

第6章 施工計画

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6-1 施工計画

1. 工程計画

タンビア地区、コロカンディ地区、レケティ地区の3地区の工事を、地域的にはタンビア地区とコロカンディ・レケティ地区の2グループに分割される。

両地区の工事とも同時に施工するものとし、工事期間としては6ヶ月を予定する。タンビア、コロカンディ両地区は圃場均平工事が主となり、しかも土工事が大部分であり干天期間が必要となる事から雨期作収穫後の雨の少ない乾期（5月～10月）に工事を実施することが望ましい。

また、工事箇所が Vanua Levu 島の北側と南側に離れており、一人の監督者で工事監理を行う事は難しい事から二人体制で工事を監理する。

工事に先立つ契約業務は工事監理担当者が実施する場合の他に、短期的な契約業務担当者の派遣も考える。

以上から策定した工事工程計画表を表6-1に示した。

2. 施工計画

工事に関する施工計画を以下にまとめた。

(1) 準備工事

現場事務所の設置、工事用道路の確認・補強、道路・水路の芯出しや工事資材置場の確保などを行う。

(2) 圃場整地工事

a) タンビア地区圃場造成工事

対象地区全域に対して表土扱いを行う。表土扱いの土層厚は10cmとし、地区内の畦畔予定箇所に集積する。次に心土に対する切盛土工を開始し、ブルドーザーによる掘削-運搬-盛土・転圧の工事を行う。この段階で支線道路、支線用水路に対する盛土を実施する。各計画耕区に対する均平工事が完了した段階で表土戻しを実施する。

扱い土量（12,000m³）から工事量を想定すると、11トⁿ級ブルドーザーを使用す

るとして時間当り扱い土量 $8.3 \text{ m}^3/\text{hr}$ (通常状態) から総稼働時間は、 $12,000 \text{ m}^3 \div 8.3 \text{ m}^3/\text{hr} = 1,446 \text{ hr}$ となり、1日の稼働時間を8時間とすると181日・台となる。

月間稼働日数を20日と考え、常時ブル2台を使用するとすれば $181 \div (20 \text{日} \times 20 \text{台}) = 4.5$ ヶ月となる。

b) コロカンディ地区圃場造成工事

タンビア地区ではB地区のみ表土扱いを実施する。扱い土層厚は10cmとし、計画の耕区境界位置に集積する。次に均平作業を実施しブルドーザーによる切盛土工事を実施する。この段階で支線道路、支線用水路の盛土工事も実施する。各計画耕区に対する均平工事が完了した段階で、表土戻しを行う。

(3) 用水路工事

a) タンビア地区

支線用水路は道路に沿って計画される。用水路断面が小さいこと及び土水路となることから、盛土工事は上記の圃場均平工事時に同時に行い、転圧工事を経てバックホーにて掘削を行う。

工事数量は次のとおりである。

$$\text{施工延長： } L = 2,226 \text{ m}$$

b) コロカンディ地区

タンビア地区と同様に圃場均平工事時に盛土工事を行い、転圧工事を行った後バックホーによる掘削工事を実施する。

工事数量は次のとおりである。

$$\text{施工延長： } L = 1,585 \text{ m}$$

(4) 排水路工事

a) タンビア地区排水路工事

支線排水路は全て打設であり、圃場均平工と並行してバックホーによる掘削を進める

工事数量は次のとおりである。

$$\text{施工延長： } L = 1,826 \text{ m}$$

b) コロカンディ地区排水路工事

既存排水路に対しては、バックホーによる堆積土、雑草除去等を行った後に計

画高の掘削を行う。新設路線に対しては圃場均平工と並行してバックホーによる掘削を進める。

工事数量は次のとおりである。

施工延長： $L = 1,158\text{m}$

(5) 道路工事

a) タンビア地区道路工事

支線道路は全て新設であるが、盛土工事は圃場均平工事時に心土を流用して実施する。十分な転圧、整形の後舗装用の砂利を10cmの厚さに散布する。工事にはブルドーザーを使用する。

工事数量は次のとおりである。

施工延長： $L = 2,351\text{m}$

b) コロカンディ地区道路工事

タンビア地区と同様に、盛土工事は圃場均平工事時に心土を流用して荒仕上げまで実施する。その後ブルドーザーによる転圧、整形を経て舗装用の砂利を10cm厚で散布する。

工事数量は次のとおりである。

施工延長： $L = 1,585\text{m}$

(6) ポンプ、送水管工事

タンビア地区では、取水用の揚水ホンプのための揚水ピット工事、揚水管工事、ポンプ据付工事、吐出水槽工事を実施する。揚水ピット工事は、河川側の導入箇所、導入パイプ及び揚水ピットからなり、特に導入箇所に対しては河川での工事となるので、土嚢等で十分な止水・排水を行ってコンクリート工事等を進める。揚水管工事は河川法面、道路及び山の斜面に敷設される事から、十分な埋設深の確保とアンカーブロック等の配置により安定施工を計る。吐出水槽に関しては、山の斜面に設置される事から法面崩壊、雨水流入に対して十分な対策を講じた上で工事を進める。

次に吐出水槽からファームポンドまでの送水管工事としては、 $\phi 300\text{mm}$ のコンクリートパイプの敷設とファームポンド工事が実施される。コンクリートパイプ敷設工事は山の斜面を通る区間と集落内を通る区間に大別されるが、いずれの区間でも十分な土被りとアンカーブロック等の設置による安全対策を施す。管理設

時の掘削では原則としてバックホーを使用するが急傾斜地、アンカーブロック設置箇所等では部分的に人力掘削も併用する。

工事数量は次のとおり

揚水管延長： L = 24m

送水管延長： L = 355m

(7) 普及・訓練施設工事

レケティ地区に建設される建屋2棟の工事は建設箇所の造成工事が終わった段階から開始する。訓練棟工事は基礎工事としてコンクリート柱のフーチング工事と床面の基礎コンクリート打設を実施する。次に柱工事、壁面工事、屋根工事、内装工事と順次実施し、最後に電気工事と外廻り工事を行って完了する。

実験棟工事は基礎工事としてコンクリート柱のフーチング工事とブロック壁下部の地中壁工事を実施する。引き続いて柱工事、壁工事、屋根工事、内装工事等を順次行い、最後に電気工事と外廻り工事を行って完了する。

尚、2棟の工事期間は訓練棟が3ヶ月、実験棟が5ヶ月程度と考えられる事から同時に開始し2棟並行して工事を進める。但し、造成・整地工事と道路工事及び電気、水道の外線工事（境界外）は行なわない。

工事数量は次のとおり

訓練棟： 建屋面積 120㎡（テラス含まず）、木造平屋建

実験棟： 建屋面積 112㎡（テラス含まず）、コンクリート造り2階建

6-2 工事費

タンビア地区、コロカンディ地区及びレケティ地区に対するパイロットインフラ整備事業の工事費は次のとおりである。

1. 総工事費

(1) 工事費	(¥)		
-タンビア地区		19,114,000	
-コロカンディ地区		12,189,000	
-レケティ地区		9,300,000	
	小計	40,603,000	— (a)
(2) 諸経費			
(a) × 20%		8,120,000	
	計	48,723,000	— (b)
(3) 予備費			
(b) × 10%		4,872,000	
	計	53,595,000	— (c)
(4) 工事諸費			
(c) × 5%		2,605,000	
	計	56,200,000	— (d)
(5) 供与機械費(ポンプ)		8,000,000	— (e)
(6) 総事業費			
(d) + (e)		64,200,000	

2. 地区別工事費

(1) タンビア地区直接工事費

タンビア地区の直接工事費内訳は次のとおりである。

工種	工事量	単価	工事費	備考
① 圃場整備工				
・A区分切盛土(ℓ=40.5m)	10,209.6m ³	2.08	21,236.00	
・B区分切盛土(ℓ=35.0m)	9,036.6m ³	2.35	21,236.00	
・均平工	11.6ha	1,234.57	14,321.01	

・畦畔工	2,384m	2.17	<u>5,173.28</u>
小計			62,066.29
② 灌がい施設工			
・灌がい用水路	2,230m	6.63	14,784.90
・インレット工 (Aタイプ)	53ヶ所	138.14	7,321.42
・インレット工 (Bタイプ)	26ヶ所	63.68	1,655.68
・進入路工 (Aタイプ)	23ヶ所	930.57	21,403.11
・進入路工 (Bタイプ)	13ヶ所	2.34	30.42
・進入路工 (Cタイプ)	5ヶ所	651.31	3,256.55
・進入路工 (Dタイプ)	2ヶ所	1.17	2.34
・道路横断工	13ヶ所	822.87	<u>10,697.31</u>
小計			59,152.21
③ ポンプ送水管工			
・ポンプピット工	1ヶ所		2,000.00
・揚水管工	24m	50.00	1,200.00
・吐出水槽工	1ヶ所		2,000.00
・送水管工	355m	50.00	17,750.00
・フェームポンド工	1ヶ所		<u>5,000.00</u>
小計			27,950.00
④ 排水路工			
・排水路	1,630m	12.03	19,608.90
・パイプカルバート	8ヶ所	337.87	2,702.96
・アウトレット工	79ヶ所	63.68	<u>5,030.72</u>
小計			27,342.58
⑤ 道路工			
・道路工	2,400m	12.09	<u>29,016.00</u>
小計			29,016.00
合計			F\$ 205,527.08

F\$ 205,527.08 × 93 円 = 19,114,000 円

(2) コロカンディ地区直接工事費

コロカンディ地区の直接工事費内訳は以下のとおりである。

工 種	工事量	単 価	工事費	備 考
① <u>圃場整備工</u>				
・表土扱 (ℓ=40m)	4,600㎡	3.67	16,882.00	
・A区分切盛土 (ℓ=40.5m)	4,500㎡	2.08	9,360.00	
・B区分切盛土 (ℓ=35.0m)	3,500㎡	2.35	8,225.00	
・均平工	9ha	1,234.57	11,111.13	
・畦畔工	2,469m	2.17	5,357.73	
小 計			50,935.86	
② <u>灌がい施設工</u>				
・灌がい用水路	1,560m	6.63	10,342.80	
・インレット工 (Aタイプ)	28ヶ所	138.14	3,867.92	
・インレット工 (Bタイプ)	50ヶ所	63.68	3,184.00	
・進入路工 (Aタイプ)	23ヶ所	30.57	21,403.11	
・進入路工 (Bタイプ)	13ヶ所	2.34	30.42	
・進入路工 (Cタイプ)	3ヶ所	651.31	1,953.93	
・進入路工 (Dタイプ)	2ヶ所	1.17	2.34	
小 計			40,784.52	
③ <u>排水路工</u>				
・排水路	1,158m	12.03	13,930.74	
・パイプカルバート工	4ヶ所	337.87	1,351.48	
・アウトレット工	77ヶ所	63.68	4,903.36	
小 計			20,185.58	
④ <u>道路工</u>				
・道路工	1,585m	12.09	19,162.65	
小 計			19,162.65	
合 計			F\$ 131,068.61	

$$F\$ 131,068.61 \times 93 \text{ 円/F\$} = 12,189,000 \text{ 円}$$

(3) レケティ地区直接工事費

レケティ地区の直接工事費内訳は以下のとおりである。

工 種	工事量	単 価	工事費	備 考
① 訓練棟工				
・基礎工	1 式		7,000	
・上屋工	1 式		26,000	
小 計			33,000	
② 実験・機械管理棟工				
・基礎工	1 式		12,000	
・上屋工	1 式		55,000	
小 計			67,000	
合 計			100,000	

$$F\$ 100,000 \times 93 \text{ 円/F\$} = 9,300,000 \text{ 円}$$

(4) 単価表

工事費算出に用いた単価総括表及びその内容を表6-2、表6-3に示した。これらの単価は、現地調査で収集したものを基礎にし、不足するものについては日本の土地改良工事標準積算便覧やメーカー見積り等を参考にした。

(5) 供与資材費

タンビア地区で使用する水中ポンプ設備一式は、日本からの供与資材とする。その内訳は次のとおり

品 目	仕 様	数量	単 価	費 用
水中ポンプ	φ100, θ=1.8m ³ /min	2	800,000	1,600,000
発 電 機	20 KVA	1		2,500,000
起 動 盤		2	900,000	1,800,000
付 属 品		1 式		1,100,000
小 計				7,000,000 (FOB)
			→	8,000,000 (CIF)

表6-1 工事工程表

工 種	工 事 量	1990年					
		5月	6月	7月	8月	9月	10月
1. タンビア地区							
1) 仮設備・準備工	1式	—					—
2) 圃場整備工							
- A区分切盛土工		—	—	—	—	—	—
- B区分切盛土工		—	—	—	—	—	—
- 均平工	11.6ha						
- 畦畔工	2,384m						
3) 灌がい施設工							
- 灌がい用水路	2,230m						
- 付帯工	1式						
4) ポンプ・送水管工							
- ポンプ工	2台						
- 揚水管工	24m						
- 送水管工	355m						
5) 排水路工							
- 排水路工	1,630m	—	—	—	—	—	—
- 付帯工	1式						
6) 道路工	2,400m	—	—	—	—	—	—
2. コロカンディ地区							
1) 仮設・準備工	1式	—					—
2) 圃場整備工							
- 表土扱工	4.6ha	—	—	—	—	—	—
- A区分切盛土工							
- B区分切盛土工							
- 均平工	9.0ha						
- 畦畔工	2,469m						
3) 灌がい施設工							
- 灌がい用水路	1,560m						
- 付帯工	1式						
4) 排水路工							
- 排水路工	1,158m	—	—	—	—	—	—
- 付帯工	1式						
5) 道路工	1,560m	—	—	—	—	—	—
3. レケティ地区							
1) 仮設・準備工	1式	—					—
2) 訓練棟							
- 基礎工	160m ²	—	—	—	—	—	—
- 上屋工	112m ²						
3) 実験・機材棟							
- 基礎工	140m ²	—	—	—	—	—	—
- 上屋工	112m ²						

表6-2 単価一覧表

番号	名 称	単位	単価 (P\$)	備 考
1	表土扱工、 $\ell = 40\text{m}$	m ³	3.67	t = 10cm
2	切盛土工、 $\ell = 65\text{m}$	m ³	3.10	t = 10cm
3	切盛土工、 $\ell = 40.5\text{m}$	m ³	2.08	t = 10cm
4	切盛土工、 $\ell = 35\text{m}$	m ³	2.35	t = 10cm
5	均平工	ha	1,234.57	
6	道路工	m	12.09	
7	用水路工	m	6.63	
8	排水路工	m	12.03	
9	パイプカルバート工、 $\phi 300$	ヶ所	337.87	
10	パイプカルバート工、 $\phi 450$	ヶ所	404.57	
11	インレット工、Aタイプ	ヶ所	138.14	
12	インレット工、Bタイプ	ヶ所	63.68	
13	アウトレット工、Aタイプ	ヶ所	138.14	
14	アントレット工、Bタイプ	ヶ所	63.68	
15	進入路工、Aタイプ	ヶ所	930.57	
16	進入路工、Bタイプ	ヶ所	2.34	
17	進入路工、Cタイプ	ヶ所	651.31	
18	進入路工、Dタイプ	ヶ所	1.17	
19	畦畔工	m	2.17	
20	用水路横断工	ヶ所	822.87	
21	ファームpond工	ヶ所	10,694.30	
22	送水管工	m	36.78	
23	吐出水槽工	ヶ所	1,507.97	
24	吸水槽工	ヶ所	1,529.42	

表6-3 単価明細表

1号単価 表土扱い工 1 m²当り (ℓ=40m t=10cm)

名 称	数 量	単 位	単 価	金 額	備 考
1. 表土集積 1 m ² 当り			F\$	F\$	
1) 機械費 20.0m ³ /hr	0.05	hr	18.00	0.90	カドラー 11t級
2) 材料費					
軽油	0.57	ℓ	0.45	0.26	
油脂類 (軽油の20%)	1	式		0.05	
小 計				1.21	
2. 表土もどし、敷均し転圧 1 m ² 当り					
1) 機械費 19.4m ³ /hr	0.102	hr	18.00	1.84	カドラー 11t級
2) 材料費					
軽油	1.16	ℓ	0.45	0.52	
油脂類 (軽油の20%)	1	式		0.10	
小 計				2.46	
合 計				3.67	

2号単価 切盛土工 1 m²当り (ℓ=65m t=10cm)

名 称	数 量	単 位	単 価	金 額	備 考
1. 掘削・運土 1 m ² 当り			F\$	F\$	
1) 機械費 13.1m ³ /hr	0.076	hr	18.00	1.37	カドラー 11t級
2) 材料費					
軽油	0.86	ℓ	0.45	0.39	
油脂類 (軽油の20%)	1	式		0.08	
小 計				1.84	
2. 敷均し、転圧工 1 m ² 当り					
1) 機械費 19.4m ³ /hr	0.052	hr	18.00	0.94	カドラー 11t級
2) 材料費					
軽油	0.59	ℓ	0.45	0.27	
油脂類 (軽油の20%)	1	式		0.05	
小 計				1.26	
合 計				3.10	

3号単価 切盛土工 1 m³当り (ℓ=40.5m t=15cm)

名 称	数 量	単 位	単 価	金 額	備 考
1. 掘削・運土 1 m ³ 当り			F\$	F\$	
1) 機械費 22.0m ³ /hr	0.045	hr	18.00	1.37	カルダー 11t級
2) 材料費					
軽油	0.51	ℓ	0.45	0.39	
油脂類 (軽油の20%)	1	式		0.08	
小 計				1.84	
2. 敷均し、転圧工 1 m ³ 当り					
1) 機械費 24.3m ³ /hr	0.041	hr	18.00	0.74	カルダー 11t級
2) 材料費					
軽油	0.46	ℓ	0.45	0.21	
油脂類 (軽油の20%)	1	式		0.04	
小 計				0.99	
合 計				2.08	

4号単価 切盛土工 1 m³当り (ℓ=35m t=10cm)

名 称	数 量	単 位	単 価	金 額	備 考
1. 掘削・運土 1 m ³ 当り			F\$	F\$	
1) 機械費 22.3m ³ /hr	0.045	hr	18.00	0.81	カルダー 11t級
2) 材料費					
軽油	0.51	ℓ	0.45	0.23	
油脂類 (軽油の20%)	1	式		0.05	
小 計				1.09	
2. 敷均し、転圧工 1 m ³ 当り					
1) 機械費 19.4m ³ /hr	0.052	hr	18.00	0.94	カルダー 11t級
2) 材料費					
軽油	0.59	ℓ	0.45	0.27	
油脂類 (軽油の20%)	1	式		0.05	
小 計				1.26	
合 計				2.35	

5号単価 均平工 1ha当り

名 称	数 量	単 位	単 価	金 額	備 考
1) 機械費 0.027ha/hr	37.0	hr	R\$ 18.00	R\$ 666.00	カルドーザ 11t級
2) 人件費	28.5	人	12.00	342.00	
3) 材料費					
軽油	419.58	ℓ	0.45	188.81	
油脂類 (軽油の20%)	1	式		37.76	
合 計				1,234.57	

6号単価 道路工 1m当り

名 称	数 量	単 位	単 価	金 額	備 考
1. 盛土工 1m当り			F\$	F\$	
1) 機械費 36.4m ³ /hr	0.102	hr	18.00	1.84	カドザ- 11t級
2) 材料費					
軽油	1.16	ℓ	0.45	0.52	
油脂類 (軽油の20%)	1	式		0.10	
小計				2.46	
2. 敷均し、転圧工 1m当り					
1) 機械費 31.5m ³ /hr	0.112	hr	18.00	2.02	カドザ- 11t級
2) 材料費					
軽油	1.27	ℓ	0.45	0.57	
油脂類 (軽油の20%)	1	式		0.11	
小計				2.70	
3. 法面仕上工 1m当り					
1) 人件費 (普通作業員)	0.064	人	12.00	0.77	
2) 機械費	0.073	hr	21.5	1.57	法面整形附付
3) 材料費					バックホ-
軽油	0.69	ℓ	0.45	0.31	
油脂類 (軽油の20%)	1	式		0.06	
小計				2.71	
4. 道路敷砂利 1m当り					
1) 人件費 (普通作業員)	0.017	人	12.00	0.20	
2) 機械費	0.017	hr	18.00	0.31	カドザ- 11t級
3) 材料費					
砕石	0.30	m ³	12.00	3.60	
軽油	0.21	ℓ	0.45	0.09	
油脂類 (軽油の20%)	1	式		0.02	
小計				4.22	
合計				12.09	

