APPENDIX B. CONSTRUCTION COST

Construction Cost for Carmen Pilot Infrastructure Project

I. Direct Cost	Amount
A. Preparatory Work	141,550
B. Land Consolidation	
1. Paddy Field Consolidation	1,079,700
2. Upland Consolidation	140,000
3. Farm Road	407,520
4. Appurtenant Structure	676,872
C. Irrigation Facility	
5. Dam	554,544
6. Pump House	40,837
7. Pipeline	41,155
8. Farm Pond	122,322
Total	₱3,204,500
II. Overhead Cost (20% of D. Cost)	₱ 640,900
III. Contingency (10% of (I + II))	₱ 384,540
Grand Total	₱4,229,940
Converted in Japanese Yen	¥57,104,190

Item	Description	Unit	Q'ty	Unit Cost	Amount	Remarks
C-BQ-0	Preparatory Work					
C-U-01	Site clearing	ha	13			regard. to tree and bush w/o vegetable area
C-U-02	Well development	pcs	2			shallow well type
C-U-03	Camp house	L.S				two storied bodega
				Total .... ₱		
C-BQ-1	Land Consolidation (Paddy field)					
C-U-11	Top soil baring	cu.m	20,000			
C-U-12	Foundation soil removal	cu.m	19,650			
C-U-13	Land levelling	sq.m	100,000			Found. and top soil
				Total .... ₱		
C-BQ-2	Up Land Consolidation	sq.m	100,000			To plowing stage
C-BQ-3	Farm Road					
C-U-31	Embankment	cu.m	6,180			
C-U-32	Gravel paving	cu.m	600			
				Total .... ₱		

Item	Description	Unit	Q'ty	Unit Cost	Amount	Remarks
C-BQ-4	Appurtenatn Structure					
C-U-41	Irrigation canal					
C-U-41-1	Excavation	cu.m	282			
C-U-41-2	Embankment	cu.m	180			
C-U-41-3	U-flume	pcs	290			50x50x60 cm
C-U-41-4	Al-concrete	cu.m	2			
C-U-41-5	Grouted riprap	cu.m	3			
C-U-41-6	R.C. pipe (ϕ450)	pcs	12			
				Sub-total .... ₱		
C-U-42	Siphon structure					
C-U-42-1	R.C pipe (ϕ300)	pcs	107			
C-U-42-2	Al-concrete	cu.m	6			
				Sub-total .... ₱		
C-U-43	Farm ditch					
C-U-43-1	U-flume	pcs	2,787			30x30x60 cm
C-U-43-2	R.C. pipe (ϕ300)	pcs	25			
C-U-43-3	R.C. pipe (ϕ450)	pcs	90			
C-U-43-4	Grouted piprap	cu.m	30			
C-U-43-5	Turn-out box	pcs	4			
				Sub-total .... ₱		
C-U-44	Drainage ditch					
C-U-44-1	U-flume	pcs	1,413			
C-U-44-2	R.C pipe (ϕ 300)	pcs	8			
C-U-44-3	R.C pipe (ϕ 450)	pcs	32			
C-U-44-4	R.C pipe (ϕ1,000)	pcs	50			
				Sub-total ... ₱		
				Total .... ₱		

Item	Description	Unit	Q'ty	Unit Cost	Amount	Remarks
C-BQ-5	Dam					
C-U-51	Excavation	cu.m	5,000			
C-U-52	Backfill	cu.m	3,850			Diverted from excav.
C-U-53	Embankment	cu.m	2,368			
C-U-54	Rubble masonry	cu.m	300			
C-U-55	A2-concrete	cu.m	23			
C-U-56	R.C pipe (ϕ300)	pcs	5			
C-U-57	Sodding	sq.m	160			
				Total .... ₱		
C-BQ-6	Pumping House					
C-U-61	Excavation	cu.m	86			
C-U-62	Rubble masonry	cu.m	14			Inlet structure
C-U-63	C.H.B wall	sq.m	54			- do -
C-U-64	Building	L.S.				
				Total .... ₱		
C-BQ-7	Pipeline					
C-U-71	Excavation	cu.m	560			
C-U-72	Backfill	cu.m	543			
C-U-73	B-concrete	cu.m	1			
C-U-74	Pipe-installation	m	350			Except pipe cost
				Total .... ₱		

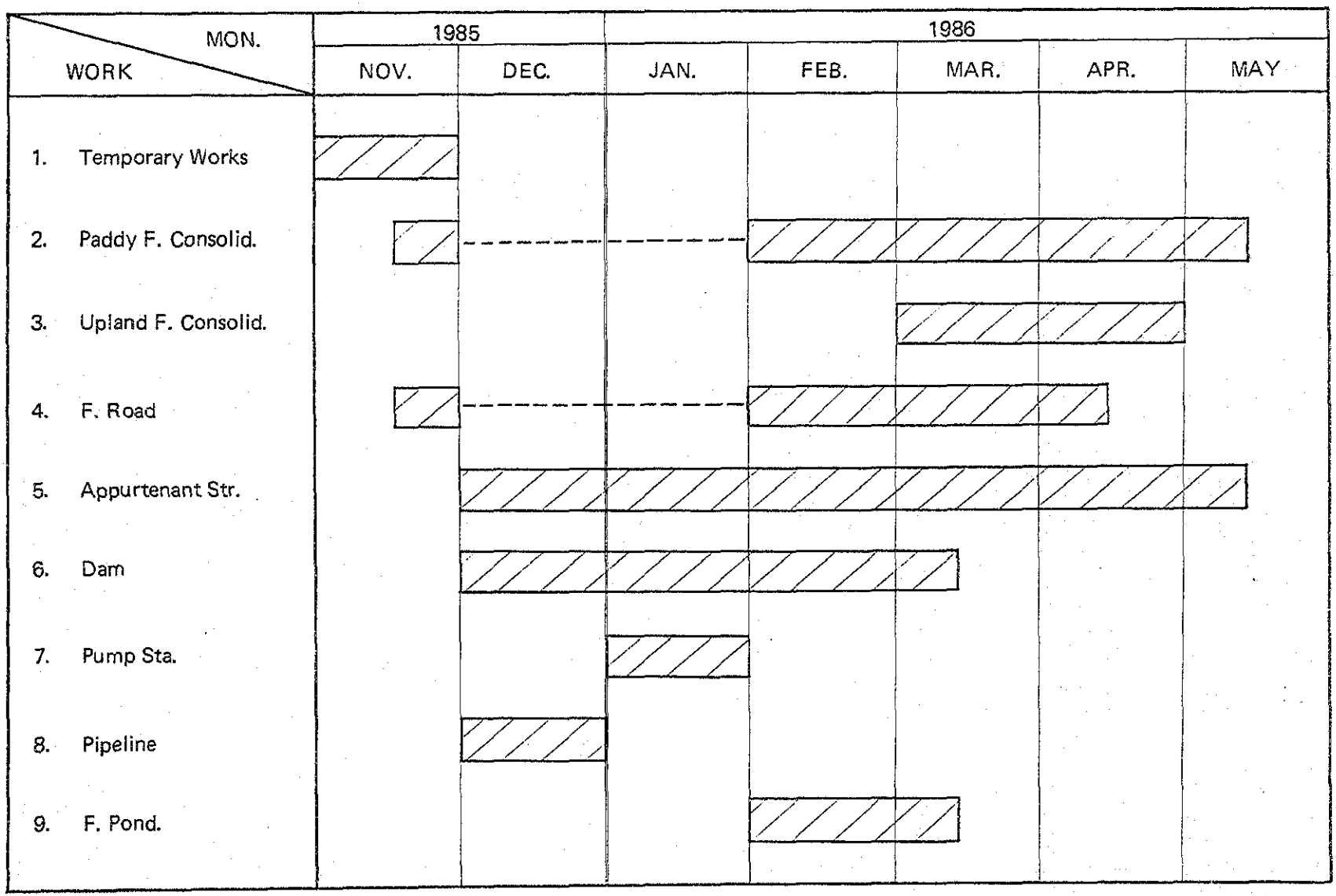
Item	Description	Unit	Q'ty	Unit Cost	Amount	Remarks
C-BQ-8	Farm Pond					
C-U-81	Excavation	cu.m	1,800			
C-U-82	Backfill	cu.m	694			
C-U-83	C.H.B wall	sq.m	202			10x20x40 cm
C-U-84	Al-concrete	cu.m	2			

Total .... ₱

Grand Total .... ₱

APPENDIX C. CONSTRUCTION SCHEDULE

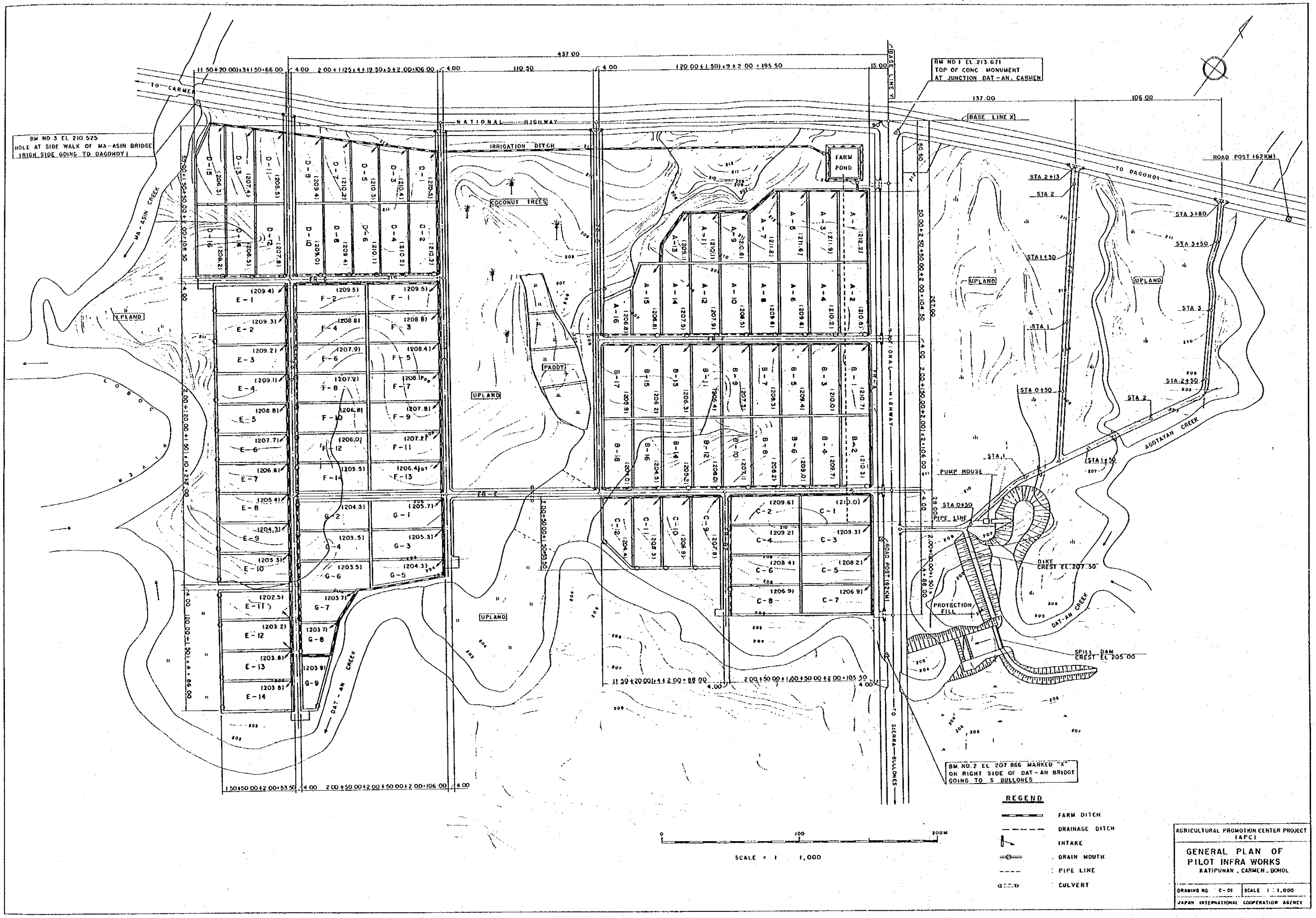
CONSTRUCTION SCHEDULE FOR CARMEN PILOT INFRA. PROJECT



APPENDIX D. CONSTRUCTION DRAWINGS

List of Construction Drawings

1. General Plan
2. Farm Pond
3. Pumping Station
4. Dam
5. Profile of Farm Road A & B
6. Profile of Farm Road C & D
7. Profile of Farm Road E & F
8. Profile of Farm Road G
9. Profile of Farm Road H & I
10. Profile of Irrigation Ditch



