189.00	239.00	8,020.00	7,614.00	2,659.00	12,720.00	14,502.00	3,229.00							24,000.00	
9 - 3. Earth Work in Dressing (by Manual)	sud																													
9 - 4. Earth Work in Base Stripping (by Manual)	sud																													
10. Repairing of Linings Work																														
10 - 1. Repairing Works of Brick Lining																														
10 - 1 - 1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed	%sq-ft																													
10 - 1 - 2. 3"thick Sand Filling under Brick Lining	sud	116.00	28.00	189.00	323.00	305.00	266.00	109.00	227.00	167.00	393.00		247.00	29.00	913.00	211.00	1,209.00	1,979.00	288.00	2,097.00	1,529.00	1,855.00	347.00	717.00	82.00	325.00	47.00	99.00	1,050.20	
10 - 1 - 3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)	%sq-ft																													
10 - 1 - 4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)	%sq-ft	92.00	21.00	161.00	304.00	272.00	264.00	77.00	173.00	104.00	317.00		187.00	20.00	862.00	136.00							331.00	645.00	62.00	328.00	35.00	62.00	1,180.00	
10 - 1 - 5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick)	%sq-ft																													
10 - 1 - 6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)	%sq-ft	361.00	109.00	733.00	1,260.00	1,192.00	1,039.00	349.00	719.00	550.00	1,226.00		780.00	96.00	2,721.00	689.00							1,059.00	2,222.00	266.00	328.00	151.00	333.00	3,017.66	
10 - 1 - 7. (1:3:6) C.C (Cement Concrete) work for Copping & Bed Kerb	%sq-ft	84.00	21.00	98.00	152.00	136.00	115.00	88.00	132.00	119.00	242.00		140.00	30.00	392.00	124.00	2,168.00	3,626.00	647.00	3,168.00	2,648.00	1,896.00	50.00	123.00	32.00	71.00	18.00	32.00	236.00	
10 - 1 - 8. Pointing Work (with 1:3 cement mortar)	%sq-ft																													
10 - 1 - 9. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete	%sq-ft																													
10 - 2 G.C (Gravelly Clay) Filling Inner Slope	%cu-ft	278.00	57.00	377.00	646.00	610.00	532.00	268.00	553.00	423.00	943.00		600.00	74.00	2,093.00	530.00	3,262.00	6,894.00	1,631.00	4,232.00	4,097.00	3,497.00	1,059.00	2,222.00	266.00	972.00	151.00	333.00	1,508.83	
10 - 3 Brick Work in (1:3) Cement Mortar																														
10 - 3 - 1. Brick Work in (1:3) Cement Mortar (With Clay Brick)	%cu-ft																													
10 - 3 - 2. Brick Work in (1:3) Cement Mortar (With Cement Brick)	%cu-ft	7.00	3.00	14.00	24.00	23.00	20.00	7.00	14.00	11.00	24.00		15.00	2.00	52.00	13.00													58.03	
10 - 4. Timber Shuttering form Work	%sq-ft	224.00	21.00	98.00	152.00	136.00	115.00	234.00	353.00	317.00	646.00		374.00	60.00	784.00	247.00	690.00	1,372.00	308.00	888.00	826.00	725.00	101.00	246.00	63.00	143.00	36.00	63.00	236.00	
11. Repairing & Reconstruction of Canal Structures																														
11 - 1. Re-Construction of Structures																														
11 - 1 - 1. Drop	unit																													
11 - 1 - 2. Head Regulator	unit																													
11 - 1 - 3. Drain Box Culvert	unit																													
11 - 1 - 4. Road Crossing and Bridge	unit																													

2.2.2 Quantity for Distribution Canal (4/8)

Name of work	Unit	Quantity																											
		DY 22	DY 23	DY 24	DY 25	DY 26	DY 27	DY 28	DY 29	DY 30	DY 31	DY 31-1	DY 32	DY 33	DY 34	DY 35	B1	B1-R	B1-L	B2	B2-R	B2-L	PKM	PK1	PK1-1	PK2	PK2-1	PK3	CL 8
11 - 1 - 5. Syphon	unit																												
11 - 1 - 6. Turn Out	unit																												
11 - 2. Repairing of Structures																													
11 - 2 - 1. Drop	unit																												11.00
11 - 2 - 2. Head Regulator	unit																												2.00
11 - 2 - 3. Drain Box Culvert	unit																												8.00
11 - 2 - 4. Road Crossing and Bridge	unit																												10.00
11 - 2 - 5. Syphon	unit																												
11 - 2 - 6. Turn Out	unit																												
11 - 3. Repairing of Canal Gate Leaf, Frame & Gear Assembly	item																												32.00
12 Road Work																													
12 - 1. G.C (Gravelly Clay) Laying Work																													
12 - 1 - 1. G.C Laying and Spreading Work for DY Canal Inspection Path	sud																												0.00
12 - 1 - 2. G.C Laying and Spreading Work for DY Canal Non Inspection Path	sud	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
12 - 2. Concrete Paving Work																													
12 - 2 - 1. Mixing only Cement Concrete (1:2:4) with (0.5"to 0.75") Gauge Stone Chippings on River Shingle	sud																												
12 - 2 - 2. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)	sud																												
12 - 2 - 3. Timber Shuttering Formworks	sud																												
12 - 2 - 4. Reinforcing Bar Preparation and Assembly	CWT																												
13 Repairing and Construction of Permanent Buildings																													
13 - 1. Repairing and Construction of Building (Bin Thar Quarter, Office, etc.)	item																												
14 Other Related Works																													
14 - 1. Repairing of Motor Vehicles , Water Pumps and Generators	item																												
14 - 2 Earth Work for Drainage Canal																													
14 - 2 - 1. Earth Work for Drainage Canal (by Manual)	sud																												
14 - 2 - 2. Earth Work for Drainage Canal (by Department Machine)	sud																												
14 - 3. Management of Construction Materials and Equipment																													
14 - 3 - 1. Shifting of Materials from Temporary Stock-pile to Work Site	item																												
14 - 3 - 2. Transporting of Materials from Quarry to Stock-pile	item																												5,832.00
14 - 3 - 3. Transporting and Shifting of Heavy Machines	item																												
14 - 3 - 4. Loading and Unloading Charges of Materials	item																												1.00
14 - 4 Dewatering Works																													
14 - 4 - 1. Water Pump for Dewatering Works	day	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	24.00	20.00	20.00	30.00	7.00	7.00	7.00	7.00	6.00	
14 - 5 Welfare Charges for Labor																													
14 - 5 - 1. Hnee Thatch	item	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	7,000.00	4,000.00	4,000.00	4,000.00	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	18,909.00
14 - 5 - 2. Bamboo	item	1,250.00	1,250.00	1,250.00	1,250.00	1,250.00	1,250.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,450.00	1,250.00	1,250.00	900.00	900.00	900.00	900.00	900.00	900.00	900.00	600.00	600.00	5,672.00
14 - 6. Labor Charges for Day & Night Watchman, Helper, Checker and General Works	M/D	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	2,600.00	1,000.00	1,000.00	1,000.00	600.00	900.00	600.00	600.00	600.00	600.00	600.00	600.00	1,200.00
14 - 7. Camps Facilities (Lighting, Water Supply, etc.)	gal	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	40.00	40.00	40.00	30.00	18.00	18.00	18.00	18.00	18.00	480.00
14 - 8. Making Data Boards and Sign Boards	item																												7.50
14 - 9. Estimating, Copying, Photo Recording and Stationary Charges, etc;	item																												1.00
14 - 10. Miscellaneous	item																												

2.2.2 Quantity for Distribution Canal (5/8)

Name of work	Unit	Quantity																											
		CL8A	CL8B	CL8B1	CL8C	CL8C1	CL8C2	CL8C3	CL8D	CL8E	CL18	CL18A	CL18B	CL18C	CL18 SUB	CL18D	CL18E	CL18 E1	CL18 E2	CL18F	CL18G	CL18 G1	CL19	CL20	CL21	CL22	CL23	CL24	CL24A
8. Preparatory Works																													
8 - 1. Survey and Profile Works	sect	397.00	833.00	467.00	857.00	167.00	200.00	500.00	667.00	767.00	1,300.00	160.00	137.00	124.00	167.00	91.60	750.00	249.00	80.00	150.00	191.00	223.00	250.00	417.00	194.00	327.00	144.00	134.00	50.00
8 - 2. Temporary Camps & Stores	unit	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8 - 3. Temporary Barracks (2 units, 4 units, etc.)	unit																												
8 - 4. Temporary Latrines	unit																												
8 - 5. Making Stock Pile Yards	unit																												
8 - 6. Labor Transporting Works	item	432.00	1,058.00	509.00	936.00	180.00	216.00	544.00	729.00	837.00	1,184.00	27.00	23.00	23.00	27.00								41.00	68.00	81.00	50.00	23.00	23.00	9.00
8 - 7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas																													
8 - 7 - 1. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas along the DY Canal (by Manual)	%sqft	3,570.00	7,500.00	4,200.00	7,710.00	1,500.00	1,800.00	4,500.00	6,000.00	6,900.00	11,700.00	1,440.00	1,230.00	1,110.00	1,500.00	816.00	6,743.70	2,238.00	720.00	1,344.00	1,710.00	2,000.00	2,250.00	3,750.00	1,740.00	2,940.00	1,290.00	1,200.00	450.00
8 - 7 - 2. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas along the DY Canal (by Department Machine)	acres																												
9. Earth Works																													
9 - 1. Canal Resectioning Work																													
9 - 1 - 1. Canal Resectioning Work (by Manual)	sud																												
9 - 1 - 2. Canal Resectioning Work (by Department Machine)	sud	1,785.00	4,350.00	2,100.00	3,855.00	750.00	900.00	2,250.00	3,000.00	3,450.00	4,875.00	115.00	98.00	88.00	120.00	244.80							180.00	281.00	348.00	220.00	103.00	96.00	36.00
9 - 2. Unsilting of Distributary Canals																													
9 - 2 - 1. Unsilting of Distributary Canals (by Manual)	sud																												
9 - 2 - 2. Unsilting of Distributary Canals (by Department Machine)	sud	1,428.00	3,480.00	1,680.00	3,084.00	600.00	720.00	1,800.00	2,400.00	2,760.00	4,875.00	144.00	132.00	111.00	200.00	245.00	3,793.00	671.00	216.00	403.00	513.00	600.00	150.00	281.00	348.00	220.00	86.00	80.00	30.00
9 - 3. Earth Work in Dressing (by Manual)	sud																												
9 - 4. Earth Work in Base Stripping (by Manual)	sud																												
10. Repairing of Linings Work																													
10 - 1. Repairing Works of Brick Lining																													
10 - 1 - 1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed	%sq-ft																												
10 - 1 - 2. 3"thick Sand Filling under Brick Lining	sud										170.50												90.75	218.75	70.18	171.50	52.03	48.40	18.15
10 - 1 - 3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)	%sq-ft																												
10 - 1 - 4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)	%sq-ft										186.00												75.00	250.00	58.00	196.00	43.00	40.00	15.00
10 - 1 - 5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick)	%sq-ft																												
10 - 1 - 6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)	%sq-ft										496.08												287.53	624.48	222.39	489.93	165.11	152.75	57.28
10 - 1 - 7. (1:3:6) C.C (Cement Concrete) work for Copping & Bed Kerb	%sq-ft										62.00												75.00	125.00	58.00	98.00	43.00	40.00	15.00
10 - 1 - 8. Pointing Work (with 1:3 cement mortar)	%sq-ft																												
10 - 1 - 9. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete	%sq-ft																												
10 - 2 G.C (Gravelly Clay) Filling Inner Slope	%cu-ft										248.04												143.76	312.24	111.19	244.96	85.55	76.37	28.64
10 - 3 Brick Work in (1:3) Cement Mortar																													
10 - 3 - 1. Brick Work in (1:3) Cement Mortar (With Clay Brick)	%cu-ft																												
10 - 3 - 2. Brick Work in (1:3) Cement Mortar (With Cement Brick)	%cu-ft										9.54												5.52	12.01	4.27	9.42	3.17	2.93	1.10
10 - 4. Timber Shuttering form Work	%sq-ft										62.00												75.00	125.00	58.00	98.00	43.00	40.00	15.00
11. Repairing & Reconstruction of Canal Structures																													
11 - 1. Re-Construction of Structures																													
11 - 1 - 1. Drop	unit																												
11 - 1 - 2. Head Regulator	unit																												
11 - 1 - 3. Drain Box Culvert	unit																												
11 - 1 - 4. Road Crossing and Bridge	unit																												

2.2.2 Quantity for Distribution Canal (6/8)

Name of work	Unit	Quantity																											
		CL8A	CL8B	CL8B1	CL8C	CL8C1	CL8C2	CL8C3	CL8D	CL8E	CL18	CL18A	CL18B	CL18C	CL18 SUB	CL18D	CL18E	CL18 E1	CL18 E2	CL18F	CL18G	CL18 G1	CL19	CL20	CL21	CL22	CL23	CL24	CL24A
11 - 1 - 5. Syphon	unit																												
11 - 1 - 6. Turn Out	unit																												
11 - 2. Repairing of Structures																													
11 - 2 - 1. Drop	unit										11.00												1.00	1.00	1.00	1.00	1.00	1.00	1.00
11 - 2 - 2. Head Regulator	unit										2.00																		
11 - 2 - 3. Drain Box Culvert	unit										8.00																		
11 - 2 - 4. Road Crossing and Bridge	unit										9.00																		
11 - 2 - 5. Syphon	unit																												
11 - 2 - 6. Turn Out	unit										3.00	3.00	4.00	2.00		2.00	4.00	4.00			7.00	6.00	4.00	5.00	5.00	5.00	5.00	5.00	7.00
11 - 3. Repairing of Canal Gate Leaf, Frame & Gear Assembly	item	24.00	16.00	16.00							24.00												4.00	4.00	4.00	4.00	4.00	4.00	4.00
12 Road Work																													
12 - 1. G.C (Gravelly Clay) Laying Work																													
12 - 1 - 1. G.C Laying and Spreading Work for DY Canal Inspection Path	sud	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							0.00	0.00	0.00	0.00	0.00	0.00	0.00	
12 - 1 - 2. G.C Laying and Spreading Work for DY Canal Non Inspection Path	sud																												
12 - 2. Concrete Paving Work																													
12 - 2 - 1. Mixing only Cement Concrete (1:2:4) with (0.5"to 0.75") Gauge Stone Chippings on River Shingle	sud																												
12 - 2 - 2. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)	sud																												
12 - 2 - 3. Timber Shuttering Formworks	sud																												
12 - 2 - 4. Reinforcing Bar Preparation and Assembly	CWT																												
13 Repairing and Construction of Permanent Buildings																													
13 - 1. Repairing and Construction of Building (Bin Thar Quarter, Office, etc.)	item	1.00	1.00																										
14 Other Related Works																													
14 - 1. Repairing of Motor Vehicles , Water Pumps and Generators	item																												
14 - 2 Earth Work for Drainage Canal																													
14 - 2 - 1. Earth Work for Drainage Canal (by Manual)	sud																												
14 - 2 - 2. Earth Work for Drainage Canal (by Department Machine)	sud																												
14 - 3. Management of Construction Materials and Equipment																													
14 - 3 - 1. Shifting of Materials from Temporary Stock-pile to Work Site	item																												
14 - 3 - 2. Transporting of Materials from Quarry to Stock-pile	item	432.00	1,058.00	509.00	936.00	180.00	216.00	544.00	729.00	837.00	1,184.00	27.00	23.00	23.00	27.00								41.00	68.00	81.00	50.00	23.00	23.00	9.00
14 - 3 - 3. Transporting and Shifting of Heavy Machines	item																												
14 - 3 - 4. Loading and Unloading Charges of Materials	item	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
14 - 4 Dewatering Works																													
14 - 4 - 1. Water Pump for Dewatering Works	day										10.00												5.00	5.00	5.00	5.00	5.00	5.00	5.00
14 - 5 Welfare Charges for Labor																													
14 - 5 - 1. Hnee Thatch	item	1,426.00	3,475.00	1,677.00	3,080.00	599.00	719.00	1,797.00	2,397.00	2,756.00	3,750.00	91.00	78.00	70.00	95.00	51.00	350.00						143.00	224.00	278.00	175.00	822.00	76.00	28.00
14 - 5 - 2. Bamboo	item	427.00	1,042.00	503.00	924.00	179.00	215.00	539.00	719.00	826.00	1,125.00	27.00	23.00	21.00	28.00	15.00	105.00						42.00	67.00	83.00	52.00	246.00	22.00	8.00
14 - 6. Labor Charges for Day & Night Watchman, Helper, Checker and General Works	M/D	60.00	60.00	60.00	60.00	60.00	90.00	60.00	60.00	90.00	1,400.00	8.00	8.00	8.00	30.00	30.00	60.00		30.00	30.00	30.00	60.00	50.00	50.00	60.00	100.00	60.00	60.00	100.00
14 - 7. Camps Facilities (Lighting, Water Supply, etc.)	gal	35.00	87.00	42.00	77.00	15.00	18.00	45.00	60.00	69.00	5.00	4.00	12.00	6.00	6.00	4.00	4.00						6.00	8.00	6.00	4.00	4.00	3.00	4.00
14 - 8. Making Data Boards and Sign Boards	item	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50						7.50	7.50	7.50	7.50	7.50	7.50	7.50
14 - 9. Estimating, Copying, Photo Recording and Stationary Charges, etc;	item	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
14 - 10. Miscellaneous	item																						1.00						

2.2.2 Quantity for Distribution Canal (7/8)

Name of work	Unit	Quantity																		
		CL25	CL26	CL27	CL27A	CL27B	CL27C	CL27D	CL27 D1	CL27 D2	CL27E	CL28	CL29	CL30	CL31	CL32	CL33	CL34	CL34A	Total
8. Preparatory Works																				
8 - 1. Survey and Profile Works	sect	110.00	234.00	933.00	110.00	336.00	61.00	881.00	167.00	244.00	194.00	194.00	220.00	215.00	228.00	280.00	144.00	215.00	220.00	29,863.60
8 - 2. Temporary Camps & Stores	unit	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	51.00
8 - 3. Temporary Barracks (2 units, 4 units, etc.)	unit																			0.00
8 - 4. Temporary Latrines	unit																			0.00
8 - 5. Making Stock Pile Yards	unit																			0.00
8 - 6. Labor Transporting Works	item	18.00	41.00	1,800.00				1,575.00					675.00	540.00	630.00				720.00	18,851.00
8 - 7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas																				
8 - 7 - 1. Clearing of the Working Areas along the DY Canal (by Manual)	%sft	990.00	2,100.00	8,400.00	773.00	2,433.00	443.00	7,920.00	1,505.00	2,202.00	1,406.00	1,292.00		2,055.00	1,940.00	2,027.00	1,038.00	1,558.00	1,584.00	224,549.21
8 - 7 - 2. Clearing of the Working Areas along the DY Canal (by Department Machine)	acres																			1,093.00
9. Earth Works																				
9 - 1. Canal Resectioning Work																				
9 - 1 - 1. Canal Resectioning Work (by Manual)	sud																			893.00
9 - 1 - 2. Canal Resectioning Work (by Department Machine)	sud	79.00	168.00	4,270.00	140.00	1,316.00	88.00	5,016.00	181.00	198.00	812.00	236.00	339.00	1,976.00	1,921.00	329.00	190.00	284.00	460.00	303,112.80
9 - 2. Unsilting of Distributary Canals																				
9 - 2 - 1. Unsilting of Distributary Canals (by Manual)	sud																			3,248.00
9 - 2 - 2. Unsilting of Distributary Canals (by Department Machine)	sud	66.00	140.00	1,470.00	169.00	329.00	48.00	3,432.00	722.00	1,982.00	190.00	121.00	200.00	214.00	144.00	355.00	97.00	341.00	386.00	119,855.00
9 - 3. Earth Work in Dressing (by Manual)	sud			5,740.00	309.00	1,645.00	136.00	8,448.00	903.00	2,180.00	1,002.00	357.00	539.00	2,190.00	2,065.00	684.00	287.00	625.00	846.00	27,956.00
9 - 4. Earth Work in Base Stripping (by Manual)	sud			1,260.00	96.00	304.00	55.00	792.00	150.00	220.00	175.00	162.00	199.00	171.00	194.00	253.00	129.00	194.00	198.00	4,552.00
10. Repairing of Linings Work																				
10 - 1. Repairing Works of Brick Lining																				
10 - 1 - 1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed	%sq-ft			976.00									332.00	265.00	257.00	506.00			356.00	2,692.00
10 - 1 - 2. 3"thick Sand Filling under Brick Lining	sud	39.93	84.70	2,401.00				225.00					342.00	287.00	269.00	126.00			415.00	23,129.09
10 - 1 - 3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)	%sq-ft																			0.00
10 - 1 - 4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)	%sq-ft	35.00	70.00	240.00				240.00					66.00	68.50	64.00	168.00			64.00	9,189.50
10 - 1 - 5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick)	%sq-ft																			0.00
10 - 1 - 6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)	%sq-ft	125.79	268.44	720.00				660.00					266.00	219.00	205.00	337.00			260.00	33,643.44
10 - 1 - 7. (1:3:6) C.C (Cement Concrete) work for Copping & Bed Kerb	%sq-ft	33.00	70.00	60.00				45.00					49.00	51.00	48.00	63.00			47.00	19,072.00
10 - 1 - 8. Pointing Work (with 1:3 cement mortar)	%sq-ft			320.00																320.00
10 - 1 - 9. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete	%sq-ft																			0.00
10 - 2 G.C (Gravelly Clay) Filling Inner Slope	%cu-ft	62.89	134.22	360.00				165.00					66.50	54.80	51.50	84.00			65.00	45,552.49
10 - 3 Brick Work in (1:3) Cement Mortar																				0.00
10 - 3 - 1. Brick Work in (1:3) Cement Mortar (With Clay Brick)	%cu-ft																			0.00
10 - 3 - 2. Brick Work in (1:3) Cement Mortar (With Cement Brick)	%cu-ft	2.41	5.16	13.50				5.00					2.50	2.16	2.00	3.80			2.68	552.20
10 - 4. Timber Shuttering form Work	%sq-ft	33.00	70.00	60.00				60.00					66.50	68.50	64.00	84.00			65.00	12,823.00
11. Repairing & Reconstruction of Canal Structures																				
11 - 1. Re-Construction of Structures																				
11 - 1 - 1. Drop	unit																			0.00
11 - 1 - 2. Head Regulator	unit																			0.00
11 - 1 - 3. Drain Box Culvert	unit																			0.00
11 - 1 - 4. Road Crossing and Bridge	unit																			0.00

2.2.2 Quantity for Distribution Canal (8/8)

Name of work	Unit	Quantity																		
		CL25	CL26	CL27	CL27A	CL27B	CL27C	CL27D	CL27 D1	CL27 D2	CL27E	CL28	CL29	CL30	CL31	CL32	CL33	CL34	CL34A	Total
11 - 1 - 5. Syphon	unit																			0.00
11 - 1 - 6. Turn Out	unit																			0.00
11 - 2. Repairing of Structures																				
11 - 2 - 1. Drop	unit		1.00	5.00								6.00	3.00	5.00	3.00					52.00
11 - 2 - 2. Head Regulator	unit			5.00																9.00
11 - 2 - 3. Drain Box Culvert	unit			4.00				1.00												21.00
11 - 2 - 4. Road Crossing and Bridge	unit				2.00	2.00	1.00	2.00	1.00		1.00	1.00	3.00							32.00
11 - 2 - 5. Syphon	unit			3.00																3.00
11 - 2 - 6. Turn Out	unit	6.00	4.00	5.00	2.00	4.00		6.00				2.00	2.00	3.00						108.00
11 - 3. Repairing of Canal Gate Leaf, Frame & Gear Assembly	item	4.00	4.00	18.00										7.50	7.50					181.00
12 Road Work																				
12 - 1. G.C (Gravelly Clay) Laying Work																				
12 - 1 - 1. G.C Laying and Spreading Work for DY Canal Inspection Path	sud	0.00	0.00	0.00																785.71
12 - 1 - 2. G.C Laying and Spreading Work for DY Canal Non Inspection Path	sud																			0.00
12 - 2. Concrete Paving Work																				
12 - 2 - 1. Mixing only Cement Concrete (1:2:4) with (0.5"to 0.75") Gauge Stone Chippings on River Shingle	sud																			0.00
12 - 2 - 2. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)	sud																			0.00
12 - 2 - 3. Timber Shuttering Formworks	sud																			0.00
12 - 2 - 4. Reinforcing Bar Preparation and Assembly	CWT																			0.00
13 Repairing and Construction of Permanent Buildings																				
13 - 1. Repairing and Construction of Building (Bin Thar Quarter, Office, etc.)	item			2.00				1.00												5.00
14 Other Related Works																				
14 - 1. Repairing of Motor Vehicles , Water Pumps and Generators	item																			0.00
14 - 2 Earth Work for Drainage Canal																				
14 - 2 - 1. Earth Work for Drainage Canal (by Manual)	sud																			0.00
14 - 2 - 2. Earth Work for Drainage Canal (by Department Machine)	sud			10,000.00																10,000.00
14 - 3. Management of Construction Materials and Equipment																				
14 - 3 - 1. Shifting of Materials from Temporary Stock-pile to Work Site	item																			0.00
14 - 3 - 2. Transporting of Materials from Quarry to Stock-pile	item	18.00	41.00	1,800.00				1,575.00				675.00	540.00	630.00				720.00		18,851.00
14 - 3 - 3. Transporting and Shifting of Heavy Machines	item																			0.00
14 - 3 - 4. Loading and Unloading Charges of Materials	item	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	46.00
14 - 4 Dewatering Works																				
14 - 4 - 1. Water Pump for Dewatering Works	day	5.00	5.00	31.00				29.00					12.00	10.00	10.00	10.00			13.00	1,034.00
14 - 5 Welfare Charges for Labor																				
14 - 5 - 1. Hnee Thatch	item	63.00	134.00	4,600.00	240.00	1,320.00	110.00	6,810.00	773.00	1,760.00	800.00	280.00	430.00	1,750.00	1,650.00	547.00	230.00	500.00	670.00	280,733.00
14 - 5 - 2. Bamboo	item	18.00	40.00	1,380.00	75.00	398.00	30.00	2,040.00	232.00	525.00	240.00	83.00	128.00	525.00	495.00	165.00	68.00	150.00	203.00	86,005.00
14 - 6. Labor Charges for Day & Night Watchman, Helper, Checker and General Works	M/D	60.00	60.00	720.00	90.00	180.00	60.00	510.00	90.00	180.00	120.00	90.00	380.00	380.00	380.00	150.00	90.00	120.00	360.00	61,744.00
14 - 7. Camps Facilities (Lighting, Water Supply, etc.)	gal	5.00	6.00	39.00				36.00					15.00	12.50	12.50	12.50			10.25	2,772.75
14 - 8. Making Data Boards and Sign Boards	item	7.50	7.50	12.00	7.50	7.50	7.50	12.00	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	324.00
14 - 9. Estimating, Copying, Photo Recording and Stationary Charges, etc;	item	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	47.00
14 - 10. Miscellaneous	item																			1.00

2.3 Quantity for Wegyi Irrigation System

2.3.1 Quantity for Main Canal (1/2)

Name of work	Unit	Quantity
		Main canal
1. Preparatory Works		
1 - 1. Survey and Profile Works	sect	850.000
1 - 2. Temporary Camps & Stores	unit	0.000
1 - 3. Temporary Barracks (2 units, 4 units, etc.)	unit	0.000
1 - 4. Temporary Latrines	unit	0.000
1 - 5. Making Stock Pile Yards	unit	0.000
1 - 6. Labor Transporting Works	item	0.000
1 - 7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas		
1 - 7 - 1. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas (by Manual)	%sq-ft	0.000
1 - 7 - 2. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas (by Department Machine)	acres	51.510
2. Earth Works		
2 - 1. Canal Bank Raising and Canal Resectioning Works		
2 - 1 - 1. Canal Bank Raising Work (by Department Machine)	sud	0.000
2 - 1 - 2. Canal Resectioning Work (by Department Machine)	sud	45,375.000
2 - 1 - 3. Canal Resectioning Work (by Blasting (at Rock Portion))	sud	0.000
2 - 1 - 4. Canal Resectioning Work (by Manual)	sud	0.000
2 - 2. Earth Work Filling into Canal Section and Inner Side Slop		
2 - 2 - 1. Earth Work Filling into Canal Section and Inner Side Slop (by Manual)	sud	0.000
2 - 2 - 2. Earth Work Filling into Canal Section and Inner Side Slop (by Department Machine)	sud	0.000
2 - 3. G.C (Gravelly Clay) Filling and Compacting Works in Canal Section and Inner Slope		
2 - 3 - 1. G.C Filling and Compacting Works in Canal Section and Inner Slope (by Manual)	sud	4,909.000
2 - 3 - 2. G.C Filling and Compacting Works in Canal Section and Inner Slope (by Department Machine)	sud	0.000
2 - 4. Making of Temporary Coffler Dam for Necessary of Work		
2 - 4 - 1. Making of Temporary Coffler Dam for Necessary of Work (by Manual)	sud	0.000
2 - 4 - 2. Making of Temporary Coffler Dam for Necessary of Work (by Department Machine)	sud	0.000
2 - 5. Earth Work Excavation for Bed Kerb & Compartment and Copping (by Manual)	sud	0.000
2 - 6. Earth Work in Dressing (by Manual)	sud	0.000
2 - 7. Earth Work in Base Stripping 3"thick (by Manual)	sud	0.000
2 - 8. Unsilting of Main Canal		
2 - 8 - 1. Unsilting of Main Canal (by Manual)	sud	0.000
2 - 8 - 2. Unsilting of Main Canal (by Department Machine)	sud	27,075.000
3. Repairing and Construction of Linings Works		
3 - 1. Brick Lining Work		
3 - 1 - 1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed	%sq-ft	0.000
3 - 1 - 2. Making of Ring Bund with Sand Bags	%sq-ft	0.000
3 - 1 - 3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)	%sq-ft	0.000
3 - 1 - 4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)	%sq-ft	0.000
3 - 1 - 5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick)	%sq-ft	0.000
3 - 1 - 6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)	%sq-ft	0.000
3 - 1 - 7. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete	sud	0.000
3 - 1 - 8. 3"thick Sand Filling under Brick Lining	sud	3,953.000
3 - 1 - 9. Pointing Work (with 1:3 Cement Mortar)	%sq-ft	0.000
3 - 2. Concreting Works		
3 - 2 - 1. 1:3:6 Cement Concrete Work for Canal Bed Kerb	sud	0.000
3 - 2 - 2. 1:3:6 Cement Concrete Work for Canal Copping	sud	255.000
3 - 2 - 3. Timber Shuttering Formworks	sud	0.000
3 - 3. Concrete Lining Work		
3 - 3 - 1. Concrete Lining Work (with1:3:6 Cement Concrete)	sud	9,818.680
3 - 4. Related Works for Concreting such as Earth Work Excavation , Timber Shuttering for Forn Work etc;		
3 - 4 - 1. Timber Shuttering Formwork for Concreting	%sq-ft	255.000
3 - 4 - 2. Brick Work with 1:3 Cement Mortar for Compartment (with Clay Brick)	sud	0.000

2.3.1 Quantity for Main Canal (2/2)

Name of work	Unit	Quantity
		Main canal
3 - 4 - 3. Brick Work with 1:3 Cement Mortar for Compartment (with Cement Brick)	sud	0.000
3 - 4 - 4. Brick Work (1:3) Cement Mortar (with Clay Brick)	sud	0.000
3 - 4 - 5. Brick Work (1:3) Cement Mortar (with Cement Brick)	sud	221.000
4. Repairing & Reconstruction of Canal Structures		
4 - 1. Re-Construction of Structures		
4 - 1 - 1. Construction of Drop	unit	1.000
4 - 1 - 2. Construction of Head Regulator	unit	0.000
4 - 1 - 3. Construction of Drain Box Culvert	unit	0.000
4 - 1 - 4. Construction of Road Crossing and Bridge	unit	0.000
4 - 1 - 5. Construction of Syphon Protection	unit	0.000
4 - 1 - 6. Construction of Course-Way	unit	0.000
4 - 1 - 7. Construction of Box Culverts (Cross Drain Culverts)	unit	0.000
4 - 2. Repairing of structures		
4 - 2 - 1. Drop	unit	0.000
4 - 2 - 2. Head Regulator	unit	0.000
4 - 2 - 3. Drain Box Culvert	unit	0.000
4 - 2 - 4. Road Crossing and Bridge	unit	2.000
4 - 2 - 5. Syphon	unit	0.000
4 - 2 - 6. Repairing of Course-Way	unit	0.000
4 - 2 - 7. Repairing of Box Culverts (Cross Drain Culverts)	unit	0.000
4 - 2 - 8. Repairing of Conduit Gate and Assembly	item	3.000
4 - 2 - 9. Repairing of Canal Gate Leaf, Frame & Gear Assembly	item	0.000
4 - 2 - 10. Repairing of Canal Structures	item	0.000
5. Road Works		
5 - 1. G.C (Gravelly Clay) Laying Work		
5 - 1 - 1. G.C Laying and Spreading Works of Canal Inspection Path	sud	0.000
5 - 1 - 2. G.C Laying and Spreading works of Canal Non Inspection Path	sud	0.000
5 - 2. Concrete Paving Work		
5 - 2 - 1. Mixing only Cement Concrete (1:2:4) with (0.5"to 0.75") Gauge Stone Chippings on River Shingle	sud	3,214.290
5 - 2 - 2. Mixing only Cement Concrete (1:3:6) with (0.5"to 0.75") Gauge Stone Chippings on River Shingle	sud	2,142.870
5 - 2 - 3. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)	sud	5,357.160
5 - 2 - 4. Timber Shuttering Formworks	%sq-ft	1,741.920
5 - 2 - 5. Reinforcing Bar Preparation and Assembly	CWT	2,577.000
5 - 2 - 6. Sodding	%sq-ft	8,387.100
6. Repairing and Construction of Permanent Buildings		
6 - 1. Repairing and Construction of Building (Gust House, Meeting Hall, Office,etc.)	item	0.000
7. Other Related Works		
7 - 1. Repairing of Heavy Machines	job	0.000
7 - 2. Repairing of Motor Vehicles , Water Pumps and Generators	item	0.000
7 - 3. Repairing Charges for Equipments	item	0.000
7 - 4. Earth Works for Drainage Canal (by Department Machine)	sud	0.000
7 - 5. Management of Construction Materials and Equipment		
7 - 5 - 1. Shifting of Materials from Temporary Stock-pile to Work Site	item	31,500.000
7 - 5 - 2. Transporting of Materials from Quarry to Stock-pile	item	3,902.000
7 - 5 - 3. Transporting and Shifting of Heavy Machines	item	0.000
7 - 5 - 4. Loading and Unloading Charges of Materials	item	37.000
7 - 6. Water Pump for Dewatering Works	day	1,000.000
7 - 7. Welfare Charges for Labor		
7 - 7 - 1. Temporary Hut Material	item	206.000
7 - 7 - 2. Hnee Thatch	item	0.000
7 - 7 - 3. Bamboo	item	0.000
7 - 7 - 4. Transporting for Labor Necessary of Works	mile	0.000
7 - 8. Labor Charges for Day & Night Watchman, Helper, Checker and General Works	M/D	9,180.000
7 - 9. Camps Facilities (Lighting, Water Supply,etc.)	gal	540.000
7 - 10. Making Data Boards and Sign Boards	item	0.000
7 - 11. Estimating, Copying, Photo Recording and stationary Charges, etc;	item	20.000
7 - 12. Miscellaneous	item	1.000

2.3.2 Quantity for Distribution Canal (1/6)

Name of work	Unit	Quantity																					
		MC-DO	RMC (1st yr)	RMC (2nd yr)	RMC -DO	RMC (3rd yr)	RDY1	RDY1-1	RDY1-2	RDY1-3	RDY2	RDY3	RDY3 -M1	RDY3 -M2	RDY3 -M3	RDY4	RDY4-1	RDY5	RDY5 to B2	RDY6	RDY6-A	RDY7	RDY8
8. Preparatory Works																							
8 - 1. Survey and Profile Works	sect	251.00	1,167.00	1,333.00	591.00	1,000.00	686.00	333.00	141.00	180.00	426.00	1,040.00	160.00	340.00	206.00	1,075.00	204.00	200.00	530.00	612.00	396.00	164.00	984.00
8 - 2. Temporary Camps & Stores	unit	1.00	1.00	2.00	1.00	1.00	1.00				1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
8 - 3. Temporary Barracks (2 units, 4 units, etc.)	unit																						
8 - 4. Temporary Latrines	unit																						
8 - 5. Making Stock Pile Yards	unit																						
8 - 6. Labor Transporting Works	item																						
8 - 7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas																							
8 - 7 - 1. Clearing of the Working Areas along the DY Canal (by Manual)	%sq-ft	2,625.00	26,334.00	30,096.00	5,310.00	22,572.00	7,331.00	2,988.00	1,260.00	1,620.00	3,808.00	12,394.00	1,206.00	3,281.00	2,044.00	11,782.00	1,830.00	2,799.00	6,315.00	6,155.00	4,039.00	1,326.00	11,068.00
8 - 7 - 2. Clearing of the Working Areas along the DY Canal (by Department Machine)	acres																						
9. Earth Works																							
9 - 1. Canal Resectioning Work																							
9 - 1 - 1. Canal Resectioning Work (by Manual)	sud																						
9 - 1 - 2. Canal Resectioning Work (by Department Machine)	sud	1,875.00	45,500.00	52,000.00	2,655.00	39,000.00	30,355.00	1,490.00	630.00	800.00	7,367.00	17,162.00	2,403.00	5,095.00	3,089.00	17,744.00	910.00	309.00		11,024.00	6,534.00	2,455.00	16,233.00
9 - 2. Unsilting of Distributary Canals																							
9 - 2 - 1. Unsilting of Distributary Canals (by Manual)																							
9 - 2 - 1. Unsilting of Distributary Canals (by Manual)	sud																						
9 - 2 - 2. Unsilting of Distributary Canals (by Department Machine)	sud	825.00	17,500.00	20,000.00	1,062.00	15,000.00	4,047.00				553.00	5,851.00	96.00	611.00	278.00	1,936.00		1,129.00	2,385.00	1,378.00	713.00	295.00	2,656.00
9 - 3. Earth Work in Dressing (by Manual)	sud																						
9 - 4. Earth Work in Base Stripping (by Manual)	sud																						
10. Repairing of Linings Work																							
10 - 1. Repairing Works of Brick Lining																							
10 - 1 - 1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed	%sq-ft																						
10 - 1 - 2. 3"thick Sand Filling under Brick Lining	sud	413.00	3,063.00	3,500.00	487.00	2,625.00	1,055.00	324.00	137.00	175.00	495.00	1,638.00	144.00	433.00	243.00	1,774.00	199.00	429.00	1,133.00	804.00	386.00	153.00	1,808.00
10 - 1 - 3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)	%sq-ft	677.32	7,892.50	9,020.00	798.27	6,765.00																	
10 - 1 - 4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)	%sq-ft						824.00	200.00	84.00	108.00	383.00	2,340.00	96.00	408.00	185.00	129.00	123.00	451.00	1,193.00	719.00	35.00	147.00	1,771.00
10 - 1 - 5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick)	%sq-ft	0.00	0.00	0.00	0.00	0.00																	
10 - 1 - 6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)	%sq-ft						4,221.00	1,098.00	465.00	592.00	1,981.00	6,553.00	577.00	1,732.00	1,174.00	710.00	674.00	1,715.00	4,532.00	3,215.00	412.00	614.00	7,231.00
10 - 1 - 7. (1:3:6) C.C (Cement Concrete) work for Copping & Bed Kerb	%sq-ft	75.00	350.00	400.00	177.00	300.00	206.00	100.00	42.00	54.00	128.00	312.00	48.00	102.00	62.00	32.00	61.00	60.00	159.00	184.00	119.00	49.00	295.00
10 - 1 - 8. Pointing Work (with 1:3 cement mortar)	%sq-ft																						
10 - 1 - 9. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete	%sq-ft																						
10 - 2 G.C (Gravelly Clay) Filling Inner Slope	%cu-ft	676.00	6,125.00	7,000.00	797.00	5,250.00	2,111.00	549.00	232.00	296.00	990.00	3,276.00	288.00	866.00	587.00	355.00	337.00	858.00	2,266.00	1,608.00	713.00	307.00	3,616.00
10 - 3 Brick Work in (1:3) Cement Mortar																							
10 - 3 - 1. Brick Work in (1:3) Cement Mortar (With Clay Brick)	%cu-ft																						
10 - 3 - 2. Brick Work in (1:3) Cement Mortar (With Cement Brick)	%cu-ft	30.00	276.00	315.00	36.00	236.00	95.00	25.00	11.00	13.00	45.00	148.00	13.00	39.00	27.00	16.00	15.00	39.00	102.00	72.00	27.00	14.00	163.00
10 - 4. Timber Shuttering form Work	%sq-ft	75.00	350.00	400.00	177.00	300.00	206.00	100.00	42.00	54.00	128.00	312.00	48.00	102.00	62.00	32.00	61.00	60.00	159.00	184.00	119.00	49.00	295.00
11. Repairing & Reconstruction of Canal Structures																							
11 - 1. Re-Construction of Structures																							
11 - 1 - 1. Drop	unit		1.00													1.00		1.00		1.00			
11 - 1 - 2. Head Regulator	unit																						
11 - 1 - 3. Drain Box Culvert	unit		2.00																				
11 - 1 - 4. Road Crossing and Bridge	unit																						

2.3.2 Quantity for Distribution Canal (2/6)

Name of work	Unit	Quantity																					
		MC-DO	RMC (1st yr)	RMC (2nd yr)	RMC -DO	RMC (3rd yr)	RDY1	RDY1-1	RDY1-2	RDY1-3	RDY2	RDY3	RDY3 -M1	RDY3 -M2	RDY3 -M3	RDY4	RDY4-1	RDY5	RDY5 to B2	RDY6	RDY6-A	RDY7	RDY8
11 - 1 - 5. Syphon	unit		1.00																				
11 - 1 - 6. Turn Out	unit						3.00				3.00	3.00					3.00		3.00	1.00	3.00	3.00	3.00
11 - 2. Repairing of Structures																							
11 - 2 - 1. Drop	unit																						
11 - 2 - 2. Head Regulator	unit																						
11 - 2 - 3. Drain Box Culvert	unit																						
11 - 2 - 4. Road Crossing and Bridge	unit		3.00																				
11 - 2 - 5. Syphon	unit																						
11 - 2 - 6. Turn Out	unit																						
11 - 3. Repairing of Canal Gate Leaf, Frame & Gear Assembly	item																						
12 Road Work																							
12 - 1. G.C (Gravelly Clay) Laying Work																							
12 - 1 - 1. G.C Laying and Spreading Work for DY Canal Inspection Path	sud	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12 - 1 - 2. G.C Laying and Spreading Work for DY Canal Non Inspection Path	sud																						
12 - 2. Concrete Paving Work																							
12 - 2 - 1. Mixing only Cement Concrete (1:2:4) with (0.5"to 0.75") Gauge Stone Chippings on River Shingle	sud																						
12 - 2 - 2. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)	sud																						
12 - 2 - 3. Timber Shuttering Formworks	sud																						
12 - 2 - 4. Reinforcing Bar Preparation and Assembly	CWT																						
13 Repairing and Construction of Permanent Buildings																							
13 - 1. Repairing and Construction of Building (Bin Thar Quarter, Office, etc.)	item																						
14 Other Related Works																							
14 - 1. Repairing of Motor Vehicles , Water Pumps and Generators	item																						
14 - 2 Earth Work for Drainage Canal																							
14 - 2 - 1. Earth Work for Drainage Canal (by Manual)	sud																						
14 - 2 - 2. Earth Work for Drainage Canal (by Department Machine)	sud																						
14 - 3. Management of Construction Materials and Equipment																							
14 - 3 - 1. Shifting of Materials from Temporary Stock-pile to Work Site	item	1,630.00	1,800.00	2,057.00	1,800.00	1,543.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00
14 - 3 - 2. Transporting of Materials from Quarry to Stock-pile	item	1,620.00	234.00	268.00	180.00	201.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00
14 - 3 - 3. Transporting and Shifting of Heavy Machines	item																						
14 - 3 - 4. Loading and Unloading Charges of Materials	item	10.00	13.00	14.00	15.00	11.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
14 - 4 Dewatering Works																							
14 - 4 - 1. Water Pump for Dewatering Works	day	130.00	113.00	129.00	130.00	98.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00
14 - 5 Welfare Charges for Labor																							
14 - 5 - 1. Hnee Thatch	item																						
14 - 5 - 2. Bamboo	item																						
14 - 6. Labor Charges for Day & Night Watchman, Helper, Checker and General Works	M/D		160.00	183.00		137.00																	
14 - 7. Camps Facilities (Lighting, Water Supply, etc.)	gal	180.00	240.00	274.00	180.00	206.00	180.00			180.00	180.00				180.00		180.00	180.00	180.00	180.00	180.00	180.00	180.00
14 - 8. Making Data Boards and Sign Boards	item																						
14 - 9. Estimating, Copying, Photo Recording and Stationary Charges, etc;	item	20.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
14 - 10. Miscellaneous	item	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

2.3.2 Quantity for Distribution Canal (3/6)

Name of work	Unit	Quantity																					
		RDY9	RDY10	RDY11	RDY11-1	RDY11-2	RDY11-3	RDY11-A	RDY11-A-1	RDY12	RDY13	RDY14	RDY15	RDY16	RDY18	L.M.C (1st yr)	L.M.C (2nd yr)	L.M.C (3rd yr)	LDY1	LDY2	LDY2-1	LDY3	LDY3-1
8. Preparatory Works																							
8 - 1. Survey and Profile Works	sect	350.00	317.00	1,686.00	507.00	833.00	239.00	660.00	466.00	927.00	634.00	488.00	172.00	716.00	387.00	700.00	500.00	1,392.00	337.00	118.00	253.00	604.00	227.00
8 - 2. Temporary Camps & Stores	unit	1.00	1.00	1.00				1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.00	1.00	1.00	1.00	1.00	1.00	
8 - 3. Temporary Barracks (2 units, 4 units, etc.)	unit																						
8 - 4. Temporary Latrines	unit																						
8 - 5. Making Stock Pile Yards	unit																						
8 - 6. Labor Transporting Works	item																						
8 - 7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas																							
8 - 7 - 1. Clearing of the Working Areas along the DY Canal (by Manual)	%sft	3,520.00	2,874.00	22,762.00	5,094.00	1,800.00	2,160.00	7,425.00	4,687.00	10,435.00	6,368.00	4,900.00	1,299.00	7,199.00	2,916.00	13,986.00	9,990.00	27,806.00	3,010.00	889.00	1,892.00	6,063.00	2,043.00
8 - 7 - 2. Clearing of the Working Areas along the DY Canal (by Department Machine)	acres																						
9. Earth Works																							
9 - 1. Canal Resectioning Work																							
9 - 1 - 1. Canal Resectioning Work (by Manual)	sud																						
9 - 1 - 2. Canal Resectioning Work (by Department Machine)	sud	5,779.00	4,752.00	27,820.00	7,603.00	900.00	1,080.00	10,890.00	6,996.00	13,913.00	8,554.00	6,582.00	2,070.00	8,596.00	4,646.00	25,200.00	18,000.00	50,100.00	5,555.00	1,725.00	1,340.00	9,050.00	1,021.00
9 - 2. Unsilting of Distributary Canals																							
9 - 2 - 1. Unsilting of Distributary Canals (by Manual)	sud																						
9 - 2 - 2. Unsilting of Distributary Canals (by Department Machine)	sud	630.00	570.00	5,058.00	912.00			1,782.00	840.00	2,504.00	760.00	585.00	103.00	1,611.00	232.00	5,775.00	4,125.00	11,481.00	454.00	796.00		1,810.00	
9 - 3. Earth Work in Dressing (by Manual)	sud																						
9 - 4. Earth Work in Base Stripping (by Manual)	sud																						
10. Repairing of Linings Work																							
10 - 1. Repairing Works of Brick Lining																							
10 - 1 - 1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed	%sq-ft																						
10 - 1 - 2. 3"thick Sand Filling under Brick Lining	sud	486.00	356.00	3,035.00	760.00	196.00	233.00	891.00	560.00	1,426.00	950.00	548.00	207.00	886.00	407.00	2,100.00	1,500.00	4,175.00	530.00	155.00	247.00	1,154.00	221.00
10 - 1 - 3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)	%sq-ft										60.00				4,046.70	2,890.50	8,045.02						
10 - 1 - 4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)	%sq-ft	420.00	380.00	5,058.00	456.00	120.00	144.00	594.00	420.00	1,670.00	760.00	585.00	103.00	1,075.00	232.00	0.00			303.00	53.00	152.00	905.00	136.00
10 - 1 - 5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick)	%sq-ft															0.00	0.00						
10 - 1 - 6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)	%sq-ft	1,944.00	1,426.00	12,140.00	1,825.00	662.00	790.00	2,376.00	1,679.00	5,704.00	3,802.00	2,194.00	828.00	3,546.00	1,626.00	0.00			1,616.00	496.00	836.00	3,348.00	749.00
10 - 1 - 7. (1:3:6) C.C (Cement Concrete) work for Copping & Bed Kerb	%sq-ft	105.00	95.00	506.00	152.00	60.00	72.00	198.00	140.00	278.00	190.00	146.00	52.00	215.00	116.00	210.00	150.00	417.00	101.00	35.00		181.00	68.00
10 - 1 - 8. Pointing Work (with 1:3 cement mortar)	%sq-ft																						
10 - 1 - 9. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete	%sq-ft																				76.00		
10 - 2 G.C (Gravelly Clay) Filling Inner Slope	%cu-ft	972.00	713.00	6,070.00	912.00	331.00	395.00	1,188.00	840.00	2,852.00	1,901.00	1,097.00	414.00	1,773.00	813.00	3,780.00	2,700.00	7,515.00	808.00	248.00	418.00	1,674.00	375.00
10 - 3 Brick Work in (1:3) Cement Mortar																							
10 - 3 - 1. Brick Work in (1:3) Cement Mortar (With Clay Brick)	%cu-ft																						
10 - 3 - 2. Brick Work in (1:3) Cement Mortar (With Cement Brick)	%cu-ft	44.00	32.00	273.00	34.00	15.00	18.00	45.00	32.00	129.00	86.00	45.00	19.00	80.00	37.00	302.00	216.00	602.00	36.00	11.00	19.00	75.00	17.00
10 - 4. Timber Shuttering form Work	%sq-ft	105.00	95.00	506.00	152.00	60.00	72.00	198.00	140.00	278.00	190.00	146.00	52.00	215.00	116.00	210.00	150.00	417.00	101.00	35.00	76.00	181.00	68.00
11. Repairing & Reconstruction of Canal Structures																							
11 - 1. Re-Construction of Structures																							
11 - 1 - 1. Drop	unit			1.00											11.00							1.00	
11 - 1 - 2. Head Regulator	unit																						
11 - 1 - 3. Drain Box Culvert	unit														4.00								
11 - 1 - 4. Road Crossing and Bridge	unit	1.00																					

2.3.2 Quantity for Distribution Canal (4/6)

Name of work	Unit	Quantity																						
		RDY9	RDY10	RDY11	RDY11-1	RDY11-2	RDY11-3	RDY11-A	RDY11-A-1	RDY12	RDY13	RDY14	RDY15	RDY16	RDY18	L.M.C (1st yr)	L.M.C (2nd yr)	L.M.C (3rd yr)	LDY1	LDY2	LDY2-1	LDY3	LDY3-1	
11 - 1 - 5. Syphon	unit																							
11 - 1 - 6. Turn Out	unit	3.00	3.00					3.00		3.00	3.00	3.00	3.00	3.00						4.00	2.00	4.00		
11 - 2. Repairing of Structures																								
11 - 2 - 1. Drop	unit																							
11 - 2 - 2. Head Regulator	unit																							
11 - 2 - 3. Drain Box Culvert	unit																							
11 - 2 - 4. Road Crossing and Bridge	unit			1.00													4.00							
11 - 2 - 5. Syphon	unit																							
11 - 2 - 6. Turn Out	unit			7.00																4.00				
11 - 3. Repairing of Canal Gate Leaf, Frame & Gear Assembly	item															10.00								
12 Road Work																								
12 - 1. G.C (Gravelly Clay) Laying Work																								
12 - 1 - 1. G.C Laying and Spreading Work for DY Canal Inspection Path	sud	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
12 - 1 - 2. G.C Laying and Spreading Work for DY Canal Non Inspection Path	sud																							
12 - 2. Concrete Paving Work																								
12 - 2 - 1. Mixing only Cement Concrete (1:2:4) with (0.5"to 0.75") Gauge Stone Chippings on River Shingle	sud																							
12 - 2 - 2. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)	sud																							
12 - 2 - 3. Timber Shuttering Formworks	sud																							
12 - 2 - 4. Reinforcing Bar Preparation and Assembly	CWT																							
13 Repairing and Construction of Permanent Buildings																								
13 - 1. Repairing and Construction of Building (Bin Thar Quarter, Office, etc.)	item																							
14 Other Related Works																								
14 - 1. Repairing of Motor Vehicles , Water Pumps and Generators	item																							
14 - 2 Earth Work for Drainage Canal																								
14 - 2 - 1. Earth Work for Drainage Canal (by Manual)	sud															9,504.00								
14 - 2 - 2. Earth Work for Drainage Canal (by Department Machine)	sud																							
14 - 3. Management of Construction Materials and Equipment																								
14 - 3 - 1. Shifting of Materials from Temporary Stock-pile to Work Site	item	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,350.00	965.00	2,685.00	2,800.00	2,800.00	2,800.00	2,800.00	2,800.00	
14 - 3 - 2. Transporting of Materials from Quarry to Stock-pile	item	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	251.00	180.00	500.00	700.00	700.00	700.00	700.00	700.00	
14 - 3 - 3. Transporting and Shifting of Heavy Machines	item																							
14 - 3 - 4. Loading and Unloading Charges of Materials	item	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	6.00	17.00	12.00	12.00	12.00	12.00	12.00	
14 - 4 Dewatering Works																								
14 - 4 - 1. Water Pump for Dewatering Works	day	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	243.00	174.00	483.00	180.00	180.00	180.00	180.00	180.00	
14 - 5 Welfare Charges for Labor																								
14 - 5 - 1. Hnee Thatch	item																							
14 - 5 - 2. Bamboo	item																							
14 - 6. Labor Charges for Day & Night Watchman, Helper, Checker and General Works	M/D																							
14 - 7. Camps Facilities (Lighting, Water Supply, etc.)	gal	180.00	180.00	180.00				180.00		180.00		180.00	180.00	180.00	180.00	243.00	174.00	483.00	180.00	180.00	180.00	180.00	180.00	
14 - 8. Making Data Boards and Sign Boards	item																							
14 - 9. Estimating, Copying, Photo Recording and Stationary Charges, etc;	item	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
14 - 10. Miscellaneous	item	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