7号単価 用水路工 1m当り

名 称	数 量	単 位	単 価	金 額	備 考
1. 盛土工	1.96	m ³	F\$ 0.70	F\$ 1.37	
2. 敷均し、転圧工	1.96	m ³	0.76	1.49	
3. 掘削工 1m当り					
1) 機械費 25.7m ³ /hr	0.04	hr	21.5	0.86	バックホー
2) 材料費					
軽油	0.38	ℓ	0.45	0.17	
油脂類 (軽油の20%)	1	式		0.03	
小計				1.06	
4. 法面整形工	1.0	m	2.71	2.71	
合計				6.63	

8号単価 排水路工 1m当り

名 称	数 量	単 位	単 価	金 額	備 考
1. 盛土工	1.74	m ³	F\$ 0.70	F\$ 1.22	カドラー 11t級
2. 敷均し転圧工	1.74	m ³	0.76	1.32	
3. 掘削工	3.19	m ³	1.04	3.32	
4. 法面仕上工	5.77	m ³	1.07	6.17	
合計				12.03	

9号単価 パイプカルバート工 (φ300) 1ヶ所当り

名 称	数 量	単 位	単 価	金 額	備 考
1. 掘削工、普通作業員	2.07	人	F\$ 12.00	F\$	
2. 基礎碎石敷	0.97	m ²	19.59	19.00	
3. 管敷設工					
特殊作業員	1.98	人	14.00	27.72	
普通作業員	2.49	人	12.00	29.88	
バックホー	1.81	hr	21.50	38.92	
軽 油	17.16	ℓ	0.45	7.72	
油脂類 (軽油の20%)	1	式		1.54	
コンクリート管 φ300	5.00	m	30.00	150.00	
接合材料 (管材の1.5%)	1	式		2.25	
小 計					
4. 防護コンクリート	0.18	m ²	200.00	36.00	
合 計				337.87	

10号単価 パイプカルバート工 (φ450) 1ヶ所当り

名 称	数 量	単 位	単 価	金 額	備 考
1. 掘削工、普通作業員	2.24	人	F\$ 12.00	F\$ 26.88	
2. 基礎碎石敷	1.05	m ²	19.59	20.57	
3. 管敷設工					
特殊作業員	1.94	人	14.00	27.16	
普通作業員	2.90	人	12.00	34.80	
バックホー	1.96	hr	21.50	42.14	
軽 油	18.56	ℓ	0.45	8.35	
油脂類 (軽油の20%)	1	式		1.67	
コンクリート管 φ450	5.00	m	40.00	200.00	
接合材料 (管材の1.5%)	1	式		3.00	
小 計					
4. 防護コンクリート	0.20	m ²	200.00	40.00	
合 計				404.57	

11号単価 インレット工 Aタイプ 1ヶ所当り

名 称	数 量	単 位	単 価	金 額	備 考
1. 掘削工、普通作業員	0.48	人	F\$ 12.00	F\$ 5.76	
2. PVCパイプ据付工					
1) 人件費					
特殊作業員	1.83	人	14.00	25.62	
普通作業員	0.82	人	12.00	9.84	
2) 材料費					
PVCパイプ φ150	6.00	m	12.00	72.00	
接合材料 (管材の1.5%)	1	式		1.08	
小 計					
3. 埋戻し、転圧 (人力)					
人件費、普通作業員	0.32	人	12.00	3.84	
インレットウォール	1		20.00	20.00	
合 計				138.14	

12号単価 インレット工 Bタイプ 1ヶ所当り

名 称	数 量	単 位	単 価	金 額	備 考
1. 掘削工、普通作業員	0.13	人	F\$ 12.00	F\$ 1.56	
2. PVCパイプ据付工					
1) 人件費					
特殊作業員	0.3	人	14.00	4.20	
普通作業員	0.33	人	12.00	3.96	
2) 材料費					
PVCパイプ φ150	2.0	m	12.00	24.00	
接合材料 (管材の1.5%)	1	人		0.36	
小 計					
3. 埋戻し、転圧 (人力)					
人件費、普通作業員	0.8	人	12.00	9.60	
インレットウォール	1		20.00	20.00	
合 計				63.68	

13号単価 アウトレット工 Aタイプ 1ヶ所当り

名 称	数 量	単 位	単 価	金 額	備 考
1. 掘削工、普通作業員	0.48	人	F\$ 12.00	F\$ 5.76	
2. PVCパイプ据付工					
1) 人件費					
特殊作業員	1.83	人	14.00	25.62	
普通作業員	0.82	人	12.00	9.84	
2) 材料費					
PVCパイプ φ150	6.00	m	12.00	72.00	
接合材料 (管材の1.5%)	1	人		1.08	
小 計					
3. 埋戻し、転圧 (人力)					
人件費、普通作業員	0.32	人	12.00	3.84	
アウトレットウォール	1		20.00	20.00	
合 計				138.14	

14号単価 アウトレット工 Bタイプ 1ヶ所当り

名 称	数 量	単 位	単 価	金 額	備 考
1. 掘削工、普通作業員	0.13	人	F\$ 12.00	F\$ 1.56	
2. PVCパイプ据付工					
1) 人件費					
特殊作業員	0.3	人	14.00	4.20	
普通作業員	0.33	人	12.00	3.96	
2) 材料費					
PVCパイプ φ150	2.00	m	12.00	24.00	
接合材料 (管材の1.5%)	1	式		0.36	
小 計					
3. 埋戻し、転圧 (人力)					
人件費、普通作業員	0.8	人	12.00	9.60	
アウトレットウォール	1		20.00	20.00	
合 計				63.68	

15号単価 進入路工 Aタイプ 1ヶ所当り

名 称	数 量	単 位	単 価	金 額	備 考
1. コンクリート管布設工			F\$	F\$	
1) 管据付工					
特殊作業員	1.98	人	14.00	27.72	
普通作業員	2.49	人	12.00	29.88	
コンクリートパイプ φ300	4.88	m	16.05	78.32	
接合材料 (管材の1.5%)	1	式		1.17	
2) 防護コンクリート					
基礎碎石敷工	0.468	m ²	19.59	9.16	
コンクリート工	1.41	m ²	200.00	282.00	
3) 埋戻し工 (人力)	1.36	人	12.00	16.32	
小 計				444.57	
2. 呑口、吐口工 *					
1) コンクリート工	1.90	m ²	200.00	380.00	
2) 鉄筋工	106.8	kg	0.63	67.28	
3) 均しコンクリート工	0.13	m ²	200.00	26.00	
4) 基礎碎石敷工	0.37	m ²	19.59	7.25	
小 計				480.53	
3. 護岸工	0.16	m ²	19.59	3.13	
4. 盛土工	1	式		2.34	
合 計				930.57	

16号単価 進入路工 Bタイプ 1ヶ所当り

名 称	数 量	単 位	単 価	金 額	備 考
1. 盛土工	1.60	m ²	F\$ 1.46	F\$ 2.34	
計				2.34	

17号単価 進入路工 Cタイプ 1ヶ所当り

名 称	数 量	単 位	単 価	金 額	備 考
1. コンクリート管布設工			F\$	F\$	
1) 管据付工					
特殊作業員	0.99	人	14.00	13.86	
普通作業員	1.25	人	12.00	15.00	
コンクリートパイプ φ300	2.44	m	16.05	39.16	
接合材料 (管材の1.5%)					
2) 防護コンクリート					
基礎碎石敷工	0.25	m ²	19.59	4.90	
コンクリート工	0.427	m ²	200.00	85.40	
3) 埋戻し工 (入力)	0.68	人	12.00	8.16	
小 計				166.48	
2. 呑口、吐口工					
1) コンクリート工	1.90	m ²	200.00	380.00	
2) 鉄筋工	106.8	kg	0.63	67.28	
3) 均しコンクリート工	0.13	m ²	200.00	26.00	
4) 基礎碎石敷工	0.37	m ²	19.59	7.25	
小 計				480.53	
3. 護岸工	0.16	m ²	19.59	3.13	
4. 盛土工	0.80	式	1.46	1.17	
合 計				651.31	

18号単価 進入路工 Dタイプ 1ヶ所当り

名 称	数 量	単 位	単 価	金 額	備 考
1. 盛土工	0.80	m ²	F\$ 1.46	F\$ 1.17	
計				1.17	

19号単価 畦畔工 1m所当り

名 称	数 量	単 位	単 価	金 額	備 考
1. 人力盛土、転圧工 10m当り			F\$	F\$	
普通作業員	0.084	人	12.00	1.01	
2. 法面仕上げ工 (人力)					
普通作業員	0.097	人	12.00	1.16	
計				2.17	

20号単価 用水路横断工 1ヶ所当り

名 称	数 量	単 位	単 価	金 額	備 考
1. コンクリート管布設工			F\$	F\$	
1) 管据付工					
特殊作業員	1.98	人	14.00	27.72	
普通作業員	2.49	人	12.00	29.88	
コンクリートパイプ $\phi 300$	4.88	m	16.05	78.32	
接合材料 (管材の1.5%)	1	式		1.17	
2) 防護コンクリート工					
基礎碎石敷工	0.50	m ²	19.59	9.80	
コンクリート工	0.88	m ²	200.00	176.00	
3) 埋戻し工 (人力)	1.36	人	12.00	16.32	
小 計				339.21	
2. 呑口、吐口工					
1) コンクリート工	1.90	m ²	200.00	380.00	
2) 鉄筋工	106.8	kg	0.63	67.28	
3) 均しコンクリート工	0.13	m ²	200.00	26.00	
4) 基礎碎石敷工	0.37	m ²	19.59	7.25	
小 計				480.53	
3. 護岸工	0.16	m ²	19.59	3.13	
合計				822.87	

21号単価 ファームpond工

名 称	数 量	単 位	単 価	金 額	備 考
1. 掘削工 (バックホー)	353.04	m ²	F\$ 4.00	F\$ 1,412.16	
2. 砕石工	7.95	m ²	20.00	159.00	
3. 均しコンクリート	4.70	m ²	200.00	940.00	
4. 鉄筋コンクリート	27.56	m ²	200.00	5,512.00	
5. 鉄筋	1,653.60	kg	0.63	1,041.77	
6. 埋戻し	239.60	m ³	4.00	958.40	
7. 伐開	144.20	m ²	12.00	72.00	
8. 普通作業員	60.00	人	10.00	600.00	
計				10,694.3	

22号単価 送水管工 1m当たり

名 称	数 量	単 位	単 価	金 額	備 考
1. 掘削 (バックホー)	0.99	m ²	F\$ 4.00	F\$ 3.96	
2. コンクリート管 (φ300 既設)	1.00	m	22.00	22.00	
3. サンドベッド	0.12	m ²	20.00	2.40	
4. 埋戻土	0.77	m ²	4.00	3.08	
5. 普通作業員	0.20	人	10.00	2.00	
6. 設置雑費 (1 ~ 5 の10%)	1.00	式		3.34	
計				36.78	

23号単価 吐出水槽工

名 称	数 量	単 位	単 価	金 額	備 考
1. 掘削工 (バックホー)	57.43	m ³	F\$ 4.00	F\$ 229.72	
2. 砕 石	1.26	m ³	20.00	25.20	
3. 均しコンクリート	0.32	m ³	200.00	64.00	
4. 鉄筋コンクリート	4.22	m ³	200.00	844.00	
5. 鉄筋	253.20	kg	0.63	159.52	
6. 埋戻し	12.11	m ³	4.00	48.44	
7. 工事雑費	1.00	式		137.09	
計				1,507.97	

24号単価 吸水槽工

名 称	数 量	単 位	単 価	金 額	備 考
1. 掘削工 (バックホー)	36.69	m ³	F\$ 4.00	F\$ 146.76	
2. 砕 石	1.26	m ³	20.00	25.20	
3. 均しコンクリート	0.32	m ³	200.00	64.00	
4. 鉄筋コンクリート	3.77	m ³	200.00	754.00	
5. 鉄筋	226.20	kg	0.63	142.06	
6. 埋戻し	14.59	m ³	4.00	58.36	
7. 工事雑費	1.00	式		200.00	
8. 工事雑費	1.00	式		139.04	
計				1,529.42	

6 - 3 工事仕様書

1. 工事請負契約書 (案)

CONTRACT

ON

THE PILOT INFRASTRUCTURE IMPROVEMENT WORKS

FOR

THE IMPROVEMENT OF RICE CULTIVATION TECHNOLOGY PROJECT

April 1990

JAPAN INTERNATIONAL COOPERATION AGENCY

CONTRACT

on

The Pilot Infrastructure Improvement Works

for

The Improvement of Rice Cultivation Technology Project

This Contract is made entered into this ____ day of _____ 1988 at the JICA Suva Office between Japan International Cooperation Agency, Suva Office by _____, Title _____ as its authorized representative of the Fiji Office, hereinafter called "The JICA" of the one part, and _____ whose office is situated at _____ Represented by _____, Title _____ hereinafter called "The Contractor" of the other part.

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

Article - 1 (a) (Description of Work)

Contractor shall carry out the construction of Pilot Farm in Tabia and Korokadi areas and Extention Training House at Dreketi Project for the Pilot Infra-structure Improvement Works.

Article - 1 (b)

The following documents shall be deemed to form, be read and constructed as port of this agreement viz:-

- i) Bill of quantities (itemized statement)
- ii) The attached construction drawings
- iii) The attached specification

Article - 2 (Contract Sum of Construction)

The contract sum of construction shall be F\$ _____
(_____)
and be based on the bill of quantities attached here.

Article - 3 (Time Limit on Construction and its Prolongation)

The Contractor shall start work within ten (10) days of signing by both parties of this agreement, and complete work by the ____ th of _____, 19 ____.

Article - 4 (Delays)

In a case where it is clear that the Contractor is failing to fulfill his obligations within the period referred to in the preceding Article. The Contractor shall inform the JICA of this as soon as possible and if the JICA agrees that the delay is due to such causes as natural calamity or others for which the Contractor is not liable, a reasonable extension of time shall be approved. In this case, the sum referred to in Article 15 shall not be collected.

Article - 5 (Process of carrying out of Work)

The Contractor shall carry out the work in accordance with the drawings and specification referred to in Article 1(b). And in cases where it is necessary for carrying out such work as is not mentioned therein for the purpose of promoting the present construction or for reasons of established practices, the Contractor shall carry out the said work under the direction of the JICA. In cases where the Contractor finds any doubt in the plans of construction, the Contractor shall ask the JICA for the necessary directions before commencing work

on that part for which there exists some doubt. The JICA must provide such information and details within seven (7) days of the written request from the Contractor.

Article - 6

The Contractor shall follow the direction of the JICA or the Engineer to be appointed by the JICA. As to materials for the construction, the Contractor shall use only those inspected and approved by the JICA or the Engineer appointed by the JICA. In cases where any defective work has been done as a result of such use of materials which have not been inspected by the Engineer. The Contractor shall be liable to change the materials or repair the work at his own responsibility. The construction shall be carried out in accordance with the proper technique and durability shall be the principal aim as regards to the construction.

Article - 7

As to the workman to be hired by the Contractor for the work, the Contractor shall assume the responsibility as entrepreneur or employer, as provided for by Laws and Regulations.

Article - 8 (Transfer of Right and Obligation)

The Contractor shall not assign or sublet to a third party the whole or part of the construction except in cases where the Contractor has obtained written approval from the JICA.

Article - 9 (Damages)

In cases where any damage is caused to the JICA or a third party, materials or buildings, through carelessness on the part of the Contractor during the course of work or transportation of materials, the Contractor shall be liable to repair or compensate such damage at his own expense by the date appointed by the JICA or the third party.

Article - 10

In case where the Contractor fails to repair or compensate such damages referred to in the proceeding Article by the fixed date, the JICA may pay for such repair on behalf of the Contractor and collect compensation from the Contractor by deducting the amount from the sum of construction to be paid to the Contractor under the provisions of Article 20, and in cases where the damages exceed the sum of construction, the JICA may collect the deficit.

Article - 11(a) (Change of Construction Drawing and Submission of Necessary Documents)

In cases where the JICA feels it necessary to discontinue work owing to unavoidable circumstances or to alter the plan of construction, the JICA may request the Contractor to calculate, on the basis of the unit prices as detailed in the priced bill of quantities referred to in Article - 2, as increase or decrease in the sum of construction resulting from the suspension or alteration of the work and the Contractor shall comply with the request. When the JICA orders such a suspension or alteration, depending on the statement of the above mentioned calculation, the Contractor shall submit a written consent by the date appointed the JICA.

Article - 11(b)

Where additional work cannot be properly measured and valued on the basis of the unit price in the bill of quantities referred to in Article - 2, the Contractor shall be allowed daywork rates in accordance with a written consent by the JICA .

Article - 12 (Price Adjustment)

(a) In the case of the costs of materials rising sharply as a result of the fluctuation in the market prices due to an unexpected change in the economic conditions, a reasonable adjustment of the above mentioned sum or the contents of the work, will be made according to a mutual agreement between the JICA and the Contractor.

(b) In a case where the Contractor incurs loss or suffers loss unreasonably in some item of Bill of quantities due to the JICA's failure to provide the information and details referred to in Article - 5 of the particular item or work, then reasonable adjustment of the above mentioned losses shall be considered by the JICA on the detailed claim submitted by the Contractor.

Article - 13 (Right to Rescind Contract and Penalty)

In cases where the Contractor fails to fulfill his obligations under this contract, the JICA may rescind the whole or part of the Contract. In such a case, the JICA may collect from the Contractor a sum as a penalty of 10 percent (10%) of the amount which is equivalent to the rescinded. In cases where the damages caused on the JICA, on account of the non-fulfillment of contract by the Contractor, exceed the sum referred to in the

preceding paragraph, the JICA may further demand the Contractor to pay the excess.

Article - 14

In cases other than provided for in the preceding Article where the Contractor fails to fulfill his obligations, or in cases where the fulfillment of obligation by the Contractor is regarded to be difficult, the JICA may have a third party fulfill, at the cost of the Contractor, the whole or part of the obligations of the Contractor. Even if liability of the Contractor exceeds the contract sum referred to in Article - 2 in consequence of this, the Contractor may not raise any objection to it.

Article - 15

In cases other than provided for in Article 13, where the Contractor fails to complete the construction at his own responsibility, within the period referred to in Article - 3, the Contractor shall be liable, a period fixed by the JICA, to pay the JICA, per week of delay, a sum equivalent to 0.2 percent (0.2%) of the contract sum referred to in Article - 2.

Article - 16 (Damages caused by Natural Calamity etc.)

In cases where serious damages occur to the completed part of the work, or the materials, tools etc., already carried into the field of construction, the Contractor shall promptly inform the JICA of the circumstances. If such damages are caused by a natural calamity, an earthquake, a flood, a civil war, a war, an epidemic, or a general/trade strike, rioting or other unavoidable reasons, for the occurrence of which no responsibility

can be attributed to either the JICA or the Contractor and it is admitted that the Contractor has paid the care of good administration to avoid the occurrence of such damages, the JICA shall be liable for the amount of the damages which shall be fixed through negotiations between the JICA and the Contractor.

Article - 17(a) (Inspection)

The work at any stage shall be subject to inspection to be conducted by the JICA or an inspector appointed by the JICA, in the presence of the Contractor and necessary labour and articles required for such an inspection shall be provided by the Contractor.

Article - 17(b)

In cases where the work fails to pass the inspection referred to in the proceeding paragraph, the Contractor shall carry out necessary repair at his own cost, under the direction of the JICA.

Article - 18 (Date of completion of construction
and obligation thereafter)

The date of completion of construction shall be regarded as that on which the final work, including removal of temporary constructions and cleaning, has passed the inspection referred to in Article - 17 and on that date the object of the total construction shall be delivered to the JICA by the Contractor. For a period of three (3) months thereafter, any defect in the construction, the cause of which is judged in the opinion of the JICA to be attributable to faulty or inadequate technique or materials employed by the Contractor, shall be immediately repaired or improved at the cost of the Contractor.