BASE LINE X
BASE LINE Y
BM NO 1 EL 213.671
TOP OF CONC MONUMENT
AT JUNCTION DAT-AN, CARMEN
BM NO 3 EL 210.525
HOLE AT SIDE WALK OF MA-ASIN BRIDGE
(RIGH SIDE GOING TO DAGOHOY)
BM NO.2 EL 207.866 MARKED "X"
ON RIGHT SIDE OF DAT-AN BRIDGE
GOING TO S BULLONES
TO CARMEN
NATIONAL HIGHWAY
TO DAGOHOY
TO SIERRA-BULLONES
IRRIGATION DITCH
FARM POND
COCONUT TREES
UPLAND
PADDY
MA-ASIN CREEK
LOBOC RIVER
DAT-AN CREEK
AGOTAYAN CREEK
PUMP HOUSE
PIPE LINE
DIKE
CREST EL. 207.50
PROTECTION FILL
SPILL DAM
CREST EL 205.00
ROAD POST (62KM)
REGEND
FARM DITCH
DRAINAGE DITCH
INTAKE
DRAIN MOUTH
PIPE LINE
CULVERT
SCALE 1 : 1,000

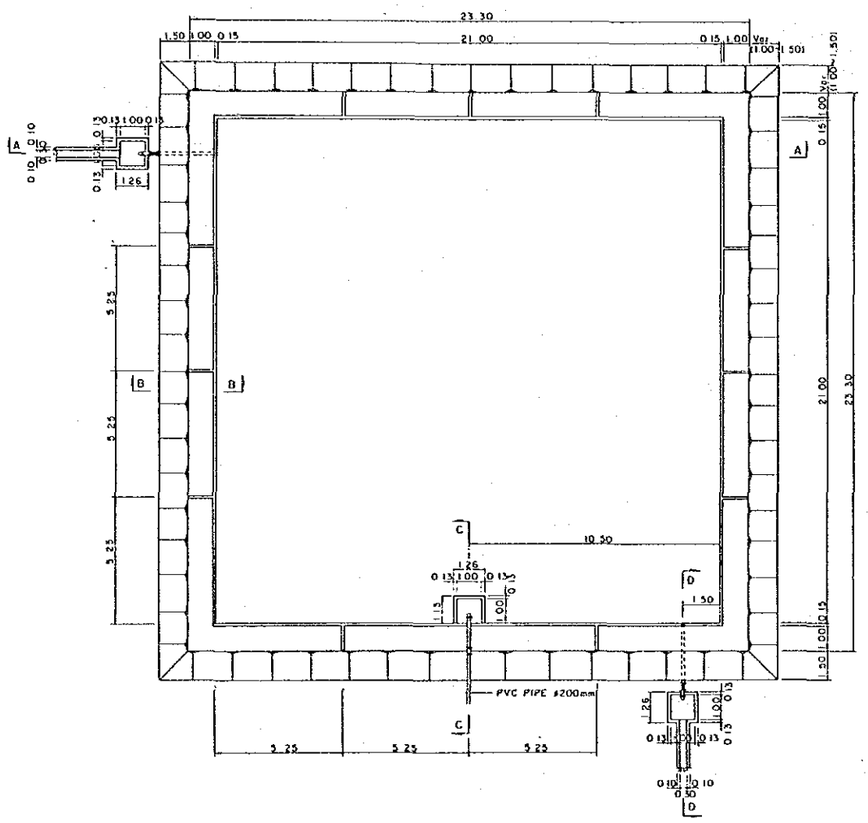
AGRICULTURAL PROMOTION CENTER PROJECT (APC)

GENERAL PLAN OF PILOT INFRA WORKS

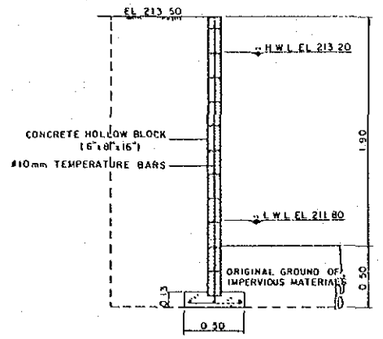
KATIPUNAN, CARMEN, BOHOL

DRAWING NO C-01 | SCALE 1 : 1,000

JAPAN INTERNATIONAL COOPERATION AGENCY



PLAN
SCALE 1.200 M.



SECTION B-B
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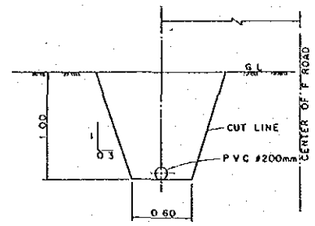
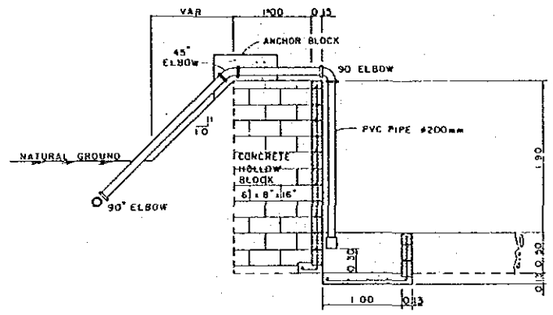
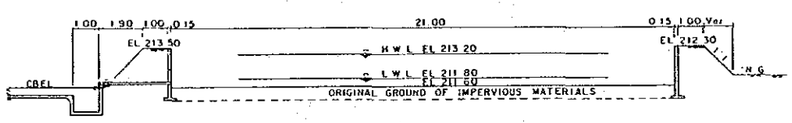


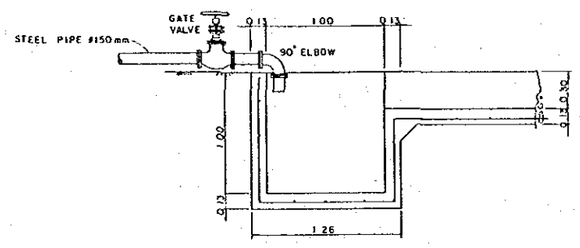
TYPICAL SECTION OF PIPE LINE
SCALE 1.20 M



SECTION C-C
SCALE 1.30 M

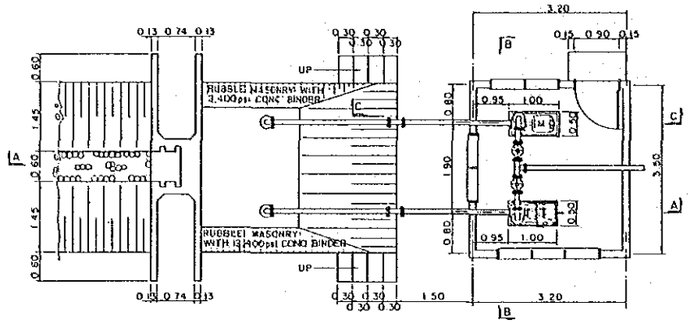


SECTION A-A
SCALE 1:100 M.

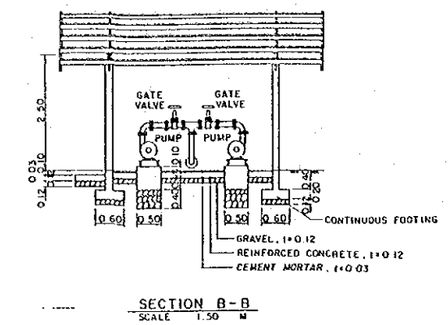


SECTION D-D
SCALE 1.20 M.

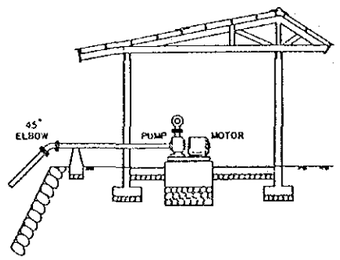
AGRICULTURAL PROMOTION CENTER PROJECT (APC)	
FARM POND KATIPUNAN, CARMEN, BOHOL	
DRAWING NO 2	SCALE
JAPAN INTERNATIONAL COOPERATION AGENCY	