2.3.2 Quantity for Distribution Canal (5/6)

Name of work	Unit	Quantity															Total
		LDY3-2	LDY4	LDY4-1	LDY5	LDY6	LDY6-A	LDY7	LDY8	LDY9	LDY10	LDY10-1	LDY10-2	LDY10-3	LDY 11	LDY 12	
8. Preparatory Works																	
8 - 1. Survey and Profile Works	sect	333.00	467.00	170.00	357.00	676.00	1,393.00	458.00	507.00	463.00	557.00	90.00	32.00	63.00	583.00	170.00	30,851.00
8 - 2. Temporary Camps & Stores	unit	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	51.00
8 - 3. Temporary Barracks (2 units, 4 units, etc.)	unit																0.00
8 - 4. Temporary Latrines	unit																0.00
8 - 5. Making Stock Pile Yards	unit																0.00
8 - 6. Labor Transporting Works	item																0.00
8 - 7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas																	
8 - 7 - 1. Clearing of the Working Areas along the DY Canal (by Manual)	%sft	2,500.00	4,690.00	1,537.00	3,584.00	6,794.00	14,003.00	4,549.00	5,092.00	4,142.00	5,594.00	810.00	285.00	570.00	5,862.00	1,377.00	378,690.00
8 - 7 - 2. Clearing of the Working Areas along the DY Canal (by Department Machine)	acres																0.00
9. Earth Works																	
9 - 1. Canal Resectioning Work																	
9 - 1 - 1. Canal Resectioning Work (by Manual)	sud																0.00
9 - 1 - 2. Canal Resectioning Work (by Department Machine)	sud	1,500.00	7,700.00	770.00	5,350.00	11,440.00	20,900.00	6,875.00	7,600.00	6,950.00	8,350.00	680.00	250.00	500.00	7,875.00	2,030.00	575,572.00
9 - 2. Unsilting of Distributary Canals																	
9 - 2 - 1. Unsilting of Distributary Canals (by Manual)	sud																0.00
9 - 2 - 2. Unsilting of Distributary Canals (by Department Machine)	sud		1,120.00		963.00	1,664.00	4,180.00	619.00	1,026.00	625.00	876.00				919.00	158.00	128,493.00
9 - 3. Earth Work in Dressing (by Manual)	sud																0.00
9 - 4. Earth Work in Base Stripping (by Manual)	sud																0.00
10. Repairing of Linings Work																	
10 - 1. Repairing Works of Brick Lining																	
10 - 1 - 1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed	%sq-ft																0.00
10 - 1 - 2. 3"thick Sand Filling under Brick Lining	sud	324.00	805.00	166.00	655.00	1,369.00	2,717.00	722.00	950.00	730.00	918.00	875.00	309.00	618.00	941.00	236.00	54,776.00
10 - 1 - 3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)	%sq-ft																40,195.31
10 - 1 - 4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)	%sq-ft	200.00	560.00	102.00	481.00	811.00	2,090.00	412.00	684.00	417.00	584.00	54.00	19.00	38.00	612.00	127.00	29,953.00
10 - 1 - 5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick)	%sq-ft																0.00
10 - 1 - 6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)	%sq-ft	1,098.00	2,380.00	563.00	1,926.00	4,259.00	7,942.00	2,200.00	2,812.00	2,224.00	2,755.00	296.00	105.00	209.00	2,800.00	714.00	117,366.00
10 - 1 - 7. (1:3:6) C.C (Cement Concrete) work for Copping & Bed Kerb	%sq-ft	100.00	140.00	51.00	107.00	203.00	418.00	137.00	152.00	139.00	167.00	27.00	10.00	19.00	175.00	51.00	8,698.00
10 - 1 - 8. Pointing Work (with 1:3 cement mortar)	%sq-ft																0.00
10 - 1 - 9. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete	%sq-ft																76.00
10 - 2 G.C (Gravelly Clay) Filling Inner Slope	%cu-ft	549.00	1,190.00	282.00	963.00	2,129.00	3,971.00	1,100.00	1,406.00	1,112.00	1,378.00	148.00	52.00	105.00	1,400.00	357.00	93,034.00
10 - 3 Brick Work in (1:3) Cement Mortar																	0.00
10 - 3 - 1. Brick Work in (1:3) Cement Mortar (With Clay Brick)	%cu-ft				43.00												43.00
10 - 3 - 2. Brick Work in (1:3) Cement Mortar (With Cement Brick)	%cu-ft	25.00	54.00	13.00	43.00	96.00	179.00	50.00	63.00	50.00	62.00	7.00	2.00	5.00	63.00	16.00	4,652.00
10 - 4. Timber Shuttering form Work	%sq-ft	100.00	140.00	51.00	107.00	203.00	418.00	137.00	152.00	139.00	167.00	27.00	10.00	19.00	175.00	51.00	8,774.00
11. Repairing & Reconstruction of Canal Structures																	
11 - 1. Re-Construction of Structures																	
11 - 1 - 1. Drop	unit					2.00		1.00									20.00
11 - 1 - 2. Head Regulator	unit																0.00
11 - 1 - 3. Drain Box Culvert	unit																6.00
11 - 1 - 4. Road Crossing and Bridge	unit																1.00

2.3.2 Quantity for Distribution Canal (6/6)

Name of work	Unit	Quantity															Total
		LDY3-2	LDY4	LDY4-1	LDY5	LDY6	LDY6-A	LDY7	LDY8	LDY9	LDY10	LDY10-1	LDY10-2	LDY10-3	LDY 11	LDY 12	
11 - 1 - 5. Syphon	unit														1.00		2.00
11 - 1 - 6. Turn Out	unit		4.00		4.00		4.00	4.00		4.00	4.00				4.00	4.00	97.00
11 - 2. Repairing of Structures																	
11 - 2 - 1. Drop	unit																0.00
11 - 2 - 2. Head Regulator	unit																0.00
11 - 2 - 3. Drain Box Culvert	unit																0.00
11 - 2 - 4. Road Crossing and Bridge	unit					1.00			1.00								10.00
11 - 2 - 5. Syphon	unit						1.00										1.00
11 - 2 - 6. Turn Out	unit					4.00			4.00								29.00
11 - 3. Repairing of Canal Gate Leaf, Frame & Gear Assembly	item																0.00
12 Road Work																	
12 - 1. G.C (Gravelly Clay) Laying Work								0.00	0.00								
12 - 1 - 1. G.C Laying and Spreading Work for DY Canal Inspection Path	sud		0.00		0.00	0.00	0.00			0.00	0.00				0.00	0.00	4,910.70
12 - 1 - 2. G.C Laying and Spreading Work for DY Canal Non Inspection Path	sud																0.00
12 - 2. Concrete Paving Work																	
12 - 2 - 1. Mixing only Cement Concrete (1:2:4) with (0.5"to 0.75") Gauge Stone Chippings on River Shingle	sud																0.00
12 - 2 - 2. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)	sud																0.00
12 - 2 - 3. Timber Shuttering Formworks	sud																0.00
12 - 2 - 4. Reinforcing Bar Preparation and Assembly	CWT																0.00
13 Repairing and Construction of Permanent Buildings																	
13 - 1. Repairing and Construction of Building (Bin Thar Quarter, Office, etc.)	item																0.00
14 Other Related Works																	
14 - 1. Repairing of Motor Vehicles , Water Pumps and Generators	item																0.00
14 - 2 Earth Work for Drainage Canal																	
14 - 2 - 1. Earth Work for Drainage Canal (by Manual)	sud																9,504.00
14 - 2 - 2. Earth Work for Drainage Canal (by Department Machine)	sud																0.00
14 - 3. Management of Construction Materials and Equipment																	
14 - 3 - 1. Shifting of Materials from Temporary Stock-pile to Work Site	item	2,800.00	2,800.00	2,800.00	2,800.00	2,800.00	2,800.00	2,800.00	2,800.00	2,800.00	2,800.00	2,800.00	2,800.00	2,800.00	2,800.00	2,800.00	125,630.00
14 - 3 - 2. Transporting of Materials from Quarry to Stock-pile	item	700.00	700.00	700.00	700.00	700.00	700.00	700.00	700.00	700.00	700.00	700.00	700.00	700.00	700.00	700.00	23,634.00
14 - 3 - 3. Transporting and Shifting of Heavy Machines	item																0.00
14 - 3 - 4. Loading and Unloading Charges of Materials	item	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	582.00
14 - 4 Dewatering Works																	
14 - 4 - 1. Water Pump for Dewatering Works	day	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	9,130.00
14 - 5 Welfare Charges for Labor																	
14 - 5 - 1. Hnee Thatch	item																0.00
14 - 5 - 2. Bamboo	item																0.00
14 - 6. Labor Charges for Day & Night Watchman, Helper, Checker and General Works	M/D																480.00
14 - 7. Camps Facilities (Lighting, Water Supply, etc.)	gal	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	9,000.00
14 - 8. Making Data Boards and Sign Boards	item																0.00
14 - 9. Estimating, Copying, Photo Recording and Stationary Charges, etc;	item	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	78.00
14 - 10. Miscellaneous	item	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	59.00

2.4 Quantity for Taung Nyo Irrigation System

2.4.1 Quantity for Main Canal (1/2)

Name of work	Unit	Quantity			
		Main Canal (1st yr)	Main Canal (2nd yr)	Main Canal (3rd yr)	Total
1. Preparatory Works					
1 - 1. Survey and Profile Works	sect	901.000		1,466.000	2,367.000
1 - 2. Temporary Camps & Stores	unit	3.000		2.000	5.000
1 - 3. Temporary Barracks (2 units, 4 units, etc.)	unit	1.000		0.000	1.000
1 - 4. Temporary Latrines	unit	2.000		2.000	4.000
1 - 5. Making Stock Pile Yards	unit	2.000		2.000	4.000
1 - 6. Labor Transporting Works	item				0.000
1 - 7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas					
1 - 7 - 1. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas (by Manual)	%sq-ft	5,940.000		8,359.220	14,299.220
1 - 7 - 2. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas (by Department Machine)	acres				0.000
2. Earth Works					
2 - 1. Canal Bank Raising and Canal Resectioning Works					
2 - 1 - 1. Canal Bank Raising Work (by Department Machine)	sud				0.000
2 - 1 - 2. Canal Resectioning Work (by Department Machine)	sud	18,360.000		27,277.600	45,637.600
2 - 1 - 3. Canal Resectioning Work (by Blasting (at Rock Portion))	sud				0.000
2 - 1 - 4. Canal Resectioning Work (by Manual)	sud				0.000
2 - 2. Earth Work Filling into Canal Section and Inner Side Slop					
2 - 2 - 1. Earth Work Filling into Canal Section and Inner Side Slop (by Manual)	sud				0.000
2 - 2 - 2. Earth Work Filling into Canal Section and Inner Side Slop (by Department Machine)	sud				0.000
2 - 3. G.C (Gravelly Clay) Filling and Compacting Works in Canal Section and Inner Slope					0.000
2 - 3 - 1. G.C Filling and Compacting Works in Canal Section and Inner Slope (by Manual)	sud	3,775.330		4,548.310	8,323.640
2 - 3 - 2. G.C Filling and Compacting Works in Canal Section and Inner Slope (by Department Machine)	sud				0.000
2 - 4. Making of Temporary Coffler Dam for Necessary of Work					
2 - 4 - 1. Making of Temporary Coffler Dam for Necessary of Work (by Manual)	sud				0.000
2 - 4 - 2. Making of Temporary Coffler Dam for Necessary of Work (by Department Machine)	sud				0.000
2 - 5. Earth Work Excavation for Bed Kerb & Compartment and Copping (by Manual)	sud				0.000
2 - 6. Earth Work in Dressing (by Manual)	sud				0.000
2 - 7. Earth Work in Base Stripping 3"thick (by Manual)	sud				0.000
2 - 8. Unsilting of Main Canal					
2 - 8 - 1. Unsilting of Main Canal (by Manual)	sud				0.000
2 - 8 - 2. Unsilting of Main Canal (by Department Machine)	sud	6,185.600		5,950.090	12,135.690
3. Repairing and Construction of Linings Works					
3 - 1. Brick Lining Work					
3 - 1 - 1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed	%sq-ft	210.000		200.000	410.000
3 - 1 - 2. Making of Ring Bund with Sand Bags	%sq-ft	110.000		110.000	220.000
3 - 1 - 3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)	%sq-ft	0.000		0.000	0.000
3 - 1 - 4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)	%sq-ft				0.000
3 - 1 - 5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick)	%sq-ft	0.000		0.000	0.000
3 - 1 - 6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)	%sq-ft				0.000
3 - 1 - 7. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete	sud				0.000
3 - 1 - 8. 3"thick Sand Filling under Brick Lining	sud	3,380.470		3,653.480	7,033.950
3 - 1 - 9. Pointing Work (with 1:3 Cement Mortar)	%sq-ft				0.000
3 - 2. Concreting Works					
3 - 2 - 1. 1:3:6 Cement Concrete Work for Canal Bed Kerb	sud	270.000		439.960	709.960
3 - 2 - 2. 1:3:6 Cement Concrete Work for Canal Copping	sud	270.000		439.960	709.960
3 - 2 - 3. Timber Shuttering Formworks	sud	0.000		0.000	0.000
3 - 3. Concrete Lining Work					
3 - 3 - 1. Concrete Lining Work (with 1:3:6 Cement Concrete)	sud	5,465.817		5,898.580	11,364.396
3 - 4. Related Works for Concreting such as Earth Work Excavation , Timber Shuttering for Forn Work etc;					
3 - 4 - 1. Timber Shuttering Formwork for Concreting	%sq-ft	540.000		879.920	1,419.920
3 - 4 - 2. Brick Work with 1:3 Cement Mortar for Compartment (with Clay Brick)	sud				0.000

2.4.1 Quantity for Main Canal (2/2)

Name of work	Unit	Quantity			
		Main Canal (1st yr)	Main Canal (2nd yr)	Main Canal (3rd yr)	Total
3 - 4 - 3. Brick Work with 1:3 Cement Mortar for Compartment (with Cement Brick)	sud				0.000
3 - 4 - 4. Brick Work (1:3) Cement Mortar (with Clay Brick)	sud				0.000
3 - 4 - 5. Brick Work (1:3) Cement Mortar (with Cement Brick)	sud	145.210		174.930	320.140
4. Repairing & Reconstruction of Canal Structures					
4 - 1. Re-Construction of Structures					
4 - 1 - 1. Construction of Drop	unit				0.000
4 - 1 - 2. Construction of Head Regulator	unit				0.000
4 - 1 - 3. Construction of Drain Box Culvert	unit				0.000
4 - 1 - 4. Construction of Road Crossing and Bridge	unit				0.000
4 - 1 - 5. Construction of Syphon Protection	unit				0.000
4 - 1 - 6. Construction of Course-Way	unit				0.000
4 - 1 - 7. Construction of Box Culverts (Cross Drain Culverts)	unit				0.000
4 - 2. Repairing of structures					
4 - 2 - 1. Drop	unit	5.000		5.000	10.000
4 - 2 - 2. Head Regulator	unit	6.000		5.000	11.000
4 - 2 - 3. Drain Box Culvert	unit	4.000		3.000	7.000
4 - 2 - 4. Road Crossing and Bridge	unit	2.000			2.000
4 - 2 - 5. Syphon	unit				0.000
4 - 2 - 6. Repairing of Course-Way	unit				0.000
4 - 2 - 7. Repairing of Box Culverts (Cross Drain Culverts)	unit				0.000
4 - 2 - 8. Repairing of Conduit Gate and Assembly	item	1.000			1.000
4 - 2 - 9. Repairing of Canal Gate Leaf, Frame & Gear Assembly	item				0.000
4 - 2 - 10. Repairing of Canal Structures	item				0.000
5. Road Works					
5 - 1. G.C (Gravelly Clay) Laying Work					
5 - 1 - 1. G.C Laying and Spreading Works of Canal Inspection Path	sud	0.000		0.000	0.000
5 - 1 - 2. G.C Laying and Spreading works of Canal Non Inspection Path	sud				0.000
5 - 2. Concrete Paving Work					0.000
5 - 2 - 1. Mixing only Cement Concrete (1:2:4) with (0.5"to 0.75") Gauge Stone Chippings on River Shingle	sud				2,367.860
5 - 2 - 2. Mixing only Cement Concrete (1:3:6) with (0.5"to 0.75") Gauge Stone Chippings on River Shingle	sud				1,578.580
5 - 2 - 3. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)	sud				3,946.440
5 - 2 - 4. Timber Shuttering Formworks	%sq-ft				1,283.210
5 - 2 - 5. Reinforcing Bar Preparation and Assembly	CWT				1,898.390
5 - 2 - 6. Sodding	%sq-ft				6,178.500
6. Repairing and Construction of Permanent Buildings					
6 - 1. Repairing and Construction of Building (Gust House, Meeting Hall, Office,etc.)	item				0.000
7. Other Related Works					
7 - 1. Repairing of Heavy Machines	job				0.000
7 - 2. Repairing of Motor Vehicles , Water Pumps and Generators	item				0.000
7 - 3. Repairing Charges for Equipments	item				0.000
7 - 4. Earth Works for Drainage Canal (by Department Machine)	sud				0.000
7 - 5. Management of Construction Materials and Equipment					
7 - 5 - 1. Shifting of Materials from Temporary Stock-pile to Work Site	item				0.000
7 - 5 - 2. Transporting of Materials from Quarry to Stock-pile	item				0.000
7 - 5 - 3. Transporting and Shifting of Heavy Machines	item				0.000
7 - 5 - 4. Loading and Unloading Charges of Materials	item				0.000
7 - 6. Water Pump for Dewatering Works	day	275.000		274.000	549.000
7 - 7. Welfare Charges for Labor					
7 - 7 - 1. Temporary Hut Material	item				0.000
7 - 7 - 2. Hnee Thatch	item				0.000
7 - 7 - 3. Bamboo	item				0.000
7 - 7 - 4. Transporting for Labor Necessary of Works	mile	28,350.000		28,350.000	56,700.000
7 - 8. Labor Charges for Day & Night Watchman, Helper, Checker and General Works	M/D	5,020.000		5,000.000	10,020.000
7 - 9. Camps Facilities (Lighting, Water Supply,etc.)	gal	450.000		425.000	875.000
7 - 10. Making Data Boards and Sign Boards	item	100.000		100.000	200.000
7 - 11. Estimating, Copying, Photo Recording and stationary Charges, etc.	item	1,000.000		500.000	1,500.000
7 - 12. Miscellaneous	item				0.000

2.4.2 Quantity for Distribution Canal (1/2)

Name of work	Unit	Quantity																	
		Branch A	Branch B (1st yr)	Branch B (2nd yr)	MDY 1	MDY 2	MDY 3	MDY 4	MDY 5	MDY 6	MDY 7	MDY 8	MDY 9	ADY 1	ADY 2	BDY 1	BDY 2	BDY 3	Total
8. Preparatory Works																			
8 - 1. Survey and Profile Works	sect	1,222.00	908.00	418.00	1,266.00	1,500.00	213.00	485.00	150.00	227.00	613.00	722.00	327.00	2,000.00	717.00	1,521.00	489.00	1,134.00	13,912.00
8 - 2. Temporary Camps & Stores	unit	4.00	2.00	1.00															7.00
8 - 3. Temporary Barracks (2 units, 4 units, etc.)	unit	1.00																	1.00
8 - 4. Temporary Latrines	unit	2.00	1.00																3.00
8 - 5. Making Stock Pile Yards	unit	2.00	1.00																3.00
8 - 6. Labor Transporting Works	item																		0.00
8 - 7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas																			
8 - 7 - 1. Clearing of the Working Areas along the DY Canal (by Manual)	%sq-ft	6,762.42	4,901.58	2,255.04	5,320.00	6,300.00	895.58	2,038.40	540.00	816.00	2,208.00	1,931.52	946.00	8,400.00	3,010.00	2,310.00	2,052.40	4,760.00	55,446.94
8 - 7 - 2. Clearing of the Working Areas along the DY Canal (by Department Machine)	acres																		0.00
9. Earth Works																			
9 - 1. Canal Resectioning Work																			
9 - 1 - 1. Canal Resectioning Work (by Manual)	sud																		0.00
9 - 1 - 2. Canal Resectioning Work (by Department Machine)	sud	9,897.93	16,338.60	7,516.80	7,220.00	19,800.00	1,215.43	2,766.40	1,620.00	2,448.00	6,624.00	1,915.08	1,007.75	11,400.00	4,085.00	8,555.06	2,748.75	6,375.00	111,533.80
9 - 2. Unsilting of Distributary Canals																			
9 - 2 - 1. Unsilting of Distributary Canals (by Manual)	sud																		0.00
9 - 2 - 2. Unsilting of Distributary Canals (by Department Machine)	sud	3,992.57	3,403.88	1,190.16	1,885.63	3,057.00	207.90	579.60	112.50	170.00	644.00	711.82	349.31	3,900.00	1,397.50	3,690.76	623.30	2,090.00	28,005.93
9 - 3. Earth Work in Dressing (by Manual)	sud																		0.00
9 - 4. Earth Work in Base Stripping (by Manual)	sud																		0.00
10. Repairing of Linings Work																			
10 - 1. Repairing Works of Brick Lining																			
10 - 1 - 1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed	%sq-ft																		0.00
10 - 1 - 2. 3"thick Sand Filling under Brick Lining	sud	2,656.24	2,620.98	876.02	1,441.75	2,366.78	175.92	467.85	112.61	170.17	672.52	384.61	306.15	3,420.00	1,225.50	3,010.01	420.28	1,652.25	21,979.64
10 - 1 - 3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)	%sq-ft	4,794.68	4,224.82	1,411.49															10,430.98
10 - 1 - 4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)	%sq-ft				1,315.63	2,382.00	111.95	361.20	45.00	68.00	368.00	387.16	201.94	3,000.00	1,075.00	3,006.35	403.40	1,580.00	14,305.63
10 - 1 - 5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick)	%sq-ft	0.00	0.00	0.00															0.00
10 - 1 - 6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)	%sq-ft				4,269.56	5,931.14	580.66	1,458.40	394.88	597.58	1,613.72	1,499.48	1,032.99	10,413.00	3,733.06	8,804.88	1,203.26	4,907.44	46,440.05
10 - 1 - 7. (1:3:6) C.C (Cement Concrete) work for Copping & Bed Kerb	%sq-ft	733.18	544.62	250.56	760.00	900.00	127.94	291.20	90.00	136.00	368.00	432.88	196.50	1,200.00	430.00	912.54	293.20	680.00	8,346.62
10 - 1 - 8. Pointing Work (with 1:3 cement mortar)	%sq-ft																		0.00
10 - 1 - 9. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete	%sq-ft																		0.00
10 - 2 G.C (Gravelly Clay) Filling Inner Slope	%cu-ft	4,125.82	3,654.52	1,220.20	2,134.78	2,965.57	290.33	729.20	197.44	298.79	806.86	749.74	516.50	5,206.50	1,866.53	4,403.70	601.63	2,453.72	32,221.83
10 - 3 Brick Work in (1:3) Cement Mortar																			0.00
10 - 3 - 1. Brick Work in (1:3) Cement Mortar (With Clay Brick)	%cu-ft																		0.00
10 - 3 - 2. Brick Work in (1:3) Cement Mortar (With Cement Brick)	%cu-ft	158.69	140.56	46.93	82.11	114.06	11.17	28.05	7.59	11.49	31.03	28.84	19.87	200.25	71.79	169.37	23.14	94.37	1,239.31
10 - 4. Timber Shuttering form Work	%sq-ft	733.18	544.62	250.56	760.00	900.00	127.94	291.20	90.00	136.00	368.00	432.88	196.50	1,200.00	430.00	912.54	293.20	680.00	8,346.62
11. Repairing & Reconstruction of Canal Structures																			
11 - 1. Re-Construction of Structures																			
11 - 1 - 1. Drop	unit																		0.00
11 - 1 - 2. Head Regulator	unit																		0.00
11 - 1 - 3. Drain Box Culvert	unit																		0.00
11 - 1 - 4. Road Crossing and Bridge	unit																		0.00

2.4.2 Quantity for Distribution Canal (2/2)

Name of work	Unit	Quantity																	
		Branch A	Branch B (1st yr)	Branch B (2nd yr)	MDY 1	MDY 2	MDY 3	MDY 4	MDY 5	MDY 6	MDY 7	MDY 8	MDY 9	ADY 1	ADY 2	BDY 1	BDY 2	BDY 3	Total
11 - 1 - 5. Syphon	unit																		0.00
11 - 1 - 6. Turn Out	unit																		0.00
11 - 2. Repairing of Structures																			
11 - 2 - 1. Drop	unit	20.00	10.00	10.00										17.00	10.00	10.00	5.00	5.00	87.00
11 - 2 - 2. Head Regulator	unit	6.00	4.00	3.00															13.00
11 - 2 - 3. Drain Box Culvert	unit	6.00	3.00	3.00															24.00
11 - 2 - 4. Road Crossing and Bridge	unit																		0.00
11 - 2 - 5. Syphon	unit																		0.00
11 - 2 - 6. Turn Out	unit																		0.00
11 - 3. Repairing of Canal Gate Leaf, Frame & Gear Assembly	item																		0.00
12 Road Work																			
12 - 1. G.C (Gravelly Clay) Laying Work																			
12 - 1 - 1. G.C Laying and Spreading Work for DY Canal Inspection Path	sud	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,910.70
12 - 1 - 2. G.C Laying and Spreading Work for DY Canal Non Inspection Path	sud																		0.00
12 - 2. Concrete Paving Work																			
12 - 2 - 1. Mixing only Cement Concrete (1:2:4) with (0.5"to 0.75") Gauge Stone Chippings on River Shingle	sud																		0.00
12 - 2 - 2. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)	sud																		0.00
12 - 2 - 3. Timber Shuttering Formworks	sud																		0.00
12 - 2 - 4. Reinforcing Bar Preparation and Assembly	CWT																		0.00
13 Repairing and Construction of Permanent Buildings																			
13 - 1. Repairing and Construction of Building (Bin Thar Quarter, Office, etc.)	item																		0.00
14 Other Related Works																			
14 - 1. Repairing of Motor Vehicles , Water Pumps and Generators	item																		0.00
14 - 2. Earth Work for Drainage Canal																			0.00
14 - 2 - 1. Earth Work for Drainage Canal (by Manual)	sud																		0.00
14 - 2 - 2. Earth Work for Drainage Canal (by Department Machine)	sud																		0.00
14 - 3. Management of Construction Materials and Equipment																			
14 - 3 - 1. Shifting of Materials from Temporary Stock-pile to Work Site	item	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	45,900.00
14 - 3 - 2. Transporting of Materials from Quarry to Stock-pile	item	1,884.00	1,600.00	1,600.00	1,600.00	1,600.00	1,600.00	1,600.00	1,600.00	1,600.00	1,600.00	1,600.00	1,600.00	1,600.00	1,600.00	1,600.00	1,600.00	1,600.00	27,484.00
14 - 3 - 3. Transporting and Shifting of Heavy Machines	item																		0.00
14 - 3 - 4. Loading and Unloading Charges of Materials	item																		0.00
14 - 4. Dewatering Works																			
14 - 4 - 1. Water Pump for Dewatering Works	day																		0.00
14 - 5. Welfare Charges for Labor																			
14 - 5 - 1. Hnee Thatch	item																		0.00
14 - 5 - 2. Bamboo	item																		0.00
14 - 6. Labor Charges for Day & Night Watchman, Helper, Checker and General Works	M/D																		0.00
14 - 7. Camps Facilities (Lighting, Water Supply, etc.)	gal																		0.00
14 - 8. Making Data Boards and Sign Boards	item																		0.00
14 - 9. Estimating, Copying, Photo Recording and Stationary Charges, etc;	item																		0.00
14 - 10. Miscellaneous	item																		0.00

CHAPTER 3 ANALYSYS RATE (PRODUCTIVITY)

CHAPTER 3 Analysis Rate (Productivity)

3.1 Analysis Rate (Productivity) for North Nawin Irrigation System

3.1.1 Analysis Rate for Main Canal

1. Preparatory Works

1-1. Survey and Profile Works (Canal length : 30 feet / sect)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Lime (Strained Lime)	cu-ft	0.20	350.0	3,150.0	70.00	630.00	700.00	
Plastic ream	No.	0.67	90.0	810.0	60.00	540.00	600.00	for finishing stake
Labor	day	0.10	350.0	3,150.0	35.00	315.00	350.00	
Total	-	-	-	-	315.00	2,835.00	3,150	(Kyat / per sect)

1-2. Temporary Camp & Stores

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) 4"~6"φMyaw Post Work								
4"~6"φMyaw (J/Wood)	No.	12.00	1,200.0	4,800.0	14,400.00	57,600.00	72,000.00	
Carpenter	day	0.50	500.0	4,500.0	250.00	2,250.00	2,500.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) 2"~4"φMyaw Post Work								
2"~4"φMyaw (J/Wood)	No.	40.00	400.0	1,600.0	16,000.00	64,000.00	80,000.00	
Wire Nail	viss	2.00	2,450.0	1,050.0	4,900.00	2,100.00	7,000.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
(3) Hnee Thatch Roofing Work								
Hnee Thatch	No.	500.00	50.0	450.0	25,000.00	225,000.00	250,000.00	
Bamboo	No.	70.00	50.0	450.0	3,500.00	31,500.00	35,000.00	
Wire Nail	viss	2.50	2,450.0	1,050.0	6,125.00	2,625.00	8,750.00	
Carpenter	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
(4) Roll Mat Ridging Work								
Roll Mat (12'×3')	No.	6.00	180.0	1,620.0	1,080.00	9,720.00	10,800.00	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.25	500.0	4,500.0	125.00	1,125.00	1,250.00	
(5) Bamboo Flooring Work								
Bamboo	No.	150.00	50.0	450.0	7,500.00	67,500.00	75,000.00	
Wire Nail	viss	1.50	2,450.0	1,050.0	3,675.00	1,575.00	5,250.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(6) Bamboo Mat Walling (Single)								
Bamboo Mat	sq-ft	1,065.00	20.0	180.0	21,300.00	191,700.00	213,000.00	
Bamboo	No.	15.00	50.0	450.0	750.00	6,750.00	7,500.00	
Wire Nail	viss	1.00	2,450.0	1,050.0	2,450.00	1,050.00	3,500.00	
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
(7) Bamboo Hand Rail work								
Bamboo	No.	15.00	50.0	450.0	750.00	6,750.00	7,500.00	
Wire Nail	viss	0.24	2,450.0	1,050.0	588.00	252.00	840.00	
Carpenter	day	0.28	500.0	4,500.0	140.00	1,260.00	1,400.00	
Total	-	-	-	-	117,378.00	750,262.00	867,640	(Kyat / per unit)

1-3. Temporary Barracks for Repair (4 units)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Hnee Thatch Roofing Work								
Hnee Thatch	No.	150.00	50.0	450.0	7,500.00	67,500.00	75,000.00	
Bamboo	No.	26.00	50.0	450.0	1,300.00	11,700.00	13,000.00	
Wire Nail	viss	0.20	2,450.0	1,050.0	490.00	210.00	700.00	
Binding Wire	lb	0.25	1,050.0	450.0	262.50	112.50	375.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(2) Double Bamboo Rollmat Ridging work								
Roll Mat (12'×3')	No.	5.00	180.0	1,620.0	900.00	8,100.00	9,000.00	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Labor	day	0.30	350.0	3,150.0	105.00	945.00	1,050.00	
(3) Spitted Bamboo flooring work								
Bamboo	No.	55.00	50.0	450.0	2,750.00	24,750.00	27,500.00	
Wire Nail	viss	0.30	2,450.0	1,050.0	735.00	315.00	1,050.00	
Binding Wire	lb	2.00	1,050.0	450.0	2,100.00	900.00	3,000.00	
Carpenter	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(4) Bamboo Mat Walling Work								
Bamboo Mat	sq-ft	140.00	20.0	180.0	2,800.00	25,200.00	28,000.00	
Jungle Wood (Plank)	cu-ft	0.32	2,083.0	8,331.8	666.56	2,666.18	3,332.74	
Wire Nail	viss	0.50	2,450.0	1,050.0	1,225.00	525.00	1,750.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(5) Bamboo Mat Door Work								
Bamboo Mat	sq-ft	30.00	20.0	180.0	600.00	5,400.00	6,000.00	
Jungle Wood (Plank)	cu-ft	2.20	2,083.0	8,331.8	4,582.60	18,329.96	22,912.56	
Wire Nail	viss	0.20	2,450.0	1,050.0	490.00	210.00	700.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(6) Bamboo Mat Window Work								
Bamboo	No.	6.00	50.0	450.0	300.00	2,700.00	3,000.00	
Jungle Wood (Plank)	cu-ft	0.60	2,083.0	8,331.8	1,249.80	4,999.08	6,248.88	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.63	500.0	4,500.0	315.00	2,835.00	3,150.00	
(7) Splitted Bamboo Triellis Work								
Bamboo	No.	21.00	50.0	450.0	1,050.00	9,450.00	10,500.00	
Wire Nail	viss	0.60	2,450.0	1,050.0	1,470.00	630.00	2,100.00	
Carpenter	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
(8) Iron fitting Work								
Butt Hinge	No.	40.00	700.0	300.0	28,000.00	12,000.00	40,000.00	
Hasp & Staple	No.	6.00	350.0	150.0	2,100.00	900.00	3,000.00	
Handle	No.	10.00	700.0	300.0	7,000.00	3,000.00	10,000.00	
Tower Bolt	No.	20.00	840.0	360.0	16,800.00	7,200.00	24,000.00	
Screw	gross	1.00	1,400.0	600.0	1,400.00	600.00	2,000.00	
Total	-	-	-	-	91,381.46	253,687.72	345,069	(Kyat / per unit)

1-4. Temporary Latrines

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Site Cleaning & Earth Work								
Site Cleaning Work for Latrines	set	1.00	600.0	5,400.0	600.00	5,400.00	6,000.00	
Digging for Post Hole (Barrack etc.)	No.	4.00	30.0	270.0	120.00	1,080.00	1,200.00	
Digging for Pit Hole (Latrines)	No.	1.00	1,200.0	10,800.0	1,200.00	10,800.00	12,000.00	
(2) 4"~6"φMyaw Post Work								
4"~6"φMyaw (J/Wood)	No.	7.00	1,200.0	8,400.0	8,400.00	33,600.00	42,000.00	
Wire Nail	viss	0.30	2,450.0	1,050.0	735.00	315.00	1,050.00	
Carpenter	day	1.40	500.0	4,500.0	700.00	6,300.00	7,000.00	
Labor	day	0.90	350.0	3,150.0	315.00	2,835.00	3,150.00	
(3) 2"~4"φMyaw Post Work								
2"~4"φMyaw (J/Wood)	No.	5.00	400.0	1,600.0	2,000.00	8,000.00	10,000.00	
Wire Nail	viss	0.20	2,450.0	1,050.0	490.00	210.00	700.00	
Carpenter	day	0.60	500.0	4,500.0	300.00	2,700.00	3,000.00	
Labor	day	0.60	350.0	3,150.0	210.00	1,890.00	2,100.00	
(4) Hnee Thatch Roofing Work								
Hnee Thatch	No.	43.20	50.0	450.0	2,160.00	19,440.00	21,600.00	
Bamboo	No.	9.00	50.0	450.0	450.00	4,050.00	4,500.00	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Binding Wire	lb	1.00	1,050.0	450.0	1,050.00	450.00	1,500.00	
Carpenter	day	0.40	500.0	4,500.0	200.00	1,800.00	2,000.00	
Labor	day	0.40	350.0	3,150.0	140.00	1,260.00	1,400.00	
(5) 6"×1" Plank Flooring Work								
Jungle Wood (Plank)	cu-ft	1.30	2,083.0	8,331.8	2,707.90	10,831.34	13,539.24	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.20	500.0	4,500.0	100.00	900.00	1,000.00	
Labor	day	0.10	350.0	3,150.0	35.00	315.00	350.00	
(6) Bamboo Mat Walling Work								
Bamboo Mat	sq-ft	96.60	20.0	180.0	1,932.00	17,388.00	19,320.00	
Jungle Wood (Plank)	cu-ft	0.30	2,083.0	8,331.8	624.90	2,499.54	3,124.44	
Wire Nail	viss	0.40	2,450.0	1,050.0	980.00	420.00	1,400.00	
Carpenter	day	0.80	500.0	4,500.0	400.00	3,600.00	4,000.00	
(7) Bamboo Mat Door Work								
Bamboo Mat	sq-ft	12.00	20.0	180.0	240.00	2,160.00	2,400.00	
Jungle Wood (Plank)	cu-ft	1.10	2,083.0	8,331.8	2,291.30	9,164.98	11,456.28	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.50	500.0	4,500.0	250.00	2,250.00	2,500.00	
(8) Iron fitting Work								
Butt Hinge	No.	2.00	700.0	300.0	1,400.00	600.00	2,000.00	
Hasp & Staple	No.	1.00	350.0	150.0	350.00	150.00	500.00	
Handle	No.	2.00	700.0	300.0	1,400.00	600.00	2,000.00	
Tower Bolt	No.	1.00	840.0	360.0	840.00	360.00	1,200.00	
Lock & Key	No.	1.00	1,400.0	600.0	1,400.00	600.00	2,000.00	
Screw	gross	2.00	1,400.0	600.0	2,800.00	1,200.00	4,000.00	
Purchasing & Fixing of W.C. Pan	No.	1.00	5,600.0	2,400.0	5,600.00	2,400.00	8,000.00	
Total	-	-	-	-	43,156.10	155,883.86	199,040	(Kyat / per unit)

1-5. Making Stock Pile Yards

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Earth Work								
Digging for Post Hole (Barrack etc.)	No.	47.00	30.0	270.0	1,410.00	12,690.00	14,100.00	
(2) Wagut Walling with Bamboo Rail Work								
Wagut (5'×2'6")	No.	40.00	240.0	960.0	9,600.00	38,400.00	48,000.00	
4"~6"φMyaw (J/Wood)	No.	15.00	1,200.0	4,800.0	18,000.00	72,000.00	90,000.00	
Bamboo	No.	33.00	50.0	450.0	1,650.00	14,850.00	16,500.00	
Wire Nail	viss	1.50	2,450.0	1,050.0	3,675.00	1,575.00	5,250.00	
Binding Wire	lb	3.00	1,050.0	450.0	3,150.00	1,350.00	4,500.00	
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	4.00	350.0	3,150.0	1,400.00	12,600.00	14,000.00	
Total	-	-	-	-	40,885.00	171,465.00	212,350	(Kyat / per unit)

1-6. Labor Transporting Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck (Capacity = 5ton)	Irrigation Department							
(2) Labor Transportation								
(a) Tar road	mile	5.00						
Diesel (H.S.D.)	gal	0.50	3,800.0	200.0	1,900.00	100.00	2,000.00	Tar road : 10mile/gal
(b) offroad	mile	4.00						
Diesel (H.S.D.)	gal	0.50	3,800.0	200.0	1,900.00	100.00	2,000.00	Off road : 8mile/gal
Total	-	-	-	-	3,800.00	200.00	4,000	(Kyat / per item)

1-7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas

1-7-1. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.30	350.0	3,150.0	105.00	945.00	1,050.00	
Total	-	-	-	-	105.00	945.00	1,050	(Kyat / per %sq-ft)

1-7-2. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Bulldozer	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	11.00	3,800.0	200.0	41,800.00	2,200.00	44,000.00	
Engine Oil	gal	0.22	17,100.0	900.0	3,762.00	198.00	3,960.00	
Hydraulic Oil	gal	0.22	9,500.0	500.0	2,090.00	110.00	2,200.00	
Grease	lb	0.055	4,275.0	225.0	235.13	12.38	247.51	
Total	-	-	-	-	47,887.13	2,520.38	50,408	(Kyat / per acres)

2. Earth Works

2-1. Canal Bank Raising and Canal Resectioning Works

2-1-1. Canal Bank Raising Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	6.00	
Total	-	-	-	-	1,067.66	56.19	1,124	(Kyat / per sud)

2-1-1. Canal Bank Raising Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.32	3,800.0	200.0	1,216.00	64.00	1,280.00	
Hydraulic Oil	gal	0.0075	9,500.0	500.0	71.25	3.75	75.00	
Engine Oil	gal	0.0075	17,100.0	900.0	128.25	6.75	135.00	
Grease	lb	0.012	4,275.0	225.0	51.30	2.70	54.00	
Total	-	-	-	-	1,466.80	77.20	1,544	(Kyat / per sud)

2-1-2. Canal Resectioning Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	6.00	
Total	-	-	-	-	1,067.66	56.19	1,124	(Kyat / per sud)

2-1-2. Canal Resectioning Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.32	3,800.0	200.0	1,216.00	64.00	1,280.00	
Hydraulic Oil	gal	0.0075	9,500.0	500.0	71.25	3.75	75.00	
Engine Oil	gal	0.0075	17,100.0	900.0	128.25	6.75	135.00	
Grease	lb	0.012	4,275.0	225.0	51.30	2.70	54.00	
Total	-	-	-	-	1,466.80	77.20	1,544	(Kyat / per sud)

2-1-3. Canal Resectioning Work (by Blasting (at Rock Portion))

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Materials								
Dynamite	gram	488.00	0.87	3.49	424.56	1,703.12	2,127.68	
Detonator	Pcs	1.00	35.2	140.8	35.20	140.80	176.00	
(2) Machine								
Air Compressor , BackHoe , Dozer , Tipper	Irrigation Department							
Diesel (H.S.D.)	gal	1.56	3,800.0	200.0	5,928.00	312.00	6,240.00	
Lubricant	gal	0.001	14,250.0	750.0	14.25	0.75	15.00	
Grease	lb	0.0013	4,275.0	225.0	4.28	0.23	4.51	
Miscellaneous	L.S	1.00	0.0	350.0	0.00	350.00	350.00	
Total	-	-	-	-	6,406.29	2,506.90	8,913	(Kyat / per sud)

2-1-4. Canal Resectioning Work (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-2. E/W (Earth Work) Filling into Canal Section and Inner Side Slop

2-2-1. E/W Filling into Canal Section and Inner Side Slop (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-2-2. E/W Filling into Canal Section and Inner Side Slop (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	6.00	
Total	-	-	-	-	1,067.66	56.19	1,124	(Kyat / per sud)

2-3. G.C (Gravelly Clay) Filling and Compacting Works in Canal Section and Inner Slope

2-3-1. G.C Filling and Compacting Works in Canal Section and Inner Slope (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-3-2. G.C Filling and Compacting Works in Canal Section and Inner Slope (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	5.85	
Total	-	-	-	-	1,067.66	56.19	1,124	(Kyat / per sud)

2-4. Making of Temporary Cofferdam for Necessary of Work

2-4-1. Making of Temporary Cofferdam for Necessary of Work (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(Digging)								
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(Packing & Carrying)								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(Stacking)								
(2) Materials Used								
Penan Bag	No.	100.00	30.0	270.0	3,000.00	27,000.00	30,000.00	
Total	-	-	-	-	4,575.0	41,175.0	45,750	(Kyat / per sud)

2-4-2. Making of Temporary Cofferdam for Necessary of Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.74	3,800.0	200.0	2,812.00	148.00	2,960.00	
Lubricant	gal	0.0148	14,250.0	750.0	210.90	11.10	222.00	
Grease	lb	0.0037	4,275.0	225.0	15.82	0.83	16.65	
Total	-	-	-	-	3,038.72	159.93	3,199	(Kyat / per sud)

2-5. Earth Work Excavation for Bed Kerb & Compartment and Copping (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-6. Earth Work in Dressing (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-7. Earth Work in Base Stripping 3"thick (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-8. Unsilted of Main Canal

2-8-1. Unsilted of Main Canal (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	3.80	350.0	3,150.0	1,330.00	11,970.00	13,300.00	
Total	-	-	-	-	1,330.00	11,970.00	13,300	(Kyat / per sud)

2-8-2. Unsilted of Main Canal (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	5.85	
Total	-	-	-	-	1,067.66	56.19	1,124	(Kyat / per sud)

3. Repairing and Construction of Linings Works

3-1. Brick Lining Work

3-1-1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250.00	(Kyat / per %sq-ft)

3-1-2. Making of Ring Bund with Sand Bags

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
(Digging)								
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(Carring & packing)								
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
(Placing & stacking)								
(2) Materials Used								
Penan Bag	No.	46.67	30.0	270.0	1,400.10	12,600.90	14,001.00	
Total	-	-	-	-	5,600.10	50,400.90	56,001.00	(Kyat / per %cu-ft)

3-1-3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.50	350.0	3,150.0	1,225.00	11,025.00	12,250.00	
(2) Materials Used								
Brick (Clay)	No.	550.00	63.6	77.8	34,980.00	42,790.00	77,770.00	
Cement	lb	356.40	54.2	2.8	19,316.88	997.92	20,314.80	
Sand	cu-ft	12.00	257.1	210.4	3,085.20	2,524.80	5,610.00	
Total	-	-	-	-	59,607.08	66,337.72	125,944.80	(Kyat / per %sq-ft)

3-1-4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.50	350.0	3,150.0	1,225.00	11,025.00	12,250.00	
(2) Materials Used								
Brick (Cement)	No.	550.00	93.8	62.6	51,590.00	34,430.00	86,020.00	
Cement	lb	356.40	54.2	2.8	19,316.88	997.92	20,314.80	
Sand	cu-ft	12.00	257.1	210.4	3,085.20	2,524.80	5,610.00	
Total	-	-	-	-	76,217.08	57,977.72	134,194.80	(Kyat / per %sq-ft)

3-1-5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.50	500.0	4,500.0	750.00	6,750.00	7,500.00	
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(2) Materials Used								
Brick (Clay)	No.	345.00	63.6	77.8	21,942.00	26,841.00	48,783.00	
Cement	lb	238.00	54.2	2.8	12,899.60	666.40	13,566.00	
Sand	cu-ft	8.00	257.1	210.4	2,056.80	1,683.20	3,740.00	
Total	-	-	-	-	38,173.40	40,665.60	78,839.00	(Kyat / per %sq-ft)

3-1-6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.50	500.0	4,500.0	750.00	6,750.00	7,500.00	
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(2) Materials Used								
Brick (Cement)	No.	345.00	93.8	62.6	32,361.00	21,597.00	53,958.00	
Cement	lb	238.00	54.2	2.8	12,899.60	666.40	13,566.00	
Sand	cu-ft	8.00	257.1	210.4	2,056.80	1,683.20	3,740.00	
Total	-	-	-	-	48,592.40	35,421.60	84,014.00	(Kyat / per %sq-ft)

3-1-7. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	9.00	500.0	4,500.0	4,500.00	40,500.00	45,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
6"-9" Stone Boulder	cu-ft	125.00	487.2	324.8	60,900.00	40,600.00	101,500.00	
Cement	lb	432.00	54.2	2.8	23,414.40	1,209.60	24,624.00	
Sand	cu-ft	14.00	257.1	210.4	3,599.40	2,945.60	6,545.00	
River Shingle	cu-ft	28.00	543.0	444.3	15,204.00	12,440.40	27,644.40	
Total	-	-	-	-	110,417.80	122,895.60	233,313.40	(Kyat / per sud)

3-1-8. 3"thick Sand Filling under Brick Lining

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor*								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(2) Materials Used								
Sand	cu-ft	125.00	257.1	210.4	32,137.50	26,300.00	58,437.50	
Total	-	-	-	-	32,487.50	29,450.00	61,937.50	(Kyat / per sud)

* Sand filling work including watering and ramming completed.

3-1-9. Pointing Work (with 1:3 Cement Mortar)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Cement	lb	54.27	54.2	2.8	2,941.43	151.96	3,093.39	
Sand	cu-ft	468.00	257.1	210.4	120,322.80	98,467.20	218,790.00	
Total	-	-	-	-	124,464.23	109,419.16	233,883	(Kyat / per %sq-ft)

3-2. Concreting Works

3-2-1. 1:3:6 Cement Concrete Work for Canal Bed Kerb

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
Cement	lb	1,440.00	54.2	2.8	78,048.00	4,032.00	82,080.00	
Sand	cu-ft	48.00	257.1	210.4	12,340.80	10,099.20	22,440.00	
River Shingle	cu-ft	96.00	543.0	444.3	52,128.00	42,652.80	94,780.80	
Total	-	-	-	-	145,816.8	86,484.0	232,301	(Kyat / per sud)

3-2-2. 1:3:6 Cement Concrete Work for Canal Copping

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
Cement	lb	1,440.00	54.2	2.8	78,048.00	4,032.00	82,080.00	
Sand	cu-ft	48.00	257.1	210.4	12,340.80	10,099.20	22,440.00	
River Shingle	cu-ft	96.00	543.0	444.3	52,128.00	42,652.80	94,780.80	
Total	-	-	-	-	145,816.8	86,484.0	232,301	(Kyat / per sud)

3-2-3. Timber Shuttering Formworks

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Jungle Wood (Scant)	cu-ft	1.50	2,083.0	8,331.8	3,124.50	12,497.70	15,622.20	
Jungle Wood (Plank)	cu-ft	0.92	2,083.0	8,331.8	1,916.36	7,665.26	9,581.62	
Wire	lb	3.00	680.5	291.7	2,041.50	875.10	2,916.60	
Total	-	-	-	-	9,782.4	45,338.1	55,121	(Kyat / per %sq-ft)

3-3. Concrete Lining Work

3-3-1. Concrete Lining Work (with 1:3:6 Cement Concrete)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(for Mixing)								
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(for Mixing)								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(for Carrying, Placing & Consolidating)								
Labor	day	5.00	350.0	3,150.0	1,750.00	15,750.00	17,500.00	
(for Carrying, Placing & Consolidating)								
Operator	day	0.50	400.0	3,600.0	200.00	1,800.00	2,000.00	
(2) Materials Used								
Cement	lb	1,440.00	54.2	2.8	78,048.00	4,032.00	82,080.00	
Sand	cu-ft	48.00	257.1	210.4	12,340.80	10,099.20	22,440.00	
River Shingle	cu-ft	96.00	543.0	444.3	52,128.00	42,652.80	94,780.80	
(3) Machine								
Mixer	Irrigation Department							
(4) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	2.00	3,800.0	200.0	7,600.00	400.00	8,000.00	
Total	-	-	-	-	155,166.80	102,634.00	257,801	(Kyat / per sud)

3-4. Related Works for Concreting such as Earth Work Excavation ,Timber Shuttering for Form Work etc;

3-4-1. Timber Shuttering Formwork for Concreting

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Timber (Scant)	cu-ft	1.50	2,083.0	8,332.0	3,124.50	12,498.00	15,622.50	
Timber (Plank)	cu-ft	0.92	2,083.0	8,332.0	1,916.36	7,665.44	9,581.80	
Wire Nail	lb	3.00	680.5	291.7	2,041.50	875.10	2,916.60	
Total	-	-	-	-	9,782.36	45,338.54	55,121	(Kyat / per %sq-ft)

3-4-2. Brick Work with 1:3 Cement Mortar for Compartment (with Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(2) Materials Used								
Brick (Clay)	No.	1,350.00	63.6	77.8	85,860.00	105,030.00	190,890.00	
Cement	lb	780.00	54.2	2.8	42,276.00	2,184.00	44,460.00	
Sand	cu-ft	26.00	257.1	210.4	6,684.60	5,470.40	12,155.00	
Total	-	-	-	-	138,920.60	149,584.40	288,505	(Kyat / per sud)

3-4-3. Brick Work with 1:3 Cement Mortar for Compartment (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(2) Materials Used								
Brick (Cement)	No.	1,350.00	93.8	62.6	126,630.00	84,510.00	211,140.00	
Cement	lb	780.00	54.2	2.8	42,276.00	2,184.00	44,460.00	
Sand	cu-ft	26.00	257.1	210.4	6,684.60	5,470.40	12,155.00	
Total	-	-	-	-	179,690.60	129,064.40	308,755	(Kyat / per sud)

3-4-4. Brick Work (1:3) Cement Mortar (with Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(2) Materials Used								
Brick (Clay)	No.	1,350.00	63.6	77.8	85,860.00	105,030.00	190,890.00	
Cement	lb	780.00	54.2	2.8	42,276.00	2,184.00	44,460.00	
Sand	cu-ft	26.00	257.1	210.4	6,684.60	5,470.40	12,155.00	
Total	-	-	-	-	138,920.60	149,584.40	288,505	(Kyat / per sud)

3-4-5. Brick Work (1:3) Cement Mortar (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(2) Materials Used								
Brick (Cement)	No.	1,350.00	93.8	62.6	126,630.00	84,510.00	211,140.00	
Cement	lb	780.00	54.2	2.8	42,276.00	2,184.00	44,460.00	
Sand	cu-ft	26.00	257.1	210.4	6,684.60	5,470.40	12,155.00	
Total	-	-	-	-	179,690.60	129,064.40	308,755	(Kyat / per sud)

4. Repairing & Reconstruction of Canal Structures

4-1. Re-Construction of Structures

4-1-1. Construction of Drop

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	60.00	500.0	4,500.0	30,000.00	270,000.00	300,000.00	
Carpenter	day	5.00	500.0	4,500.0	2,500.00	22,500.00	25,000.00	
Labor	day	92.00	350.0	3,150.0	32,200.00	289,800.00	322,000.00	
(2) Materials Used								
Cement	lb	7,840.00	54.2	2.8	424,928.00	21,952.00	446,880.00	
Sand	cu-ft	300.00	257.1	210.4	77,130.00	63,120.00	140,250.00	
River Shingle	cu-ft	200.00	543.0	444.3	108,600.00	88,860.00	197,460.00	
Brick (Cement)	No.	4,280.00	93.8	62.6	401,464.00	267,928.00	669,392.00	
Miscellaneous Works	L.S				0.00	2,850,000.00	2,850,000.00	
Total	-	-	-	-	1,076,822.00	3,874,160.00	4,950,982	(Kyat / per unit)

4-1-2. Construction of Head Regulator

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	60.00	500.0	4,500.0	30,000.00	270,000.00	300,000.00	
Carpenter	day	5.00	500.0	4,500.0	2,500.00	22,500.00	25,000.00	
Labor	day	92.00	350.0	3,150.0	32,200.00	289,800.00	322,000.00	
(2) Materials Used								
Cement	lb	7,840.00	54.2	2.8	424,928.00	21,952.00	446,880.00	
Sand	cu-ft	300.00	257.1	210.4	77,130.00	63,120.00	140,250.00	
River Shingle	cu-ft	200.00	543.0	444.3	108,600.00	88,860.00	197,460.00	
Brick (Cement)	No.	4,280.00	93.8	62.6	401,464.00	267,928.00	669,392.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	1,076,822.00	1,524,160.00	2,600,982	(Kyat / per unit)

4-1-3. Construction of Drain Box Culvert

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	56.00	500.0	4,500.0	28,000.00	252,000.00	280,000.00	
Carpenter	day	250.00	500.0	4,500.0	125,000.00	1,125,000.00	1,250,000.00	
Labor	day	792.00	350.0	3,150.0	277,200.00	2,494,800.00	2,772,000.00	
(2) Materials Used								
Cement	lb	53222.00	54.2	2.8	2,884,632.40	149,021.60	3,033,654.00	
Sand	cu-ft	1902.00	257.1	210.4	489,004.20	400,180.80	889,185.00	
River Shingle	cu-ft	1525.00	543.0	444.3	828,075.00	677,557.50	1,505,632.50	
Brick (Cement)	No.	29356.00	93.8	62.6	2,753,592.80	1,837,685.60	4,591,278.40	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	7,385,504.40	7,436,245.50	14,821,750	(Kyat / per unit)

4-1-4. Construction of Road Crossing and Bridge

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	110.00	500.0	4,500.0	55,000.00	495,000.00	550,000.00	
Labor	day	344.00	350.0	3,150.0	120,400.00	1,083,600.00	1,204,000.00	
(2) Materials Used								
Cement	lb	28336.00	54.2	2.8	1,535,811.20	79,340.80	1,615,152.00	
Sand	cu-ft	1487.00	257.1	210.4	382,307.70	312,864.80	695,172.50	
River Shingle	cu-ft	978.00	543.0	444.3	531,054.00	434,525.40	965,579.40	
Brick (Cement)	No.	19527.00	93.8	62.6	1,831,632.60	1,222,390.20	3,054,022.80	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	4,456,205.50	4,127,721.20	8,583,927	(Kyat / per unit)

4-1-5. Construction of Syphon Protection

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Carpenter	day	35.00	500.0	4,500.0	17,500.00	157,500.00	175,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	54.2	2.8	916,630.40	47,353.60	963,984.00	
Sand	cu-ft	772.00	257.1	210.4	198,481.20	162,428.80	360,910.00	
River Shingle	cu-ft	998.00	543.0	444.3	541,914.00	443,411.40	985,325.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	1,964,575.60	2,553,343.80	4,517,919	(Kyat / per unit)

4-1-6. Construction of Course-Way

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	54.2	2.8	916,630.40	47,353.60	963,984.00	
Sand	cu-ft	772.00	257.1	210.4	198,481.20	162,428.80	360,910.00	
River Shingle	cu-ft	998.00	543.0	444.3	541,914.00	443,411.40	985,325.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	1,947,075.60	2,395,843.80	4,342,919	(Kyat / per unit)

4-1-7. Construction of Box Culverts (Cross Drain Culverts) (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Carpenter	day	35.00	500.0	4,500.0	17,500.00	157,500.00	175,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	

4-1-7. Construction of Box Culverts (Cross Drain Culverts) (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
Cement	lb	16912.00	54.2	2.8	916,630.40	47,353.60	963,984.00	
Sand	cu-ft	772.00	257.1	210.4	198,481.20	162,428.80	360,910.00	
River Shingle	cu-ft	998.00	543.0	444.3	541,914.00	443,411.40	985,325.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	1,964,575.60	2,553,343.80	4,517,919	(Kyat / per unit)

4-2. Repairing of structures

4-2-1. Drop

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	9.00	500.0	4,500.0	4,500.00	40,500.00	45,000.00	
Labor	day	28.00	350.0	3,150.0	9,800.00	88,200.00	98,000.00	
(2) Materials Used								
Cement	lb	6,361.60	54.2	2.8	344,798.72	17,812.48	362,611.20	
Sand	cu-ft	4.06	25,712.5	21,037.5	104,392.75	85,412.25	189,805.00	
River Shingle	cu-ft	2.98	54,301.5	44,428.5	161,818.47	132,396.93	294,215.40	
Brick (Cement)	No.	2,359.00	93.8	62.6	221,274.20	147,673.40	368,947.60	
Miscellaneous Works	L.S				0.00	294,366.00	294,366.00	
Total	-	-	-	-	846,584.14	806,361.06	1,652,945	(Kyat / per unit)

