

4 スタンプ苗貯蔵庫新築工事内訳表

名 称	摘 要	数 量	単 位	単 価	金 額	備 考
水 盛 遺 形		1	式		262	
根 切 り		38.4	m ³	36	1,382	
砕 石 地 形		4.3	m ³	250	1,075	
型 枠		61.2	m ²	300	18,360	
コンクリート打		7.2	m ³	2,000	14,400	
レンガ積		34.2	m ²	300	10,260	
木 材		3.1	m ³	5,000	15,500	
工 費		1	式		17,600	
釘 ・ 金 物		1	式		500	
屋根ヤーカー葺		106.2	m ²	80	8,496	
外壁ヤーカー葺		72.5	m ²	30	2,175	
板 戸		4	本	1,300	5,200	
運 搬 費		1	式		2,856	
計					98,066	

5 スタンプ苗準備室新築工事内訳表

名 称	摘 要	数 量	単 位	単 価	金 額	備 考
水 盛 遺 形		1	式		200	
根 切 り		3.9	m ³	36	140	
砕 石 地 形		5.7	m ³	250	1,425	
型 枠		34.8	m ²	300	10,440	
コンクリート打		8.5	m ³	2,000	17,000	
鉄 筋		0.1	t	26,000	2,600	
金 網	φ6 150×150	54	m ²	80	4,320	
屋根波形スレート葺		76	m ²	90	6,840	
木 材		4.4	m ³	7,000	38,290	
合 板	ガセットプレート用	10	m ²	200	2,000	
工 費		1	式		14,000	
釘 ・ 金 物		1	式		400	
作 業 台		2	個	5,000	10,000	
電 灯 工 事		1	式		5,000	
運 搬 費		1	式		2,706	
計					115,361	

7 車庫新築工事内訳表

名 称	摘 要	数 量	単 位	単 価	金 額	備 考
水 盛 遣 形		1	式		360	
根 切 り		10.5	m ²	36	378	
砕 石 地 形		7.8	m ²	250	1,950	
型 枠		35.2	m ²	300	10,560	
コンクリート打		9.7	m ³	2,000	19,400	
金 網	土 間	72	m ²	80	5,760	
鉄 筋		0.13	t	26,000	3,380	
木 材		3.14	m ³	7,000	21,980	
合 板	ガセットプレート用	8	m ²	200	1,600	
屋根波形スレート葺		101.4	m ²	90	9,126	
工 費		1	式		13,000	
電 灯 工 事		1	式		5,000	
運 搬 費		1	式		2,373	
計					94,867	

8 標識板設置工事内訳表

名 称	摘 要	数 量	単 位	単 価	金 額	備 考
案 内 板	アルミ製一式	2	枚	34,000	68,000	7ヶ所道入口 セクター入口
工 費		1	式		753	
運 搬 費		1	式		540	
計					69,293	

9 樹木名札標識

名 称	摘 要	数 量	単 位	単 価	金 額	備 考
金 属 板	3 cm×5 cm	500	枚	55	27,500	
セラミック板	15cm×35cm	300	枚	155	46,500	
計					74,000	

10 公衆便所新築工事内訳表

名 称	摘 要	数 量	単 位	単 価	金 額	備 考
水 盛 遺 形		1	式		50	
根 切 り		16	m ²	36	576	
砕 石 地 形		2.5	m ²	250	625	
型 枠		36	m ²	300	10,800	
コンクリート打		4.6	m ³	2,000	9,200	
鉄 筋		0.15	t	26,000	3,900	
ブロックレンガ積		21	m ²	140	2,940	
壁モルタル塗	吹 抜 け 共	63.6	m ²	100	6,360	
床モルタル塗		12.5	m ²	70	875	
木 材		0.5	m ³	7,000	3,500	
屋根スレート葺		18.5	m ²	90	1,665	
大 工		1	式		5,000	
釘 ・ 金 物		1	式		130	
板 戸		2	本	1,500	3,000	
大 便 器	タ イ 式	2	個	200	400	
小 便 器		2	個	520	1,040	
手 洗 器		2	個	300	600	
雨 樋		1	個		1,000	
水 槽	1.2m×1.2m×1.2m	1	個	4,000	4,000	
水 栓		5	個	625	3,125	
給 水 管		40	m	92	3,680	
同上接合材バルブ類		1	式		5,000	
配 管 工 費		1	式		4,946	
浄 化 槽	コンクリート管φ800	8	本	2,300	18,400	
排 水		2	個	750	1,500	
排 水 管	φ100	30	m	813	24,390	
マンホール蓋	φ800	2	個	500	1,000	
同上継子接合材類		1	式		325	
工 費	浄化槽根切り据付 排水管	1	式		14,424	
砕 石		2.0	m ³	230	460	
コンクリート		0.3	m ³	2,000	600	
金 網	φ6 150×150	1	m ²		80	
運 搬 費		1	式		3,202	
計					136,793	

11 横断溝新設工事内訳表

名 称	摘 要	数 量	単 位	単 価	金 額	備 考
床 掘		15.24	m ³	80	1,219	
埋 戻 し		10.07	m ³	60	604	
砕 石 地 形		0.55	m ³	250	138	
型 枠		19.50	m ²	300	5,850	
コンクリート打		0.44	m ³	2,000	880	
鉄 筋	φ15	0.13	t	26,000	3,380	
グ レ ー チ ング		5.00	m	1,900	9,500	
工 費	750×1000	1.00	式		17,600	
運 搬		1.00	式		2,706	
計					41,877	