Article - 19(a)(Payment & currency)

The JICA shall pay to the Contractor in local currency as follows:-

Payment for the part of the work already completed shall be allowed by the JICA three times during the course of construction at the request of the Contractor, provided that it has passed the inspection referred to in Article - 17.

However, the amount of the payment shall be limited to ninety per cent (90%) of the work already completed. The final payment will be carried out within one month after the JICA receives the bill which will be submitted by the Contractor on or after the date of completion of construction referred to in the preceding Article.

Article - 19(b)

Ten per cent (10%) of the contract price shall be paid as advance payment for mobilization with order to commence, upon production of a refund bond or Bank Guarantee for the same amount as the said advance payment.

Article - 19(c)

This advance payment shall be adjusted from subsequent monthly bills by such sum as the proportionate to the monthly progress stated in the said bills.

Article - 19(d)

The refund bond or bank guarantee as provided in paragraph (b) here or shall be returned to the Contractor by the JICA upon the delivery of the works.

Article - 20 (Interest for the delay of payment)

In cases of the payment referred to in the preceding Article being delayed owing to a cause or causes attributable to the JICA, the Contractor may request the JICA to pay, per week of delay, a sum equivalent to 1.0 per cent (1.0%) of the bill sum on arrear of payment.

Article - 21(a) (Settlement of dispute)

If there arises any dispute with regard to this Agreement or the construction Drawings or Specification referred to in Article - 1(b) it will be settled by a mutual consultation between the JICA and Contractor.

Article 21(b)

Should it not be possible to reach a mutual agreement between the JICA and the Contractor on such dispute, then it shall be referred to an Arbitrator or Arbitrators acceptable to both the JICA and the Contractor and the decision of this Arbitrator or/of Arbitrators shall be binding on both the JICA and the Contractor.

The Conclusion of the Agreement:

Two copies of the Agreement shall be prepared with the signature of both parties affixed to each of the copies, one copy to be held by each party.

Date : _____

.....JICA

Mr. _____ , Resident Representative
JICA, Suva Office

.....Contractor

.....Witness

.....Witness

2. 工事仕様書 (案)

Specification

Section 1. General

Section 2. Earth Works

Section 3. Concrete Works

Section 4. Land Consolidation Works

Section 5. Irrigation Canal Works

Section 6. Drainage Canal Works

Section 7. Road Works

Section 8. Housing Works

Specification

Section 1. General

1-1. Application

1) This specification is applicable to "Construction of Pilot Farm at Tabia and Korokadi areas and Extention Training House at Dreketi Project in Fiji".

2) Quantity of main work

A) TABIA PROJECT (Pilot Farm)

- (i) Land Consolidation Works 11.6 ha
- (ii) Irrigation Facilities
 - Irrigation Canal 2,230 m
 - Submergible Pump 2 sets
- (iii) Drainage Facilities
 - Drainage Canal 1,630 m
- (iv) Road works
 - Farm road 2,400 m

B) KOROKADI PROJECT (Pilot Farm)

- (i) Land Consolidation Works 9.0 ha
- (ii) Irrigation Facilities
 - Irrigation Canal 1,560 m
- (ii) Drainage Facilities
 - Drainage Canal 1,138 m
- (iii) Road Works
 - Farm road 1,560 m

C) DREKETI PROJECT (EXTENTION TRAINING HOUSE)

- (i) Training House
- (ii) Laboratory and Storage House

3) Specifications entered in the drawing showing shall be treated in reference to this specification.

1-2. Engineer

"Engineer" means the engineer who was appointed to supervise the works by the JICA.

1-3. Site Representative

Site representative shall be well qualified in supervision or have enough experience of supervision. The Contractor shall submit career history of a site representative to the Engineer for his approval.

1-4. Work Schedule

The Contractor shall submit his work schedule before the commencement of the works at the job site. If the Contractor intends to change the work schedule, the approval from the Engineer shall be obtained prior to the modification of schedule.

Also the Contractor shall submit the machineries scheme including the numbers, and kind of machineries and using period of them.

1-5. Field Test and Inspection

The field tests in accordance with the specifications and the demands from the Engineer shall be the responsibility for the Contractor. The charges for such fields test shall be included in the total amount of the construction cost, and the Contractor is not entitled to claim any amount of the field test charges.

1-6. Temporary Office and Residence

In case the Contractor intends to build the temporary office, residence and so forth, the Contractor shall submit the plan to the Engineer for approval at least 10 (ten) days in advance of the commencement of such works.

The Contractor is required to always keep the buildings and facilities in good condition and to make proper drainage and sanitary system. Should the Contractor build them outside of the job site, the Contractor shall arrange with the owner of such land and at its own expense.

1-7. Record on Construction

The Contractor shall submit the record on whole progress of Construction every week to the Engineer.

1-8. Clearance of the Work Site

Upon completion of the works, the Contractor shall clear the site within period of construction.

Section 2. Earth Works

2-1. Scope

The work under this Section shall consist of all classes of grading, leveling, ditching, earthmoving, all other excavation, backfill, banking, surfacing and any other such construction work.

2-2. Clearing and Stripping

(1) Clearing

All areas to be cleared will be as designated on the Drawings and/or as directed by the Engineer. This work shall basically consist of clearing all vegetation, roots, brush, rubbish and other objectionable matter from the specified area to the satisfaction of the Engineer.

(2) Stripping

All the surfaces which are to be stripped will be as shown on the Drawings and/or as directed by the Engineer. This work shall basically consist of removing boulders, underground roots and other undesirable items to a depth as shown on the Drawings or as otherwise stipulated by the Engineer.

Materials obtained from stripping work shall be deposited in places approved by the Engineer. Stockpiled material shall be smoothed to a measurable outline and shall not be higher than that specified by the Engineer.

2-3. Excavation

(1) Excavation of all canals, ditches, pipelines and structure shall be in accordance with cross-section, line and grades shown in the drawings. Excavation operations shall be such that all suitable materials for embankment shall be separated from objectionable materials which are to be wasted.

(2) If the spontaneous landslide of the slope occurs or is expected to occur, the Contractor shall inform the Engineer without any delay and shall ask him how to deal with landslide.

(3) The excavation of the slope shall be finished with tools to have the gradient indicated in the drawings or by the Engineer.

(4) If the slope and the foundation of the canals, ditches, or the foundation of pipe, structures are over excavated, the Contractor shall backfill with gravel or other material approved by the Engineer at the Contractor's expense and the backfilled materials shall be compacted sufficiently.

2-4. Backfill and Fill

Backfill and fill shall be placed to the lines and dimensions as shown on the Drawings.

The materials to be used for backfill and fill shall be all classes of disposed or excavated materials available in-situ. The quality of such materials shall be approved by the Engineer and shall be free from any organic matter or other objectionable material such as large clods or stones, boulders, etc.

The material shall be handled and placed in such manner as to achieve favorable compaction and density. The method of placing, moisture controlling and compacting backfill and fill shall be subject to approval by the Engineer.

2-5. Embankment

Embankments shall be placed and trimmed to the lines and dimensions as shown on the Drawings. The materials to be used for embankment shall be all classes of disposed or excavated materials available in-situ. The quality of such materials shall be approved by the Engineer and shall be free from any organic matter or other objectionable material such as large clods or stones, boulders, etc. The material shall be placed in successive horizontal layers of loose material not more than 200mm in depth. Each layer shall be spread uniformly on a soil surface that has been moistened or aerated as necessary and scarified or otherwise broken up in such a manner that the fill will bond with the surface on which it is placed. The material shall be handled and placed in such manner as to achieve favorable compaction and density. The method of placing, moisture controlling, compacting and trimming of the embankment shall be subject to approval by the Engineer. The surface of the embankment shall be left 150mm above final grade to allow for settlement. After an adequate period approved by the Engineer, the Contractor shall return and fill in low spots, or scrape off high spots.

2-6. Disposal of Excavated Material

Excavated materials may be used for backfilling and/or embanking unless otherwise specified or directed by the Engineer. Excavated material in excess of requirements, shall be disposed of in the disposal area appointed by the Engineer. Waste material shall be piled by taking sufficient measures to avoid injury or damage to adjacent area and properties.

Section 3. Concrete Works

3-1. General

All concrete works shall be performed as established on the Drawing or directed by the Engineer. Unless specifically provided in this specification, the concrete shall be produced, transported, placed, cured, finished and tested in accordance with the ASTM and JIS provisions or equivalent standard approved by the Engineer.

3-2. Materials

(1) Cement

(i) Cement used in Concrete mixture shall be normal portland cement, properties of which shall be in accordance with ASTM-C150 and JIS-R5210 or equivalent standard approved by the Engineer.

(ii) Cement shall be reliable brand, good quality and absolutely dry.

(iii) The Contractor shall construct a water-proof cement storage shed at the job site, floor of which shall be higher than the ground surface at least 30 (thirty) cm.

(iv) The Contractor shall not keep cement at the job site more than 1 (one) month, and the storage period is counted from the date when the cement is transported from the manufacturing factory to the job site.

(v) During the course of construction, the Contractor shall not use cement for the works properties of which are changed, especially consolidated.

(2) Fine aggregate

(i) Fine aggregate shall be river sand that is clean and rigid without organic matter and other substance.

Fine aggregate shall have the properties as shown in following table.

Sieve No.	Percent Retained by Weight
4	0 - 5
16	25 - 40
100	93 - 97

The fineness modules shall be in the range from 2.30 to 3.00

(ii) The Contractor shall keep fine aggregate at clean and good drainage place, which shall be protect against the mixture with harmful substance such as clay, soil and so on.

(3) Coarse aggregate

(i) The Contractor shall use crushed stone as coarse aggregate which is rigid and endurable substance without organic and harmful materials.

(ii) Coarse aggregate shall have the grading as shown in the following table.

Sieve Size	Percent Retained by Weight
1"	0
3/4"	0 - 10
3/8"	45 - 80

(iii) Coarse aggregate shall be stored in such manner as to avoid inclusion of foreign materials. All coarse aggregate

shall be maintained in saturated moisture content and surface dry conditions.

(4) Water

(i) Water used in Concrete shall be clean free from oils, acid, alkali or other matters detrimental to the quality or durability of the concrete.

(ii) Water shall be stored in tanks and not to be exposed to the direct rays of the sun.

3-3. Mixing Design of Concrete

Concrete shall have the proportion as follows:

Class	Compressive	Mixing portion	
	Strength 28 days	Cement:Fine A: Coarse A	Slump
Reinforce concrete	$f'c=210$ kg/cm	1:2:3 (by volume)	8 - 12 cm
Plain concrete	$f'c=160$ kg/cm	1:3:6 (by volume)	8 - 12 cm
Lean concrete	-	1:4:6 (by volume)	

Fine A : fine aggregate

Coarse A : coarse aggregate

Other proportions for mixed design may be indicated by the Engineer at the job site, if it is necessary.

3-4. Slump Test

The Contractor shall make slump test in each batch in accordance with JIS 1101. In case the Contractor intends to place concrete, the Contractor shall not pour the concrete without prior inspection for the value of slump test by the Engineer. After the completion of the concrete Works, the Contractor shall submit the data of slump test to the Engineer.

3-5. Mixing the Concrete

The Contractor shall use a power-driven concrete mixer and quantities of cement, aggregate and water in concrete mixture shall be measured correctly in each time. The driving time for mixing concrete shall be more than 2 (two) minutes and less than 5 (five) minutes in order to make concrete with constant consistency and good quality. Take out from the concrete mixer, concrete shall be placed in the form within 30 (thirty) minutes. The concrete mixer shall be checked and cleaned every day and the Contractor shall remove concrete debris attached the concrete mixer.

3-6 Concrete Form Work

(1) Concrete form shall be rigid and strong enough to support the weight of concrete without deformation, and the Contractor shall make concrete form tightly in order to prevent water seepage from unsolid concrete.

(2) The Contractor may use wood form, plywood form and steel form, in any case surface of form shall be smooth and have no damage.

(3) In case the Contractor set up concrete form, the iron embedded within concrete to hold the form shall be cut at concrete surface.

(4) Before placing concrete, concrete form shall be inspected by the Engineer for correctness of size, good preparation and so on.

(5) Before placing concrete, the Contractor shall paint oil on inner side of concrete form for good separation between concrete and concrete form after solidness of concrete.

3-7. Placing Concrete

(1) Before placing concrete, the Contractor shall check and clean the floor and the surface of concrete form.

(2) After a batch of concrete is placed, the surface height of concrete in concrete form shall have same height in a block, and the height of placed concrete layer shall be less than 40 (forty) cm in each placing.

(3) The Contractor shall place concrete continuously into a look of structure such as wall, slab and so on.

(4) In case the new concrete is placed on solid concrete, the Contractor shall take out laitance, loose aggregate, low quality concrete on the surface of solid concrete.

3-8. Compaction of Concrete

After placing concrete, the Contractor shall compact concrete by using immersion type vibrator. Should the Contractor

intends to use another type of vibrator, the Contractor shall obtain the prior permission of the Engineer.

3-9. Curing

The Contractor shall cure concrete completely with water. If the Contractor intends to use curing chemical, the Contractor shall obtain the prior permission of the Engineer.

3-10. Reinforcing Bars

(i) Reinforcing bars which are used in reinforced concrete works shall be round bar or deformed bar in accordance with ASTM designation A-7-55 and A-141-55 or JIS G 3112, when the Contractor uses round bars, hook shall be provided as directed by the Engineer.

(ii) The equipment and tool which are to be used to cut, bend and manufacture shall be approved by the Engineer. Hot manufacturing of the reinforcing bar is not permitted.

(iii) Before the bar is erected, the surface of the bars and the surface of any metal supports shall be clean and free from all the dirt and deteriorates which in the opinion of the Engineer is objectionable.

(iv) The minimum coverage for all main reinforcing bars shall be 5 cm.

(v) Cutting and bending of reinforcing bars may be done in a shop or at the job site. All bending works shall be in accordance with the standard approved practice of the industry or by other approved machine methods. Radial for bend and hooks will be as per the detailed approved drawings.

(vi) Laps at joints of reinforcing bar shall have a length at least thirty times of the diameter of bar and shall be bound by steel wire.

Section 4. Land Consolidation Works

4-1 Scope

The work under this Section shall consist of clearing and stripping and grading works, all in accordance with the Drawing and these specifications or as directed by the Engineer.

4-2 Work Preparation

Prior to the work, the planned area shall be isolated from outside drainage to prevent the water coming in. During the work, surface water in the planned area shall be removed as much as practicable.

4-3 Clearing and stripping Work

(1) The Contractor shall conform the boundary of work area in attendance of the Engineer before the commencement of work and shall place boundary post, if necessary.

(2) Clearing and stripping work shall conform to the requirements specified under Section 2.

4-4 Earthmoving and Filling

(1) Primary earthmoving and filling shall be made within the planned area as a rule.

(2) Earthmoving and filling work shall conform to the requirements specified under Section 2.

(3) Slope surface shall be finished evenly with the grade given in the Drawings. Final grading shall be carried out using a bulldozer.

(4) In case of over-excavation, the Contractor shall dispose according to the instruction of the Engineer. Its cost shall be borne by the Contractor.

Section 5. Irrigation canal works

5-1 Scope

This Scope under this Section shall consist of excavation, embankment and relative structures for the irrigation canals, all in accordance with the Drawings and these Specifications or as directed by the Engineer.

5-2 Earth Work

Earth Work for irrigation canals shall be in accordance with Section 2.

5-3 Concrete Work

Where shown on the Drawings or as directed by the Engineer, the Contractor shall construct division and inlet works for the irrigation canals. Those structures shall be constructed in accordance with the applicable provision as Section 3 and the relevant Drawings.

Section 6. Drainage Canal works

6-1 Scope

The scope under this Section shall consist of excavation of canals and construction of the pipe culvert for drainage canal in accordance with the Drawings and Specifications or as directed by the Engineer.

6-2 Earth Work

Earth Work for drainage canals shall be in accordance with Section 2.

After banking operations are terminated the slope of banking shall be formed by means of slope tamping.

6-3 Pipe Culvert

Pipe culvert shall be made with locally manufactured concrete pipes. Concrete works shall comply with the descriptions of Section 3.

Section 7. Road Works

7-1 Scope

The scope under this Section shall cover the construction of farm road. The work shall include grubbing clearing embankment and excavation, all in accordance with the Drawings and these specifications, or as directed by the Engineer.

7-2 Earthwork

The earthwork needed for construction of the roads shall be conducted according to the applicable provisions of Section 2.

7-3 Earth Materials

The road base shall be formed with those earth materials as surplus in excavation of ditch, when those materials are appropriate or equivalent in quality to those found in borrow pits.

7-4 Compaction

The base of the embankment shall be compacted with bulldozer and thickness of one compaction shall be about 15 cm in spread. During compaction, water shall be sprinkled for keeping optimum moisture content of the materials.

Section 8. Housing Works

8-1 Scope

The scope under this Section shall cover the construction of Extension Training house in accordance with the Drawings and Specifications.

8-2 Earth work

The earthwork needed for construction of the foundation of those facilities above mentioned shall be conducted according to the applicable provisions of Section 2.

8-3 Concrete Work

The concrete work needed for construction of the foundation of those facilities above mentioned shall be conducted according to the applicable provisions of Section 3.

8-4 Brick Masonry

The work under this clause consists of all brick masonry work shown in the Drawings. Local products can be used and it shall be the first class. All bricks shall be laid after applying mortar.

8-5 Carpentry

The work under this paragraph consists of all carpentry work shown in the Drawings. Local timber can be used and it should be first class. The construction method shall conform to Fiji specifications.

3. 申請書(案)

平成 年 月 日

国際協力事業団

総裁 _____ 殿

フィジー事務所長

氏名 _____ 印

下記内容に対するパイロット・インフラ整備費の支給を申請する。

(1) プロジェクト名

(2) 工 事 名 タンビア地区、コロカンディ地区パイロット圃場整備工事及
びレケティ地区、普及・訓練施設建設工事

(3) 工 事 費 64,200千円(精算内訳参照)

(4) 工 事 内 容

(a) タンビア地区工事概要 11.6haの圃場造成、用排水施設及び農道の整備工事
等を行う。

i) 圃場整地工	圃場造成	11.6 ha
ii) 用水施設工	揚水管	30 m
	送水管	360 m
	用水路(開水路)	2,230 m
iii) 排水路施設工	排水路	1,630 m
iv) 道 路 工	農 道	2,350 m

(b) コロカンディ地区工事概要 9.0haの圃場造成、用排水施設及び農道の整備工事
等を行う。

i) 圃場整地工	圃場造成	9.0 ha
ii) 用水施設工	用水路	1,560 m
iii) 排水路施設工	排水路	1,138 m
iv) 道 路 工	農 道	1,560 m

(c) レケティ地区工事概要 普及・訓練施設の建設工事

i) 訓練・研修棟工事	A=160㎡	木造平屋建
ii) 実験・機材管理棟工事	A=140㎡	コンクリート造り2階建

(d) 工 期

平成 年 月 日 ~ 平成 年 月 日

(5) 申請の事由

4. 工事施工業者

フィジー国で比較的規模の大きい工事施工業者は次のとおりである。

圃場造成工事

- 1) Grayburn Construction Ltd.
Box 889, Suva
- 2) J S Hill & Associates Ltd.
Box 3105, Lami
- 3) Vanua Landscrapers
Box 4276, Samabula
- 4) Construction Equipment Hire Ltd.
Box 13831, Suva
- 5) Subhan & Sons
Box 375, Laiwaga
- 6) Ram's Construction Co.,Ltd.
Box 575, Labasa
- 7) Northern Civil Engineering Contractors Ltd.
Box 575, Labasa
- 8) Valebasoga Transport Ltd.
Box 528, Labasa
- 9) Afzal Industries
Box 50, Labasa
- 10) Mohammed Yakub Khan & Co.
Box 547, Loutoka

建築工事

- 1) Begg Construction Ltd.
Box 6132, Valelevu

付属資料

1. 調査団の構成

MEMBERS LIST

Field	Name	Title
Team Leader	Keizaburou NAGAYOSI	Director, Planning Dep., KANTOU Regional Agricultural Administration, Office, MAFF
Coordination	Noriharu USUKI	Deputy Head, Agricultural Development Div., Agricultural Development Cooperation Dept., JICA
Field Design	Yosizou MOCHIZUKI	Managing Director, Taiyo Consultants CO., LTD.
Facility Design	Ryosuke SAKANASHI	Civil Engineer, Overseas Dept. Taiyo Consultants CO., LTD.