4-2-2. Head Regulator

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	7.00	500.0	4,500.0	3,500.00	31,500.00	35,000.00	
Labor	day	15.00	350.0	3,150.0	5,250.00	47,250.00	52,500.00	
(2) Materials Used								
Cement	lb	6,300.00	54.2	2.8	341,460.00	17,640.00	359,100.00	
Sand	cu-ft	3.75	25,712.5	21,037.5	96,421.88	78,890.63	175,312.51	
River Shingle	cu-ft	5.63	54,301.5	44,428.5	305,717.45	250,132.46	555,849.91	
Brick (Cement)	No.	281.00	93.8	62.6	26,357.80	17,590.60	43,948.40	
Miscellaneous Works	L.S				0.00	0.00	0.00	
Total	-	-	-	-	778,707.13	443,003.69	1,221,711	(Kyat / per unit)

4-2-3. Drain Box Culvert (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	28.00	500.0	4,500.0	14,000.00	126,000.00	140,000.00	
Labor	day	47.00	350.0	3,150.0	16,450.00	148,050.00	164,500.00	

4-2-3. Drain Box Culvert (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
Cement	lb	3,461.80	54.2	2.8	187,629.56	9,693.04	197,322.60	
Sand	sud	2.00	25,712.5	21,037.5	51,425.00	42,075.00	93,500.00	
River Shingle	sud	3.00	54,301.5	44,428.5	162,904.50	133,285.50	296,190.00	
Brick (Cement)	No.	1,500.00	93.8	62.6	140,700.00	93,900.00	234,600.00	
Miscellaneous Works	L.S				0.00	0.00	0.00	
Total	-	-	-	-	573,109.06	553,003.54	1,126,113	(Kyat / per unit)

4-2-4. Road Crossing and Bridge

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	40.00	500.0	4,500.0	20,000.00	180,000.00	200,000.00	
Labor	day	73.00	350.0	3,150.0	25,550.00	229,950.00	255,500.00	
(2) Materials Used								
Cement	lb	6,720.00	54.2	2.8	364,224.00	18,816.00	383,040.00	
Sand	sud	4.00	25,712.5	21,037.5	102,850.00	84,150.00	187,000.00	
River Shingle	sud	6.00	54,301.5	44,428.5	325,809.00	266,571.00	592,380.00	
Brick (Cement)	No.	3,000.00	93.8	62.6	281,400.00	187,800.00	469,200.00	
Miscellaneous Works	L.S				0.00	0.00	0.00	
Total	-	-	-	-	1,119,833.00	967,287.00	2,087,120	(Kyat / per unit)

4-2-5. Syphon

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Carpenter	day	35.00	500.0	4,500.0	17,500.00	157,500.00	175,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	54.2	2.8	916,630.40	47,353.60	963,984.00	
Sand	cu-ft	772.00	257.1	210.4	198,481.20	162,428.80	360,910.00	
River Shingle	cu-ft	998.00	543.0	444.3	541,914.00	443,411.40	985,325.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	1,964,575.60	2,553,343.80	4,517,919	(Kyat / per unit)

4-2-6. Repairing of Course-Way (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	

4-2-6. Repairing of Course-Way (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
Cement	lb	16912.00	54.2	2.8	916,630.40	47,353.60	963,984.00	
Sand	cu-ft	772.00	257.1	210.4	198,481.20	162,428.80	360,910.00	
River Shingle	cu-ft	998.00	543.0	444.3	541,914.00	443,411.40	985,325.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	1,947,075.60	2,395,843.80	4,342,919	(Kyat / per unit)

4-2-7. Repairing of Box Culverts (Cross Drain Culverts)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Carpenter	day	35.00	500.0	4,500.0	17,500.00	157,500.00	175,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	54.2	2.8	916,630.40	47,353.60	963,984.00	
Sand	cu-ft	772.00	257.1	210.4	198,481.20	162,428.80	360,910.00	
River Shingle	cu-ft	998.00	543.0	444.3	541,914.00	443,411.40	985,325.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	1,964,575.60	2,553,343.80	4,517,919	(Kyat / per unit)

4-2-8. Repairing of Conduit Gate and Assembly

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Smith	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Steel Gate	No.	1.00	135,000.0	15,000.0	135,000.00	15,000.00	150,000.00	
Steel Rod (10mm)	lb	10.00	73.6	3.9	736.00	39.00	775.00	
Binding Wire	lb	2.00	1,050.0	450.0	2,100.00	900.00	3,000.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	139,036.00	126,739.00	265,775	(Kyat / per item)

4-2-9. Repairing of Canal Gate Leaf, Frame & Gear Assembly

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Smith	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Steel Gate	No.	1.00	135,000.0	15,000.0	135,000.00	15,000.00	150,000.00	
Steel Rod (10mm)	lb	10.00	73.6	3.9	736.00	39.00	775.00	
Binding Wire	lb	2.00	1,050.0	450.0	2,100.00	900.00	3,000.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	139,036.00	126,739.00	265,775	(Kyat / per item)

4-2-10. Repairing of Canal Structures

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	54.2	2.8	916,630.40	47,353.60	963,984.00	
Sand	cu-ft	772.00	257.1	210.4	198,481.20	162,428.80	360,910.00	
River Shingle	cu-ft	998.00	543.0	444.3	541,914.00	443,411.40	985,325.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	1,947,075.60	1,995,843.80	3,942,919	(Kyat / per item)

5. Road Works

5-1. G.C (Gravelly Clay) Laying Work

5-1-1. G.C Laying and spreading works of Canal Inspection Path

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(laying, dressing, spreading & compacting)								
(2) Materials Used								
Gravelly Clay (G.C)	cu-ft	110.00	285.4	190.3	31,394.00	20,933.00	52,327.00	
Total	-	-	-	-	31,919.0	25,658.0	57,577	(Kyat / per sud)

5-1-2. G.C Laying and spreading work of Canal Non Inspection Path

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(laying, dressing, spreading & compacting)								
(2) Materials Used								
Gravelly Clay (G.C)	cu-ft	110.00	285.4	190.3	31,394.00	20,933.00	52,327.00	
Total	-	-	-	-	31,919.0	25,658.0	57,577	(Kyat / per sud)

5-2. Concrete Paving Work

5-2-1. Mixing only Cement Concrete (1:2:4) with (0.5" to 0.75") Gauge Stone Chippings on River Shingle

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
(2) Materials Used								
Cement	lb	2,070.00	54.2	2.8	112,194.00	5,796.00	117,990.00	
River Shingle	cu-ft	92.00	543.0	444.3	49,956.00	40,875.60	90,831.60	
Sand	cu-ft	46.00	257.1	210.4	11,826.60	9,678.40	21,505.00	
Total	-	-	-	-	177,976.6	92,350.0	270,327	(Kyat / per sud)

5-2-2. Mixing only Cement Concrete (1:3:6) with (0.5" to 0.75") Gauge Stone Chippings on River Shingle

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
(2) Materials Used								
Cement	lb	1,440.00	54.2	2.8	78,048.00	4,032.00	82,080.00	
River Shingle	cu-ft	96.00	543.0	444.3	52,128.00	42,652.80	94,780.80	
Sand	cu-ft	48.00	257.1	210.4	12,340.80	10,099.20	22,440.00	
Total	-	-	-	-	146,516.8	92,784.0	239,301	(Kyat / per sud)

5-2-3. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
Total	-	-	-	-	1,550.0	13,950.0	15,500	(Kyat / per sud)

5-2-4. Timber Shuttering Formworks

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Jungle Wood (Scant)	cu-ft	1.50	2,083.0	8,331.8	3,124.50	12,497.70	15,622.20	
Jungle Wood (Plank)	cu-ft	0.92	2,083.0	8,331.8	1,916.36	7,665.26	9,581.62	
Wire Nail	lb	3.00	680.5	291.7	2,041.50	875.10	2,916.60	
Total	-	-	-	-	9,782.36	45,338.06	55,120	(Kyat / per %sq-ft)

5-2-5. Reinforcing Bar Preparation and Assembly

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
Steel Fixer	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(2) Materials Used								
Steel Rod (10mm)	lb	117.60	73.6	3.9	8,655.36	458.64	9,114.00	
Binding Wire	lb	1.00	1,050.0	450.0	1,050.00	450.00	1,500.00	
Total	-	-	-	-	10,555.36	8,558.64	19,114	(Kyat / per CWT)

6. Repairing and Construction of Permanent Buildings

6-1. Repairing and Construction of Building (Gust House, Meeting Hall, Office, etc.)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	20.00	500.0	4,500.0	10,000.00	90,000.00	100,000.00	
Labor	day	30.00	350.0	3,150.0	10,500.00	94,500.00	105,000.00	
(2) Materials Used								
Repairing and Construction of Building	Set	1.00	4,000,000.0	6,000,000.0	4,000,000.00	6,000,000.00	10,000,000.00	
Miscellaneous Works	L.S				0.00	2,850,000.00	2,850,000.00	
Total	-	-	-	-	4,020,500.00	9,034,500.00	13,055,000	(Kyat / per item)

7. Other Related Works

7-1. Repairing of Heavy Machines

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Operator (Machine Driver)	day	3.00	400.0	3,600.0	1,200.00	10,800.00	12,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
Total	-	-	-	-	4,700.00	42,300.00	47,000	(Kyat / per job)

7-2. Repairing of Motor Vehicles , Water Pumps and Generators

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Operator (Machine Driver)	day	4.00	400.0	3,600.0	1,600.00	14,400.00	16,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
Total	-	-	-	-	5,100.00	45,900.00	51,000	(Kyat / per item)

7-3. Repairing Charges for Equipments

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Operator (Machine Driver)	day	3.00	400.0	3,600.0	1,200.00	10,800.00	12,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
Total	-	-	-	-	4,000.00	36,000.00	40,000	(Kyat / per item)

7-4. Earth Works for Drainage Canal (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	5.85	
Total	-	-	-	-	1,067.7	56.2	1,124	(Kyat / per sud)

7-5. Management of Construction Materials and Equipment

7-5-1. Shifting of Materials from Temporary Stock-pile to Work Site

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							
(2) Labor								
Labor	day	0.05	350.0	3,150.0	17.50	157.50	175.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Engine Oil	gal	0.0052	17,100.0	900.0	88.92	4.68	93.60	
Lubricant	gal	0.0013	14,250.0	750.0	18.53	0.98	19.51	
Total	-	-	-	-	1,112.95	215.16	1,328	(Kyat / per item)

7-5-2. Transporting of Materials from Quarry to Stock-pile

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							
(2) Labor								
Labor	day	0.05	350.0	3,150.0	17.50	157.50	175.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.36	3,800.0	200.0	1,368.00	72.00	1,440.00	
Engine Oil	gal	0.0072	17,100.0	900.0	123.12	6.48	129.60	
Lubricant	gal	0.0018	14,250.0	750.0	25.65	1.35	27.00	
Total	-	-	-	-	1,534.27	237.33	1,772	(Kyat / per item)

7-5-3. Transporting and Shifting of Heavy Machinery

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							
(2) Labor								
Operator (Machine Driver)	day	10.00	400.0	3,600.0	4,000.00	36,000.00	40,000.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.36	3,800.0	200.0	1,368.00	72.00	1,440.00	
Engine Oil	gal	0.0072	17,100.0	900.0	123.12	6.48	129.60	
Lubricant	gal	0.0018	14,250.0	750.0	25.65	1.35	27.00	
Total	-	-	-	-	5,516.77	36,079.83	41,597	(Kyat / per item)

7-5-4. Loading and Unloading Charges of Materials

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
Total	-	-	-	-	2,800.00	25,200.00	28,000	(Kyat / per item)

7-6. Water Pump for Dewatering Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Water Pump	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	10.00	3,800.0	200.0	38,000.00	2,000.00	40,000.00	
Total	-	-	-	-	38,000.00	2,000.00	40,000	(Kyat / per day)

7-7. Welfare Charges for Labor

7-7-1. Temporary Hut Material for One Family

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
Temporary Hut Material for One Family	item	1.00	100,000.0	2,000,000.0	100,000.00	2,000,000.00	2,100,000.00	
Total	-	-	-	-	102,800.0	2,025,200.0	2,128,000	(Kyat / per item)

7-7-2. Hnee Thatch

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(2) Materials Used								
Hnee Thatch	item	1.00	10,000.0	200,000.0	10,000.00	200,000.00	210,000.00	
Total	-	-	-	-	10,350.00	203,150.00	213,500	(Kyat / per item)

7-7-3. Bamboo

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Bamboo	item	1.00	5,000.0	100,000.0	5,000.00	100,000.00	105,000.00	
Total	-	-	-	-	5,700.00	106,300.00	112,000	(Kyat / per item)

7-7-4. Transporting for Labor Necessary of Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck (Capacity = 5ton)	Irrigation Department							
					0.00	0.00	0.00	
(2) Labor Transportation								
(a) Tar road	mile	5.00						
Diesel (H.S.D.)	gal	0.50	3,800.0	200.0	1,900.00	100.00	2,000.00	Tar road : 10mile/gal
(b) off road	mile	4.00						
Diesel (H.S.D.)	gal	0.50	3,800.0	200.0	1,900.00	100.00	2,000.00	Off road : 8mile/gal
Total	-	-	-	-	3,800.00	200.00	4,000	(Kyat / per mile)

7-8. Labor Charges for Day & Night Watchman, Helper, Checker and General Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
Total	-	-	-	-	350.0	3,150.0	3,500	(Kyat / per M/D)

7-9. Camps Facilities (Lighting, Water Supply, etc.)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Water Pump	Irrigation Department							1 gal/bowser
Water Bowser	Irrigation Department							3 gal/trip
Diesel Generator	Irrigation Department							1 gal/hr
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	1.00	3,800.0	200.0	3,800.00	200.00	4,000.00	4 hr/day
(Water Pump)								
Diesel (H.S.D.)	gal	3.00	3,800.0	200.0	11,400.00	600.00	12,000.00	1 trip/day
(Water Bowser)								
Diesel (H.S.D.)	gal	4.00	3,800.0	200.0	15,200.00	800.00	16,000.00	1 bowser/day
(Generator)								
Total	-	-	-	-	30,400.00	1,600.00	32,000	(Kyat / per gal)

7-10. Making Data Boards and Sign Boards

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Painter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Ply Wood (8'x4')	No.	1.00	3,000.0	12,000.0	3,000.00	12,000.00	15,000.00	
Paint	gal	2.50	10,000.0	10,000.0	25,000.00	25,000.00	50,000.00	
Painting charges	L.S	1.00	1,500.0	13,500.0	1,500.00	13,500.00	15,000.00	
Beading 1"x½"	cu-ft	0.30	5,207.5	5,207.5	1,562.25	1,562.25	3,124.50	
Total	-	-	-	-	34,762.25	85,362.25	120,125	(Kyat / per item)

7-11. Estimating, Copying, Photo Recording and stationary Charges, etc;

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Materials Used								
Paper	Page	500.00	3.0	7.0	1,500.00	3,500.00	5,000.00	
(2) Service Charges								
Typing & Printing charges	Page	90.00	25.0	225.0	2,250.00	20,250.00	22,500.00	
Photo & Printing charges	Page	50.00	50.0	450.0	2,500.00	22,500.00	25,000.00	
Copying charges	Page	360.00	2.5	22.5	900.00	8,100.00	9,000.00	
Binding charges	No.	5.00	100.0	900.0	500.00	4,500.00	5,000.00	
Total	-	-	-	-	7,650.00	58,850.00	66,500	(Kyat / per item)

7-12. Miscellaneous

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
Miscellaneous	item	1.00	5,000.0	100,000.0	5,000.00	100,000.00	105,000.00	
Total	-	-	-	-	5,000.00	100,000.00	105,000	(Kyat / per item)

3.1.2 Analysis Rate for Distribution Canal

8. Preparatory Works

8-1. Survey and Profile Works (Canal length : 30 feet / sect)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Lime (Strained Lime)	cu-ft	0.20	350.0	3,150.0	70.00	630.00	700.00	
Plastic ream	No.	0.67	90.0	810.0	60.00	540.00	600.00	for finishing stake
Labor	day	0.10	350.0	3,150.0	35.00	315.00	350.00	
Total	-	-	-	-	315.00	2,835.00	3,150	(Kyat / per sect)

8-2. Temporary Camps & Stores

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) 4"~6"φMyaw Post Work								
4"~6"φMyaw (J/Wood)	No.	12.00	1,200.0	4,800.0	14,400.00	57,600.00	72,000.00	
Carpenter	day	0.50	500.0	4,500.0	250.00	2,250.00	2,500.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) 2"~4"φMyaw Post Work								
2"~4"φMyaw (J/Wood)	No.	40.00	400.0	1,600.0	16,000.00	64,000.00	80,000.00	
Wire Nail	viss	2.00	2,450.0	1,050.0	4,900.00	2,100.00	7,000.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
(3) Hnee Thatch Roofing Work								
Hnee Thatch	No.	500.00	50.0	450.0	25,000.00	225,000.00	250,000.00	
Bamboo	No.	70.00	50.0	450.0	3,500.00	31,500.00	35,000.00	
Wire Nail	viss	2.50	2,450.0	1,050.0	6,125.00	2,625.00	8,750.00	
Carpenter	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
(4) Roll Mat Ridging Work								
Roll Mat (12'×3')	No.	6.00	180.0	1,620.0	1,080.00	9,720.00	10,800.00	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.25	500.0	4,500.0	125.00	1,125.00	1,250.00	
(5) Bamboo Flooring Work								
Bamboo	No.	150.00	50.0	450.0	7,500.00	67,500.00	75,000.00	
Wire Nail	viss	1.50	2,450.0	1,050.0	3,675.00	1,575.00	5,250.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(6) Bamboo Mat Walling (Single)								
Bamboo Mat	sq-ft	1,065.00	20.0	180.0	21,300.00	191,700.00	213,000.00	
Bamboo	No.	15.00	50.0	450.0	750.00	6,750.00	7,500.00	
Wire Nail	viss	1.00	2,450.0	1,050.0	2,450.00	1,050.00	3,500.00	
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
(7) Bamboo Hand Rail work								
Bamboo	No.	15.00	50.0	450.0	750.00	6,750.00	7,500.00	
Wire Nail	viss	0.24	2,450.0	1,050.0	588.00	252.00	840.00	
Carpenter	day	0.28	500.0	4,500.0	140.00	1,260.00	1,400.00	
Total	-	-	-	-	117,378.00	750,262.00	867,640	(Kyat / per item)

8-3. Temporary Barracks (2 units, 4 units, etc.)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Hnee Thatch Roofing Work								
Hnee Thatch	No.	150.00	50.0	450.0	7,500.00	67,500.00	75,000.00	
Bamboo	No.	26.00	50.0	450.0	1,300.00	11,700.00	13,000.00	
Wire Nail	viss	0.20	2,450.0	1,050.0	490.00	210.00	700.00	
Binding Wire	lb	0.25	1,050.0	450.0	262.50	112.50	375.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(2) Double Bamboo Rallmat Ridging work								
Roll Mat (12'×3')	No.	5.00	180.0	1,620.0	900.00	8,100.00	9,000.00	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Labor	day	0.30	350.0	3,150.0	105.00	945.00	1,050.00	
(3) Spitted Bamboo flooring work								
Bamboo	No.	55.00	50.0	450.0	2,750.00	24,750.00	27,500.00	
Wire Nail	viss	0.30	2,450.0	1,050.0	735.00	315.00	1,050.00	
Binding Wire	lb	2.00	1,050.0	450.0	2,100.00	900.00	3,000.00	
Carpenter	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(4) Bamboo Mat Walling Work								
Bamboo Mat	sq-ft	140.00	20.0	180.0	2,800.00	25,200.00	28,000.00	
Jungle Wood (Plank)	cu-ft	0.32	2,083.0	8,331.8	666.56	2,666.18	3,332.74	
Wire Nail	viss	0.50	2,450.0	1,050.0	1,225.00	525.00	1,750.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(5) Bamboo Mat Door Work								
Bamboo Mat	sq-ft	30.00	20.0	180.0	600.00	5,400.00	6,000.00	
Jungle Wood (Plank)	cu-ft	2.20	2,083.0	8,331.8	4,582.60	18,329.96	22,912.56	
Wire Nail	viss	0.20	2,450.0	1,050.0	490.00	210.00	700.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(6) Bamboo Mat Window Work								
Bamboo	No.	6.00	50.0	450.0	300.00	2,700.00	3,000.00	
Jungle Wood (Plank)	cu-ft	0.60	2,083.0	8,331.8	1,249.80	4,999.08	6,248.88	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.63	500.0	4,500.0	315.00	2,835.00	3,150.00	
(7) Splitted Bamboo Triellis Work								
Bamboo	No.	21.00	50.0	450.0	1,050.00	9,450.00	10,500.00	
Wire Nail	viss	0.60	2,450.0	1,050.0	1,470.00	630.00	2,100.00	
Carpenter	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
(8) Iron fitting Work								
Butt Hinge	No.	40.00	700.0	300.0	28,000.00	12,000.00	40,000.00	
Hasp & Staple	No.	6.00	350.0	150.0	2,100.00	900.00	3,000.00	
Handle	No.	10.00	700.0	300.0	7,000.00	3,000.00	10,000.00	
Tower Bolt	No.	20.00	840.0	360.0	16,800.00	7,200.00	24,000.00	
Screw	gross	1.00	1,400.0	600.0	1,400.00	600.00	2,000.00	
Total	-	-	-	-	91,381.46	253,687.72	345,069	(Kyat / per item)

8-4. Temporary Latrines

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Site Cleaning & Earth Work								
Site Cleaning Work for Latrines	set	1.00	600.0	5,400.0	600.00	5,400.00	6,000.00	
Digging for Post Hole (Barrack etc.)	No.	4.00	30.0	270.0	120.00	1,080.00	1,200.00	
Digging for Pit Hole (Latrines)	No.	1.00	1,200.0	10,800.0	1,200.00	10,800.00	12,000.00	
(2) 4"~6"φMyaw Post Work								
4"~6"φMyaw (J/Wood)	No.	7.00	1,200.0	8,400.0	8,400.00	33,600.00	42,000.00	
Wire Nail	viss	0.30	2,450.0	1,050.0	735.00	315.00	1,050.00	
Carpenter	day	1.40	500.0	4,500.0	700.00	6,300.00	7,000.00	
Labor	day	0.90	350.0	3,150.0	315.00	2,835.00	3,150.00	
(3) 2"~4"φMyaw Post Work								
2"~4"φMyaw (J/Wood)	No.	5.00	400.0	1,600.0	2,000.00	8,000.00	10,000.00	
Wire Nail	viss	0.20	2,450.0	1,050.0	490.00	210.00	700.00	
Carpenter	day	0.60	500.0	4,500.0	300.00	2,700.00	3,000.00	
Labor	day	0.60	350.0	3,150.0	210.00	1,890.00	2,100.00	
(4) Hnee Thatch Roofing Work								
Hnee Thatch	No.	43.20	50.0	450.0	2,160.00	19,440.00	21,600.00	
Bamboo	No.	9.00	50.0	450.0	450.00	4,050.00	4,500.00	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Binding Wire	lb	1.00	1,050.0	450.0	1,050.00	450.00	1,500.00	
Carpenter	day	0.40	500.0	4,500.0	200.00	1,800.00	2,000.00	
Labor	day	0.40	350.0	3,150.0	140.00	1,260.00	1,400.00	
(5) 6"×1" Plank Flooring Work								
Jungle Wood (Plank)	cu-ft	1.30	2,083.0	8,331.8	2,707.90	10,831.34	13,539.24	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.20	500.0	4,500.0	100.00	900.00	1,000.00	
Labor	day	0.10	350.0	3,150.0	35.00	315.00	350.00	
(6) Bamboo Mat Walling Work								
Bamboo Mat	sq-ft	96.60	20.0	180.0	1,932.00	17,388.00	19,320.00	
Jungle Wood (Plank)	cu-ft	0.30	2,083.0	8,331.8	624.90	2,499.54	3,124.44	
Wire Nail	viss	0.40	2,450.0	1,050.0	980.00	420.00	1,400.00	
Carpenter	day	0.80	500.0	4,500.0	400.00	3,600.00	4,000.00	
(7) Bamboo Mat Door Work								
Bamboo Mat	sq-ft	12.00	20.0	180.0	240.00	2,160.00	2,400.00	
Jungle Wood (Plank)	cu-ft	1.10	2,083.0	8,331.8	2,291.30	9,164.98	11,456.28	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.50	500.0	4,500.0	250.00	2,250.00	2,500.00	
(8) Iron fitting Work								
Butt Hinge	No.	2.00	700.0	300.0	1,400.00	600.00	2,000.00	
Hasp & Staple	No.	1.00	350.0	150.0	350.00	150.00	500.00	
Handle	No.	2.00	700.0	300.0	1,400.00	600.00	2,000.00	
Tower Bolt	No.	1.00	840.0	360.0	840.00	360.00	1,200.00	
Lock & Key	No.	1.00	1,400.0	600.0	1,400.00	600.00	2,000.00	
Screw	gross	2.00	1,400.0	600.0	2,800.00	1,200.00	4,000.00	
Purchasing & Fixing of W.C. Pan	No.	1.00	5,600.0	2,400.0	5,600.00	2,400.00	8,000.00	
Total	-	-	-	-	43,156.10	155,883.86	199,040	(Kyat / per item)

8-5. Making Stock Pile Yards

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Earth Work								
Digging for Post Hole (Barrack etc.)	No.	47.00	30.0	270.0	1,410.00	12,690.00	14,100.00	
(2) Wagut Walling with Bamboo Rail Work								
Wagut (5'×2'6")	No.	40.00	240.0	960.0	9,600.00	38,400.00	48,000.00	
4"~6"φMyaw (J/Wood)	No.	15.00	1,200.0	4,800.0	18,000.00	72,000.00	90,000.00	
Bamboo	No.	33.00	50.0	450.0	1,650.00	14,850.00	16,500.00	
Wire Nail	viss	1.50	2,450.0	1,050.0	3,675.00	1,575.00	5,250.00	
Binding Wire	lb	3.00	1,050.0	450.0	3,150.00	1,350.00	4,500.00	
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	4.00	350.0	3,150.0	1,400.00	12,600.00	14,000.00	
Total	-	-	-	-	40,885.00	171,465.00	212,350	(Kyat / per item)

8-6. Labor Transporting Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck (Capacity = 5ton)	Irrigation Department							
(2) Labor Transportation								
(a) Tar road	mile	0.44						
Diesel (H.S.D.)	gal	0.044	3,800.0	200.0	167.20	8.80	176.00	Tar road : 10mile/gal
(b) offroad	mile	0.44						
Diesel (H.S.D.)	gal	0.055	3,800.0	200.0	209.00	11.00	220.00	Off road : 8mile/gal
Total	-	-	-	-	376.20	19.80	396	(Kyat / per item)

8-7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas

8-7-1. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas along the DY Canal (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.30	350.0	3,150.0	105.00	945.00	1,050.00	
Total	-	-	-	-	105.00	945.00	1,050	(Kyat / per %sq-ft)

8-7-2. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas along the DY Canal (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Bulldozer	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	11.00	3,800.0	200.0	41,800.00	2,200.00	44,000.00	
Engine Oil	gal	0.22	17,100.0	900.0	3,762.00	198.00	3,960.00	
Hydraulic Oil	gal	0.22	9,500.0	500.0	2,090.00	110.00	2,200.00	
Grease	lb	0.055	4,275.0	225.0	235.13	12.38	247.51	
Total	-	-	-	-	47,887.13	2,520.38	50,408	(Kyat / per acres)

9. Earth Works

9-1. Canal Resectioning Work

9-1-1. Canal Resectioning Work (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.0	4,725.0	5,250.00	(Kyat / per sud)

9-1-2. Canal Resectioning Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.32	3,800.0	200.0	1,216.00	64.00	1,280.00	
Hydraulic Oil	gal	0.0075	9,500.0	500.0	71.25	3.75	75.00	
Engine Oil	gal	0.0075	17,100.0	900.0	128.25	6.75	135.00	
Grease	lb	0.012	4,275.0	225.0	51.30	2.70	54.00	
Total	-	-	-	-	1,466.80	77.20	1,544.00	(Kyat / per sud)

9-2. Unsiltng of Distributary Canals

9-2-1. Unsiltng of Distributary Canals (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	3.80	350.0	3,150.0	1,330.00	11,970.00	13,300.00	
Total	-	-	-	-	1,330.0	11,970.0	13,300.00	(Kyat / per sud)

9-2-2. Unsiltng of Distributary Canals (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	5.85	
Total	-	-	-	-	1,067.7	56.2	1,124.00	(Kyat / per sud)

9-3. Earth Work in Dressing (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.0	4,725.0	5,250.00	(Kyat / per sud)

9-4. Earth Work in Base Stripping (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.0	4,725.0	5,250.00	(Kyat / per sud)

10. Repairing of Linings Work

10-1. Repairing Works of Brick Lining

10-1-1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.0	4,725.0	5,250.00	(Kyat / per %sq-ft)

10-1-2. 3"thick Sand Filling under Brick Lining

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(2) Materials Used								
Sand	cu-ft	125.00	257.1	210.4	32,137.50	26,300.00	58,437.50	
Total	-	-	-	-	32,487.5	29,450.0	61,938.00	(Kyat / per sud)

10-1-3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.50	350.0	3,150.0	1,225.00	11,025.00	12,250.00	
(2) Materials Used								
Brick (Clay)	No.	550.00	63.6	77.8	34,980.00	42,790.00	77,770.00	
Cement	lb	356.40	54.2	2.8	19,316.88	997.92	20,314.80	
Sand	cu-ft	12.00	257.1	210.4	3,085.20	2,524.80	5,610.00	
Total	-	-	-	-	59,607.1	66,337.7	125,945.00	(Kyat / per %sq-ft)

10-1-4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.50	350.0	3,150.0	1,225.00	11,025.00	12,250.00	
(2) Materials Used								
Brick (Cement)	No.	550.00	93.8	62.6	51,590.00	34,430.00	86,020.00	
Cement	lb	356.40	54.2	2.8	19,316.88	997.92	20,314.80	
Sand	cu-ft	12.00	257.1	210.4	3,085.20	2,524.80	5,610.00	
Total	-	-	-	-	76,217.1	57,977.7	134,195.00	(Kyat / per %sq-ft)

10-1-5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick) (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.50	500.0	4,500.0	750.00	6,750.00	7,500.00	
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	

10-1-5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick) (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
Brick (Clay)	No.	345.00	63.6	77.8	21,942.00	26,841.00	48,783.00	
Cement	lb	238.00	54.2	2.8	12,899.60	666.40	13,566.00	
Sand	cu-ft	8.00	257.1	210.4	2,056.80	1,683.20	3,740.00	
Total	-	-	-	-	38,173.4	40,665.6	78,839	(Kyat / per %sq-ft)

10-1-6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.50	500.0	4,500.0	750.00	6,750.00	7,500.00	
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(2) Materials Used								
Brick (Cement)	No.	345.00	93.8	62.6	32,361.00	21,597.00	53,958.00	
Cement	lb	238.00	54.2	2.8	12,899.60	666.40	13,566.00	
Sand	cu-ft	8.00	257.1	210.4	2,056.80	1,683.20	3,740.00	
Total	-	-	-	-	48,592.4	35,421.6	84,014	(Kyat / per %sq-ft)

10-1-7. (1:3:6) C.C (Cement Concrete) work for Copping & Bed Kerb

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
Cement	lb	1,440.00	54.2	2.8	78,048.00	4,032.00	82,080.00	
Sand	cu-ft	48.00	257.1	210.4	12,340.80	10,099.20	22,440.00	
River Shingle	cu-ft	96.00	543.0	444.3	52,128.00	42,652.80	94,780.80	
Total	-	-	-	-	145,816.8	86,484.0	232,301	(Kyat / per %sq-ft)

10-1-8. Pointing Work (with 1:3 cement mortar)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Cement	lb	54.27	54.2	2.8	2,941.43	151.96	3,093.39	
Sand	cu-ft	468.00	257.1	210.4	120,322.80	98,467.20	218,790.00	
Total	-	-	-	-	124,464.2	109,419.2	233,883	(Kyat / per %sq-ft)

10-1-9. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	9.00	500.0	4,500.0	4,500.00	40,500.00	45,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	

10-1-9. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
6"-9" Stone Boulder	cu-ft	125.00	487.2	324.8	60,900.00	40,600.00	101,500.00	
Cement	lb	432.00	54.2	2.8	23,414.40	1,209.60	24,624.00	
Sand	cu-ft	14.00	257.1	210.4	3,599.40	2,945.60	6,545.00	
River Shingle	cu-ft	28.00	543.0	444.3	15,204.00	12,440.40	27,644.40	
Total	-	-	-	-	110,417.8	122,895.6	233,313	(Kyat / per %sq-ft)

10-2. G.C (Gravelly Clay) Filling Inner Slope

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250.00	(Kyat / per sud)

10-3. Brick Work in (1:3) Cement Mortar

10-3-1. Brick Work in (1:3) Cement Mortar (With Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Cement	lb	54.27	54.2	2.8	2,941.43	151.96	3,093.39	
Sand	cu-ft	468.00	257.1	210.4	120,322.80	98,467.20	218,790.00	
Total	-	-	-	-	124,464.23	109,419.16	233,883	(Kyat / per %sq-ft)

10-3-2. Brick Work in (1:3) Cement Mortar (With Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Cement	lb	54.27	54.2	2.8	2,941.43	151.96	3,093.39	
Sand	cu-ft	468.00	257.1	210.4	120,322.80	98,467.20	218,790.00	
Total	-	-	-	-	124,464.23	109,419.16	233,883	(Kyat / per %sq-ft)

10-4. Timber Shuttering form Work

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Jungle Wood (Scant)	cu-ft	1.50	2,083.0	8,331.8	3,124.50	12,497.70	15,622.20	
Jungle Wood (Plank)	cu-ft	0.92	2,083.0	8,331.8	1,916.36	7,665.26	9,581.62	
Wire	lb	3.00	680.5	291.7	2,041.50	875.10	2,916.60	
Total	-	-	-	-	9,782.4	45,338.1	55,121	(Kyat / per %sq-ft)

11. Repairing & Reconstruction of Canal Structures

11-1. Re-Construction of Structures

11-1-1. Drop

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	60.00	500.0	4,500.0	30,000.00	270,000.00	300,000.00	
Carpenter	day	5.00	500.0	4,500.0	2,500.00	22,500.00	25,000.00	
Labor	day	92.00	350.0	3,150.0	32,200.00	289,800.00	322,000.00	
(2) Materials Used								
Cement	lb	7,840.00	54.2	2.8	424,928.00	21,952.00	446,880.00	
Sand	cu-ft	300.00	257.1	210.4	77,130.00	63,120.00	140,250.00	
River Shingle	cu-ft	200.00	543.0	444.3	108,600.00	88,860.00	197,460.00	
Brick (Cement)	No.	4,280.00	93.8	62.6	401,464.00	267,928.00	669,392.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	1,076,822.0	1,524,160.0	2,600,982	(Kyat / per unit)

11-1-2. Head Regulator

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	60.00	500.0	4,500.0	30,000.00	270,000.00	300,000.00	
Carpenter	day	5.00	500.0	4,500.0	2,500.00	22,500.00	25,000.00	
Labor	day	92.00	350.0	3,150.0	32,200.00	289,800.00	322,000.00	
(2) Materials Used								
Cement	lb	7,840.00	54.2	2.8	424,928.00	21,952.00	446,880.00	
Sand	cu-ft	300.00	257.1	210.4	77,130.00	63,120.00	140,250.00	
River Shingle	cu-ft	200.00	543.0	444.3	108,600.00	88,860.00	197,460.00	
Brick (Cement)	No.	4,280.00	93.8	62.6	401,464.00	267,928.00	669,392.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	1,076,822.0	1,524,160.0	2,600,982	(Kyat / per unit)

11-1-3. Drain Box Culvert

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	56.00	500.0	4,500.0	28,000.00	252,000.00	280,000.00	
Carpenter	day	250.00	500.0	4,500.0	125,000.00	1,125,000.00	1,250,000.00	
Labor	day	792.00	350.0	3,150.0	277,200.00	2,494,800.00	2,772,000.00	
(2) Materials Used								
Cement	lb	53222.00	54.2	2.8	2,884,632.40	149,021.60	3,033,654.00	
Sand	cu-ft	1902.00	257.1	210.4	489,004.20	400,180.80	889,185.00	
River Shingle	cu-ft	1525.00	543.0	444.3	828,075.00	677,557.50	1,505,632.50	
Brick (Cement)	No.	29356.00	93.8	62.6	2,753,592.80	1,837,685.60	4,591,278.40	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	7,385,504.4	7,436,245.5	14,821,750	(Kyat / per unit)

11-1-4. Road Crossing and Bridge

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	110.00	500.0	4,500.0	55,000.00	495,000.00	550,000.00	
Labor	day	344.00	350.0	3,150.0	120,400.00	1,083,600.00	1,204,000.00	
(2) Materials Used								
Cement	lb	28336.00	54.2	2.8	1,535,811.20	79,340.80	1,615,152.00	
Sand	cu-ft	1487.00	257.1	210.4	382,307.70	312,864.80	695,172.50	
River Shingle	cu-ft	978.00	543.0	444.3	531,054.00	434,525.40	965,579.40	
Brick (Cement)	No.	19527.00	93.8	62.6	1,831,632.60	1,222,390.20	3,054,022.80	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	4,456,205.5	4,127,721.2	8,583,927	(Kyat / per unit)

11-1-5. Syphon

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Carpenter	day	35.00	500.0	4,500.0	17,500.00	157,500.00	175,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	54.2	2.8	916,630.40	47,353.60	963,984.00	
Sand	cu-ft	772.00	257.1	210.4	198,481.20	162,428.80	360,910.00	
River Shingle	cu-ft	998.00	543.0	444.3	541,914.00	443,411.40	985,325.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	1,964,575.6	2,553,343.8	4,517,919	(Kyat / per unit)

11-1-6. Turn Out

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Carpenter	day	35.00	500.0	4,500.0	17,500.00	157,500.00	175,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	54.2	2.8	916,630.40	47,353.60	963,984.00	
Sand	cu-ft	772.00	257.1	210.4	198,481.20	162,428.80	360,910.00	
River Shingle	cu-ft	998.00	543.0	444.3	541,914.00	443,411.40	985,325.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	1,964,575.6	2,553,343.8	4,517,919	(Kyat / per unit)

11-2. Repairing of Structures

11-2-1. Drop (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	10.00	500.0	4,500.0	5,000.00	45,000.00	50,000.00	
Labor	day	30.00	350.0	3,150.0	10,500.00	94,500.00	105,000.00	

11-2-1. Drop (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
Cement	lb	6,361.60	54.2	2.8	344,798.72	17,812.48	362,611.20	
Sand	sud	4.06	25,712.5	21,037.5	104,392.75	85,412.25	189,805.00	
River Shingle	sud	2.98	54,301.5	44,428.5	161,818.47	132,396.93	294,215.40	
Brick (Cement)	No.	2,359.00	93.8	62.6	221,274.20	147,673.40	368,947.60	
Miscellaneous Works	L.S				0.00	30,000.00	30,000.00	
Total	-	-	-	-	847,784.1	552,795.1	1,400,579	(Kyat / per unit)

11-2-2. Head Regulator

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	7.00	500.0	4,500.0	3,500.00	31,500.00	35,000.00	
Labor	day	15.00	350.0	3,150.0	5,250.00	47,250.00	52,500.00	
(2) Materials Used								
Cement	lb	6,300.00	54.2	2.8	341,460.00	17,640.00	359,100.00	
Sand	sud	3.75	25,712.5	21,037.5	96,421.88	78,890.63	175,312.51	
River Shingle	sud	5.63	54,301.5	44,428.5	305,717.45	250,132.46	555,849.91	
Brick (Cement)	No.	281.00	93.8	62.6	26,357.80	17,590.60	43,948.40	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	778,707.1	543,003.7	1,321,711	(Kyat / per unit)

11-2-3. Drain Box Culvert

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	28.00	500.0	4,500.0	14,000.00	126,000.00	140,000.00	
Labor	day	47.00	350.0	3,150.0	16,450.00	148,050.00	164,500.00	
(2) Materials Used								
Cement	lb	3,461.80	54.2	2.8	187,629.56	9,693.04	197,322.60	
Sand	sud	2.00	25,712.5	21,037.5	51,425.00	42,075.00	93,500.00	
River Shingle	sud	3.00	54,301.5	44,428.5	162,904.50	133,285.50	296,190.00	
Brick (Cement)	No.	1,500.00	93.8	62.6	140,700.00	93,900.00	234,600.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	573,109.1	653,003.5	1,226,113	(Kyat / per unit)

11-2-4. Road Crossing and Bridge

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	40.00	500.0	4,500.0	20,000.00	180,000.00	200,000.00	
Labor	day	73.00	350.0	3,150.0	25,550.00	229,950.00	255,500.00	
(2) Materials Used								
Cement	lb	6,720.00	54.2	2.8	364,224.00	18,816.00	383,040.00	
Sand	sud	4.00	25,712.5	21,037.5	102,850.00	84,150.00	187,000.00	
River Shingle	sud	6.00	54,301.5	44,428.5	325,809.00	266,571.00	592,380.00	
Brick (Cement)	No.	3,000.00	93.8	62.6	281,400.00	187,800.00	469,200.00	
Miscellaneous Works	L.S				0.00	10,000.00	10,000.00	
Total	-	-	-	-	1,119,833.0	977,287.0	2,097,120	(Kyat / per unit)

11-2-5. Syphon

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Carpenter	day	385.00	500.0	4,500.0	192,500.00	1,732,500.00	1,925,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	54.2	2.8	916,630.40	47,353.60	963,984.00	
Sand	cu-ft	772.00	257.1	210.4	198,481.20	162,428.80	360,910.00	
River Shingle	cu-ft	998.00	543.0	444.3	541,914.00	443,411.40	985,325.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	2,139,575.6	3,728,343.8	5,867,919	(Kyat / per unit)

11-2-6. Turn Out

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	9.00	500.0	4,500.0	4,500.00	40,500.00	45,000.00	
Carpenter	day	21.00	500.0	4,500.0	10,500.00	94,500.00	105,000.00	
Labor	day	167.00	350.0	3,150.0	58,450.00	526,050.00	584,500.00	
(2) Materials Used								
Cement	lb	10992.80	54.2	2.8	595,809.76	30,779.84	626,589.60	
Sand	cu-ft	501.80	257.1	210.4	129,012.78	105,578.72	234,591.50	
River Shingle	cu-ft	648.70	543.0	444.3	352,244.10	288,217.41	640,461.51	
Brick (Cement)	No.	1137.50	93.8	62.6	106,697.50	71,207.50	177,905.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	1,257,214.1	1,256,833.5	2,514,048	(Kyat / per unit)

11-3. Repairing of Canal Gate Leaf, Frame & Gear Assembly

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Smith	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	4.00	350.0	3,150.0	1,400.00	12,600.00	14,000.00	
(2) Materials Used								
Steel Gate	No.	1.00	135,000.0	15,000.0	135,000.00	15,000.00	150,000.00	
Steel Rod (10mm)	lb	20.00	73.6	3.9	1,472.00	78.00	1,550.00	
Binding Wire	lb	4.00	1,050.0	450.0	4,200.00	1,800.00	6,000.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	143,072.0	138,478.0	281,550	(Kyat / per item)

12. Road Work

12-1. G.C (Gravelly Clay) Laying Work

12-1-1. G.C Laying and Spreading Work for DY Canal Inspection Path

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(laying, dressing, spreading & compacting)								
(2) Materials Used								
Gravelly Clay (G.C)	cu-ft	110.00	285.4	190.3	31,394.00	20,933.00	52,327.00	
Total	-	-	-	-	31,919.0	25,658.0	57,577	(Kyat / per sud)

12-1-2. G.C Laying and Spreading Work for DY Canal Non Inspection Path

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(laying, dressing, spreading & compacting)								
(2) Materials Used								
Gravelly Clay (G.C)	cu-ft	110.00	285.4	190.3	31,394.00	20,933.00	52,327.00	
Total	-	-	-	-	31,919.0	25,658.0	57,577	(Kyat / per sud)

12-2. Concrete Paving Work

12-2-1. Mixing only Cement Concrete (1:2:4) with (0.5" to 0.75") Gauge Stone Chippings on River Shingle

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
(2) Materials Used								
Cement	lb	2,070.00	54.2	2.8	112,194.00	5,796.00	117,990.00	
River Shingle	cu-ft	92.00	543.0	444.3	49,956.00	40,875.60	90,831.60	
Sand	cu-ft	46.00	257.1	210.4	11,826.60	9,678.40	21,505.00	
Total	-	-	-	-	177,976.6	92,350.0	270,327	(Kyat / per sud)

12-2-2. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
Total	-	-	-	-	1,550.0	13,950.0	15,500	(Kyat / per sud)

12-2-3. Timber Shuttering Formworks

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Jungle Wood (Scant)	cu-ft	1.50	2,083.0	8,331.8	3,124.50	12,497.70	15,622.20	
Jungle Wood (Plank)	cu-ft	0.92	2,083.0	8,331.8	1,916.36	7,665.26	9,581.62	
Wire Nail	lb	3.00	680.5	291.7	2,041.50	875.10	2,916.60	
Total	-	-	-	-	9,782.4	45,338.1	55,121	(Kyat / per %sq-ft)

12-2-4. Reinforcing Bar Preparation and Assembly

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
Steel Fixer	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(2) Materials Used								
Steel Rod (10mm)	lb	117.60	73.6	3.9	8,655.36	458.64	9,114.00	
Binding Wire	lb	1.00	1,050.0	450.0	1,050.00	450.00	1,500.00	
Total	-	-	-	-	10,555.4	8,558.6	19,114	(Kyat / per CWT)

13. Repairing and Construction of Permanent Buildings

13-1. Repairing and Construction of Building (Bin Thar Quarter, Office, etc.)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	20.00	500.0	4,500.0	10,000.00	90,000.00	100,000.00	
Labor	day	30.00	350.0	3,150.0	10,500.00	94,500.00	105,000.00	
(2) Materials Used								
Repairing and Construction of Building	Set	1.00	4,000,000.0	6,000,000.0	4,000,000.00	6,000,000.00	10,000,000.00	
Miscellaneous Works	L.S				0.00	2,850,000.00	2,850,000.00	
Total	-	-	-	-	4,020,500.0	9,034,500.0	13,055,000	(Kyat / per item)

14. Other Related Works

14-1. Repairing of Motor Vehicles, Water Pumps and Generators

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Operator (Machine Driver)	day	4.00	400.0	3,600.0	1,600.00	14,400.00	16,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
Total	-	-	-	-	5,100.0	45,900.0	51,000	(Kyat / per item)

14-2. Earth Work for Drainage Canal

14-2-1. Earth Work for Drainage Canal (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.0	4,725.0	5,250	(Kyat / per sud)

14-2-2. Earth Work for Drainage Canal (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.2600	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	5.85	
Total	-	-	-	-	1,067.7	56.2	1,124	(Kyat / per sud)

14-3. Management of Construction Materials and Equipment

14-3-1. Shifting of Materials from Temporary Stock-pile to Work Site

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							
(2) Labor								
Labor	day	0.05	350.0	3,150.0	17.50	157.50	175.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Engine Oil	gal	0.0052	17,100.0	900.0	88.92	4.68	93.60	
Lubricant	gal	0.0013	14,250.0	750.0	18.53	0.98	19.51	
Total	-	-	-	-	1,113.0	215.2	1,328	(Kyat / per item)

14-3-2. Transporting of Materials from Quarry to Stock-pile (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							

14-3-2. Transporting of Materials from Quarry to Stock-pile (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Labor								
Labor	day	0.05	350.0	3,150.0	17.50	157.50	175.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.36	3,800.0	200.0	1,368.00	72.00	1,440.00	
Engine Oil	gal	0.0072	17,100.0	900.0	123.12	6.48	129.60	
Lubricant	gal	0.0018	14,250.0	750.0	25.65	1.35	27.00	
Total	-	-	-	-	1,534.3	237.3	1,772	(Kyat / per item)

14-3-3. Transporting and Shifting of Heavy Machines

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							
(2) Labor								
Operator (Machine Driver)	day	10.00	400.0	3,600.0	4,000.00	36,000.00	40,000.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.36	3,800.0	200.0	1,368.00	72.00	1,440.00	
Engine Oil	gal	0.0072	17,100.0	900.0	123.12	6.48	129.60	
Lubricant	gal	0.0018	14,250.0	750.0	25.65	1.35	27.00	
Total	-	-	-	-	5,516.8	36,079.8	41,597	(Kyat / per item)

14-3-4. Loading and Unloading Charges of Materials

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
Total	-	-	-	-	2,800.0	25,200.0	28,000	(Kyat / per item)

14-4. Dewatering Works

14-4-1. Water Pump for Dewatering Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Water Pump	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	10.00	3,800.0	200.0	38,000.00	2,000.00	40,000.00	
Total	-	-	-	-	38,000.0	2,000.0	40,000	(Kyat / per gal)

14-5. Welfare Charges for Labor

14-5-1. Hnee Thatch

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.002	350.0	3,150.0	0.70	6.30	7.00	
(2) Materials Used								
Hnee Thatch	item	0.002	10,000.0	200,000.0	20.00	400.00	420.00	
Total	-	-	-	-	20.7	406.3	427	(Kyat / per item)

14-5-2. Bamboo

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.004	350.0	3,150.0	1.40	12.60	14.00	
(2) Materials Used								
Bamboo	item	0.005	5,000.0	100,000.0	25.00	500.00	525.00	
Total	-	-	-	-	26.4	512.6	539	(Kyat / per item)

14-6. Labor Charges for Day & Night Watchman, Helper, Checker and General Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
Total	-	-	-	-	350.0	3,150.0	3,500	(Kyat / per M/D)

14-7. Camps Facilities (Lighting, Water Supply, etc.)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Water Pump	Irrigation Department							1 gal/bowser
Water Bowser	Irrigation Department							3 gal/trip
Diesel Generator	Irrigation Department							1 gal/hr
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	1.00	3,800.0	200.0	3,800.00	200.00	4,000.00	4 hr/day
(Water Pump)								
Diesel (H.S.D.)	gal	3.00	3,800.0	200.0	11,400.00	600.00	12,000.00	1 trip/day
(Water Bowser)								
Diesel (H.S.D.)	gal	4.00	3,800.0	200.0	15,200.00	800.00	16,000.00	1 bowser/day
(Generator)								
Total	-	-	-	-	30,400.0	1,600.0	32,000	(Kyat / per gal)

14-8. Making Data Boards and Sign Boards

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Painter	day	0.10	500.0	4,500.0	50.00	450.00	500.00	
Carpenter	day	0.10	500.0	4,500.0	50.00	450.00	500.00	
Labor	day	0.05	350.0	3,150.0	17.50	157.50	175.00	
(2) Materials Used								
Ply Wood (8'x4')	No.	0.05	3,000.0	12,000.0	150.00	600.00	750.00	
Paint	gal	0.05	10,000.0	10,000.0	500.00	500.00	1,000.00	
Painting charges	L.S	0.04	1,500.0	13,500.0	60.00	540.00	600.00	
Beading 1"x½"	cu-ft	0.03	5,207.5	5,207.5	156.23	156.23	312.46	
Total	-	-	-	-	983.7	2,853.7	3,837	(Kyat / per item)

14-9. Estimating, Copying, Photo Recording and Stationary Charges, etc;

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Materials Used								
Paper	Page	100.00	3.0	7.0	300.00	700.00	1,000.00	
(2) Service Charges								
Typing & Printing charges	Page	20.00	25.0	225.0	500.00	4,500.00	5,000.00	
Photo & Printing charges	Page	10.00	50.0	450.0	500.00	4,500.00	5,000.00	
Copying charges	Page	60.00	2.5	22.5	150.00	1,350.00	1,500.00	
Binding charges	No.	2.00	100.0	900.0	200.00	1,800.00	2,000.00	
Total	-	-	-	-	1,650.0	12,850.0	14,500	(Kyat / per item)

14-10. Miscellaneous

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
Miscellaneous	item	1.00	5,000.0	100,000.0	5,000.00	100,000.00	105,000.00	
Total	-	-	-	-	5,000.0	100,000.0	105,000	(Kyat / per item)

3.2 Analysis Rate (Productivity) for South Nawin Irrigation System

3.2.1 Analysis Rate for Main Canal

1. Preparatory Works

1-1. Survey and Profile Works (Canal length : 30 feet / sect)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Lime (Strained Lime)	cu-ft	0.20	350.0	3,150.0	70.00	630.00	700.00	
Plastic ream	No.	0.67	90.0	810.0	60.00	540.00	600.00	for finishing stake
Labor	day	0.10	350.0	3,150.0	35.00	315.00	350.00	
Total	-	-	-	-	315.00	2,835.00	3,150	(Kyat / per sect)

1-2. Temporary Camp & Stores

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) 4"~6"φMyaw Post Work								
4"~6"φMyaw (J/Wood)	No.	12.00	1,200.0	4,800.0	14,400.00	57,600.00	72,000.00	
Carpenter	day	0.50	500.0	4,500.0	250.00	2,250.00	2,500.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) 2"~4"φMyaw Post Work								
2"~4"φMyaw (J/Wood)	No.	43.00	400.0	1,600.0	17,200.00	68,800.00	86,000.00	
Wire Nail	viss	2.00	2,450.0	1,050.0	4,900.00	2,100.00	7,000.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
(3) Hnee Thatch Roofing Work								
Hnee Thatch	No.	550.00	50.0	450.0	27,500.00	247,500.00	275,000.00	
Bamboo	No.	75.00	50.0	450.0	3,750.00	33,750.00	37,500.00	
Wire Nail	viss	2.50	2,450.0	1,050.0	6,125.00	2,625.00	8,750.00	
Carpenter	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
(4) Roll Mat Ridging Work								
Roll Mat (12'×3')	No.	6.00	180.0	1,620.0	1,080.00	9,720.00	10,800.00	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.25	500.0	4,500.0	125.00	1,125.00	1,250.00	
(5) Bamboo Flooring Work								
Bamboo	No.	150.00	50.0	450.0	7,500.00	67,500.00	75,000.00	
Wire Nail	viss	1.50	2,450.0	1,050.0	3,675.00	1,575.00	5,250.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(6) Bamboo Mat Walling (Single)								
Bamboo Mat	sq-ft	1,173.00	20.0	180.0	23,460.00	211,140.00	234,600.00	
Bamboo	No.	15.00	50.0	450.0	750.00	6,750.00	7,500.00	
Wire Nail	viss	1.00	2,450.0	1,050.0	2,450.00	1,050.00	3,500.00	
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
(7) Bamboo Hand Rail work								
Bamboo	No.	15.00	50.0	450.0	750.00	6,750.00	7,500.00	
Wire Nail	viss	0.25	2,450.0	1,050.0	612.50	262.50	875.00	
Carpenter	day	0.25	500.0	4,500.0	125.00	1,125.00	1,250.00	
Total	-	-	-	-	123,497.50	799,127.50	922,625	(Kyat / per unit)

1-3. Temporary Barracks for Repair (4 units)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Hnee Thatch Roofing Work								
Hnee Thatch	No.	150.00	50.0	450.0	7,500.00	67,500.00	75,000.00	
Bamboo	No.	26.00	50.0	450.0	1,300.00	11,700.00	13,000.00	
Wire Nail	viss	0.20	2,450.0	1,050.0	490.00	210.00	700.00	
Binding Wire	lb	0.25	1,050.0	450.0	262.50	112.50	375.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(2) Double Bamboo Rollmat Ridging work								
Roll Mat (12'×3')	No.	5.00	180.0	1,620.0	900.00	8,100.00	9,000.00	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Labor	day	0.30	350.0	3,150.0	105.00	945.00	1,050.00	
(3) Spitted Bamboo flooring work								
Bamboo	No.	55.00	50.0	450.0	2,750.00	24,750.00	27,500.00	
Wire Nail	viss	0.30	2,450.0	1,050.0	735.00	315.00	1,050.00	
Binding Wire	lb	2.00	1,050.0	450.0	2,100.00	900.00	3,000.00	
Carpenter	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(4) Bamboo Mat Walling Work								
Bamboo Mat	sq-ft	140.00	20.0	180.0	2,800.00	25,200.00	28,000.00	
Jungle Wood (Plank)	cu-ft	0.32	2,083.0	8,331.8	666.56	2,666.18	3,332.74	
Wire Nail	viss	0.50	2,450.0	1,050.0	1,225.00	525.00	1,750.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(5) Bamboo Mat Door Work								
Bamboo Mat	sq-ft	30.00	20.0	180.0	600.00	5,400.00	6,000.00	
Jungle Wood (Plank)	cu-ft	2.20	2,083.0	8,331.8	4,582.60	18,329.96	22,912.56	
Wire Nail	viss	0.20	2,450.0	1,050.0	490.00	210.00	700.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(6) Bamboo Mat Window Work								
Bamboo	No.	6.00	50.0	450.0	300.00	2,700.00	3,000.00	
Jungle Wood (Plank)	cu-ft	0.60	2,083.0	8,331.8	1,249.80	4,999.08	6,248.88	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.63	500.0	4,500.0	315.00	2,835.00	3,150.00	
(7) Splitted Bamboo Triellis Work								
Bamboo	No.	21.00	50.0	450.0	1,050.00	9,450.00	10,500.00	
Wire Nail	viss	0.60	2,450.0	1,050.0	1,470.00	630.00	2,100.00	
Carpenter	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
(8) Iron fitting Work								
Butt Hinge	No.	40.00	700.0	300.0	28,000.00	12,000.00	40,000.00	
Hasp & Staple	No.	6.00	350.0	150.0	2,100.00	900.00	3,000.00	
Handle	No.	10.00	700.0	300.0	7,000.00	3,000.00	10,000.00	
Tower Bolt	No.	20.00	840.0	360.0	16,800.00	7,200.00	24,000.00	
Screw	gross	1.00	1,400.0	600.0	1,400.00	600.00	2,000.00	
Total	-	-	-	-	91,381.46	253,687.72	345,069	(Kyat / per unit)