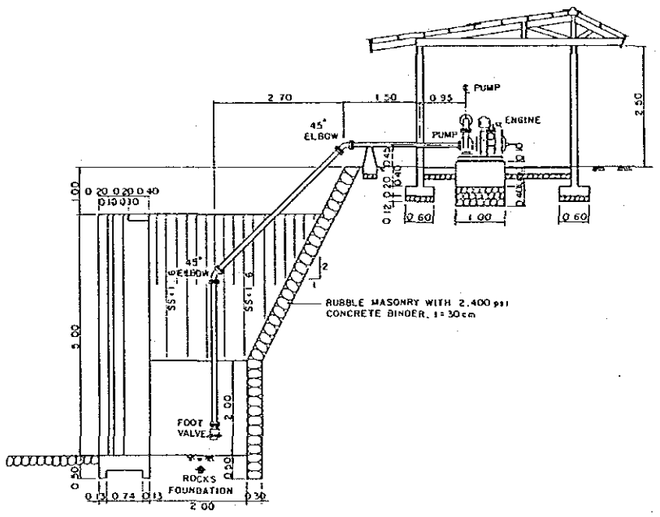
PLAN
SCALE 1.50 M



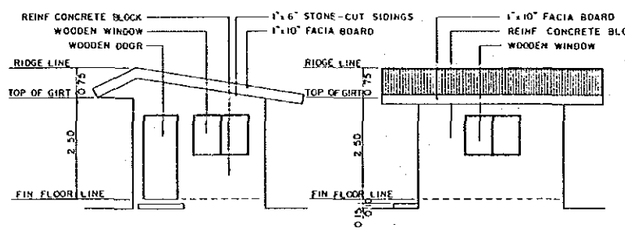
SECTION B-B
SCALE 1.50 M



SECTION C-C
SCALE 1.50 M

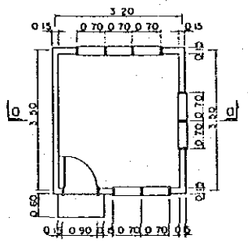


SECTION A-A
SCALE 1.50 M

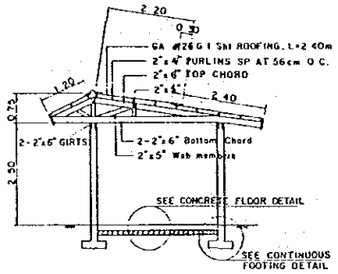


FRONT ELEVATION
SCALE 1.60 M

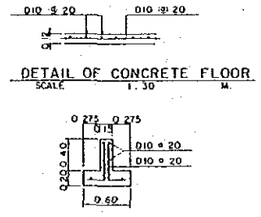
RIGHT SIDE ELEVATION
SCALE 1.60 M



FLOOR PLAN
SCALE 1.60 M



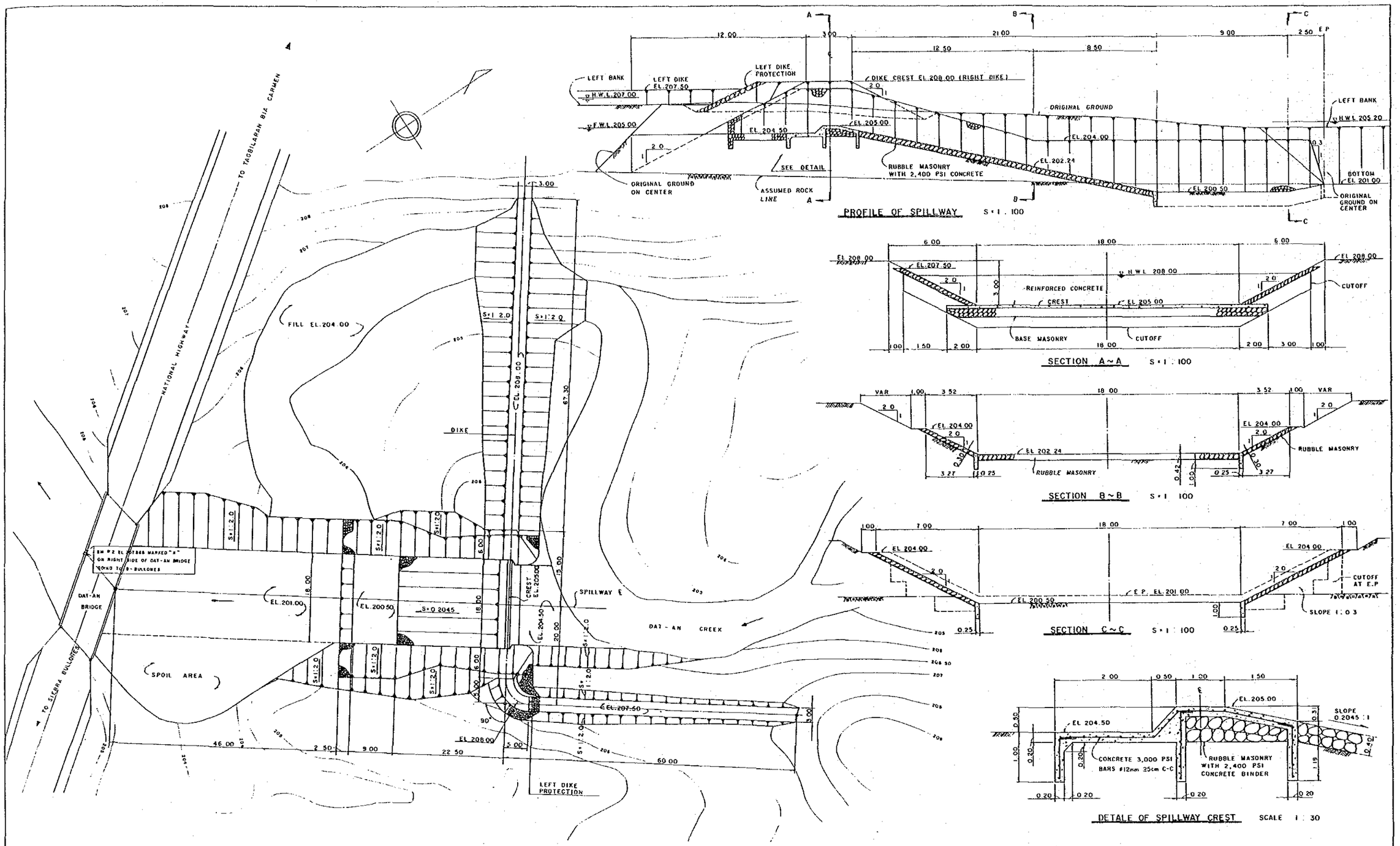
SECTION a-a
SCALE 1.60 M



DETAIL OF CONCRETE FLOOR
SCALE 1.30 M

DETAIL OF CONTINUOUS FOOTING
SCALE 1.30 M

AGRICULTURAL PROMOTION CENTER PROJECT (APC)	
PUMPING HOUSE KATIPUNAN, CARMEN, BOHOL	
DRAWING NO. 3	SCALE
JAPAN INTERNATIONAL COOPERATION AGENCY	



PROFILE OF SPILLWAY S = 1 : 100

SECTION A ~ A S = 1 : 100

SECTION B ~ B S = 1 : 100

SECTION C ~ C S = 1 : 100

DETALE OF SPILLWAY CREST SCALE 1 : 30

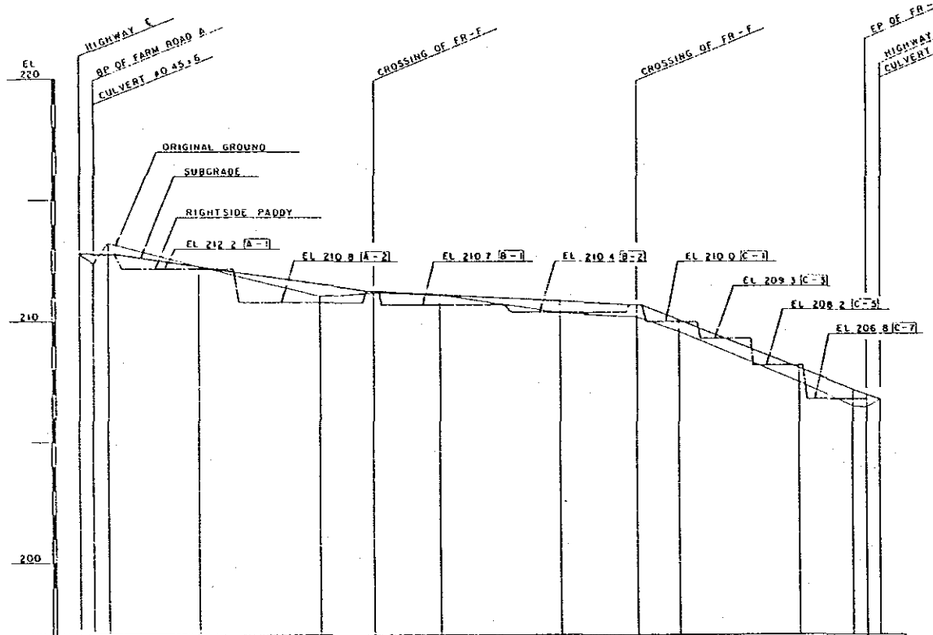
AGRICULTURAL PROMOTION CENTER PROJECT (APC)

DIKE AND SPILLWAY

KATIPUNAN, CARMEN, BOHOL

DRAWING NO 4 | SCALE 1 : 300

JAPAN INTERNATIONAL COOPERATION AGENCY



FARM ROAD A

GRAD.	BANK H	CUT H	ROAD EL	GROUND EL	ACCUM DIST	DIST	STA
0	0.40	0	212.80	212.80	0	0	0
	0.40		212.80	212.40	6.00	6.00	+6.00
1/70.4	0.40		212.80	213.20	12.00	6.00	+12.00
		0	212.30	212.30	50.00	38.00	+50.00
1/90	0.50		211.55	211.05	100.00	50.00	1
1/100	0.10		211.30	211.20	122.50	22.50	+22.50
	0.05		211.15	211.10	150.00	22.50	+50.00
	0.45		210.85	210.40	200.00	50.00	2
1/23.95	0.50		210.70	210.20	232.50	32.50	+32.50
	0.30		210.10	209.80	250.00	17.50	+50.00
	0.60		208.10	207.50	300.00	50.00	3
	0.70		207.20	206.50	322.50	22.50	+22.50
	0.55		207.00	206.45	328.50	6.00	+28.50
		0	206.80	206.80	334.50	6.00	+34.50

CURVE: 90° (at start), 90° (at end)

FARM ROAD B

GRAD.	BANK H	CUT H	ROAD EL	GROUND EL	ACCUM DIST	DIST	STA
			212.23	212.23	0	0	0
1/16.13	0.55		212.20	211.75	6.00	6.00	+6.00
1/21.35		0	210.90	210.80	21.00	15.00	+21.00
		0	209.30	209.50	50.00	29.00	+50.00
1/64.44		0	207.20	207.20	100.00	50.00	1
	2.40		206.80	204.40	121.00	21.00	+21.00
	0.20		206.40	206.20	150.00	29.00	+50.00
1/42.00	0.25		206.30	206.05	158.00	8.00	+58.00
1/76.92	0.80		205.30	204.50	200.00	42.00	2
1/78.00	0.45		204.65	204.20	250.00	50.00	+50.00
		0	204.90	204.00	269.50	19.50	+69.50
1/100	0.40		208.30	207.90	0	0	0
1/17.83	0.20		207.80	207.60	50.00	50.00	+50.00
	0.50		205.50	204.50	91.00	41.00	+91.00

CURVE

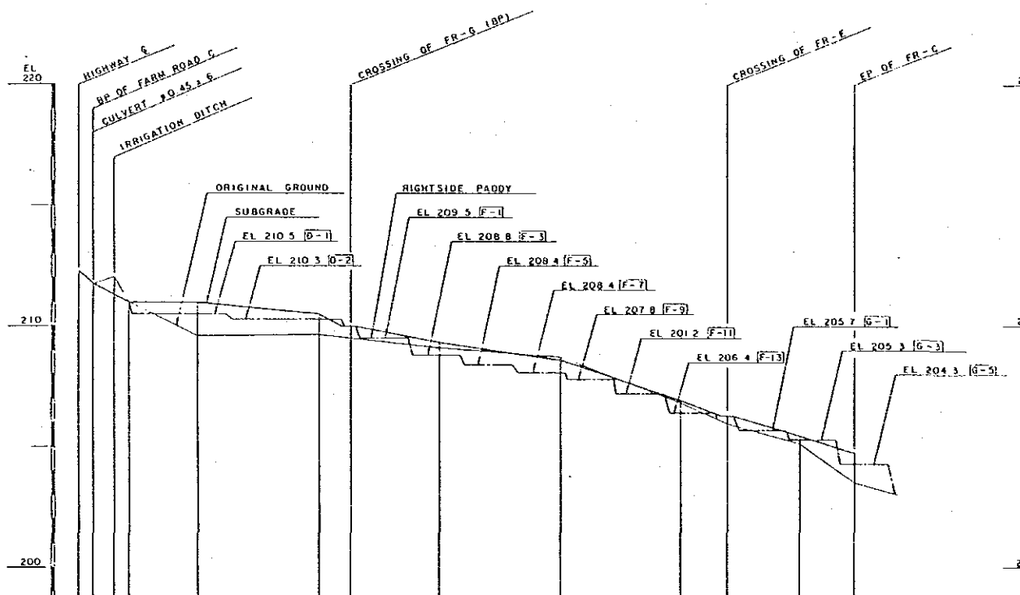
AGRICULTURAL PROMOTION CENTER PROJECT (APC)

PROFILE OF FARM ROAD A AND B

KATIPUNAN, CARMEN, BOHOL

DRAWING NO 5 | SCALE H=1 : 1000, V=1 : 100

JAPAN INTERNATIONAL COOPERATION AGENCY



AGRICULTURAL PROMOTION CENTER PROJECT
(APC)

PROFILE OF FARM ROAD
C & D

KATIPUNAN, CARMEN, BOHOL

DRAWING NO 6 | SCALE

JAPAN INTERNATIONAL COOPERATION AGENCY

FARM ROAD C

GRAD: 1/187.5 | L | 1/100 | 1/260 | 1/62.14 | 1/30.43 | 1/35.33

STA	DIST	ACCUM DIST	GROUND EL	ROAD EL	CUT H	BANK H
0	0	0	212.35	212.35	0	
+ 6.00	6.00	6.00	211.80	211.80	0	
+ 15.00	9.00	15.00	212.05	211.30	0.75	
+ 21.00	6.00	21.00	211.00	211.00	0	
+ 50.00	29.00	50.00	209.60	211.00		1.40
1	50.00	100.00	209.70	210.50		0.80
+ 13.00	13.00	113.00	209.50	210.00		0.50
+ 50.00	37.00	150.00	209.10	209.30		0.20
2	50.00	200.00	208.75	208.60	0.15	
+ 50.00	50.00	250.00	206.80	206.90		0.10
+ 70.00	20.00	270.00	205.95	206.30		0.35
3	30.00	300.00	205.10	205.50		0.40
+ 23.00	23.00	323.00	203.50	204.80		1.30

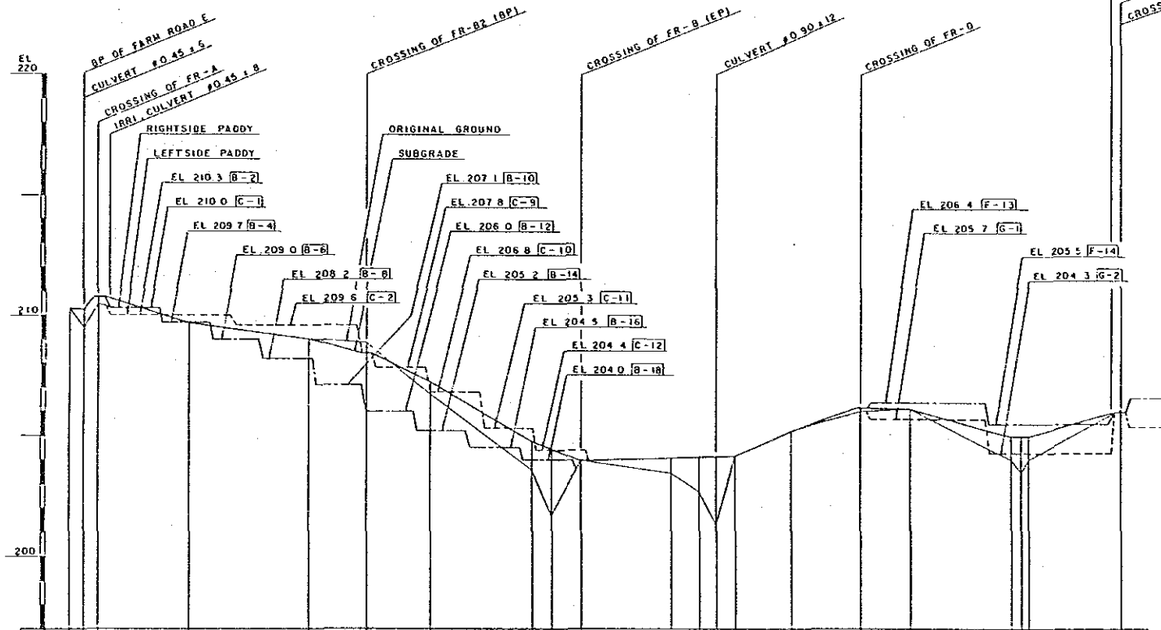
CURVE

FARM ROAD D

GRAD: 1/235.0 | -1/35.71 | L | 1/33.33 | 1/32.0 | 1/35.00 | -1/275 | L

STA	DIST	ACCUM DIST	GROUND EL	ROAD EL	CUT H	BANK H
0	0	0	209.65	209.65	0	
+ 6.00	6.00	6.00	209.20	209.70		0.50
+ 17.00	11.00	17.00	209.75	209.75	0	
+ 50.00	33.00	50.00	210.00	209.60	0.40	
1	50.00	100.00	208.70	209.30		0.60
+ 25.00	25.00	125.00	209.00	210.00		1.00
+ 50.00	25.00	150.00	209.70	210.00		0.30
2	50.00	200.00	208.70	208.50	0.20	
+ 50.00	50.00	250.00	207.50	207.00	0.50	
+ 82.00	32.00	282.00	206.20	206.00	0.20	
3	18.00	300.00	205.20	205.60		0.30
+ 45.00	45.00	345.00	202.25	204.20		1.95
+ 50.00	5.00	350.00	202.40	204.20		1.80
4	50.00	400.00	204.00	204.40		0.40
+ 42.00	42.00	442.00	203.10	204.40		1.30