12 給水施設新設工事内訳表

名 称	摘 要	数 量	単 位	単 価	金 額	備 考
(1) 水槽新設						
水盛遺形		1	式		80	
根 切 り		43.2	m ³	36	1,555	
砕石地形		6	m ³	250	1,500	
型 枠		162	m ²	300	48,600	
コンクリート打		29.5	m ³	2,000	59,000	
鉄 筋		4.3	t	26,000	111,800	
足 場		1	式		500	
外部モルタル塗		81	m ²	60	4,860	
内部防水モルタル塗		64	m ²	80	5,120	
自動給水		1	式		7,000	
浄水器	マンホール蓋共	1	個		19,000	
運 搬 費		1	式		7,511	
小 計					266,526	
(2) 給水管新設						
揚水ポンプ	口径3.2 全揚程76 出力 1.1K	1	式		92,700	
同上ケーブル		1	本		7,750	
〃 揚水管	φ32	1	式		48,200	
ポリリング代		1	式		345,800	
根 切 り	埋 戻 し 共	300	m ³	80	24,000	
水道管	鋼管 4"	100	m	1,435	143,500	
水道管	鋼管 3"	125	m	990	123,750	
水道管	V P 2"	910	m	235	213,850	
バルブ類		1	式		21,000	
消耗品雑材料		1	式		12,044	
工 費		1	式		42,800	
運 搬 費		1	式		36,443	
小 計					1,111,837	
計					1,378,363	

13 公共電気配線引込み工事内訳表

名 称	摘 要	数 量	単 位	単 価	金 額	備 考
本 線 接 続		1	式		33,000	
トランスフォーマー		2	セット	55,400	110,800	
コンクリート柱	H=12	57	本	3,850	219,450	
クロスアーム		57	個	870	49,590	
磚 子		114	個	660	75,240	
保 安 器		2	セット	3,500	7,000	
固定ワイヤー		57	セット	3,700	210,900	
ス タ ブ		57	箇所	2,600	148,200	
電 線	185mm	4,440	m	100	444,000	
電 線	35mm	10	m	95	950	
電 線	10mm	10	m	30	300	
添 え 木		57	箇所	95	5,415	
基 礎		1	式		15,000	
配 線 工 費		1	式		132,000	
消 耗 品 雑 材 料		1	式		13,268	
運 搬 費		1	式		40,203	
小 計					1,505,316	

14 百葉箱新設内訳表

名 称	摘 要	数 量	単 位	単 価	金 額	備 考
百 葉 箱	600×600	1	個		26,000	ボックスのみ
計						

8 付属資料

8-1 施工業者選定に当たっての留意点

8-1-1 工事の特徴

- a アクセス道路は、横断溝工事のみであるが、センター施設工用アクセス道路となるので、工程管理に十分留意すること。
- b 給水槽、ポンプ場、貯水槽のレンガ工事については、漏水が無いようにすること。
- c 導水管、配水管の敷設工事においては、測量監督を厳密に行うこと。
- d 配管及び貯水槽の継手については、特に入念に施工すること。
- e 施工地がランパン（資材、労働者の供給拠点）から約70km離れた所にあり、このため、仮設労働者宿舍等が必要であり、この事前準備についてRFDの協力を得て適切な場所の確保を行うこと。

8-1-2 施工業者選定の検討

工事は、道路補修、給水施設、給電施設、研究棟、車庫、ガラスハウス等の建築工事と工種が多岐にわたっている。また、工事発注は、国際協力事業団タイ事務所において行われることから、中規模以上の信用確実な、かつ、健全な業者に施工させることが重要である。

なお、工種が多岐にわたることなどから、施工者と施工管理者との細部にわたる打合せが必要であるので、日本語を解する現場監督者の配置をも可能な業者を選定する必要がある。地元建設業者については、タイ国建設業協会加盟業者は約300社で安定した能力をもつ会社は20社ほどに絞られる。地元建設業者の問題点としては以下のようなことが考えられる。

- ・タイ国では、工事のプロセス別及び工事内容別に分業化がすすんでおり、こうした発注形態をまとめることのできる強力なコーディネーターを必要とする。
- ・建設開始後においても、打算的に業務に取り組む姿勢を変えるので、工程・品質の確保に問題が生じる。日系建設業者に比べ、業務に取り組む姿勢に大きな違いがある。
- ・発注者が額面価格の低さで発注する傾向があり、結果として予算的にアフター

ケアやアフターサービスの欠如を招いている。建設後のメンテナンスを業者
選択の判断材料にする場合もある。

なお、日系建設業者についても施工業者を数社別途に調査した。

8-2 協議議事録

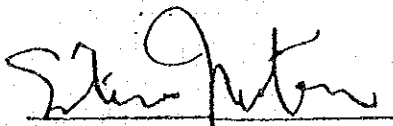
THE MINUTES ON
THE PILOT INFRASTRUCTURE PROJECT UNDER THE RESEARCH AND TRAINING
IN RE-AFFORESTATION PROJECT (PHASE II)

The pilot infrastructure implementation design survey team headed by
Mr. EITARO MITOMA, Deputy Director of Forestry Development Division, JICA,
visited Thailand from Aug. 10 to Aug. 24, 1989 for the purpose of working out
the outline of the said project.

During its stay in Thailand, the Team exchanged views and had a series
of discussions with Thai Authorities concerned in respect of the desirable
measures to be taken by both Governments for raising the demonstration effect
of the Research and Training in Re-afforestation Project (Phase II).