1-4. Temporary Latrines

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Site Cleaning & Earth Work								
Site Cleaning Work for Latrines	set	1.00	600.0	5,400.0	600.00	5,400.00	6,000.00	
Digging for Post Hole (Barrack etc.)	No.	4.00	30.0	270.0	120.00	1,080.00	1,200.00	
Digging for Pit Hole (Latrines)	No.	1.00	1,200.0	10,800.0	1,200.00	10,800.00	12,000.00	
(2) 4"~6"φMyaw Post Work								
4"~6"φMyaw (J/Wood)	No.	7.00	1,200.0	8,400.0	8,400.00	33,600.00	42,000.00	
Wire Nail	viss	0.30	2,450.0	1,050.0	735.00	315.00	1,050.00	
Carpenter	day	1.40	500.0	4,500.0	700.00	6,300.00	7,000.00	
Labor	day	0.90	350.0	3,150.0	315.00	2,835.00	3,150.00	
(3) 2"~4"φMyaw Post Work								
2"~4"φMyaw (J/Wood)	No.	5.00	400.0	1,600.0	2,000.00	8,000.00	10,000.00	
Wire Nail	viss	0.20	2,450.0	1,050.0	490.00	210.00	700.00	
Carpenter	day	0.60	500.0	4,500.0	300.00	2,700.00	3,000.00	
Labor	day	0.60	350.0	3,150.0	210.00	1,890.00	2,100.00	
(4) Hnee Thatch Roofing Work								
Hnee Thatch	No.	43.20	50.0	450.0	2,160.00	19,440.00	21,600.00	
Bamboo	No.	9.00	50.0	450.0	450.00	4,050.00	4,500.00	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Binding Wire	lb	1.00	1,050.0	450.0	1,050.00	450.00	1,500.00	
Carpenter	day	0.40	500.0	4,500.0	200.00	1,800.00	2,000.00	
Labor	day	0.40	350.0	3,150.0	140.00	1,260.00	1,400.00	
(5) 6"×1" Plank Flooring Work								
Jungle Wood (Plank)	cu-ft	1.30	2,083.0	8,331.8	2,707.90	10,831.34	13,539.24	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.20	500.0	4,500.0	100.00	900.00	1,000.00	
Labor	day	0.10	350.0	3,150.0	35.00	315.00	350.00	
(6) Bamboo Mat Walling Work								
Bamboo Mat	sq-ft	96.60	20.0	180.0	1,932.00	17,388.00	19,320.00	
Jungle Wood (Plank)	cu-ft	0.30	2,083.0	8,331.8	624.90	2,499.54	3,124.44	
Wire Nail	viss	0.40	2,450.0	1,050.0	980.00	420.00	1,400.00	
Carpenter	day	0.80	500.0	4,500.0	400.00	3,600.00	4,000.00	
(7) Bamboo Mat Door Work								
Bamboo Mat	sq-ft	12.00	20.0	180.0	240.00	2,160.00	2,400.00	
Jungle Wood (Plank)	cu-ft	1.10	2,083.0	8,331.8	2,291.30	9,164.98	11,456.28	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.50	500.0	4,500.0	250.00	2,250.00	2,500.00	
(8) Iron fitting Work								
Butt Hinge	No.	2.00	700.0	300.0	1,400.00	600.00	2,000.00	
Hasp & Staple	No.	1.00	350.0	150.0	350.00	150.00	500.00	
Handle	No.	2.00	700.0	300.0	1,400.00	600.00	2,000.00	
Tower Bolt	No.	1.00	840.0	360.0	840.00	360.00	1,200.00	
Lock & Key	No.	1.00	1,400.0	600.0	1,400.00	600.00	2,000.00	
Screw	gross	2.00	1,400.0	600.0	2,800.00	1,200.00	4,000.00	
Purchasing & Fixing of W.C. Pan	No.	1.00	5,600.0	2,400.0	5,600.00	2,400.00	8,000.00	
Total	-	-	-	-	43,156.10	155,883.86	199,040	(Kyat / per unit)

1-5. Making Stock Pile Yards

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Earth Work								
Digging for Post Hole (Barrack etc.)	No.	47.00	30.0	270.0	1,410.00	12,690.00	14,100.00	
(2) Wagut Walling with Bamboo Rail Work								
Wagut (5'×2'6")	No.	40.00	240.0	960.0	9,600.00	38,400.00	48,000.00	
4"~6"φMyaw (J/Wood)	No.	15.00	1,200.0	4,800.0	18,000.00	72,000.00	90,000.00	
Bamboo	No.	33.00	50.0	450.0	1,650.00	14,850.00	16,500.00	
Wire Nail	viss	1.50	2,450.0	1,050.0	3,675.00	1,575.00	5,250.00	
Binding Wire	lb	3.00	1,050.0	450.0	3,150.00	1,350.00	4,500.00	
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	4.00	350.0	3,150.0	1,400.00	12,600.00	14,000.00	
Total	-	-	-	-	40,885.00	171,465.00	212,350	(Kyat / per unit)

1-6. Labor Transporting Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck (Capacity = 5ton)	Irrigation Department							
(2) Labor Transportation								
(a) Tar road	mile	5.00						
Diesel (H.S.D.)	gal	0.50	3,800.0	200.0	1,900.00	100.00	2,000.00	Tar road : 10mile/gal
(b) offroad	mile	4.00						
Diesel (H.S.D.)	gal	0.50	3,800.0	200.0	1,900.00	100.00	2,000.00	Off road : 8mile/gal
Total	-	-	-	-	3,800.00	200.00	4,000	(Kyat / per item)

1-7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas

1-7-1. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.30	350.0	3,150.0	105.00	945.00	1,050.00	
Total	-	-	-	-	105.00	945.00	1,050	(Kyat / per %sq-ft)

1-7-2. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Bulldozer	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	11.00	3,800.0	200.0	41,800.00	2,200.00	44,000.00	
Engine Oil	gal	0.22	17,100.0	900.0	3,762.00	198.00	3,960.00	
Hydraulic Oil	gal	0.22	9,500.0	500.0	2,090.00	110.00	2,200.00	
Grease	lb	0.055	4,275.0	225.0	235.13	12.38	247.51	
Total	-	-	-	-	47,887.13	2,520.38	50,408	(Kyat / per acres)

2. Earth Works

2-1. Canal Bank Raising and Canal Resectioning Works

2-1-1. Canal Bank Raising Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	6.00	
Total	-	-	-	-	1,067.66	56.19	1,124	(Kyat / per sud)

2-1-1. Canal Bank Raising Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.32	3,800.0	200.0	1,216.00	64.00	1,280.00	
Hydraulic Oil	gal	0.0075	9,500.0	500.0	71.25	3.75	75.00	
Engine Oil	gal	0.0075	17,100.0	900.0	128.25	6.75	135.00	
Grease	lb	0.012	4,275.0	225.0	51.30	2.70	54.00	
Total	-	-	-	-	1,466.80	77.20	1,544	(Kyat / per sud)

2-1-2. Canal Resectioning Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	6.00	
Total	-	-	-	-	1,067.66	56.19	1,124	(Kyat / per sud)

2-1-2. Canal Resectioning Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.32	3,800.0	200.0	1,216.00	64.00	1,280.00	
Hydraulic Oil	gal	0.0075	9,500.0	500.0	71.25	3.75	75.00	
Engine Oil	gal	0.0075	17,100.0	900.0	128.25	6.75	135.00	
Grease	lb	0.012	4,275.0	225.0	51.30	2.70	54.00	
Total	-	-	-	-	1,466.80	77.20	1,544	(Kyat / per sud)

2-1-3. Canal Resectioning Work (by Blasting (at Rock Portion))

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Materials								
Dynamite	gram	488.00	0.87	3.49	424.56	1,703.12	2,127.68	
Detonator	Pcs	1.00	35.2	140.8	35.20	140.80	176.00	
(2) Machine								
Air Compressor , BackHoe , Dozer , Tipper	Irrigation Department							
Diesel (H.S.D.)	gal	1.56	3,800.0	200.0	5,928.00	312.00	6,240.00	
Lubricant	gal	0.001	14,250.0	750.0	14.25	0.75	15.00	
Grease	lb	0.001	4,275.0	225.0	4.28	0.23	4.51	
Miscellaneous	L.S	1.00	0.0	350.0	0.00	350.00	350.00	
Total	-	-	-	-	6,406.29	2,506.90	8,913	(Kyat / per sud)

2-1-4. Canal Resectioning Work (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-2. E/W (Earth Work) Filling into Canal Section and Inner Side Slop

2-2-1. E/W Filling into Canal Section and Inner Side Slop (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-2-2. E/W Filling into Canal Section and Inner Side Slop (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	6.00	
Total	-	-	-	-	1,067.66	56.19	1,124	(Kyat / per sud)

2-3. G.C (Gravelly Clay) Filling and Compacting Works in Canal Section and Inner Slope

2-3-1. G.C Filling and Compacting Works in Canal Section and Inner Slope (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-3-2. G.C Filling and Compacting Works in Canal Section and Inner Slope (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	5.85	
Total	-	-	-	-	1,067.66	56.19	1,124	(Kyat / per sud)

2-4. Making of Temporary Cofferdam for Necessary of Work

2-4-1. Making of Temporary Cofferdam for Necessary of Work (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(Digging)								
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(Packing & Carrying)								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(Stacking)								
(2) Materials Used								
Penan Bag	No.	100.00	30.0	270.0	3,000.00	27,000.00	30,000.00	
Total	-	-	-	-	4,575.0	41,175.0	45,750	(Kyat / per sud)

2-4-2. Making of Temporary Cofferdam for Necessary of Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.74	3,800.0	200.0	2,812.00	148.00	2,960.00	
Lubricant	gal	0.0148	14,250.0	750.0	210.90	11.10	222.00	
Grease	lb	0.0037	4,275.0	225.0	15.82	0.83	16.65	
Total	-	-	-	-	3,038.72	159.93	3,199	(Kyat / per sud)

2-5. Earth Work Excavation for Bed Kerb & Compartment and Copping (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-6. Earth Work in Dressing (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-7. Earth Work in Base Stripping 3"thick (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-8. Unsilted of Main Canal

2-8-1. Unsilted of Main Canal (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	3.80	350.0	3,150.0	1,330.00	11,970.00	13,300.00	
Total	-	-	-	-	1,330.0	11,970.0	13,300	(Kyat / per sud)

2-8-2. Unsilted of Main Canal (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	5.85	
Total	-	-	-	-	1,067.66	56.19	1,124	(Kyat / per sud)

3. Repairing and Construction of Linings Works

3-1. Brick Lining Work

3-1-1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per %sq-ft)

3-1-2. Making of Ring Bund with Sand Bags

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
(Digging)								
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(Carring & packing)								
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
(Placing & stacking)								
(2) Materials Used								
Penan Bag	No.	46.67	30.0	270.0	1,400.10	12,600.90	14,001.00	
Total	-	-	-	-	5,600.10	50,400.90	56,001	(Kyat / per %cu-ft)

3-1-3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.50	350.0	3,150.0	1,225.00	11,025.00	12,250.00	
(2) Materials Used								
Brick (Clay)	No.	550.00	63.6	77.8	34,980.00	42,790.00	77,770.00	
Cement	lb	356.40	52.3	2.7	18,639.72	962.28	19,602.00	
Sand	cu-ft	12.00	257.1	210.4	3,085.20	2,524.80	5,610.00	
Total	-	-	-	-	58,929.92	66,302.08	125,232	(Kyat / per %sq-ft)

3-1-4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.50	350.0	3,150.0	1,225.00	11,025.00	12,250.00	
(2) Materials Used								
Brick (Cement)	No.	550.00	93.8	62.6	51,590.00	34,430.00	86,020.00	
Cement	lb	356.40	52.3	2.7	18,639.72	962.28	19,602.00	
Sand	cu-ft	12.00	257.1	210.4	3,085.20	2,524.80	5,610.00	
Total	-	-	-	-	75,539.92	57,942.08	133,482	(Kyat / per %sq-ft)

3-1-5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.50	500.0	4,500.0	750.00	6,750.00	7,500.00	
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(2) Materials Used								
Brick (Clay)	No.	345.00	63.6	77.8	21,942.00	26,841.00	48,783.00	
Cement	lb	238.00	52.3	2.7	12,447.40	642.60	13,090.00	
Sand	cu-ft	8.00	257.1	210.4	2,056.80	1,683.20	3,740.00	
Total	-	-	-	-	37,721.20	40,641.80	78,363	(Kyat / per %sq-ft)

3-1-6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.50	500.0	4,500.0	750.00	6,750.00	7,500.00	
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(2) Materials Used								
Brick (Cement)	No.	345.00	93.8	62.6	32,361.00	21,597.00	53,958.00	
Cement	lb	238.00	52.3	2.7	12,447.40	642.60	13,090.00	
Sand	cu-ft	8.00	257.1	210.4	2,056.80	1,683.20	3,740.00	
Total	-	-	-	-	48,140.20	35,397.80	83,538	(Kyat / per %sq-ft)

3-1-7. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	9.00	500.0	4,500.0	4,500.00	40,500.00	45,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
6"-9" Stone Boulder	cu-ft	125.00	762.0	508.0	95,250.00	63,500.00	158,750.00	
Cement	lb	432.00	52.3	2.7	22,593.60	1,166.40	23,760.00	
Sand	cu-ft	14.00	257.1	210.4	3,599.40	2,945.60	6,545.00	
River Shingle	cu-ft	28.00	543.0	444.3	15,204.00	12,440.40	27,644.40	
Total	-	-	-	-	143,947.00	145,752.40	289,699	(Kyat / per sud)

3-1-8. 3"thick Sand Filling under Brick Lining

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor*								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(2) Materials Used								
Sand	cu-ft	125.00	257.1	210.4	32,137.50	26,300.00	58,437.50	
Total	-	-	-	-	32,487.50	29,450.00	61,938	(Kyat / per sud)

* Sand filling work including watering and ramming completed.

3-1-9. Pointing Work (with 1:3 Cement Mortar)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Cement	lb	54.27	52.3	2.7	2,838.32	146.53	2,984.85	
Sand	cu-ft	468.00	257.1	210.4	120,322.80	98,467.20	218,790.00	
Total	-	-	-	-	124,361.12	109,413.73	233,775	(Kyat / per %sq-ft)

3-2. Concreting Works

3-2-1. 1:3:6 Cement Concrete Work for Canal Bed Kerb

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
Cement	lb	1,440.00	52.3	2.7	75,312.00	3,888.00	79,200.00	
Sand	cu-ft	48.00	257.1	210.4	12,340.80	10,099.20	22,440.00	
River Shingle	cu-ft	96.00	543.0	444.3	52,128.00	42,652.80	94,780.80	
Total	-	-	-	-	143,080.8	86,340.0	229,421	(Kyat / per sud)

3-2-2. 1:3:6 Cement Concrete Work for Canal Copping

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
Cement	lb	1,440.00	52.3	2.7	75,312.00	3,888.00	79,200.00	
Sand	cu-ft	48.00	257.1	210.4	12,340.80	10,099.20	22,440.00	
River Shingle	cu-ft	96.00	543.0	444.3	52,128.00	42,652.80	94,780.80	
Total	-	-	-	-	143,080.8	86,340.0	229,421	(Kyat / per sud)

3-2-3. Timber Shuttering Formworks

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Jungle Wood (Scant)	cu-ft	1.50	2,083.0	8,331.8	3,124.50	12,497.70	15,622.20	
Jungle Wood (Plank)	cu-ft	0.92	2,083.0	8,331.8	1,916.36	7,665.26	9,581.62	
Wire	lb	3.00	680.5	291.7	2,041.50	875.10	2,916.60	
Total	-	-	-	-	9,782.4	45,338.1	55,121	(Kyat / per %sq-ft)

3-3. Concrete Lining Work

3-3-1. Concrete Lining Work (with 1:3:6 Cement Concrete)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(for Mixing)								
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(for Mixing)								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(for Carrying, Placing & Consolidating)								
Labor	day	5.00	350.0	3,150.0	1,750.00	15,750.00	17,500.00	
(for Carrying, Placing & Consolidating)								
Operator	day	0.50	400.0	3,600.0	200.00	1,800.00	2,000.00	
(2) Materials Used								
Cement	lb	1,440.00	52.3	2.7	75,312.00	3,888.00	79,200.00	
Sand	cu-ft	48.00	257.1	210.4	12,340.80	10,099.20	22,440.00	
River Shingle	cu-ft	96.00	543.0	444.3	52,128.00	42,652.80	94,780.80	
(3) Machine								
Mixer	Irrigation Department							
(4) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	2.00	3,800.0	200.0	7,600.00	400.00	8,000.00	
Total	-	-	-	-	152,430.80	102,490.00	254,921	(Kyat / per sud)

3-4. Related Works for Concreting such as Earth Work Excavation ,Timber Shuttering for Form Work etc;

3-4-1. Timber Shuttering Formwork for Concreting

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Timber (Scant)	cu-ft	1.50	2,083.0	8,332.0	3,124.50	12,498.00	15,622.50	
Timber (Plank)	cu-ft	0.92	2,083.0	8,332.0	1,916.36	7,665.44	9,581.80	
Wire Nail	lb	3.00	680.5	291.7	2,041.50	875.10	2,916.60	
Total	-	-	-	-	9,782.36	45,338.54	55,121	(Kyat / per %sq-ft)

3-4-2. Brick Work with 1:3 Cement Mortar for Compartment (with Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(2) Materials Used								
Brick (Clay)	No.	1,350.00	63.6	77.8	85,860.00	105,030.00	190,890.00	
Cement	lb	780.00	52.3	2.7	40,794.00	2,106.00	42,900.00	
Sand	cu-ft	26.00	257.1	210.4	6,684.60	5,470.40	12,155.00	
Total	-	-	-	-	137,438.60	149,506.40	286,945	(Kyat / per sud)

3-4-3. Brick Work with 1:3 Cement Mortar for Compartment (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(2) Materials Used								
Brick (Cement)	No.	1,350.00	93.8	62.6	126,630.00	84,510.00	211,140.00	
Cement	lb	780.00	52.3	2.7	40,794.00	2,106.00	42,900.00	
Sand	cu-ft	26.00	257.1	210.4	6,684.60	5,470.40	12,155.00	
Total	-	-	-	-	178,208.60	128,986.40	307,195	(Kyat / per sud)

3-4-4. Brick Work (1:3) Cement Mortar (with Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(2) Materials Used								
Brick (Clay)	No.	1,350.00	63.6	77.8	85,860.00	105,030.00	190,890.00	
Cement	lb	780.00	52.3	2.7	40,794.00	2,106.00	42,900.00	
Sand	cu-ft	26.00	257.1	210.4	6,684.60	5,470.40	12,155.00	
Total	-	-	-	-	137,438.60	149,506.40	286,945	(Kyat / per sud)

3-4-5. Brick Work (1:3) Cement Mortar (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(2) Materials Used								
Brick (Cement)	No.	1,350.00	93.8	62.6	126,630.00	84,510.00	211,140.00	
Cement	lb	780.00	52.3	2.7	40,794.00	2,106.00	42,900.00	
Sand	cu-ft	26.00	257.1	210.4	6,684.60	5,470.40	12,155.00	
Total	-	-	-	-	178,208.60	128,986.40	307,195	(Kyat / per sud)

4. Repairing & Reconstruction of Canal Structures

4-1. Re-Construction of Structures

4-1-1. Construction of Drop

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	120.00	500.0	4,500.0	60,000.00	540,000.00	600,000.00	
Carpenter	day	10.00	500.0	4,500.0	5,000.00	45,000.00	50,000.00	
Labor	day	180.00	350.0	3,150.0	63,000.00	567,000.00	630,000.00	
(2) Materials Used								
Cement	lb	15,680.00	52.3	2.7	820,064.00	42,336.00	862,400.00	
Sand	cu-ft	600.00	257.1	210.4	154,260.00	126,240.00	280,500.00	
River Shingle	cu-ft	400.00	543.0	444.3	217,200.00	177,720.00	394,920.00	
Brick (Cement)	No.	8,560.00	93.8	62.6	802,928.00	535,856.00	1,338,784.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	2,122,452.00	2,534,152.00	4,656,604	(Kyat / per unit)

4-1-2. Construction of Head Regulator

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	60.00	500.0	4,500.0	30,000.00	270,000.00	300,000.00	
Carpenter	day	5.00	500.0	4,500.0	2,500.00	22,500.00	25,000.00	
Labor	day	92.00	350.0	3,150.0	32,200.00	289,800.00	322,000.00	
(2) Materials Used								
Cement	lb	7,840.00	52.3	2.7	410,032.00	21,168.00	431,200.00	
Sand	cu-ft	300.00	257.1	210.4	77,130.00	63,120.00	140,250.00	
River Shingle	cu-ft	200.00	543.0	444.3	108,600.00	88,860.00	197,460.00	
Brick (Cement)	No.	4,280.00	93.8	62.6	401,464.00	267,928.00	669,392.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	1,061,926.00	1,123,376.00	2,185,302	(Kyat / per unit)

4-1-3. Construction of Drain Box Culvert

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	100.00	500.0	4,500.0	50,000.00	450,000.00	500,000.00	
Carpenter	day	400.00	500.0	4,500.0	200,000.00	1,800,000.00	2,000,000.00	
Labor	day	1200.00	350.0	3,150.0	420,000.00	3,780,000.00	4,200,000.00	
(2) Materials Used								
Cement	lb	106440.00	52.3	2.7	5,566,812.00	287,388.00	5,854,200.00	
Sand	cu-ft	3800.00	257.1	210.4	976,980.00	799,520.00	1,776,500.00	
River Shingle	cu-ft	3050.00	543.0	444.3	1,656,150.00	1,355,115.00	3,011,265.00	
Brick (Cement)	No.	58700.00	93.8	62.6	5,506,060.00	3,674,620.00	9,180,680.00	
Miscellaneous Works	L.S				0.00	1,000,000.00	1,000,000.00	
Total	-	-	-	-	14,376,002.00	13,146,643.00	27,522,645	(Kyat / per unit)

4-1-4. Construction of Road Crossing and Bridge

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	110.00	500.0	4,500.0	55,000.00	495,000.00	550,000.00	
Labor	day	344.00	350.0	3,150.0	120,400.00	1,083,600.00	1,204,000.00	
(2) Materials Used								
Cement	lb	28336.00	52.3	2.7	1,481,972.80	76,507.20	1,558,480.00	
Sand	cu-ft	1487.00	257.1	210.4	382,307.70	312,864.80	695,172.50	
River Shingle	cu-ft	978.00	543.0	444.3	531,054.00	434,525.40	965,579.40	
Brick (Cement)	No.	19527.00	93.8	62.6	1,831,632.60	1,222,390.20	3,054,022.80	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	4,402,367.10	4,124,887.60	8,527,255	(Kyat / per unit)

4-1-5. Construction of Syphon Protection

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Carpenter	day	35.00	500.0	4,500.0	17,500.00	157,500.00	175,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	52.3	2.7	884,497.60	45,662.40	930,160.00	
Sand	cu-ft	772.00	257.1	210.4	198,481.20	162,428.80	360,910.00	
River Shingle	cu-ft	998.00	543.0	444.3	541,914.00	443,411.40	985,325.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	1,932,442.80	2,551,652.60	4,484,095	(Kyat / per unit)

4-1-6. Construction of Course-Way

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	52.3	2.7	884,497.60	45,662.40	930,160.00	
Sand	cu-ft	772.00	257.1	210.4	198,481.20	162,428.80	360,910.00	
River Shingle	cu-ft	998.00	543.0	444.3	541,914.00	443,411.40	985,325.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	1,914,942.80	2,394,152.60	4,309,095	(Kyat / per unit)

4-1-7. Construction of Box Culverts (Cross Drain Culverts) (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Carpenter	day	35.00	500.0	4,500.0	17,500.00	157,500.00	175,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	

4-1-7. Construction of Box Culverts (Cross Drain Culverts) (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
Cement	lb	16912.00	52.3	2.7	884,497.60	45,662.40	930,160.00	
Sand	cu-ft	772.00	257.1	210.4	198,481.20	162,428.80	360,910.00	
River Shingle	cu-ft	998.00	543.0	444.3	541,914.00	443,411.40	985,325.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	1,932,442.80	2,551,652.60	4,484,095	(Kyat / per unit)

4-2. Repairing of structures

4-2-1. Drop

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	9.00	500.0	4,500.0	4,500.00	40,500.00	45,000.00	
Labor	day	28.00	350.0	3,150.0	9,800.00	88,200.00	98,000.00	
(2) Materials Used								
Cement	lb	6,361.60	52.3	2.7	332,711.68	17,176.32	349,888.00	
Sand	cu-ft	4.06	25,712.5	21,037.5	104,392.75	85,412.25	189,805.00	
River Shingle	cu-ft	2.98	54,301.5	44,428.5	161,818.47	132,396.93	294,215.40	
Brick (Cement)	No.	2,359.00	93.8	62.6	221,274.20	147,673.40	368,947.60	
Miscellaneous Works	L.S				0.00	300,000.00	300,000.00	
Total	-	-	-	-	834,497.10	811,358.90	1,645,856	(Kyat / per unit)

4-2-2. Head Regulator

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	7.00	500.0	4,500.0	3,500.00	31,500.00	35,000.00	
Labor	day	15.00	350.0	3,150.0	5,250.00	47,250.00	52,500.00	
(2) Materials Used								
Cement	lb	6,300.00	52.3	2.7	329,490.00	17,010.00	346,500.00	
Sand	cu-ft	3.75	25,712.5	21,037.5	96,421.88	78,890.63	175,312.51	
River Shingle	cu-ft	5.63	54,301.5	44,428.5	305,717.45	250,132.46	555,849.91	
Brick (Cement)	No.	281.00	93.8	62.6	26,357.80	17,590.60	43,948.40	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	766,737.13	542,373.69	1,309,111	(Kyat / per unit)

4-2-3. Drain Box Culvert (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	50.00	500.0	4,500.0	25,000.00	225,000.00	250,000.00	
Labor	day	100.00	350.0	3,150.0	35,000.00	315,000.00	350,000.00	

4-2-3. Drain Box Culvert (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
Cement	lb	6,923.60	52.3	2.7	362,104.28	18,693.72	380,798.00	
Sand	sud	4.00	25,712.5	21,037.5	102,850.00	84,150.00	187,000.00	
River Shingle	sud	6.00	54,301.5	44,428.5	325,809.00	266,571.00	592,380.00	
Brick (Cement)	No.	3,000.00	93.8	62.6	281,400.00	187,800.00	469,200.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	1,132,163.28	1,197,214.72	2,329,378	(Kyat / per unit)

4-2-4. Road Crossing and Bridge

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	120.00	500.0	4,500.0	60,000.00	540,000.00	600,000.00	
Labor	day	200.00	350.0	3,150.0	70,000.00	630,000.00	700,000.00	
(2) Materials Used								
Cement	lb	16,800.00	52.3	2.7	878,640.00	45,360.00	924,000.00	
Sand	sud	10.00	25,712.5	21,037.5	257,125.00	210,375.00	467,500.00	
River Shingle	sud	15.00	54,301.5	44,428.5	814,522.50	666,427.50	1,480,950.00	
Brick (Cement)	No.	7,500.00	93.8	62.6	703,500.00	469,500.00	1,173,000.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	2,783,787.50	2,661,662.50	5,445,450	(Kyat / per unit)

4-2-5. Syphon

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Carpenter	day	35.00	500.0	4,500.0	17,500.00	157,500.00	175,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	52.3	2.7	884,497.60	45,662.40	930,160.00	
Sand	cu-ft	772.00	257.1	210.4	198,481.20	162,428.80	360,910.00	
River Shingle	cu-ft	998.00	543.0	444.3	541,914.00	443,411.40	985,325.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	1,932,442.80	2,551,652.60	4,484,095	(Kyat / per unit)

4-2-6. Repairing of Course-Way (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	

4-2-6. Repairing of Course-Way (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
Cement	lb	16912.00	52.3	2.7	884,497.60	45,662.40	930,160.00	
Sand	cu-ft	772.00	257.1	210.4	198,481.20	162,428.80	360,910.00	
River Shingle	cu-ft	998.00	543.0	444.3	541,914.00	443,411.40	985,325.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	1,914,942.80	2,394,152.60	4,309,095	(Kyat / per unit)

4-2-7. Repairing of Box Culverts (Cross Drain Culverts)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Carpenter	day	35.00	500.0	4,500.0	17,500.00	157,500.00	175,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	52.3	2.7	884,497.60	45,662.40	930,160.00	
Sand	cu-ft	772.00	257.1	210.4	198,481.20	162,428.80	360,910.00	
River Shingle	cu-ft	998.00	543.0	444.3	541,914.00	443,411.40	985,325.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	1,932,442.80	2,551,652.60	4,484,095	(Kyat / per unit)

4-2-8. Repairing of Conduit Gate and Assembly

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Smith	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	4.00	350.0	3,150.0	1,400.00	12,600.00	14,000.00	
(2) Materials Used								
Steel Gate	No.	2.00	135,000.0	15,000.0	270,000.00	30,000.00	300,000.00	
Steel Rod (10mm)	lb	20.00	73.6	3.9	1,472.00	78.00	1,550.00	
Binding Wire	lb	4.00	1,050.0	450.0	4,200.00	1,800.00	6,000.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	278,072.00	553,478.00	831,550	(Kyat / per item)

4-2-9. Repairing of Canal Gate Leaf, Frame & Gear Assembly

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Smith	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	4.00	350.0	3,150.0	1,400.00	12,600.00	14,000.00	
(2) Materials Used								
Steel Gate	No.	2.00	135,000.0	15,000.0	270,000.00	30,000.00	300,000.00	
Steel Rod (10mm)	lb	20.00	73.6	3.9	1,472.00	78.00	1,550.00	
Binding Wire	lb	4.00	1,050.0	450.0	4,200.00	1,800.00	6,000.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	278,072.00	153,478.00	431,550	(Kyat / per item)

4-2-10. Repairing of Canal Structures

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	52.3	2.7	884,497.60	45,662.40	930,160.00	
Sand	cu-ft	772.00	257.1	210.4	198,481.20	162,428.80	360,910.00	
River Shingle	cu-ft	998.00	543.0	444.3	541,914.00	443,411.40	985,325.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	1,914,942.80	2,394,152.60	4,309,095	(Kyat / per item)

5. Road Works

5-1. G.C (Gravelly Clay) Laying Work

5-1-1. G.C Laying and spreading works of Canal Inspection Path

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(laying, dressing, spreading & compacting)								
(2) Materials Used								
Gravelly Clay (G.C)	cu-ft	110.00	285.4	190.3	31,394.00	20,933.00	52,327.00	
Total	-	-	-	-	31,919.0	25,658.0	57,577	(Kyat / per sud)

5-1-2. G.C Laying and spreading work of Canal Non Inspection Path

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(laying, dressing, spreading & compacting)								
(2) Materials Used								
Gravelly Clay (G.C)	cu-ft	110.00	285.4	190.3	31,394.00	20,933.00	52,327.00	
Total	-	-	-	-	31,919.0	25,658.0	57,577	(Kyat / per sud)

5-2. Concrete Paving Work

5-2-1. Mixing only Cement Concrete (1:2:4) with (0.5" to 0.75") Gauge Stone Chippings on River Shingle

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
(2) Materials Used								
Cement	lb	2,070.00	52.3	2.7	108,261.00	5,589.00	113,850.00	
River Shingle	cu-ft	92.00	543.0	444.3	49,956.00	40,875.60	90,831.60	
Sand	cu-ft	46.00	257.1	210.4	11,826.60	9,678.40	21,505.00	
Total	-	-	-	-	174,043.6	92,143.0	266,187	(Kyat / per sud)

5-2-2. Mixing only Cement Concrete (1:3:6) with (0.5" to 0.75") Gauge Stone Chippings on River Shingle

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
(2) Materials Used								
Cement	lb	1,440.00	52.3	2.7	75,312.00	3,888.00	79,200.00	
River Shingle	cu-ft	96.00	543.0	444.3	52,128.00	42,652.80	94,780.80	
Sand	cu-ft	48.00	257.1	210.4	12,340.80	10,099.20	22,440.00	
Total	-	-	-	-	143,780.8	92,640.0	236,421	(Kyat / per sud)

5-2-3. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
Total	-	-	-	-	1,550.0	13,950.0	15,500	(Kyat / per sud)

5-2-4. Timber Shuttering Formworks

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Jungle Wood (Scant)	cu-ft	1.50	2,083.0	8,331.8	3,124.50	12,497.70	15,622.20	
Jungle Wood (Plank)	cu-ft	0.92	2,083.0	8,331.8	1,916.36	7,665.26	9,581.62	
Wire Nail	lb	3.00	680.5	291.7	2,041.50	875.10	2,916.60	
Total	-	-	-	-	9,782.36	45,338.06	55,120	(Kyat / per %sq-ft)

5-2-5. Reinforcing Bar Preparation and Assembly

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
Steel Fixer	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(2) Materials Used								
Steel Rod (10mm)	lb	117.60	73.6	3.9	8,655.36	458.64	9,114.00	
Binding Wire	lb	1.00	1,050.0	450.0	1,050.00	450.00	1,500.00	
Total	-	-	-	-	10,555.36	8,558.64	19,114	(Kyat / per CWT)

6. Repairing and Construction of Permanent Buildings

6-1. Repairing and Construction of Building (Gust House, Meeting Hall, Office, etc.)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	20.00	500.0	4,500.0	10,000.00	90,000.00	100,000.00	
Labor	day	30.00	350.0	3,150.0	10,500.00	94,500.00	105,000.00	
(2) Materials Used								
Repairing and Construction of Building	Set	1.00	4,000,000.0	6,000,000.0	4,000,000.00	6,000,000.00	10,000,000.00	
Miscellaneous Works	L.S				0.00	2,850,000.00	2,850,000.00	
Total	-	-	-	-	4,020,500.00	9,034,500.00	13,055,000	(Kyat / per item)

7. Other Related Works

7-1. Repairing of Heavy Machines

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Operator (Machine Driver)	day	3.00	400.0	3,600.0	1,200.00	10,800.00	12,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
Total	-	-	-	-	4,700.00	42,300.00	47,000	(Kyat / per job)

7-2. Repairing of Motor Vehicles , Water Pumps and Generators

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Operator (Machine Driver)	day	4.00	400.0	3,600.0	1,600.00	14,400.00	16,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
Total	-	-	-	-	5,100.00	45,900.00	51,000	(Kyat / per item)

7-3. Repairing Charges for Equipments

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Operator (Machine Driver)	day	3.00	400.0	3,600.0	1,200.00	10,800.00	12,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
Total	-	-	-	-	4,000.00	36,000.00	40,000	(Kyat / per item)

7-4. Earth Works for Drainage Canal (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	5.85	
Total	-	-	-	-	1,067.7	56.2	1,124	(Kyat / per sud)

7-5. Management of Construction Materials and Equipment

7-5-1. Shifting of Materials from Temporary Stock-pile to Work Site

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							
(2) Labor								
Labor	day	0.05	350.0	3,150.0	17.50	157.50	175.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Engine Oil	gal	0.0052	17,100.0	900.0	88.92	4.68	93.60	
Lubricant	gal	0.0013	14,250.0	750.0	18.53	0.98	19.51	
Total	-	-	-	-	1,112.95	215.16	1,328	(Kyat / per item)

7-5-2. Transporting of Materials from Quarry to Stock-pile

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							
(2) Labor								
Labor	day	0.05	350.0	3,150.0	17.50	157.50	175.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.36	3,800.0	200.0	1,368.00	72.00	1,440.00	
Engine Oil	gal	0.0072	17,100.0	900.0	123.12	6.48	129.60	
Lubricant	gal	0.0018	14,250.0	750.0	25.65	1.35	27.00	
Total	-	-	-	-	1,534.27	237.33	1,772	(Kyat / per item)

7-5-3. Transporting and Shifting of Heavy Machinery

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							
(2) Labor								
Operator (Machine Driver)	day	10.00	400.0	3,600.0	4,000.00	36,000.00	40,000.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.36	3,800.0	200.0	1,368.00	72.00	1,440.00	
Engine Oil	gal	0.0072	17,100.0	900.0	123.12	6.48	129.60	
Lubricant	gal	0.0018	14,250.0	750.0	25.65	1.35	27.00	
Total	-	-	-	-	5,516.77	36,079.83	41,597	(Kyat / per item)

7-5-4. Loading and Unloading Charges of Materials

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
Total	-	-	-	-	2,800.00	25,200.00	28,000	(Kyat / per item)

7-6. Water Pump for Dewatering Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Water Pump	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	9.00	3,800.0	200.0	34,200.00	1,800.00	36,000.00	
Total	-	-	-	-	34,200.00	1,800.00	36,000	(Kyat / per day)

7-7. Welfare Charges for Labor

7-7-1. Temporary Hut Material for One Family

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
Temporary Hut Material for One Family	item	1.00	100,000.0	2,000,000.0	100,000.00	2,000,000.00	2,100,000.00	
Total	-	-	-	-	102,800.0	2,025,200.0	2,128,000	(Kyat / per item)

7-7-2. Hnee Thatch

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.002	350.0	3,150.0	0.70	6.30	7.00	
(2) Materials Used								
Hnee Thatch	item	0.002	10,000.0	200,000.0	20.00	400.00	420.00	
Total	-	-	-	-	20.70	406.30	427	(Kyat / per item)

7-7-3. Bamboo

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.004	350.0	3,150.0	1.40	12.60	14.00	
(2) Materials Used								
Bamboo	item	0.005	5,000.0	100,000.0	25.00	500.00	525.00	
Total	-	-	-	-	26.40	512.60	539	(Kyat / per item)

7-7-4. Transporting for Labor Necessary of Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck (Capacity = 5ton)	Irrigation Department							
					0.00	0.00	0.00	
(2) Labor Transportation								
(a) Tar road	mile	5.00						
Diesel (H.S.D.)	gal	0.50	3,800.0	200.0	1,900.00	100.00	2,000.00	Tar road : 10mile/gal
(b) off road	mile	4.00						
Diesel (H.S.D.)	gal	0.50	3,800.0	200.0	1,900.00	100.00	2,000.00	Off road : 8mile/gal
Total	-	-	-	-	3,800.00	200.00	4,000	(Kyat / per mile)

7-8. Labor Charges for Day & Night Watchman, Helper, Checker and General Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.80	350.0	3,150.0	280.00	2,520.00	2,800.00	
Total	-	-	-	-	280.0	2,520.0	2,800	(Kyat / per M/D)

7-9. Camps Facilities (Lighting, Water Supply, etc.)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Water Pump	Irrigation Department							1 gal/bowser
Water Bowser	Irrigation Department							3 gal/trip
Diesel Generator	Irrigation Department							1 gal/hr
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.90	3,800.0	200.0	3,420.00	180.00	3,600.00	4 hr/day
(Water Pump)								
Diesel (H.S.D.)	gal	2.70	3,800.0	200.0	10,260.00	540.00	10,800.00	1 trip/day
(Water Bowser)								
Diesel (H.S.D.)	gal	3.60	3,800.0	200.0	13,680.00	720.00	14,400.00	1 bowser/day
(Generator)								
Total	-	-	-	-	27,360.00	1,440.00	28,800	(Kyat / per gal)

7-10. Making Data Boards and Sign Boards

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Painter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Ply Wood (8'x4')	No.	1.00	3,000.0	12,000.0	3,000.00	12,000.00	15,000.00	
Paint	gal	2.50	10,000.0	10,000.0	25,000.00	25,000.00	50,000.00	
Painting charges	L.S	1.00	1,500.0	13,500.0	1,500.00	13,500.00	15,000.00	
Beading 1"x½"	cu-ft	0.30	5,207.5	5,207.5	1,562.25	1,562.25	3,124.50	
Total	-	-	-	-	34,762.25	85,362.25	120,125	(Kyat / per item)

7-11. Estimating, Copying, Photo Recording and stationary Charges, etc;

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Materials Used								
Paper	Page	100.00	3.0	7.0	300.00	700.00	1,000.00	
(2) Service Charges								
Typing & Printing charges	Page	18.00	25.0	225.0	450.00	4,050.00	4,500.00	
Photo & Printing charges	Page	12.00	50.0	450.0	600.00	5,400.00	6,000.00	
Copying charges	Page	80.00	2.5	22.5	200.00	1,800.00	2,000.00	
Binding charges	No.	1.00	100.0	900.0	100.00	900.00	1,000.00	
Total	-	-	-	-	1,650.00	12,850.00	14,500	(Kyat / per item)

7-12. Miscellaneous

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
Miscellaneous	item	1.00	5,000.0	100,000.0	5,000.00	100,000.00	105,000.00	
Total	-	-	-	-	5,000.00	100,000.00	105,000	(Kyat / per item)

3.2.2 Analysis Rate for Distribution Canal

8. Preparatory Works

8-1. Survey and Profile Works (Canal length : 30 feet / sect)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Lime (Strained Lime)	cu-ft	0.20	350.0	3,150.0	70.00	630.00	700.00	
Plastic ream	No.	0.67	90.0	810.0	60.00	540.00	600.00	for finishing stake
Labor	day	0.10	350.0	3,150.0	35.00	315.00	350.00	
Total	-	-	-	-	315.00	2,835.00	3,150	(Kkyat / per sect)

8-2. Temporary Camps & Stores

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) 4"~6"φMyaw Post Work								
4"~6"φMyaw (J'Wood)	No.	12.00	1,200.0	4,800.0	14,400.00	57,600.00	72,000.00	
Carpenter	day	0.50	500.0	4,500.0	250.00	2,250.00	2,500.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) 2"~4"φMyaw Post Work								
2"~4"φMyaw (J'Wood)	No.	43.00	400.0	1,600.0	17,200.00	68,800.00	86,000.00	
Wire Nail	viss	2.00	2,450.0	1,050.0	4,900.00	2,100.00	7,000.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
(3) Hnee Thatch Roofing Work								
Hnee Thatch	No.	550.00	50.0	450.0	27,500.00	247,500.00	275,000.00	
Bamboo	No.	75.00	50.0	450.0	3,750.00	33,750.00	37,500.00	
Wire Nail	viss	2.50	2,450.0	1,050.0	6,125.00	2,625.00	8,750.00	
Carpenter	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
(4) Roll Mat Ridging Work								
Roll Mat (12'x3')	No.	6.00	180.0	1,620.0	1,080.00	9,720.00	10,800.00	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.25	500.0	4,500.0	125.00	1,125.00	1,250.00	
(5) Bamboo Flooring Work								
Bamboo	No.	150.00	50.0	450.0	7,500.00	67,500.00	75,000.00	
Wire Nail	viss	1.50	2,450.0	1,050.0	3,675.00	1,575.00	5,250.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(6) Bamboo Mat Walling (Single)								
Bamboo Mat	sq-ft	1,173.00	20.0	180.0	23,460.00	211,140.00	234,600.00	
Bamboo	No.	15.00	50.0	450.0	750.00	6,750.00	7,500.00	
Wire Nail	viss	1.00	2,450.0	1,050.0	2,450.00	1,050.00	3,500.00	
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
(7) Bamboo Hand Rail work								
Bamboo	No.	15.00	50.0	450.0	750.00	6,750.00	7,500.00	
Wire Nail	viss	0.25	2,450.0	1,050.0	612.50	262.50	875.00	
Carpenter	day	0.25	500.0	4,500.0	125.00	1,125.00	1,250.00	
Total	-	-	-	-	123,497.50	799,127.50	922,625	(Kkyat / per item)

8-3. Temporary Barracks (2 units, 4 units, etc.)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Hnee Thatch Roofing Work								
Hnee Thatch	No.	150.00	50.0	450.0	7,500.00	67,500.00	75,000.00	
Bamboo	No.	26.00	50.0	450.0	1,300.00	11,700.00	13,000.00	
Wire Nail	viss	0.20	2,450.0	1,050.0	490.00	210.00	700.00	
Binding Wire	lb	0.25	1,050.0	450.0	262.50	112.50	375.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(2) Double Bamboo Rollmat Ridging work								
Roll Mat (12'x3')	No.	5.00	180.0	1,620.0	900.00	8,100.00	9,000.00	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Labor	day	0.30	350.0	3,150.0	105.00	945.00	1,050.00	
(3) Spitted Bamboo flooring work								
Bamboo	No.	55.00	50.0	450.0	2,750.00	24,750.00	27,500.00	
Wire Nail	viss	0.30	2,450.0	1,050.0	735.00	315.00	1,050.00	
Binding Wire	lb	2.00	1,050.0	450.0	2,100.00	900.00	3,000.00	
Carpenter	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(4) Bamboo Mat Walling Work								
Bamboo Mat	sq-ft	140.00	20.0	180.0	2,800.00	25,200.00	28,000.00	
Jungle Wood (Plank)	cu-ft	0.32	2,083.0	8,331.8	666.56	2,666.18	3,332.74	
Wire Nail	viss	0.50	2,450.0	1,050.0	1,225.00	525.00	1,750.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(5) Bamboo Mat Door Work								
Bamboo Mat	sq-ft	30.00	20.0	180.0	600.00	5,400.00	6,000.00	
Jungle Wood (Plank)	cu-ft	2.20	2,083.0	8,331.8	4,582.60	18,329.96	22,912.56	
Wire Nail	viss	0.20	2,450.0	1,050.0	490.00	210.00	700.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(6) Bamboo Mat Window Work								
Bamboo	No.	6.00	50.0	450.0	300.00	2,700.00	3,000.00	
Jungle Wood (Plank)	cu-ft	0.60	2,083.0	8,331.8	1,249.80	4,999.08	6,248.88	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.63	500.0	4,500.0	315.00	2,835.00	3,150.00	
(7) Splitted Bamboo Triellis Work								
Bamboo	No.	21.00	50.0	450.0	1,050.00	9,450.00	10,500.00	
Wire Nail	viss	0.60	2,450.0	1,050.0	1,470.00	630.00	2,100.00	
Carpenter	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
(8) Iron fitting Work								
Butt Hinge	No.	40.00	700.0	300.0	28,000.00	12,000.00	40,000.00	
Hasp & Staple	No.	6.00	350.0	150.0	2,100.00	900.00	3,000.00	
Handle	No.	10.00	700.0	300.0	7,000.00	3,000.00	10,000.00	
Tower Bolt	No.	20.00	840.0	360.0	16,800.00	7,200.00	24,000.00	
Screw	gross	1.00	1,400.0	600.0	1,400.00	600.00	2,000.00	
Total	-	-	-	-	91,381.46	253,687.72	345,069	(Kkyat / per item)

8-4. Temporary Latrines

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Site Cleaning & Earth Work								
Site Cleaning Work for Latrines	set	1.00	600.0	5,400.0	600.00	5,400.00	6,000.00	
Digging for Post Hole (Barrack etc.)	No.	4.00	30.0	270.0	120.00	1,080.00	1,200.00	
Digging for Pit Hole (Latrines)	No.	1.00	1,200.0	10,800.0	1,200.00	10,800.00	12,000.00	
(2) 4"~6"φMyaw Post Work								
4"~6"φMyaw (J/Wood)	No.	7.00	1,200.0	8,400.0	8,400.00	33,600.00	42,000.00	
Wire Nail	viss	0.30	2,450.0	1,050.0	735.00	315.00	1,050.00	
Carpenter	day	1.40	500.0	4,500.0	700.00	6,300.00	7,000.00	
Labor	day	0.90	350.0	3,150.0	315.00	2,835.00	3,150.00	
(3) 2"~4"φMyaw Post Work								
2"~4"φMyaw (J/Wood)	No.	5.00	400.0	1,600.0	2,000.00	8,000.00	10,000.00	
Wire Nail	viss	0.20	2,450.0	1,050.0	490.00	210.00	700.00	
Carpenter	day	0.60	500.0	4,500.0	300.00	2,700.00	3,000.00	
Labor	day	0.60	350.0	3,150.0	210.00	1,890.00	2,100.00	
(4) Hnee Thatch Roofing Work								
Hnee Thatch	No.	43.20	50.0	450.0	2,160.00	19,440.00	21,600.00	
Bamboo	No.	9.00	50.0	450.0	450.00	4,050.00	4,500.00	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Binding Wire	lb	1.00	1,050.0	450.0	1,050.00	450.00	1,500.00	
Carpenter	day	0.40	500.0	4,500.0	200.00	1,800.00	2,000.00	
Labor	day	0.40	350.0	3,150.0	140.00	1,260.00	1,400.00	
(5) 6"×1" Plank Flooring Work								
Jungle Wood (Plank)	cu-ft	1.30	2,083.0	8,331.8	2,707.90	10,831.34	13,539.24	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.20	500.0	4,500.0	100.00	900.00	1,000.00	
Labor	day	0.10	350.0	3,150.0	35.00	315.00	350.00	
(6) Bamboo Mat Walling Work								
Bamboo Mat	sq-ft	96.60	20.0	180.0	1,932.00	17,388.00	19,320.00	
Jungle Wood (Plank)	cu-ft	0.30	2,083.0	8,331.8	624.90	2,499.54	3,124.44	
Wire Nail	viss	0.40	2,450.0	1,050.0	980.00	420.00	1,400.00	
Carpenter	day	0.80	500.0	4,500.0	400.00	3,600.00	4,000.00	
(7) Bamboo Mat Door Work								
Bamboo Mat	sq-ft	12.00	20.0	180.0	240.00	2,160.00	2,400.00	
Jungle Wood (Plank)	cu-ft	1.10	2,083.0	8,331.8	2,291.30	9,164.98	11,456.28	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.50	500.0	4,500.0	250.00	2,250.00	2,500.00	
(8) Iron fitting Work								
Butt Hinge	No.	2.00	700.0	300.0	1,400.00	600.00	2,000.00	
Hasp & Staple	No.	1.00	350.0	150.0	350.00	150.00	500.00	
Handle	No.	2.00	700.0	300.0	1,400.00	600.00	2,000.00	
Tower Bolt	No.	1.00	840.0	360.0	840.00	360.00	1,200.00	
Lock & Key	No.	1.00	1,400.0	600.0	1,400.00	600.00	2,000.00	
Screw	gross	2.00	1,400.0	600.0	2,800.00	1,200.00	4,000.00	
Purchasing & Fixing of W.C. Pan	No.	1.00	5,600.0	2,400.0	5,600.00	2,400.00	8,000.00	
Total	-	-	-	-	43,156.10	155,883.86	199,040	(Kyat / per item)

8-5. Making Stock Pile Yards

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Earth Work								
Digging for Post Hole (Barrack etc.)	No.	47.00	30.0	270.0	1,410.00	12,690.00	14,100.00	
(2) Wagut Walling with Bamboo Rail Work								
Wagut (5'×2'6")	No.	40.00	240.0	960.0	9,600.00	38,400.00	48,000.00	
4"~6"φMyaw (J/Wood)	No.	15.00	1,200.0	4,800.0	18,000.00	72,000.00	90,000.00	
Bamboo	No.	33.00	50.0	450.0	1,650.00	14,850.00	16,500.00	
Wire Nail	viss	1.50	2,450.0	1,050.0	3,675.00	1,575.00	5,250.00	
Binding Wire	lb	3.00	1,050.0	450.0	3,150.00	1,350.00	4,500.00	
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	4.00	350.0	3,150.0	1,400.00	12,600.00	14,000.00	
Total	-	-	-	-	40,885.00	171,465.00	212,350	(Kyat / per item)

8-6. Labor Transporting Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck (Capacity = 5ton)	Irrigation Department							
(2) Labor Transportation								
(a) Tar road	mile	0.44						
Diesel (H.S.D.)	gal	0.044	3,800.0	200.0	167.20	8.80	176.00	Tar road : 10mile/gal
(b) offroad	mile	0.44						
Diesel (H.S.D.)	gal	0.055	3,800.0	200.0	209.00	11.00	220.00	Off road : 8mile/gal
Total	-	-	-	-	376.20	19.80	396	(Kyat / per item)

8-7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas

8-7-1. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas along the DY Canal (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.30	350.0	3,150.0	105.00	945.00	1,050.00	
Total	-	-	-	-	105.00	945.00	1,050	(Kyat / per %sq-ft)

8-7-2. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas along the DY Canal (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Bulldozer	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	11.00	3,800.0	200.0	41,800.00	2,200.00	44,000.00	
Engine Oil	gal	0.22	17,100.0	900.0	3,762.00	198.00	3,960.00	
Hydraulic Oil	gal	0.22	9,500.0	500.0	2,090.00	110.00	2,200.00	
Grease	lb	0.055	4,275.0	225.0	235.13	12.38	247.51	
Total	-	-	-	-	47,887.13	2,520.38	50,408	(Kyat / per acres)

9. Earth Works

9-1. Canal Resectioning Work

9-1-1. Canal Resectioning Work (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.0	4,725.0	5,250.0	(Kyat / per sud)

9-1-2. Canal Resectioning Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.32	3,800.0	200.0	1,216.00	64.00	1,280.00	
Hydraulic Oil	gal	0.0075	9,500.0	500.0	71.25	3.75	75.00	
Engine Oil	gal	0.0075	17,100.0	900.0	128.25	6.75	135.00	
Grease	lb	0.012	4,275.0	225.0	51.30	2.70	54.00	
Total	-	-	-	-	1,466.80	77.20	1,544.00	(Kyat / per sud)

9-2. Unsiltng of Distributary Canals

9-2-1. Unsiltng of Distributary Canals (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	3.80	350.0	3,150.0	1,330.00	11,970.00	13,300.00	
Total	-	-	-	-	1,330.0	11,970.0	13,300.00	(Kyat / per sud)

9-2-2. Unsiltng of Distributary Canals (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	5.85	
Total	-	-	-	-	1,067.7	56.2	1,124.00	(Kyat / per sud)

9-3. Earth Work in Dressing (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.0	4,725.0	5,250.00	(Kyat / per sud)

9-4. Earth Work in Base Stripping (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.0	4,725.0	5,250.00	(Kyat / per sud)

10. Repairing of Linings Work

10-1. Repairing Works of Brick Lining

10-1-1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.0	4,725.0	5,250.00	(Kyat / per %sq-ft)

10-1-2. 3"thick Sand Filling under Brick Lining

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(2) Materials Used								
Sand	cu-ft	125.00	257.1	210.4	32,137.50	26,300.00	58,437.50	
Total	-	-	-	-	32,487.5	29,450.0	61,938.00	(Kyat / per sud)

10-1-3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.50	350.0	3,150.0	1,225.00	11,025.00	12,250.00	
(2) Materials Used								
Brick (Clay)	No.	550.00	63.6	77.8	34,980.00	42,790.00	77,770.00	
Cement	lb	356.40	52.3	2.7	18,639.72	962.28	19,602.00	
Sand	cu-ft	12.00	257.1	210.4	3,085.20	2,524.80	5,610.00	
Total	-	-	-	-	58,929.9	66,302.1	125,232.00	(Kyat / per %sq-ft)

10-1-4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.50	350.0	3,150.0	1,225.00	11,025.00	12,250.00	
(2) Materials Used								
Brick (Cement)	No.	550.00	93.8	62.6	51,590.00	34,430.00	86,020.00	
Cement	lb	356.40	52.3	2.7	18,639.72	962.28	19,602.00	
Sand	cu-ft	12.00	257.1	210.4	3,085.20	2,524.80	5,610.00	
Total	-	-	-	-	75,539.9	57,942.1	133,482.00	(Kyat / per %sq-ft)

10-1-5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick) (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.50	500.0	4,500.0	750.00	6,750.00	7,500.00	
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	

10-1-5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick) (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
Brick (Clay)	No.	345.00	63.6	77.8	21,942.00	26,841.00	48,783.00	
Cement	lb	238.00	52.3	2.7	12,447.40	642.60	13,090.00	
Sand	cu-ft	8.00	257.1	210.4	2,056.80	1,683.20	3,740.00	
Total	-	-	-	-	37,721.2	40,641.8	78,363	(Kyat / per %sq-ft)