CURVE



AGRICULTURAL PROMOTION CENTER PROJECT
(APC)

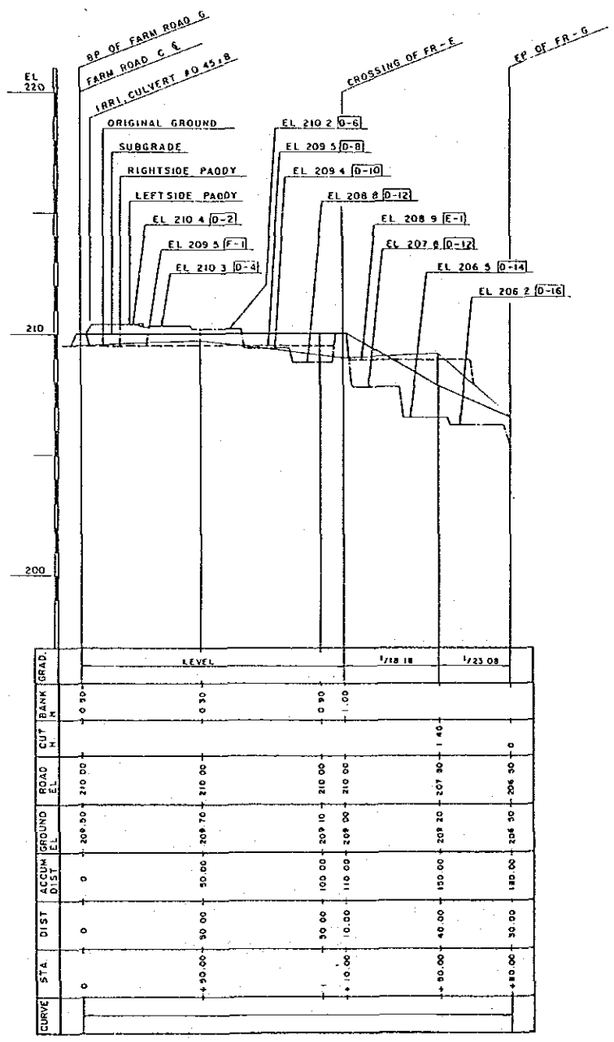
PROFILE OF FARM ROAD
E & F

KATIPUNAN, CARMEN, BOHOL

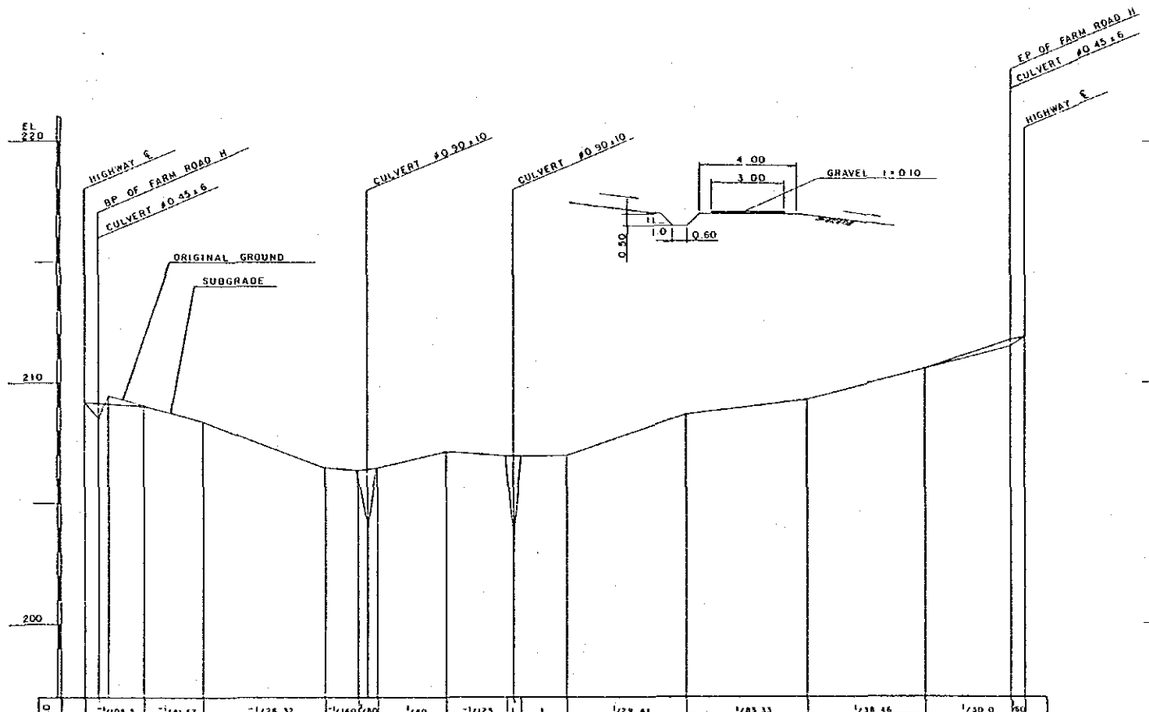
DRAWING NO 7 | SCALE H = 1 : 1,000 V = 1 : 100

JAPAN INTERNATIONAL COOPERATION AGENCY

FARM ROAD G



AGRICULTURAL PROMOTION CENTER PROJECT (APC)	
PROFILE OF FARM ROAD G KATIPUNAN, CARMEN, BOHOL	
DRAWING NO. 8	SCALE H: 1/1,000 V: 1/100
JAPAN INTERNATIONAL COOPERATION AGENCY	



FARM ROAD H

FARM ROAD I

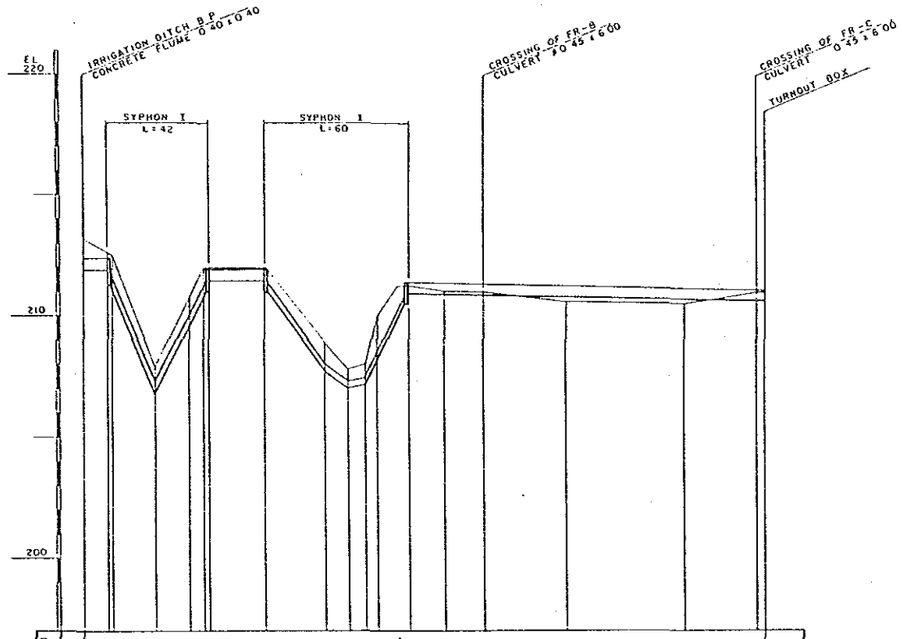
AGRICULTURAL PROMOTION CENTER PROJECT
(APC)

PROFILE OF FARM ROAD
H & I

KATIPUNAN, CARMEN, BOHOL

DRAWING NO 9 | SCALE

JAPAN INTERNATIONAL COOPERATION AGENCY



1/1,000

CURVE	STA	DIST	ACCUM DIST	GROUND EL.	BOTTOM EL.	CUT H.	BANK H.	GRAD
	0	0	0	213.20	211.92			
	+ 10.00	10.00	10.00	212.90	211.91			
	+ 12.00	2.00	12.00	212.50				
	+ 30.00	18.00	30.00	207.90				
	+ 44.00	14.00	44.00	211.00	211.43			
	+ 50.00	6.00	50.00	212.00				
	+ 52.00	2.00	52.00	212.00				
	+ 75.00	25.00	75.00	213.00	211.41			
1								
	+ 100.00	25.00	100.00	208.90	207.70			
	+ 110.00	10.00	110.00	207.60	207.00			
	+ 117.00	7.00	117.00	208.00	207.10			
	+ 122.00	5.00	122.00	210.00	208.85			
	+ 130.00	8.00	130.00	213.80	209.90			
	+ 135.00	5.00	135.00	211.20	210.91			
	+ 150.00	28.00	150.00	211.00	210.68			
	+ 166.00	16.00	166.00	211.00	210.87			
2								
	+ 200.00	34.00	200.00	210.40	210.83			
	+ 250.00	50.00	250.00	210.30	210.78			
	+ 280.00	30.00	280.00	211.00	210.70			
	+ 283.00	3.00	283.00	211.00	210.70			

AGRICULTURAL PROMOTION CENTER PROJECT (APC)

PROFILE OF IRRIGATION DITCH

KATIPUNAN, CARMEN, BOHOL

DRAWING NO 10 | SCALE H = 1: 1,000 V = 1: 100

JAPAN INTERNATIONAL COOPERATION AGENCY

ANNEX E. TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS

SECTION I. TEMPORARY WORKS AND MOBILIZATION OF CONSTRUCTION EQUIPMENT

101. Scope

(a) Temporary works

NIA shall furnish all materials, labor, equipment, tool and install such temporary works as are necessary for the successful completion of the Agreement Works.

NIA shall submit to the Engineer for approval NIA's plan of temporary works.

The temporary works consist of the following works.

(1) Access roads and temporary detours in any places required in the Site for construction of the works.

(2) NIA's camps, offices, store houses, workshops labor's camps, water supply and other facilities in the site.

(3) Temporary power and water supplies in the site for construction of the work.

(4) Negotiation for the right of way if or when necessary.

(b) Mobilization of equipment

NIA shall mobilize and move into the project site (in accordance with the approved Construction program and Equipment moving-in and Utilization schedule) the required construction equipment needed for the successful completion of the Agreement work immediately after receipt of the approved Construction program.

SECTION II. CLEARING AND LAND RECLAMATION

201. Scope

(a) The work under this section shall consist of the removal and disposal of all vegetations, trees, stumps, roots, brushes, rubbishes and all objectionable matters from the borrow area and the work area.

(b) The wood and others which are produced by the clearing and the grubbing in the above-mentioned work areas shall be treated in accordance with the direction of the Engineer.

202. Grubbing

(a) Grubbing shall include necessary stripping of the natural ground surface to an adequate depth by effective means to remove all objectionable materials from the said work areas.

(b) The proposed project areas shall be cleared and grubbed sufficiently by directions of the Engineer.

203. Land reclamation

(a) Removal of rocks

NIA shall remove all stones and rocks exceeded 5.0 cm size by equipment or manpower within 20 cm thick of the top-soils at the design farm area.

(b) Land leveling of farmland

All dents shall be filled up and made smooth surface. The tolerance of the land leveling of the paddy field surface is - 5.0 cm.