Referred to in the document attached hereto

Bangkok, 23rd August 1989



Eitaro Mitoma

Leader

Implementation Design Survey Team
for the Research and Training
in Re-afforestation Project (Phase II)
in Thailand



Dr. Thanit Yingwanasiri
Director of Silviculture Division
Royal Forest Department

ATTACH

The purpose of the meeting is to discuss and finalize the following matters :

1. Establishment of the project :
2. Necessary facilities
3. Design/Construction schedule
4. Tentative plan

Participants :

1. RFD Side

Mr. Boonchoob	Boontawee
Mr. Vichien	Sumantakul
Dr. Apichart	Kaosa-ard
Mr. Thurdpong	Supaperm

2. JICA Mission

Mr. Eitaro	Mitoma
Mr. Tadami	Imai
Mr. Keiji	Horiuchi

3. JICA expert

Mr. Ryosuke	Kato
Mr. Shozo	Nakamura
Dr. Masaharu	Sakai
Mr. Toshifumi	Serizawa

1. Establishment of the project

The Forest Research, Demonstration and Extension Center will be established under the RFD/JICA cooperative programme (Phase II), and the center will be jointly operated under the three main organizations : Division of Forest Management, Division of Silviculture and the Lampang Regional Forest Office . The cost of establishment of the center will be allocated by JICA (at approximately 7,000,000 Baht) and the running cost will be allocated by RFD.

2. Necessary Facilities

The infrastructure to be constructed in the compound area consists of :

(1) The main building which includes demonstration room, office, research laboratories, accomodation, lecture room, and etc.

(2) Seed storage house

(3) Glasshouse

(4) Teak stump storage house

(5) Teak stump preparation shed

(6) Water supply system

(7) Electricity supply system from the entrance of the plantation (approximately 1.5 km.)

The RFD will be responsible for connecting the high voltage main line system from the nearest village (Ban Huad) to the entrance of the Hae Huad Teak Plantation (approximately 5 km.). Right now, the center is using generators. A letter to the Secretary of Provincial Electric Authority is issued from the Director-General of RFD asking installing the high voltage powerline to the center and its vicinity.

(8) Improvement of the main road from the entrance to the center (approximately 1.5 km.)

(9) Improvement of an arboretum and natural forests within the compound.

(10) Climatic Station

3. Design Construction Schedule

(1) A detail design of establishment of the infrastructure will be conducted by Mr. Tadami Imai and Mr. Keiji Horiuchi during the period of August 24 to September 23, 1989.

(2) The submission of the final report will be in November, 1989.

(3) The construction period is expected for four months, from February 1990 to May 1990.

4. Tentative Plan

Identification, function and plan of the project (shown in appendix) should be completed as soon as possible.

APPENDIX

Identification/Function and Plan of the Project

a) Identification

b) Function/Plan

	Research	Demonstration	Extention (Training)
Forest Management Department (DF Sub-div.)			
Silviculture Dept. (TIC, Silvicultural Research Sub-div.)			
Lampang Regional Forest Office			

8-3 8月21日協議の質問事項「当センターの利用計画」についての回答

8-3-1 デモンストレーションフォレスト課

調査計画

1. 天然林及び人工林の成長及び収穫解析—森林火災防止措置の乾性フタバガキ林の更新、成長に及ぼす影響に関する調査—
2. 天然林及び人工林の成長及び収穫解析—択伐後落葉混交林への天然林保育作業の更新及び成長に及ぼす影響に関する調査—
3. 天然林及び人工林の成長及び収穫解析—チーク人工林間伐試験—

* 調査結果、設計された試験方法、調査プロットは他の森林官そしてKasetsart大学の学生に対して展示及び普及される。

4. リモートセンシング技術、近代的測樹器具（プリズム、レラスコープ）を用い、様々なサンプリング設計方法による森林調査は、訓練、ジャーナル、報告書により普及される。

5. 森林管理のモデル化

既往の森林管理モデルを検討、評価、修正し、地理情報システムを統括し総合的な森林管理モデルを開発する。

測樹学及び森林管理の運営

用材の売却及び林業に関連する情報サービス、経営技術のデモンストレーション

-現場の輸送手段（象等）

-近代の技術（架線集材）

* 上述の項目5は普及活動と展示研究会を含む。

8-3-2 チーク造林センター

研究計画

- 1) 植物の増殖、(例) 挿木、接木、芽継ぎ
- 2) 種子の採集法及び貯蔵法

3) 種子の発芽及び苗畑技術

4) 造林地造成技術

デモンストレーション

近年開発された知識及び技術、あるいはTICの現在行われている試験を普及するために、TICは次の内容についてデモンストレーションを行う。

1. 林木育種計画、(例) プラス木の選抜、クローンバンク、クローン種子採種園、採種地区、クローンテスト
2. 産地試験
3. チーク苗畑技術、(例) 苗およびスタンプ苗準備、スタンプ苗準備室
4. チーク人工林の造成技術

普及

1. 林木改良及び採種
2. 苗畑運営
3. 人工林造成計画

8 - 4 Main Species in Arboretum

	<u>Local Name</u>	<u>Academic Name</u>
1	Hak Khee Muu	Melanorrhoea usitata
2	Liang Eai	Kydia calyeina
3	Sak	Tectona grandis
4	Rok foa	Terminalia alata
5	Daeng	Xyllia kerrei
6	Sakae-saeng	Cananga latifolia
7	Ploug	Dipterocarpus tuberculatus
8	Som-kob	Hymenodictyon excelsum
9	Teng	Shorea obtusa
10	Rung	Shorea siamensis
11	Ka-sa-long	Millingtonia hortensis
12	Koa	Sehleichera oleose
13	Ma-kok-pha	Spondias pinnata
14	Ma-kha-mong	Afgekia xyloerpa
15	Ma-had	Artocarpus lakoocha
16	Pu-chao	Terminalia tripteroides
17	Ta-baek lued	Terminalia mueronata
18	Krang	Ficus altissima
19	Phe-ka	Oroxylum indicum
20	Pheesuca	Alangium chinense
21	Krorum khao	Neonauclea calyeima
22	Kraphee khao khwaai	Dalbergia cultrata
23	Ket khiao khwaai	Dalbergia fusca
24	Tabtow	Diospyros ehretioides
25	Mee men	Litsea glutinosa
26	Kea-lack-pha	Cassia siamea
27	Salaeng-fai	Strychnos nux-vomica
28	Cook	Lannea coromandelica
29	Taeo	Cratoxylon formoxem
30	Khee-aa	Walsura robusta
31	Kang hua moo	Milium relutina
32	Po-dao	Sterculia fulgens
33	Kraphee khruua	Dalbergia foliacea
34	Tabaek plueak baang	Lagerstroemia doperreana