10-1-6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.50	500.0	4,500.0	750.00	6,750.00	7,500.00	
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(2) Materials Used								
Brick (Cement)	No.	345.00	93.8	62.6	32,361.00	21,597.00	53,958.00	
Cement	lb	238.00	52.3	2.7	12,447.40	642.60	13,090.00	
Sand	cu-ft	8.00	257.1	210.4	2,056.80	1,683.20	3,740.00	
Total	-	-	-	-	48,140.2	35,397.8	83,538	(Kyat / per %sq-ft)

10-1-7. (1:3:6) C.C (Cement Concrete) work for Copping & Bed Kerb

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
Cement	lb	1,440.00	52.3	2.7	75,312.00	3,888.00	79,200.00	
Sand	cu-ft	48.00	257.1	210.4	12,340.80	10,099.20	22,440.00	
River Shingle	cu-ft	96.00	543.0	444.3	52,128.00	42,652.80	94,780.80	
Total	-	-	-	-	143,080.8	86,340.0	229,421	(Kyat / per %sq-ft)

10-1-8. Pointing Work (with 1:3 cement mortar)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Cement	lb	54.27	52.3	2.7	2,838.32	146.53	2,984.85	
Sand	cu-ft	468.00	257.1	210.4	120,322.80	98,467.20	218,790.00	
Total	-	-	-	-	124,361.1	109,413.7	233,775	(Kyat / per %sq-ft)

10-1-9. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	9.00	500.0	4,500.0	4,500.00	40,500.00	45,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	

10-1-9. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
6"-9" Stone Boulder	cu-ft	125.00	762.0	508.0	95,250.00	63,500.00	158,750.00	
Cement	lb	432.00	52.3	2.7	22,593.60	1,166.40	23,760.00	
Sand	cu-ft	14.00	257.1	210.4	3,599.40	2,945.60	6,545.00	
River Shingle	cu-ft	28.00	543.0	444.3	15,204.00	12,440.40	27,644.40	
Total	-	-	-	-	143,947.0	145,752.4	289,699	(Kyat / per %sq-ft)

10-2. G.C (Gravelly Clay) Filling Inner Slope

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

10-3. Brick Work in (1:3) Cement Mortar

10-3-1. Brick Work in (1:3) Cement Mortar (With Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Cement	lb	54.27	52.3	2.7	2,838.32	146.53	2,984.85	
Sand	cu-ft	468.00	257.1	210.4	120,322.80	98,467.20	218,790.00	
Total	-	-	-	-	124,361.12	109,413.73	233,775	(Kyat / per %sq-ft)

10-3-2. Brick Work in (1:3) Cement Mortar (With Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Cement	lb	54.27	52.3	2.7	2,838.32	146.53	2,984.85	
Sand	cu-ft	468.00	257.1	210.4	120,322.80	98,467.20	218,790.00	
Total	-	-	-	-	124,361.12	109,413.73	233,775	(Kyat / per %sq-ft)

10-4. Timber Shuttering form Work

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Jungle Wood (Scant)	cu-ft	1.50	2,083.0	8,331.8	3,124.50	12,497.70	15,622.20	
Jungle Wood (Plank)	cu-ft	0.92	2,083.0	8,331.8	1,916.36	7,665.26	9,581.62	
Wire	lb	3.00	680.5	291.7	2,041.50	875.10	2,916.60	
Total	-	-	-	-	9,782.4	45,338.1	55,121	(Kyat / per %sq-ft)

11. Repairing & Reconstruction of Canal Structures

11-1. Re-Construction of Structures

11-1-1. Drop

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	120.00	500.0	4,500.0	60,000.00	540,000.00	600,000.00	
Carpenter	day	10.00	500.0	4,500.0	5,000.00	45,000.00	50,000.00	
Labor	day	180.00	350.0	3,150.0	63,000.00	567,000.00	630,000.00	
(2) Materials Used								
Cement	lb	11,760.00	52.3	2.7	615,048.00	31,752.00	646,800.00	
Sand	cu-ft	450.00	257.1	210.4	115,695.00	94,680.00	210,375.00	
River Shingle	cu-ft	300.00	543.0	444.3	162,900.00	133,290.00	296,190.00	
Brick (Cement)	No.	6,420.00	93.8	62.6	602,196.00	401,892.00	1,004,088.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	1,623,839.0	1,913,614.0	3,537,453	(Kyat / per unit)

11-1-2. Head Regulator

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	60.00	500.0	4,500.0	30,000.00	270,000.00	300,000.00	
Carpenter	day	5.00	500.0	4,500.0	2,500.00	22,500.00	25,000.00	
Labor	day	92.00	350.0	3,150.0	32,200.00	289,800.00	322,000.00	
(2) Materials Used								
Cement	lb	7,840.00	52.3	2.7	410,032.00	21,168.00	431,200.00	
Sand	cu-ft	300.00	257.1	210.4	77,130.00	63,120.00	140,250.00	
River Shingle	cu-ft	200.00	543.0	444.3	108,600.00	88,860.00	197,460.00	
Brick (Cement)	No.	4,280.00	93.8	62.6	401,464.00	267,928.00	669,392.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	1,061,926.0	1,123,376.0	2,185,302	(Kyat / per unit)

11-1-3. Drain Box Culvert

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	100.00	500.0	4,500.0	50,000.00	450,000.00	500,000.00	
Carpenter	day	400.00	500.0	4,500.0	200,000.00	1,800,000.00	2,000,000.00	
Labor	day	1200.00	350.0	3,150.0	420,000.00	3,780,000.00	4,200,000.00	
(2) Materials Used								
Cement	lb	106440.00	52.3	2.7	5,566,812.00	287,388.00	5,854,200.00	
Sand	cu-ft	3800.00	257.1	210.4	976,980.00	799,520.00	1,776,500.00	
River Shingle	cu-ft	3050.00	543.0	444.3	1,656,150.00	1,355,115.00	3,011,265.00	
Brick (Cement)	No.	58700.00	93.8	62.6	5,506,060.00	3,674,620.00	9,180,680.00	
Miscellaneous Works	L.S				0.00	1,000,000.00	1,000,000.00	
Total	-	-	-	-	14,376,002.0	13,146,643.0	27,522,645	(Kyat / per unit)

11-1-4. Road Crossing and Bridge

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	110.00	500.0	4,500.0	55,000.00	495,000.00	550,000.00	
Labor	day	344.00	350.0	3,150.0	120,400.00	1,083,600.00	1,204,000.00	
(2) Materials Used								
Cement	lb	28336.00	52.3	2.7	1,481,972.80	76,507.20	1,558,480.00	
Sand	cu-ft	1487.00	257.1	210.4	382,307.70	312,864.80	695,172.50	
River Shingle	cu-ft	978.00	543.0	444.3	531,054.00	434,525.40	965,579.40	
Brick (Cement)	No.	19527.00	93.8	62.6	1,831,632.60	1,222,390.20	3,054,022.80	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	4,402,367.1	3,724,887.6	8,127,255	(Kyat / per unit)

11-1-5. Syphon

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Carpenter	day	35.00	500.0	4,500.0	17,500.00	157,500.00	175,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	52.3	2.7	884,497.60	45,662.40	930,160.00	
Sand	cu-ft	772.00	257.1	210.4	198,481.20	162,428.80	360,910.00	
River Shingle	cu-ft	998.00	543.0	444.3	541,914.00	443,411.40	985,325.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	1,932,442.8	2,151,652.6	4,084,095	(Kyat / per unit)

11-1-6. Turn Out

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Carpenter	day	35.00	500.0	4,500.0	17,500.00	157,500.00	175,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	25368.00	52.3	2.7	1,326,746.40	68,493.60	1,395,240.00	
Sand	cu-ft	1158.00	257.1	210.4	297,721.80	243,643.20	541,365.00	
River Shingle	cu-ft	1497.00	543.0	444.3	812,871.00	665,117.10	1,477,988.10	
Brick (Cement)	No.	2625.00	93.8	62.6	246,225.00	164,325.00	410,550.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	2,826,964.2	2,532,178.9	5,359,143	(Kyat / per unit)

11-2. Repairing of Structures

11-2-1. Drop (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	14.00	350.0	3,150.0	4,900.00	44,100.00	49,000.00	

11-2-1. Drop (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
Cement	lb	3,180.80	52.3	2.7	166,355.84	8,588.16	174,944.00	
Sand	sud	2.03	25,712.5	21,037.5	52,196.38	42,706.13	94,902.51	
River Shingle	sud	1.49	54,301.5	44,428.5	80,909.24	66,198.47	147,107.71	
Brick (Cement)	No.	1,179.50	93.8	62.6	110,637.10	73,836.70	184,473.80	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	416,998.6	353,429.5	770,428	(Kyat / per unit)

11-2-2. Head Regulator

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
Cement	lb	3,150.00	52.3	2.7	164,745.00	8,505.00	173,250.00	
Sand	sud	1.88	25,712.5	21,037.5	48,210.94	39,445.31	87,656.25	
River Shingle	sud	2.82	54,301.5	44,428.5	152,858.72	125,066.23	277,924.95	
Brick (Cement)	No.	140.50	93.8	62.6	13,178.90	8,795.30	21,974.20	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	383,793.6	325,011.8	708,805	(Kyat / per unit)

11-2-3. Drain Box Culvert

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	14.00	500.0	4,500.0	7,000.00	63,000.00	70,000.00	
Labor	day	25.00	350.0	3,150.0	8,750.00	78,750.00	87,500.00	
(2) Materials Used								
Cement	lb	1,730.90	52.3	2.7	90,526.07	4,673.43	95,199.50	
Sand	sud	1.00	25,712.5	21,037.5	25,712.50	21,037.50	46,750.00	
River Shingle	sud	1.50	54,301.5	44,428.5	81,452.25	66,642.75	148,095.00	
Brick (Cement)	No.	750.00	93.8	62.6	70,350.00	46,950.00	117,300.00	
Miscellaneous Works	L.S				0.00	50,000.00	50,000.00	
Total	-	-	-	-	283,790.8	331,053.7	614,845	(Kyat / per unit)

11-2-4. Road Crossing and Bridge

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	20.00	500.0	4,500.0	10,000.00	90,000.00	100,000.00	
Labor	day	40.00	350.0	3,150.0	14,000.00	126,000.00	140,000.00	
(2) Materials Used								
Cement	lb	3,360.00	52.3	2.7	175,728.00	9,072.00	184,800.00	
Sand	sud	2.00	25,712.5	21,037.5	51,425.00	42,075.00	93,500.00	
River Shingle	sud	3.00	54,301.5	44,428.5	162,904.50	133,285.50	296,190.00	
Brick (Cement)	No.	1,500.00	93.8	62.6	140,700.00	93,900.00	234,600.00	
Miscellaneous Works	L.S				0.00	50,000.00	50,000.00	
Total	-	-	-	-	554,757.5	544,332.5	1,099,090	(Kyat / per unit)

11-2-5. Syphon

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	9.00	500.0	4,500.0	4,500.00	40,500.00	45,000.00	
Carpenter	day	20.00	500.0	4,500.0	10,000.00	90,000.00	100,000.00	
Labor	day	200.00	350.0	3,150.0	70,000.00	630,000.00	700,000.00	
(2) Materials Used								
Cement	lb	8456.00	52.3	2.7	442,248.80	22,831.20	465,080.00	
Sand	cu-ft	386.00	257.1	210.4	99,240.60	81,214.40	180,455.00	
River Shingle	cu-ft	1497.00	543.0	444.3	812,871.00	665,117.10	1,477,988.10	
Brick (Cement)	No.	2625.00	93.8	62.6	246,225.00	164,325.00	410,550.00	
Miscellaneous Works	L.S				0.00	50,000.00	50,000.00	
Total	-	-	-	-	1,685,085.4	1,743,987.7	3,429,073	(Kyat / per unit)

11-2-6. Turn Out

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	15.00	500.0	4,500.0	7,500.00	67,500.00	75,000.00	
Carpenter	day	35.00	500.0	4,500.0	17,500.00	157,500.00	175,000.00	
Labor	day	250.00	350.0	3,150.0	87,500.00	787,500.00	875,000.00	
(2) Materials Used								
Cement	lb	33824.00	52.3	2.7	1,768,995.20	91,324.80	1,860,320.00	
Sand	cu-ft	1544.00	257.1	210.4	396,962.40	324,857.60	721,820.00	
River Shingle	cu-ft	1996.00	543.0	444.3	1,083,828.00	886,822.80	1,970,650.80	
Brick (Cement)	No.	3500.00	93.8	62.6	328,300.00	219,100.00	547,400.00	
Miscellaneous Works	L.S				0.00	50,000.00	50,000.00	
Total	-	-	-	-	3,690,585.6	2,584,605.2	6,275,191	(Kyat / per unit)

11-3. Repairing of Canal Gate Leaf, Frame & Gear Assembly

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Smith	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Steel Gate	No.	1.00	135,000.0	15,000.0	135,000.00	15,000.00	150,000.00	
Steel Rod (10mm)	lb	10.00	73.6	3.9	736.00	39.00	775.00	
Binding Wire	lb	2.00	1,050.0	450.0	2,100.00	900.00	3,000.00	
Miscellaneous Works	L.S				0.00	50,000.00	50,000.00	
Total	-	-	-	-	139,036.0	76,739.0	215,775	(Kyat / per item)

12. Road Work

12-1. G.C (Gravelly Clay) Laying Work

12-1-1. G.C Laying and Spreading Work for DY Canal Inspection Path

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(laying, dressing, spreading & compacting)								
(2) Materials Used								
Gravelly Clay (G.C)	cu-ft	110.00	285.4	190.3	31,394.00	20,933.00	52,327.00	
Total	-	-	-	-	31,919.0	25,658.0	57,577	(Kyat / per sud)

12-1-2. G.C Laying and Spreading Work for DY Canal Non Inspection Path

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(laying, dressing, spreading & compacting)								
(2) Materials Used								
Gravelly Clay (G.C)	cu-ft	110.00	285.4	190.3	31,394.00	20,933.00	52,327.00	
Total	-	-	-	-	31,919.0	25,658.0	57,577	(Kyat / per sud)

12-2. Concrete Paving Work

12-2-1. Mixing only Cement Concrete (1:2:4) with (0.5" to 0.75") Gauge Stone Chippings on River Shingle

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
(2) Materials Used								
Cement	lb	2,070.00	52.3	2.7	108,261.00	5,589.00	113,850.00	
River Shingle	cu-ft	92.00	543.0	444.3	49,956.00	40,875.60	90,831.60	
Sand	cu-ft	46.00	257.1	210.4	11,826.60	9,678.40	21,505.00	
Total	-	-	-	-	174,043.6	92,143.0	266,187	(Kyat / per sud)

12-2-2. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
Total	-	-	-	-	1,550.0	13,950.0	15,500	(Kyat / per sud)

12-2-3. Timber Shuttering Formworks

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Jungle Wood (Scant)	cu-ft	1.50	2,083.0	8,331.8	3,124.50	12,497.70	15,622.20	
Jungle Wood (Plank)	cu-ft	0.92	2,083.0	8,331.8	1,916.36	7,665.26	9,581.62	
Wire Nail	lb	3.00	680.5	291.7	2,041.50	875.10	2,916.60	
Total	-	-	-	-	9,782.4	45,338.1	55,121	(Kyat / per %sq-ft)

12-2-4. Reinforcing Bar Preparation and Assembly

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
Steel Fixer	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(2) Materials Used								
Steel Rod (10mm)	lb	117.60	73.6	3.9	8,655.36	458.64	9,114.00	
Binding Wire	lb	1.00	1,050.0	450.0	1,050.00	450.00	1,500.00	
Total	-	-	-	-	10,555.4	8,558.6	19,114	(Kyat / per CWT)

13. Repairing and Construction of Permanent Buildings

13-1. Repairing and Construction of Building (Bin Thar Quarter, Office, etc.)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	20.00	500.0	4,500.0	10,000.00	90,000.00	100,000.00	
Labor	day	30.00	350.0	3,150.0	10,500.00	94,500.00	105,000.00	
(2) Materials Used								
Repairing and Construction of Building	Set	1.00	4,000,000.0	6,000,000.0	4,000,000.00	6,000,000.00	10,000,000.00	
Miscellaneous Works	L.S				0.00	2,850,000.00	2,850,000.00	
Total	-	-	-	-	4,020,500.0	9,034,500.0	13,055,000	(Kyat / per item)

14. Other Related Works

14-1. Repairing of Motor Vehicles, Water Pumps and Generators

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Operator (Machine Driver)	day	4.00	400.0	3,600.0	1,600.00	14,400.00	16,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
Total	-	-	-	-	5,100.0	45,900.0	51,000	(Kyat / per item)

14-2. Earth Work for Drainage Canal

14-2-1. Earth Work for Drainage Canal (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.0	4,725.0	5,250	(Kyat / per sud)

14-2-2. Earth Work for Drainage Canal (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.2600	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	5.85	
Total	-	-	-	-	1,067.7	56.2	1,124	(Kyat / per sud)

14-3. Management of Construction Materials and Equipment

14-3-1. Shifting of Materials from Temporary Stock-pile to Work Site

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							
(2) Labor								
Labor	day	0.05	350.0	3,150.0	17.50	157.50	175.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Engine Oil	gal	0.0052	17,100.0	900.0	88.92	4.68	93.60	
Lubricant	gal	0.0013	14,250.0	750.0	18.53	0.98	19.51	
Total	-	-	-	-	1,113.0	215.2	1,328	(Kyat / per item)

14-3-2. Transporting of Materials from Quarry to Stock-pile (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							

14-3-2. Transporting of Materials from Quarry to Stock-pile (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Labor								
Labor	day	0.05	350.0	3,150.0	17.50	157.50	175.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.36	3,800.0	200.0	1,368.00	72.00	1,440.00	
Engine Oil	gal	0.0072	17,100.0	900.0	123.12	6.48	129.60	
Lubricant	gal	0.0018	14,250.0	750.0	25.65	1.35	27.00	
Total	-	-	-	-	1,534.3	237.3	1,772	(Kyat / per item)

14-3-3. Transporting and Shifting of Heavy Machines

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							
(2) Labor								
Operator (Machine Driver)	day	10.00	400.0	3,600.0	4,000.00	36,000.00	40,000.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.36	3,800.0	200.0	1,368.00	72.00	1,440.00	
Engine Oil	gal	0.0072	17,100.0	900.0	123.12	6.48	129.60	
Lubricant	gal	0.0018	14,250.0	750.0	25.65	1.35	27.00	
Total	-	-	-	-	5,516.8	36,079.8	41,597	(Kyat / per item)

14-3-4. Loading and Unloading Charges of Materials

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
Total	-	-	-	-	2,800.0	25,200.0	28,000	(Kyat / per item)

14-4. Dewatering Works

14-4-1. Water Pump for Dewatering Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Water Pump	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	10.00	3,800.0	200.0	38,000.00	2,000.00	40,000.00	
Total	-	-	-	-	38,000.0	2,000.0	40,000	(Kyat / per gal)

14-5. Welfare Charges for Labor

14-5-1. Hnee Thatch

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.002	350.0	3,150.0	0.70	6.30	7.00	
(2) Materials Used								
Hnee Thatch	item	0.002	10,000.0	200,000.0	20.00	400.00	420.00	
Total	-	-	-	-	20.7	406.3	427	(Kyat / per item)

14-5-2. Bamboo

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.004	350.0	3,150.0	1.40	12.60	14.00	
(2) Materials Used								
Bamboo	item	0.005	5,000.0	100,000.0	25.00	500.00	525.00	
Total	-	-	-	-	26.4	512.6	539	(Kyat / per item)

14-6. Labor Charges for Day & Night Watchman, Helper, Checker and General Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
Total	-	-	-	-	350.0	3,150.0	3,500	(Kyat / per M/D)

14-7. Camps Facilities (Lighting, Water Supply, etc.)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Water Pump	Irrigation Department							1 gal/bowser
Water Bowser	Irrigation Department							3 gal/trip
Diesel Generator	Irrigation Department							1 gal/hr
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	1.00	3,800.0	200.0	3,800.00	200.00	4,000.00	4 hr/day
(Water Pump)								
Diesel (H.S.D.)	gal	3.00	3,800.0	200.0	11,400.00	600.00	12,000.00	1 trip/day
(Water Bowser)								
Diesel (H.S.D.)	gal	4.00	3,800.0	200.0	15,200.00	800.00	16,000.00	1 bowser/day
(Generator)								
Total	-	-	-	-	30,400.0	1,600.0	32,000	(Kyat / per gal)

14-8. Making Data Boards and Sign Boards

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Painter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Ply Wood (8'x4')	No.	1.00	3,000.0	12,000.0	3,000.00	12,000.00	15,000.00	
Paint	gal	2.50	10,000.0	10,000.0	25,000.00	25,000.00	50,000.00	
Painting charges	L.S	1.00	1,500.0	13,500.0	1,500.00	13,500.00	15,000.00	
Beading 1"x½"	cu-ft	0.30	5,207.5	5,207.5	1,562.25	1,562.25	3,124.50	
Total	-	-	-	-	34,762.3	85,362.3	120,125	(Kyat / per item)

14-9. Estimating, Copying, Photo Recording and Stationary Charges, etc;

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Materials Used								
Paper	Page	500.00	3.0	7.0	1,500.00	3,500.00	5,000.00	
(2) Service Charges								
Typing & Printing charges	Page	90.00	25.0	225.0	2,250.00	20,250.00	22,500.00	
Photo & Printing charges	Page	50.00	50.0	450.0	2,500.00	22,500.00	25,000.00	
Copying charges	Page	360.00	2.5	22.5	900.00	8,100.00	9,000.00	
Binding charges	No.	5.00	100.0	900.0	500.00	4,500.00	5,000.00	
Total	-	-	-	-	7,650.0	58,850.0	66,500	(Kyat / per item)

14-10. Miscellaneous

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
Miscellaneous	item	1.00	5,000.0	100,000.0	5,000.00	100,000.00	105,000.00	
Total	-	-	-	-	5,000.0	100,000.0	105,000	(Kyat / per item)

3.3 Analysis Rate (Productivity) for Wegyi Irrigation System

3.3.1 Analysis Rate for Main Canal

1. Preparatory Works

1-1. Survey and Profile Works (Canal length : 30 feet / sect)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Lime (Strained Lime)	cu-ft	0.20	350.0	3,150.0	70.00	630.00	700.00	
Plastic ream	No.	0.67	90.0	810.0	60.00	540.00	600.00	for finishing stake
Labor	day	0.10	350.0	3,150.0	35.00	315.00	350.00	
Total	-	-	-	-	315.00	2,835.00	3,150	(Kkyat / per sect)

1-2. Temporary Camp & Stores

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) 4"~6"φMyaw Post Work								
4"~6"φMyaw (J/Wood)	No.	12.00	1,200.0	4,800.0	14,400.00	57,600.00	72,000.00	
Carpenter	day	0.50	500.0	4,500.0	250.00	2,250.00	2,500.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) 2"~4"φMyaw Post Work								
2"~4"φMyaw (J/Wood)	No.	43.00	400.0	1,600.0	17,200.00	68,800.00	86,000.00	
Wire Nail	viss	2.00	2,450.0	1,050.0	4,900.00	2,100.00	7,000.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
(3) Hnee Thatch Roofing Work								
Hnee Thatch	No.	550.00	50.0	450.0	27,500.00	247,500.00	275,000.00	
Bamboo	No.	75.00	50.0	450.0	3,750.00	33,750.00	37,500.00	
Wire Nail	viss	2.50	2,450.0	1,050.0	6,125.00	2,625.00	8,750.00	
Carpenter	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
(4) Roll Mat Ridging Work								
Roll Mat (12'x3')	No.	6.00	180.0	1,620.0	1,080.00	9,720.00	10,800.00	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.25	500.0	4,500.0	125.00	1,125.00	1,250.00	
(5) Bamboo Flooring Work								
Bamboo	No.	150.00	50.0	450.0	7,500.00	67,500.00	75,000.00	
Wire Nail	viss	1.50	2,450.0	1,050.0	3,675.00	1,575.00	5,250.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(6) Bamboo Mat Walling (Single)								
Bamboo Mat	sq-ft	1,173.00	20.0	180.0	23,460.00	211,140.00	234,600.00	
Bamboo	No.	15.00	50.0	450.0	750.00	6,750.00	7,500.00	
Wire Nail	viss	1.00	2,450.0	1,050.0	2,450.00	1,050.00	3,500.00	
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
(7) Bamboo Hand Rail work								
Bamboo	No.	15.00	50.0	450.0	750.00	6,750.00	7,500.00	
Wire Nail	viss	0.25	2,450.0	1,050.0	612.50	262.50	875.00	
Carpenter	day	0.25	500.0	4,500.0	125.00	1,125.00	1,250.00	
Total	-	-	-	-	123,497.50	799,127.50	922,625	(Kkyat / per unit)

1-3. Temporary Barracks for Repair (4 units)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Hnee Thatch Roofing Work								
Hnee Thatch	No.	150.00	50.0	450.0	7,500.00	67,500.00	75,000.00	
Bamboo	No.	26.00	50.0	450.0	1,300.00	11,700.00	13,000.00	
Wire Nail	viss	0.20	2,450.0	1,050.0	490.00	210.00	700.00	
Binding Wire	lb	0.25	1,050.0	450.0	262.50	112.50	375.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(2) Double Bamboo Rallmat Ridging work								
Roll Mat (12'x3')	No.	5.00	180.0	1,620.0	900.00	8,100.00	9,000.00	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Labor	day	0.30	350.0	3,150.0	105.00	945.00	1,050.00	
(3) Spitted Bamboo flooring work								
Bamboo	No.	55.00	50.0	450.0	2,750.00	24,750.00	27,500.00	
Wire Nail	viss	0.30	2,450.0	1,050.0	735.00	315.00	1,050.00	
Binding Wire	lb	2.00	1,050.0	450.0	2,100.00	900.00	3,000.00	
Carpenter	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(4) Bamboo Mat Walling Work								
Bamboo Mat	sq-ft	140.00	20.0	180.0	2,800.00	25,200.00	28,000.00	
Jungle Wood (Plank)	cu-ft	0.32	2,085.4	8,341.8	667.33	2,669.38	3,336.71	
Wire Nail	viss	0.50	2,450.0	1,050.0	1,225.00	525.00	1,750.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(5) Bamboo Mat Door Work								
Bamboo Mat	sq-ft	30.00	20.0	180.0	600.00	5,400.00	6,000.00	
Jungle Wood (Plank)	cu-ft	2.20	2,085.4	8,341.8	4,587.88	18,351.96	22,939.84	
Wire Nail	viss	0.20	2,450.0	1,050.0	490.00	210.00	700.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(6) Bamboo Mat Window Work								
Bamboo	No.	6.00	50.0	450.0	300.00	2,700.00	3,000.00	
Jungle Wood (Plank)	cu-ft	0.60	2,085.4	8,341.8	1,251.24	5,005.08	6,256.32	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.63	500.0	4,500.0	315.00	2,835.00	3,150.00	
(7) Splitted Bamboo Triellis Work								
Bamboo	No.	21.00	50.0	450.0	1,050.00	9,450.00	10,500.00	
Wire Nail	viss	0.60	2,450.0	1,050.0	1,470.00	630.00	2,100.00	
Carpenter	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
(8) Iron fitting Work								
Butt Hinge	No.	40.00	700.0	300.0	28,000.00	12,000.00	40,000.00	
Hasp & Staple	No.	6.00	350.0	150.0	2,100.00	900.00	3,000.00	
Handle	No.	10.00	700.0	300.0	7,000.00	3,000.00	10,000.00	
Tower Bolt	No.	20.00	840.0	360.0	16,800.00	7,200.00	24,000.00	
Screw	gross	1.00	1,400.0	600.0	1,400.00	600.00	2,000.00	
Total	-	-	-	-	91,388.95	253,718.92	345,108	(Kkyat / per unit)

1-4. Temporary Latrines

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Site Cleaning & Earth Work								
Site Cleaning Work for Latrines	set	1.00	600.0	5,400.0	600.00	5,400.00	6,000.00	
Digging for Post Hole (Barrack etc.)	No.	4.00	30.0	270.0	120.00	1,080.00	1,200.00	
Digging for Pit Hole (Latrines)	No.	1.00	1,200.0	10,800.0	1,200.00	10,800.00	12,000.00	
(2) 4"~6"φMyaw Post Work								
4"~6"φMyaw (J/Wood)	No.	7.00	1,200.0	8,400.0	8,400.00	33,600.00	42,000.00	
Wire Nail	viss	0.30	2,450.0	1,050.0	735.00	315.00	1,050.00	
Carpenter	day	1.40	500.0	4,500.0	700.00	6,300.00	7,000.00	
Labor	day	0.90	350.0	3,150.0	315.00	2,835.00	3,150.00	
(3) 2"~4"φMyaw Post Work								
2"~4"φMyaw (J/Wood)	No.	5.00	400.0	1,600.0	2,000.00	8,000.00	10,000.00	
Wire Nail	viss	0.20	2,450.0	1,050.0	490.00	210.00	700.00	
Carpenter	day	0.60	500.0	4,500.0	300.00	2,700.00	3,000.00	
Labor	day	0.60	350.0	3,150.0	210.00	1,890.00	2,100.00	
(4) Hnee Thatch Roofing Work								
Hnee Thatch	No.	43.20	50.0	450.0	2,160.00	19,440.00	21,600.00	
Bamboo	No.	9.00	50.0	450.0	450.00	4,050.00	4,500.00	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Binding Wire	lb	1.00	1,050.0	450.0	1,050.00	450.00	1,500.00	
Carpenter	day	0.40	500.0	4,500.0	200.00	1,800.00	2,000.00	
Labor	day	0.40	350.0	3,150.0	140.00	1,260.00	1,400.00	
(5) 6"×1" Plank Flooring Work								
Jungle Wood (Plank)	cu-ft	1.30	2,085.4	8,341.8	2,711.02	10,844.34	13,555.36	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.20	500.0	4,500.0	100.00	900.00	1,000.00	
Labor	day	0.10	350.0	3,150.0	35.00	315.00	350.00	
(6) Bamboo Mat Walling Work								
Bamboo Mat	sq-ft	96.60	20.0	180.0	1,932.00	17,388.00	19,320.00	
Jungle Wood (Plank)	cu-ft	0.30	2,085.4	8,341.8	625.62	2,502.54	3,128.16	
Wire Nail	viss	0.40	2,450.0	1,050.0	980.00	420.00	1,400.00	
Carpenter	day	0.80	500.0	4,500.0	400.00	3,600.00	4,000.00	
(7) Bamboo Mat Door Work								
Bamboo Mat	sq-ft	12.00	20.0	180.0	240.00	2,160.00	2,400.00	
Jungle Wood (Plank)	cu-ft	1.10	2,085.4	8,341.8	2,293.94	9,175.98	11,469.92	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.50	500.0	4,500.0	250.00	2,250.00	2,500.00	
(8) Iron fitting Work								
Butt Hinge	No.	2.00	700.0	300.0	1,400.00	600.00	2,000.00	
Hasp & Staple	No.	1.00	350.0	150.0	350.00	150.00	500.00	
Handle	No.	2.00	700.0	300.0	1,400.00	600.00	2,000.00	
Tower Bolt	No.	1.00	840.0	360.0	840.00	360.00	1,200.00	
Lock & Key	No.	1.00	1,400.0	600.0	1,400.00	600.00	2,000.00	
Screw	gross	2.00	1,400.0	600.0	2,800.00	1,200.00	4,000.00	
Purchasing & Fixing of W.C. Pan	No.	1.00	5,600.0	2,400.0	5,600.00	2,400.00	8,000.00	
Total	-	-	-	-	43,162.58	155,910.86	199,073	(Kyat / per unit)

1-5. Making Stock Pile Yards

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Earth Work								
Digging for Post Hole (Barrack etc.)	No.	47.00	30.0	270.0	1,410.00	12,690.00	14,100.00	
(2) Wagut Walling with Bamboo Rail Work								
Wagut (5'×2'6")	No.	40.00	240.0	960.0	9,600.00	38,400.00	48,000.00	
4"~6"φMyaw (J/Wood)	No.	15.00	1,200.0	4,800.0	18,000.00	72,000.00	90,000.00	
Bamboo	No.	33.00	50.0	450.0	1,650.00	14,850.00	16,500.00	
Wire Nail	viss	1.50	2,450.0	1,050.0	3,675.00	1,575.00	5,250.00	
Binding Wire	lb	3.00	1,050.0	450.0	3,150.00	1,350.00	4,500.00	
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	4.00	350.0	3,150.0	1,400.00	12,600.00	14,000.00	
Total	-	-	-	-	40,885.00	171,465.00	212,350	(Kyat / per unit)

1-6. Labor Transporting Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck (Capacity = 5ton)	Irrigation Department							
(2) Labor Transportation								
(a) Tar road	mile	5.00						
Diesel (H.S.D.)	gal	0.50	3,800.0	200.0	1,900.00	100.00	2,000.00	Tar road : 10mile/gal
(b) offroad	mile	4.00						
Diesel (H.S.D.)	gal	0.50	3,800.0	200.0	1,900.00	100.00	2,000.00	Off road : 8mile/gal
Total	-	-	-	-	3,800.00	200.00	4,000	(Kyat / per item)

1-7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas

1-7-1. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.30	350.0	3,150.0	105.00	945.00	1,050.00	
Total	-	-	-	-	105.00	945.00	1,050	(Kyat / per %sq-ft)

1-7-2. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Bulldozer	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	11.00	3,800.0	200.0	41,800.00	2,200.00	44,000.00	
Engine Oil	gal	0.22	17,100.0	900.0	3,762.00	198.00	3,960.00	
Hydraulic Oil	gal	0.22	9,500.0	500.0	2,090.00	110.00	2,200.00	
Grease	lb	0.055	4,275.0	225.0	235.13	12.38	247.51	
Total	-	-	-	-	47,887.13	2,520.38	50,408	(Kyat / per acres)

2. Earth Works

2-1. Canal Bank Raising and Canal Resectioning Works

2-1-1. Canal Bank Raising Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	6.00	
Total	-	-	-	-	1,067.66	56.19	1,124	(Kyat / per sud)

2-1-1. Canal Bank Raising Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.32	3,800.0	200.0	1,216.00	64.00	1,280.00	
Hydraulic Oil	gal	0.0075	9,500.0	500.0	71.25	3.75	75.00	
Engine Oil	gal	0.0075	17,100.0	900.0	128.25	6.75	135.00	
Grease	lb	0.012	4,275.0	225.0	51.30	2.70	54.00	
Total	-	-	-	-	1,466.80	77.20	1,544	(Kyat / per sud)

2-1-2. Canal Resectioning Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	6.00	
Total	-	-	-	-	1,067.66	56.19	1,124	(Kyat / per sud)

2-1-2. Canal Resectioning Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.32	3,800.0	200.0	1,216.00	64.00	1,280.00	
Hydraulic Oil	gal	0.0075	9,500.0	500.0	71.25	3.75	75.00	
Engine Oil	gal	0.0075	17,100.0	900.0	128.25	6.75	135.00	
Grease	lb	0.012	4,275.0	225.0	51.30	2.70	54.00	
Total	-	-	-	-	1,466.80	77.20	1,544	(Kyat / per sud)

2-1-3. Canal Resectioning Work (by Blasting (at Rock Portion))

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Materials								
Dynamite	gram	488.00	0.87	3.49	424.56	1,703.12	2,127.68	
Detonator	Pcs	1.00	35.2	140.8	35.20	140.80	176.00	
(2) Machine								
Air Compressor , BackHoe , Dozer , Tipper	Irrigation Department							
Diesel (H.S.D.)	gal	1.56	3,800.0	200.0	5,928.00	312.00	6,240.00	
Lubricant	gal	0.001	14,250.0	750.0	14.25	0.75	15.00	
Grease	lb	0.001	4,275.0	225.0	4.28	0.23	4.51	
Miscellaneous	L.S	1.00	0.0	350.0	0.00	350.00	350.00	
Total	-	-	-	-	6,406.29	2,506.90	8,913	(Kyat / per sud)

2-1-4. Canal Resectioning Work (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-2. E/W (Earth Work) Filling into Canal Section and Inner Side Slop

2-2-1. E/W Filling into Canal Section and Inner Side Slop (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-2-2. E/W Filling into Canal Section and Inner Side Slop (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	6.00	
Total	-	-	-	-	1,067.66	56.19	1,124	(Kyat / per sud)

2-3. G.C (Gravelly Clay) Filling and Compacting Works in Canal Section and Inner Slope

2-3-1. G.C Filling and Compacting Works in Canal Section and Inner Slope (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-3-2. G.C Filling and Compacting Works in Canal Section and Inner Slope (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	5.85	
Total	-	-	-	-	1,067.66	56.19	1,124	(Kyat / per sud)

2-4. Making of Temporary Cofferdam for Necessary of Work

2-4-1. Making of Temporary Cofferdam for Necessary of Work (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(Digging)								
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(Packing & Carrying)								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(Stacking)								
(2) Materials Used								
Penan Bag	No.	100.00	30.0	270.0	3,000.00	27,000.00	30,000.00	
Total	-	-	-	-	4,575.0	41,175.0	45,750	(Kyat / per sud)

2-4-2. Making of Temporary Cofferdam for Necessary of Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.74	3,800.0	200.0	2,812.00	148.00	2,960.00	
Lubricant	gal	0.0148	14,250.0	750.0	210.90	11.10	222.00	
Grease	lb	0.0037	4,275.0	225.0	15.82	0.83	16.65	
Total	-	-	-	-	3,038.72	159.93	3,199	(Kyat / per sud)

2-5. Earth Work Excavation for Bed Kerb & Compartment and Copping (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-6. Earth Work in Dressing (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-7. Earth Work in Base Stripping 3"thick (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-8. Unsilted of Main Canal

2-8-1. Unsilted of Main Canal (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	3.80	350.0	3,150.0	1,330.00	11,970.00	13,300.00	
Total	-	-	-	-	1,330.0	11,970.0	13,300	(Kyat / per sud)

2-8-2. Unsilted of Main Canal (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	5.85	
Total	-	-	-	-	1,067.66	56.19	1,124	(Kyat / per sud)

3. Repairing and Construction of Linings Works

3-1. Brick Lining Work

3-1-1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per %sq-ft)

3-1-2. Making of Ring Bund with Sand Bags

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
(Digging)								
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(Carring & packing)								
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
(Placing & stacking)								
(2) Materials Used								
Penan Bag	No.	46.67	30.0	270.0	1,400.10	12,600.90	14,001.00	
Total	-	-	-	-	5,600.10	50,400.90	56,001	(Kyat / per %cu-ft)

3-1-3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.50	350.0	3,150.0	1,225.00	11,025.00	12,250.00	
(2) Materials Used								
Brick (Clay)	No.	550.00	65.2	79.7	35,860.00	43,835.00	79,695.00	
Cement	lb	356.40	56.0	2.9	19,958.40	1,033.56	20,991.96	
Sand	cu-ft	12.00	318.2	260.3	3,818.40	3,123.60	6,942.00	
Total	-	-	-	-	61,861.80	68,017.16	129,879	(Kyat / per %sq-ft)

3-1-4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.50	350.0	3,150.0	1,225.00	11,025.00	12,250.00	
(2) Materials Used								
Brick (Cement)	No.	550.00	93.8	62.6	51,590.00	34,430.00	86,020.00	
Cement	lb	356.40	56.0	2.9	19,958.40	1,033.56	20,991.96	
Sand	cu-ft	12.00	318.2	260.3	3,818.40	3,123.60	6,942.00	
Total	-	-	-	-	77,591.80	58,612.16	136,204	(Kyat / per %sq-ft)

3-1-5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.50	500.0	4,500.0	750.00	6,750.00	7,500.00	
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(2) Materials Used								
Brick (Clay)	No.	345.00	65.2	79.7	22,494.00	27,496.50	49,990.50	
Cement	lb	238.00	56.0	2.9	13,328.00	690.20	14,018.20	
Sand	cu-ft	8.00	318.2	260.3	2,545.60	2,082.40	4,628.00	
Total	-	-	-	-	39,642.60	41,744.10	81,387	(Kyat / per %sq-ft)

3-1-6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.50	500.0	4,500.0	750.00	6,750.00	7,500.00	
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(2) Materials Used								
Brick (Cement)	No.	345.00	93.8	62.6	32,361.00	21,597.00	53,958.00	
Cement	lb	238.00	56.0	2.9	13,328.00	690.20	14,018.20	
Sand	cu-ft	8.00	318.2	260.3	2,545.60	2,082.40	4,628.00	
Total	-	-	-	-	49,509.60	35,844.60	85,354	(Kyat / per %sq-ft)

3-1-7. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	9.00	500.0	4,500.0	4,500.00	40,500.00	45,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
6"-9" Stone Boulder	cu-ft	125.00	541.2	360.8	67,650.00	45,100.00	112,750.00	
Cement	lb	432.00	56.0	2.9	24,192.00	1,252.80	25,444.80	
Sand	cu-ft	14.00	318.2	260.3	4,454.80	3,644.20	8,099.00	
River Shingle	cu-ft	28.00	593.1	485.2	16,606.80	13,585.60	30,192.40	
Total	-	-	-	-	120,203.60	129,282.60	249,486	(Kyat / per sud)

3-1-8. 3"thick Sand Filling under Brick Lining

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor*								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(2) Materials Used								
Sand	cu-ft	125.00	318.2	260.3	39,775.00	32,537.50	72,312.50	
Total	-	-	-	-	40,125.00	35,687.50	75,813	(Kyat / per sud)

* Sand filling work including watering and ramming completed.

3-1-9. Pointing Work (with 1:3 Cement Mortar)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Cement	lb	54.27	56.0	2.9	3,039.12	157.38	3,196.50	
Sand	cu-ft	468.00	318.2	260.3	148,917.60	121,820.40	270,738.00	
Total	-	-	-	-	153,156.72	132,777.78	285,935	(Kyat / per %sq-ft)

3-2. Concreting Works

3-2-1. 1:3:6 Cement Concrete Work for Canal Bed Kerb

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
Cement	lb	1,440.00	56.0	2.9	80,640.00	4,176.00	84,816.00	
Sand	cu-ft	48.00	318.2	260.3	15,273.60	12,494.40	27,768.00	
River Shingle	cu-ft	96.00	593.1	485.2	56,937.60	46,579.20	103,516.80	
Total	-	-	-	-	156,151.2	92,949.6	249,101	(Kyat / per sud)

3-2-2. 1:3:6 Cement Concrete Work for Canal Copping

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
Cement	lb	1,440.00	56.0	2.9	80,640.00	4,176.00	84,816.00	
Sand	cu-ft	48.00	318.2	260.3	15,273.60	12,494.40	27,768.00	
River Shingle	cu-ft	96.00	593.1	485.2	56,937.60	46,579.20	103,516.80	
Total	-	-	-	-	156,151.2	92,949.6	249,101	(Kyat / per sud)

3-2-3. Timber Shuttering Formworks

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Jungle Wood (Scant)	cu-ft	1.50	2,085.4	8,341.8	3,128.10	12,512.70	15,640.80	
Jungle Wood (Plank)	cu-ft	0.92	2,085.4	8,341.8	1,918.57	7,674.46	9,593.03	
Wire	lb	3.00	680.5	291.7	2,041.50	875.10	2,916.60	
Total	-	-	-	-	9,788.2	45,362.3	55,151	(Kyat / per %sq-ft)

3-3. Concrete Lining Work

3-3-1. Concrete Lining Work (with 1:3:6 Cement Concrete)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(for Mixing)								
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(for Mixing)								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(for Carrying, Placing & Consolidating)								
Labor	day	5.00	350.0	3,150.0	1,750.00	15,750.00	17,500.00	
(for Carrying, Placing & Consolidating)								
Operator	day	0.50	400.0	3,600.0	200.00	1,800.00	2,000.00	
(2) Materials Used								
Cement	lb	1,440.00	56.0	2.9	80,640.00	4,176.00	84,816.00	
Sand	cu-ft	48.00	318.2	260.3	15,273.60	12,494.40	27,768.00	
River Shingle	cu-ft	96.00	593.1	485.2	56,937.60	46,579.20	103,516.80	
(3) Machine								
Mixer	Irrigation Department							
(4) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	2.00	3,800.0	200.0	7,600.00	400.00	8,000.00	
Total	-	-	-	-	165,501.20	109,099.60	274,601	(Kyat / per sud)

3-4. Related Works for Concreting such as Earth Work Excavation ,Timber Shuttering for Form Work etc;

3-4-1. Timber Shuttering Formwork for Concreting

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Timber (Scant)	cu-ft	1.50	2,083.0	8,332.0	3,124.50	12,498.00	15,622.50	
Timber (Plank)	cu-ft	0.92	2,083.0	8,332.0	1,916.36	7,665.44	9,581.80	
Wire Nail	lb	3.00	680.5	291.7	2,041.50	875.10	2,916.60	
Total	-	-	-	-	9,782.36	45,338.54	55,121	(Kyat / per %sq-ft)

3-4-2. Brick Work with 1:3 Cement Mortar for Compartment (with Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(2) Materials Used								
Brick (Clay)	No.	1,350.00	65.2	79.7	88,020.00	107,595.00	195,615.00	
Cement	lb	780.00	56.0	2.9	43,680.00	2,262.00	45,942.00	
Sand	cu-ft	26.00	318.2	260.3	8,273.20	6,767.80	15,041.00	
Total	-	-	-	-	144,073.20	153,524.80	297,598	(Kyat / per sud)

3-4-3. Brick Work with 1:3 Cement Mortar for Compartment (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(2) Materials Used								
Brick (Cement)	No.	1,350.00	93.8	62.6	126,630.00	84,510.00	211,140.00	
Cement	lb	780.00	56.0	2.9	43,680.00	2,262.00	45,942.00	
Sand	cu-ft	26.00	318.2	260.3	8,273.20	6,767.80	15,041.00	
Total	-	-	-	-	182,683.20	130,439.80	313,123	(Kyat / per sud)

3-4-4. Brick Work (1:3) Cement Mortar (with Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(2) Materials Used								
Brick (Clay)	No.	1,350.00	65.2	79.7	88,020.00	107,595.00	195,615.00	
Cement	lb	780.00	56.0	2.9	43,680.00	2,262.00	45,942.00	
Sand	cu-ft	26.00	318.2	260.3	8,273.20	6,767.80	15,041.00	
Total	-	-	-	-	144,073.20	153,524.80	297,598	(Kyat / per sud)

3-4-5. Brick Work (1:3) Cement Mortar (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(2) Materials Used								
Brick (Cement)	No.	1,350.00	93.8	62.6	126,630.00	84,510.00	211,140.00	
Cement	lb	780.00	56.0	2.9	43,680.00	2,262.00	45,942.00	
Sand	cu-ft	26.00	318.2	260.3	8,273.20	6,767.80	15,041.00	
Total	-	-	-	-	182,683.20	130,439.80	313,123	(Kyat / per sud)

4. Repairing & Reconstruction of Canal Structures

4-1. Re-Construction of Structures

4-1-1. Construction of Drop

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	400.00	500.0	4,500.0	200,000.00	1,800,000.00	2,000,000.00	
Carpenter	day	100.00	500.0	4,500.0	50,000.00	450,000.00	500,000.00	
Labor	day	800.00	350.0	3,150.0	280,000.00	2,520,000.00	2,800,000.00	
(2) Materials Used								
Cement	lb	39,200.00	56.0	2.9	2,195,200.00	113,680.00	2,308,880.00	
Sand	cu-ft	1,500.00	318.2	260.3	477,300.00	390,450.00	867,750.00	
River Shingle	cu-ft	1,000.00	593.1	485.2	593,100.00	485,200.00	1,078,300.00	
Brick (Cement)	No.	21,400.00	93.8	62.6	2,007,320.00	1,339,640.00	3,346,960.00	
Miscellaneous Works	L.S				0.00	1,000,000.00	1,000,000.00	
Total	-	-	-	-	5,802,920.00	8,098,970.00	13,901,890	(Kyat / per unit)

4-1-2. Construction of Head Regulator

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	60.00	500.0	4,500.0	30,000.00	270,000.00	300,000.00	
Carpenter	day	5.00	500.0	4,500.0	2,500.00	22,500.00	25,000.00	
Labor	day	92.00	350.0	3,150.0	32,200.00	289,800.00	322,000.00	
(2) Materials Used								
Cement	lb	7,840.00	56.0	2.9	439,040.00	22,736.00	461,776.00	
Sand	cu-ft	300.00	318.2	260.3	95,460.00	78,090.00	173,550.00	
River Shingle	cu-ft	200.00	593.1	485.2	118,620.00	97,040.00	215,660.00	
Brick (Cement)	No.	4,280.00	93.8	62.6	401,464.00	267,928.00	669,392.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	1,119,284.00	1,148,094.00	2,267,378	(Kyat / per unit)

4-1-3. Construction of Drain Box Culvert

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	100.00	500.0	4,500.0	50,000.00	450,000.00	500,000.00	
Carpenter	day	350.00	500.0	4,500.0	175,000.00	1,575,000.00	1,750,000.00	
Labor	day	900.00	350.0	3,150.0	315,000.00	2,835,000.00	3,150,000.00	
(2) Materials Used								
Cement	lb	133000.00	56.0	2.9	7,448,000.00	385,700.00	7,833,700.00	
Sand	cu-ft	4750.00	318.2	260.3	1,511,450.00	1,236,425.00	2,747,875.00	
River Shingle	cu-ft	3812.50	593.1	485.2	2,261,193.75	1,849,825.00	4,111,018.75	
Brick (Cement)	No.	73375.00	93.8	62.6	6,882,575.00	4,593,275.00	11,475,850.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	18,643,218.75	13,025,225.00	31,668,444	(Kyat / per unit)

4-1-4. Construction of Road Crossing and Bridge

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	110.00	500.0	4,500.0	55,000.00	495,000.00	550,000.00	
Labor	day	344.00	350.0	3,150.0	120,400.00	1,083,600.00	1,204,000.00	
(2) Materials Used								
Cement	lb	28336.00	56.0	2.9	1,586,816.00	82,174.40	1,668,990.40	
Sand	cu-ft	1487.00	318.2	260.3	473,163.40	387,066.10	860,229.50	
River Shingle	cu-ft	978.00	593.1	485.2	580,051.80	474,525.60	1,054,577.40	
Brick (Cement)	No.	19527.00	93.8	62.6	1,831,632.60	1,222,390.20	3,054,022.80	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	4,647,063.80	3,844,756.30	8,491,820	(Kyat / per unit)

4-1-5. Construction of Syphon Protection

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Carpenter	day	35.00	500.0	4,500.0	17,500.00	157,500.00	175,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	56.0	2.9	947,072.00	49,044.80	996,116.80	
Sand	cu-ft	772.00	318.2	260.3	245,650.40	200,951.60	446,602.00	
River Shingle	cu-ft	998.00	593.1	485.2	591,913.80	484,229.60	1,076,143.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	2,092,186.20	2,234,376.00	4,326,562	(Kyat / per unit)

4-1-6. Construction of Course-Way

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	56.0	2.9	947,072.00	49,044.80	996,116.80	
Sand	cu-ft	772.00	318.2	260.3	245,650.40	200,951.60	446,602.00	
River Shingle	cu-ft	998.00	593.1	485.2	591,913.80	484,229.60	1,076,143.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	2,074,686.20	2,076,876.00	4,151,562	(Kyat / per unit)

4-1-7. Construction of Box Culverts (Cross Drain Culverts) (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Carpenter	day	35.00	500.0	4,500.0	17,500.00	157,500.00	175,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	

4-1-7. Construction of Box Culverts (Cross Drain Culverts) (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
Cement	lb	16912.00	56.0	2.9	947,072.00	49,044.80	996,116.80	
Sand	cu-ft	772.00	318.2	260.3	245,650.40	200,951.60	446,602.00	
River Shingle	cu-ft	998.00	593.1	485.2	591,913.80	484,229.60	1,076,143.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	2,092,186.20	2,234,376.00	4,326,562	(Kyat / per unit)

4-2. Repairing of structures

4-2-1. Drop

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	30.00	500.0	4,500.0	15,000.00	135,000.00	150,000.00	
Labor	day	70.00	350.0	3,150.0	24,500.00	220,500.00	245,000.00	
(2) Materials Used								
Cement	lb	12,723.20	56.0	2.9	712,499.20	36,897.28	749,396.48	
Sand	cu-ft	8.12	31,817.5	26,032.5	258,358.10	211,383.90	469,742.00	
River Shingle	cu-ft	5.96	59,306.5	48,523.5	353,466.74	289,200.06	642,666.80	
Brick (Cement)	No.	4,718.00	93.8	62.6	442,548.40	295,346.80	737,895.20	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	1,806,372.44	1,288,328.04	3,094,700	(Kyat / per unit)

4-2-2. Head Regulator

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	14.00	500.0	4,500.0	7,000.00	63,000.00	70,000.00	
Labor	day	30.00	350.0	3,150.0	10,500.00	94,500.00	105,000.00	
(2) Materials Used								
Cement	lb	15,750.00	56.0	2.9	882,000.00	45,675.00	927,675.00	
Sand	cu-ft	9.38	31,817.5	26,032.5	298,289.06	244,054.69	542,343.75	
River Shingle	cu-ft	12.50	59,306.5	48,523.5	741,331.25	606,543.75	1,347,875.00	
Brick (Cement)	No.	702.50	93.8	62.6	65,894.50	43,976.50	109,871.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	2,005,014.81	1,197,749.94	3,202,765	(Kyat / per unit)

4-2-3. Drain Box Culvert (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	50.00	500.0	4,500.0	25,000.00	225,000.00	250,000.00	
Labor	day	100.00	350.0	3,150.0	35,000.00	315,000.00	350,000.00	

4-2-3. Drain Box Culvert (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
Cement	lb	6,923.60	56.0	2.9	387,721.60	20,078.44	407,800.04	
Sand	sud	4.00	31,817.5	26,032.5	127,270.00	104,130.00	231,400.00	
River Shingle	sud	6.00	59,306.5	48,523.5	355,839.00	291,141.00	646,980.00	
Brick (Cement)	No.	3,000.00	93.8	62.6	281,400.00	187,800.00	469,200.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	1,212,230.60	1,243,149.44	2,455,380	(Kyat / per unit)

4-2-4. Road Crossing and Bridge

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	240.00	500.0	4,500.0	120,000.00	1,080,000.00	1,200,000.00	
Labor	day	400.00	350.0	3,150.0	140,000.00	1,260,000.00	1,400,000.00	
(2) Materials Used								
Cement	lb	40,320.00	56.0	2.9	2,257,920.00	116,928.00	2,374,848.00	
Sand	sud	24.00	31,817.5	26,032.5	763,620.00	624,780.00	1,388,400.00	
River Shingle	sud	36.00	59,306.5	48,523.5	2,135,034.00	1,746,846.00	3,881,880.00	
Brick (Cement)	No.	15,000.00	93.8	62.6	1,407,000.00	939,000.00	2,346,000.00	
Miscellaneous Works	L.S				0.00	1,000,000.00	1,000,000.00	
Total	-	-	-	-	6,823,574.00	6,767,554.00	13,591,128	(Kyat / per unit)

4-2-5. Syphon

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Carpenter	day	35.00	500.0	4,500.0	17,500.00	157,500.00	175,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	56.0	2.9	947,072.00	49,044.80	996,116.80	
Sand	cu-ft	772.00	318.2	260.3	245,650.40	200,951.60	446,602.00	
River Shingle	cu-ft	998.00	593.1	485.2	591,913.80	484,229.60	1,076,143.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	2,092,186.20	2,634,376.00	4,726,562	(Kyat / per unit)

4-2-6. Repairing of Course-Way (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	

4-2-6. Repairing of Course-Way (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
Cement	lb	16912.00	56.0	2.9	947,072.00	49,044.80	996,116.80	
Sand	cu-ft	772.00	318.2	260.3	245,650.40	200,951.60	446,602.00	
River Shingle	cu-ft	998.00	593.1	485.2	591,913.80	484,229.60	1,076,143.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	2,074,686.20	2,476,876.00	4,551,562	(Kyat / per unit)

4-2-7. Repairing of Box Culverts (Cross Drain Culverts)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Carpenter	day	35.00	500.0	4,500.0	17,500.00	157,500.00	175,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	56.0	2.9	947,072.00	49,044.80	996,116.80	
Sand	cu-ft	772.00	318.2	260.3	245,650.40	200,951.60	446,602.00	
River Shingle	cu-ft	998.00	593.1	485.2	591,913.80	484,229.60	1,076,143.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	2,092,186.20	2,634,376.00	4,726,562	(Kyat / per unit)

4-2-8. Repairing of Conduit Gate and Assembly

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Smith	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
Steel Gate	No.	1.00	135,000.0	15,000.0	135,000.00	15,000.00	150,000.00	
Steel Rod (10mm)	lb	40.00	75.5	4.0	3,020.00	160.00	3,180.00	
Binding Wire	lb	8.00	1,050.0	450.0	8,400.00	3,600.00	12,000.00	
Miscellaneous Works	L.S				0.00	50,000.00	50,000.00	
Total	-	-	-	-	151,220.00	111,960.00	263,180	(Kyat / per item)