(c) Land plowing shall be done by suitable equipment until 15 cm depth from the ground surface.

(d) Depth of top soil

The top soil shall be provided with the depth of 20 cm at least any place in the design farm area.

SECTION III. EARTH AND FOUNDATION WORKS

301. Scope

The provisions of this Section shall cover the earth works and foundation works for structures such as Dam, Canals, Roads, Pipes, Pumping-house, Farm pond and other small structures.

302. General

(a) The work site shall be maintained well-drained and shall be kept free from the inundation caused by the rainfall or the spring during the construction.

(b) The materials taken from the borrow areas shall not be used for embankment unless the Engineer approve the clearing and the grubbing works after the inspection of the works. NIA shall rearrange the land of the borrow areas according to the directions of the Engineer after the completion of the construction.

(c) The sediment deposited during the construction in the ditches, canal and the pipe shall be removed at the NIA's own expense.

303. Excavation

(a) Foundation shall be excavated according to the outline of the footings, floors or the foundation of the pipeline as shown on the Drawings or as directed by the Engineer, and shall be sufficient in marginal space for workers.

(b) If at any point, materials are excavated beyond the lines and grades of any part of the structure, the over-excavation shall be filled back with selected materials approved by the Engineer at the NIA's expense.

(c) The excavated materials which are not suitable to the embankment shall be spoiled to the site approved by Engineer.

304. Embankment and backfill

(a) The thickness of the spreading of the embanking materials shall be less than 30 cm. The density of the compacted embankment shall be more than 90 percent of the standard testing dry density of the material.

(b) The embankment work shall be suspended without any delay if it rains while working. After the rainfall, the embankment work shall not be resumed until the embankment materials become dry to the appropriate moisture content.

(c) The slope of the embankment shall be finished to the designed gradient by providing fixed ruler.

(d) Embankment or backfill works for the parts contiguous to the structures shall be carried out in a manner not to bring the partial stress to the structure.

(e) Backfill for the construction of the pipeline shall be carried out in parallel with the pipe laying work. The backfill until 60 cm above the top of the pipe shall be made soon after the inspection for the joint works. The heavy equipment including truck shall not be used for the spreading and the rolling compaction of the above-mentioned backfill works. The backfill of

succeeding layers can be carried out by the method and equipment approved by the Engineer.

(f) The gravel foundation for the concrete structures shall be compacted in order to secure the uniform foundation.

305. Gravel paving

(a) The gravel to be spread on the gravel road shall be unscreened gravel, and the grading shall be as follows:

Sieve mesh	Percent by weight passing individual size
40 mm	95 - 100
20	50 - 80
2.5	5 - 25

(b) The spreading of gravel after compaction shall be made in the thickness of seven (7) cm on an average.

SECTION IV. EMBANKMENT FOR DIKE

401. Scope

The provisions of this Section cover the preparation of the foundation, furnishing of all the equipment, labor and machines necessary to construction of dike and such works as are required for execution of the Project. These works shall be conducted in accordance with the Drawings and the specification.

402. General

(a) Lines and slopes

The dike shall be constructed according to the line, slope and section as illustrated on the Drawings. If deemed necessary, the Engineer can modify the original designs in increase or decrease in excavation and embankment of the dam.

(b) Borrow-pit

Borrow-pit is designated on a terrain at vicinity of the dam site.

403. Materials

(a) General

Materials for embankment shall be taken from the borrow-pit and/or the excavation sites. Materials containing branches of trees, roots of trees, grass and other foreign materials shall not be used. At the

borrow-pit excavation shall be made in such a way as to ensure satisfactory mixture of the materials to be taken, if necessary.

(b) Filling materials

The filling materials shall be such clayey soils as to be taken from the borrow-areas designated.

(c) Filter materials

Filter materials are to be taken from the designated borrow-areas. These materials however, shall be exclusive of organic materials and be such sand and gravel with a good grading distribution as are inclusive of those materials in the range from fine grains to coarse grains.

The grading of those materials shall be as follows:

(1) $$\frac{\text{15\% grain size of filter materials}}{\text{15\% grain size of materials protected by filter}} > 5$$

(2) $$\frac{\text{15\% grain size of filter materials}}{\text{85\% grain size of materials protected by filter}} < 5$$

15 percent or 85 percent grain size means grain size of materials finer than respective percentage by weight of total volume of the materials.

The maximum grain size of the filter materials shall be 40 mm.

(d) Riprap materials

Riprap materials are referred to such durable materials among the rocks excavated at the quarry site designated and permeable materials as are relatively large and solid, being neither flat nor plate in shape.

(e) Material for backfill

Unless otherwise designated on the Drawings, materials for backfill shall be referred to such materials as properly conform to the nature of oil nd excavated materials at the place to be re-filled.

404. Preparation of foundation

After excavation for foundation and stripping is completed up to the level shown on Drawings, holes produced by removal of stumps, other holes and hollows shall be raked evenly, so that foundation materials and embankment materials may be combined well.

405. Embankment

(a) General

Until inspection of the foundation for embankment is made, no embankment shall be done on any foundation. The grading distribution of clayey soils shall not be fundamentally different from that of circumferential clayey material in terms of composition and grain size.

(b) Spreading

In order that compaction may be carried out on the heels of dumping, the materials required shall be spread almost horizontally over the whole surface of the projected embankment either by a bulldozer or other adequate machine. Unless otherwise directed specifically, the standard thickness of the layer to be formed in advance of compaction shall be 15 cm (±) as for impervious materials and 30 cm (±) as for filter materials, respectively. In case the surface of the materials compacted is so glassy that their connection with the next layer is likely to be hampered, their surface shall be loosened by a lakedozer or other adequate machine, prior to the spreading of the layer that follows. While materials are spread and adjusted to the adequate moisture content, NIA shall remove the pieces of wood, stump and other improper materials from every kind of embankment materials. Improper embankment materials shall be disposed to the designated area. The whole surface of the embankment underway shall be kept in good order, so that the machines required may pass through it smoothly, and the wheel tracks created on the surface of the layer shall be fully filled prior to commencement of the compaction.

406. Adjustment of moisture content

The materials for formation of each layer of embankment shall be a moisture content within the extent specified herein-below, so that compaction thereof may be made to the designated extent.

The moisture content of any part of the layer shall be as uniform as possible. The embankment materials shall have such a moisture content as to ensure the acquisition of minimum 90 percent of the degree of the standard compaction test. The materials have dried excessively, NIA shall pour water on each layer of embankment and shall adjust the materials by a harrow or other means until the moisture content has become uniform. In case the surface of the embankment is dry that the soil for embankment to be layed thereon is not likely to adhere thereto well NIA shall rake the surface and moisten the recked materials.

407. Compaction machine

The machines to be used for compaction shall be as follows:

(a) Rollers

The roller to be used for compaction may either be of vibratory steel Face Type or be of Pneumatic Type.

(b) Rammer & tamping

As to compaction of the zones at which compaction by roller cannot be employed, such a rammer or tamper shall be used.

408. Compaction

(a) Dike

The compaction shall be made by roller at the rate of eight time passes or more and each pass of the roller shall overlap 0.3 m or more the proceeding pass. Where no roller can be used, the layer with the thickness of 10

cm shall be made and be compacted by rammer or tamper to the same density as roller compaction. Dumping, spreading, removal of inferior materials, adjustment for acquisition of the specified moisture content for the site, spraying of water, compaction and so forth may be carried out simultaneously on the indentical surface of embankment, provide that the area involved is so wide as to permit simultaneous execution of these works.

(b) Supplemental compaction

In case the compaction of any one of the embankment is insufficient, supplemental compaction shall be made in accordance with the Engineer's instructions.

SECTION V. CONCRETE WORK

501. Scope

The specifications are applicable to the concrete works which are to be used in this construction, i.e. Reinforced concrete (Class A), Plain concrete (Class B) and Lean concrete (Class D).

502. Cement

(a) Cement used to concrete and mortar shall be Portland cement which conforms to the standard described in ASTM C-150 TYPE I.

(b) The bagged cement shall be stored in the well damp-proofed warehouse of which the height of floor is more than 30 cm. The bagged cement which has been stored more than three month or which are suspected to be damped shall not be used unless otherwise approved by the Engineer.

503. Water

(a) Water used for mixing concrete and mortar shall not contain harmful quantity of oil, acid, salt and so on which affect the quality of the concrete.

(b) Even if the quality of the water is questionable, the water may be used if the concrete expecting to obtain 90 percent of the compressive strength at the age of 28 days of the concrete of which was made by using the city water.

504. Fine Aggregate

(a) Fine aggregate which is to be used in concrete and mortar shall be clean, sound and durable. It shall not contain the harmful quantity of organic impurities like salt and others.

(b) Fine aggregate shall be well graded from large particle size to small one. Its grading shall conform to the standard shown in the following table unless otherwise approved by the Engineer.

Sieve mesh	Percent by weight passing individual size
3/8"	100
No. 4	95 - 100
No. 8	65 - 95
No. 16	45 - 80
No. 40	25 - 85
No. 50	10 - 35
No. 100	2 - 10
No. 200	0 - 5

The fineness modulus shall be in the range from 2.3 to 3.00. The design mix shall be redesigned when the fineness modulus of the fine aggregate deviate more than 0.2 from the one which was originally designated as design mix of the concrete.

505. Coarse Aggregate

(a) The coarse aggregate which is to be used in concrete and mortar shall be clean, sound and durable. It shall not contain the harmful quantity of thin or elongated shape gravel, organic impurities like salt and others. The coarse aggregate shall conform to ASTM C-33.

(b) The coarse aggregate shall have the proper grading from large to small in particle sizes. Grading shall conform to the standard shown in the following table;

Sieve mesh	Percent by weight passing individual size
1"	100
3/4"	90 - 100
3/8"	20 - 55
No.4	0 - 10

506. Design Mix

(a) For the approval of the Engineer, NIA shall design the mix proportion for every class of concrete before placing the concrete. NIA shall carry out the mix test in case being requested by the Engineer. The test is to be made at the expense of NIA.

(b) The compressive strength at the age of 28 days shall be as follows:

Class	Maximum size of coarse aggregate	Minimum 28 days compressive strength	Slump
A (Refinforced concrete)	3/4	210 kg/cm^2	7.5 $\pm$ 1.5 cm
B (Plain concrete)	1 1/2"	180 kg/cm^2	7.5 $\pm$ 1.5 cm
C (Lean concrete)	1 1/2"	135 kg/cm^2	15 cm

507. Mixing

(a) Concrete shall be used a mixer unless otherwise approved by the Engineer in writing. The mixer shall produce homogeneous concrete and shall be subject to the approval of the Engineer.

(b) The measurement of every ingredient of concrete shall be made in weight. Nevertheless, the measurement in volume is admitted subject to the approval of the Engineer.

(c) The mixing time of concrete shall be more than one and a half minute. Overmixing, requiring the introduction of additional water to preserve the required consistency, will not be permitted. Overmixed concrete shall be wasted.

(d) The mixer shall be completely emptied before receiving the materials for the succeeding batch and shall be kept clean and washed out after stopping the works at the end of each shift.

(e) One commencing the works, the first batch shall contain sufficient excess of cement, sand and water to coat the inside of the drum to avoid the reduction of the required mortar content of the mix.

508. Hauling and Placing

(a) Concrete shall be hauled speedily to the placing site by the method which does not cause the segregation of the ingredient. The concrete shall be placed within 45 minutes after mixing. The concrete of which the ingredient is segregated shall be remixed.

(b) NIA shall prepare a plan for the method of hauling and placing of the concrete and shall submit such plan to the Engineer for approval before commencement of the concrete work.

(c) Before placing the concrete, the construction joint of concrete structure shall be cleaned and shall be covered

with a layer of mortar at least 1.5 cm thick. The mortar shall have the same mix proportion of cement and sand as the concrete mix to be placed upon it.

(d) Before placing the concrete, the inside of the forms shall be cleaned in order to keep from mingling of impurities.

(e) The height from the lowest edge of the chute to the placing concrete surface shall be less than 1.5 m.

(f) Before placing the concrete, NIA shall obtain approval of the Engineer as to the arrangement of the reinforcing bars and the setting of the forms.

(g) The concrete shall be consolidated by internal vibrators. The form vibrator may be used together with the internal vibrator in such place as the thin wall in which the latter is difficult to use.

(h) The vibrator shall be inserted vertically and with the constant intervals into the concrete. The vibrator shall be drawn out slowly and steadily in order to avoid remaining the void in the concrete.

(i) The interval and the duration of vibration shall be subject to the direction of the Engineer.

509. Form

(a) Forms shall have the sufficient strength to withstand the pressure resulting from placement and vibration of the concrete. In addition, the form is to conform to the shapes, lines and dimensions of the concrete shown on the drawings and shall be tight enough to prevent loss of mortar from the concrete.