	<u>Local Name</u>	<u>Academic Name</u>
35	Krapheechan	<i>Millettia brandisiana</i>
36	Matuum	<i>Aegle marmelos</i>
37	Ma-dook	<i>Siphonodon celastrineus</i>
38	Kae hang khang	<i>Fernandoa adenophylla</i>
39	Ko daeng	<i>Guercus ringiana</i>
40	Plaoyal	<i>Croton oblongifolius</i>
41	Ketdam	<i>Dalbergia assamiea</i>
42	Khae foi	<i>Stereospermum cylindricum</i>
43	Pa-yab	<i>Colona flagroearpa</i>
44	Mued khon	<i>Helicia excelsa</i>
45	Teen nok	<i>Vitex pinnata</i>
46	Ma mao dong	<i>Antidesma bunius</i>
47	San hing	<i>Dillenia parviflora</i>
48	Ngiu paa	<i>Bombax anceps</i>
49	Ha	<i>Syzygium zemmermanh</i>
50	Tiew	<i>Cratoxylum fonnosum</i>
51	Ho saphaai khwaof	<i>Sphenodesme pentandra</i>
52	Lieng-man	<i>Borrya ammonilla</i>
53	Soh-maeo	<i>Premna flaveseens</i>
54	Liang faai	<i>Kydia calycina</i>
55	Ngiu pha	<i>Bombax valetionii</i>
56	Yomhin	<i>Chukrasia velutina</i>
57	Ma kuem	<i>Canarium kerrie</i>
58	Ket daeng	<i>Dalbergia oliveri</i>
59	Pradu	<i>Pterocarpus macrocarpus</i>
60	Samo thai	<i>Terminalia chebula</i>
61	Pha sian	<i>Vitex canecans</i>
62	Inthanin bok	<i>Lagerstroemia macrocarpa</i>
63	Saw	<i>Gmelina arborea</i>
64	Teng-nam	<i>Bridelia retusa</i>
65	Yo-paa	<i>Morinda coreia</i>
66	Hheng	<i>Dipterocarpus obtusifolius</i>
67	Ta-kham	<i>Garuga pinnata</i>
68	Kra-bok	<i>Irvingia malayana</i>
69	Siew-paa	<i>Bauhinia variegata</i>
70	Ma-khet	<i>Gelsemium elegans</i>

	<u>Local Name</u>	<u>Academic Name</u>
71	Thum-kwang	Mitragyna brunonis
72	Kea-leck american	Cassia floribunda
73	Sai-yoi	Ficus benjamina
74	Ma-kham-pom	Phyllanthus emblica
75	Kra-daon	Careya sphacriea
76	Ma-kea	Diospyros mollis
77	Ma-kwon	Flacourtia indica
78	Pho	Ficus religiosa

8 - 5 Draft Work Contract

This contract form (original in Thai) drafted by the Lampang Regional Forest Office of the RFD is given below as a work contract example.

No. _____

CONTRACT

This contract is made at _____
sub-district, _____ district and _____
province _____ on _____ day _____ month _____ year, between _____
_____ hereinafter
referred to "employer" and _____
_____ of the address: _____, _____ Road, _____
_____ sub-district, _____ district, _____ province
hereinafter referred to "employee" with following conditions:

Article 1. Employer agrees with employee to _____

according to the design and the details attached hereto, the total cost
is baht _____ (_____).

Article 2. Employee admits the operation following the article 1 by
promising to provide good materials and equipment including qualified
workmen till the work finished.

Article 3. Date of signature. Employee deposits baht _____ as security to employer. The security is valid until the date the work finished within limited period agreed upon in the contract. If the duration of work is extended due to any causes, employee must deposit the security to employer for the period of contract.

The security deposited by employee according to the first paragraph, will be returned when employee is out of the bind according to the first paragraph of article 6.

Article 4. Employer and employee agree with payment of wages as follows.

The first time, baht _____ (_____)
when employee _____

_____ It will be finished until _____ day _____ month _____ year.

The second time, baht _____ (_____)
when employee _____

_____ It will be finished until _____ day _____ month _____ year, and employee has already done according to the article 22.

When employee delivers job correctly and completely following each time of the contract, employer or employer's officer will examine the job as evidence.

Article 5. In the case of events of beyond control, employer's offense, or the event at employee must not be liable according to law, which will cause work delay, employee must inform the mentioned event together with document to employer within 15 days, as from the end of the event, so that the working period will be extended.

If employee does not perform according to the first paragraph, it is regarded as employee leave the rights to ask for extention of work period without any conditions. Unless the offense caused by the employer due to evidence expressly or employer has known for the beginning.

The extension of working period according to the first paragraph depends on employer's consideration.

Article 6. The employee promises to begin the work at the appointed place on ___ day ___ month ___ year and the work will be finished completely until ___ day ___ month ___ year. If the employee does not begin work within the agreed date or the employer believes that the employee can not complete work in the limited period agreed upon or the employee breaks the contract, the employer has the rights to cancel the contract and can hire other contractor to do this work, too.

In the event the employer does not cancel the contract following the first paragraph, it does not mean that the employee is out of responsibility.

