

ANNEX II

LABORATORY EQUIPMENT

OUTDOOR TANKS

SMALL VEHICLES AND A SMALL BOAT

ITEM	EQUIPMENT NAME	QUANTITY	COST US\$	SUB-TOTAL
1	Sea Water Pump System (pumps, pipe line, check valves, installation, etc.)	5	\$30,500	
2	Freezer	2	\$3,500	
3	Medical Freezer	2	\$1,800	
4	Refrigerator	2	\$10,500	
5	Deep Freezer	2	\$5,500	
6	Low Temperature Incubator	4	\$6,500	
6a	Electrophoresis equipment	3 sets	\$6,000	
7	Scuba Diving Equipment	4 sets	\$5,000	
8	Double Beam Spectrophotometer (190 - 900 nm) (187 - 2,600 nm)	2	\$45,000	
9	Atomic Absorption Spectrophotometer	1	\$35,000	
10	Amino Acid Analyser (440 - 470 nm)	1	\$20,000	
11	Crude Protein Analyser	1	\$12,000	
12	Kjeldahl Nitrogen Distillation Apparatus	1	\$10,000	
13	Kjeldahl Digesting Apparatus	1	\$8,000	
14	Crude Fiber Extractor	1	\$8,000	
15	Soxhlet's Fat Extractor	1	\$8,000	
16	Magnetic Stirrer	10	\$4,200	
17	Homogenizer	2	\$2,500	
18	Blender	10	\$1,500	
19	Stirrer with Hot Plate	6 sets	\$3,200	
20	Autoclave (2 - 6 gallon capacity)	5	\$20,000	
21	Peristaltic Pump	6	\$2,200	
22	Magnetic pump	9	\$3,400	
23	Ultrasonic Cleaner	6	\$3,000	
24	Ultrasonic Pipet Washer	6	\$3,000	
25	Centrifuge (0 - 10,000 rpm)	3	\$35,000	\$293,300

26	Centrifuge Table Top	4	\$15,000	
27	Drying Oven	5	\$4,500	
28	Drying Sterlizer	4	\$7,500	
29	Distiller (2 - 6 lt/hr)	4	\$12,000	
30	Cold Storage Room (25m2)	1	\$20,000	
31	Card Catalogue Cabinets	10	\$5,000	
32	Inverted Microscope	4	\$25,000	
33	CO2 Incubator	3	\$8,000	
34	Incubator	4	\$10,000	
35	Muffle Furnace	4	\$12,000	
36	Water Bath - Bio lab+2	6	\$10,000	
37	Shaking Incubator	1		
38	Meat Chopper	3	\$10,000	
39	Disk Mill	1	\$15,000	
41	All Glass Filter Apparatus	4	\$3,500	
42	Ultrafiltration	8	\$6,300	
43	Ice Maker	2	\$6,500	
44	Oceanographic portable Temp-Oxy-deep-salinity	1	\$20,000	
45	Rotary Microtome and Parafine spreading appratus	3	\$30,000	
46	Analytical Balance (0.1 - 0.001 g)	8	\$35,000	
47	Electric Top Balance	6	\$15,000	
48	Electric Platform Scale	3	\$10,000	
49	Freeze Dryer	2	\$9,200	
50	Hot Plate	5	\$2,500	
51	Plankton Sampling Devise	5	\$10,000	
52	Laboratory Timer	12	\$6,000	
53	Constant Temperature Circulator	3	\$30,000	
54	Immersion Cooler	2	\$25,000	\$363,000