2. 團長レター

JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)
DETAIL DESIGN SURVEY TEAM
FOR
THE IMPROVEMENT OF RICE CULTIVATION TECHNOLOGY PROJECT
IN FIJI

29, March, 1989

Mr. Tui Cavuilati
Acting Deputy Permanent Secretary
for Primary Industries and Project Director,
Ministry of Primary Industries,
SUVA

Re: The Pilot Infrastructure Improvement Works
for the Improvement of Rice Cultivation Technology Project

Dear Sir,

The Detailed Design Survey Team (herein after referred to as "The Team") has been organized by Japan International Cooperation Agency (hereinafter referred to as "JICA") for the purpose of formulating detailed Plan on the Pilot Infrastructure Improvement Works for the Improvement of Rice Cultivation Technology Project (herein after referred to as "The Project").

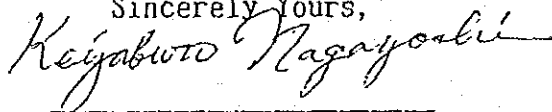
The Team has, so far, made a series of site reconnaissances and discussions with authorities concerned of Fiji as well as Japanese experts in order to determine the location and scale of the facilities. As the result, we would like to submit to you the Basic Plan as per the attached.

The team will proceed with your staff to conduct further field surveys and investigations at the site and make the detailed design on the basis of the result of those surveys. After the completion of the detailed design and assessment of its cost estimated by JICA, you will be informed of its result through the JICA Fiji office.

Further, for the timely commencement of the construction, we would like to ask you to take the necessary formalities in due consultation with the JICA Fiji office.

Lastly, We would like to express our appreciation for the kind cooperation of you and your staff during our stay.

Sincerely Yours,



Keizaburou NAGAYOSI

Team Leader

Detail Design Survey Team
for the Improvement of Rice
Cultivation technology
Project

c.c. Ministry of Foreign Affairs
Ministry of Finance
Embassy of Japan
JICA Fiji Office

BASIC PLAN
ON
THE PILOT INFRASTRUCTURE IMPROVEMENT WORKS

I. Objective

The Team has been dispatched for the purpose of formulating detailed plan on the Pilot Farm and Training facilities in Vanua Levu (Northern Island). Each have a role of the extension and demonstration in Northern Island on the results of rice cultivation technology which studied and developed in Koronivia Research Station.

The Pilot Farm was planned on the basis of the recommendation on MATSUYAMA Mission in 1987.

II. Outline of Pilot Infrastructure Improvement Works

The Team carried out the reconnaissance survey with Fiji officials concerned as well as Japanese experts, in accordance with the request.

The survey carried out taking into consideration the conditions of topography, irrigation and drainage, water source, etc.

Candidate areas were selected two sites as pilot farms in Tabia and Korokadi Valley, and one site as training center in Dreketi.

The result of survey is shown below.

III. Outline of Candidate Areas

1. Pilot Farm

(1) Tabia

About 40 hectares are utilized for rainfed paddy field, and Fiji government has a new development plan of about 80 hectares paddy field in the eastern adjoining area.

Existing paddy field is being kept at good condition for

farming, introduction of double cropping, therefore, shall be easy if irrigation water is prepared.

As the Pilot Farm, about 10 hectares shall be reclaimed newly. New reclaimed farm is considered to plan 0.4 hectare (1 acre) as a unit plot which equipped tertiary irrigation canal, drain, farm road, levelling and others.

Water source is Tabia river and a weir and intake canal are established for existing and new reclaimed paddy field for double cropping (120 hectares).

(2) Korokadi Valley

Korokadi project area is about 200 hectares, in which double cropping system is already introduced with a main canal and main drain. The area exist between a main drain which located in central low land and main irrigation canals which located on the both hill-foot.

About 8 hectares (20 acres) is selected as the Pilot Area which is a unit irrigable area of a division work. Consolidation works are levelling, tertiary irrigation canal, drain, farm road and others.

Unit plot is considered as existing wide.

2. Extension and Training facilities

Dreketi project area, which is the central area of rice production in Northern Island, is selected the lot for extension and training facilities of rice cultivation technology.

A part of hill area adjoining of the project office area is selected for the plot. Components of the Center are considered to be included lecture rooms, laboratory, showing room of achievement, etc.

3. Detailed Design

The detail engineering designs of the two pilot farms and the

training facilities will be prepared by the remaining two members after consultation with the Fiji side and the Japanese Expert Team.

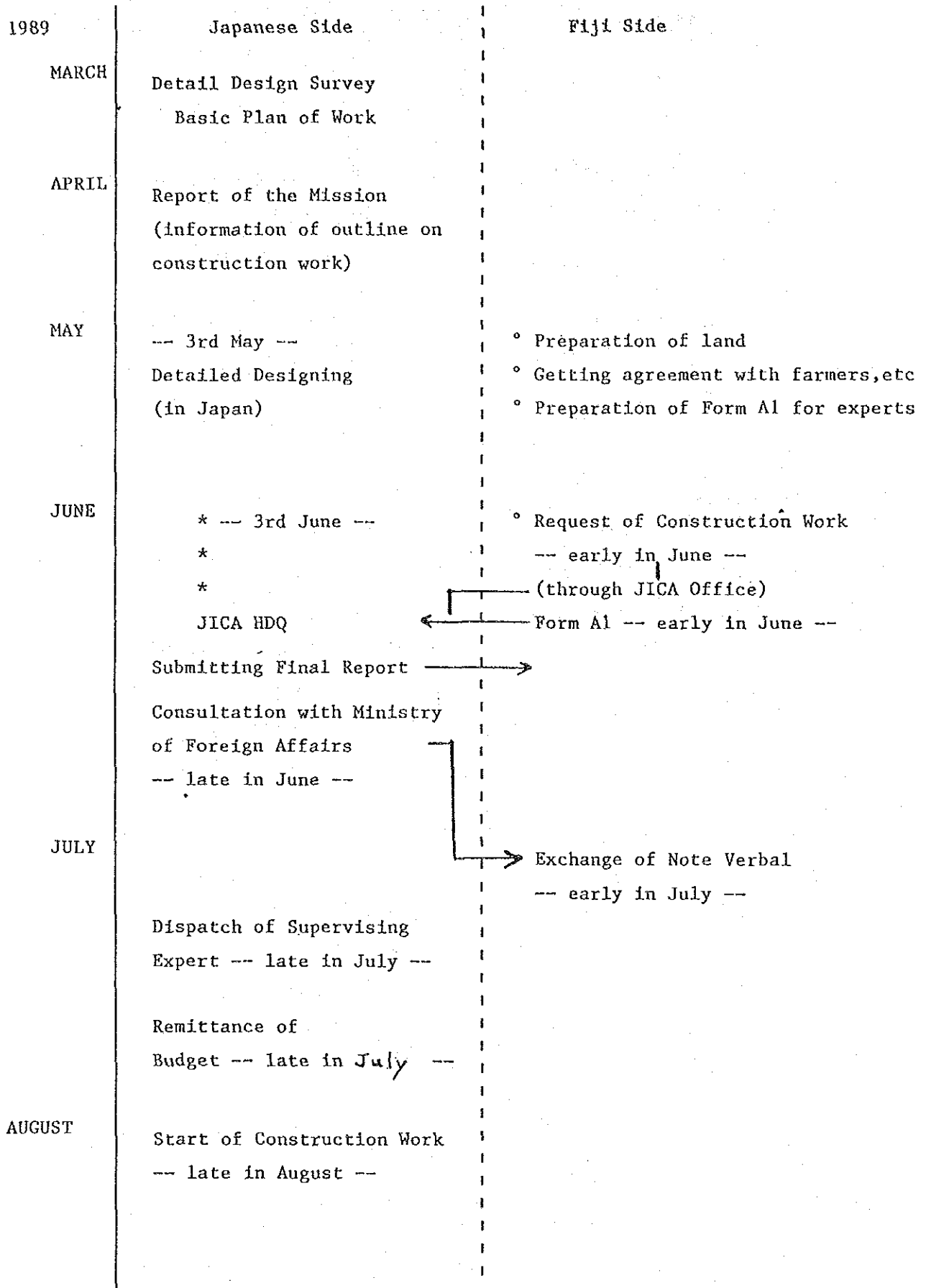
IV. Others

The Fiji Government should take the full responsibilities on the following items on the execution of the Pilot Infrastructure improvement Works.

- (1) to get agreement of the concerned farmers to be used as a pilot farm under the technical cooperation and other related areas for the construction works.
- (2) to handle any problem which arises during and after the construction works.
- (3) to prepare and consolidate the plot for Extension and Training facilities at Dreketi.
- (4) to arrange counterparts during the construction period.
- (5) to assign extension staffs of the Pilot farm and instructors for Training Center as full-time counterparts under the project.

Necessary measures is requested to the Fiji authorities for the procedure of the future programme.

OUTLINE OF THE TENTATIVE SCHEDULE ON PILOT
INFRASTRUCTURE IMPROVEMENT WORK



3. フィールドレポート

JAPAN INTERNATIONAL COOPERATION AGENCY

(JICA)

DETAIL DESIGN SURVEY TEAM

FOR

IMPROVEMENT OF RICE CULTIVATION TECHNOLOGY PROJECT

IN FIJI

May 1st, 1989

Mr J. Teaiwa
Actg. Permanent Secretary
Ministry of Primary Industries
SUVA

Dear Sir,

Re : FIELD REPORT OF THE DETAIL DESIGN SURVEY FOR THE
PILOT INFRASTRUCTURE IMPROVEMENT WORKS FOR THE
IMPROVEMENT OF RICE CULTIVATION TECHNOLOGY PROJECT.

The Detail Design Survey Team organized by JICA visited Fiji on March 21st, 1989 to carry out field works for above mentioned Project.

The Team has carried out necessary field survey and discussions with Fiji authorities concerned, as the result, we would like to submit to you attached Field Report.

In Japan we will prepare the Final Report of detail design and it shall be sent to you through JICA Fiji Office.

Finally we would like to express our appreciation for the kind co-operation of you and your staff during our stay.

Sincerely Yours,

.....
Keizaburo Nagayoshi
Team Leader
Detail Design Survey Team
for the Improvement of
Rice Cultivation Technology
Project.

Encls.

DETAILED DESIGN SURVEY
ON
THE PILOT INFRASTRUCTURE IMPROVEMENT WORKS
FOR
THE IMPROVEMENT OF RICE CULTIVATION
IN
FIJI

FIELD REPORT

MAY 1989

JAPAN INTERNATIONAL COOPERATION AGENCY

I GENERAL

Detail Design Survey Team has been dispatched from March 20 to May 3, 1989 to carry out the detail design survey for the Pilot Infrastructure Improvement Works in Fiji.

Survey Team has prepared Basic Plan , which based on a reconnaissance survey in Northern Division carried out at the first quarter of the survey term, and Fiji side agreed on it.

This Interim Report was compiled in accordance with the field survey, which shown in Basic Plan, by Team members of consultant engineers.

Consultant engineers explained on the Interim Report to Japanese organizations concerned in Fiji, and discussed with Fijian organizations concerned also.

Final Report shall be prepared till the end of June in Japan, and submitted to Fiji side.

II RESULT OF SURVEY1. Scope of Survey

Field survey carried out at following three sites, namely Tabia and Korokadi Valley for pilot area and Dreketi for extension and training facilities.

Scope of survey in each site are as follows,

(1) Tabia Pilot Area

- a) selection of intake site
- b) alignment of intake and main canal
- c) selection of pilot area (about 10ha)
- d) confirmation of soil and water

- (2) Korokadi Valley Pilot Area
- a) selection of pilot area (about 8 ha)
 - b) survey of actual conditions of irrigation and drainage
 - c) confirmation of soil
- (3) Drokoti Extension and Training Facilities
- a) selection and survey of plot
 - b) confirmation of foundation

2. Analysis of Survey Results

2-1 Tabia Pilot Area

(1) Acreage Concerned

Acreage of each concerning area are confirmed by the field survey as follows:

Project Area

existing paddy field	40.2 ha
fallow field	4.8
Total	45.0

Pilot Area

existing paddy field	5.7 ha
fallow field	4.8
Total	10.5

Planning Irrigable Area

project area	45.0 ha
undeveloped area	15.0
Total	60.0

Potential Area (Left bank)

potential area I (upper)	30.0 ha
" " II (lower)	55.0
Total	85.0

(2) Irrigation Canals

Main canal in the project area

open canal	825 ^m
pipeline	363
Total	1,188

Intake open canal 1,335^m(3) Intake Facilities

(1) In the survey three options were compared as an intake facility, namely weir No. 1, weir No. 2 and pumping station.

(2) Original proposal of Fiji side was weir No. 1.

This site of Weir No. 1 is located in a center of the alluvion of Tabia river, therefore both banks of the river are relatively low (EL(+) 1.60^m).

According to the calculation, planning water head in this point are needed EL(+) $6.17m$, therefore it is required to construct the weir No. 1 $6.53m$ high from the river bed and $30m$ in width, and the connecting dikes $370m$ long to both hillsides.

Intake canal between weir No. 1 and beginning point of the main canal is $595 m$ long.

(3) Weir No. 2 is a point of relatively short distance of both hillsides. In this point planning water head is EL(+) $6.67m$, therefore construction works required are the weir $6.21m$ high and $20m$ in width, connecting dikes $190m$ long and intake canal $1,335m$ long.

(4) Weir systems are anyway required so big construction works, therefore pumping system for an intake facility is studied as an option.

In the pumping system a farm pond (control reservoir) is needed, therefore maximum planning water head is required EL(+) 7.27m in P point.

Specification of pumps are as follows,

type	inclined type
actual head	6.77m
diameter	250mm
number	2 sets

In case of pumping system, weir, connecting dike and intake canal are naturally no needed, however maintenance cost is needed.

(5) Considerations

Construction cost of 3 options are shown attached table, needless to say, pumping system is drastically lower than weir systems in initial cost.

Survey Team recommends strongly the pumping system for Tabia Project.

In future when the potential area I and II in the left bank of Tabia river shall be developed, Tabia Project can be joined into the new project. In this case two pumping sets can, of course, be diverted to another project or purpose.

2-2 Korokadi Valley Pilot Area(1) Selection of Pilot Area

In accordance with the recommendation of the Irrigation Office and the agreement of farmers concerned, following 9.7 ha of 2 blocks with 5 farmers were selected for Korokadi Valley Pilot Area.

Block No. 1		4.7 ha
	1 - 1	K. Krishna
	1 - 2	H. Prasad
Block No. 2		5.0 ha
	2 - 1	F. Lal
	2 - 2	D. Narayan
	2 - 3	B. Narayan

(2) Existing Irrigation and Drainage

Korokadi Project Area is about 200 ha, in which double cropping system is already introduced with a main canals and main drain. Main drain is located in the central low land and main irrigation canals are located on the both hill-sides.

In the paddy fields, there are very few tertiary canals and drains, therefore distribution of irrigation water is very disparity.

Moreover, each plot has considerable undulation, therefore it makes deterioration of water disparity.

(3) Plan of Field Improvement

For the effective extension works by specialists, following improvement works are carried out in the pilot area.

- (a) levelling work
- (b) construction of tertiary irrigation canal and drains
- (c) construction of some farming roads

2-3 Dreketi Extension and Training Facilities

Topographical survey was carried out in the plot adjoining to the Office of Dreketi Irrigation Project to construct extension and Training facilities.

As the facilities one or two buildings including a training room, a laboratory, a display room and others, shall be designed after ground levelling.

The space of training room is considered for 20 peoples and attached instructors' room, warehouse for instruments.

Specification of the buildings, such as the building in Koronivia Station, is considered the block layer type with one or two stories.



TEL. NO. 312355

MINISTRY OF PRIMARY INDUSTRIES

P O BOX 1292 SUVA FIJI ISLANDS

REF. NO. DI 1/11

DATE :

Mr K Nagayoshi
Team Leader
Detail Design Survey Team
for the Improvement of Rice
Cultivation Technology Project
JICA

Dear Sir,

DRAFT FIELD REPORT : DETAIL DESIGN SURVEY FOR
PILOT INFRASTRUCTURE WORKS FOR THE IMPROVEMENT
OF RICE CULTIVATION TECHNOLOGY PROJECT

This is to advise you that the draft field report on the above project submitted by Messrs Hochizuki and Sakanashi today had been discussed. Those present during the discussion were the Acting Permanent Secretary for Primary Industries, Mr John Teaiwa, Acting Deputy Secretary, Mr T. Cavuilati, Director, (Drainage and Irrigation), Mr V. Nath, Principal Engineer (Drainage and Irrigation), Mr S. Swami and the consultants Messrs Hochizuki and Sakanashi.

During the discussion the following were agreed to:

- (a) The consultants prepare a preliminary engineering design for the option weir No. 2 site giving the cost estimates. This option will entail a command area of 150 ha on both banks of the Tabia River in Calaudrove.
- (b) The detail design for the proposed Pilot Infrastructure using the pumping system of irrigation be prepared with cost estimates. The area for the pilot infrastructure will now be in excess of 10.5 ha.
- (c) That the irrigation pumps be supplied with the spare parts to the value of about 12% to 15% of the pump and engine.
- (d) Korokadi
Prepare detail Engineering design with cost estimates as laid out in the draft report.
- (e) Dreketi
Prepare detail Engineering design with cost estimates as outlined in the draft report.