Article 7. When the work has been finished and the employee (new or old) delivered the work to employer in case of employee did not follow the contract and employer canceled the contract following article 5, if the damages occur within _____ year(s) _____ months as from the delivered date and the damages are the offense of employee, i.e. incomplete work within limited period, free charged material, free-charged wages or free-charged other expenses; if employee refuses to repair the damage within _____ days as from the date of notification, or the repair is not finished within limited period, employer has the rights to hire other contractor instead of the employee.

In case of the damages happen after the above limited period, employee must still have responsibility for the damages according to Civil and Commercial Code.

In the event of employer hiring other contractor instead of the employee following article 5 and the first paragraph of article 6, employee admits payment of wages, materials, and other expenses (if having) according to the amount that employer pays, and employee is still responsible for the damages following No.3 as if the work that new employee does is his.

Article 8. Due to the agreement of both parties according to this contract, employee admits that factory, buildings, and materials taken to the construction area for work following article 1 are the property of

Article 12. The employee must control this work all time when the work is not complete, or he can assign others to control instead. In this case, the employee must inform the name of the assigned person or persons to the employee by letter. The controller and representatives of the employee, has to take responsibilities instead; any command that informs the representatives is regarded as it informs the employee directly.

Article 13. In the case the employee appoints the representatives as the controller following article 11 when the employer asks for the new representatives, the employee accepts and changes immediately without any claim for charges or the cause of extension of working period. And the employee must inform name of the new representatives by letter everytime.

Article 14. The employee must take responsibility for accidents, dangers, or damages that result from the employee's working, and must take responsibility for the damages to the employer in the construction area, which occurs from workmen, technicians, and other people under employee's control.

Article 15. The employee must pay wages to workers according to law and time that both parties agree together.

If the employee does not perform following the first paragraph, the employee allow the employer to pay wages to workers with money that the employer will pay the employee, and it is regarded as that amount of payment has been paid to the employee already.

If the employee does not pay the workers' wages following the second paragraph, besides allowing the employer pay the workers' with his wage, it is considered that the employee breaks the contract and the employer can cancel all the contract.

Article 16. If the employer appoints the committee or supervisor to examine the work permanently at the construction site at the time that the employee works, the committee or supervisor has the rights to check all the time. The employee must cooperate.

Even when there are the committee or supervisor examining the work, it does not mean that the employee will be out of the responsibilities.

Article 17. Before the work, if there are the misplace of the design or details attached hereto, the employee promises to do following the judgement of the committee or supervisor, and if this judgement is match correctly with any items in the design, the employee must admit it absolutely. If any item is not stated in the details, but it is necessary for completing the work correctly, the employee promises to manage it without any additional charge. Anyway the misplace item or unappeared item must not be the important matter.

Article 18. In the case that the employer appoints the committee or supervisor, the employee admits the committee or supervisor to have the authority to check and control according to the contract, the design and details. And the committee or supervisor has the power to change, correct, add, or cancel this work to follow the contract, the design and details. And if the employee refuses, the committee or supervisor can stop this work temporarily and this delay can not count for the extension of the working period.

Article 19. The employee has the right to correct, add or reduce the work in design or details according to the contract without canceling the contract. The increase or decrease must be calculated and make a new agreement on the new price, and if the increase or decrease of price or the extension of working period are existed, it must be done at that time.

Article 20. If the employee delivers the work later than the agreed date, but the employer do not cancel the contract, the employee admits the employer to do as follows:

(1) Fine the employee per day at the cost of baht _____ (_____) as from the date that is agreed upon in the contract for the work to finish to the date that work is completed.

(2) Call for the damage fee from the delay of employee's work (if there is any)

(3) Call for the expense in controlling the work since the employer has to hire the contractor as from the date that is passed the limited date in the contract to the date that the employee delivers the work at the cost of baht _____ per day (_____).

During the insurance period if the employer considers that the employee can not follow the contract, the employer has the right to cancel the contract and use his right in article 2, besides the fine, until the cancellation date.

Article 21. If the employer cancels the contract, the employee admits the employer the following:

- (1) Confiscate the security mentioned in article 3.
- (2) Admit the employer to call for the increase of wage because of hiring others to work until the works are completed.
- (3) Call for the expense in controlling the work because of hiring the controllers until the works are completed.
- (4) Call for any damage fee existed from the employee.

Article 22. When the employer cancels the contract, all works that the employee has done and the materials that brought into the construction area, especially for the works, the employee transfers the right of ownership to the employer and the employee can not claim for any charges of any payments. And the employee admits the employer to have the right to stop paying the unpaid wage for the ready work which is to insure the debt payment.

In the case of hiring others to do the incompleated work, and the remaining wage is not enough for this hiring, the employee admits the employer to deduct this amount from the unpaid wage as in the first paragraph and response for the missing amount.

If the wage according to the contract, which is deducted for the insurance fee and damage fee, is left, it will be returned to the employee all.

Article 23. If the employee or the workers of employee build any factory or any accommodations around the construction area or make the hotel, the employee promises to keep the area clean during the work period. And when the works are completed, they must remove any buildings away, make the ground smooth and bring the splinter and lift over materials out of the construction area, including cleaning the construction area in a usable situation.

Article 24. In the event of any dispute arising about the contents of this contract or the performance of its terms, both parties agree to make the best attempt with sincerity and goodwill to negotiate and amicably settle such dispute(s).

This contract is written in two copies with the same contents. After understanding the details thoroughly, both parties sign in front of the witnesses and one copy will be kept by each party.

(Signature) _____ Employer
(_____)

(Signature) _____ Employee
(_____)

(Signature) _____ Witness
(_____)

(Signature) _____ Witness
(_____)

The following is another example of contract form which is used by Japan International Cooperation Agency (JICA).