55	Fraction Collector	1	\$8,000	
56	Auto Seal Machine	1	\$2,000	
57	Binocular Microscope	3	\$10,000	
58	Microscope with Nikon C-Mount	20	\$120,000	
58a	Microscope with TV adapter (0.9 x 2.25x)	2	\$35,000	
59	Microscope (Trinocular)	10	\$60,000	
60	Microphotographic Apparatus and accessories	3	\$35,000	
61	Microscope Projector (Projection Screen Optiphot (A))	3	\$45,000	
62	Rotary Evaporator	8	\$6,500	
63	Reversing Water Bottle	6	\$3,500	
64	Sounding Machine	1	\$5,500	
65	Bottom Sampler	3	\$4,500	
66	Plankton Net (surface)	4	\$6,500	
67	Plankton Net (medium layer)	4	\$6,500	
68	Dissolved Oxygen Meter	4	\$22,000	
69	pH Meter	6	\$8,500	
70	pH Meter (portable)	6	\$12,000	
71	Salinity Refractometer	6	\$4,000	
72	Turbidimeter	4	\$8,500	
73	Handy Water Pump (0.25 - 1 Hp)	10	\$6,500	
74	Water Tester Kit	3	\$12,000	
75	Mantle Heater	5	\$3,500	
76	Dissecting Microscope	4	\$3,200	
77	Reversing Thermometer	4	\$3,500	
78	Sea Water Thermometer (0 - 100°C)	60	\$1,500	
79	Room Thermometer	20	\$1,000	
80	Espectrofrophotometer (220- 730 nm)	2	\$40,000	
81	Vacuum Pump and accessories	6	\$3,500	\$477,700

82	Air stone diffusers, plastic tubing 3/16" and valves (1 - 4 inches)		\$40,000	
83	B.O.D. Measuring Apparatus	4	\$15,000	
84	Mechanical - Electrical Tool Box Set	2	\$25,000	
85	Electric Drill	2	\$2,500	
86	Circular Saw	2	\$2,500	
87	Bench Grinder	2	\$2,500	
88	Electric Planner	2	\$2,500	
89	Parallel Vise	2	\$2,000	
90	Camera Set	2	\$8,500	
91	Submersable camera set	2	\$4,500	
92	Portable Video System (VHS-BETA)	2	\$4,500	
93	Video Camera	1	\$3,500	
94	Color TV Monitor	3	\$2,500	
95	Overhead Projector	4	\$6,000	
96	Slide Projector	6	\$4,500	
97	Telefax equipment	1	\$10,000	
98	Typewriter	5	\$7,500	
99	Photocopy Machine	4	\$18,800	
100	Calculator	10	\$2,500	
101	Glass Materials & consumables	1	\$8,000	
102	Automatic Pellet Feeder	5	\$10,000	
103	Salinometer	4	\$2,000	
104	Self-recording Thermometer	6	\$5,500	
105	Hydrometer	10	\$5,500	
106	Carts for the above	10	\$2,000	
107	Center Table	6	\$2,500	
108	Hot Plate	8	\$4,500	
109	Ice Box	8	\$2,500	
110	UV Radiometer	2	\$4,000	\$211,300

111	Portable Water Quality Checker (colorimetric)	2	\$3,500	
112	Lux Meter	4	\$1,000	
113	Water Sampler	4	\$1,200	
114	Meteorological Station	1	\$10,000	
115	Water Circulation Pump	12	\$8,500	
116	Drawing Equipment	2 sets	\$5,000	
117	Plankton Net (sheet) (30-60-120-300 um)	10	\$8,000	
118	Aeration System and small oxygen bottles with valves	6	\$3,000	
119	Cellulose Acetate Electrophoresis Apparatus and accessories	1 set	\$4,500	
120	Boat with Outboard motor (see Annex II)	1	\$200,000	
121	Sieve Shaker and Sieve	2 sets	\$4,000	
122	Blood cell counter (colorimetric) and 20 Hemocytometer	2 sets	\$5,500	
123	Computer syster (including plotter accessories and electric protector and modem)	2	\$25,000	
124	Photo Processing Set	1 set	\$15,000	
125	Central desk, tables	10	\$12,000	
126	Dissecting Apparatus	20 sets	\$2,500	
127	Diesel and Gasoline Tanks		\$10,000	
128	Stereo Radio Cassette	5	\$5,000	
129	Station Watgon _Full equipment (15 people) with radio communication system)	1	\$35,000	
130a	Double cabin Pick-up Truck	1	\$20,000	
130b	Jeep double cabin 4 wheel drive	1	\$20,000	
131	Live Shrimp Transportation Truck	1	\$25,000	
132	Pelleter equipment	2 sets	\$10,000	
133	Food mixers	2	\$8,000	
134	Tissue culture equipment		\$15,000	\$456,700