J. Teaiwa
J. Teaiwa

Actg. Permanent Secretary for Primary Industries

添付図面

TABIA PILOT PROJECT

- DRAWING NO. 1 General Plan
- DRAWING NO. 2 Pump Pit Work, Pipe Line Work and Outlet Box Work
- DRAWING NO. 3 Farm Pond Work, Drop Work
- DRAWING NO. 4 Inlet Works, Pipe Culvert, Outlet Work, Others
- DRAWING NO. 5 Typical Section
- DRAWING NO. 6 Tabia Head Work Plan

KOROKADI PILOT PROJECT

- DRAWING NO. 7 General Plan
- DRAWING NO. 8 Inlet Work, Pipe Culvert, Outlet Work, Others
- DRAWING NO. 9 Typical Section
- DRAWING NO.10 Drop Work

DREKETI PILOT FACILITIES

- DRAWING NO.11 Extention Training Center
- DRAWING NO.12 " " , Detail (1)
- DRAWING NO.13 Laboratory and Storage House
- DRAWING NO.14 " " , Detail (1)
- DRAWING NO.15 " " , Detail (2)

GENERAL PLAN (TABIA PILOT FARM)

NOTE



- LEGEND
- FIELD PLOT NUMBER
 - IC. NO. 1 IRRIGATION CANAL NO. 1
 - DC. NO. 1 DRAINAGE CANAL NO. 1
 - RD. NO. 1 ROAD NO. 1
 - PCI NO. 1 PIPE CULVERT (IRRIGATION) NO. 1
 - PCD NO. 1 PIPE CULVERT (DRAINAGE) NO. 1
 - IA-1 INLET (TYPE-A) NO. 1
 - IB-1 INLET (TYPE-B) NO. 1
 - O-1 OUTLET NO. 1

SCALE 1:1000

THE GOVERNMENT OF FIJI
 THE IMPROVEMENT OF RICE CULTIVATION
 TECHNOLOGY PROJECT

TITLE OF DRAWING
GENERAL PLAN
 (TABIA PILOT FARM)

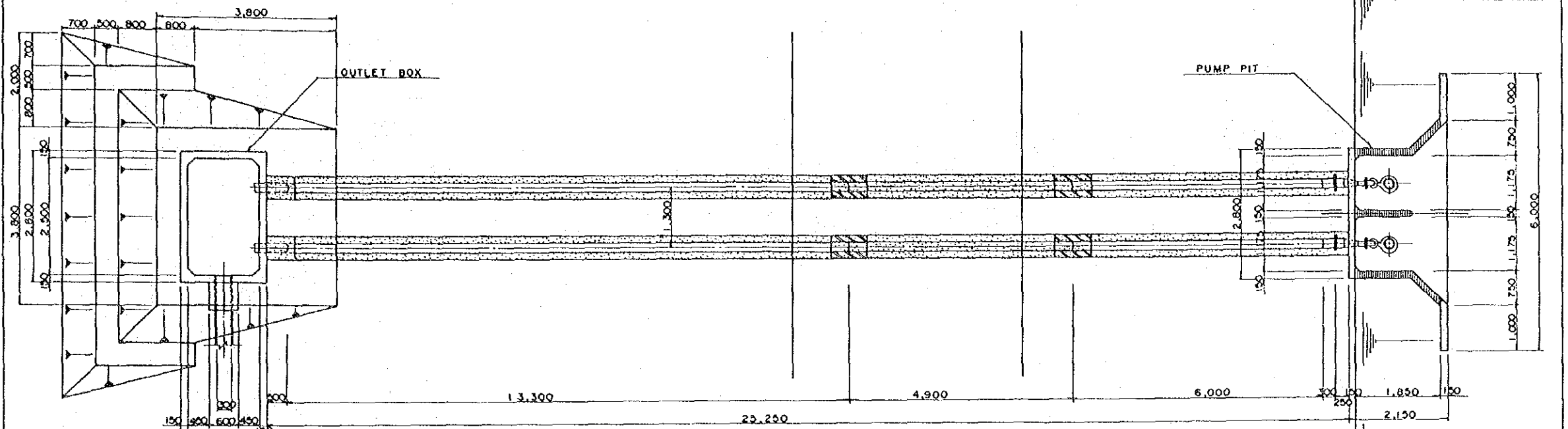
JAPAN INTERNATIONAL COOPERATION AGENCY
 TOKYO JAPAN

DWG. No.
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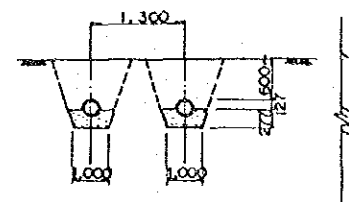
PIPELINE : PUMP ~ OUTLET BOX

NOTE

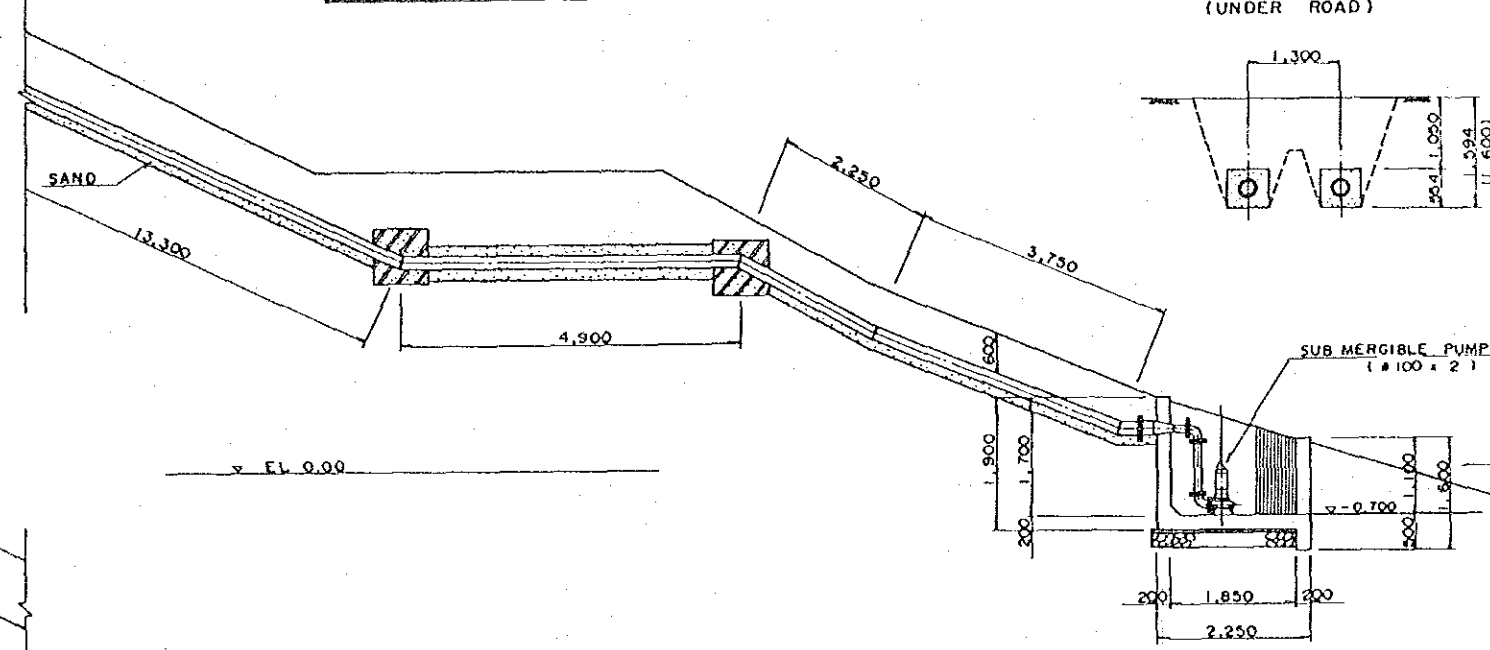
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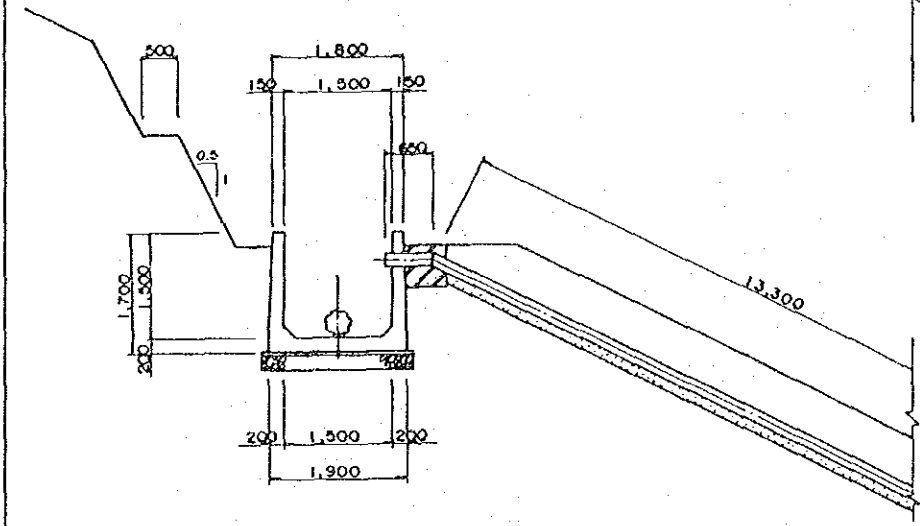
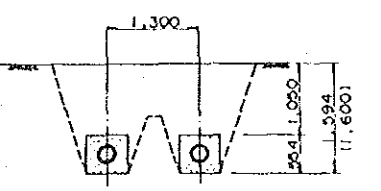
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CROSS SECTION



TYPICAL SECTION (UNDER ROAD)

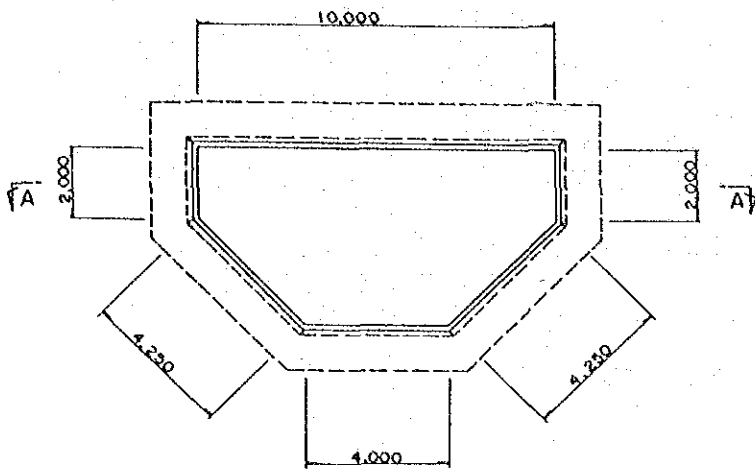


THE GOVERNMENT OF FIJI
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**PUMP PIT, PIPE LINE AND
 OUTLET BOX WORKS**
 JAPAN INTERNATIONAL COOPERATION AGENCY
 TOKYO JAPAN

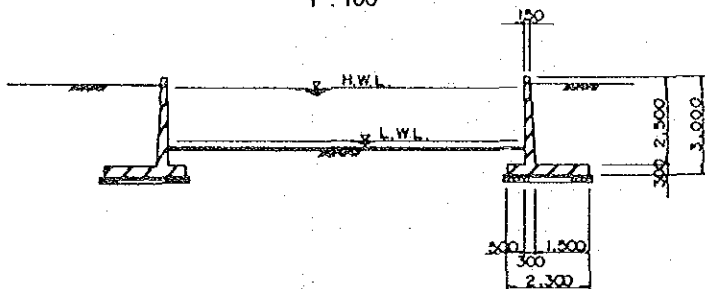
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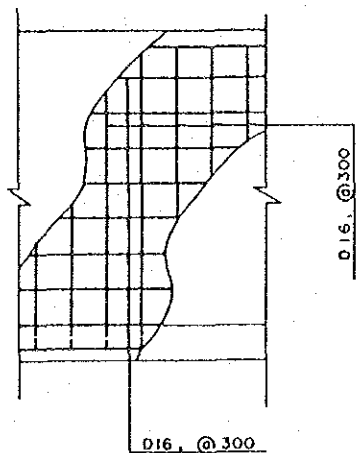
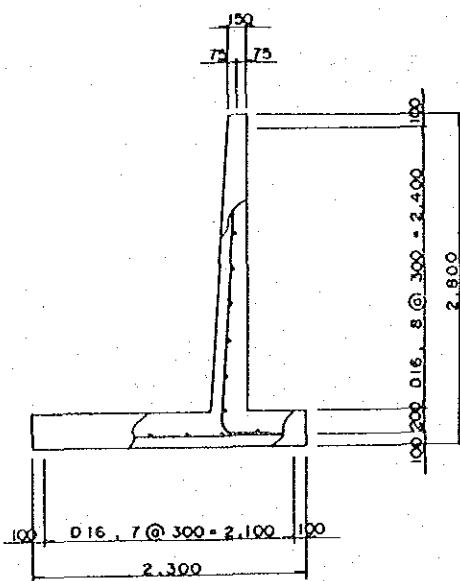
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SECTION A-A
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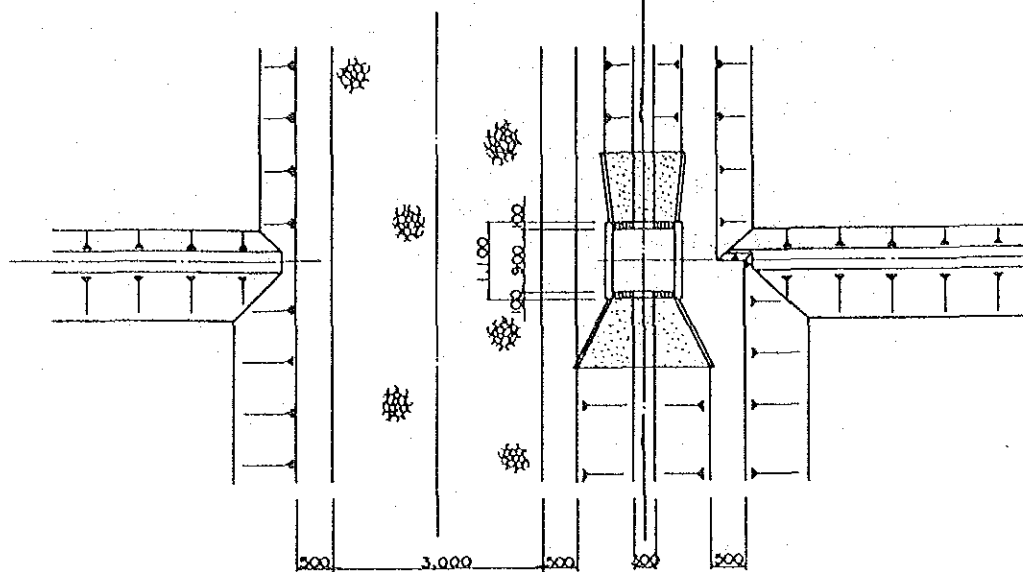


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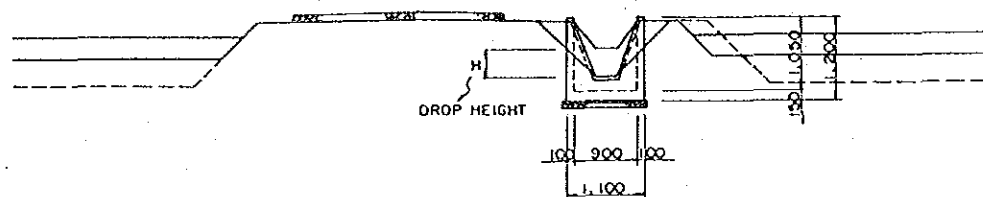


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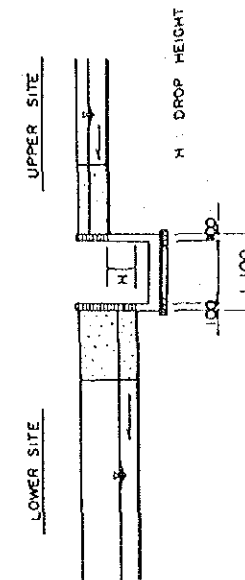
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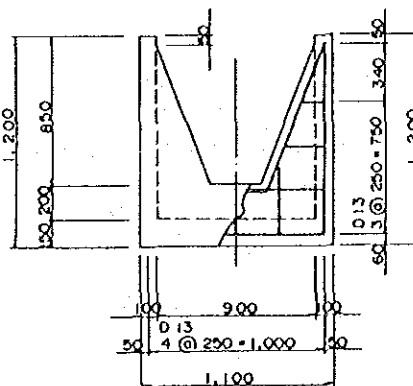


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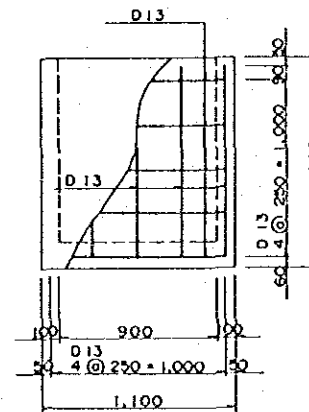


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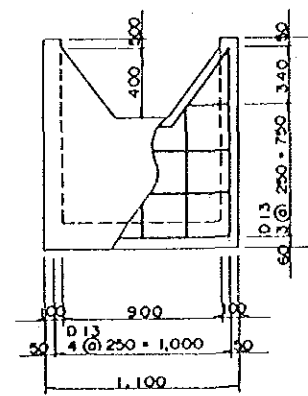
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SIDE SEC.



LOWER SEC.

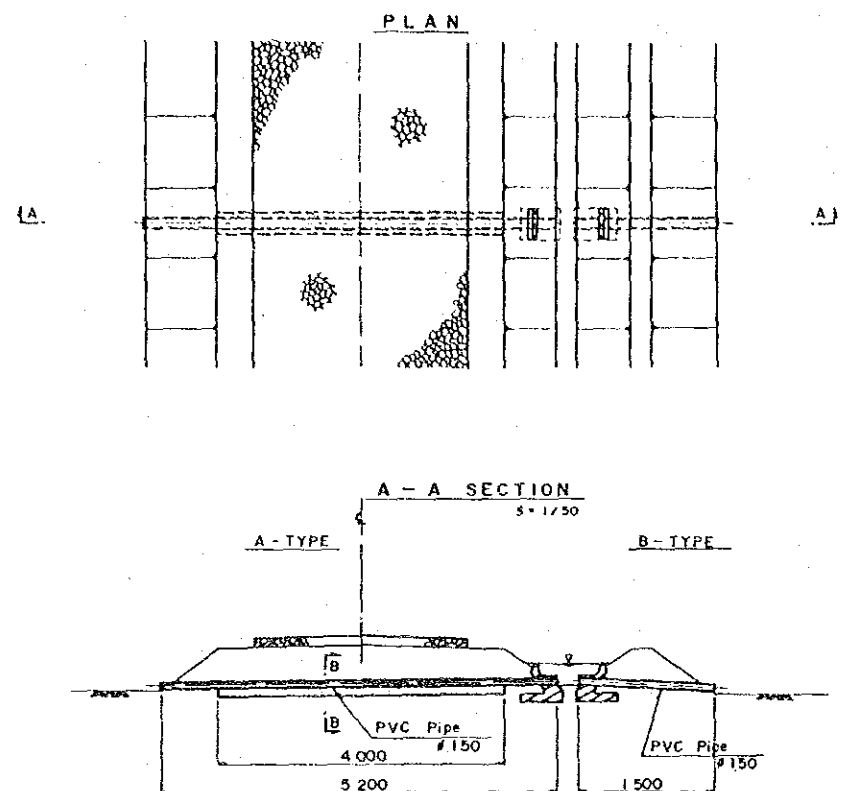


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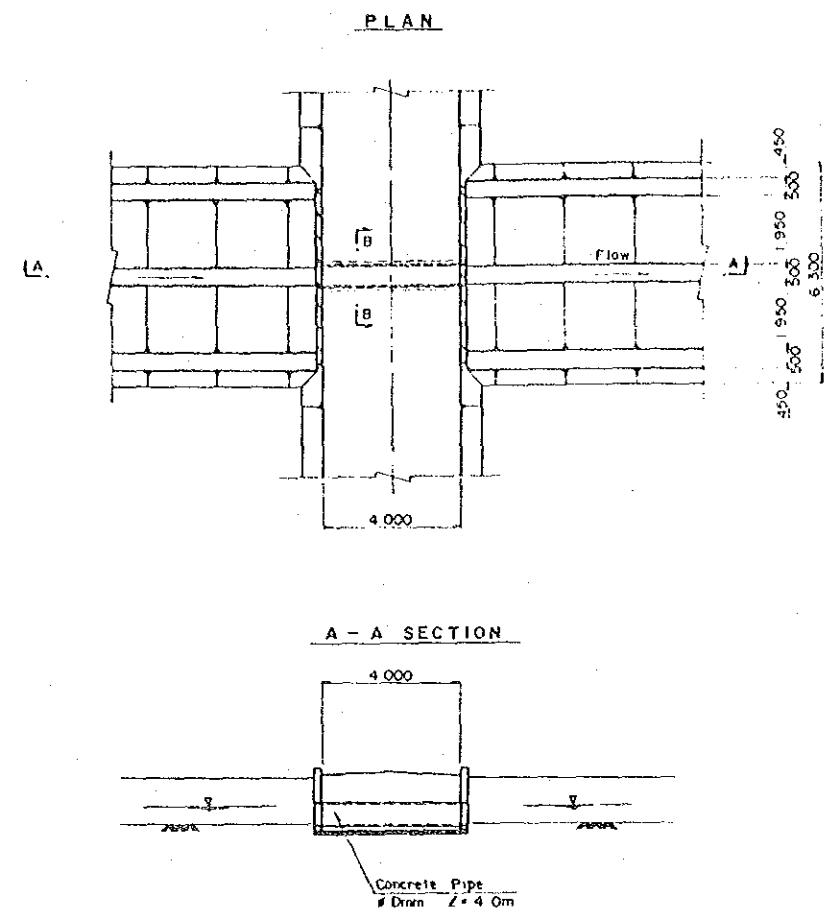
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THE IMPROVEMENT OF RICE CULTIVATION
TECHNOLOGY PROJECT
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TOKYO JAPAN
DWG.No.
3