CONTRACT

For Construction of _____

This contract is executed on the ____ day of _____ at the JICA Bangkok Office between _____

Japan International Cooperation Agency, Thailand Office as authorized representative of the JICA Thailand Office, hereinafter called "the JICA", and Mr. _____ of _____

TEL. _____ Represented by _____ Nationality _____
_____ Title _____ hereinafter called "the Contractor".

Both parties mutually agree under the terms of this Contract as follows;

ARTICLE 1 PURPOSE OF THE CONTRACT AND CONTRACT COST

The JICA agrees to employ the Contractor and the Contractor agrees to perform the Works for the construction of Pilot Infrastructure on Research and Training in Re-afforestation Project (phase 2) Located at Demonstration Forest in Lampang District for the total amount of Baht. _____ (_____) hereinafter called "contract Cost".

The following documents shall form integral part of this Contract;-

- Terms and conditions of this contract
- Specifications
- Bill of Quantities
- Drawings

Article 2 PERFORMANCE BOND

As a security for the faithful performance of the Works under this Contract, the Contractor has on the execution of this Contract deposited a performance bond with the JICA _____ Baht (_____) in a Bank Guarantee issued by the _____ bearing the number _____ and date _____ which represents five (5) percent of the Contract Price. The name of the issuing bank and the form of the bank guarantee are to be approved by the JICA.

The JICA will return the performance Bond in cash or the Bank Guarantee to the Contractor as the case may be at the end of the twelve (12) months after final acceptance of the Works by the JICA as stipulated in Article 15 of this Contract, provided that the completed Works shall not show any defect or damage caused through the fault of the Contractor, or through the fault of any new Contractor in the case of termination of Contract by the JICA under Article 4.

Should the Contractor be in default, the JICA shall have the right to demand payment from all or any part of the performance Bond. In addition, the Contractor shall remain liable for the full loss sustained by the JICA.

Article 3 PAYMENT

The JICA agrees to effect payments for the Works to the Contractor in the following manner;--

a. Advance Payment to be effected upon the bringing of equipment and materials required for the Works and properly stored at the job site by the Contractor and of value estimated by the supervisor. Baht _____ (_____) which corresponds to Thirty (30) percent of the Contract Price shall be paid upon signing of this Contract.

b. Interim Payment to be effected according to the progress of the Works satisfactorily executed by the Contractor and accepted by the supervisor. Baht _____ (_____) which corresponds to Thirty (30) percent of the Contract Price shall be requested for payment at the middle of the construction term. In case that value of the executed construction works estimated by the supervisor is less than fifty (50) percent of the Contract Price, Interim payment shall be deducted by the full amount of advance payment, balance of which correspond to value of the executed construction works.

c. Final Payment, to be effected upon the satisfactory completion of the Works by the Contractor and accepted by the supervisor.

The remainder of Baht _____ (_____) which corresponds to Forty (40) percent of the Contract Price, or the remaining amount of Contract Price shall be paid after the Final Certificate by the JICA for payment to the Contractor.

Payment under (b) and (c) shall be effected within ten (10) days after the respective acceptance of the Works by the supervisor.

Taxes payable by the Contractor, if any, shall be deducted at source by the JICA on each payment.

It is expressly understood that payments by the JICA do not mean acceptance responsibilities under this Contract.

Article 4 COMPLETION TIME

The Contractor agrees to commence the Works at the site within ten (10) days from the date of signing of this Contract (commencement date) and the Contractor agrees to satisfactorily complete the Works within _____ days (completion time) after the date hereof which will become due on _____ (completion date)

If the Contractor fails to commence the Works by the above commencement date, or should in the course of the construction any event occur which may reasonably cause the JICA to believe that the Contractor will not be able to complete the Works on the completion date, or should the Contractor fail to meet any of the Contract requirements, the JICA shall have the right to terminate this Contract by giving written notice to the Contractor.

However, in case that the Contractor fails to complete the Works by the completion date, or to meet any of the Contract requirements, if the supervisor thinks that the Contractor has the ability for completion of the Works within reasonably extended period, the Contractor may be permitted by the JICA to continue the Works beyond the completion date.

Article 5 PENALTY

In case that the Contractor is in default as mentioned in Article 4, the Contractor agrees to be responsible to the JICA as follows:-

5.1 In case of the termination by the default of commencement for the Works, the Contractor shall pay a penalty of Twenty Thousand Bath (20,000.00 Bath) per day counting from the commencement date until the new Contract is completely executed with a new Contractor for this Works.

The period of which is included the time spent for finding the new Contractor and executing the new Contract etc.

5.2 In case the JICA thinks that the Contractor will not be able to complete the Works within the completion time and thereby terminates this Contract, the Contractor shall pay a penalty of Twenty Thousand Baht (20,000.00 Baht) per day counting the number of days in the same manner as prescribed in 5.1 above. However, the JICA may reduce such number of days according to the ratio between the completed Works and the total Works as may be decided by the supervisor.

5.3 In case the Contractor fails to complete the Works by the completion date or to meet any Contract requirement, the Contractor shall pay a penalty of Twenty Thousand Baht (20,000.00 Baht) per day counting from the date following the completion date until the Works satisfactorily completed and accepted by the supervisor.

Article 6 COMPENSATION

If the JICA sustains any losses as direct or indirect damages caused by the Contractor's failure, the Contractor shall compensate the JICA for such losses. The parties agree that time is essential for the completion of the Works.

Article 7 THE JICA'S RIGHT FOR DEFAULT

The JICA has the sole and absolute right to decide whether to terminate the Contract, to impose only the penalty on the Contractor or to claim the compensation for the damage as stated in Article 5 or Article 6. The money due to the JICA exercising its right under this article shall be retained and deducted from any money due to the Contractor but yet unpaid, including from the performance bond. If the total amount of the loss is larger than the money above-mentioned, the Contractor agrees that the JICA has the right to retain the construction equipment; materials and supplies etc. and demand payment of the balance from such equipment etc. or proceeds of sale thereof.