135	Pellet Dryer	2	\$6,500	
136	Impact Pulverizer	2	\$4,000	
137	Chopper	2	\$4,500	
138	Live Shrimp Transportation Tank and oxygen tank with accessories (2-4 ton)	2	\$10,000	
139	Pipets aids and safety equipment		\$10,000	
140	Chair (round)	20	\$5,000	
141	Reagent Cabinet	6	\$3,500	
142	Laboratory Equipment reactives	2 sets	\$10,000	
143	PVC Tubing, trays, support pipets	10 sets	\$10,000	
144	TV satellite antenna and accessories	1	\$40,000	
145	Automatic electric protector (for microscopes and computer)	10	\$20,000	
146	Blower and accessories 8.5/5/3 HP (4) (2) (3)	10	\$35,000	
147	Ultraviolet Lamps for Sterilization 30 - 60 GPM	12	\$6,000	
148	OZONE 1-5 mg/lt	3	\$1,500	
148a	OZONE > 5 mg/lt	2	\$4,500	
149	Generator 65KW (60Hz)	2	\$60,000	
150	Auxiliary Generator 15KW (60Hz)	2	\$35,000	
151	Gas Chromatograph for lipid determination with processor accessories and reactives	1 set	\$15,000	
152	Gas (liquid) aChromatograph for pesticides determination with processor accessories and reactives (Schasler extractor)	1	\$25,000	
153	Boiler and accessories 30HP and 10 HP	4	\$32,000	
154	Thermostat 50 watts (20) 500 watts (20) 2KW (2)	50	\$10,000	
155	Microbiological reactives, slides, plaques micropipets (0.5 - 5 ml) etc.	1 set	\$30,000	
156	Film Projector screen and accessories	1 set	\$10,000	
157	Books and Prints related to aquaculture (Periodic table of chemistry, etc.)		\$30,000	\$417,500

158	Chemicals and glassware		\$25,000	
159	Radio Communications system (cars, boat, office) and phone patch		\$20,000	
160	Sand Filters (50 nm) with automatic valves, fittings, etc. (30 - Ton/hr)	5	\$50,000	
161	Air Conditioner equipment			
	14000 BTU	10		
	2800 BTU	15	\$35,000	
162	Microfilm reading equipment		\$5,000	
163	Desk and chairs	20	\$6,000	
164	Scuba diving complete set, including photographic camera, valves, tanks, portable compressor, boat	4 sets	\$20,000	
165	Bacteriological Chamber, culture and accessories	2	\$15,000	
166	Electron Microscope (250x - 100,000x)	2	\$80,000	
167	Scanning Microscope (20x - 150,000x)	1	\$75,000	
168	Microprocessor pH instrumentation	4	\$12,000	
169	Outdoor and Experimental tanks Tank including valves, earth system, water tank Circular 2 of 90 ton 2 of 45 ton 6 of 15 ton 10 of 8 ton Rectangular 10 of 10 ton 15 of 5 ton		\$100,000	
170	Warehouse (150m2)	2	\$30,000	
171	Temperature Control tank 6 of 2 ton tank 4 of 1 ton		\$20,000	
172	Circulation filter equipment 5 of 2 ton 5 of 5 ton		\$10,000	
173	Earth System, Raceways tank 5 of 2 ton 5 of 7 ton 5 of 10 ton		\$35,000	
174	Water tank attached filter tank 4 of 2 ton		\$6,500	\$544,500