NOTE

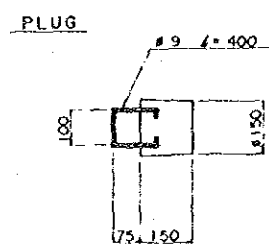
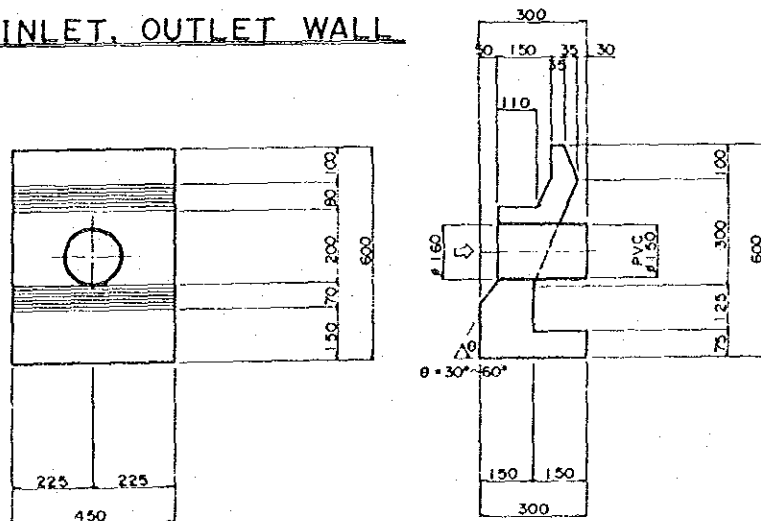
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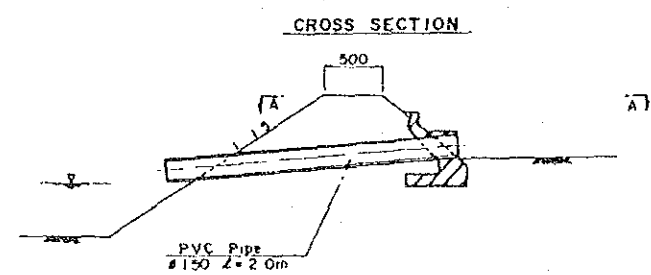
PIPE CULVERT S = 1/100



INLET, OUTLET WALL



OUTLET WORKS S = 1/30



THE GOVERNMENT OF FIJI
 THE IMPROVEMENT OF RICE CULTIVATION
 TECHNOLOGY PROJECT

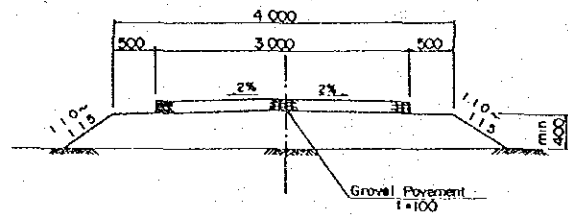
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**INLET WORKS, PIPE CULVERT
 OUTLET WORKS, OTERS**

JAPAN INTERNATIONAL COOPERATION AGENCY
 TOKYO JAPAN

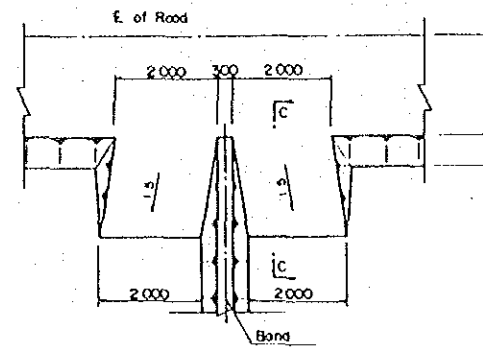
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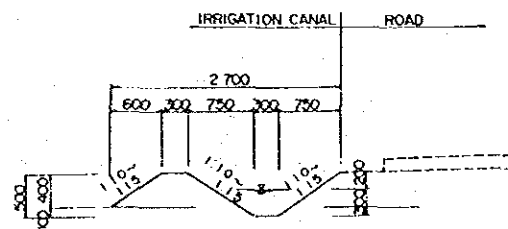
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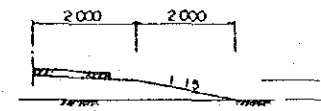
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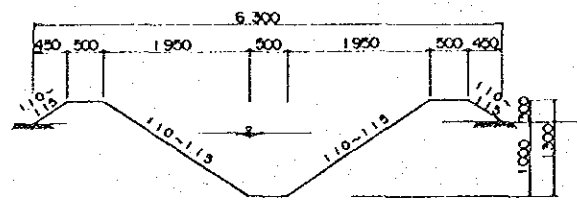
ACCESS TO PLOT



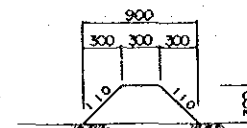
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C-C SECTION



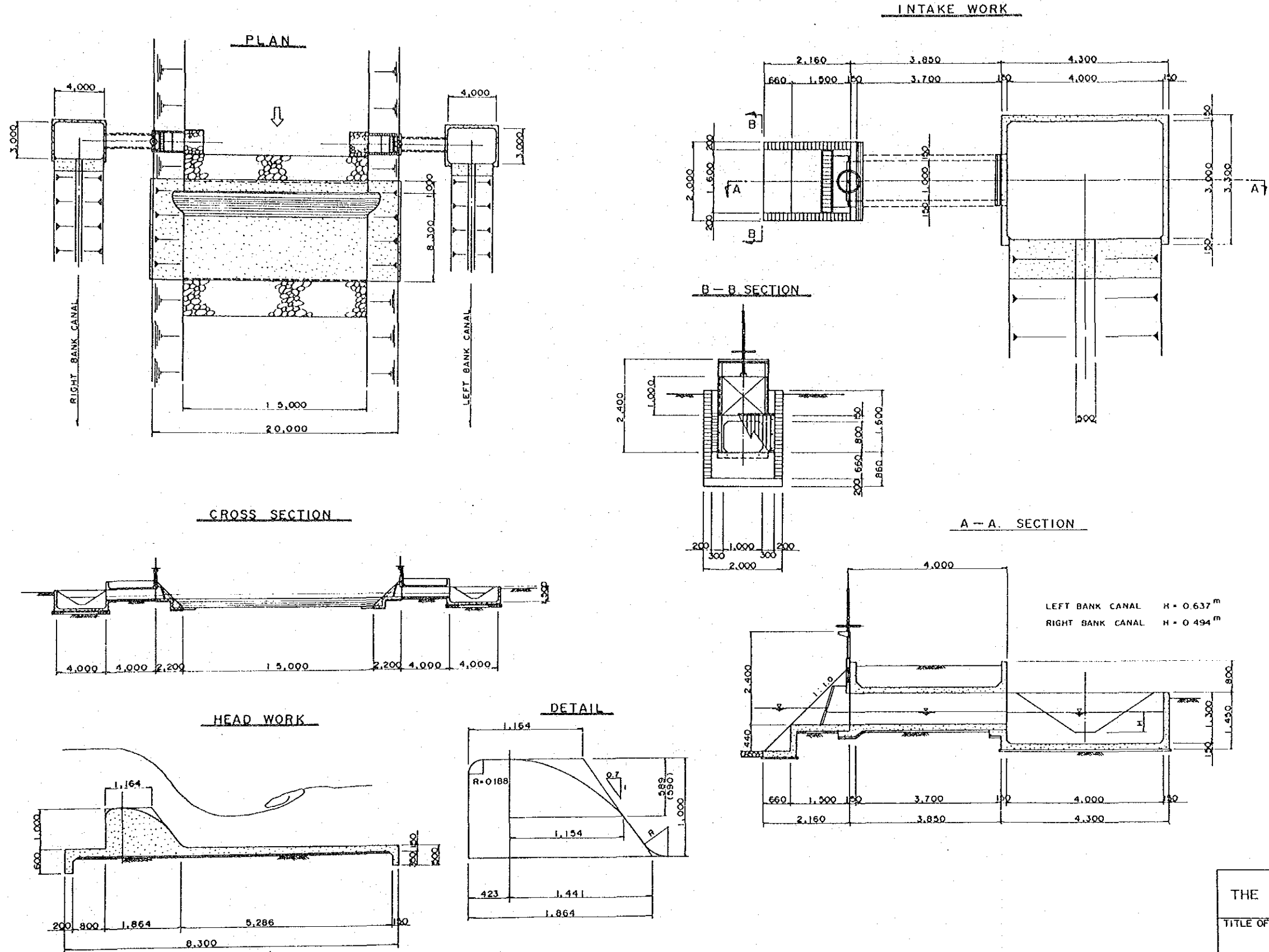
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FIELD BAND

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NOTE



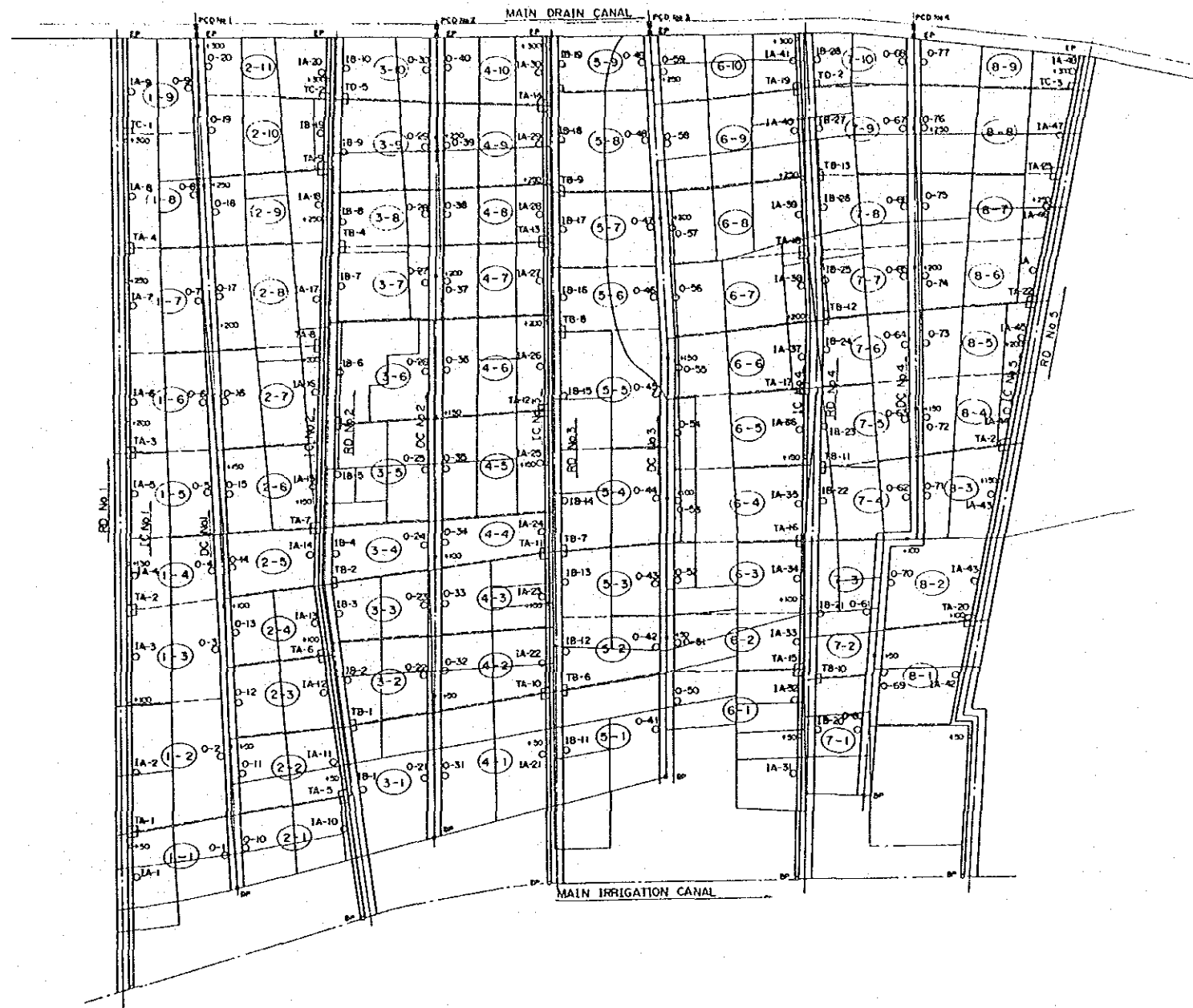
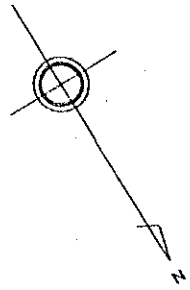
THE GOVERNMENT OF FIJI
 THE IMPROVEMENT OF RICE CULTIVATION
 TECHNOLOGY PROJECT

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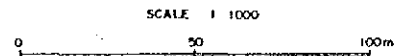
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 6

NOTE

GENERAL PLAN (KOROKADI PILOT FARM)



- LEGEND**
- FIELD PLOT NUMBER
 - IC No 1 IRRIGATION CANAL No 1
 - DC No 1 DRAINAGE CANAL No 1
 - RD No 1 ROAD No 1
 - RCD No 1 PIPE CULVERT (DRAINAGE) No 1
 - IA-1 INLET (A-TYPE) No 1
 - IB-1 INLET (B-TYPE) No 1
 - O-1 OUTLET No 1



THE GOVERNMENT OF FIJI
 THE IMPROVEMENT OF RICE CULTIVATION
 TECHNOLOGY PROJECT

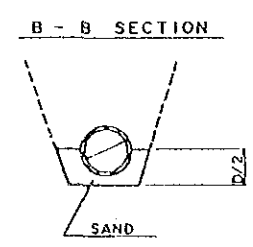
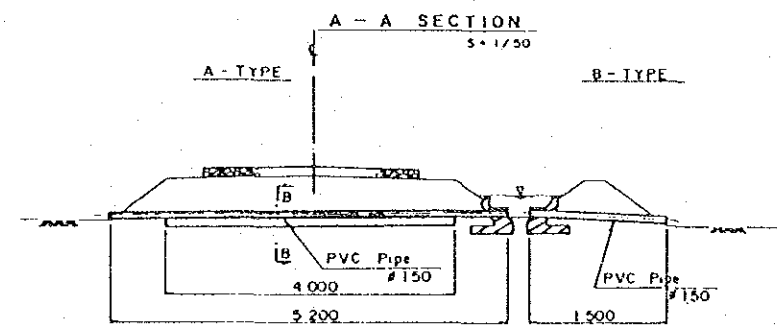
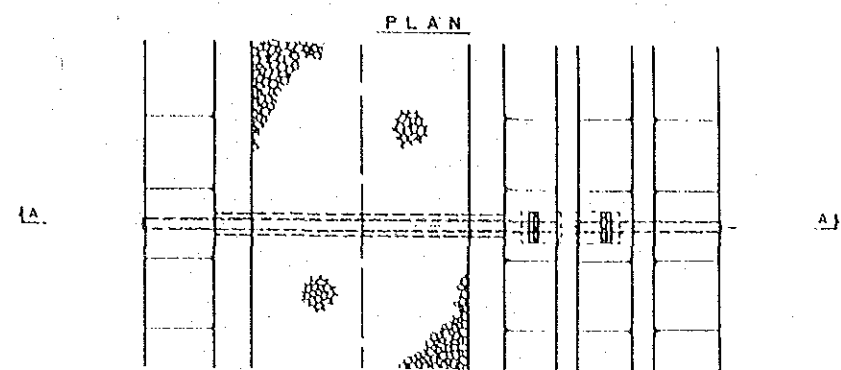
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 (KOROKADI PILOT FARM)**

JAPAN INTERNATIONAL COOPERATION AGENCY
 TOKYO JAPAN

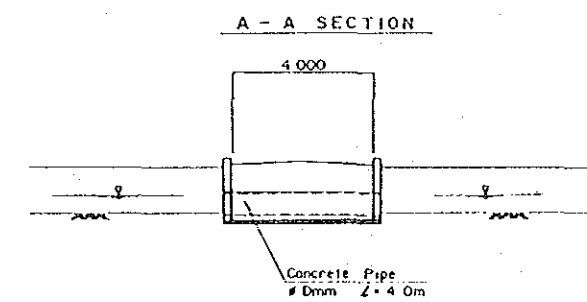
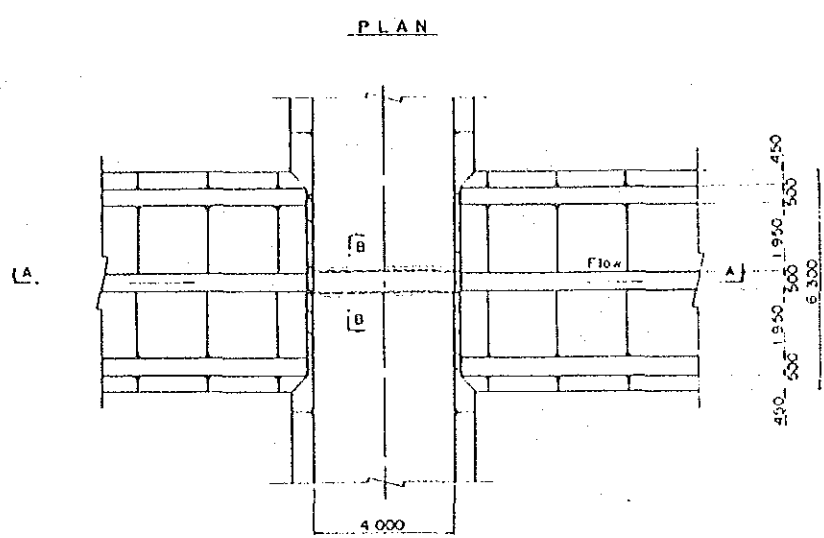
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NOTE

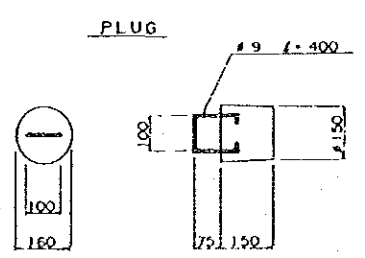
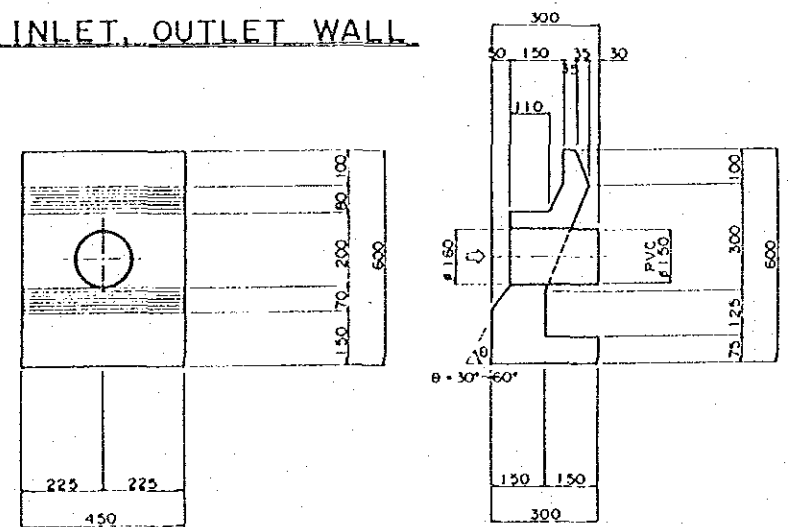
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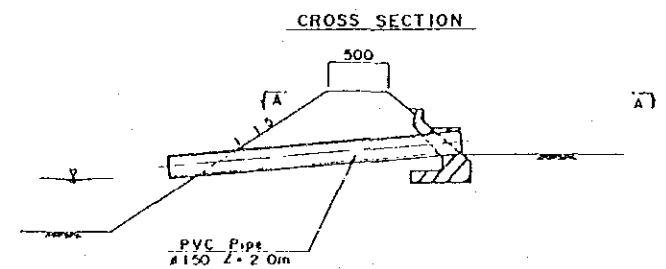
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INLET, OUTLET WALL



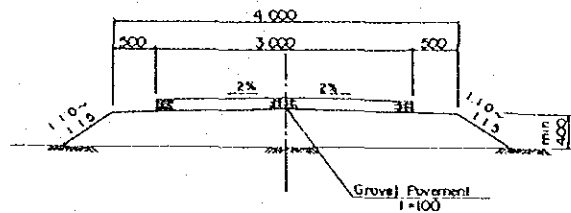
OUTLET WORKS S = 1/30



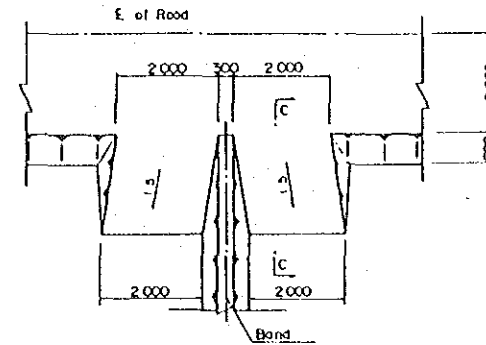
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JAPAN INTERNATIONAL COOPERATION AGENCY TOKYO JAPAN	DWG.No 8