Article 8 CONTRACTOR'S RESPONSIBILITY ON TERMINATION OF THIS CONTRACT

After the Contract has been terminated in accordance with the foregoing Article 4, the JICA shall have the right to employ another Contractor (hereinafter called the "New Contractor") to carry on the remaining parts of the Works, and the payment for the Contractor that fall to complete the work shall be made out of the necessary Contract Price for the remaining Works. Should the remaining amount after payment of the advance and interim payment from the Contract Price, be

insufficient to effect payment to the new Contractor, the difference between such remaining amount and actual cost estimated by the JICA for the satisfactory completion Works carried out by the JICA, and the Contractor shall pay such difference to the JICA within ten (10) days from the date of request by the JICA, failing which interest at the rate of eighteen (18) percent per annum shall be charged thereon.

Article 9 SUPERVISOR

The supervisor, authorized to act on behalf of the JICA will be appointed by the JICA and the supervisor is entitled to do all things that the JICA may do so. The supervisor shall control and supervise the Works all the times whether it is in the preparation or implementation of the Works and the Contractor shall promptly furnish all necessary facilities for proper inspections of the Works in accordance with the supervisor's request. At any moment the supervisor can request the Contractor to stop the Works, if necessary and the Contractor shall have no claim on the JICA for extension of the completion time due to such suspension of the Works under this Article.

The Inspection will not be deemed as the acceptance of the Works, and the Contractor shall not be relieved from his responsibility to meet the Contract requirements by the fact that the Supervisor exercise their duties. Should it be found that the Works have not been satisfactorily performed in the faithful manner, the Contractor shall correct any part of the Works indicated by the supervisor within the period specified by the supervisor.

Article 10 PROHIBITION FOR THE EQUIPMENT REMOVAL

Should the Contractor fail to complete the Works during the completion time or the supervisor thinks that the contractor will not be able to satisfactorily complete the Works, any equipment and materials brought to the site for use on the Works shall not be removed without the prior approval of the supervisor in writing.

Article 11 RECTIFICATION OF THE DEFECTIVE CONSTRUCTION

For a further period of One (1) year after satisfactory completion and final acceptance of the Works by the JICA, whether completed by the Contractor or by the new Contractor in case of termination of Contract under Article 4, any damage to the Works which is caused by the Contractor's fault, either because of defective workmanship or the use of inferior materials or any other cause, shall be made good as necessary by the Contractor to the satisfaction of the JICA at no extra cost.

In case of the termination of the Contract, the JICA may decide which part of the Works should come under the Contractor's responsibility, and requests the Contractor to make good of the damaged Works. Should the Contractor fail to do so within period specified after receipt of written request to do so from the JICA, the JICA shall have the right to employ another Contractor to carry out such work and the Contractor agrees to bear all expenses incurred.

Article 12 DISCREPANCIES AMONG THE CONTRACT DOCUMENTS

Of, prior to or during the course of the Works, any discrepancies found in the drawing and/or the Specifications etc. attached to this Contract; the Contractor shall follow the ruling given by the supervisor at no additional cost to the JICA.

Article 13 CONSTRUCTION METHOD AND TEMPORARY WORKS

The construction method including implementation schedule and plan of the temporary works such as installation of temporary facilities, offices, ware house, construction roads, electric wiring, etc. shall be submitted by the Contractor and approved by the supervisor at least ten (10) days in advance of the commencement of the Works.

Should the cost the above temporary works be estimated in the unit cost of each work items of Bill of Quantities in this Contract, and the Contractor is not entitled to claim any amount of charges for the temporary works.

Article 14 MODIFICATION OF PLAN

If the Supervisor finds it necessary to make modification of construction design, quantities and/or materials and so forth during the course of construction, the JICA has the right to order the modification of the Works to the Contractor, and such order shall be made in writing from the supervisor to the Contractor.

The JICA agrees to adjust upwards or downwards the necessary expense for such modification to the Contractor, which will be estimated by unit price in the bill of quantities of this Contract in case of modification of quantities of construction works. In the case of additional works which are not quoted by unit price in the bill of quantities of this Contract, the supervisor will make estimation thereof and the JICA will pay to the Contractor for such additional works accordingly. But if the Contractor does not agree to such estimation, the Contractor is then entitled to negotiate with the JICA. Also the extension of the completion time due to the modification shall be given by the JICA who

shall have the sole right to decide the number of days of such extension.

Article 15 ACCEPTANCE OF THE WORKS

When the entire Works have been completed, the Contractor shall submit the invoice in written form indicating the Work actually completed to the supervisor. If there are compliance with drawings or Technical Specifications, the JICA shall accept the Works as the final acceptance of satisfactory completion Works within ten (10) days after the receipt of the written form and it shall be deemed that the final acceptance has been made on such date of the receipt of the written form.

On the other hand, should non-compliance with drawings or General Specifications or defects be found in the Works executed by the Contractor, the supervisor will have the right not to accept the Works and to order the rectification of the Works. If the required period for the rectification of the Works is beyond the completion date, the Contractor shall not be relieved from its responsibility to pay the penalty as stipulated under clause 5.3, and after the completion of rectification of the Works, then the final acceptance will be made in the same manner as described in the first paragraph of this Article.

During the course of construction, whether in the completion time or of extended time specified in the last paragraph of Article 4, the JICA has the right to accept a part of the Works already completed in the written form which shall be considered as a part of final acceptance. However, both parties shall negotiate with each other for the maintenance and usage of the accepted part of the Works the contractor is not entitled to request the extension of the completion time due to any interruption caused by the use of such accepted Works by the JICA, the supervisor or the officers of Thai Government authorities, or any delay in repairing such accepted Works.