175	Filter and settling tank 4 of 2 ton	\$4,500	
176	Acrylic Display Water Tank 4 of 2 ton	\$4,500	
177	Polycarbonate Polystyrene water tank 20 of 2 ton	\$5,000	
178	Aartemia incubation tank (20)	\$8,000	
179	Live fish transport 2 tanks for 2 ton car	\$10,000	
180	Oxygen diffusers, flow rate control devises	\$3,000	
181	Water testing	\$10,000	
182	Heater-cooler unit 4 of 2 ton Titanium heater Thermostat 500 - 200 watts	\$10,000	
183	Fume hood and accessories	\$15,000	
184	Air pump, Diaphragm blower	\$5,000	
185	PVC take out fittings, piping materials, valves 3/16" - 4"	\$10,000	
186	Sea water sterilizing apparatus and accessories 3 - 30 m3/hr	\$15,000	
187	Molusc culture cage and collector holder	\$10,000	
188	Pond aereator paddle wheel system 6 of 1-2 Hp 4 of 3 Hp	\$15,000	\$125,000

Grand Total \$2,889,000

ANNEX II

REPORT ON THE BOAT FOR THE AQUACULTURE RESEARCH CENTER

Taking into account that this boat will serve to support for the Aquaculture Research Center for research both on shrimp and on fish, the following type of boat and equipment are recommended as being the most appropriate for this work.

As seen in the *Blue Revolution — Yammar's Total Fishery System* catalogue I recommend that the boat that has the following characteristics:

- a) Ability to fish for shrimp with trammel nets
- b) Ability to fish for shrimp and fish with trawling nets
- c) Storage system

This boat is the FRP Yammar DE50, with the following characteristics:

L : 15:25 mts.
B : 3:74 mts.
D : 1:83 mts.
TB : 6.6 Tons
ENG : 4 KDE

FISHING EQUIPMENT

In regards to the fishing equipment, I recommend that the boat be equipped with the following:

- a) Net and Line Hauler — Model Mini block 35
(for winding the gear for trammel fishing)
- b) Winch — Model TR-12-12A
(for winding the gear for trawl fishing nets)
- c) Capstan (vertical — for auxiliary jobs)
- d) Stern Roller (Fig. Pg. 51)
- e) Boom (Fig. Pg. 51)

AUXILIARY EQUIPMENT

In regards to auxiliary equipment for navigation and research, the boat should be equipped with the following:

NAVIGATION

- a. Echo Sounder
- b. Magnetic Compass
- c. Clinometer
- d. Anemometer
- e. Psicrometer
- f. Thermometer
- g. Radio
- h. Radiogoniometer
- i. Sextant
- j. Chronometer
- k. Log Meter
- l. Fascimil
- m. Azimuth Finder
- n. Aneroid Barometer
- o. Binoculars

RESEARCH

- a. Nanssen Bottels (3)
- b. pH meters (2)
- c. Salinometers (2)
- d. Oxygen Meter
- e. Submarine Thermometer
- f. Plankton Nets
- g. Larva Nets
- h. Dredger


FISHING EQUIPMENT AND REPAIR MATERIALS

- a. 20 Trammel Shrimp Nets ready for use
- b. 3 pairs of Trawl Nets ready for use
- c. 4 Trawling Doors
- d. Lines for Trawling
- e. 2 Radio Buoys
- f. Knives, Lines, Needles, Sail Cloth, Thread, etc.

EQUIPMENT FOR MACHINERY MAINTENANCE AND REPAIR

- a. Set of Tools
- b. Filters
- c. Nozzles
- d. Injectors
- e. Rings
- f. Pistons
- g. Seals, etc.

LIFESAVING EQUIPMENT

- a. Lanterns
 - b. Lifesaving Vests
 - c. Bengal Lights
 - d. Lifesaving Rings
 - e. Extinguishers, etc.
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ANNEX III

INSTALLATION OF THE AQUACULTURE RESEARCH CENTER

- 1.- PRINCIPAL LABORATORY
- 2.- AUXILIAR LABORATORY 1
- 3.- AUXILIAR LABORATORY 2
- 4.- SOCIAL AREA
- 5.- DINNING ROOM AND APARTMENTS FOR VISITING SCIENTISTS.
- 6.- DORMITORIES FOR STUDENTS AND LOCAL SCIENTISTS.
- 7.- TV. SATELITE AND ACCESORIES.
- 8.- PARKING AREA.
- 9.- PUMPING STATION
WATER RESERVORIES
MACHINERY AREA:
GENERATOR
BLOWERS
BOILERS
- 10.- FREE AREA
- 11.- OUT DOOR PONDS SHRIMP-FISH-MOLLUSC.