NOTE

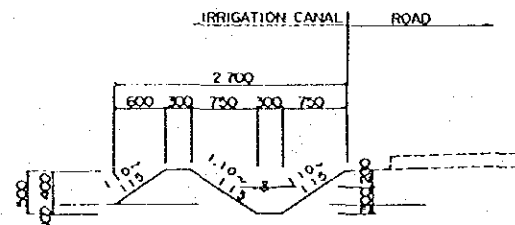
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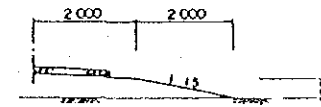
SECONDARY FARM ROAD



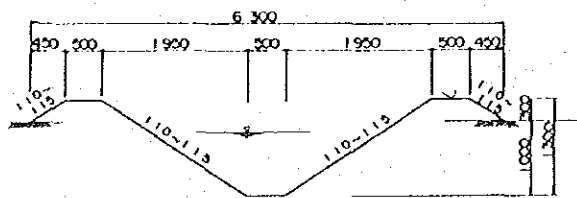
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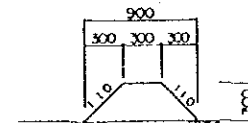
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C-C SECTION



SECONDARY DRAINAGE CANAL



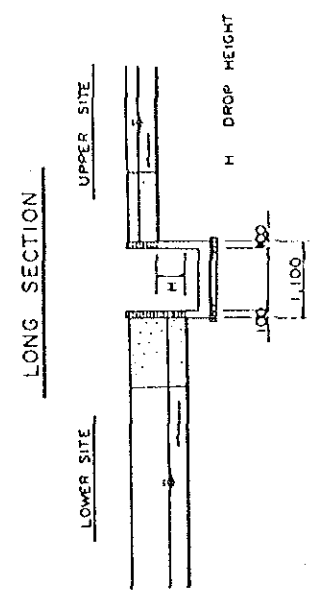
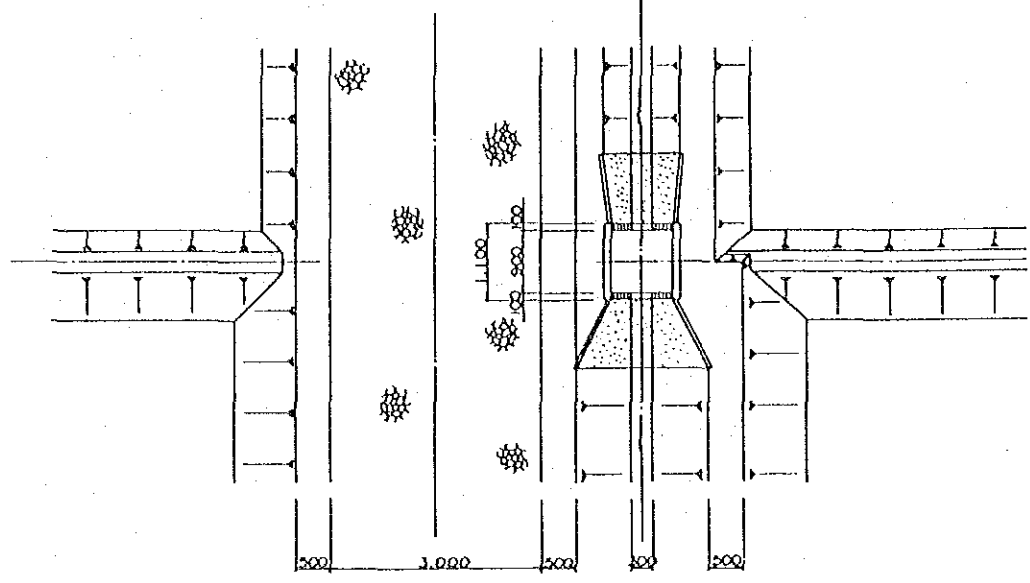
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THE GOVERNMENT OF FIJI THE IMPROVEMENT OF RICE CULTIVATION TECHNOLOGY PROJECT	
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JAPAN INTERNATIONAL COOPERATION AGENCY TOKYO JAPAN	DWG No 9

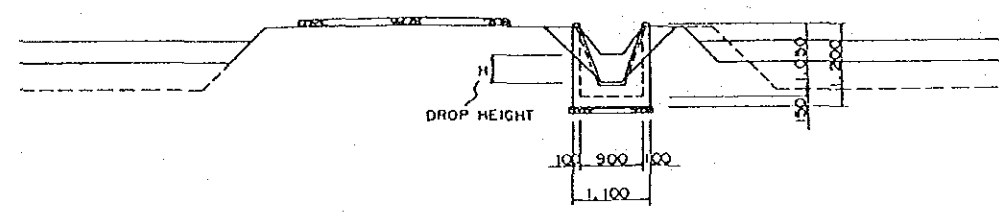
NOTE

DROP WORKS

PLAN
1:200



CROSS SECTION

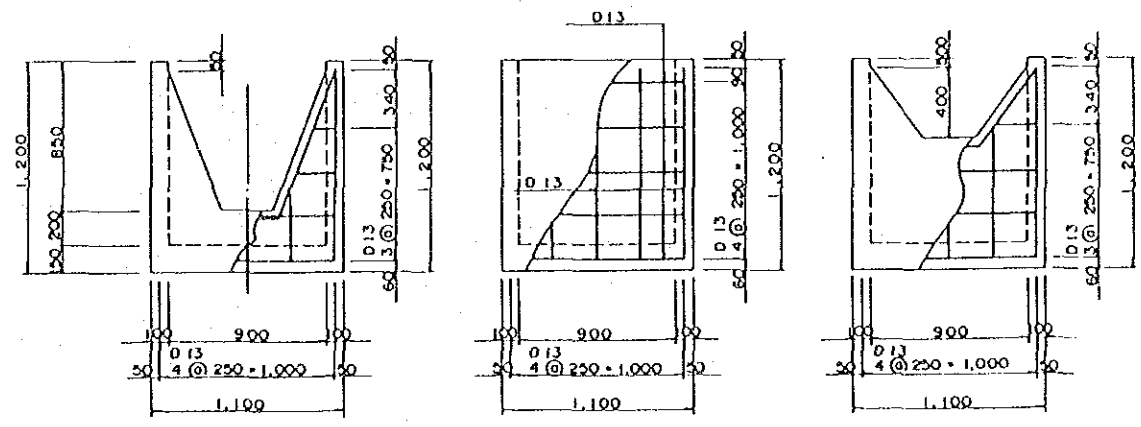


DETAIL 1:20

UPPER SEC.

SIDE SEC.

LOWER SEC.

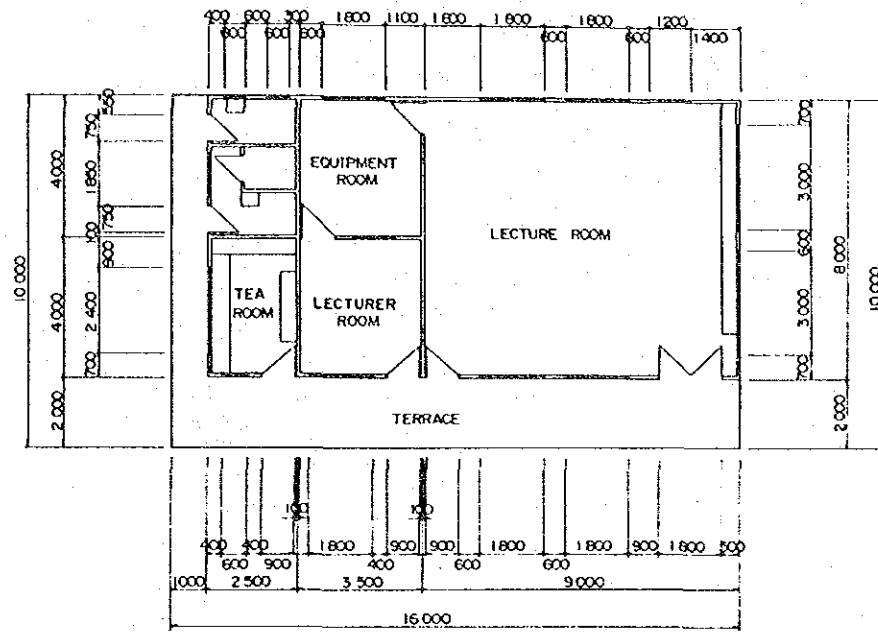


THE GOVERNMENT OF FIJI	
THE IMPROVEMENT OF RICE CULTIVATION	
TECHNOLOGY PROJECT	
TITLE OF DRAWING	
DROP WORKS	
JAPAN INTERNATIONAL COOPERATION AGENCY TOKYO JAPAN	DWG.No 10

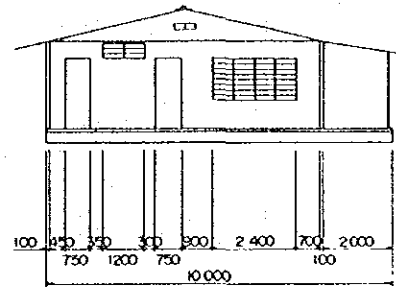
NOTE

EXTENSION TRAINING CENTER

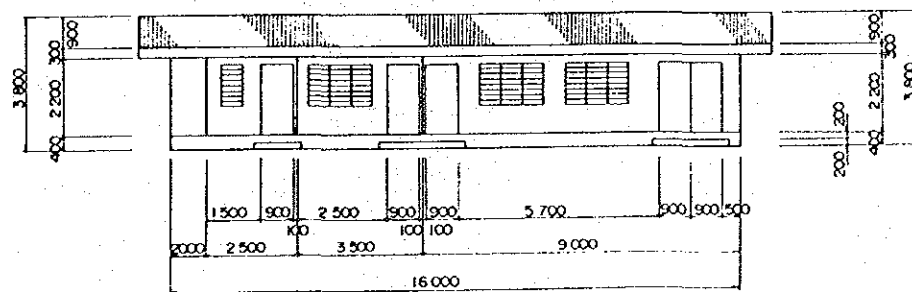
S = 1:100



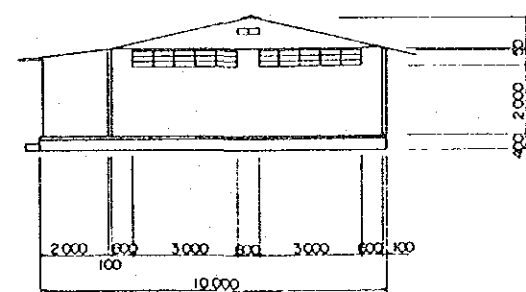
FLOOR PLAN



RIGHT SIDE VIEW



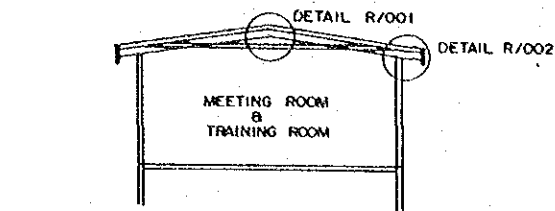
FRONT VIEW



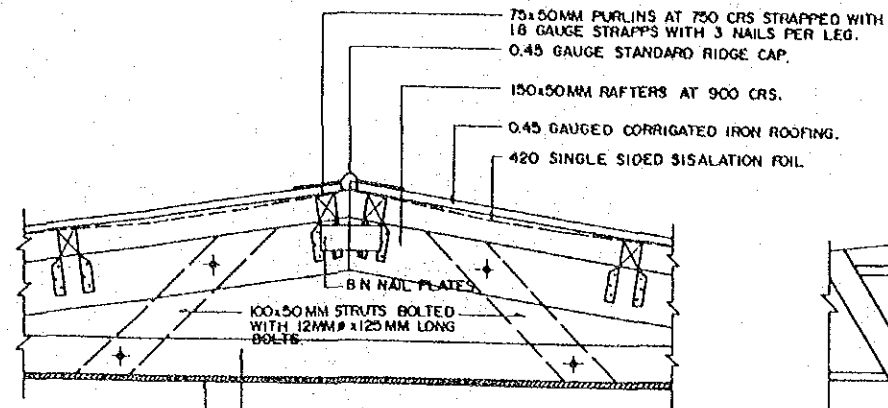
LEFT SIDE VIEW

THE GOVERNMENT OF FIJI THE IMPROVEMENT OF RICE CULTIVATION TECHNOLOGY PROJECT	
TITLE OF DRAWING EXTENSION TRAINING CENTER	
JAPAN INTERNATIONAL COOPERATION AGENCY TOKYO JAPAN	DWG.No 11

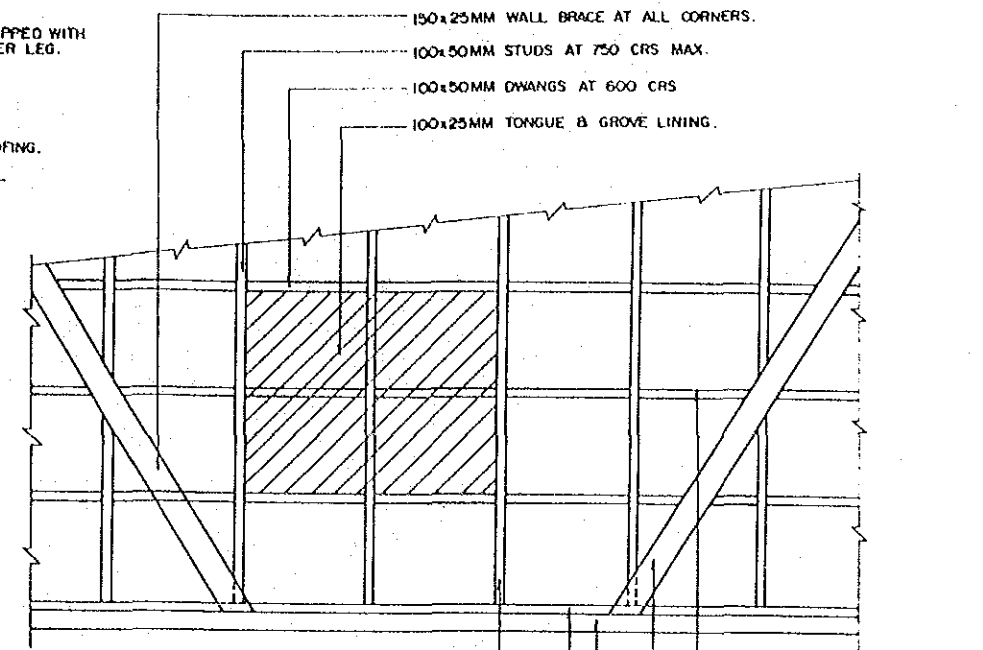
NOTE



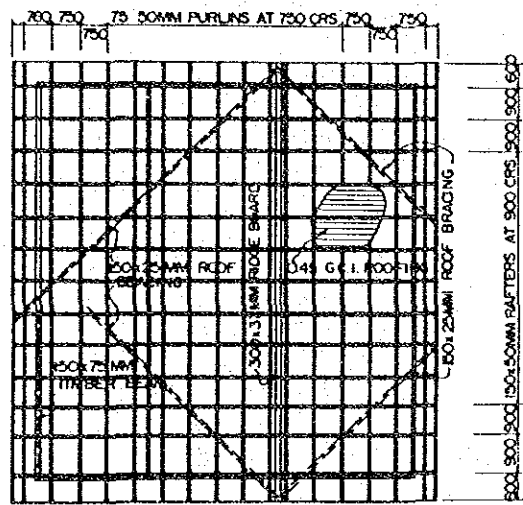
CROSS SECTION AT XX
1:100



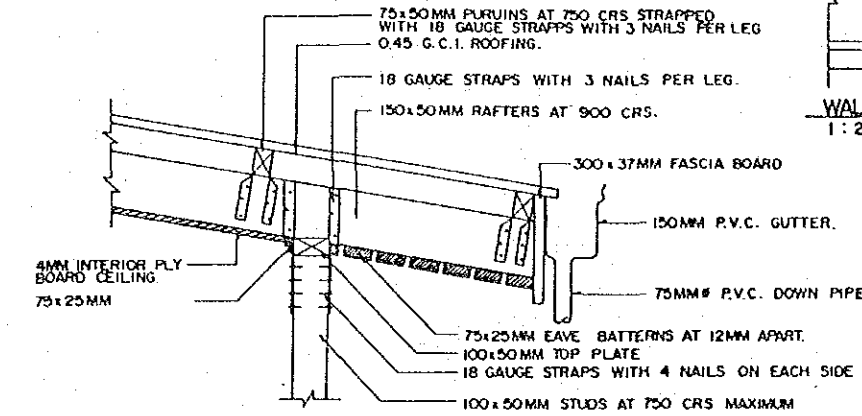
DETAIL R/001
1:10



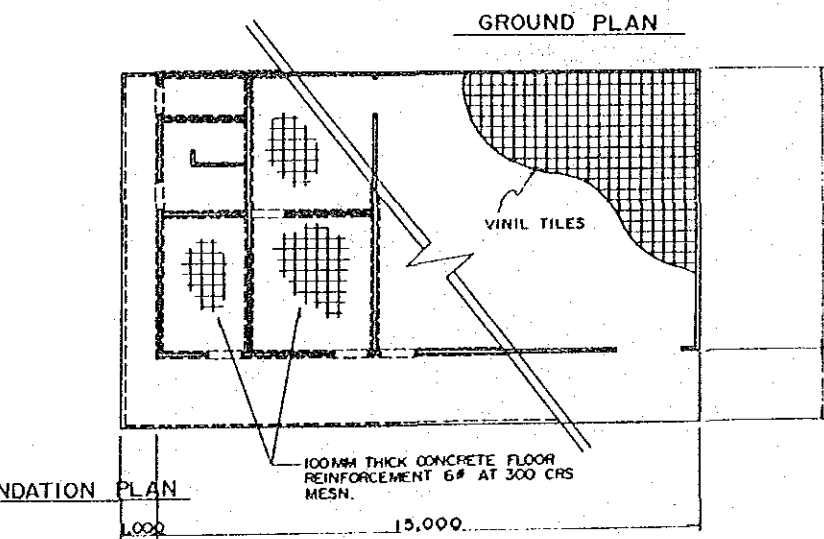
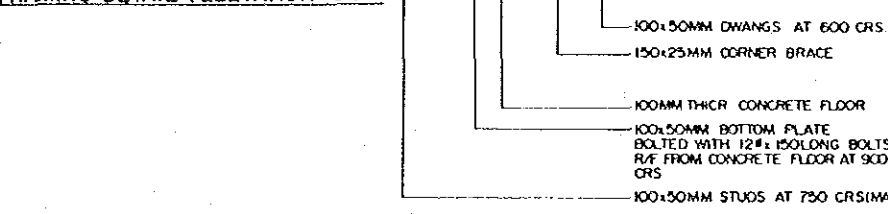
WALL FRAMING DETAIL (ELEVATION 3)
1:20