Article 16 CONSTRUCTION ENGINEER

The Contractor shall appoint a construction engineer at his own expense for the supervisor of the Works performance, who shall be authorized to act on behalf of the Contractor, and the instructions given to him shall be deemed as given to the Contractor. Such construction engineer shall be a good speaker of English and accepted by the JICA, who shall stay at the job site all the time and shall not leave without obtaining the prior approval from the supervisor. If the Contractor replaces the construction engineer, the Contractor shall obtain the prior approval from the supervisor in writing.

Article 20 DISPUTE

In the event of any dispute arising from the interpretation and performance of the terms of this contract, both parties agree to make the best attempt with sincerity and in good faith to negotiate and amicably settle such dispute. When failed to do so, the parties agree to refer such dispute to arbitration under Thai Commercial Arbitration Rules and Regulation, Bangkok, by 2 arbitrators, each of which is to be appointed by each party. If either party fails to appoint its arbitrator within seven (7) days or should be arbitrators fail, within fifteen (15) days after their appointment, to agree upon the decision of the dispute or on decision is reached on the appointment of an umpire, then the dispute shall be brought before the court in Thailand for decision under the laws and procedures of the Kingdom of Thailand.

This Contract is executed in duplicate of the same tenor, one of the original copy to be kept by JICA and the other original copy to be kept by the Contractor. Both the JICA and the Contractor have set their signatures and affixed the seals thereto in the presence of the witnesses.

8-6 Labour and Material Unit Price List

Item	Unit Price	Note
Chief Supervisor	200	B/DAY 8 Hour/Day
Common Worker	90	"
Light Worker	80	"
Mannipulater	600	"
Driver	100	"
Scaffolding Man	100	"
Chipping Man	150	"
Carpenter	150	"
Assistant Carpenter	100	"
Carpenter	150	"
Reinforcing Bar Mechanic	120	"
Brick layer	120	"
Assistant Mason	100	"
Mason	150	"
Tile layer	200	"
Roofing Worker	100	"
Tinsmith	150	"

Item	Unit Price		Note
Assistant Plasterer	100	"	
Plasterer	150	"	
Joiner (Wood)	120	"	
Joiner (Metal)	200	"	
Glass Worker	200	"	
Assistant Painter	100	"	
Painter	150	"	
Assistant Electrician	150	"	
Electrician	250	"	
Assistant Plumber	150	"	
Plumber	250	"	
Well Borer	600	"	
Cement (50kg - 1 Bag)	70	B/BAG	for Mortar
Cement (50kg - 1 Bag)	80	B/BAG	for Concrete
Sand	330	B/m ³	for Concrete
Sand	180	B/m ³	for Earth Work
Gravel 3/4	230	B/m ³	
Steel ϕ 6	14.7	B/kg	
ϕ 9	14.7	B/kg	

Item	Unit Price	Note
SD 30 D12	13.3	B/kg
SD 30 D16	13.0	B/kg
COC, Block 190 x 390 x 70	2.7	B/PCS
COC, Block 190 x 390 x 90	4.7	B/PCS
Corrugated Asbestos Sheet 1,200m x 500 x 5T	38	B/PCS
Asbestos Sheet Plain 1,200m x 2,400 x 6T	195	B/PCS
Monier (Roof)	110	B/SQM
Hard Wood (Teng) 100m x 100 x 5M	580	B/PCS
2" x 6" x 4M (51m x 152m x 4M)	65.5	B/PCS
2" x 8" x 4M (51m x 203m x 4M)	88	B/PCS
Soft Wood 100m x 100 x 5M	450	B/PCS
Flooring Block	300	B/m ²
Thairite Chamber Pot White	200	B/PCS
Foreign Style White	1,750	B/PCS
Stall Urinal	520	B/PCS
Pipe PCB 1"	92	B/M
2"	235	B/M

Item	Unit Price	Note
Rental Fee		
Bulldozer D=30	3,500	B/DAY
D=50	4,500	B/DAY
Back Hoe 0,5	4,500	B/DAY
Truck 10 Wheels	1,800	B/DAY
Truck 6 Wheels	1,000	B/DAY
From Lampang to the Poject Site		
100km about		
100kg	50	B/kg
500kg	10	B/kg
1,000kg	5	B/kg
4,000kg	1.25	B/kg

8 - 7 Water Analysis Report for Project Site

Messrs. TEM ENGINEERING CO., LTD.
(JICA PROJECT)

Date September 18, 1989.

No. PD-09013-B

WATER ANALYSIS REPORT

Item	Sample Name	Well front Dormitory		
Sampling Date		5/9/89		
Appearance		Yellow to Brown		
Turbidity		23.5		
Color		*Lack of sample		
pH		6.85		
Electric Conductivity (micro S/cm)		650		
Total Solid (ppm. as NaCl)				
Total Hardness (ppm. as CaCO ₃)		332		
Calcium Hardness (ppm. as CaCO ₃)				
Total Iron (ppm. as Fe)		5.8		
M-Alkalinity (ppm. as CaCO ₃)		213.0		
P-Alkalinity (ppm. as CaCO ₃)		None		
Chloride Ion (ppm. as Cl)		83.6		
Sulfate Ion (ppm. as SO ₄)		*Lack of sample		
Silica (ppm. as SiO ₂)		*Lack of sample		
Phosphate Ion (ppm. as PO ₄)				
Chemical Oxygen Demand				
Manganese (ppm. as Mn)				
Suspen solid (ppm)		11.3		
Remark	700 cc sample volume is not enough to analysis to all items. If need more items, Please send at least 2,000 cc. Thank you.			

Manager _____

Representative _____