4-2-9. Repairing of Canal Gate Leaf, Frame & Gear Assembly

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Smith	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Steel Gate	No.	1.00	135,000.0	15,000.0	135,000.00	15,000.00	150,000.00	
Steel Rod (10mm)	lb	10.00	75.5	4.0	755.00	40.00	795.00	
Binding Wire	lb	2.00	1,050.0	450.0	2,100.00	900.00	3,000.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	139,055.00	126,740.00	265,795	(Kyat / per item)

4-2-10. Repairing of Canal Structures

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	56.0	2.9	947,072.00	49,044.80	996,116.80	
Sand	cu-ft	772.00	318.2	260.3	245,650.40	200,951.60	446,602.00	
River Shingle	cu-ft	998.00	593.1	485.2	591,913.80	484,229.60	1,076,143.40	
Brick (Cement)	No.	1750.00	93.8	62.6	164,150.00	109,550.00	273,700.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	2,074,686.20	2,076,876.00	4,151,562	(Kyat / per item)

5. Road Works

5-1. G.C (Gravelly Clay) Laying Work

5-1-1. G.C Laying and spreading works of Canal Inspection Path

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(laying, dressing, spreading & compacting)								
(2) Materials Used								
Gravelly Clay (G.C)	cu-ft	110.00	426.4	284.3	46,904.00	31,273.00	78,177.00	
Total	-	-	-	-	47,429.0	35,998.0	83,427	(Kyat / per sud)

5-1-2. G.C Laying and spreading work of Canal Non Inspection Path

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(laying, dressing, spreading & compacting)								
(2) Materials Used								
Gravelly Clay (G.C)	cu-ft	110.00	426.4	284.3	46,904.00	31,273.00	78,177.00	
Total	-	-	-	-	47,429.0	35,998.0	83,427	(Kyat / per sud)

5-2. Concrete Paving Work

5-2-1. Mixing only Cement Concrete (1:2:4) with (0.5" to 0.75") Gauge Stone Chippings on River Shingle

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
(2) Materials Used								
Cement	lb	2,070.00	56.0	2.9	115,920.00	6,003.00	121,923.00	
River Shingle	cu-ft	92.00	593.1	485.2	54,565.20	44,638.40	99,203.60	
Sand	cu-ft	46.00	318.2	260.3	14,637.20	11,973.80	26,611.00	
Total	-	-	-	-	189,122.4	98,615.2	287,738	(Kyat / per sud)

5-2-2. Mixing only Cement Concrete (1:3:6) with (0.5" to 0.75") Gauge Stone Chippings on River Shingle

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
(2) Materials Used								
Cement	lb	1,440.00	56.0	2.9	80,640.00	4,176.00	84,816.00	
River Shingle	cu-ft	96.00	593.1	485.2	56,937.60	46,579.20	103,516.80	
Sand	cu-ft	48.00	318.2	260.3	15,273.60	12,494.40	27,768.00	
Total	-	-	-	-	156,851.2	99,249.6	256,101	(Kyat / per sud)

5-2-3. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
Total	-	-	-	-	1,550.0	13,950.0	15,500	(Kyat / per sud)

5-2-4. Timber Shuttering Formworks

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Jungle Wood (Scant)	cu-ft	1.50	2,085.4	8,341.8	3,128.10	12,512.70	15,640.80	
Jungle Wood (Plank)	cu-ft	0.92	2,085.4	8,341.8	1,918.57	7,674.46	9,593.03	
Wire Nail	lb	3.00	680.5	291.7	2,041.50	875.10	2,916.60	
Total	-	-	-	-	9,788.17	45,362.26	55,150	(Kyat / per %sq-ft)

5-2-5. Reinforcing Bar Preparation and Assembly

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
Steel Fixer	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(2) Materials Used								
Steel Rod (10mm)	lb	117.60	75.5	4.0	8,878.80	470.40	9,349.20	
Binding Wire	lb	1.00	1,050.0	450.0	1,050.00	450.00	1,500.00	
Total	-	-	-	-	10,778.80	8,570.40	19,349	(Kyat / per CWT)

6. Repairing and Construction of Permanent Buildings

6-1. Repairing and Construction of Building (Gust House, Meeting Hall, Office, etc.)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	20.00	500.0	4,500.0	10,000.00	90,000.00	100,000.00	
Labor	day	30.00	350.0	3,150.0	10,500.00	94,500.00	105,000.00	
(2) Materials Used								
Repairing and Construction of Building	Set	1.00	4,000,000.0	6,000,000.0	4,000,000.00	6,000,000.00	10,000,000.00	
Miscellaneous Works	L.S				0.00	2,850,000.00	2,850,000.00	
Total	-	-	-	-	4,020,500.00	9,034,500.00	13,055,000	(Kyat / per item)

7. Other Related Works

7-1. Repairing of Heavy Machines

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Operator (Machine Driver)	day	3.00	400.0	3,600.0	1,200.00	10,800.00	12,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
Total	-	-	-	-	4,700.00	42,300.00	47,000	(Kkyat / per job)

7-2. Repairing of Motor Vehicles , Water Pumps and Generators

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Operator (Machine Driver)	day	4.00	400.0	3,600.0	1,600.00	14,400.00	16,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
Total	-	-	-	-	5,100.00	45,900.00	51,000	(Kkyat / per item)

7-3. Repairing Charges for Equipments

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Operator (Machine Driver)	day	3.00	400.0	3,600.0	1,200.00	10,800.00	12,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
Total	-	-	-	-	4,000.00	36,000.00	40,000	(Kkyat / per item)

7-4. Earth Works for Drainage Canal (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	5.85	
Total	-	-	-	-	1,067.7	56.2	1,124	(Kkyat / per sud)

7-5. Management of Construction Materials and Equipment

7-5-1. Shifting of Materials from Temporary Stock-pile to Work Site

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							
(2) Labor								
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Engine Oil	gal	0.0052	17,100.0	900.0	88.92	4.68	93.60	
Lubricant	gal	0.0013	14,250.0	750.0	18.53	0.98	19.51	
Total	-	-	-	-	2,145.45	9,507.66	11,653	(Kkyat / per item)

7-5-2. Transporting of Materials from Quarry to Stock-pile

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							
(2) Labor								
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.36	3,800.0	200.0	1,368.00	72.00	1,440.00	
Engine Oil	gal	0.0072	17,100.0	900.0	123.12	6.48	129.60	
Lubricant	gal	0.0018	14,250.0	750.0	25.65	1.35	27.00	
Total	-	-	-	-	2,566.77	9,529.83	12,097	(Kkyat / per item)

7-5-3. Transporting and Shifting of Heavy Machinery

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							
(2) Labor								
Operator (Machine Driver)	day	10.00	400.0	3,600.0	4,000.00	36,000.00	40,000.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.36	3,800.0	200.0	1,368.00	72.00	1,440.00	
Engine Oil	gal	0.0072	17,100.0	900.0	123.12	6.48	129.60	
Lubricant	gal	0.0018	14,250.0	750.0	25.65	1.35	27.00	
Total	-	-	-	-	5,516.77	36,079.83	41,597	(Kkyat / per item)

7-5-4. Loading and Unloading Charges of Materials

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
Total	-	-	-	-	2,800.00	25,200.00	28,000	(Kkyat / per item)

7-6. Water Pump for Dewatering Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Water Pump	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	10.00	3,800.0	200.0	38,000.00	2,000.00	40,000.00	
Total	-	-	-	-	38,000.00	2,000.00	40,000	(Kkyat / per day)

7-7. Welfare Charges for Labor

7-7-1. Temporary Hut Material for One Family

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
Temporary Hut Material for One Family	item	1.00	100,000.0	2,000,000.0	100,000.00	2,000,000.00	2,100,000.00	
Total	-	-	-	-	102,800.0	2,025,200.0	2,128,000	(Kyat / per item)

7-7-2. Hnee Thatch

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.002	350.0	3,150.0	0.70	6.30	7.00	
(2) Materials Used								
Hnee Thatch	item	0.002	10,000.0	200,000.0	20.00	400.00	420.00	
Total	-	-	-	-	20.70	406.30	427	(Kyat / per item)

7-7-3. Bamboo

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.004	350.0	3,150.0	1.40	12.60	14.00	
(2) Materials Used								
Bamboo	item	0.005	5,000.0	100,000.0	25.00	500.00	525.00	
Total	-	-	-	-	26.40	512.60	539	(Kyat / per item)

7-7-4. Transporting for Labor Necessary of Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck (Capacity = 5ton)	Irrigation Department							
					0.00	0.00	0.00	
(2) Labor Transportation								
(a) Tar road	mile	5.00						
Diesel (H.S.D.)	gal	0.50	3,800.0	200.0	1,900.00	100.00	2,000.00	Tar road : 10mile/gal
(b) off road	mile	4.00						
Diesel (H.S.D.)	gal	0.50	3,800.0	200.0	1,900.00	100.00	2,000.00	Off road : 8mile/gal
Total	-	-	-	-	3,800.00	200.00	4,000	(Kyat / per mile)

7-8. Labor Charges for Day & Night Watchman, Helper, Checker and General Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
Total	-	-	-	-	350.0	3,150.0	3,500	(Kyat / per M/D)

7-9. Camps Facilities (Lighting, Water Supply, etc.)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Water Pump	Irrigation Department							1 gal/bowser
Water Bowser	Irrigation Department							3 gal/trip
Diesel Generator	Irrigation Department							1 gal/hr
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	1.00	3,800.0	200.0	3,800.00	200.00	4,000.00	4 hr/day
(Water Pump)								
Diesel (H.S.D.)	gal	3.00	3,800.0	200.0	11,400.00	600.00	12,000.00	1 trip/day
(Water Bowser)								
Diesel (H.S.D.)	gal	4.00	3,800.0	200.0	15,200.00	800.00	16,000.00	1 bowser/day
(Generator)								
Total	-	-	-	-	30,400.00	1,600.00	32,000	(Kyat / per gal)

7-10. Making Data Boards and Sign Boards

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Painter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Ply Wood (8'x4')	No.	1.00	3,000.0	12,000.0	3,000.00	12,000.00	15,000.00	
Paint	gal	2.50	10,000.0	10,000.0	25,000.00	25,000.00	50,000.00	
Painting charges	L.S	1.00	1,500.0	13,500.0	1,500.00	13,500.00	15,000.00	
Beading 1"x½"	cu-ft	0.30	5,207.5	5,207.5	1,562.25	1,562.25	3,124.50	
Total	-	-	-	-	34,762.25	85,362.25	120,125	(Kyat / per item)

7-11. Estimating, Copying, Photo Recording and stationary Charges, etc;

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Materials Used								
Paper	Page	500.00	3.0	7.0	1,500.00	3,500.00	5,000.00	
(2) Service Charges								
Typing & Printing charges	Page	90.00	25.0	225.0	2,250.00	20,250.00	22,500.00	
Photo & Printing charges	Page	50.00	50.0	450.0	2,500.00	22,500.00	25,000.00	
Copying charges	Page	360.00	2.5	22.5	900.00	8,100.00	9,000.00	
Binding charges	No.	5.00	100.0	900.0	500.00	4,500.00	5,000.00	
Total	-	-	-	-	7,650.00	58,850.00	66,500	(Kyat / per item)

7-12. Miscellaneous

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
Miscellaneous	item	1.00	5,000.0	100,000.0	5,000.00	100,000.00	105,000.00	
Total	-	-	-	-	5,000.00	100,000.00	105,000	(Kyat / per item)

3.3.2 Analysis Rate for Distribution Canal

8. Preparatory Works

8-1. Survey and Profile Works (Canal length : 30 feet / sect)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Lime (Strained Lime)	cu-ft	0.20	350.0	3,150.0	70.00	630.00	700.00	
Plastic ream	No.	0.67	90.0	810.0	60.00	540.00	600.00	for finishing stake
Labor	day	0.10	350.0	3,150.0	35.00	315.00	350.00	
Total	-	-	-	-	315.00	2,835.00	3,150	(Kyat / per sect)

8-2. Temporary Camps & Stores

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) 4"~6"φMyaw Post Work								
4"~6"φMyaw (J/Wood)	No.	12.00	1,200.0	4,800.0	14,400.00	57,600.00	72,000.00	
Carpenter	day	0.50	500.0	4,500.0	250.00	2,250.00	2,500.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) 2"~4"φMyaw Post Work								
2"~4"φMyaw (J/Wood)	No.	43.00	400.0	1,600.0	17,200.00	68,800.00	86,000.00	
Wire Nail	viss	2.00	2,450.0	1,050.0	4,900.00	2,100.00	7,000.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
(3) Hnee Thatch Roofing Work								
Hnee Thatch	No.	550.00	50.0	450.0	27,500.00	247,500.00	275,000.00	
Bamboo	No.	75.00	50.0	450.0	3,750.00	33,750.00	37,500.00	
Wire Nail	viss	2.50	2,450.0	1,050.0	6,125.00	2,625.00	8,750.00	
Carpenter	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
(4) Roll Mat Ridging Work								
Roll Mat (12'x3')	No.	6.00	180.0	1,620.0	1,080.00	9,720.00	10,800.00	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.25	500.0	4,500.0	125.00	1,125.00	1,250.00	
(5) Bamboo Flooring Work								
Bamboo	No.	150.00	50.0	450.0	7,500.00	67,500.00	75,000.00	
Wire Nail	viss	1.50	2,450.0	1,050.0	3,675.00	1,575.00	5,250.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(6) Bamboo Mat Walling (Single)								
Bamboo Mat	sq-ft	1,173.00	20.0	180.0	23,460.00	211,140.00	234,600.00	
Bamboo	No.	15.00	50.0	450.0	750.00	6,750.00	7,500.00	
Wire Nail	viss	1.00	2,450.0	1,050.0	2,450.00	1,050.00	3,500.00	
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
(7) Bamboo Hand Rail work								
Bamboo	No.	15.00	50.0	450.0	750.00	6,750.00	7,500.00	
Wire Nail	viss	0.25	2,450.0	1,050.0	612.50	262.50	875.00	
Carpenter	day	0.25	500.0	4,500.0	125.00	1,125.00	1,250.00	
Total	-	-	-	-	123,497.50	799,127.50	922,625	(Kyat / per item)

8-3. Temporary Barracks (2 units, 4 units, etc.)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Hnee Thatch Roofing Work								
Hnee Thatch	No.	150.00	50.0	450.0	7,500.00	67,500.00	75,000.00	
Bamboo	No.	26.00	50.0	450.0	1,300.00	11,700.00	13,000.00	
Wire Nail	viss	0.20	2,450.0	1,050.0	490.00	210.00	700.00	
Binding Wire	lb	0.25	1,050.0	450.0	262.50	112.50	375.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(2) Double Bamboo Rollmat Ridging work								
Roll Mat (12'x3')	No.	5.00	180.0	1,620.0	900.00	8,100.00	9,000.00	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Labor	day	0.30	350.0	3,150.0	105.00	945.00	1,050.00	
(3) Spitted Bamboo flooring work								
Bamboo	No.	55.00	50.0	450.0	2,750.00	24,750.00	27,500.00	
Wire Nail	viss	0.30	2,450.0	1,050.0	735.00	315.00	1,050.00	
Binding Wire	lb	2.00	1,050.0	450.0	2,100.00	900.00	3,000.00	
Carpenter	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(4) Bamboo Mat Walling Work								
Bamboo Mat	sq-ft	140.00	20.0	180.0	2,800.00	25,200.00	28,000.00	
Jungle Wood (Plank)	cu-ft	0.32	2,085.4	8,341.8	667.33	2,669.38	3,336.71	
Wire Nail	viss	0.50	2,450.0	1,050.0	1,225.00	525.00	1,750.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(5) Bamboo Mat Door Work								
Bamboo Mat	sq-ft	30.00	20.0	180.0	600.00	5,400.00	6,000.00	
Jungle Wood (Plank)	cu-ft	2.20	2,085.4	8,341.8	4,587.88	18,351.96	22,939.84	
Wire Nail	viss	0.20	2,450.0	1,050.0	490.00	210.00	700.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(6) Bamboo Mat Window Work								
Bamboo	No.	6.00	50.0	450.0	300.00	2,700.00	3,000.00	
Jungle Wood (Plank)	cu-ft	0.60	2,085.4	8,341.8	1,251.24	5,005.08	6,256.32	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.63	500.0	4,500.0	315.00	2,835.00	3,150.00	
(7) Splitted Bamboo Triellis Work								
Bamboo	No.	21.00	50.0	450.0	1,050.00	9,450.00	10,500.00	
Wire Nail	viss	0.60	2,450.0	1,050.0	1,470.00	630.00	2,100.00	
Carpenter	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
(8) Iron fitting Work								
Butt Hinge	No.	40.00	700.0	300.0	28,000.00	12,000.00	40,000.00	
Hasp & Staple	No.	6.00	350.0	150.0	2,100.00	900.00	3,000.00	
Handle	No.	10.00	700.0	300.0	7,000.00	3,000.00	10,000.00	
Tower Bolt	No.	20.00	840.0	360.0	16,800.00	7,200.00	24,000.00	
Screw	gross	1.00	1,400.0	600.0	1,400.00	600.00	2,000.00	
Total	-	-	-	-	91,388.95	253,718.92	345,108	(Kyat / per item)

8-4. Temporary Latrines

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Site Cleaning & Earth Work								
Site Cleaning Work for Latrines	set	1.00	600.0	5,400.0	600.00	5,400.00	6,000.00	
Digging for Post Hole (Barrack etc.)	No.	4.00	30.0	270.0	120.00	1,080.00	1,200.00	
Digging for Pit Hole (Latrines)	No.	1.00	1,200.0	10,800.0	1,200.00	10,800.00	12,000.00	
(2) 4"~6"φMyaw Post Work								
4"~6"φMyaw (J/Wood)	No.	7.00	1,200.0	4,800.0	8,400.00	33,600.00	42,000.00	
Wire Nail	viss	0.30	2,450.0	1,050.0	735.00	315.00	1,050.00	
Carpenter	day	1.40	500.0	4,500.0	700.00	6,300.00	7,000.00	
Labor	day	0.90	350.0	3,150.0	315.00	2,835.00	3,150.00	
(3) 2"~4"φMyaw Post Work								
2"~4"φMyaw (J/Wood)	No.	5.00	400.0	1,600.0	2,000.00	8,000.00	10,000.00	
Wire Nail	viss	0.20	2,450.0	1,050.0	490.00	210.00	700.00	
Carpenter	day	0.60	500.0	4,500.0	300.00	2,700.00	3,000.00	
Labor	day	0.60	350.0	3,150.0	210.00	1,890.00	2,100.00	
(4) Hnee Thatch Roofing Work								
Hnee Thatch	No.	43.20	50.0	450.0	2,160.00	19,440.00	21,600.00	
Bamboo	No.	9.00	50.0	450.0	450.00	4,050.00	4,500.00	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Binding Wire	lb	1.00	1,050.0	450.0	1,050.00	450.00	1,500.00	
Carpenter	day	0.40	500.0	4,500.0	200.00	1,800.00	2,000.00	
Labor	day	0.40	350.0	3,150.0	140.00	1,260.00	1,400.00	
(5) 6"x1" Plank Flooring Work								
Jungle Wood (Plank)	cu-ft	1.30	2,085.4	8,341.8	2,711.02	10,844.34	13,555.36	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.20	500.0	4,500.0	100.00	900.00	1,000.00	
Labor	day	0.10	350.0	3,150.0	35.00	315.00	350.00	
(6) Bamboo Mat Walling Work								
Bamboo Mat	sq-ft	96.60	20.0	180.0	1,932.00	17,388.00	19,320.00	
Jungle Wood (Plank)	cu-ft	0.30	2,085.4	8,341.8	625.62	2,502.54	3,128.16	
Wire Nail	viss	0.40	2,450.0	1,050.0	980.00	420.00	1,400.00	
Carpenter	day	0.80	500.0	4,500.0	400.00	3,600.00	4,000.00	
(7) Bamboo Mat Door Work								
Bamboo Mat	sq-ft	12.00	20.0	180.0	240.00	2,160.00	2,400.00	
Jungle Wood (Plank)	cu-ft	1.10	2,085.4	8,341.8	2,293.94	9,175.98	11,469.92	
Wire Nail	viss	0.10	2,450.0	1,050.0	245.00	105.00	350.00	
Carpenter	day	0.50	500.0	4,500.0	250.00	2,250.00	2,500.00	
(8) Iron fitting Work								
Butt Hinge	No.	2.00	700.0	300.0	1,400.00	600.00	2,000.00	
Hasp & Staple	No.	1.00	350.0	150.0	350.00	150.00	500.00	
Handle	No.	2.00	700.0	300.0	1,400.00	600.00	2,000.00	
Tower Bolt	No.	1.00	840.0	360.0	840.00	360.00	1,200.00	
Lock & Key	No.	1.00	1,400.0	600.0	1,400.00	600.00	2,000.00	
Screw	gross	2.00	1,400.0	600.0	2,800.00	1,200.00	4,000.00	
Purchasing & Fixing of W.C. Pan	No.	1.00	5,600.0	2,400.0	5,600.00	2,400.00	8,000.00	
Total	-	-	-	-	43,162.58	155,910.86	199,073	(Kyat / per item)

8-5. Making Stock Pile Yards

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Earth Work								
Digging for Post Hole (Barrack etc.)	No.	47.00	30.0	270.0	1,410.00	12,690.00	14,100.00	
(2) Wagut Walling with Bamboo Rail Work								
Wagut (5'x2'6")	No.	40.00	240.0	960.0	9,600.00	38,400.00	48,000.00	
4"~6"φMyaw (J/Wood)	No.	15.00	1,200.0	4,800.0	18,000.00	72,000.00	90,000.00	
Bamboo	No.	33.00	50.0	450.0	1,650.00	14,850.00	16,500.00	
Wire Nail	viss	1.50	2,450.0	1,050.0	3,675.00	1,575.00	5,250.00	
Binding Wire	lb	3.00	1,050.0	450.0	3,150.00	1,350.00	4,500.00	
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	4.00	350.0	3,150.0	1,400.00	12,600.00	14,000.00	
Total	-	-	-	-	40,885.00	171,465.00	212,350	(Kyat / per item)

8-6. Labor Transporting Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck (Capacity = 5ton)	Irrigation Department							
(2) Labor Transportation								
(a) Tar road	mile	0.44						
Diesel (H.S.D.)	gal	0.044	3,800.0	200.0	167.20	8.80	176.00	Tar road : 10mile/gal
(b) off road	mile	0.44						
Diesel (H.S.D.)	gal	0.055	3,800.0	200.0	209.00	11.00	220.00	Off road : 8mile/gal
Total	-	-	-	-	376.20	19.80	396	(Kyat / per item)

8-7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas

8-7-1. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas along the DY Canal (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.30	350.0	3,150.0	105.00	945.00	1,050.00	
Total	-	-	-	-	105.00	945.00	1,050	(Kyat / per %sq-ft)

8-7-2. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas along the DY Canal (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Bulldozer	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	11.00	3,800.0	200.0	41,800.00	2,200.00	44,000.00	
Engine Oil	gal	0.22	17,100.0	900.0	3,762.00	198.00	3,960.00	
Hydraulic Oil	gal	0.22	9,500.0	500.0	2,090.00	110.00	2,200.00	
Grease	lb	0.055	4,275.0	225.0	235.13	12.38	247.51	
Total	-	-	-	-	47,887.13	2,520.38	50,408	(Kyat / per acres)

9. Earth Works

9-1. Canal Resectioning Work

9-1-1. Canal Resectioning Work (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.0	4,725.0	5,250.00	(Kyat / per sud)

9-1-2. Canal Resectioning Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.32	3,800.0	200.0	1,216.00	64.00	1,280.00	
Hydraulic Oil	gal	0.0075	9,500.0	500.0	71.25	3.75	75.00	
Engine Oil	gal	0.0075	17,100.0	900.0	128.25	6.75	135.00	
Grease	lb	0.012	4,275.0	225.0	51.30	2.70	54.00	
Total	-	-	-	-	1,466.80	77.20	1,544.00	(Kyat / per sud)

9-2. Unsiltng of Distributary Canals

9-2-1. Unsiltng of Distributary Canals (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	3.80	350.0	3,150.0	1,330.00	11,970.00	13,300.00	
Total	-	-	-	-	1,330.0	11,970.0	13,300.00	(Kyat / per sud)

9-2-2. Unsiltng of Distributary Canals (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	5.85	
Total	-	-	-	-	1,067.7	56.2	1,124.00	(Kyat / per sud)

9-3. Earth Work in Dressing (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.0	4,725.0	5,250.00	(Kyat / per sud)

9-4. Earth Work in Base Stripping (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.0	4,725.0	5,250.00	(Kyat / per sud)

10. Repairing of Linings Work

10-1. Repairing Works of Brick Lining

10-1-1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.0	4,725.0	5,250.00	(Kyat / per %sq-ft)

10-1-2. 3"thick Sand Filling under Brick Lining

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(2) Materials Used								
Sand	cu-ft	125.00	318.2	260.3	39,775.00	32,537.50	72,312.50	
Total	-	-	-	-	40,125.0	35,687.5	75,813.00	(Kyat / per sud)

10-1-3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.50	350.0	3,150.0	1,225.00	11,025.00	12,250.00	
(2) Materials Used								
Brick (Clay)	No.	550.00	65.2	79.7	35,860.00	43,835.00	79,695.00	
Cement	lb	356.40	56.0	2.9	19,958.40	1,033.56	20,991.96	
Sand	cu-ft	12.00	318.2	260.3	3,818.40	3,123.60	6,942.00	
Total	-	-	-	-	61,861.8	68,017.2	129,879.00	(Kyat / per %sq-ft)

10-1-4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.50	350.0	3,150.0	1,225.00	11,025.00	12,250.00	
(2) Materials Used								
Brick (Cement)	No.	550.00	93.8	62.6	51,590.00	34,430.00	86,020.00	
Cement	lb	356.40	56.0	2.9	19,958.40	1,033.56	20,991.96	
Sand	cu-ft	12.00	318.2	260.3	3,818.40	3,123.60	6,942.00	
Total	-	-	-	-	77,591.8	58,612.2	136,204.00	(Kyat / per %sq-ft)

10-1-5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick) (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.50	500.0	4,500.0	750.00	6,750.00	7,500.00	
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	

10-1-5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick) (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
Brick (Clay)	No.	345.00	65.2	79.7	22,494.00	27,496.50	49,990.50	
Cement	lb	238.00	56.0	2.9	13,328.00	690.20	14,018.20	
Sand	cu-ft	8.00	318.2	260.3	2,545.60	2,082.40	4,628.00	
Total	-	-	-	-	39,642.6	41,744.1	81,387	(Kyat / per %sq-ft)

10-1-6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.50	500.0	4,500.0	750.00	6,750.00	7,500.00	
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(2) Materials Used								
Brick (Cement)	No.	345.00	93.8	62.6	32,361.00	21,597.00	53,958.00	
Cement	lb	238.00	56.0	2.9	13,328.00	690.20	14,018.20	
Sand	cu-ft	8.00	318.2	260.3	2,545.60	2,082.40	4,628.00	
Total	-	-	-	-	49,509.6	35,844.6	85,354	(Kyat / per %sq-ft)

10-1-7. (1:3:6) C.C (Cement Concrete) work for Copping & Bed Kerb

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
Cement	lb	1,440.00	56.0	2.9	80,640.00	4,176.00	84,816.00	
Sand	cu-ft	48.00	318.2	260.3	15,273.60	12,494.40	27,768.00	
River Shingle	cu-ft	96.00	593.1	485.2	56,937.60	46,579.20	103,516.80	
Total	-	-	-	-	156,151.2	92,949.6	249,101	(Kyat / per %sq-ft)

10-1-8. Pointing Work (with 1:3 cement mortar)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Cement	lb	54.27	56.0	2.9	3,039.12	157.38	3,196.50	
Sand	cu-ft	468.00	318.2	260.3	148,917.60	121,820.40	270,738.00	
Total	-	-	-	-	153,156.7	132,777.8	285,935	(Kyat / per %sq-ft)

10-1-9. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	9.00	500.0	4,500.0	4,500.00	40,500.00	45,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	

10-1-9. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
6"-9" Stone Boulder	cu-ft	125.00	541.2	360.8	67,650.00	45,100.00	112,750.00	
Cement	lb	432.00	56.0	2.9	24,192.00	1,252.80	25,444.80	
Sand	cu-ft	14.00	318.2	260.3	4,454.80	3,644.20	8,099.00	
River Shingle	cu-ft	28.00	593.1	485.2	16,606.80	13,585.60	30,192.40	
Total	-	-	-	-	120,203.6	129,282.6	249,486	(Kyat / per %sq-ft)

10-2. G.C (Gravelly Clay) Filling Inner Slope

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

10-3. Brick Work in (1:3) Cement Mortar

10-3-1. Brick Work in (1:3) Cement Mortar (With Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Cement	lb	54.27	56.0	2.9	3,039.12	157.38	3,196.50	
Sand	cu-ft	468.00	318.2	260.3	148,917.60	121,820.40	270,738.00	
Total	-	-	-	-	153,156.72	132,777.78	285,935	(Kyat / per %sq-ft)

10-3-2. Brick Work in (1:3) Cement Mortar (With Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Cement	lb	54.27	56.0	2.9	3,039.12	157.38	3,196.50	
Sand	cu-ft	468.00	318.2	260.3	148,917.60	121,820.40	270,738.00	
Total	-	-	-	-	153,156.72	132,777.78	285,935	(Kyat / per %sq-ft)

10-4. Timber Shuttering form Work

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Jungle Wood (Scant)	cu-ft	1.50	2,085.4	8,341.8	3,128.10	12,512.70	15,640.80	
Jungle Wood (Plank)	cu-ft	0.92	2,085.4	8,341.8	1,918.57	7,674.46	9,593.03	
Wire	lb	3.00	680.5	291.7	2,041.50	875.10	2,916.60	
Total	-	-	-	-	9,788.2	45,362.3	55,151	(Kyat / per %sq-ft)

11. Repairing & Reconstruction of Canal Structures

11-1. Re-Construction of Structures

11-1-1. Drop

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	100.00	500.0	4,500.0	50,000.00	450,000.00	500,000.00	
Carpenter	day	10.00	500.0	4,500.0	5,000.00	45,000.00	50,000.00	
Labor	day	150.00	350.0	3,150.0	52,500.00	472,500.00	525,000.00	
(2) Materials Used								
Cement	lb	31,360.00	56.0	2.9	1,756,160.00	90,944.00	1,847,104.00	
Sand	cu-ft	1,200.00	318.2	260.3	381,840.00	312,360.00	694,200.00	
River Shingle	cu-ft	800.00	593.1	485.2	474,480.00	388,160.00	862,640.00	
Brick (Cement)	No.	17,120.00	93.8	62.6	1,605,856.00	1,071,712.00	2,677,568.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	4,325,836.0	3,330,676.0	7,656,512	(Kyat / per unit)

11-1-2. Head Regulator

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	100.00	500.0	4,500.0	50,000.00	450,000.00	500,000.00	
Carpenter	day	10.00	500.0	4,500.0	5,000.00	45,000.00	50,000.00	
Labor	day	150.00	350.0	3,150.0	52,500.00	472,500.00	525,000.00	
(2) Materials Used								
Cement	lb	19,600.00	56.0	2.9	1,097,600.00	56,840.00	1,154,440.00	
Sand	cu-ft	750.00	318.2	260.3	238,650.00	195,225.00	433,875.00	
River Shingle	cu-ft	500.00	593.1	485.2	296,550.00	242,600.00	539,150.00	
Brick (Cement)	No.	10,700.00	93.8	62.6	1,003,660.00	669,820.00	1,673,480.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	2,743,960.0	2,631,985.0	5,375,945	(Kyat / per unit)

11-1-3. Drain Box Culvert

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	200.00	500.0	4,500.0	100,000.00	900,000.00	1,000,000.00	
Carpenter	day	900.00	500.0	4,500.0	450,000.00	4,050,000.00	4,500,000.00	
Labor	day	1500.00	350.0	3,150.0	525,000.00	4,725,000.00	5,250,000.00	
(2) Materials Used								
Cement	lb	266110.00	56.0	2.9	14,902,160.00	771,719.00	15,673,879.00	
Sand	cu-ft	9510.00	318.2	260.3	3,026,082.00	2,475,453.00	5,501,535.00	
River Shingle	cu-ft	7625.00	593.1	485.2	4,522,387.50	3,699,650.00	8,222,037.50	
Brick (Cement)	No.	146780.00	93.8	62.6	13,767,964.00	9,188,428.00	22,956,392.00	
Miscellaneous Works	L.S				0.00	3,000,000.00	3,000,000.00	
Total	-	-	-	-	37,293,593.5	28,810,250.0	66,103,844	(Kyat / per unit)

11-1-4. Road Crossing and Bridge

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	110.00	500.0	4,500.0	55,000.00	495,000.00	550,000.00	
Labor	day	344.00	350.0	3,150.0	120,400.00	1,083,600.00	1,204,000.00	
(2) Materials Used								
Cement	lb	28336.00	56.0	2.9	1,586,816.00	82,174.40	1,668,990.40	
Sand	cu-ft	1487.00	318.2	260.3	473,163.40	387,066.10	860,229.50	
River Shingle	cu-ft	978.00	593.1	485.2	580,051.80	474,525.60	1,054,577.40	
Brick (Cement)	No.	19527.00	93.8	62.6	1,831,632.60	1,222,390.20	3,054,022.80	
Miscellaneous Works	L.S				0.00	1,000,000.00	1,000,000.00	
Total	-	-	-	-	4,647,063.8	4,744,756.3	9,391,820	(Kyat / per unit)

11-1-5. Syphon

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	70.00	500.0	4,500.0	35,000.00	315,000.00	350,000.00	
Carpenter	day	100.00	500.0	4,500.0	50,000.00	450,000.00	500,000.00	
Labor	day	900.00	350.0	3,150.0	315,000.00	2,835,000.00	3,150,000.00	
(2) Materials Used								
Cement	lb	84560.00	56.0	2.9	4,735,360.00	245,224.00	4,980,584.00	
Sand	cu-ft	3860.00	318.2	260.3	1,228,252.00	1,004,758.00	2,233,010.00	
River Shingle	cu-ft	4990.00	593.1	485.2	2,959,569.00	2,421,148.00	5,380,717.00	
Brick (Cement)	No.	8750.00	93.8	62.6	820,750.00	547,750.00	1,368,500.00	
Miscellaneous Works	L.S				0.00	1,000,000.00	1,000,000.00	
Total	-	-	-	-	10,143,931.0	8,818,880.0	18,962,811	(Kyat / per unit)

11-1-6. Turn Out

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	50.00	500.0	4,500.0	25,000.00	225,000.00	250,000.00	
Carpenter	day	70.00	500.0	4,500.0	35,000.00	315,000.00	350,000.00	
Labor	day	550.00	350.0	3,150.0	192,500.00	1,732,500.00	1,925,000.00	
(2) Materials Used								
Cement	lb	84560.00	56.0	2.9	4,735,360.00	245,224.00	4,980,584.00	
Sand	cu-ft	3860.00	318.2	260.3	1,228,252.00	1,004,758.00	2,233,010.00	
River Shingle	cu-ft	4990.00	593.1	485.2	2,959,569.00	2,421,148.00	5,380,717.00	
Brick (Cement)	No.	8750.00	93.8	62.6	820,750.00	547,750.00	1,368,500.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	9,996,431.0	6,991,380.0	16,987,811	(Kyat / per unit)

11-2. Repairing of Structures

11-2-1. Drop (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	9.00	500.0	4,500.0	4,500.00	40,500.00	45,000.00	
Labor	day	28.00	350.0	3,150.0	9,800.00	88,200.00	98,000.00	

11-2-1. Drop (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
Cement	lb	6,361.60	56.0	2.9	356,249.60	18,448.64	374,698.24	
Sand	sud	4.06	31,817.5	26,032.5	129,179.05	105,691.95	234,871.00	
River Shingle	sud	2.98	59,306.5	48,523.5	176,733.37	144,600.03	321,333.40	
Brick (Cement)	No.	2,359.00	93.8	62.6	221,274.20	147,673.40	368,947.60	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	897,736.2	645,114.0	1,542,850	(Kyat / per unit)

11-2-2. Head Regulator

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	7.00	500.0	4,500.0	3,500.00	31,500.00	35,000.00	
Labor	day	15.00	350.0	3,150.0	5,250.00	47,250.00	52,500.00	
(2) Materials Used								
Cement	lb	6,300.00	56.0	2.9	352,800.00	18,270.00	371,070.00	
Sand	sud	3.75	31,817.5	26,032.5	119,315.63	97,621.88	216,937.51	
River Shingle	sud	5.63	59,306.5	48,523.5	333,895.60	273,187.31	607,082.91	
Brick (Cement)	No.	281.00	93.8	62.6	26,357.80	17,590.60	43,948.40	
Miscellaneous Works	L.S				0.00	0.00	0.00	
Total	-	-	-	-	841,119.0	485,419.8	1,326,539	(Kyat / per unit)

11-2-3. Drain Box Culvert

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	28.00	500.0	4,500.0	14,000.00	126,000.00	140,000.00	
Labor	day	47.00	350.0	3,150.0	16,450.00	148,050.00	164,500.00	
(2) Materials Used								
Cement	lb	3,461.80	56.0	2.9	193,860.80	10,039.22	203,900.02	
Sand	sud	2.00	31,817.5	26,032.5	63,635.00	52,065.00	115,700.00	
River Shingle	sud	3.00	59,306.5	48,523.5	177,919.50	145,570.50	323,490.00	
Brick (Cement)	No.	1,500.00	93.8	62.6	140,700.00	93,900.00	234,600.00	
Miscellaneous Works	L.S				0.00	0.00	0.00	
Total	-	-	-	-	606,565.3	575,624.7	1,182,190	(Kyat / per unit)

11-2-4. Road Crossing and Bridge

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	150.00	500.0	4,500.0	75,000.00	675,000.00	750,000.00	
Labor	day	350.00	350.0	3,150.0	122,500.00	1,102,500.00	1,225,000.00	
(2) Materials Used								
Cement	lb	33,600.00	56.0	2.9	1,881,600.00	97,440.00	1,979,040.00	
Sand	sud	20.00	31,817.5	26,032.5	636,350.00	520,650.00	1,157,000.00	
River Shingle	sud	30.00	59,306.5	48,523.5	1,779,195.00	1,455,705.00	3,234,900.00	
Brick (Cement)	No.	15,000.00	93.8	62.6	1,407,000.00	939,000.00	2,346,000.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	5,901,645.0	5,290,295.0	11,191,940	(Kyat / per unit)

11-2-5. Syphon

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	35.00	500.0	4,500.0	17,500.00	157,500.00	175,000.00	
Carpenter	day	70.00	500.0	4,500.0	35,000.00	315,000.00	350,000.00	
Labor	day	500.00	350.0	3,150.0	175,000.00	1,575,000.00	1,750,000.00	
(2) Materials Used								
Cement	lb	33824.00	56.0	2.9	1,894,144.00	98,089.60	1,992,233.60	
Sand	cu-ft	1544.00	318.2	260.3	491,300.80	401,903.20	893,204.00	
River Shingle	cu-ft	1996.00	593.1	485.2	1,183,827.60	968,459.20	2,152,286.80	
Brick (Cement)	No.	3500.00	93.8	62.6	328,300.00	219,100.00	547,400.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	4,125,072.4	3,835,052.0	7,960,124	(Kyat / per unit)

11-2-6. Turn Out

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	30.00	500.0	4,500.0	15,000.00	135,000.00	150,000.00	
Carpenter	day	50.00	500.0	4,500.0	25,000.00	225,000.00	250,000.00	
Labor	day	450.00	350.0	3,150.0	157,500.00	1,417,500.00	1,575,000.00	
(2) Materials Used								
Cement	lb	33824.00	56.0	2.9	1,894,144.00	98,089.60	1,992,233.60	
Sand	cu-ft	1544.00	318.2	260.3	491,300.80	401,903.20	893,204.00	
River Shingle	cu-ft	1996.00	593.1	485.2	1,183,827.60	968,459.20	2,152,286.80	
Brick (Cement)	No.	3500.00	93.8	62.6	328,300.00	219,100.00	547,400.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	4,095,072.4	3,565,052.0	7,660,124	(Kyat / per unit)

11-3. Repairing of Canal Gate Leaf, Frame & Gear Assembly

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Smith	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	5.00	350.0	3,150.0	1,750.00	15,750.00	17,500.00	
(2) Materials Used								
Steel Gate	No.	2.00	135,000.0	15,000.0	270,000.00	30,000.00	300,000.00	
Steel Rod (10mm)	lb	20.00	75.5	4.0	1,510.00	80.00	1,590.00	
Binding Wire	lb	4.00	1,050.0	450.0	4,200.00	1,800.00	6,000.00	
Miscellaneous Works	L.S				0.00	10,000.00	10,000.00	
Total	-	-	-	-	278,460.0	66,630.0	345,090	(Kyat / per item)

12. Road Work

12-1. G.C (Gravelly Clay) Laying Work

12-1-1. G.C Laying and Spreading Work for DY Canal Inspection Path

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(laying, dressing, spreading & compacting)								
(2) Materials Used								
Gravelly Clay (G.C)	cu-ft	110.00	426.4	284.3	46,904.00	31,273.00	78,177.00	
Total	-	-	-	-	47,429.0	35,998.0	83,427	(Kyat / per sud)

12-1-2. G.C Laying and Spreading Work for DY Canal Non Inspection Path

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(laying, dressing, spreading & compacting)								
(2) Materials Used								
Gravelly Clay (G.C)	cu-ft	110.00	426.4	284.3	46,904.00	31,273.00	78,177.00	
Total	-	-	-	-	47,429.0	35,998.0	83,427	(Kyat / per sud)

12-2. Concrete Paving Work

12-2-1. Mixing only Cement Concrete (1:2:4) with (0.5" to 0.75") Gauge Stone Chippings on River Shingle

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
(2) Materials Used								
Cement	lb	2,070.00	56.0	2.9	115,920.00	6,003.00	121,923.00	
River Shingle	cu-ft	92.00	593.1	485.2	54,565.20	44,638.40	99,203.60	
Sand	cu-ft	46.00	318.2	260.3	14,637.20	11,973.80	26,611.00	
Total	-	-	-	-	189,122.4	98,615.2	287,738	(Kyat / per sud)

12-2-2. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
Total	-	-	-	-	1,550.0	13,950.0	15,500	(Kyat / per sud)

12-2-3. Timber Shuttering Formworks

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Jungle Wood (Scant)	cu-ft	1.50	2,085.4	8,341.8	3,128.10	12,512.70	15,640.80	
Jungle Wood (Plank)	cu-ft	0.92	2,085.4	8,341.8	1,918.57	7,674.46	9,593.03	
Wire Nail	lb	3.00	680.5	291.7	2,041.50	875.10	2,916.60	
Total	-	-	-	-	9,788.2	45,362.3	55,151	(Kyat / per %sq-ft)

12-2-4. Reinforcing Bar Preparation and Assembly

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
Steel Fixer	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(2) Materials Used								
Steel Rod (10mm)	lb	117.60	75.5	4.0	8,878.80	470.40	9,349.20	
Binding Wire	lb	1.00	1,050.0	450.0	1,050.00	450.00	1,500.00	
Total	-	-	-	-	10,778.8	8,570.4	19,349	(Kyat / per CWT)

13. Repairing and Construction of Permanent Buildings

13-1. Repairing and Construction of Building (Bin Thar Quarter, Office, etc.)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	20.00	500.0	4,500.0	10,000.00	90,000.00	100,000.00	
Labor	day	30.00	350.0	3,150.0	10,500.00	94,500.00	105,000.00	
(2) Materials Used								
Repairing and Construction of Building	Set	1.00	4,000,000.0	6,000,000.0	4,000,000.00	6,000,000.00	10,000,000.00	
Miscellaneous Works	L.S				0.00	2,850,000.00	2,850,000.00	
Total	-	-	-	-	4,020,500.0	9,034,500.0	13,055,000	(Kyat / per item)

14. Other Related Works

14-1. Repairing of Motor Vehicles, Water Pumps and Generators

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Operator (Machine Driver)	day	4.00	400.0	3,600.0	1,600.00	14,400.00	16,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
Total	-	-	-	-	5,100.0	45,900.0	51,000	(Kyat / per item)

14-2. Earth Work for Drainage Canal

14-2-1. Earth Work for Drainage Canal (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.0	4,725.0	5,250	(Kyat / per sud)

14-2-2. Earth Work for Drainage Canal (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.2600	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	5.85	
Total	-	-	-	-	1,067.7	56.2	1,124	(Kyat / per sud)

14-3. Management of Construction Materials and Equipment

14-3-1. Shifting of Materials from Temporary Stock-pile to Work Site

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							
(2) Labor								
Labor	day	0.05	350.0	3,150.0	17.50	157.50	175.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Engine Oil	gal	0.0052	17,100.0	900.0	88.92	4.68	93.60	
Lubricant	gal	0.0013	14,250.0	750.0	18.53	0.98	19.51	
Total	-	-	-	-	1,113.0	215.2	1,328	(Kyat / per item)

14-3-2. Transporting of Materials from Quarry to Stock-pile (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							

14-3-2. Transporting of Materials from Quarry to Stock-pile (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Labor								
Labor	day	0.05	350.0	3,150.0	17.50	157.50	175.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.36	3,800.0	200.0	1,368.00	72.00	1,440.00	
Engine Oil	gal	0.0072	17,100.0	900.0	123.12	6.48	129.60	
Lubricant	gal	0.0018	14,250.0	750.0	25.65	1.35	27.00	
Total	-	-	-	-	1,534.3	237.3	1,772	(Kyat / per item)

14-3-3. Transporting and Shifting of Heavy Machines

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							
(2) Labor								
Operator (Machine Driver)	day	10.00	400.0	3,600.0	4,000.00	36,000.00	40,000.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.36	3,800.0	200.0	1,368.00	72.00	1,440.00	
Engine Oil	gal	0.0072	17,100.0	900.0	123.12	6.48	129.60	
Lubricant	gal	0.0018	14,250.0	750.0	25.65	1.35	27.00	
Total	-	-	-	-	5,516.8	36,079.8	41,597	(Kyat / per item)

14-3-4. Loading and Unloading Charges of Materials

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
Total	-	-	-	-	2,800.0	25,200.0	28,000	(Kyat / per item)

14-4. Dewatering Works

14-4-1. Water Pump for Dewatering Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Water Pump	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	10.00	3,800.0	200.0	38,000.00	2,000.00	40,000.00	
Total	-	-	-	-	38,000.0	2,000.0	40,000	(Kyat / per gal)

14-5. Welfare Charges for Labor

14-5-1. Hnee Thatch

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.002	350.0	3,150.0	0.70	6.30	7.00	
(2) Materials Used								
Hnee Thatch	item	0.002	10,000.0	200,000.0	20.00	400.00	420.00	
Total	-	-	-	-	20.7	406.3	427	(Kyat / per item)

14-5-2. Bamboo

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.004	350.0	3,150.0	1.40	12.60	14.00	
(2) Materials Used								
Bamboo	item	0.005	5,000.0	100,000.0	25.00	500.00	525.00	
Total	-	-	-	-	26.4	512.6	539	(Kyat / per item)

14-6. Labor Charges for Day & Night Watchman, Helper, Checker and General Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
Total	-	-	-	-	350.0	3,150.0	3,500	(Kyat / per M/D)

14-7. Camps Facilities (Lighting, Water Supply, etc.)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Water Pump	Irrigation Department							1 gal/bowser
Water Bowser	Irrigation Department							3 gal/trip
Diesel Generator	Irrigation Department							1 gal/hr
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	1.00	3,800.0	200.0	3,800.00	200.00	4,000.00	4 hr/day
(Water Pump)								
Diesel (H.S.D.)	gal	3.00	3,800.0	200.0	11,400.00	600.00	12,000.00	1 trip/day
(Water Bowser)								
Diesel (H.S.D.)	gal	4.00	3,800.0	200.0	15,200.00	800.00	16,000.00	1 bowser/day
(Generator)								
Total	-	-	-	-	30,400.0	1,600.0	32,000	(Kyat / per gal)

14-8. Making Data Boards and Sign Boards

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Painter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Ply Wood (8'x4')	No.	1.00	3,000.0	12,000.0	3,000.00	12,000.00	15,000.00	
Paint	gal	2.50	10,000.0	10,000.0	25,000.00	25,000.00	50,000.00	
Painting charges	L.S	1.00	1,500.0	13,500.0	1,500.00	13,500.00	15,000.00	
Beading 1"x½"	cu-ft	0.30	5,207.5	5,207.5	1,562.25	1,562.25	3,124.50	
Total	-	-	-	-	34,762.3	85,362.3	120,125	(Kyat / per item)

14-9. Estimating, Copying, Photo Recording and Stationary Charges, etc;

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Materials Used								
Paper	Page	500.00	3.0	7.0	1,500.00	3,500.00	5,000.00	
(2) Service Charges								
Typing & Printing charges	Page	90.00	25.0	225.0	2,250.00	20,250.00	22,500.00	
Photo & Printing charges	Page	50.00	50.0	450.0	2,500.00	22,500.00	25,000.00	
Copying charges	Page	360.00	2.5	22.5	900.00	8,100.00	9,000.00	
Binding charges	No.	5.00	100.0	900.0	500.00	4,500.00	5,000.00	
Total	-	-	-	-	7,650.0	58,850.0	66,500	(Kyat / per item)

14-10. Miscellaneous

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
Miscellaneous	item	1.00	5,000.0	100,000.0	5,000.00	100,000.00	105,000.00	
Total	-	-	-	-	5,000.0	100,000.0	105,000	(Kyat / per item)

3.4 Analysis Rate (Productivity) for Taung Nyo Irrigation System

3.4.1 Analysis Rate for Main Canal

1. Preparatory Works

1-1. Survey and Profile Works (Canal length : 30 feet / sect)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Lime (Strained Lime)	cu-ft	0.20	450.0	4,050.0	90.00	810.00	900.00	
Plastic ream	No.	0.67	90.0	810.0	60.00	540.00	600.00	for finishing stake
Labor	day	0.10	350.0	3,150.0	35.00	315.00	350.00	
Total	-	-	-	-	335.00	3,015.00	3,350	(Kkyat / per sect)

1-2. Temporary Camp & Stores

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) 4"~6"φMyaw Post Work								
4"~6"φMyaw (J'Wood)	No.	3.00	1,500.0	6,000.0	4,500.00	18,000.00	22,500.00	
Carpenter	day	0.50	500.0	4,500.0	250.00	2,250.00	2,500.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) 2"~4"φMyaw Post Work								
2"~4"φMyaw (J'Wood)	No.	8.00	800.0	3,200.0	6,400.00	25,600.00	32,000.00	
Wire Nail	viss	1.00	2,520.0	1,080.0	2,520.00	1,080.00	3,600.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(3) Hnee Thatch Roofing Work								
Hnee Thatch	No.	150.00	50.0	450.0	7,500.00	67,500.00	75,000.00	
Bamboo	No.	15.00	50.0	450.0	750.00	6,750.00	7,500.00	
Wire Nail	viss	0.50	2,520.0	1,080.0	1,260.00	540.00	1,800.00	
Carpenter	day	0.50	500.0	4,500.0	250.00	2,250.00	2,500.00	
Labor	day	0.50	350.0	3,150.0	175.00	1,575.00	1,750.00	
(4) Roll Mat Ridging Work								
Roll Mat (12'×3')	No.	1.50	180.0	1,620.0	270.00	2,430.00	2,700.00	
Bamboo	No.	0.50	50.0	450.0	25.00	225.00	250.00	
Wire Nail	viss	0.10	2,520.0	1,080.0	252.00	108.00	360.00	
Carpenter	day	0.25	500.0	4,500.0	125.00	1,125.00	1,250.00	
(5) Bamboo Flooring Work								
Bamboo	No.	30.00	50.0	450.0	1,500.00	13,500.00	15,000.00	
Wire Nail	viss	0.50	2,520.0	1,080.0	1,260.00	540.00	1,800.00	
Carpenter	day	0.50	500.0	4,500.0	250.00	2,250.00	2,500.00	
Labor	day	0.50	350.0	3,150.0	175.00	1,575.00	1,750.00	
(6) Bamboo Mat Walling (Single)								
Bamboo Mat	sq-ft	200.00	20.0	180.0	4,000.00	36,000.00	40,000.00	
Bamboo	No.	3.00	50.0	450.0	1,500.00	1,350.00	1,500.00	
Wire Nail	viss	1.00	2,520.0	1,080.0	2,520.00	1,080.00	3,600.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(7) Bamboo Hand Rail work								
Bamboo	No.	1.00	50.0	450.0	50.00	450.00	500.00	
Wire Nail	viss	0.25	2,520.0	1,080.0	630.00	270.00	900.00	
Carpenter	day	0.25	500.0	4,500.0	125.00	1,125.00	1,250.00	
Total	-	-	-	-	36,637.00	202,873.00	239,510	(Kkyat / per unit)

1-3. Temporary Barracks for Repair (4 units)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Hnee Thatch Roofing Work								
Hnee Thatch	No.	200.00	50.0	450.0	10,000.00	90,000.00	100,000.00	
Bamboo	No.	35.00	50.0	450.0	1,750.00	15,750.00	17,500.00	
Wire Nail	viss	0.50	2,520.0	1,080.0	1,260.00	540.00	1,800.00	
Binding Wire	lb	0.25	1,050.0	450.0	262.50	112.50	375.00	
Carpenter	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Double Bamboo Rallmat Ridging work								
Roll Mat (12'×3')	No.	15.00	180.0	1,620.0	2,700.00	24,300.00	27,000.00	
Wire Nail	viss	1.00	2,520.0	1,080.0	2,520.00	1,080.00	3,600.00	
Bamboo	No.	5.00	50.0	450.0	250.00	2,250.00	2,500.00	
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(3) Spitted Bamboo flooring work								
Bamboo	No.	100.00	50.0	450.0	5,000.00	45,000.00	50,000.00	
Wire Nail	viss	0.30	2,520.0	1,080.0	756.00	324.00	1,080.00	
Binding Wire	lb	4.00	1,050.0	450.0	4,200.00	1,800.00	6,000.00	
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	4.00	350.0	3,150.0	1,400.00	12,600.00	14,000.00	
(4) Bamboo Mat Walling Work								
Bamboo Mat	sq-ft	200.00	20.0	180.0	4,000.00	36,000.00	40,000.00	
Jungle Wood (Plank)	cu-ft	0.32	2,063.6	8,254.4	660.35	2,641.41	3,301.76	
Wire Nail	viss	0.50	2,520.0	1,080.0	1,260.00	540.00	1,800.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(5) Bamboo Mat Door Work								
Bamboo Mat	sq-ft	30.00	20.0	180.0	600.00	5,400.00	6,000.00	
Jungle Wood (Plank)	cu-ft	2.20	2,063.6	8,254.4	4,539.92	18,159.68	22,699.60	
Wire Nail	viss	0.20	2,520.0	1,080.0	504.00	216.00	720.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(6) Bamboo Mat Window Work								
Bamboo	No.	20.00	50.0	450.0	1,000.00	9,000.00	10,000.00	
Jungle Wood (Plank)	cu-ft	0.60	2,063.6	8,254.4	1,238.16	4,952.64	6,190.80	
Wire Nail	viss	0.10	2,520.0	1,080.0	252.00	108.00	360.00	
Carpenter	day	0.63	500.0	4,500.0	315.00	2,835.00	3,150.00	
(7) Splitted Bamboo Triellis Work								
Bamboo	No.	30.00	50.0	450.0	1,500.00	13,500.00	15,000.00	
Wire Nail	viss	2.00	2,520.0	1,080.0	5,040.00	2,160.00	7,200.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
(8) Iron fitting Work								
Butt Hinge	No.	50.00	700.0	300.0	35,000.00	15,000.00	50,000.00	
Hasp & Staple	No.	8.00	350.0	150.0	2,800.00	1,200.00	4,000.00	
Handle	No.	15.00	700.0	300.0	10,500.00	4,500.00	15,000.00	
Tower Bolt	No.	20.00	840.0	360.0	16,800.00	7,200.00	24,000.00	
Screw	gross	1.00	1,400.0	600.0	1,400.00	600.00	2,000.00	
Total	-	-	-	-	124,057.93	376,719.23	500,777	(Kkyat / per unit)