ANNEX IV ALTERNATIVE 1 FOR EQUIPMENT PRIORITIES.

LABORATORY EQUIPMENT - OUTDOOR TANKS - SMALL VEHICLES AND A SMALL BOAT

ITEM	EQUIPMENT NAME	Q'TY	COST US\$	SUB-TOTAL
1	Sea Water Pump System (pumps, pipe line, check valves, instalation, etc)	5 sets	30.500	
2	Freezer	2 sets	3.500	
3	Medical Freezer	2 sets	1.800	
4	Refrigerator	6 sets	10.500	
5	Deep Freezer	2 sets	5.500	
6	Low Temperature Incubator	4 sets	6.500	
6a	Electrophoresis equipment	3 sets	6.000	
7	Scuba Diving Set	4 sets	5.000	
8				
9				
10	Amino Acid Analyser (440-570cm)	1 set	20.000	
11	Crude Protein Analyser	1 set	12.000	
12	Kjeldahl Nitrogen Distillation Apparatus	1 set	10.000	
13	Kjeldahl Digesting Apparatus	1 set	8.000	
14	Crude Fiber Extractor	1 set	9.000	
15	Soxhlet's Fat Extractor	1 set	8.000	
16	Magnetic Stirrer	10 sets	4.500	
17	Homogenizer	2 sets	2.500	
18	Blender	10 sets	1.500	
19	Stirrer with Hot Plate	5 sets	3.000	146.500

20

21	Peristaltic Pump	6 sets	2.200
22	Magnet pump	9 sets	3.400
23	Ultrasonic Cleaner	6 sets	3.000
24	Ultrasonic Pipet Washer	6 sets	3.000
25	Centrifuge (0-10,000 RPM)	3 sets	35.000
26			
27	Drying Oven	5 sets	4.500
28	Drying Sterilizer	4 sets	7.500
29	Distiller (2-6 lt/hr)	4 sets	12.000
30	Cool Room Storage (25x2)	1 set	20.000
31	Card catalog cabinets	10 sets	5.000
32	Inverted Microscope	2 sets	10.000
33	CO2 Incubator	3 sets	8.000
34	Incubator	4 sets	10.000
35	Muffle Furnace	4 sets	12.000
36	Water Bath - Bio lab+2	6 sets	10.000
37			
38	Meat Chopper	3 sets	10.000
39	Disk Mill	1 set	15.000
40			
41	All-Glass Filter Apparatus	4 sets	3.500
42	Ultrafiltration	8 sets	6.000
43	Ice Maker	2 sets	6.500

44

131.000

45	Rotary Microtome and Paraffine spreading apparatus	2 sets	20.000	
46	Analytical Balance (0.1 - 0.001 g)	6 sets	25.000	
47	Electric Top Balance	6 sets	15.000	
48	Electric Platform Scale	3 sets	10.300	
49	Freeze Drier	2 set	9.200	
50	Hot Plate	5 sets	2.500	
51	Plankton Sample Device	5 sets	10.000	
52	Laboratory Tixer	12 sets	6.000	
53				
54				
55	Fraction Collector	1 set	8.000	
56	Auto Seal Machine	1 set	2.000	
57	Binocular Microscope	3 sets	10.000	
58	Microscope with Nikon C- Mount	20 sets	120.000	
58a	Microscope with TV adapter (0.7 x 2.25X)	2 sets	35.000	
59	Microscope (Trinocular)	10 sets	60.000	
60				
61	Microscope Projector (Projection Screen) Optiphot (A)	3 sets	45.000	
62	Rotary Evaporator	8 sets	6.500	
63				
64				
65	Bottom Sampler	2 sets	2.500	
66	Plankton Net (Surface)	2 sets	3.000	
67	Plankton Net (Medium Layer)	2 sets	3.000	392.700