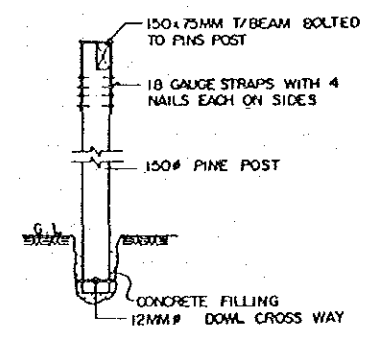
ROOF PLAN
1:100



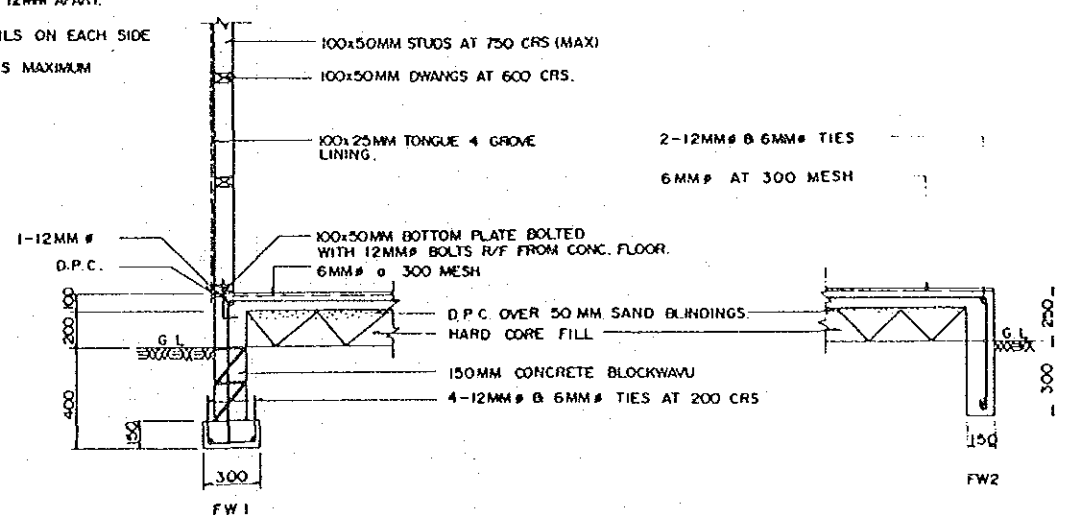
DETAIL R/002
1:10



FOUNDATION PLAN



POST FIXING DETAIL
1:20



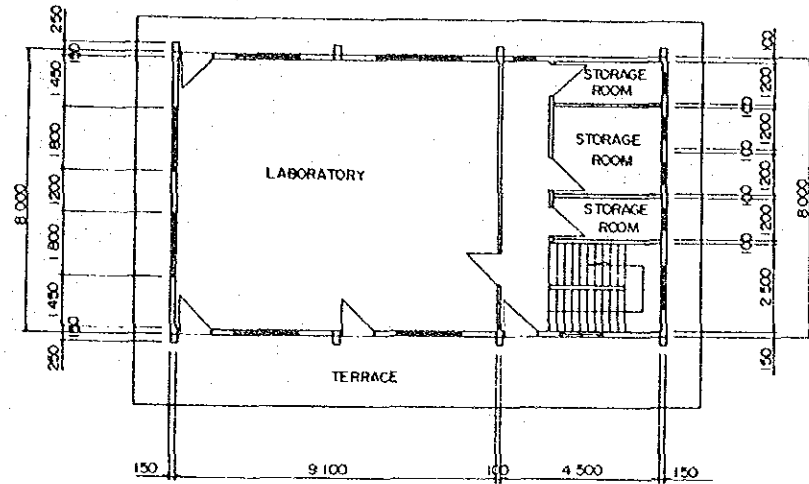
R.C. FOOTING DETAIL
1:20

THE GOVERNMENT OF FIJI
THE IMPROVEMENT OF RICE CULTIVATION
TECHNOLOGY PROJECT
TITLE OF DRAWING
**EXTENSION TRAINING CENTER
DETAIL (1)**
JAPAN INTERNATIONAL COOPERATION AGENCY
TOKYO JAPAN
DWG.No
12

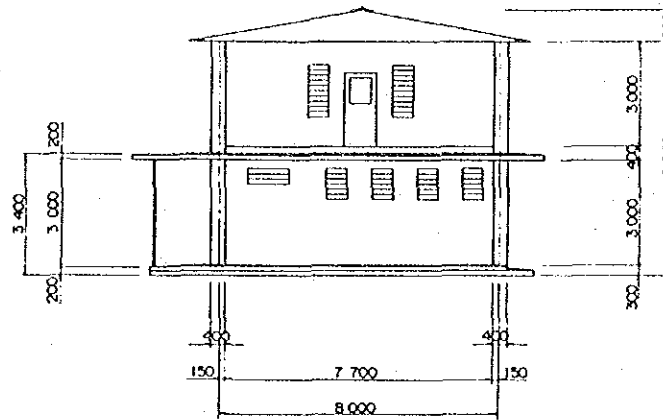
LABORATORY AND STORAGE HOUSE

S = 1:100

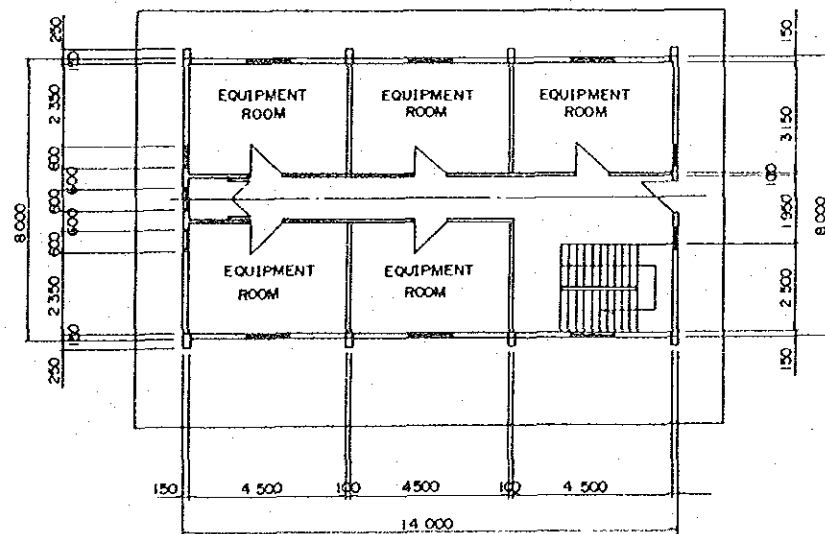
NOTE



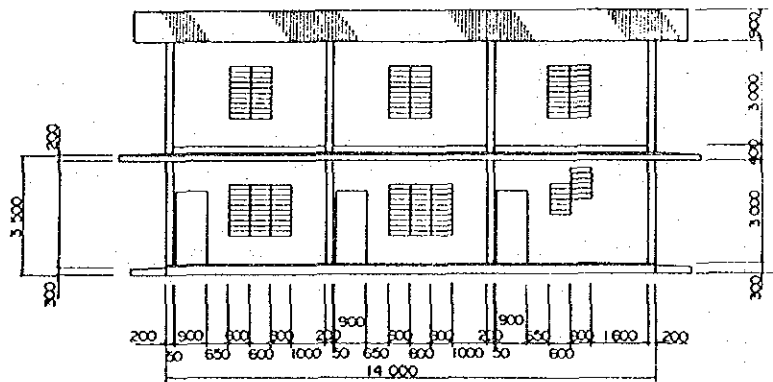
FIRST FLOOR PLAN



SIDE VIEW PLAN



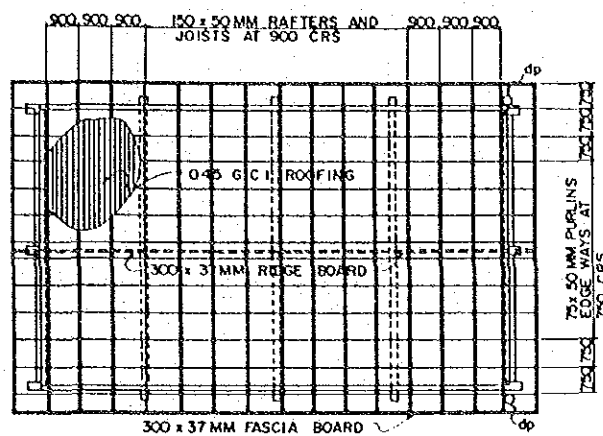
SECOND FLOOR PLAN



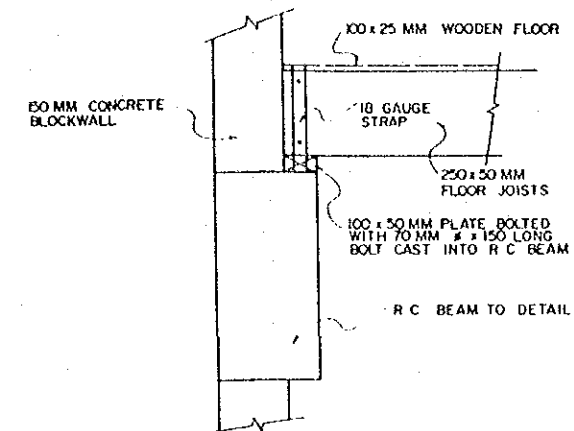
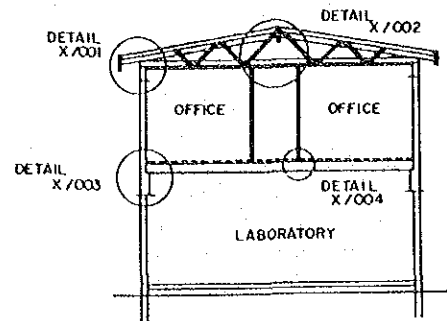
FRON VIEW PLAN

THE GOVERNMENT OF FIJI THE IMPROVEMENT OF RICE CULTIVATION TECHNOLOGY PROJECT	
TITLE OF DRAWING LABORATORY AND STORAGE HOUSE	
JAPAN INTERNATIONAL COOPERATION AGENCY TOKYO JAPAN	DWG.No 13

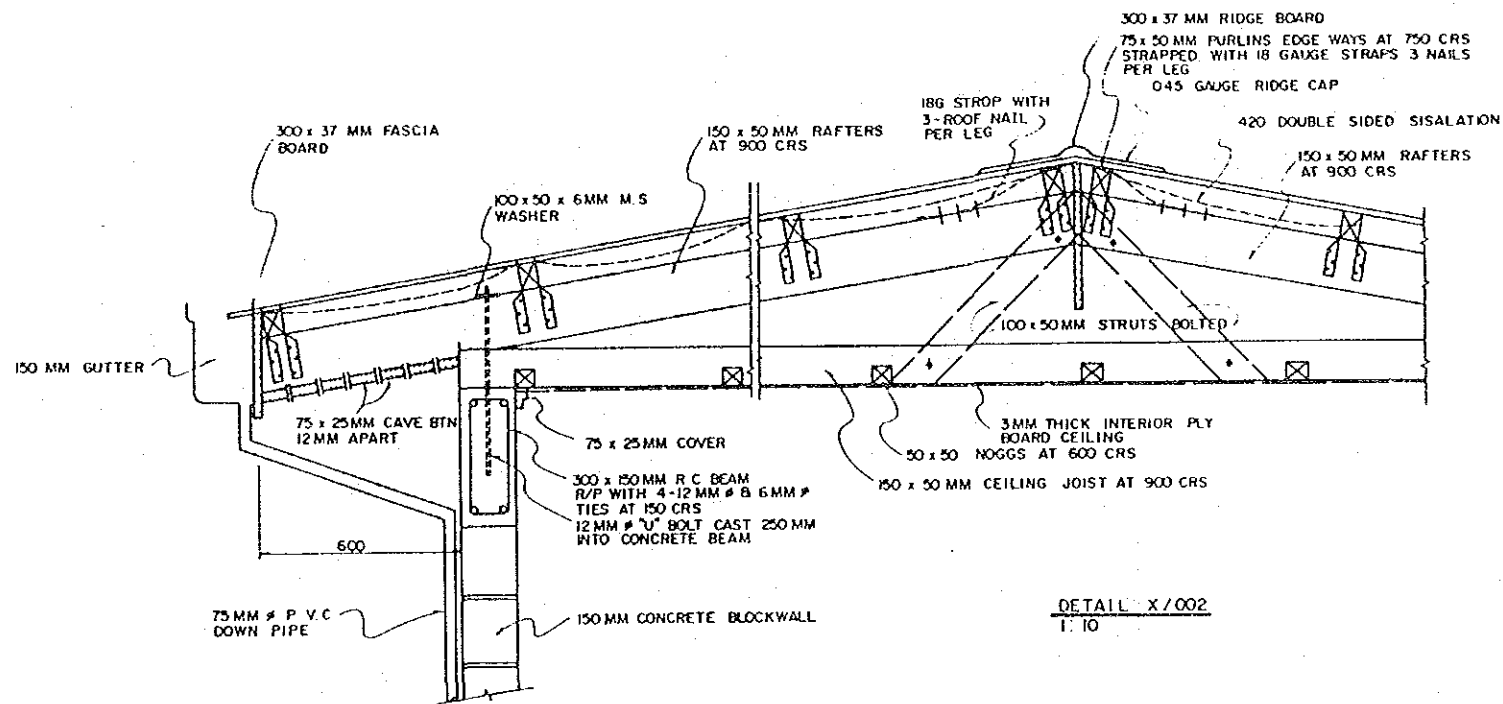
DETAIL



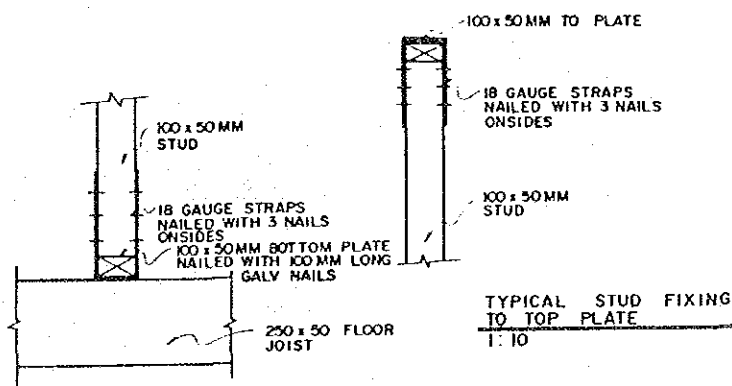
ROOF PLAN
1:100



DETAIL X/003
1:10



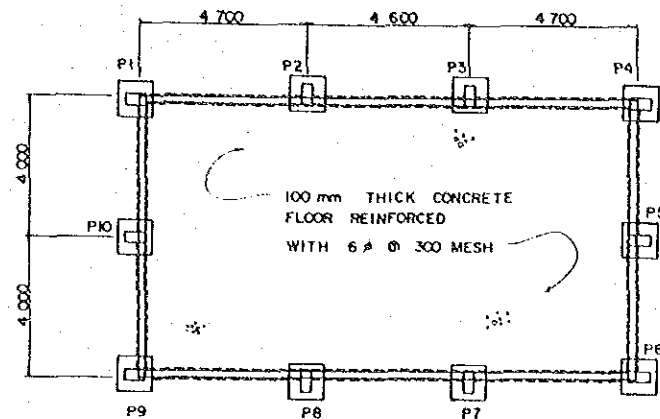
DETAIL X/001
1:10



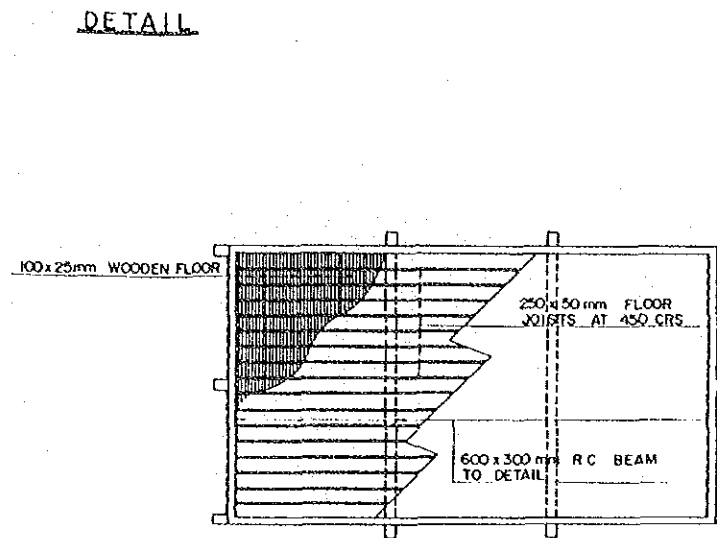
DETAIL X/004
1:10

NOTE
STRAP ALL PURLINS TO RAFTERS USING 18 GAUGE STRAPS WITH 3 NAILS PER LEG

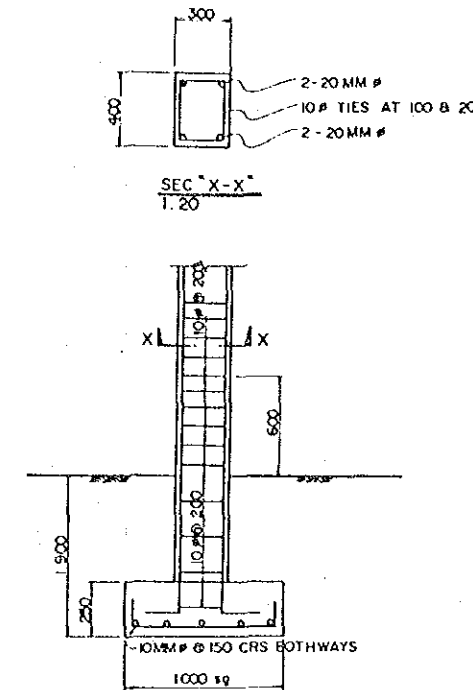
THE GOVERNMENT OF FIJI THE IMPROVEMENT OF RICE CULTIVATION TECHNOLOGY PROJECT	
TITLE OF DRAWING LABORATORY AND STORAGE HOUSE DETAIL (1)	
JAPAN INTERNATIONAL COOPERATION AGENCY TOKYO JAPAN	DWG No 14



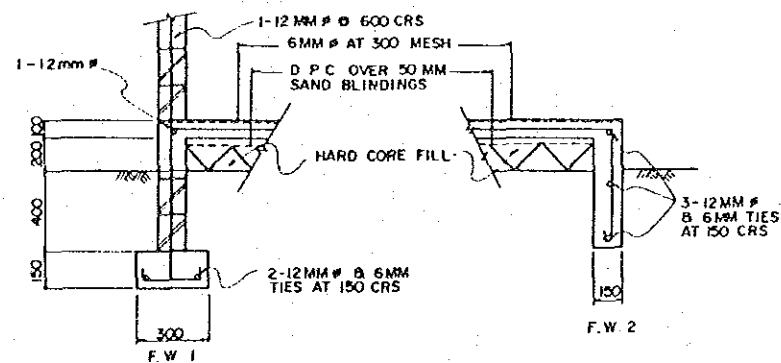
FOUNDATION PLAN
1:100



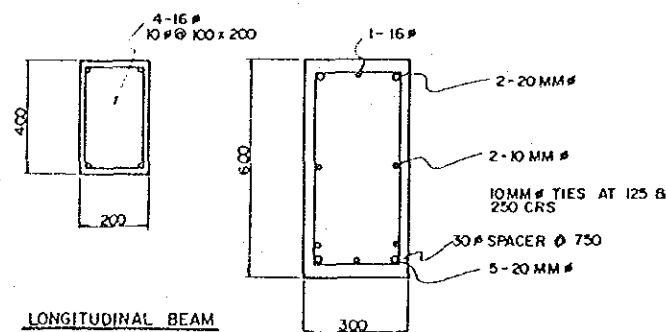
FIRST FLOOR FOUNDATION
1:100



PAD SECTION P1-P12
1:20

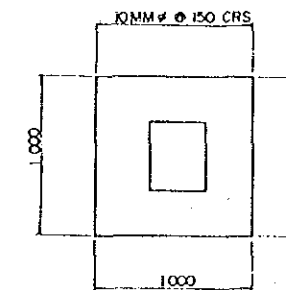


R.C. FOOTING DETAIL



LONGITUDINAL BEAM

TRANSVERSE BEAM



PAD PLAN P1-P10
1:20

NOTE

- CONCRETE MIX TO RATIO 4.3 : 1
- ALL REINFORCED CAVITIES TO BE FILLED WITH CONCRETE
- USE BOND BLOCK AT EVERY FOURTH ROW OF BLOCKS USE 16MM # BARS IN BOND BEAM.
- STEEL COVER TO BE 75MM CLEAR

THE GOVERNMENT OF FIJI THE IMPROVEMENT OF RICE CULTIVATION TECHNOLOGY PROJECT	
TITLE OF DRAWING LABORATORY AND STORAGE HOUSE DETAIL (2)	
JAPAN INTERNATIONAL COOPERATION AGENCY TOKYO JAPAN	DWG.No 15

JICA