(b) Form may be of steel, plane wood and plywood. The form surface in contact with the concrete shall be completely smooth.

(c) Unless otherwise instructed, the form shall be with chamfering of 2 cm x 2 cm in the corner of the concrete.

(d) Bolts or steel bars may be used to tighten the forms. These clamps shall not be remained on the surface of the concrete after removal of the form.

(e) The surface of the form shall be coated with shutter oil to prevent adherence of the concrete to the form.

(f) The minimum time to elapse from concrete placing to removal of the form shall be as follows:

Form	Minimum time required for removal of formers after concrete placing
Vertical or near vertical faces of thick member	1 day
Vertical or near vertical faces of thin member	3 days
Slab	6 days

510. Finishing

(a) Finishing shall be made by wood trowel. Nevertheless, the surface of the concrete which is required to be smooth and dense shall be finished by iron trowel with pressure after placing of the concrete as late as practicable.

(b) The protrusion on the surface of the concrete shall be removed and shall be levelled. The honeycomb or faults in the concrete shall be wetted by water and shall be patched up by the concrete or mortar which are properly mixed and shall be finished after removing the incompleteness around them.

511. Curing

The placed concrete shall be covered by mat and kept continuously damp for a minimum of three days after placing.

512. Reinforcing Bar

(a) Unless otherwise shown on the drawings, the reinforcing bars shall be deformed bars and shall conform to ASTM-A15, A-305 and A-408.

(b) The equipment and tool which are to be used to cut, bend and manufacture the bar shall be to the Engineer's approval. Hot manufacturing of the reinforcing bar is not permitted.

(c) Before the bar is placed, the rust, dirt, grease or other foreign substances shall be removed from the surfaces of the reinforcing bars and the surfaces of any metal bar support and spacer.

(d) The minimum cover for all main reinforcing bars shall be 5 cm. The errors in the covering and in the distance between the center of bars shall be less than $\pm$ 1 cm.

(e) The radius of 90° bend of the bar in the members of the rahmen structures shall be more than 10 times of the steel bar diameter. The radius of 45° bend of the bar shall be more than five times of the diameter of bar.

(f) Laps at joints of the reinforcing bar shall have a length at least thirty times of the diameter of bar and shall be bound by steel wire of which the diameter is bigger than 0.9 mm.

SECTION VI. GROUTED RIPRAP

601. Materials

(a) The stones used for grouted riprap shall be free from fissures and cracks, have sufficient strength and durability against weathering and erosion by water and air, and have at least more than 15 cm diameter. The specific gravity of the stones shall be 2.6 or more.

(b) Gravel for back-filling shall have sufficient resistance against weathering and alteration and shall be in the range from 10 to 150 mm in diameter.

(c) The proportion of cement and sand in grouting mortar is one to three (1:3) in bulk. The quality of the sand for mortar shall be same as the concrete material.

602. Curing

The grouted riprap shall be covered with wet mats immediately after execution f work, and cured for at least three days.

603. Joint

The joints of grouted riprap shall be provided at 10 m intervals. The material of joints shall be one-centimeter thick wooden plate with corrosion inhibitor coated.

SECTION VII. RUBBLE MASONRY WITH CONCRETE

701. Materials

(a) The stones shall consist of field stones that are clean, sound, resistant to the action of water, and must have a specific gravity of at least 2.4. Such stones shall weight from 20 to 50 kilograms a piece.

(b) Materials for the concrete binder shall be governed by Section-V for B-Concrete.

702. Curing

The rubble masonry with concrete shall be covered with wet mats and cured for at least three days.

703. Joint

The joints of rubble masonry with concrete shall be provided at 10 m interval. The materials of joints shall be 1.0 cm thick wooden plate with corrosion inhibitor coated.

SECTION VIII. PIPE WORKS

801. Earthworks

For the earthworks required for piping, the specifications of Section III shall be applied to.

802. Reinforced Concrete Pipes and Fittings

(a) Reinforced concrete pipes shall designed subject to 10-ton Trucks loading with minimum overfills of 0.60 meters.

(b) Joint works

Joint of pipes shall be filled with stiff mortar composed of one part cement and one half parts of sand in bulk. The mortar shall be placed so as to form a durable watertight joint. After setting of the mortar joint, the construction of the reinforced concrete collar shall be done as per Drawings.

803. Galvanized Steel Pipes and Fittings

(a) Galvanized steel pipes shall conform to JIS G-3442 or equivalent (JIS stands for Japan Industrial Standards).

(b) Joints shall be of flanged with all bolts, nuts, gasket seats, washers and joint rings as may be required, except otherwise specified as welding in the Drawings. All metal parts of joints shall be adequately protected with rustproof paint.

(c) All flanges shall be of steel pipe flange of 10 kilograms per square centimeter in nominal pressure used for connecting pipes, valves etc. and shall conform to JIS B2212 or equivalent. Connecting with flanges and steel pipes shall be welded in such position and right angles to the axis of pipe.

804. Polyvingyl Chloride Pipes and Fittings

(a) Polyvinyl chloride (PVC) pipes shall conform to JIS K-6741 or equivalent for water services piping at five kilograms per square centimeter in nominal pressure.

(b) The pipes shall be provided at one Taper Socket at the end of pipes in compliance with manufactures' standard. The connection's pipes and fittings shall be used suitable bonding agent which is approved by the Engineer.

(c) Internal and external surfaces of pipes should be smooth without harmful flaws, longitudinal streaks, cracks, distortions and other defects.

(d) Fittings such as bends, reducers, sockets, caps and socket tees shall be made of PVC conforming to JIS K-6743 or equivalent. Any said fittings shall be at Taper Socket in the required figure.

(e) The Contractor shall submit full details of the materials dimensions and test pressures of the fittings offered.

(f) Precautions shall be given to avoid damages to the pipes and fittings. In handling and storing the pipes and fittings, every care shall be given to avoid distortion, flattening, scoring or other damages. The pipes and fittings shall not be allowed to drop or strike objects.

805. Sluice Valve

(a) The sluice valves shall be of vertical and flanged type conforming to JIS B 2062 or equivalent.

(b) The sluice valves shall be suitable for water services piping at the maximum operating pressure of static head up to 75 m.

(c) Valve bodies shall be made of cast iron conforming to class 3 (FC 20) of JIS G5501 or equivalent.

806. Check Valve

(a) The check valves shall be of flanged swing type in accordance with JIS B2074 or equivalent.

(b) The check valves shall be suitable for water services piping at the maximum operating pressure of static head up to 75 m.

(c) Valve body and disc shall be made of cast iron conforming to class 3 (FC 20) of JIS G5501 or equivalent.

SECTION IX. PUMP FACILITIES

901. Materials

The volute pump with accessories shall be furnished by JICA. JICA shall show to the NIA the specifications and drawings inconditions assembled, disassembled and installed, which are prepared by the manufacturers.

The capacity of the proposed pump shall meet the following specifications or equivalent:

Type	:	volute motor pump
Discharge diameter	:	125 mm
Capacity	:	1,250 liter/min.
Total head	:	14.5 m
Actual head	:	8.5 m
Motor	:	5.5 KW, 4P, 1,800 RPM
Electric Power	:	3 phase, 220 V, 60 Hz
Engine	:	7.5 HP, 1,800 RPM

The pumping unit to be furnished shall be in accordance with the latest applicable standards in the country of origin for the type of pump to be supplied, unless otherwise specified herein. The efficiency of the unit to be furnished shall be as high as practicable and consistent with the best modern design. The pump shall ensure equal or higher quality than the specified special standard or the indicated design requirements of these Agreement Documents.

902. List of pump equipment and accessories

Pump facilities shall be contained following equipment and accessories.

1. Centrifugal pump ϕ125 mm suction & ϕ125 mm discharge, 1,800 RPM, vertical, stainless steel shafting, bronze impeller, & cast iron casing.
   Flange type, 15 meters TDH (total dynamic Head) with capacity of 300 to 350 U.S. GPM, flexibly coupled to an electric motor, 5.5 KW (7.5 HP), 3-phase, 220 volts, 1,800 RPM, mounted on a common Steel Base with primming funnel nd cock ..... 1 unit

2. Foot valve-ϕ125 mm cast iron made withstrainer Flange type ..... 1 pc.

3. GI Pipe ch.40, ϕ125 mm x 3.00 m threaded w/ Flange on both ends ..... 1 pc.

4. 45° Elbow ϕ125 mm Flange type ..... 2 pcs.

5. GI Pipe sch. 40, ϕ125 mm by 2.00 m threaded with Flange on both ends ..... 1 pc.

6. 90° Elbow, 125 mm Flange type-steel ..... 1 pc.

7. Nipple - 125 mm x .2 m Flange type ..... 1 pc.

8. Gate valve-non rising, ϕ125 mm Flange type ..... 1 pc.

9. Steel Tee-ϕ125 mm x ϕ130 mm x ϕ200 mm Flange type ..... 1 pc.

10. GI Pipe sch. 40, ϕ200 mm x 1.5 m, threaded with Flange on both ends ..... 1 pc.

11. 90° Elbow, ϕ200 m Flange type-steel ..... 1 pc.

12. GI Pipe sch. 40, ϕ200 mm x 4.50 m threaded with Flange on both ends ..... 1 pc.

13. Rubber gasket for Flange ϕ100 mm ..... 12 pcs.

14. Bolts and Nuts stainless steel ϕ5/8" x 2-1/2 .... 96 pcs.

15. PVC Pipes sch. 30, ϕ200 mm w/ socket .....400 pcs.

16. PVC coupling, ϕ200 mm ..... 67 pcs.

17. PVC 90° Elbow, ϕ200 m ..... 3 pcs.

18. PVC 45° Elbow, ϕ200 mm ..... 2 pcs.

19. Steel-Gate valve, ϕ150 mm Flange type ..... 2 pcs.

20. GI Pipes-sch. 40, ϕ150 mm x 3.00 m, Flange Type ..... 2 pcs.

21. GI Pipes-sch. 40, ϕ150 mm x 1.00 m, Flange type ..... 2 pcs.

22. Diesel Engine, 7.5 - 10 HP, single cylinder, water cooled with radiator 1800-2200 RPM, Manual Starter, with crank & standard tools coupled with centrifugal pump ϕ130 mm suction and ϕ130 mm discharge-vertical, flange type 1,800 RPM with discharge capacity of 600-650 U.S. GPM, Stainless steel shafting, bronze impeller & cast iron casing mounted on a common steel base with priming funnel and cook (attached to pump) ..... 1 unit

23. Foot valve-ϕ130 mm cast iron made with strainer Flange type ..... 1 pc.

24. GI Pipes sch. 40, ϕ130 mm x 3.00 m threaded with Flange on both ends ..... 1 pc.

25. GI Pipe sch. 40, ϕ130 mm x 3.50 m threaded with Flange on both ends ..... 1 pc.

26. Steel - 45° Elbow - ϕ130 mm Flange type ..... 2 pcs.

27. GI Pipes sch. 40, ϕ130 mm by 2.00 m threaded with Flange on both ends ..... 1 pc.

28. Steel - 90° Elbow ϕ130 mm Flange type ..... 1 pc.

29. Nipple - ϕ130 mm x .20 m Flange type ..... 1 pc.

30. Steel-gate valve - ϕ130 mm Flange type ..... 1 pc.

31. Rubber gasket ϕ130 mm ..... 12 pcs.

32.	Bolts and nuts ϕ5/8 x 2-1/2" stainless steel	96 pcs.
33.	Rubber gasket - ϕ200 mm	6 pcs.
34.	Bolts & huts ϕ3/4" x 2-1/2" stainless steel	48 pcs.
35.	Rubber gasket, ϕ150 mm	4 pcs.
36.	Bolts & nut ϕ3/4" x 2-1/2" stainless steel	32 pcs.
37.	Solid electrical wire No.2 insolated	800 mtrs.
38.	Stranded electrical wire No.2 (bare)	400 mtrs.
39.	Electric meter 3 phase	1 unit
40.	Electric switch good for 5.5 kw motor 220 volts 3-phase with fuse	1 unit
41.	Magnetic automatic switch, 220 volts, 3 phase ..	1 unit

903. Installation

The pump shall be installed and incorporated with the structure as indicated in the drawings furnished by the manufacturer.

904. Servicing and operation test

After the pump is completely installed, the pump's accessories shall be cleaned and serviced by NIA.

905. Guarantee of materials and workmanship

NIA shall guarantee the quality of the equipment and be fully responsible for any defective equipment and parts found within one (1) year from the date of acceptance.