68	Dissolved Oxygen Meter	2 sets	11.000	
69	pH Meter	6 sets	8.500	
70	pH Meter (Portable Type)	6 sets	12.000	
71	Salinity Refractometer	6 sets	4.000	
72	Turbidimeter	4 sets	8.500	
73	Handy Water Pump (0.25 - 1Hp)	10 sets	6.500	
74				
75	Mantle Heater	5 sets	3.500	
76	Dissecting Microscope	4 sets	3.200	
77	Reversing Thermometer	4 sets	3.500	
78	Sea Water Thermometer (0-100°C.)	60 sets	1.500	
79	Room Thermometer	20 sets	1.000	
80	Spectrophotometer (220-750 nm)	2 sets	40.000	
81	Vacuum Pump and accessories	6 sets	3.500	
82	Air stone diffusers, plastic tubing 3/16" and valves (1 - 4 inches)		40.000	
83	B. O. D. Measuring Apparatus	2 sets	8.300	
84	Mechanical - electrical Tool Box Set	1 set	10.000	
85	Electric Drill	2 sets	2.500	
86	Circular saw	2 sets	2.500	
87	Bench grinder	2 sets	2.500	
88	Electrical Planer	2 sets	2.500	
89	Parallel Vise	2 sets	2.000	
90	Camera Set	2 sets	8.500	
91	Submerge camera Set	2 sets	4.500	157.700

92	Video Portable System 'VHS-BETA'	2 sets	4.500	
93	Video Camera	1 set	3.500	
94	Color TV/Monitor	3 sets	2.500	
95	Overhead Projector	4 sets	6.000	
96	Slide Projector	6 sets	4.500	
97				
98	Typewriter	5 sets	7.500	
99	Photocopy Machine	2 sets	10.300	
100	Calculator	10 sets	2.500	
101	Glass Material & Consumable	1 set	8.000	
102	Automatic Pellet Feeder	5 sets	10.500	
103	Salinometer	4 sets	2.000	
104	Self-Recording Thermometer	6 sets	5.500	
105	Hydrometer	10 sets	5.500	
106	Carts for above	10 sets	2.000	
107	Center Table	6 sets	2.500	
108	Hot Plate	8 sets	4.500	
109	Ice Box	8 sets	2.500	
110	UV Radiometer	2 sets	4.000	
111	Portable Water Quality Checker (colorimetric)	2 sets	3.500	
112	Lux Meter	4 sets	1.000	
113	Water Sampler	4 sets	1.200	
114				
115	Water Circulation Pump	4 sets	4.500	
116	Drawing equipment	2 sets	5.000	
117	Plankton Net (Sheet) (36-40-120-200 cm)	10 sets	8.000	111.500

118	Aeration System and small oxygen bottles with valves	6 sets	3,000	
119	Cellulose Acetate Electrophoresis Apparatus and accessories	1 set	4,500	
120	Boat with Outboard Engine	1 set	60,000	
121	Sieve Shaker and Sieve	2 sets	4,000	
122	Blood cell counter (colorimetric) and 20 Hemocytometer	2 sets	5,500	
123	Computer system (including plotter, accessories and electric protector) and phone patch	1 set	12,000	
124				
125	Central desk, tables	10 sets	12,000	
126	Dissecting Apparatus Set	20 sets	2,500	
127				
128	Stereo Radio Casset	5 sets	5,000	
129	Station Wagon - Full equipment (15 people) with radio communication system	1 set	35,000	
130 a)	Double cabin Pick-Up Truck	1 set	20,000	
130 b)	Jeep Double cabin 4 wheel drive	1 set	20,000	
131				
132	Pelletier equipment	2 sets	10,000	
133	Nines food	2 sets	2,000	
134	Tissue culture equipment		15,000	
135	Pellet Dryer	2 sets	6,500	
136	Impact Pulverizer	2 sets	4,000	
137	Chopper	2 sets	4,500	
138	Live Shrimp Transportation Tank and oxygen tank with accessories (2-4) Ton	1 set	5,000	236,500