1-4. Temporary Latrines

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Site Cleaning & Earth Work								
Site Cleaning Work for Latrines	set	1.00	600.0	5,400.0	600.00	5,400.00	6,000.00	
Digging for Post Hole (Barrack etc.)	No.	1.00	30.0	270.0	30.00	270.00	300.00	
Digging for Pit Hole (Latrines)	No.	1.00	1,200.0	10,800.0	1,200.00	10,800.00	12,000.00	
(2) 4"~6"φMyaw Post Work								
4"~6"φMyaw (J/Wood)	No.	2.00	1,500.0	6,000.0	3,000.00	12,000.00	15,000.00	
Wire Nail	viss	0.30	2,520.0	1,080.0	756.00	324.00	1,080.00	
Carpenter	day	1.40	500.0	4,500.0	700.00	6,300.00	7,000.00	
Labor	day	0.90	350.0	3,150.0	315.00	2,835.00	3,150.00	
(3) 2"~4"φMyaw Post Work								
2"~4"φMyaw (J/Wood)	No.	1.00	800.0	3,200.0	800.00	3,200.00	4,000.00	
Wire Nail	viss	0.10	2,520.0	1,080.0	252.00	108.00	360.00	
Carpenter	day	0.10	500.0	4,500.0	50.00	450.00	500.00	
Labor	day	0.10	350.0	3,150.0	35.00	315.00	350.00	
(4) Hnee Thatch Roofing Work								
Hnee Thatch	No.	10.00	50.0	450.0	500.00	4,500.00	5,000.00	
Bamboo	No.	1.00	50.0	450.0	50.00	450.00	500.00	
Wire Nail	viss	0.10	2,520.0	1,080.0	252.00	108.00	360.00	
Binding Wire	lb	1.00	1,050.0	450.0	1,050.00	450.00	1,500.00	
Carpenter	day	0.40	500.0	4,500.0	200.00	1,800.00	2,000.00	
Labor	day	0.40	350.0	3,150.0	140.00	1,260.00	1,400.00	
(5) 6"×1" Plank Flooring Work								
Jungle Wood (Plank)	cu-ft	1.30	2,063.6	8,254.4	2,682.68	10,730.72	13,413.40	
Wire Nail	viss	0.10	2,520.0	1,080.0	252.00	108.00	360.00	
Carpenter	day	0.20	500.0	4,500.0	100.00	900.00	1,000.00	
Labor	day	0.10	350.0	3,150.0	35.00	315.00	350.00	
(6) Bamboo Mat Walling Work								
Bamboo Mat	sq-ft	20.00	20.0	180.0	400.00	3,600.00	4,000.00	
Jungle Wood (Plank)	cu-ft	0.30	2,063.6	8,254.4	619.08	2,476.32	3,095.40	
Wire Nail	viss	0.40	2,520.0	1,080.0	1,008.00	432.00	1,440.00	
Carpenter	day	0.80	500.0	4,500.0	400.00	3,600.00	4,000.00	
(7) Bamboo Mat Door Work								
Bamboo Mat	sq-ft	5.00	20.0	180.0	100.00	900.00	1,000.00	
Jungle Wood (Plank)	cu-ft	0.20	2,063.6	8,254.4	412.72	1,650.88	2,063.60	
Wire Nail	viss	0.10	2,520.0	1,080.0	252.00	108.00	360.00	
Carpenter	day	0.20	500.0	4,500.0	100.00	900.00	1,000.00	
(8) Iron fitting Work								
Butt Hinge	No.	2.00	700.0	300.0	1,400.00	600.00	2,000.00	
Hasp & Staple	No.	1.00	350.0	150.0	350.00	150.00	500.00	
Handle	No.	2.00	700.0	300.0	1,400.00	600.00	2,000.00	
Tower Bolt	No.	1.00	840.0	360.0	840.00	360.00	1,200.00	
Lock & Key	No.	1.00	1,400.0	600.0	1,400.00	600.00	2,000.00	
Screw	gross	2.00	1,400.0	600.0	2,800.00	1,200.00	4,000.00	
Purchasing & Fixing of W.C. Pan	No.	1.00	5,600.0	2,400.0	5,600.00	2,400.00	8,000.00	
Total	-	-	-	-	30,081.48	82,200.92	112,282	(Kyat / per unit)

1-5. Making Stock Pile Yards

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Earth Work								
Digging for Post Hole (Barrack etc.)	No.	47.00	30.0	270.0	1,410.00	12,690.00	14,100.00	
(2) Wagut Walling with Bamboo Rail Work								
Wagut (5'×2'6")	No.	40.00	200.0	800.0	8,000.00	32,000.00	40,000.00	
4"~6"φMyaw (J/Wood)	No.	15.00	1,500.0	6,000.0	22,500.00	90,000.00	112,500.00	
Bamboo	No.	33.00	50.0	450.0	1,650.00	14,850.00	16,500.00	
Wire Nail	viss	1.50	2,520.0	1,080.0	3,780.00	1,620.00	5,400.00	
Binding Wire	lb	3.00	1,050.0	450.0	3,150.00	1,350.00	4,500.00	
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	4.00	350.0	3,150.0	1,400.00	12,600.00	14,000.00	
Total	-	-	-	-	43,890.00	183,110.00	227,000	(Kyat / per unit)

1-6. Labor Transporting Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck (Capacity = 5ton)	Irrigation Department							
(2) Labor Transportation								
(a) Tar road	mile	5.00						
Diesel (H.S.D.)	gal	0.50	3,800.0	200.0	1,900.00	100.00	2,000.00	Tar road : 10mile/gal
(b) offroad	mile	4.00						
Diesel (H.S.D.)	gal	0.50	3,800.0	200.0	1,900.00	100.00	2,000.00	Off road : 8mile/gal
Total	-	-	-	-	3,800.00	200.00	4,000	(Kyat / per item)

1-7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas

1-7-1. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.30	350.0	3,150.0	105.00	945.00	1,050.00	
Total	-	-	-	-	105.00	945.00	1,050	(Kyat / per %sq-ft)

1-7-2. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Bulldozer	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	11.00	3,800.0	200.0	41,800.00	2,200.00	44,000.00	
Engine Oil	gal	0.22	17,100.0	900.0	3,762.00	198.00	3,960.00	
Hydraulic Oil	gal	0.22	9,500.0	500.0	2,090.00	110.00	2,200.00	
Grease	lb	0.055	4,275.0	225.0	235.13	12.38	247.51	
Total	-	-	-	-	47,887.13	2,520.38	50,408	(Kyat / per acres)

2. Earth Works

2-1. Canal Bank Raising and Canal Resectioning Works

2-1-1. Canal Bank Raising Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	6.00	
Total	-	-	-	-	1,067.66	56.19	1,124	(Kyat / per sud)

2-1-1. Canal Bank Raising Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.32	3,800.0	200.0	1,216.00	64.00	1,280.00	
Hydraulic Oil	gal	0.0075	9,500.0	500.0	71.25	3.75	75.00	
Engine Oil	gal	0.0075	17,100.0	900.0	128.25	6.75	135.00	
Grease	lb	0.012	4,275.0	225.0	51.30	2.70	54.00	
Total	-	-	-	-	1,466.80	77.20	1,544	(Kyat / per sud)

2-1-2. Canal Resectioning Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	6.00	
Total	-	-	-	-	1,067.66	56.19	1,124	(Kyat / per sud)

2-1-2. Canal Resectioning Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.32	3,800.0	200.0	1,216.00	64.00	1,280.00	
Hydraulic Oil	gal	0.0075	9,500.0	500.0	71.25	3.75	75.00	
Engine Oil	gal	0.0075	17,100.0	900.0	128.25	6.75	135.00	
Grease	lb	0.012	4,275.0	225.0	51.30	2.70	54.00	
Total	-	-	-	-	1,466.80	77.20	1,544	(Kyat / per sud)

2-1-3. Canal Resectioning Work (by Blasting (at Rock Portion))

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Materials								
Dynamite	gram	488.00	0.87	3.49	424.56	1,703.12	2,127.68	
Detonator	Pcs	1.00	35.2	140.8	35.20	140.80	176.00	
(2) Machine								
Air Compressor , BackHoe , Dozer , Tipper	Irrigation Department							
Diesel (H.S.D.)	gal	1.56	3,800.0	200.0	5,928.00	312.00	6,240.00	
Lubricant	gal	0.001	14,250.0	750.0	14.25	0.75	15.00	
Grease	lb	0.001	4,275.0	225.0	4.28	0.23	4.51	
Miscellaneous	L.S	1.00	0.0	350.0	0.00	350.00	350.00	
Total	-	-	-	-	6,406.29	2,506.90	8,913	(Kyat / per sud)

2-1-4. Canal Resectioning Work (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-2. E/W (Earth Work) Filling into Canal Section and Inner Side Slop

2-2-1. E/W Filling into Canal Section and Inner Side Slop (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-2-2. E/W Filling into Canal Section and Inner Side Slop (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	6.00	
Total	-	-	-	-	1,067.66	56.19	1,124	(Kyat / per sud)

2-3. G.C (Gravelly Clay) Filling and Compacting Works in Canal Section and Inner Slope

2-3-1. G.C Filling and Compacting Works in Canal Section and Inner Slope (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-3-2. G.C Filling and Compacting Works in Canal Section and Inner Slope (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	5.85	
Total	-	-	-	-	1,067.66	56.19	1,124	(Kyat / per sud)

2-4. Making of Temporary Cofferdam for Necessary of Work

2-4-1. Making of Temporary Cofferdam for Necessary of Work (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(Digging)								
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(Packing & Carrying)								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(Stacking)								
(2) Materials Used								
Penan Bag	No.	100.00	30.0	270.0	3,000.00	27,000.00	30,000.00	
Total	-	-	-	-	4,575.0	41,175.0	45,750	(Kyat / per sud)

2-4-2. Making of Temporary Cofferdam for Necessary of Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.74	3,800.0	200.0	2,812.00	148.00	2,960.00	
Lubricant	gal	0.0148	14,250.0	750.0	210.90	11.10	222.00	
Grease	lb	0.0037	4,275.0	225.0	15.82	0.83	16.65	
Total	-	-	-	-	3,038.72	159.93	3,199	(Kyat / per sud)

2-5. Earth Work Excavation for Bed Kerb & Compartment and Copping (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-6. Earth Work in Dressing (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-7. Earth Work in Base Stripping 3"thick (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

2-8. Unsilted of Main Canal

2-8-1. Unsilted of Main Canal (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	3.80	350.0	3,150.0	1,330.00	11,970.00	13,300.00	
Total	-	-	-	-	1,330.00	11,970.00	13,300	(Kyat / per sud)

2-8-2. Unsilted of Main Canal (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	5.85	
Total	-	-	-	-	1,067.66	56.19	1,124	(Kyat / per sud)

3. Repairing and Construction of Linings Works

3-1. Brick Lining Work

3-1-1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per %sq-ft)

3-1-2. Making of Ring Bund with Sand Bags

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
(Digging)								
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(Carring & packing)								
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
(Placing & stacking)								
(2) Materials Used								
Penan Bag	No.	46.67	30.0	270.0	1,400.10	12,600.90	14,001.00	
Total	-	-	-	-	5,600.10	50,400.90	56,001	(Kyat / per %cu-ft)

3-1-3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.50	350.0	3,150.0	1,225.00	11,025.00	12,250.00	
(2) Materials Used								
Brick (Clay)	No.	550.00	65.7	80.3	36,135.00	44,165.00	80,300.00	
Cement	lb	356.40	62.0	3.3	22,096.80	1,176.12	23,272.92	
Sand	cu-ft	12.00	415.3	339.7	4,983.60	4,076.40	9,060.00	
Total	-	-	-	-	65,440.40	69,442.52	134,883	(Kyat / per %sq-ft)

3-1-4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.50	350.0	3,150.0	1,225.00	11,025.00	12,250.00	
(2) Materials Used								
Brick (Cement)	No.	550.00	93.2	62.2	51,260.00	34,210.00	85,470.00	
Cement	lb	356.40	62.0	3.3	22,096.80	1,176.12	23,272.92	
Sand	cu-ft	12.00	415.3	339.7	4,983.60	4,076.40	9,060.00	
Total	-	-	-	-	80,565.40	59,487.52	140,053	(Kyat / per %sq-ft)

3-1-5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.50	500.0	4,500.0	750.00	6,750.00	7,500.00	
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(2) Materials Used								
Brick (Clay)	No.	345.00	65.7	80.3	22,666.50	27,703.50	50,370.00	
Cement	lb	238.00	62.0	3.3	14,756.00	785.40	15,541.40	
Sand	cu-ft	8.00	415.3	339.7	3,322.40	2,717.60	6,040.00	
Total	-	-	-	-	42,019.90	42,681.50	84,701	(Kyat / per %sq-ft)

3-1-6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.50	500.0	4,500.0	750.00	6,750.00	7,500.00	
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(2) Materials Used								
Brick (Cement)	No.	345.00	93.2	62.2	32,154.00	21,459.00	53,613.00	
Cement	lb	238.00	62.0	3.3	14,756.00	785.40	15,541.40	
Sand	cu-ft	8.00	415.3	339.7	3,322.40	2,717.60	6,040.00	
Total	-	-	-	-	51,507.40	36,437.00	87,944	(Kyat / per %sq-ft)

3-1-7. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	9.00	500.0	4,500.0	4,500.00	40,500.00	45,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
6"-9" Stone Boulder	cu-ft	125.00	487.2	324.8	60,900.00	40,600.00	101,500.00	
Cement	lb	432.00	62.0	3.3	26,784.00	1,425.60	28,209.60	
Sand	cu-ft	14.00	415.3	339.7	5,814.20	4,755.80	10,570.00	
River Shingle	cu-ft	28.00	584.1	477.9	16,354.80	13,381.20	29,736.00	
Total	-	-	-	-	117,153.00	125,862.60	243,016	(Kyat / per sud)

3-1-8. 3"thick Sand Filling under Brick Lining

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor*								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(2) Materials Used								
Sand	cu-ft	125.00	415.3	339.7	51,912.50	42,462.50	94,375.00	
Total	-	-	-	-	52,262.50	45,612.50	97,875	(Kyat / per sud)

* Sand filling work including watering and ramming completed.

3-1-9. Pointing Work (with 1:3 Cement Mortar)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Cement	lb	54.27	62.0	3.3	3,364.74	179.09	3,543.83	
Sand	cu-ft	468.00	415.3	339.7	194,360.40	158,979.60	353,340.00	
Total	-	-	-	-	198,925.14	169,958.69	368,884	(Kyat / per %sq-ft)

3-2. Concreting Works

3-2-1. 1:3:6 Cement Concrete Work for Canal Bed Kerb

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
Cement	lb	1,440.00	62.0	3.3	89,280.00	4,752.00	94,032.00	
Sand	cu-ft	48.00	415.3	339.7	19,934.40	16,305.60	36,240.00	
River Shingle	cu-ft	96.00	584.1	477.9	56,073.60	45,878.40	101,952.00	
Total	-	-	-	-	168,588.0	96,636.0	265,224	(Kyat / per sud)

3-2-2. 1:3:6 Cement Concrete Work for Canal Copping

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
Cement	lb	1,440.00	62.0	3.3	89,280.00	4,752.00	94,032.00	
Sand	cu-ft	48.00	415.3	339.7	19,934.40	16,305.60	36,240.00	
River Shingle	cu-ft	96.00	584.1	477.9	56,073.60	45,878.40	101,952.00	
Total	-	-	-	-	168,588.0	96,636.0	265,224	(Kyat / per sud)

3-2-3. Timber Shuttering Formworks

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Jungle Wood (Scant)	cu-ft	1.50	2,063.6	8,254.4	3,095.40	12,381.60	15,477.00	
Jungle Wood (Plank)	cu-ft	0.92	2,063.6	8,254.4	1,898.51	7,594.05	9,492.56	
Wire	lb	3.00	700.0	300.0	2,100.00	900.00	3,000.00	
Total	-	-	-	-	9,793.9	45,175.7	54,970	(Kyat / per %sq-ft)

3-3. Concrete Lining Work

3-3-1. Concrete Lining Work (with 1:3:6 Cement Concrete)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(for Mixing)								
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(for Mixing)								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(for Carrying, Placing & Consolidating)								
Labor	day	5.00	350.0	3,150.0	1,750.00	15,750.00	17,500.00	
(for Carrying, Placing & Consolidating)								
Operator	day	0.50	500.0	4,500.0	250.00	2,250.00	2,500.00	
(2) Materials Used								
Cement	lb	1,440.00	62.0	3.3	89,280.00	4,752.00	94,032.00	
Sand	cu-ft	48.00	415.3	339.7	19,934.40	16,305.60	36,240.00	
River Shingle	cu-ft	96.00	584.1	477.9	56,073.60	45,878.40	101,952.00	
(3) Machine								
Mixer	Irrigation Department							
(4) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	2.00	3,800.0	200.0	7,600.00	400.00	8,000.00	
Total	-	-	-	-	177,988.00	113,236.00	291,224	(Kyat / per sud)

3-4. Related Works for Concreting such as Earth Work Excavation ,Timber Shuttering for Form Work etc;

3-4-1. Timber Shuttering Formwork for Concreting

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Timber (Scant)	cu-ft	1.50	2,083.0	8,332.0	3,124.50	12,498.00	15,622.50	
Timber (Plank)	cu-ft	0.92	2,083.0	8,332.0	1,916.36	7,665.44	9,581.80	
Wire Nail	lb	3.00	700.0	300.0	2,100.00	900.00	3,000.00	
Total	-	-	-	-	9,840.86	45,363.44	55,204	(Kyat / per %sq-ft)

3-4-2. Brick Work with 1:3 Cement Mortar for Compartment (with Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(2) Materials Used								
Brick (Clay)	No.	1,350.00	65.7	80.3	88,695.00	108,405.00	197,100.00	
Cement	lb	780.00	62.0	3.3	48,360.00	2,574.00	50,934.00	
Sand	cu-ft	26.00	415.3	339.7	10,797.80	8,832.20	19,630.00	
Total	-	-	-	-	151,952.80	156,711.20	308,664	(Kyat / per sud)

3-4-3. Brick Work with 1:3 Cement Mortar for Compartment (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(2) Materials Used								
Brick (Cement)	No.	1,350.00	93.2	62.2	125,820.00	83,970.00	209,790.00	
Cement	lb	780.00	62.0	3.3	48,360.00	2,574.00	50,934.00	
Sand	cu-ft	26.00	415.3	339.7	10,797.80	8,832.20	19,630.00	
Total	-	-	-	-	189,077.80	132,276.20	321,354	(Kyat / per sud)

3-4-4. Brick Work (1:3) Cement Mortar (with Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(2) Materials Used								
Brick (Clay)	No.	1,350.00	65.7	80.3	88,695.00	108,405.00	197,100.00	
Cement	lb	780.00	62.0	3.3	48,360.00	2,574.00	50,934.00	
Sand	cu-ft	26.00	415.3	339.7	10,797.80	8,832.20	19,630.00	
Total	-	-	-	-	151,952.80	156,711.20	308,664	(Kyat / per sud)

3-4-5. Brick Work (1:3) Cement Mortar (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	6.00	350.0	3,150.0	2,100.00	18,900.00	21,000.00	
(2) Materials Used								
Brick (Cement)	No.	1,350.00	93.2	62.2	125,820.00	83,970.00	209,790.00	
Cement	lb	780.00	62.0	3.3	48,360.00	2,574.00	50,934.00	
Sand	cu-ft	26.00	415.3	339.7	10,797.80	8,832.20	19,630.00	
Total	-	-	-	-	189,077.80	132,276.20	321,354	(Kyat / per sud)

4. Repairing & Reconstruction of Canal Structures

4-1. Re-Construction of Structures

4-1-1. Construction of Drop

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	500.00	500.0	4,500.0	250,000.00	2,250,000.00	2,500,000.00	
Carpenter	day	40.00	500.0	4,500.0	20,000.00	180,000.00	200,000.00	
Labor	day	700.00	350.0	3,150.0	245,000.00	2,205,000.00	2,450,000.00	
(2) Materials Used								
Cement	lb	117,600.00	62.0	3.3	7,291,200.00	388,080.00	7,679,280.00	
Sand	cu-ft	4,500.00	415.3	339.7	1,868,850.00	1,528,650.00	3,397,500.00	
River Shingle	cu-ft	3,000.00	584.1	477.9	1,752,300.00	1,433,700.00	3,186,000.00	
Brick (Cement)	No.	64,200.00	93.2	62.2	5,983,440.00	3,993,240.00	9,976,680.00	
Miscellaneous Works	L.S				0.00	2,000,000.00	2,000,000.00	
Total	-	-	-	-	17,410,790.00	13,978,670.00	31,389,460	(Kyat / per unit)

4-1-2. Construction of Head Regulator

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	120.00	500.0	4,500.0	60,000.00	540,000.00	600,000.00	
Carpenter	day	100.00	500.0	4,500.0	50,000.00	450,000.00	500,000.00	
Labor	day	1,100.00	350.0	3,150.0	385,000.00	3,465,000.00	3,850,000.00	
(2) Materials Used								
Cement	lb	117,600.00	62.0	3.3	7,291,200.00	388,080.00	7,679,280.00	
Sand	cu-ft	4,500.00	415.3	339.7	1,868,850.00	1,528,650.00	3,397,500.00	
River Shingle	cu-ft	3,000.00	584.1	477.9	1,752,300.00	1,433,700.00	3,186,000.00	
Brick (Cement)	No.	64,200.00	93.2	62.2	5,983,440.00	3,993,240.00	9,976,680.00	
Miscellaneous Works	L.S				0.00	1,000,000.00	1,000,000.00	
Total	-	-	-	-	17,390,790.00	12,798,670.00	30,189,460	(Kyat / per unit)

4-1-3. Construction of Drain Box Culvert

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	360.00	500.0	4,500.0	180,000.00	1,620,000.00	1,800,000.00	
Carpenter	day	900.00	500.0	4,500.0	450,000.00	4,050,000.00	4,500,000.00	
Labor	day	1300.00	350.0	3,150.0	455,000.00	4,095,000.00	4,550,000.00	
(2) Materials Used								
Cement	lb	266110.00	62.0	3.3	16,498,820.00	878,163.00	17,376,983.00	
Sand	cu-ft	9510.00	415.3	339.7	3,949,503.00	3,230,547.00	7,180,050.00	
River Shingle	cu-ft	7625.00	584.1	477.9	4,453,762.50	3,643,987.50	8,097,750.00	
Brick (Cement)	No.	146780.00	93.2	62.2	13,679,896.00	9,129,716.00	22,809,612.00	
Miscellaneous Works	L.S				0.00	1,000,000.00	1,000,000.00	
Total	-	-	-	-	39,666,981.50	27,647,413.50	67,314,395	(Kyat / per unit)

4-1-4. Construction of Road Crossing and Bridge

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	300.00	500.0	4,500.0	150,000.00	1,350,000.00	1,500,000.00	
Labor	day	900.00	350.0	3,150.0	315,000.00	2,835,000.00	3,150,000.00	
(2) Materials Used								
Cement	lb	170016.00	62.0	3.3	10,540,992.00	561,052.80	11,102,044.80	
Sand	cu-ft	8922.00	415.3	339.7	3,705,306.60	3,030,803.40	6,736,110.00	
River Shingle	cu-ft	5868.00	584.1	477.9	3,427,498.80	2,804,317.20	6,231,816.00	
Brick (Cement)	No.	117162.00	93.2	62.2	10,919,498.40	7,287,476.40	18,206,974.80	
Miscellaneous Works	L.S				0.00	1,000,000.00	1,000,000.00	
Total	-	-	-	-	29,058,295.80	18,868,649.80	47,926,946	(Kyat / per unit)

4-1-5. Construction of Syphon Protection

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	30.00	500.0	4,500.0	15,000.00	135,000.00	150,000.00	
Carpenter	day	50.00	500.0	4,500.0	25,000.00	225,000.00	250,000.00	
Labor	day	450.00	350.0	3,150.0	157,500.00	1,417,500.00	1,575,000.00	
(2) Materials Used								
Cement	lb	33820.00	62.0	3.3	2,096,840.00	111,606.00	2,208,446.00	
Sand	cu-ft	1540.00	415.3	339.7	639,562.00	523,138.00	1,162,700.00	
River Shingle	cu-ft	2000.00	584.1	477.9	1,168,200.00	955,800.00	2,124,000.00	
Brick (Cement)	No.	3500.00	93.2	62.2	326,200.00	217,700.00	543,900.00	
Miscellaneous Works	L.S				0.00	1,000,000.00	1,000,000.00	
Total	-	-	-	-	4,428,302.00	4,585,744.00	9,014,046	(Kyat / per unit)

4-1-6. Construction of Course-Way

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	30.00	500.0	4,500.0	15,000.00	135,000.00	150,000.00	
Labor	day	450.00	350.0	3,150.0	157,500.00	1,417,500.00	1,575,000.00	
(2) Materials Used								
Cement	lb	33820.00	62.0	3.3	2,096,840.00	111,606.00	2,208,446.00	
Sand	cu-ft	1540.00	415.3	339.7	639,562.00	523,138.00	1,162,700.00	
River Shingle	cu-ft	2000.00	584.1	477.9	1,168,200.00	955,800.00	2,124,000.00	
Brick (Cement)	No.	3500.00	93.2	62.2	326,200.00	217,700.00	543,900.00	
Miscellaneous Works	L.S				0.00	1,000,000.00	1,000,000.00	
Total	-	-	-	-	4,403,302.00	3,460,744.00	7,864,046	(Kyat / per unit)

4-1-7. Construction of Box Culverts (Cross Drain Culverts) (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	30.00	500.0	4,500.0	15,000.00	135,000.00	150,000.00	
Carpenter	day	50.00	500.0	4,500.0	25,000.00	225,000.00	250,000.00	
Labor	day	450.00	350.0	3,150.0	157,500.00	1,417,500.00	1,575,000.00	

4-1-7. Construction of Box Culverts (Cross Drain Culverts) (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
Cement	lb	33820.00	62.0	3.3	2,096,840.00	111,606.00	2,208,446.00	
Sand	cu-ft	1540.00	415.3	339.7	639,562.00	523,138.00	1,162,700.00	
River Shingle	cu-ft	2000.00	584.1	477.9	1,168,200.00	955,800.00	2,124,000.00	
Brick (Cement)	No.	3500.00	93.2	62.2	326,200.00	217,700.00	543,900.00	
Miscellaneous Works	L.S				0.00	1,000,000.00	1,000,000.00	
Total	-	-	-	-	4,428,302.00	3,685,744.00	8,114,046	(Kyat / per unit)

4-2. Repairing of structures

4-2-1. Drop

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	250.00	500.0	4,500.0	125,000.00	1,125,000.00	1,250,000.00	
Carpenter	day	20.00	500.0	4,500.0	10,000.00	90,000.00	100,000.00	
Labor	day	350.00	350.0	3,150.0	122,500.00	1,102,500.00	1,225,000.00	
(2) Materials Used								
Cement	lb	39,200.00	62.0	3.3	2,430,400.00	129,360.00	2,559,760.00	
Sand	cu-ft	1,500.00	415.3	339.7	622,875.00	509,625.00	1,132,500.00	
River Shingle	cu-ft	1,000.00	584.1	477.9	584,100.00	477,900.00	1,062,000.00	
Brick (Cement)	No.	21,400.00	93.2	62.2	1,994,480.00	1,331,080.00	3,325,560.00	
Miscellaneous Works	L.S				0.00	5,000,000.00	5,000,000.00	
Total	-	-	-	-	125,579,880.00	107,530,440.00	232,910,320	(Kyat / per unit)

4-2-2. Head Regulator

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	30.00	500.0	4,500.0	15,000.00	135,000.00	150,000.00	
Labor	day	70.00	350.0	3,150.0	24,500.00	220,500.00	245,000.00	
(2) Materials Used								
Cement	lb	25,200.00	62.0	3.3	1,562,400.00	83,160.00	1,645,560.00	
Sand	cu-ft	15.00	415.3	339.7	6,229.50	5,096.25	11,325.75	
River Shingle	cu-ft	22.52	584.1	477.9	13,152.30	10,762.30	23,914.60	
Brick (Cement)	No.	1,124.00	93.2	62.2	104,756.80	69,912.80	174,669.60	
Miscellaneous Works	L.S				0.00	1,000,000.00	1,000,000.00	
Total	-	-	-	-	3,644,925.00	3,094,428.60	6,739,354	(Kyat / per unit)

4-2-3. Drain Box Culvert (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	80.00	500.0	4,500.0	40,000.00	360,000.00	400,000.00	
Labor	day	150.00	350.0	3,150.0	52,500.00	472,500.00	525,000.00	

4-2-3. Drain Box Culvert (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
Cement	lb	17,300.00	62.0	3.3	1,072,600.00	57,090.00	1,129,690.00	
Sand	sd	12.00	41,525.0	33,975.0	498,300.00	407,700.00	906,000.00	
River Shingle	sd	20.00	58,410.0	47,790.0	1,168,200.00	955,800.00	2,124,000.00	
Brick (Cement)	No.	9,000.00	93.2	62.2	838,800.00	559,800.00	1,398,600.00	
Miscellaneous Works	L.S				0.00	1,000,000.00	1,000,000.00	
Total	-	-	-	-	3,670,400.00	3,812,890.00	7,483,290	(Kyat / per unit)

4-2-4. Road Crossing and Bridge

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	100.00	500.0	4,500.0	50,000.00	450,000.00	500,000.00	
Labor	day	250.00	350.0	3,150.0	87,500.00	787,500.00	875,000.00	
(2) Materials Used								
Cement	lb	33,600.00	62.0	3.3	2,083,200.00	110,880.00	2,194,080.00	
Sand	sd	20.00	41,525.0	33,975.0	830,500.00	679,500.00	1,510,000.00	
River Shingle	sd	30.00	58,410.0	47,790.0	1,752,300.00	1,433,700.00	3,186,000.00	
Brick (Cement)	No.	15,000.00	93.2	62.2	1,398,000.00	933,000.00	2,331,000.00	
Miscellaneous Works	L.S				0.00	1,000,000.00	1,000,000.00	
Total	-	-	-	-	6,201,500.00	5,394,580.00	11,596,080	(Kyat / per unit)

4-2-5. Syphon

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	30.00	500.0	4,500.0	15,000.00	135,000.00	150,000.00	
Carpenter	day	70.00	500.0	4,500.0	35,000.00	315,000.00	350,000.00	
Labor	day	450.00	350.0	3,150.0	157,500.00	1,417,500.00	1,575,000.00	
(2) Materials Used								
Cement	lb	50730.00	62.0	3.3	3,145,260.00	167,409.00	3,312,669.00	
Sand	cu-ft	2310.00	415.3	339.7	959,343.00	784,707.00	1,744,050.00	
River Shingle	cu-ft	3000.00	584.1	477.9	1,752,300.00	1,433,700.00	3,186,000.00	
Brick (Cement)	No.	5250.00	93.2	62.2	489,300.00	326,550.00	815,850.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	6,553,703.00	5,079,866.00	11,633,569	(Kyat / per unit)

4-2-6. Repairing of Course-Way

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	30.00	500.0	4,500.0	15,000.00	135,000.00	150,000.00	
Labor	day	450.00	350.0	3,150.0	157,500.00	1,417,500.00	1,575,000.00	
(2) Materials Used								
Cement	lb	33820.00	62.0	3.3	2,096,840.00	111,606.00	2,208,446.00	
Sand	cu-ft	1540.00	415.3	339.7	639,562.00	523,138.00	1,162,700.00	
River Shingle	cu-ft	2000.00	584.1	477.9	1,168,200.00	955,800.00	2,124,000.00	
Brick (Cement)	No.	3500.00	93.2	62.2	326,200.00	217,700.00	543,900.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	4,403,302.00	3,860,744.00	8,264,046	(Kyat / per unit)

4-2-7. Repairing of Box Culverts (Cross Drain Culverts)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Carpenter	day	35.00	500.0	4,500.0	17,500.00	157,500.00	175,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	62.0	3.3	1,048,544.00	55,809.60	1,104,353.60	
Sand	cu-ft	772.00	415.3	339.7	320,611.60	262,248.40	582,860.00	
River Shingle	cu-ft	998.00	584.1	477.9	582,931.80	476,944.20	1,059,876.00	
Brick (Cement)	No.	1750.00	93.2	62.2	163,100.00	108,850.00	271,950.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	2,258,587.40	2,694,452.20	4,953,040	(Kyat / per unit)

4-2-8. Repairing of Conduit Gate and Assembly

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Smith	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
(2) Materials Used								
Steel Gate	No.	1.00	135,000.0	15,000.0	135,000.00	15,000.00	150,000.00	
Steel Rod (10mm)	lb	40.00	66.1	3.5	2,644.00	140.00	2,784.00	
Binding Wire	lb	8.00	1,050.0	450.0	8,400.00	3,600.00	12,000.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	151,544.00	568,240.00	719,784	(Kyat / per item)

4-2-9. Repairing of Canal Gate Leaf, Frame & Gear Assembly

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Smith	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	4.00	350.0	3,150.0	1,400.00	12,600.00	14,000.00	
(2) Materials Used								
Steel Gate	No.	2.00	135,000.0	15,000.0	270,000.00	30,000.00	300,000.00	
Steel Rod (10mm)	lb	20.00	66.1	3.5	1,322.00	70.00	1,392.00	
Binding Wire	lb	4.00	1,050.0	450.0	4,200.00	1,800.00	6,000.00	
Miscellaneous Works	L.S				0.00	50,000.00	50,000.00	
Total	-	-	-	-	277,922.00	103,470.00	381,392	(Kyat / per item)

4-2-10. Repairing of Canal Structures

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	18.00	500.0	4,500.0	9,000.00	81,000.00	90,000.00	
Labor	day	334.00	350.0	3,150.0	116,900.00	1,052,100.00	1,169,000.00	
(2) Materials Used								
Cement	lb	16912.00	62.0	3.3	1,048,544.00	55,809.60	1,104,353.60	
Sand	cu-ft	772.00	415.3	339.7	320,611.60	262,248.40	582,860.00	
River Shingle	cu-ft	998.00	584.1	477.9	582,931.80	476,944.20	1,059,876.00	
Brick (Cement)	No.	1750.00	93.2	62.2	163,100.00	108,850.00	271,950.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	2,241,087.40	2,136,952.20	4,378,040	(Kyat / per item)

5. Road Works

5-1. G.C (Gravelly Clay) Laying Work

5-1-1. G.C Laying and spreading works of Canal Inspection Path

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(laying, dressing, spreading & compacting)								
(2) Materials Used								
Gravelly Clay (G.C)	cu-ft	110.00	344.4	229.6	37,884.00	25,256.00	63,140.00	
Total	-	-	-	-	38,409.0	29,981.0	68,390	(Kyat / per sud)

5-1-2. G.C Laying and spreading work of Canal Non Inspection Path

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(laying, dressing, spreading & compacting)								
(2) Materials Used								
Gravelly Clay (G.C)	cu-ft	110.00	344.4	229.6	37,884.00	25,256.00	63,140.00	
Total	-	-	-	-	38,409.0	29,981.0	68,390	(Kyat / per sud)

5-2. Concrete Paving Work

5-2-1. Mixing only Cement Concrete (1:2:4) with (0.5" to 0.75") Gauge Stone Chippings on River Shingle

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
(2) Materials Used								
Cement	lb	2,070.00	62.0	3.3	128,340.00	6,831.00	135,171.00	
River Shingle	cu-ft	92.00	584.1	477.9	53,737.20	43,966.80	97,704.00	
Sand	cu-ft	46.00	415.3	339.7	19,103.80	15,626.20	34,730.00	
Total	-	-	-	-	205,181.0	102,424.0	307,605	(Kyat / per sud)

5-2-2. Mixing only Cement Concrete (1:3:6) with (0.5" to 0.75") Gauge Stone Chippings on River Shingle

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
(2) Materials Used								
Cement	lb	1,440.00	62.0	3.3	89,280.00	4,752.00	94,032.00	
River Shingle	cu-ft	96.00	584.1	477.9	56,073.60	45,878.40	101,952.00	
Sand	cu-ft	48.00	415.3	339.7	19,934.40	16,305.60	36,240.00	
Total	-	-	-	-	169,288.0	102,936.0	272,224	(Kyat / per sud)

5-2-3. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
Total	-	-	-	-	1,550.0	13,950.0	15,500	(Kyat / per sud)

5-2-4. Timber Shuttering Formworks

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Jungle Wood (Scant)	cu-ft	1.50	2,063.6	8,254.4	3,095.40	12,381.60	15,477.00	
Jungle Wood (Plank)	cu-ft	0.92	2,063.6	8,254.4	1,898.51	7,594.05	9,492.56	
Wire Nail	lb	3.00	700.0	300.0	2,100.00	900.00	3,000.00	
Total	-	-	-	-	9,793.91	45,175.65	54,970	(Kyat / per %sq-ft)

5-2-5. Reinforcing Bar Preparation and Assembly

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
Steel Fixer	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(2) Materials Used								
Steel Rod (10mm)	lb	117.60	66.1	3.5	7,773.36	411.60	8,184.96	
Binding Wire	lb	1.00	1,050.0	450.0	1,050.00	450.00	1,500.00	
Total	-	-	-	-	9,673.36	8,511.60	18,185	(Kyat / per CWT)

6. Repairing and Construction of Permanent Buildings

6-1. Repairing and Construction of Building (Gust House, Meeting Hall, Office, etc.)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	20.00	500.0	4,500.0	10,000.00	90,000.00	100,000.00	
Labor	day	30.00	350.0	3,150.0	10,500.00	94,500.00	105,000.00	
(2) Materials Used								
Repairing and Construction of Building	Set	1.00	4,000,000.0	6,000,000.0	4,000,000.00	6,000,000.00	10,000,000.00	
Miscellaneous Works	L.S				0.00	2,850,000.00	2,850,000.00	
Total	-	-	-	-	4,020,500.00	9,034,500.00	13,055,000	(Kyat / per item)

7. Other Related Works

7-1. Repairing of Heavy Machines

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Operator (Machine Driver)	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
Total	-	-	-	-	5,000.00	45,000.00	50,000	(Kkyat / per job)

7-2. Repairing of Motor Vehicles , Water Pumps and Generators

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Operator (Machine Driver)	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
Total	-	-	-	-	5,500.00	49,500.00	55,000	(Kkyat / per item)

7-3. Repairing Charges for Equipments

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Operator (Machine Driver)	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
Total	-	-	-	-	4,300.00	38,700.00	43,000	(Kkyat / per item)

7-4. Earth Works for Drainage Canal (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	5.85	
Total	-	-	-	-	1,067.7	56.2	1,124	(Kkyat / per sud)

7-5. Management of Construction Materials and Equipment

7-5-1. Shifting of Materials from Temporary Stock-pile to Work Site

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							
(2) Labor								
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Engine Oil	gal	0.0052	17,100.0	900.0	88.92	4.68	93.60	
Lubricant	gal	0.0013	14,250.0	750.0	18.53	0.98	19.51	
Total	-	-	-	-	2,145.45	9,507.66	11,653	(Kkyat / per item)

7-5-2. Transporting of Materials from Quarry to Stock-pile

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							
(2) Labor								
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.36	3,800.0	200.0	1,368.00	72.00	1,440.00	
Engine Oil	gal	0.0072	17,100.0	900.0	123.12	6.48	129.60	
Lubricant	gal	0.0018	14,250.0	750.0	25.65	1.35	27.00	
Total	-	-	-	-	2,566.77	9,529.83	12,097	(Kkyat / per item)

7-5-3. Transporting and Shifting of Heavy Machinery

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							
(2) Labor								
Operator (Machine Driver)	day	10.00	500.0	4,500.0	5,000.00	45,000.00	50,000.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.36	3,800.0	200.0	1,368.00	72.00	1,440.00	
Engine Oil	gal	0.0072	17,100.0	900.0	123.12	6.48	129.60	
Lubricant	gal	0.0018	14,250.0	750.0	25.65	1.35	27.00	
Total	-	-	-	-	6,516.77	45,079.83	51,597	(Kkyat / per item)

7-5-4. Loading and Unloading Charges of Materials

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
Total	-	-	-	-	2,800.00	25,200.00	28,000	(Kkyat / per item)

7-6. Water Pump for Dewatering Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Water Pump	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	10.00	3,800.0	200.0	38,000.00	2,000.00	40,000.00	
Total	-	-	-	-	38,000.00	2,000.00	40,000	(Kkyat / per day)

7-7. Welfare Charges for Labor

7-7-1. Temporary Hut Material for One Family

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
Temporary Hut Material for One Family	item	1.00	100,000.0	2,000,000.0	100,000.00	2,000,000.00	2,100,000.00	
Total	-	-	-	-	102,800.0	2,025,200.0	2,128,000	(Kyat / per item)

7-7-2. Hnee Thatch

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.002	350.0	3,150.0	0.70	6.30	7.00	
(2) Materials Used								
Hnee Thatch	item	0.002	10,000.0	200,000.0	20.00	400.00	420.00	
Total	-	-	-	-	20.70	406.30	427	(Kyat / per item)

7-7-3. Bamboo

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.004	350.0	3,150.0	1.40	12.60	14.00	
(2) Materials Used								
Bamboo	item	0.005	5,000.0	100,000.0	25.00	500.00	525.00	
Total	-	-	-	-	26.40	512.60	539	(Kyat / per item)

7-7-4. Transporting for Labor Necessary of Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck (Capacity = 5ton)	Irrigation Department				0.00	0.00	0.00	
(2) Labor Transportation								
(a) Tar road	mile	5.00						
Diesel (H.S.D.)	gal	0.50	3,800.0	200.0	1,900.00	100.00	2,000.00	Tar road : 10mile/gal
(b) off road	mile	4.00						
Diesel (H.S.D.)	gal	0.50	3,800.0	200.0	1,900.00	100.00	2,000.00	Off road : 8mile/gal
Total	-	-	-	-	3,800.00	200.00	4,000	(Kyat / per mile)

7-8. Labor Charges for Day & Night Watchman, Helper, Checker and General Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
Total	-	-	-	-	350.0	3,150.0	3,500	(Kyat / per M/D)

7-9. Camps Facilities (Lighting, Water Supply, etc.)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Water Pump	Irrigation Department							1 gal/bowser
Water Bowser	Irrigation Department							3 gal/trip
Diesel Generator	Irrigation Department							1 gal/hr
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	1.00	3,800.0	200.0	3,800.00	200.00	4,000.00	4 hr/day
(Water Pump)								
Diesel (H.S.D.)	gal	3.00	3,800.0	200.0	11,400.00	600.00	12,000.00	1 trip/day
(Water Bowser)								
Diesel (H.S.D.)	gal	4.00	3,800.0	200.0	15,200.00	800.00	16,000.00	1 bowser/day
(Generator)								
Total	-	-	-	-	30,400.00	1,600.00	32,000	(Kyat / per gal)

7-10. Making Data Boards and Sign Boards

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Painter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Ply Wood (8'x4')	No.	1.00	2,400.0	9,600.0	2,400.00	9,600.00	12,000.00	
Paint	gal	2.50	10,000.0	10,000.0	25,000.00	25,000.00	50,000.00	
Painting charges	L.S	1.00	1,500.0	13,500.0	1,500.00	13,500.00	15,000.00	
Beading 1"x½"	cu-ft	0.30	5,207.5	5,207.5	1,562.25	1,562.25	3,124.50	
Total	-	-	-	-	34,162.25	82,962.25	117,125	(Kyat / per item)

7-11. Estimating, Copying, Photo Recording and stationary Charges, etc;

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Materials Used								
Paper	Page	500.00	3.0	7.0	1,500.00	3,500.00	5,000.00	
(2) Service Charges								
Typing & Printing charges	Page	90.00	25.0	225.0	2,250.00	20,250.00	22,500.00	
Photo & Printing charges	Page	50.00	50.0	450.0	2,500.00	22,500.00	25,000.00	
Copying charges	Page	360.00	2.5	22.5	900.00	8,100.00	9,000.00	
Binding charges	No.	5.00	100.0	900.0	500.00	4,500.00	5,000.00	
Total	-	-	-	-	7,650.00	58,850.00	66,500	(Kyat / per item)

7-12. Miscellaneous

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
Miscellaneous	item	1.00	5,000.0	100,000.0	5,000.00	100,000.00	105,000.00	
Total	-	-	-	-	5,000.00	100,000.00	105,000	(Kyat / per item)

3.4.2 Analysis Rate for Distribution Canal

8. Preparatory Works

8-1. Survey and Profile Works (Canal length : 30 feet / sect)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Lime (Strained Lime)	cu-ft	0.20	450.0	4,050.0	90.00	810.00	900.00	
Plastic ream	No.	0.67	90.0	810.0	60.00	540.00	600.00	for finishing stake
Labor	day	0.10	350.0	3,150.0	35.00	315.00	350.00	
Total	-	-	-	-	335.00	3,015.00	3,350	(Kyat / per sect)

8-2. Temporary Camps & Stores

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) 4"~6"φMyaw Post Work								
4"~6"φMyaw (J/Wood)	No.	3.00	1,500.0	6,000.0	4,500.00	18,000.00	22,500.00	
Carpenter	day	0.50	500.0	4,500.0	250.00	2,250.00	2,500.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) 2"~4"φMyaw Post Work								
2"~4"φMyaw (J/Wood)	No.	8.00	800.0	3,200.0	6,400.00	25,600.00	32,000.00	
Wire Nail	viss	1.00	2,520.0	1,080.0	2,520.00	1,080.00	3,600.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(3) Hnee Thatch Roofing Work								
Hnee Thatch	No.	150.00	50.0	450.0	7,500.00	67,500.00	75,000.00	
Bamboo	No.	15.00	50.0	450.0	750.00	6,750.00	7,500.00	
Wire Nail	viss	0.50	2,520.0	1,080.0	1,260.00	540.00	1,800.00	
Carpenter	day	0.50	500.0	4,500.0	250.00	2,250.00	2,500.00	
Labor	day	0.50	350.0	3,150.0	175.00	1,575.00	1,750.00	
(4) Roll Mat Ridging Work								
Roll Mat (12'×3')	No.	1.50	180.0	1,620.0	270.00	2,430.00	2,700.00	
Bamboo	No.	0.50	50.0	450.0	25.00	225.00	250.00	
Wire Nail	viss	0.10	2,520.0	1,080.0	252.00	108.00	360.00	
Carpenter	day	0.25	500.0	4,500.0	125.00	1,125.00	1,250.00	
(5) Bamboo Flooring Work								
Bamboo	No.	30.00	50.0	450.0	1,500.00	13,500.00	15,000.00	
Wire Nail	viss	0.50	2,520.0	1,080.0	1,260.00	540.00	1,800.00	
Carpenter	day	0.50	500.0	4,500.0	250.00	2,250.00	2,500.00	
Labor	day	0.50	350.0	3,150.0	175.00	1,575.00	1,750.00	
(6) Bamboo Mat Walling (Single)								
Bamboo Mat	sq-ft	200.00	20.0	180.0	4,000.00	36,000.00	40,000.00	
Bamboo	No.	3.00	50.0	450.0	150.00	1,350.00	1,500.00	
Wire Nail	viss	1.00	2,520.0	1,080.0	2,520.00	1,080.00	3,600.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(7) Bamboo Hand Rail work								
Bamboo	No.	1.00	50.0	450.0	50.00	450.00	500.00	
Wire Nail	viss	0.25	2,520.0	1,080.0	630.00	270.00	900.00	
Carpenter	day	0.25	500.0	4,500.0	125.00	1,125.00	1,250.00	
Total	-	-	-	-	36,637.00	202,873.00	239,510	(Kyat / per item)

8-3. Temporary Barracks (2 units, 4 units, etc.)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Hnee Thatch Roofing Work								
Hnee Thatch	No.	200.00	50.0	450.0	10,000.00	90,000.00	100,000.00	
Bamboo	No.	35.00	50.0	450.0	1,750.00	15,750.00	17,500.00	
Wire Nail	viss	0.50	2,520.0	1,080.0	1,260.00	540.00	1,800.00	
Binding Wire	lb	0.25	1,050.0	450.0	262.50	112.50	375.00	
Carpenter	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Double Bamboo Rallmat Ridging work								
Roll Mat (12'×3')	No.	15.00	180.0	1,620.0	2,700.00	24,300.00	27,000.00	
Wire Nail	viss	1.00	2,520.0	1,080.0	2,520.00	1,080.00	3,600.00	
Bamboo	No.	5.00	50.0	450.0	250.00	2,250.00	2,500.00	
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(3) Spitted Bamboo flooring work								
Bamboo	No.	100.00	50.0	450.0	5,000.00	45,000.00	50,000.00	
Wire Nail	viss	0.30	2,520.0	1,080.0	756.00	324.00	1,080.00	
Binding Wire	lb	4.00	1,050.0	450.0	4,200.00	1,800.00	6,000.00	
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	4.00	350.0	3,150.0	1,400.00	12,600.00	14,000.00	
(4) Bamboo Mat Walling Work								
Bamboo Mat	sq-ft	200.00	20.0	180.0	4,000.00	36,000.00	40,000.00	
Jungle Wood (Plank)	cu-ft	0.32	2,063.6	8,254.4	660.35	2,641.41	3,301.76	
Wire Nail	viss	0.50	2,520.0	1,080.0	1,260.00	540.00	1,800.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(5) Bamboo Mat Door Work								
Bamboo Mat	sq-ft	30.00	20.0	180.0	600.00	5,400.00	6,000.00	
Jungle Wood (Plank)	cu-ft	2.20	2,063.6	8,254.4	4,539.92	18,159.68	22,699.60	
Wire Nail	viss	0.20	2,520.0	1,080.0	504.00	216.00	720.00	
Carpenter	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(6) Bamboo Mat Window Work								
Bamboo	No.	20.00	50.0	450.0	1,000.00	9,000.00	10,000.00	
Jungle Wood (Plank)	cu-ft	0.60	2,063.6	8,254.4	1,238.16	4,952.64	6,190.80	
Wire Nail	viss	0.10	2,520.0	1,080.0	252.00	108.00	360.00	
Carpenter	day	0.63	500.0	4,500.0	315.00	2,835.00	3,150.00	
(7) Splitted Bamboo Triellis Work								
Bamboo	No.	30.00	50.0	450.0	1,500.00	13,500.00	15,000.00	
Wire Nail	viss	2.00	2,520.0	1,080.0	5,040.00	2,160.00	7,200.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
(8) Iron fitting Work								
Butt Hinge	No.	50.00	700.0	300.0	35,000.00	15,000.00	50,000.00	
Hasp & Staple	No.	8.00	350.0	150.0	2,800.00	1,200.00	4,000.00	
Handle	No.	15.00	700.0	300.0	10,500.00	4,500.00	15,000.00	
Tower Bolt	No.	20.00	840.0	360.0	16,800.00	7,200.00	24,000.00	
Screw	gross	1.00	1,400.0	600.0	1,400.00	600.00	2,000.00	
Total	-	-	-	-	124,057.93	376,719.23	500,777	(Kyat / per item)

8-4. Temporary Latrines

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Site Cleaning & Earth Work								
Site Cleaning Work for Latrines	set	1.00	600.0	5,400.0	600.00	5,400.00	6,000.00	
Digging for Post Hole (Barrack etc.)	No.	1.00	30.0	270.0	30.00	270.00	300.00	
Digging for Pit Hole (Latrines)	No.	1.00	1,200.0	10,800.0	1,200.00	10,800.00	12,000.00	
(2) 4"~6"φMyaw Post Work								
4"~6"φMyaw (J/Wood)	No.	2.00	1,500.0	6,000.0	3,000.00	12,000.00	15,000.00	
Wire Nail	viss	0.30	2,520.0	1,080.0	756.00	324.00	1,080.00	
Carpenter	day	1.40	500.0	4,500.0	700.00	6,300.00	7,000.00	
Labor	day	0.90	350.0	3,150.0	315.00	2,835.00	3,150.00	
(3) 2"~4"φMyaw Post Work								
2"~4"φMyaw (J/Wood)	No.	1.00	800.0	3,200.0	800.00	3,200.00	4,000.00	
Wire Nail	viss	0.10	2,520.0	1,080.0	252.00	108.00	360.00	
Carpenter	day	0.10	500.0	4,500.0	50.00	450.00	500.00	
Labor	day	0.10	350.0	3,150.0	35.00	315.00	350.00	
(4) Hnee Thatch Roofing Work								
Hnee Thatch	No.	10.00	50.0	450.0	500.00	4,500.00	5,000.00	
Bamboo	No.	1.00	50.0	450.0	50.00	450.00	500.00	
Wire Nail	viss	0.10	2,520.0	1,080.0	252.00	108.00	360.00	
Binding Wire	lb	1.00	1,050.0	450.0	1,050.00	450.00	1,500.00	
Carpenter	day	0.40	500.0	4,500.0	200.00	1,800.00	2,000.00	
Labor	day	0.40	350.0	3,150.0	140.00	1,260.00	1,400.00	
(5) 6"×1" Plank Flooring Work								
Jungle Wood (Plank)	cu-ft	1.30	2,063.6	8,254.4	2,682.68	10,730.72	13,413.40	
Wire Nail	viss	0.10	2,520.0	1,080.0	252.00	108.00	360.00	
Carpenter	day	0.20	500.0	4,500.0	100.00	900.00	1,000.00	
Labor	day	0.10	350.0	3,150.0	35.00	315.00	350.00	
(6) Bamboo Mat Walling Work								
Bamboo Mat	sq-ft	20.00	20.0	180.0	400.00	3,600.00	4,000.00	
Jungle Wood (Plank)	cu-ft	0.30	2,063.6	8,254.4	619.08	2,476.32	3,095.40	
Wire Nail	viss	0.40	2,520.0	1,080.0	1,008.00	432.00	1,440.00	
Carpenter	day	0.80	500.0	4,500.0	400.00	3,600.00	4,000.00	
(7) Bamboo Mat Door Work								
Bamboo Mat	sq-ft	5.00	20.0	180.0	100.00	900.00	1,000.00	
Jungle Wood (Plank)	cu-ft	0.20	2,063.6	8,254.4	412.72	1,650.88	2,063.60	
Wire Nail	viss	0.10	2,520.0	1,080.0	252.00	108.00	360.00	
Carpenter	day	0.20	500.0	4,500.0	100.00	900.00	1,000.00	
(8) Iron fitting Work								
Butt Hinge	No.	2.00	700.0	300.0	1,400.00	600.00	2,000.00	
Hasp & Staple	No.	1.00	350.0	150.0	350.00	150.00	500.00	
Handle	No.	2.00	700.0	300.0	1,400.00	600.00	2,000.00	
Tower Bolt	No.	1.00	840.0	360.0	840.00	360.00	1,200.00	
Lock & Key	No.	1.00	1,400.0	600.0	1,400.00	600.00	2,000.00	
Screw	gross	2.00	1,400.0	600.0	2,800.00	1,200.00	4,000.00	
Purchasing & Fixing of W.C. Pan	No.	1.00	5,600.0	2,400.0	5,600.00	2,400.00	8,000.00	
Total	-	-	-	-	30,081.48	82,200.92	112,282	(Kyat / per item)

8-5. Making Stock Pile Yards

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Earth Work								
Digging for Post Hole (Barrack etc.)	No.	47.00	30.0	270.0	1,410.00	12,690.00	14,100.00	
(2) Wagut Walling with Bamboo Rail Work								
Wagut (5'×2'6")	No.	40.00	200.0	800.0	8,000.00	32,000.00	40,000.00	
4"~6"φMyaw (J/Wood)	No.	15.00	1,500.0	6,000.0	22,500.00	90,000.00	112,500.00	
Bamboo	No.	33.00	50.0	450.0	1,650.00	14,850.00	16,500.00	
Wire Nail	viss	1.50	2,520.0	1,080.0	3,780.00	1,620.00	5,400.00	
Binding Wire	lb	3.00	1,050.0	450.0	3,150.00	1,350.00	4,500.00	
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	4.00	350.0	3,150.0	1,400.00	12,600.00	14,000.00	
Total	-	-	-	-	43,890.00	183,110.00	227,000	(Kyat / per item)

8-6. Labor Transporting Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck (Capacity = 5ton)	Irrigation Department							
(2) Labor Transportation								
(a) Tar road	mile	0.44						
Diesel (H.S.D.)	gal	0.044	3,800.0	200.0	167.20	8.80	176.00	Tar road : 10mile/gal
(b) offroad	mile	0.44						
Diesel (H.S.D.)	gal	0.055	3,800.0	200.0	209.00	11.00	220.00	Off road : 8mile/gal
Total	-	-	-	-	376.20	19.80	396	(Kyat / per item)

8-7. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas

8-7-1. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas along the DY Canal (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.30	350.0	3,150.0	105.00	945.00	1,050.00	
Total	-	-	-	-	105.00	945.00	1,050	(Kyat / per %sq-ft)

8-7-2. Site Clearing (Grass, Bushes) Cutting and Clearing of the Working Areas along the DY Canal (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Bulldozer	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	11.00	3,800.0	200.0	41,800.00	2,200.00	44,000.00	
Engine Oil	gal	0.22	17,100.0	900.0	3,762.00	198.00	3,960.00	
Hydraulic Oil	gal	0.22	9,500.0	500.0	2,090.00	110.00	2,200.00	
Grease	lb	0.055	4,275.0	225.0	235.13	12.38	247.51	
Total	-	-	-	-	47,887.13	2,520.38	50,408	(Kyat / per acres)