SECTION X. MISCELLANEOUS

1001. Metal Works

The work under this section consists of all metal works shown in drawings. Materials to be used shall conform to the requirement of the Philippines Standard or JIS wherever applicable.

Painting shall be complied with Section XII of this specification.

1002. Weep Hole

As weep holes of 50 mm in diameter shall be provided at the intervals shown on the Drawings, which material shall be directed by the Engineer.

The sand and gravel filter shall be provided behind the concrete wall at the position of the weep hole as shown on the Drawings.

SECTION XI. ELECTRICAL WORKS

1101. Regulations and Standards

The complete electrical works shall be carried out as per the Specifications, complying with Electric Power Act and other related Rules and Standards of the Republic of the Philippines and Codes of Practices.

1102. Materials

All materials used in the Project shall comply with the appropriate Standard Specifications in the Philippines where such applies.

1103. Power Supply and Incoming Switch Box

Power shall be taken from 60 cycles, 220 volts, three phase system of public line. The connecting point of public line and the Project will be directed by the Engineer at the Site. An incoming switch box with watt-hour meter shall be installed at the connecting point.

1104. Power Control Panel

A power control panel shall be designed and manufactured by NIA in accordance with following conditions.

For pump facilities;

(a) Pump shall be operative by manual operation.
(b) Power shall be fed from public line.

1105. Inspection and Test

When all works are completed, NIA shall test the electrical installations for ground and/or short circuits in the presence of the Engineer, or his authorized representative.

SECTION XII. PUMP HOUSE

1201. Materials

All materials used in the pump house construction shall be subject to the Engineer's approval. NIA shall submit to the Engineer, samples of the said materials prior to the commencement of relative works for the approval.

1202. Earth Works

(a) Leveling of grounds

The ground of the pump house shall be levelled before commencement of the works.

(b) Backfill

The portions around the foundations or other portions requiring backfill shall be filled with good materials and sufficiently compacted.

1203. Concrete Works

(a) Materials

The cement used shall be Portland cement conforming to the standard of ASTM C-150-TYPE I. The coarse aggregate of concrete shall be 25 mm in maximum.

(b) Proportioning and Strength

The 28 days age strength of concrete shall be as given in the following table. The proportion of concrete

mixes shall be in conformity with the Reinforced Concrete Works Specifications instituted by the Architectural Institute of Japan or with any equivalent standards.

Concrete	Design Strength (kg/cm^2)	Slump (cm)	Application
Plain concrete		Proportion 1:3:6	Lean concrete
Plain concrete	150 or more	13 - 15	Floor
Reinforced Concrete	180 or more	15 - 18	Footing & Footing Beam
Reinforced concrete	210 or more	18 - 21	Column

1204. Form Work

The forms shall satisfy the requirements not to cause faults such as honeycomb and void in concrete and the forms for architectural concrete shall be guaranteed in the finish of the surfaces.

1205. Reinforcing Bars

Reinforcing bars shall conform to the requirements specified under Section V.

1206. Concrete Block Works

(a) Materials

The concrete blocks shall be in conformity with JIS A 6406 Hollow Concrete Blocks or other equivalent standards. The thickness of concrete blocks for walls shall be 13 cm in the pump house.

1207. Carpentry

(a) Materials

The wood used shall be dried to 24 percent or less in moisture content. And the wood may be Yacal.

(b) Preservative treatment and insecticide treatment

All the surfaces of wood in contact with concrete, mortar, etc. shall be coated twice with phenol preservative.

Lauan not treated with insecticide shall not be used.

All metalic parts shall be coated with rust preventives, except the portions embedded in concrete.

(c) Protection

The portions which may be spoiled or damaged during working shall be protected by the covering of paper, board, or any other suitable materials.

1208. Roofing

(a) Material

All the roof materials shall be No.26 corrugated galvanized iron sheets. The overlapped portions shall extend more than 2 crests in crosswise direction and more than 30 cm in lengthwise direction.

1209. Joiner's Work

(a) Window

The windows shall be of wooden sashes.

(b) Door

The doors shall be wooden flush doors.

(c) Hardwares

All the locks for fittings and other accessory hardwares shall be of first class quality, and their samples shall be submitted and approved by the Engineer.

Door locks	:	Cylinder locks with master keys Knobs to be made of stainless steel
Door closers	:	With floor hinge stops
Hinges	:	Hinges in office shall be pivot hinges

1210. Glazing Works

(a) Materials

The sheet glass shall be polished sheet glass.

(b) Fitting materials

For edge keeping portions, Thiokol sealing agent shall be used.

1211. Painting

(a) General

All the facings of woods and steels in the buildings shall be painted in accordance with the Engineer's instruction.

(b) Painting Schedule

The painting schedule shall be as shown in the following tables.

Alkyd resin paint

Ferrous portions		Wooden portions	
Painting schedule	Number of coats	Painting schedule	Number of coats
Unticorrosive coat	1	Surface preparation	1
Intermediate coat	1	First coat	1
Finish coat	2	Intermediate coat	1
		Finish coat	2

Supplement 6. Draft of Agreement on Farmer's Organization

MEMORANDUM OF AGREEMENT

KNOW ALL MEN BY THESE PRESENTS:

This Memorandum of Agreement entered into and executed this _____ day of _____, by and between:

THE NATIONAL IRRIGATION ADMINISTRATION, with office address at Dao District, City of Tagbilaran herein referred to as "NIA" represented by CALIXTO M. SEROJE, Provincial Irrigation Engineer;

- and -

The APC-Farmer's Association with office address at Dat-an, Katipunan, Carmen, Bohol referred to as "THE ASSOCIATION" represented in this Agreement by the President _____ ;

WITNESSETH:

WHEREAS, the JICA has established the Bohol Agricultural Promotion Center Project under the Bohol Integrated Agricultural Development Project (BIADP) of the National Council on Integrated Area Development (NACIAD);

WHEREAS, the main objective of the project is to establish pilot infrastructure for lowland rice development as well as upland culture of agricultural crops;

WHEREAS, the main source of irrigation is the construction and development of a water reservoir within the Dat-an Creek to store sufficient water reserve;

WHEREAS, pump irrigation system is provided and being run by both electrical motor and diesel-fed engine as pump prime mover;

WHEREAS, there is need to properly maintain the operations and maintenance of the above-mentioned pump sets for proper operations by the farmer-tillers formed into farmer's association;

NO THEREFORE, NIA PIO and APC-Carmen Farmer's Association hereby mutually agree to the following stipulations:

ARTICLE I

Obligations of NIA

1. NIA shall prepare Operations and Maintenance guidelines in the proper operations of the pump irrigation as well as proper water management practices and equitable water distribution;

2. NIA shall assign irrigation technician to supervise and check the farmers' activities relative to the preceding section to ascertain adherence to the guidelines prepared;

3. NIA shall coordinate with the APC Staff in the overall operations and maintenance requirements of the APC Carmen Irrigations Systems.

ARTICLE II

Obligations of the Association

1. The board of Directors of the APC-Carmen Farmer's Association shall designate at least two (2) qualified pump operators to operate the pump irrigation system as well as oversee the water distribution to the whole area of coverage;

2. The Association shall pass governing laws in the collection of irrigation fees to be undertaken by the Association to defray the cost of depreciation so that continuous good operation can be attained;

3. The Association members shall at all times cooperate in the safeguarding of reservoir area as well as all established structures to put said structures in good order;

4. The Association shall cooperate all activities relative to farm production initiated by the NIA Staff as well as APC Staff and other government agencies.

ARTICLE III

Term of Agreement

1. This Agreement shall be effective upon the execution by both parties.

IN WITNESS WHEREOF, the parties hereunto set their hands this _____, 1985.

NATIONAL IRRIGATION ADMINISTRATION
BY:

CALIXTO M. SEROJE
Provincial Irrigation Engineer

APC-CARMEN FARMER'S ASSOCIATION
BY:

_____
President

WITNESSES:

_____ _____

BOHOL AGRICULTURAL PROMOTION CENTER
PILOT INFRA PROJECT
DAT-AN, KATIPUNAN, CARMEN, BOHOL

- 0 -

APC-CARMEN FARMERS ASSOCIATION

BY-LAWS

KNOW ALL MEN BY THESE PRESENTS:

That we the undersigned all of legal ages, filipino citizen, and residents of Carmen, Bohol, Philippines are members of APC-Carmen Farmers Association hereby promulgate and adopt the herein By-Laws:

ARTICLE I

Name, Domicile and Objectives

The APC-Carmen Farmers Association with principal office at Dat-an, Katipunan, Carmen, Bohol is organized for the specific objective of working with the National Irrigation Administration and the Bohol Integrated Area Development Project and the Staff of Bohol Agricultural Promotion Center in the National effort of Rural Development, thus this organization is committed to the following objectives:

1. To operate, manage a communal pump irrigation system and maintain an equitable irrigation water supply to the members;

2. To develop, acquire, improve managerial capabilities by consciously seeking assistance and accept advices from the government and private entities in pursuance of improve agricultural development goal;

3. To undertake a continuing education and training activities with the assistance and support of local and national government as a means to gain knowledge and develop necessary skills to manage the activities of the association and its facilities and services for the members and communities;

4. To adopt recommended production and water management technology for efficient productivity;

5. To produce quality seeds principally for distribution at cost to the members;

6. To adopt to actual conditions management scheme for collective supplying and procurement of production inputs and other consumer goods for the use of the members and their families;

7. To acquire for the members appropriate farm tools, equipments machineries and other infrastructure facilities and consequently adopt to actual conditions, a management scheme for collective use of the acquired farm tools, equipments machineries and other farm infrastructure as well as those own by the members;

8. To adopt a management scheme for extension for credit services to the members, and initiate a savings and loaning plan for the members family;

9. To adopt a cropping pattern scheme that will intensify farm productivity, employment of family labor and wise use of land and water resources of the association and thus increase farm family income;

10. To adopt a livestock production scheme that will assure availability of a more balance food recourse for the members and nearby communities;

11. To set up facilities and services for the maintenance of the farm tools equipments machineries of the association as well as those owned by the members and facilities and services the will hasten the economic, social and cultural development of the members and their families and that of other communities;

12. To cooperate and undertake with similar organization undertaking agricultural development activities that are mutually beneficial and contributes to the national development and undertake any and all necessary but lawful activities that will benefit the members, their families, their communities and the country.

ARTICLE II
Membership

Section 1. Qualification for Membership - Membership shall be opened to any person of legal age who is the owner, lease or other lawful possessor of agricultural land covered by the APC-Carmen Pilot Infra Project at Dat-an, Katipunan, Carmen, Bohol.

Section 2. Application for Membership - The application for a membership shall be made in writing on a form provided for the purpose. Application for membership shall be submitted to the Secretary who shall present the same to the executive board of the Association for appropriate action.

Section 3. member in Good Standing - A member in good standing is one who complies with all the duties of a member set forth in Section 5 of this Article.

Section 4. Rights of Members - A members shall have the following Rights:

1. To exercise the right to vote on all matters relating to the affairs of the association brought before any meeting of the members;

2. To be eligible to any elective or appointive office of the association;

3. To participate in all deliberations of the membership meeting and to express his opinion on any matter under discussion;

4. To avail of all facilities and services of the association;

5. To examine the records of the association; and

6. To criticize and be criticized affirmatively on matters relative to the affairs of the association for the common good.

Section 5. Duties of Members - A member shall have the following duties:

1. To obey and comply with the by-laws and such rules and regulations as may be promulgated by the Executive Board of the Association;

2. To attend all meetings, training and seminars that may be called by the Executive Board and/or any government agency engaged in Rural Development;

3. To perform faithfully, honestly and delightly the duties and responsibilities that may be vested upon him to assume any position of leadership, authority and responsibility;

4. To pay his irrigation fees and other dues;

5. To contribute personal services to the association in the maintenance of the irrigation system and other projects of the association;

6. To participate without reservation in any system of procurement and supplying of production inputs and marketing of produce that may be instituted by the association;

7. To adopt and apply techniques in agriculture as may be taught or suggested by government technicians engaged in food production;

8. To strive to gain knowledge and skills to be worthy of membership and consequent leadership responsibilities;

9. To take note of announcement in the association's Bulletin Board for timely information and proper guidance; and

10. To perform such other lawful duties as the association may deem necessary for its best interest.

ARTICLE III

Fees and Dues

Section 1. Membership Fees - Every member of the Association shall pay a membership fee of ₱50.00 or its equivalent in acceptable commodity, upon his admission to the Association to defray the expenses to be incurred in the registration of the Association;

Section 2. Irrigation Fees - Every member of the Association shall pay ten (10) cavans of palay of fifty (50) kilos per cavan of sufficient dryness per harvest per ha or its equivalent amount in cash for crops planted other than rice base on the amount and extent of irrigation services extended by the association to members;

Section 3. Semistral Dues - A Semistral dues of ₱100.00 shall be paid by every member on or before the end of June and December of each year to help defray administrative and operational expenses of the association;

Section 4. Contributions - The Association may raise funds for its activities through contributions or donations from members and non-members either in a form of cash, labor or in kind and through related projects considered appropriate and legal for the purpose.

Section 5. General Fund - All fines and penalties paid by members as well as donations, contributions and monies derived from other sources shall form part of the general fund of the association.

ARTICLE IV

Assembly Meetings

Section 1. Fiscal Year - The Fiscal Year of the Association commences on the first day of January and ends on the last of December.

Section 2. Annual Meetings - The Members shall meet at least once a year every last Saturday of December.

Section 3. Special Meetings - Special meetings of the General Assembly may be called at anytime by the Executive Board upon written request of at least 60% of the members.

Section 4. Notice of Meetings - Notice of every meeting shall be written on the Association's Bulletin Board one week before the meeting stating the purpose, the date, time and place.

Section 5. Quorum and Voting - A majority (1/2 + 1) of the entire membership of the association shall constitute a quorum for the transaction of official business. At every meeting of the members of the association, every member shall be entitled to only one vote.

Section 6. Order of Business - The Order of Business at each meeting of the members shall, as far as practicable, be as follows:

a) Roll call and proof of quorum;
b) Proof of due notice;
c) Reading of an action on the minutes of the last meeting;
d) Report of officers and committees;

e) Recommendation and Proposals;
f) Approval of the Budget for the ensuing year;
g) Election of Directors and Committee Members;
h) Other unfinished business; and
i) Adjournment.

ARTICLE V

The General Assembly

Section 1. The General Assembly it is the supreme Body and the final decision maker in the association. It is the formal grouping or gathering of the members in good standing of the association to perform an organization function or activity;

Section 2. Powers of the General Assembly - The general assembly shall have the following powers:

a) To hear and pass upon the reports of the governing Body and officers of the association;
b) To take formal decision regarding any drastic change in financial policies subject to legal restriction;
c) To act as final arbiter in any dispute or disagreement which may arise between or among themselves of the governing Body and working committees, officers, and individual members;
d) To determine the amendment/s in the articles of Incorporation and/or by-laws;
e) To exercise final authority in all matters vitally affecting the association;
f) To protect the association against any social, economic, and political elements that will undermine its existence and the facilities and services that support the members' socio-economic upliftment; and
g) To protect the right and privilege of the members.

ARTICLE VI

Board of Directors

The Board of Directors is the Executive Body of the Association. A Chairman of the Board of Directors is elected by and from among the Board of Director Members.

The elected Chairman of the Board of Directors becomes automatically the president of the Association.

Immediately after the election of the Board Member, they convene to elect the president, then appoint a Secretary of the Association.

Section 1. Number of Directors - The affairs and business of the Association shall be administered by a Board of Directors composed of 7 members;

Section 2. Term of Office - Members of the Board of Directors shall hold office for a term of two (2) years until the election and qualification of their successors or until recalled.

Section 3. Powers and Duties of the Board of Directors - The Board of Directors shall have entire charge of the management of the affairs and properties of the association. Without prejudice to the general powers herein above-mentioned, the Board of Directors shall have the following powers and duties:

a) To make rules, regulations, policied not inconsistent with law, the Articles of Incorporation and this by-laws;

b) To decide on matter of fees, fines and other fees provided in the Articles of Incorporation and this by-laws;

c) To require proper records to be keep for all transactions of the association;

d) To elect and/or appoint the officers of the association except the Auditor, the Treasurer and Sector leaders;

e) To appoint/hire other employees, if it deems it necessary, who may not be a members of the association and to fix their compensation;

f) To secure loans from any bank of banking institution or from any government or private lending agency, or otherwise to obtain credit for the association by any means whatsoever;

g) Create and define the composition, functions and duration of the management units, and working committees as maybe;

h) Call and hold the necessary meetings, general, semestral, or special;

i) To authorize any officer of the association to enter into any negotiation, contract or agreement with any person, firm or entity which may consider necessary for the best interest of the association;

j) The members of the Board of Directors to have or act on all of the above powers, functions and responsibilities after the adjournment of its meetings, and act individually as officer and as ordinary member, respectively.

Section 4. Vecancies - When ever a vacancy occurs in the Board of Directors through death disability, resignation or otherwise, the vacancy shall be filled by Sector leader elected in the sector as successor to the position vacated who shall serve only the unexpired term.

Section 5. Removal of a Board of Director - Any members of the association may bring charges against a Board of Director by filing the same in writing with the Secretary of the association, together with the position signed by at least five (5) members in good standing of the association. The Board of Directors shall call special meeting of the members of the association to consider the removal. The affirmative vote of 2/3 of the entire membership of the association shall be necessary to remove the director in question.

The directors, against whom charges have been brought shall be informed in writing of the charges against him at least ten (10) days before the meeting, and shall have an opportunity to be heared in person or by council and to present witness and/or evidence during the meeting called for the purpose, and the person or persons bringing the charged shall have the same opportunity.

Section 6. Reimbursement of Expenses - The Board of Directors shall serve the association without compensation or honorarium. However, they maybe allowed reimbursement for actual and necessary expenses incurred by them for activities directly related to the operations of the association.

Section 7. Organizational Meeting - The Members of the Board of Directors shall hold an organizational meeting immediately after their election. At such organizational meeting, the members of the Board of Directors shall then by viva-voce or secret ballot elect from among themselves the president and from among the general membership and members of their household appoint the Secretary and shall hold office until the election and qualification of their successors, unless sonner remove for cause.

Section 8. Regular Meeting - Regular meeting of the Board of Directors shall be held at the principal office of the association on the Second Saturday of each month or on such other date or time at such other place as the Board of Directors by resolution, may determine. Written notice of the time and place of such regular meetings shall be sent to each sector leader at least one week before the meeting.

Section 9. Special Meeting - Special meetings or emergency meetings of the Board of Director shall be held when ever called by the president or by a majority of the members of the Board or 24 hours written notice to each board of director. Such call shall state the time, place and purpose of the meeting.

Section 10. Quorum - A majority of the Board of Directors shall constitute a quorum for the transaction of business, and in the presence of a quorum, a majority vote of the Board of Directors present at any Board Meeting shall be sufficient to decide a question.

ARTICLE VII

Officers, Manner of Selection and Duties

Section 1. Officers of the Association - The officers of the association shall consist of president, secretary, auditor, treasurer and sector leaders whose powers and duties shall be as hereinafter provided and as the Board of Directors may fix conformity with the provisions of the by-laws. The Board of Directors may serve such other offices as it may deem necessary.

Section 2. The President - The president shall be the chairman of the Board of Directors and shall have the following duties and responsibilities:

a) To serve as the Chairman of the Board of Directors;
b) To exercise general supervisor of the affairs of the association;
c) To represent the association in all contracts and activities;
d) To preside at all meetings of the members and of the Board of Directors;
e) To prepare a yearly program of activities and to submit an annual report of the operations of the association;
f) To organize and supervise sectoral groups and other work groups among the members;
g) To recommend candidates to the Board of Directors for appointments of officers and working committee members;
h) To confirm the election of sectoral leaders;
i) To sign the certificate of membership;
j) To properly delegate his tasks, prior to his planned absence; and
k) To perform other duties as the Board of Directors may from time to time fix or delegate.

Section 3. The Secretary - who is appointed by the Board of Directors

from among the members or dependents of the members of the association by virtue of qualifications required to the position. The Secretary shall have the following powers nd duties:

a) To exercise all the powers and perform all the duties of the president during the absence or incapacity of the latter;

b) To serve as Secretary of the Board of Directors;

c) To keep full minutes of all meetings of the members of the Board of Directors;

d) To keep and up to date list of members;

e) To receive application for membership for presentation to the Board of Directors and to notify the applicant within one (1) week of whatsoever action is taken by the Board of Directors;

f) To fill and countersign all certificates of membership issued;

g) To given or cause to be given, all notices of meetings of the members and the Board of Directors;

h) To provide the Board of Directors and/or the President may from time to time fix or delegate.

Section 4. The Treasurer - The treasurer is elected by the members of the association from among the candidates prepared by the association. He has the following powers and duties:

a) Serve as custodian of all assets of the association;

b) Provide documents pertaining to the financial status of the association;

c) Submit annual budget of the association to the Board of Directors;

d) Coordinate with budget/finance committee officers and other functional officers of the association regarding fund requirement;

e) Imburse funds and accept payments of the association; and

f) Perform such other duties that the Board of Directors or President from time to time prescribed.

Section 5. The Auditor - The Auditor is elected by the general Assembly. He has the following powers and duties:

a) Implement policies on audit and inventory as approved by the Board of Directors;
b) Perform other tasks as maybe prescribed by the Board of Directors and/or President from time to time.

ARTICLE VIII
Committees

Section 1. Working Committees - The Board of Directors shall create working committees towards the end of each cropping season as the need may arise to assist the Board of Directors in preparing organizational plans and activities for the succeeding cropping season. The Committees shall be provided with guideline by the Board of Directors, and will be supervised by the president in their specific tasks.

Section 2. Composition and functions - The working committees shall composed of functional leaders of the sector representing specific task and responsibility. This committees as the need arises prepare cropping year plans for water distribution, production inputs supply, financing, general education and management skills development and other social and economic activities that will enhance development of the association and the community.

The Board of Directors may appoint the Chairman for each of the committees that will be organized shall for a maximum duration of one (1) month, primarily to prepare for the Board of Director's approval, program of activities or project for every coming year.

ARTICLE IX
Dissolution and Liquidation

Section 1. Causes for Dissolution - The association maybe dissolved voluntarily by resolution adopted by the affirmative vote of not less than 3/4 of all members at a regular or special meeting of the general assembly called for any cause provided by law.

Section 2. Order of Payments on Liquidation - After dissolving, the assets of the association shall be used to pay the liquidation expenses and debts of the association. If the assets of the association are not sufficient to pay for liabilities, all members must equally be assessed as to their individual farm holding to meet the obligations. However, any surplus after paying all liabilities of the association maybe donated to any social, economic, or cultural projects of the community.

ARTICLE X
Other Rules and Regulations

The Board of Directors shall promote such other rules and regulations may deem necessary, concerning the relationship of the members of the association relating to the rendition of personal

services, distribution of irrigation water, use and disposition of irrigation water construction of dikes and dams or irrigation canal and ditches and other matters and may involve the operation of the irrigation system and the use of the members of the facilities of the association and members shall abide and comply with such rules and regulations as embodied in the by-laws of the association.

ARTICLE XI

Use and Disposition of Association Funds

Section 1. Use of Association Funds - The funds of the Association shall be utilized:

a) To pay the amortization of any loans and discharge all other obligations of the association;
b) To pay the operations and maintenance of the equipments and facilities and services;
c) To pay for such other expenses as may arise in the conduct and operation of its activities.

Section 2. Withdrawal of Funds - Withdrawal of funds of the association which are deposited in bank or banking institution shall be only the signature of any officer of officers of the association as may be designated by the Board of Directors.

ARTICLE XII

Miscellaneous Provisions, Affiliations, Printing, Waiver of Notice, Seal

Section 1. Affiliation - The Association may upon the approval of the Majority of the general membership, affiliate itself with other associations or federation having similar objectives as those of the association.

Section 2. Seal - The Board of Directors or the President, by delegation of the Board of Directors shall provide a suitable seal for the association.

Section 3. Printing of Documents - The Articles of Incorporation and those By-Laws shall be prepared accordingly and a copy will be distributed to each member.

Amendment

These By-Laws may be amended in whole or in part by the affirmative vote of not less than two-thirds (2/3) of all members of the Association at any regular or special meeting where such actions have been announced in the call of said meeting.

Adopted in the Municipality of Carmen, Province of Bohol, this _____ day of _____, 1985 by the vote of a majority of the members of the Association.

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

Attest:

_____

Chairman of the Members' Meeting

_____

Secretary of the Members' Meeting

CERTIFICATION

KNOW ALL MEN BY THESE PRESENTS:

That we, the undersigned, constituting a majority of the members of the Board of Directors of the APC-CARMEN FARMERS ASSOCIATION, as Association, organized and existing under the laws of the Philippines, and the Secretary thereof, do hereby certify that the foregoing document is a true and correct copy of the By-Laws of the said Association duly adopted by the affirmative vote of a majority of the Members of the Association at a members' meeting held on the day of _____, 1985 at Dat-an, Katipunan, Carmen, Bohol, Philippines.

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

COUNTERSIGNED BY:

_____

Secretary

JICA