9. Earth Works

9-1. Canal Resectioning Work

9-1-1. Canal Resectioning Work (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.0	4,725.0	5,250.00	(Kyat / per sud)

9-1-2. Canal Resectioning Work (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.32	3,800.0	200.0	1,216.00	64.00	1,280.00	
Hydraulic Oil	gal	0.0075	9,500.0	500.0	71.25	3.75	75.00	
Engine Oil	gal	0.0075	17,100.0	900.0	128.25	6.75	135.00	
Grease	lb	0.012	4,275.0	225.0	51.30	2.70	54.00	
Total	-	-	-	-	1,466.80	77.20	1,544.00	(Kyat / per sud)

9-2. Unsiltng of Distributary Canals

9-2-1. Unsiltng of Distributary Canals (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	3.80	350.0	3,150.0	1,330.00	11,970.00	13,300.00	
Total	-	-	-	-	1,330.0	11,970.0	13,300.00	(Kyat / per sud)

9-2-2. Unsiltng of Distributary Canals (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	5.85	
Total	-	-	-	-	1,067.7	56.2	1,124.00	(Kyat / per sud)

9-3. Earth Work in Dressing (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.0	4,725.0	5,250.00	(Kyat / per sud)

9-4. Earth Work in Base Stripping (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.0	4,725.0	5,250.00	(Kyat / per sud)

10. Repairing of Linings Work

10-1. Repairing Works of Brick Lining

10-1-1. Dismantling of Old Crush Brick Lining and Dispersive Materials Removed as Directed

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.0	4,725.0	5,250.00	(Kyat / per %sq-ft)

10-1-2. 3"thick Sand Filling under Brick Lining

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
(2) Materials Used								
Sand	cu-ft	125.00	415.3	339.7	51,912.50	42,462.50	94,375.00	
Total	-	-	-	-	52,262.5	45,612.5	97,875.00	(Kyat / per sud)

10-1-3. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Clay Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.50	350.0	3,150.0	1,225.00	11,025.00	12,250.00	
(2) Materials Used								
Brick (Clay)	No.	550.00	65.7	80.3	36,135.00	44,165.00	80,300.00	
Cement	lb	356.40	62.0	3.3	22,096.80	1,176.12	23,272.92	
Sand	cu-ft	12.00	415.3	339.7	4,983.60	4,076.40	9,060.00	
Total	-	-	-	-	65,440.4	69,442.5	134,883.00	(Kyat / per %sq-ft)

10-1-4. 4½"thick Brick Lining with (1:3) Cement Mortar for Canal Bed (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	3.50	350.0	3,150.0	1,225.00	11,025.00	12,250.00	
(2) Materials Used								
Brick (Cement)	No.	550.00	93.2	62.2	51,260.00	34,210.00	85,470.00	
Cement	lb	356.40	62.0	3.3	22,096.80	1,176.12	23,272.92	
Sand	cu-ft	12.00	415.3	339.7	4,983.60	4,076.40	9,060.00	
Total	-	-	-	-	80,565.4	59,487.5	140,053.00	(Kyat / per %sq-ft)

10-1-5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick) (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.50	500.0	4,500.0	750.00	6,750.00	7,500.00	
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	

10-1-5. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Clay Brick) (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
Brick (Clay)	No.	345.00	65.7	80.3	22,666.50	27,703.50	50,370.00	
Cement	lb	238.00	62.0	3.3	14,756.00	785.40	15,541.40	
Sand	cu-ft	8.00	415.3	339.7	3,322.40	2,717.60	6,040.00	
Total	-	-	-	-	42,019.9	42,681.5	84,701	(Kyat / per %sq-ft)

10-1-6. 3"thick Brick Lining with (1:3) Cement Mortar for Canal Slope (with Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.50	500.0	4,500.0	750.00	6,750.00	7,500.00	
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(2) Materials Used								
Brick (Cement)	No.	345.00	93.2	62.2	32,154.00	21,459.00	53,613.00	
Cement	lb	238.00	62.0	3.3	14,756.00	785.40	15,541.40	
Sand	cu-ft	8.00	415.3	339.7	3,322.40	2,717.60	6,040.00	
Total	-	-	-	-	51,507.4	36,437.0	87,944	(Kyat / per %sq-ft)

10-1-7. (1:3:6) C.C (Cement Concrete) work for Copping & Bed Kerb

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
(2) Materials Used								
Cement	lb	1,440.00	62.0	3.3	89,280.00	4,752.00	94,032.00	
Sand	cu-ft	48.00	415.3	339.7	19,934.40	16,305.60	36,240.00	
River Shingle	cu-ft	96.00	584.1	477.9	56,073.60	45,878.40	101,952.00	
Total	-	-	-	-	168,588.0	96,636.0	265,224	(Kyat / per %sq-ft)

10-1-8. Pointing Work (with 1:3 cement mortar)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Cement	lb	54.27	62.0	3.3	3,364.74	179.09	3,543.83	
Sand	cu-ft	468.00	415.3	339.7	194,360.40	158,979.60	353,340.00	
Total	-	-	-	-	198,925.1	169,958.7	368,884	(Kyat / per %sq-ft)

10-1-9. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	9.00	500.0	4,500.0	4,500.00	40,500.00	45,000.00	
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	

10-1-9. C.R Grouted Stone Masonry Work with (1:3:6) Cement Concrete (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
6"-9" Stone Boulder	cu-ft	125.00	487.2	324.8	60,900.00	40,600.00	101,500.00	
Cement	lb	432.00	62.0	3.3	26,784.00	1,425.60	28,209.60	
Sand	cu-ft	14.00	415.3	339.7	5,814.20	4,755.80	10,570.00	
River Shingle	cu-ft	28.00	584.1	477.9	16,354.80	13,381.20	29,736.00	
Total	-	-	-	-	117,153.0	125,862.6	243,016	(Kyat / per %sq-ft)

10-2. G.C (Gravelly Clay) Filling Inner Slope

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.00	4,725.00	5,250	(Kyat / per sud)

10-3. Brick Work in (1:3) Cement Mortar**10-3-1. Brick Work in (1:3) Cement Mortar (With Clay Brick)**

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Cement	lb	54.27	62.0	3.3	3,364.74	179.09	3,543.83	
Sand	cu-ft	468.00	415.3	339.7	194,360.40	158,979.60	353,340.00	
Total	-	-	-	-	198,925.14	169,958.69	368,884	(Kyat / per %sq-ft)

10-3-2. Brick Work in (1:3) Cement Mortar (With Cement Brick)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Cement	lb	54.27	62.0	3.3	3,364.74	179.09	3,543.83	
Sand	cu-ft	468.00	415.3	339.7	194,360.40	158,979.60	353,340.00	
Total	-	-	-	-	198,925.14	169,958.69	368,884	(Kyat / per %sq-ft)

10-4. Timber Shuttering form Work

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Jungle Wood (Scant)	cu-ft	1.50	2,063.6	8,254.4	3,095.40	12,381.60	15,477.00	
Jungle Wood (Plank)	cu-ft	0.92	2,063.6	8,254.4	1,898.51	7,594.05	9,492.56	
Wire	lb	3.00	700.0	300.0	2,100.00	900.00	3,000.00	
Total	-	-	-	-	9,793.9	45,175.7	54,970	(Kyat / per %sq-ft)

11. Repairing & Reconstruction of Canal Structures

11-1. Re-Construction of Structures

11-1-1. Drop

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	250.00	500.0	4,500.0	125,000.00	1,125,000.00	1,250,000.00	
Carpenter	day	20.00	500.0	4,500.0	10,000.00	90,000.00	100,000.00	
Labor	day	350.00	350.0	3,150.0	122,500.00	1,102,500.00	1,225,000.00	
(2) Materials Used								
Cement	lb	39,200.00	62.0	3.3	2,430,400.00	129,360.00	2,559,760.00	
Sand	cu-ft	1,500.00	415.3	339.7	622,950.00	509,550.00	1,132,500.00	
River Shingle	cu-ft	1,000.00	584.1	477.9	584,100.00	477,900.00	1,062,000.00	
Brick (Cement)	No.	21,400.00	93.2	62.2	1,994,480.00	1,331,080.00	3,325,560.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	5,889,430.0	4,865,390.0	10,754,820	(Kyat / per unit)

11-1-2. Head Regulator

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	90.00	500.0	4,500.0	45,000.00	405,000.00	450,000.00	
Carpenter	day	75.00	500.0	4,500.0	37,500.00	337,500.00	375,000.00	
Labor	day	825.00	350.0	3,150.0	288,750.00	2,598,750.00	2,887,500.00	
(2) Materials Used								
Cement	lb	58,800.00	62.0	3.3	3,645,600.00	194,040.00	3,839,640.00	
Sand	cu-ft	2,250.00	415.3	339.7	934,425.00	764,325.00	1,698,750.00	
River Shingle	cu-ft	1,500.00	584.1	477.9	876,150.00	716,850.00	1,593,000.00	
Brick (Cement)	No.	32,100.00	93.2	62.2	2,991,720.00	1,996,620.00	4,988,340.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	8,819,145.0	7,113,085.0	15,932,230	(Kyat / per unit)

11-1-3. Drain Box Culvert

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	180.00	500.0	4,500.0	90,000.00	810,000.00	900,000.00	
Carpenter	day	450.00	500.0	4,500.0	225,000.00	2,025,000.00	2,250,000.00	
Labor	day	650.00	350.0	3,150.0	227,500.00	2,047,500.00	2,275,000.00	
(2) Materials Used								
Cement	lb	117088.40	62.0	3.3	7,259,480.80	386,391.72	7,645,872.52	
Sand	cu-ft	4184.40	415.3	339.7	1,737,781.32	1,421,440.68	3,159,222.00	
River Shingle	cu-ft	3355.00	584.1	477.9	1,959,655.50	1,603,354.50	3,563,010.00	
Brick (Cement)	No.	64583.20	93.2	62.2	6,019,154.24	4,017,075.04	10,036,229.28	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	17,518,571.9	12,410,761.9	29,929,334	(Kyat / per unit)

11-1-4. Road Crossing and Bridge

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	150.00	500.0	4,500.0	75,000.00	675,000.00	750,000.00	
Labor	day	450.00	350.0	3,150.0	157,500.00	1,417,500.00	1,575,000.00	
(2) Materials Used								
Cement	lb	51004.80	62.0	3.3	3,162,297.60	168,315.84	3,330,613.44	
Sand	cu-ft	2676.60	415.3	339.7	1,111,591.98	909,241.02	2,020,833.00	
River Shingle	cu-ft	1760.40	584.1	477.9	1,028,249.64	841,295.16	1,869,544.80	
Brick (Cement)	No.	35148.60	93.2	62.2	3,275,849.52	2,186,242.92	5,462,092.44	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	8,810,488.7	6,297,594.9	15,108,084	(Kyat / per unit)

11-1-5. Syphon

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	30.00	500.0	4,500.0	15,000.00	135,000.00	150,000.00	
Carpenter	day	70.00	500.0	4,500.0	35,000.00	315,000.00	350,000.00	
Labor	day	500.00	350.0	3,150.0	175,000.00	1,575,000.00	1,750,000.00	
(2) Materials Used								
Cement	lb	50700.00	62.0	3.3	3,143,400.00	167,310.00	3,310,710.00	
Sand	cu-ft	2310.00	415.3	339.7	959,343.00	784,707.00	1,744,050.00	
River Shingle	cu-ft	3000.00	584.1	477.9	1,752,300.00	1,433,700.00	3,186,000.00	
Brick (Cement)	No.	5250.00	93.2	62.2	489,300.00	326,550.00	815,850.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	6,569,343.0	5,237,267.0	11,806,610	(Kyat / per unit)

11-1-6. Turn Out

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	30.00	500.0	4,500.0	15,000.00	135,000.00	150,000.00	
Carpenter	day	50.00	500.0	4,500.0	25,000.00	225,000.00	250,000.00	
Labor	day	450.00	350.0	3,150.0	157,500.00	1,417,500.00	1,575,000.00	
(2) Materials Used								
Cement	lb	33800.00	62.0	3.3	2,095,600.00	111,540.00	2,207,140.00	
Sand	cu-ft	1500.00	415.3	339.7	622,950.00	509,550.00	1,132,500.00	
River Shingle	cu-ft	2000.00	584.1	477.9	1,168,200.00	955,800.00	2,124,000.00	
Brick (Cement)	No.	3500.00	93.2	62.2	326,200.00	217,700.00	543,900.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	4,410,450.0	4,072,090.0	8,482,540	(Kyat / per unit)

11-2. Repairing of Structures

11-2-1. Drop (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	25.00	500.0	4,500.0	12,500.00	112,500.00	125,000.00	
Labor	day	60.00	350.0	3,150.0	21,000.00	189,000.00	210,000.00	

11-2-1. Drop (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Materials Used								
Cement	lb	25,446.40	62.0	3.3	1,577,676.80	83,973.12	1,661,649.92	
Sand	sud	16.24	41,525.0	33,975.0	674,366.00	551,754.00	1,226,120.00	
River Shingle	sud	11.92	58,410.0	47,790.0	696,247.20	569,656.80	1,265,904.00	
Brick (Cement)	No.	9,436.00	93.2	62.2	879,435.20	586,919.20	1,466,354.40	
Miscellaneous Works	L.S				0.00	300,000.00	300,000.00	
Total	-	-	-	-	3,861,225.2	2,393,803.1	6,255,028	(Kyat / per unit)

11-2-2. Head Regulator

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	20.00	500.0	4,500.0	10,000.00	90,000.00	100,000.00	
Labor	day	45.00	350.0	3,150.0	15,750.00	141,750.00	157,500.00	
(2) Materials Used								
Cement	lb	25,200.00	62.0	3.3	1,562,400.00	83,160.00	1,645,560.00	
Sand	sud	15.00	41,525.0	33,975.0	622,875.00	509,625.00	1,132,500.00	
River Shingle	sud	22.52	58,410.0	47,790.0	1,315,393.20	1,076,230.80	2,391,624.00	
Brick (Cement)	No.	1,124.00	93.2	62.2	104,756.80	69,912.80	174,669.60	
Miscellaneous Works	L.S				0.00	1,000,000.00	1,000,000.00	
Total	-	-	-	-	3,631,175.0	2,970,678.6	6,601,854	(Kyat / per unit)

11-2-3. Drain Box Culvert

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	50.00	500.0	4,500.0	25,000.00	225,000.00	250,000.00	
Labor	day	120.00	350.0	3,150.0	42,000.00	378,000.00	420,000.00	
(2) Materials Used								
Cement	lb	34,618.00	62.0	3.3	2,146,316.00	114,239.40	2,260,555.40	
Sand	sud	20.00	41,525.0	33,975.0	830,500.00	679,500.00	1,510,000.00	
River Shingle	sud	30.00	58,410.0	47,790.0	1,752,300.00	1,433,700.00	3,186,000.00	
Brick (Cement)	No.	15,000.00	93.2	62.2	1,398,000.00	933,000.00	2,331,000.00	
Miscellaneous Works	L.S				0.00	500,000.00	500,000.00	
Total	-	-	-	-	6,194,116.0	4,263,439.4	10,457,555	(Kyat / per unit)

11-2-4. Road Crossing and Bridge

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	40.00	500.0	4,500.0	20,000.00	180,000.00	200,000.00	
Labor	day	73.00	350.0	3,150.0	25,550.00	229,950.00	255,500.00	
(2) Materials Used								
Cement	lb	13,440.00	62.0	3.3	833,280.00	44,352.00	877,632.00	
Sand	sud	8.00	41,525.0	33,975.0	332,200.00	271,800.00	604,000.00	
River Shingle	sud	12.00	58,410.0	47,790.0	700,920.00	573,480.00	1,274,400.00	
Brick (Cement)	No.	6,000.00	93.2	62.2	559,200.00	373,200.00	932,400.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	2,471,150.0	1,772,782.0	4,243,932	(Kyat / per unit)

11-2-5. Syphon

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	35.00	500.0	4,500.0	17,500.00	157,500.00	175,000.00	
Carpenter	day	70.00	500.0	4,500.0	35,000.00	315,000.00	350,000.00	
Labor	day	500.00	350.0	3,150.0	175,000.00	1,575,000.00	1,750,000.00	
(2) Materials Used								
Cement	lb	50736.00	62.0	3.3	3,145,632.00	167,428.80	3,313,060.80	
Sand	cu-ft	2316.00	415.3	339.7	961,834.80	786,745.20	1,748,580.00	
River Shingle	cu-ft	2994.00	584.1	477.9	1,748,795.40	1,430,832.60	3,179,628.00	
Brick (Cement)	No.	5250.00	93.2	62.2	489,300.00	326,550.00	815,850.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	6,573,062.2	4,859,056.6	11,432,119	(Kyat / per unit)

11-2-6. Turn Out

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	30.00	500.0	4,500.0	15,000.00	135,000.00	150,000.00	
Carpenter	day	70.00	500.0	4,500.0	35,000.00	315,000.00	350,000.00	
Labor	day	500.00	350.0	3,150.0	175,000.00	1,575,000.00	1,750,000.00	
(2) Materials Used								
Cement	lb	50736.00	62.0	3.3	3,145,632.00	167,428.80	3,313,060.80	
Sand	cu-ft	2316.00	415.3	339.7	961,834.80	786,745.20	1,748,580.00	
River Shingle	cu-ft	2994.00	584.1	477.9	1,748,795.40	1,430,832.60	3,179,628.00	
Brick (Cement)	No.	5250.00	93.2	62.2	489,300.00	326,550.00	815,850.00	
Miscellaneous Works	L.S				0.00	100,000.00	100,000.00	
Total	-	-	-	-	6,570,562.2	4,836,556.6	11,407,119	(Kyat / per unit)

11-3. Repairing of Canal Gate Leaf, Frame & Gear Assembly

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Smith	day	2.00	500.0	4,500.0	1,000.00	9,000.00	10,000.00	
Labor	day	4.00	350.0	3,150.0	1,400.00	12,600.00	14,000.00	
(2) Materials Used								
Steel Gate	No.	1.00	135,000.0	15,000.0	135,000.00	15,000.00	150,000.00	
Steel Rod (10mm)	lb	20.00	66.1	3.5	1,322.00	70.00	1,392.00	
Binding Wire	lb	4.00	1,050.0	450.0	4,200.00	1,800.00	6,000.00	
Miscellaneous Works	L.S				0.00	50,000.00	50,000.00	
Total	-	-	-	-	142,922.0	88,470.0	231,392	(Kyat / per item)

12. Road Work

12-1. G.C (Gravelly Clay) Laying Work

12-1-1. G.C Laying and Spreading Work for DY Canal Inspection Path

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(laying, dressing, spreading & compacting)								
(2) Materials Used								
Gravelly Clay (G.C)	cu-ft	110.00	344.4	229.6	37,884.00	25,256.00	63,140.00	
Total	-	-	-	-	38,409.0	29,981.0	68,390	(Kyat / per sud)

12-1-2. G.C Laying and Spreading Work for DY Canal Non Inspection Path

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
(laying, dressing, spreading & compacting)								
(2) Materials Used								
Gravelly Clay (G.C)	cu-ft	110.00	344.4	229.6	37,884.00	25,256.00	63,140.00	
Total	-	-	-	-	38,409.0	29,981.0	68,390	(Kyat / per sud)

12-2. Concrete Paving Work

12-2-1. Mixing only Cement Concrete (1:2:4) with (0.5" to 0.75") Gauge Stone Chippings on River Shingle

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
(2) Materials Used								
Cement	lb	2,070.00	62.0	3.3	128,340.00	6,831.00	135,171.00	
River Shingle	cu-ft	92.00	584.1	477.9	53,737.20	43,966.80	97,704.00	
Sand	cu-ft	46.00	415.3	339.7	19,103.80	15,626.20	34,730.00	
Total	-	-	-	-	205,181.0	102,424.0	307,605	(Kyat / per sud)

12-2-2. Transport, Placing and Consolidation of Cement Concrete (Reinforced, by Hand)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Mason	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
Total	-	-	-	-	1,550.0	13,950.0	15,500	(Kyat / per sud)

12-2-3. Timber Shuttering Formworks

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Jungle Wood (Scant)	cu-ft	1.50	2,063.6	8,254.4	3,095.40	12,381.60	15,477.00	
Jungle Wood (Plank)	cu-ft	0.92	2,063.6	8,254.4	1,898.51	7,594.05	9,492.56	
Wire Nail	lb	3.00	700.0	300.0	2,100.00	900.00	3,000.00	
Total	-	-	-	-	9,793.9	45,175.7	54,970	(Kyat / per %sq-ft)

12-2-4. Reinforcing Bar Preparation and Assembly

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
Steel Fixer	day	1.00	500.0	4,500.0	500.00	4,500.00	5,000.00	
(2) Materials Used								
Steel Rod (10mm)	lb	117.60	66.1	3.5	7,773.36	411.60	8,184.96	
Binding Wire	lb	1.00	1,050.0	450.0	1,050.00	450.00	1,500.00	
Total	-	-	-	-	9,673.4	8,511.6	18,185	(Kyat / per CWT)

13. Repairing and Construction of Permanent Buildings

13-1. Repairing and Construction of Building (Bin Thar Quarter, Office, etc.)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Carpenter	day	20.00	500.0	4,500.0	10,000.00	90,000.00	100,000.00	
Labor	day	30.00	350.0	3,150.0	10,500.00	94,500.00	105,000.00	
(2) Materials Used								
Repairing and Construction of Building	Set	1.00	4,000,000.0	6,000,000.0	4,000,000.00	6,000,000.00	10,000,000.00	
Miscellaneous Works	L.S				0.00	2,850,000.00	2,850,000.00	
Total	-	-	-	-	4,020,500.0	9,034,500.0	13,055,000	(Kyat / per item)

14. Other Related Works

14-1. Repairing of Motor Vehicles, Water Pumps and Generators

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Operator (Machine Driver)	day	4.00	500.0	4,500.0	2,000.00	18,000.00	20,000.00	
Labor	day	10.00	350.0	3,150.0	3,500.00	31,500.00	35,000.00	
Total	-	-	-	-	5,500.0	49,500.0	55,000	(Kyat / per item)

14-2. Earth Work for Drainage Canal

14-2-1. Earth Work for Drainage Canal (by Manual)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.50	350.0	3,150.0	525.00	4,725.00	5,250.00	
Total	-	-	-	-	525.0	4,725.0	5,250	(Kyat / per sud)

14-2-2. Earth Work for Drainage Canal (by Department Machine)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Hydraulic Excavator	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.2600	3,800.0	200.0	988.00	52.00	1,040.00	
Lubricant	gal	0.0052	14,250.0	750.0	74.10	3.90	78.00	
Grease	lb	0.0013	4,275.0	225.0	5.56	0.29	5.85	
Total	-	-	-	-	1,067.7	56.2	1,124	(Kyat / per sud)

14-3. Management of Construction Materials and Equipment

14-3-1. Shifting of Materials from Temporary Stock-pile to Work Site

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							
(2) Labor								
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.26	3,800.0	200.0	988.00	52.00	1,040.00	
Engine Oil	gal	0.0052	17,100.0	900.0	88.92	4.68	93.60	
Lubricant	gal	0.0013	14,250.0	750.0	18.53	0.98	19.51	
Total	-	-	-	-	2,145.5	9,507.7	11,653	(Kyat / per item)

14-3-2. Transporting of Materials from Quarry to Stock-pile (1/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							

14-3-2. Transporting of Materials from Quarry to Stock-pile (2/2)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(2) Labor								
Labor	day	3.00	350.0	3,150.0	1,050.00	9,450.00	10,500.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.36	3,800.0	200.0	1,368.00	72.00	1,440.00	
Engine Oil	gal	0.0072	17,100.0	900.0	123.12	6.48	129.60	
Lubricant	gal	0.0018	14,250.0	750.0	25.65	1.35	27.00	
Total	-	-	-	-	2,566.8	9,529.8	12,097	(Kyat / per item)

14-3-3. Transporting and Shifting of Heavy Machines

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Truck	Irrigation Department							
(2) Labor								
Operator (Machine Driver)	day	10.00	500.0	4,500.0	5,000.00	45,000.00	50,000.00	
(3) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	0.36	3,800.0	200.0	1,368.00	72.00	1,440.00	
Engine Oil	gal	0.0072	17,100.0	900.0	123.12	6.48	129.60	
Lubricant	gal	0.0018	14,250.0	750.0	25.65	1.35	27.00	
Total	-	-	-	-	6,516.8	45,079.8	51,597	(Kyat / per item)

14-3-4. Loading and Unloading Charges of Materials

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	8.00	350.0	3,150.0	2,800.00	25,200.00	28,000.00	
Total	-	-	-	-	2,800.0	25,200.0	28,000	(Kyat / per item)

14-4. Dewatering Works

14-4-1. Water Pump for Dewatering Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Water Pump	Irrigation Department							
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	10.00	3,800.0	200.0	38,000.00	2,000.00	40,000.00	
Total	-	-	-	-	38,000.0	2,000.0	40,000	(Kyat / per gal)

14-5. Welfare Charges for Labor

14-5-1. Hnee Thatch

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.002	350.0	3,150.0	0.70	6.30	7.00	
(2) Materials Used								
Hnee Thatch	item	0.002	10,000.0	200,000.0	20.00	400.00	420.00	
Total	-	-	-	-	20.7	406.3	427	(Kyat / per item)

14-5-2. Bamboo

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	0.004	350.0	3,150.0	1.40	12.60	14.00	
(2) Materials Used								
Bamboo	item	0.005	5,000.0	100,000.0	25.00	500.00	525.00	
Total	-	-	-	-	26.4	512.6	539	(Kyat / per item)

14-6. Labor Charges for Day & Night Watchman, Helper, Checker and General Works

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Labor	day	1.00	350.0	3,150.0	350.00	3,150.00	3,500.00	
Total	-	-	-	-	350.0	3,150.0	3,500	(Kyat / per M/D)

14-7. Camps Facilities (Lighting, Water Supply, etc.)

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Machine								
Water Pump	Irrigation Department							1 gal/bowser
Water Bowser	Irrigation Department							3 gal/trip
Diesel Generator	Irrigation Department							1 gal/hr
(2) P.O.L. (Procurement of Lubricant) for Operation								
Diesel (H.S.D.)	gal	1.00	3,800.0	200.0	3,800.00	200.00	4,000.00	4 hr/day
(Water Pump)								
Diesel (H.S.D.)	gal	3.00	3,800.0	200.0	11,400.00	600.00	12,000.00	1 trip/day
(Water Bowser)								
Diesel (H.S.D.)	gal	4.00	3,800.0	200.0	15,200.00	800.00	16,000.00	1 bowser/day
(Generator)								
Total	-	-	-	-	30,400.0	1,600.0	32,000	(Kyat / per gal)

14-8. Making Data Boards and Sign Boards

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Labor								
Painter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Carpenter	day	3.00	500.0	4,500.0	1,500.00	13,500.00	15,000.00	
Labor	day	2.00	350.0	3,150.0	700.00	6,300.00	7,000.00	
(2) Materials Used								
Ply Wood (8'x4')	No.	1.00	2,400.0	9,600.0	2,400.00	9,600.00	12,000.00	
Paint	gal	2.50	10,000.0	10,000.0	25,000.00	25,000.00	50,000.00	
Painting charges	L.S	1.00	1,500.0	13,500.0	1,500.00	13,500.00	15,000.00	
Beading 1"x½"	cu-ft	0.30	5,207.5	5,207.5	1,562.25	1,562.25	3,124.50	
Total	-	-	-	-	34,162.3	82,962.3	117,125	(Kyat / per item)

14-9. Estimating, Copying, Photo Recording and Stationary Charges, etc;

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
(1) Materials Used								
Paper	Page	500.00	3.0	7.0	1,500.00	3,500.00	5,000.00	
(2) Service Charges								
Typing & Printing charges	Page	90.00	25.0	225.0	2,250.00	20,250.00	22,500.00	
Photo & Printing charges	Page	50.00	50.0	450.0	2,500.00	22,500.00	25,000.00	
Copying charges	Page	360.00	2.5	22.5	900.00	8,100.00	9,000.00	
Binding charges	No.	5.00	100.0	900.0	500.00	4,500.00	5,000.00	
Total	-	-	-	-	7,650.0	58,850.0	66,500	(Kyat / per item)

14-10. Miscellaneous

Name	Unit	Quantity	Unit Cost (Kyats)		Estimate Cost (Kyats)			Remarks
			FC	LC	FC	LC	Total	
Miscellaneous	item	1.00	5,000.0	100,000.0	5,000.00	100,000.00	105,000.00	
Total	-	-	-	-	5,000.0	100,000.0	105,000	(Kyat / per item)

CHAPTER 4 UNIT PRICE

CHAPTER 4 Unit Price

4.1 Unit Price (North Nawin Irrigation System)

No.	Particulars	Unit	Unit Price (Kyats)			Ratio	
			FC _{※1}	LC _{※2}	Total	FC _{※1}	LC _{※2}
1. Material							
1-1	Cement	lb	54.2	2.8	57.0	95%	5%
1-2	Steel Rod (10mm)	CWT	8,244.0	433.9	8,677.9	95%	5%
1-3	Steel Rod (10mm)	lb	73.6	3.9	77.5	95%	5%
1-4	Steel Rod (12mm)	CWT	8,244.0	433.9	8,677.9	95%	5%
1-5	Steel Rod (12mm)	lb	73.6	3.9	77.5	95%	5%
1-6	Steel Rod (16mm)	CWT	8,244.0	433.9	8,677.9	95%	5%
1-7	Steel Rod (16mm)	lb	73.6	3.9	77.5	95%	5%
1-8	Steel Rod (20mm)	CWT	8,244.0	433.9	8,677.9	95%	5%
1-9	Steel Rod (20mm)	lb	73.6	3.9	77.5	95%	5%
1-10	Diesel (H.S.D.)	gal	3,800.0	200.0	4,000.0	95%	5%
1-11	Engine Oil	gal	17,100.0	900.0	18,000.0	95%	5%
1-12	Gear Oil	gal	17,100.0	900.0	18,000.0	95%	5%
1-13	Hydraulic Oil	gal	9,500.0	500.0	10,000.0	95%	5%
1-14	Lubricant	gal	14,250.0	750.0	15,000.0	95%	5%
1-15	Grease	lb	4,275.0	225.0	4,500.0	95%	5%
1-16	Brick (Clay)	No.	63.6	77.8	141.4	45%	55%
1-17	Brick (Cement)	No.	93.8	62.6	156.4	60%	40%
1-18	River Shingle	sud	54,301.5	44,428.5	98,730.0	55%	45%
1-19	River Shingle	cu-ft	543.0	444.3	987.3	55%	45%
1-20	Sand	sud	25,712.5	21,037.5	46,750.0	55%	45%
1-21	Sand	cu-ft	257.1	210.4	467.5	55%	45%
1-22	Gravelly Clay (G.C)	cu-ft	285.4	190.3	475.7	60%	40%
1-23	6"-9" Stone Boulder	cu-ft	487.2	324.8	812.0	60%	40%
1-24	Bamboo	No.	50.0	450.0	500.0	10%	90%
1-25	Lime (Strained Lime)	cu-ft	350.0	3,150.0	3,500.0	10%	90%
1-26	Plastic ream	No.	90.0	810.0	900.0	10%	90%
1-27	4"~6"φMyaw (J/Wood)	No.	1,200.0	4,800.0	6,000.0	20%	80%
1-28	2"~4"φMyaw (J/Wood)	No.	400.0	1,600.0	2,000.0	20%	80%
1-29	Jungle Wood (Plank)	cu-ft	2,083.0	8,331.8	10,414.8	20%	80%
1-30	Jungle Wood (Scant)	cu-ft	2,083.0	8,331.8	10,414.8	20%	80%
1-31	Jungle Wood	ton	110,000.0	440,000.0	550,000.0	20%	80%
1-32	Hard Wood	ton	164,148.4	656,593.6	820,742.0	20%	80%
1-33	Ply Wood (8'x4')	No.	3,000.0	12,000.0	15,000.0	20%	80%
1-34	Timber (Plank)	cu-ft	2,083.0	8,332.0	10,415.0	20%	80%
1-35	Timber (Scant)	cu-ft	2,083.0	8,332.0	10,415.0	20%	80%
1-36	Wire Nail	viss	2,450.0	1,050.0	3,500.0	70%	30%
1-37	Wire Nail	lb	680.5	291.7	972.2	70%	30%
1-38	Wire	lb	680.5	291.7	972.2	70%	30%

No.	Particulars	Unit	Unit Price (Kyats)			Ratio	
			FC _{※1}	LC _{※2}	Total	FC _{※1}	LC _{※2}
1-39	Binding Wire	lb	1,050.0	450.0	1,500.0	70%	30%
1-40	Hnee Thatch	No.	50.0	450.0	500.0	10%	90%
1-41	Roll Mat (12'x3')	No.	180.0	1,620.0	1,800.0	10%	90%
1-42	Bamboo Mat	sq-ft	20.0	180.0	200.0	10%	90%
1-43	Penan Bag	No.	30.0	270.0	300.0	10%	90%
1-44	Site Cleaning Work for Barrack (4 units)	set	3,000.0	27,000.0	30,000.0	10%	90%
1-45	Site Cleaning Work for Latrines	set	600.0	5,400.0	6,000.0	10%	90%
1-46	Digging for Post Hole (Barrack etc.)	No.	30.0	270.0	300.0	10%	90%
1-47	Digging for Pit Hole (Latrines)	No.	1,200.0	10,800.0	12,000.0	10%	90%
1-48	Tower Bolt	No.	840.0	360.0	1,200.0	70%	30%
1-49	Screw	gross	1,400.0	600.0	2,000.0	70%	30%
1-50	Butt Hinge	No.	700.0	300.0	1,000.0	70%	30%
1-51	Hasp & Staple	No.	350.0	150.0	500.0	70%	30%
1-52	Handle	No.	700.0	300.0	1,000.0	70%	30%
1-53	Lock & Key	No.	1,400.0	600.0	2,000.0	70%	30%
1-54	Purchasing & Fixing of W.C. Pan	No.	5,600.0	2,400.0	8,000.0	70%	30%
1-55	Wagut (5'x2'6")	No.	240.0	960.0	1,200.0	20%	80%
1-56	Dynamite	gram	0.9	3.5	4.4	20%	80%
1-57	Detonator	Pcs	35.2	140.8	176.0	20%	80%
1-58	Paint	gal	10,000.0	10,000.0	20,000.0	50%	50%
1-59	Painting charges	L.S	1,500.0	13,500.0	15,000.0	10%	90%
1-60	Beading 1"x½"	cu-ft	5,207.5	5,207.5	10,415.0	50%	50%
1-61	Paper	Page	3.0	7.0	10.0	30%	70%
2. Labor							
2-1	Carpenter	day	500.0	4,500.0	5,000.0	10%	90%
2-2	Mason	day	500.0	4,500.0	5,000.0	10%	90%
2-3	Labor	day	350.0	3,150.0	3,500.0	10%	90%
2-4	Painter	day	500.0	4,500.0	5,000.0	10%	90%
2-5	Operator (Machine Driver)	day	400.0	3,600.0	4,000.0	10%	90%
2-6	Operator	day	400.0	3,600.0	4,000.0	10%	90%
2-7	Smith	day	500.0	4,500.0	5,000.0	10%	90%
2-8	Steel Fixer	day	500.0	4,500.0	5,000.0	10%	90%
2-9	Typing & Printing charges	Page	25.0	225.0	250.0	10%	90%
2-10	Photo & Printing charges	Page	50.0	450.0	500.0	10%	90%
2-11	Copying charges	Page	2.5	22.5	25.0	10%	90%
2-12	Binding charges	No.	100.0	900.0	1,000.0	10%	90%

※1 FC : Foreign Currency Portion

※2 LC : Local Currency Portion

4.2 Unit Price (South Nawin Irrigation System)

No.	Particulars	Unit	Unit Price (Kyats)			Ratio	
			FC _{※1}	LC _{※2}	Total	FC _{※1}	LC _{※2}
1. Material							
1-1	Cement	lb	52.3	2.7	55.0	95%	5%
1-2	Steel Rod (10mm)	CWT	8,244.0	433.9	8,677.9	95%	5%
1-3	Steel Rod (10mm)	lb	73.6	3.9	77.5	95%	5%
1-4	Steel Rod (12mm)	CWT	8,244.0	433.9	8,677.9	95%	5%
1-5	Steel Rod (12mm)	lb	73.6	3.9	77.5	95%	5%
1-6	Steel Rod (16mm)	CWT	8,244.0	433.9	8,677.9	95%	5%
1-7	Steel Rod (16mm)	lb	73.6	3.9	77.5	95%	5%
1-8	Steel Rod (20mm)	CWT	8,244.0	433.9	8,677.9	95%	5%
1-9	Steel Rod (20mm)	lb	73.6	3.9	77.5	95%	5%
1-10	Diesel (H.S.D.)	gal	3,800.0	200.0	4,000.0	95%	5%
1-11	Engine Oil	gal	17,100.0	900.0	18,000.0	95%	5%
1-12	Gear Oil	gal	17,100.0	900.0	18,000.0	95%	5%
1-13	Hydraulic Oil	gal	9,500.0	500.0	10,000.0	95%	5%
1-14	Lubricant	gal	14,250.0	750.0	15,000.0	95%	5%
1-15	Grease	lb	4,275.0	225.0	4,500.0	95%	5%
1-16	Brick (Clay)	No.	63.6	77.8	141.4	45%	55%
1-17	Brick (Cement)	No.	93.8	62.6	156.4	60%	40%
1-18	River Shingle	sud	54,301.5	44,428.5	98,730.0	55%	45%
1-19	River Shingle	cu-ft	543.0	444.3	987.3	55%	45%
1-20	Sand	sud	25,712.5	21,037.5	46,750.0	55%	45%
1-21	Sand	cu-ft	257.1	210.4	467.5	55%	45%
1-22	Gravelly Clay (G.C)	cu-ft	285.4	190.3	475.7	60%	40%
1-23	6"-9" Stone Boulder	cu-ft	762.0	508.0	1,270.0	60%	40%
1-24	Bamboo	No.	50.0	450.0	500.0	10%	90%
1-25	Lime (Strained Lime)	cu-ft	350.0	3,150.0	3,500.0	10%	90%
1-26	Plastic ream	No.	90.0	810.0	900.0	10%	90%
1-27	4"~6"φMyaw (J/Wood)	No.	1,200.0	4,800.0	6,000.0	20%	80%
1-28	2"~4"φMyaw (J/Wood)	No.	400.0	1,600.0	2,000.0	20%	80%
1-29	Jungle Wood (Plank)	cu-ft	2,083.0	8,331.8	10,414.8	20%	80%
1-30	Jungle Wood (Scant)	cu-ft	2,083.0	8,331.8	10,414.8	20%	80%
1-31	Jungle Wood	ton	110,000.0	440,000.0	550,000.0	20%	80%
1-32	Hard Wood	ton	164,148.4	656,593.6	820,742.0	20%	80%
1-33	Ply Wood (8'x4')	No.	3,000.0	12,000.0	15,000.0	20%	80%
1-34	Timber (Plank)	cu-ft	2,083.0	8,332.0	10,415.0	20%	80%
1-35	Timber (Scant)	cu-ft	2,083.0	8,332.0	10,415.0	20%	80%
1-36	Wire Nail	viss	2,450.0	1,050.0	3,500.0	70%	30%
1-37	Wire Nail	lb	680.5	291.7	972.2	70%	30%
1-38	Wire	lb	680.5	291.7	972.2	70%	30%

No.	Particulars	Unit	Unit Price (Kyats)			Ratio	
			FC _{※1}	LC _{※2}	Total	FC _{※1}	LC _{※2}
1-39	Binding Wire	lb	1,050.0	450.0	1,500.0	70%	30%
1-40	Hnee Thatch	No.	50.0	450.0	500.0	10%	90%
1-41	Roll Mat (12'x3')	No.	180.0	1,620.0	1,800.0	10%	90%
1-42	Bamboo Mat	sq-ft	20.0	180.0	200.0	10%	90%
1-43	Penan Bag	No.	30.0	270.0	300.0	10%	90%
1-44	Site Cleaning Work for Barrack (4 units)	set	3,000.0	27,000.0	30,000.0	10%	90%
1-45	Site Cleaning Work for Latrines	set	600.0	5,400.0	6,000.0	10%	90%
1-46	Digging for Post Hole (Barrack etc.)	No.	30.0	270.0	300.0	10%	90%
1-47	Digging for Pit Hole (Latrines)	No.	1,200.0	10,800.0	12,000.0	10%	90%
1-48	Tower Bolt	No.	840.0	360.0	1,200.0	70%	30%
1-49	Screw	gross	1,400.0	600.0	2,000.0	70%	30%
1-50	Butt Hinge	No.	700.0	300.0	1,000.0	70%	30%
1-51	Hasp & Staple	No.	350.0	150.0	500.0	70%	30%
1-52	Handle	No.	700.0	300.0	1,000.0	70%	30%
1-53	Lock & Key	No.	1,400.0	600.0	2,000.0	70%	30%
1-54	Purchasing & Fixing of W.C. Pan	No.	5,600.0	2,400.0	8,000.0	70%	30%
1-55	Wagut (5'x2'6")	No.	240.0	960.0	1,200.0	20%	80%
1-56	Dynamite	gram	0.9	3.5	4.4	20%	80%
1-57	Detonator	Pcs	35.2	140.8	176.0	20%	80%
1-58	Paint	gal	10,000.0	10,000.0	20,000.0	50%	50%
1-59	Painting charges	L.S	1,500.0	13,500.0	15,000.0	10%	90%
1-60	Beading 1"x½"	cu-ft	5,207.5	5,207.5	10,415.0	50%	50%
1-61	Paper	Page	3.0	7.0	10.0	30%	70%
2. Labor							
2-1	Carpenter	day	500.0	4,500.0	5,000.0	10%	90%
2-2	Mason	day	500.0	4,500.0	5,000.0	10%	90%
2-3	Labor	day	350.0	3,150.0	3,500.0	10%	90%
2-4	Painter	day	500.0	4,500.0	5,000.0	10%	90%
2-5	Operator (Machine Driver)	day	400.0	3,600.0	4,000.0	10%	90%
2-6	Operator	day	400.0	3,600.0	4,000.0	10%	90%
2-7	Smith	day	500.0	4,500.0	5,000.0	10%	90%
2-8	Steel Fixer	day	500.0	4,500.0	5,000.0	10%	90%
2-9	Typing & Printing charges	Page	25.0	225.0	250.0	10%	90%
2-10	Photo & Printing charges	Page	50.0	450.0	500.0	10%	90%
2-11	Copying charges	Page	2.5	22.5	25.0	10%	90%
2-12	Binding charges	No.	100.0	900.0	1,000.0	10%	90%

※1 FC : Foreign Currency Portion

※2 LC : Local Currency Portion

4.3 Unit Price (Wegyi Irrigation System)

No.	Particulars	Unit	Unit Price (Kyats)			Ratio	
			FC _{※1}	LC _{※2}	Total	FC _{※1}	LC _{※2}
1. Material							
1-1	Cement	lb	56.0	2.9	58.9	95%	5%
1-2	Steel Rod (10mm)	CWT	8,455.2	445.0	8,900.2	95%	5%
1-3	Steel Rod (10mm)	lb	75.5	4.0	79.5	95%	5%
1-4	Steel Rod (12mm)	CWT	8,455.2	445.0	8,900.2	95%	5%
1-5	Steel Rod (12mm)	lb	75.5	4.0	79.5	95%	5%
1-6	Steel Rod (16mm)	CWT	8,455.2	445.0	8,900.2	95%	5%
1-7	Steel Rod (16mm)	lb	75.5	4.0	79.5	95%	5%
1-8	Steel Rod (20mm)	CWT	8,455.2	445.0	8,900.2	95%	5%
1-9	Steel Rod (20mm)	lb	75.5	4.0	79.5	95%	5%
1-10	Diesel (H.S.D.)	gal	3,800.0	200.0	4,000.0	95%	5%
1-11	Engine Oil	gal	17,100.0	900.0	18,000.0	95%	5%
1-12	Gear Oil	gal	17,100.0	900.0	18,000.0	95%	5%
1-13	Hydraulic Oil	gal	9,500.0	500.0	10,000.0	95%	5%
1-14	Lubricant	gal	14,250.0	750.0	15,000.0	95%	5%
1-15	Grease	lb	4,275.0	225.0	4,500.0	95%	5%
1-16	Brick (Clay)	No.	65.2	79.7	144.9	45%	55%
1-17	Brick (Cement)	No.	93.8	62.6	156.4	60%	40%
1-18	River Shingle	sud	59,306.5	48,523.5	107,830.0	55%	45%
1-19	River Shingle	cu-ft	593.1	485.2	1,078.3	55%	45%
1-20	Sand	sud	31,817.5	26,032.5	57,850.0	55%	45%
1-21	Sand	cu-ft	318.2	260.3	578.5	55%	45%
1-22	Gravelly Clay (G.C)	cu-ft	426.4	284.3	710.7	60%	40%
1-23	6"-9" Stone Boulder	cu-ft	541.2	360.8	902.0	60%	40%
1-24	Bamboo	No.	50.0	450.0	500.0	10%	90%
1-25	Lime (Strained Lime)	cu-ft	350.0	3,150.0	3,500.0	10%	90%
1-26	Plastic ream	No.	90.0	810.0	900.0	10%	90%
1-27	4"~6"φMyaw (J/Wood)	No.	1,200.0	4,800.0	6,000.0	20%	80%
1-28	2"~4"φMyaw (J/Wood)	No.	400.0	1,600.0	2,000.0	20%	80%
1-29	Jungle Wood (Plank)	cu-ft	2,085.4	8,341.8	10,427.2	20%	80%
1-30	Jungle Wood (Scant)	cu-ft	2,085.4	8,341.8	10,427.2	20%	80%
1-31	Jungle Wood	ton	110,000.0	440,000.0	550,000.0	20%	80%
1-32	Hard Wood	ton	164,271.9	657,087.5	821,359.4	20%	80%
1-33	Ply Wood (8'x4')	No.	3,000.0	12,000.0	15,000.0	20%	80%
1-34	Timber (Plank)	cu-ft	2,083.0	8,332.0	10,415.0	20%	80%
1-35	Timber (Scant)	cu-ft	2,083.0	8,332.0	10,415.0	20%	80%
1-36	Wire Nail	viss	2,450.0	1,050.0	3,500.0	70%	30%
1-37	Wire Nail	lb	680.5	291.7	972.2	70%	30%
1-38	Wire	lb	680.5	291.7	972.2	70%	30%

No.	Particulars	Unit	Unit Price (Kyats)			Ratio	
			FC _{※1}	LC _{※2}	Total	FC _{※1}	LC _{※2}
1-39	Binding Wire	lb	1,050.0	450.0	1,500.0	70%	30%
1-40	Hnee Thatch	No.	50.0	450.0	500.0	10%	90%
1-41	Roll Mat (12'x3')	No.	180.0	1,620.0	1,800.0	10%	90%
1-42	Bamboo Mat	sq-ft	20.0	180.0	200.0	10%	90%
1-43	Penan Bag	No.	30.0	270.0	300.0	10%	90%
1-44	Site Cleaning Work for Barrack (4 units)	set	3,000.0	27,000.0	30,000.0	10%	90%
1-45	Site Cleaning Work for Latrines	set	600.0	5,400.0	6,000.0	10%	90%
1-46	Digging for Post Hole (Barrack etc.)	No.	30.0	270.0	300.0	10%	90%
1-47	Digging for Pit Hole (Latrines)	No.	1,200.0	10,800.0	12,000.0	10%	90%
1-48	Tower Bolt	No.	840.0	360.0	1,200.0	70%	30%
1-49	Screw	gross	1,400.0	600.0	2,000.0	70%	30%
1-50	Butt Hinge	No.	700.0	300.0	1,000.0	70%	30%
1-51	Hasp & Staple	No.	350.0	150.0	500.0	70%	30%
1-52	Handle	No.	700.0	300.0	1,000.0	70%	30%
1-53	Lock & Key	No.	1,400.0	600.0	2,000.0	70%	30%
1-54	Purchasing & Fixing of W.C. Pan	No.	5,600.0	2,400.0	8,000.0	70%	30%
1-55	Wagut (5'x2'6")	No.	240.0	960.0	1,200.0	20%	80%
1-56	Dynamite	gram	0.9	3.5	4.4	20%	80%
1-57	Detonator	Pcs	35.2	140.8	176.0	20%	80%
1-58	Paint	gal	10,000.0	10,000.0	20,000.0	50%	50%
1-59	Painting charges	L.S	1,500.0	13,500.0	15,000.0	10%	90%
1-60	Beading 1"x½"	cu-ft	5,207.5	5,207.5	10,415.0	50%	50%
1-61	Paper	Page	3.0	7.0	10.0	30%	70%
2. Labor							
2-1	Carpenter	day	500.0	4,500.0	5,000.0	10%	90%
2-2	Mason	day	500.0	4,500.0	5,000.0	10%	90%
2-3	Labor	day	350.0	3,150.0	3,500.0	10%	90%
2-4	Painter	day	500.0	4,500.0	5,000.0	10%	90%
2-5	Operator (Machine Driver)	day	400.0	3,600.0	4,000.0	10%	90%
2-6	Operator	day	400.0	3,600.0	4,000.0	10%	90%
2-7	Smith	day	500.0	4,500.0	5,000.0	10%	90%
2-8	Steel Fixer	day	500.0	4,500.0	5,000.0	10%	90%
2-9	Typing & Printing charges	Page	25.0	225.0	250.0	10%	90%
2-10	Photo & Printing charges	Page	50.0	450.0	500.0	10%	90%
2-11	Copying charges	Page	2.5	22.5	25.0	10%	90%
2-12	Binding charges	No.	100.0	900.0	1,000.0	10%	90%

※1 FC : Foreign Currency Portion

※2 LC : Local Currency Portion

4.4 Unit Price (Taung Nyo Irrigation System)

No.	Particulars	Unit	Unit Price (Kyats)			Ratio	
			FC _{※1}	LC _{※2}	Total	FC _{※1}	LC _{※2}
1. Material							
1-1	Cement	lb	62.0	3.3	65.3	95%	5%
1-2	Steel Rod (10mm)	CWT	7,410.0	390.0	7,800.0	95%	5%
1-3	Steel Rod (10mm)	lb	66.1	3.5	69.6	95%	5%
1-4	Steel Rod (12mm)	CWT	7,410.0	390.0	7,800.0	95%	5%
1-5	Steel Rod (12mm)	lb	66.1	3.5	69.6	95%	5%
1-6	Steel Rod (16mm)	CWT	7,410.0	390.0	7,800.0	95%	5%
1-7	Steel Rod (16mm)	lb	66.1	3.5	69.6	95%	5%
1-8	Steel Rod (20mm)	CWT	7,410.0	390.0	7,800.0	95%	5%
1-9	Steel Rod (20mm)	lb	66.1	3.5	69.6	95%	5%
1-10	Diesel (H.S.D.)	gal	3,800.0	200.0	4,000.0	95%	5%
1-11	Engine Oil	gal	17,100.0	900.0	18,000.0	95%	5%
1-12	Gear Oil	gal	17,100.0	900.0	18,000.0	95%	5%
1-13	Hydraulic Oil	gal	9,500.0	500.0	10,000.0	95%	5%
1-14	Lubricant	gal	14,250.0	750.0	15,000.0	95%	5%
1-15	Grease	lb	4,275.0	225.0	4,500.0	95%	5%
1-16	Brick (Clay)	No.	65.7	80.3	146.0	45%	55%
1-17	Brick (Cement)	No.	93.2	62.2	155.4	60%	40%
1-18	River Shingle	sud	58,410.0	47,790.0	106,200.0	55%	45%
1-19	River Shingle	cu-ft	584.1	477.9	1,062.0	55%	45%
1-20	Sand	sud	41,525.0	33,975.0	75,500.0	55%	45%
1-21	Sand	cu-ft	415.3	339.7	755.0	55%	45%
1-22	Gravelly Clay (G.C)	cu-ft	344.4	229.6	574.0	60%	40%
1-23	6"-9" Stone Boulder	cu-ft	487.2	324.8	812.0	60%	40%
1-24	Bamboo	No.	50.0	450.0	500.0	10%	90%
1-25	Lime (Strained Lime)	cu-ft	450.0	4,050.0	4,500.0	10%	90%
1-26	Plastic ream	No.	90.0	810.0	900.0	10%	90%
1-27	4"~6"φMyaw (J/Wood)	No.	1,500.0	6,000.0	7,500.0	20%	80%
1-28	2"~4"φMyaw (J/Wood)	No.	800.0	3,200.0	4,000.0	20%	80%
1-29	Jungle Wood (Plank)	cu-ft	2,063.6	8,254.4	10,318.0	20%	80%
1-30	Jungle Wood (Scant)	cu-ft	2,063.6	8,254.4	10,318.0	20%	80%
1-31	Jungle Wood	ton	100,000.0	400,000.0	500,000.0	20%	80%
1-32	Hard Wood	ton	153,180.0	612,720.0	765,900.0	20%	80%
1-33	Ply Wood (8'x4')	No.	2,400.0	9,600.0	12,000.0	20%	80%
1-34	Timber (Plank)	cu-ft	2,083.0	8,332.0	10,415.0	20%	80%
1-35	Timber (Scant)	cu-ft	2,083.0	8,332.0	10,415.0	20%	80%
1-36	Wire Nail	viss	2,520.0	1,080.0	3,600.0	70%	30%
1-37	Wire Nail	lb	700.0	300.0	1,000.0	70%	30%
1-38	Wire	lb	700.0	300.0	1,000.0	70%	30%

No.	Particulars	Unit	Unit Price (Kyats)			Ratio	
			FC _{※1}	LC _{※2}	Total	FC _{※1}	LC _{※2}
1-39	Binding Wire	lb	1,050.0	450.0	1,500.0	70%	30%
1-40	Hnee Thatch	No.	50.0	450.0	500.0	10%	90%
1-41	Roll Mat (12'x3')	No.	180.0	1,620.0	1,800.0	10%	90%
1-42	Bamboo Mat	sq-ft	20.0	180.0	200.0	10%	90%
1-43	Penan Bag	No.	30.0	270.0	300.0	10%	90%
1-44	Site Cleaning Work for Barrack (4 units)	set	3,000.0	27,000.0	30,000.0	10%	90%
1-45	Site Cleaning Work for Latrines	set	600.0	5,400.0	6,000.0	10%	90%
1-46	Digging for Post Hole (Barrack etc.)	No.	30.0	270.0	300.0	10%	90%
1-47	Digging for Pit Hole (Latrines)	No.	1,200.0	10,800.0	12,000.0	10%	90%
1-48	Tower Bolt	No.	840.0	360.0	1,200.0	70%	30%
1-49	Screw	gross	1,400.0	600.0	2,000.0	70%	30%
1-50	Butt Hinge	No.	700.0	300.0	1,000.0	70%	30%
1-51	Hasp & Staple	No.	350.0	150.0	500.0	70%	30%
1-52	Handle	No.	700.0	300.0	1,000.0	70%	30%
1-53	Lock & Key	No.	1,400.0	600.0	2,000.0	70%	30%
1-54	Purchasing & Fixing of W.C. Pan	No.	5,600.0	2,400.0	8,000.0	70%	30%
1-55	Wagut (5'x2'6")	No.	200.0	800.0	1,000.0	20%	80%
1-56	Dynamite	gram	0.9	3.5	4.4	20%	80%
1-57	Detonator	Pcs	35.2	140.8	176.0	20%	80%
1-58	Paint	gal	10,000.0	10,000.0	20,000.0	50%	50%
1-59	Painting charges	L.S	1,500.0	13,500.0	15,000.0	10%	90%
1-60	Beading 1"x½"	cu-ft	5,207.5	5,207.5	10,415.0	50%	50%
1-61	Paper	Page	3.0	7.0	10.0	30%	70%
2. Labor							
2-1	Carpenter	day	500.0	4,500.0	5,000.0	10%	90%
2-2	Mason	day	500.0	4,500.0	5,000.0	10%	90%
2-3	Labor	day	350.0	3,150.0	3,500.0	10%	90%
2-4	Painter	day	500.0	4,500.0	5,000.0	10%	90%
2-5	Operator (Machine Driver)	day	500.0	4,500.0	5,000.0	10%	90%
2-6	Painter	day	500.0	4,500.0	5,000.0	10%	90%
2-7	Smith	day	500.0	4,500.0	5,000.0	10%	90%
2-8	Steel Fixer	day	500.0	4,500.0	5,000.0	10%	90%
2-9	Typing & Printing charges	Page	25.0	225.0	250.0	10%	90%
2-10	Photo & Printing charges	Page	50.0	450.0	500.0	10%	90%
2-11	Copying charges	Page	2.5	22.5	25.0	10%	90%
2-12	Binding charges	No.	100.0	900.0	1,000.0	10%	90%

※1 FC : Foreign Currency Portion

※2 LC : Local Currency Portion