139	Pipets aids and safety equipaent		10.000	
140	Chairs (Round Type)	20 sets	5.000	
141	Reagent Cabinet	6 sets	3.500	
142	Laboratory Equipment reactives	2 sets	10.000	
143	Tubing PVC, trays, support pipets	10 sets	10.000	
144	TV Satellite antena and accesories	1 set	40.000	
145	Automatic electric protector (for microscopes and computer)	10 sets	20.000	
146	Blower and accesories 8.5/5/3 HP (4) (2) (3)	10 sets	35.000	
147	Ultraviolet Lamps for Sterilization 30 - 60 GPM	12 sets	6.000	
148	OZONO 1-5 mg/lt	3 sets	1.500	
148a	OZONO > 5 mg/lt	2 sets	4.500	
149	Generator 65 KW (60 HZ)	2 sets	60.000	
150	Auxiliar Generator 15 KW (60 HZ)	2 sets	35.000	
151	Gas Chromatograph for lipid determination with processor accesories and reactives	1 set	15.000	
152	Gas (liquid) Chromatograph for pesticides determination with processor accesories and reactives (Extractor de shcasfer)	1 set	20.000	
153	Boiler and accesories 30 HP y 10 HP	4 set	32.000	
154	Termostat 250 watts (20) 500 watts (20) 2 KW (10)	50 sets	10.000	317.500

155	Microbiological reactivities, slides, plaques, micro pipets (0.5 - 5 ml) etc.	1 set	30.000	
156	Film Projector screen and accessories standard	1 set	10.000	
157	Books and Prints related to aquaculture (Periodic table of chemistry, etc.)		30.000	
158	Chemicals and glassware		25.000	
159	Radio communication system (cars, boat, office) and phone patch		20.000	
160	Sand filters (50mm) with automatic valves fittings etc. 1"30 - Ton/hr)	5 sets	50.000	
161	Air conditioner equipment 14.000 - BTU (10) 28.000 - BTU (15)	10 sets 15 sets	35.000	
162	Microfilm lecture equipment		5.000	
163	Desk, chairs	20 sets	6.000	
164	Scuba diving complete set including photographic camera, valves, tanks, compressor portable boat	2 sets	10.000	
165	Bacteriological Camera, culture and accessories	2 sets	15.000	
166				
167				
168	Microprocessor pH instrumentation	4 sets	12.000	
169	OUTDOOR AND EXPERIMENTAL TANKS Tank including valves Earth System, water tank		100.000	348.000
	Circular			
	2 of 90 Ton			
	2 of 45 Ton			
	6 of 15 Ton			
	10 of 8 Ton			

	Rectangular 10 of 10 Ton 15 of 5 Ton		
170	Ware house (150m ²)	1 sets	15.000
171	Temperature Control Tank 6 of 2 Ton Tank 4 of 1 Ton		20.900
172	Circulation filter equipaent 5 of 2 Ton 5 og 5 Ton		10.000
173	Earth System, Raceways tank 5 of 2 Ton 5 of 7 Ton 5 of 10 Ton		35.000
174	Water tank attached filter tank 4 of 2 Ton		6.500
175	Filter and settling tank 4 of 2 Ton		4.500
176	Acrylic Display Water Tank 4 of 2 Ton		4.500
177	Polycarbonate Polystyrene water tank 20 of 2 Ton		5.000
178	Artseia incubation tank (20)		9.900
179			
180	Oxygen diffusers, flowrate control devise		3.000
181	Water testing		10.000
182	Heater cooler unit 4 of 2 Ton Titanium heater Thermostat 500 - 200 watts		10.900
183	Fume hoods and accesories		15.300
184	Air gunn, Diaphragm blower		5.000
			151.500

185 PVC take out fittings 10,300
piping materials
valves 3/16" -- 4"

186 Sea Water sterilizing 15,000
apparatus and accessories
3 - 30 m3/H

187

188



GRAN TOTAL US \$ 2'085,800

ANNEX V

INSTALLATION PRIORITIES OF THE AQUACULTURE RESEARCH CENTER

- | | |
|--|---|
| 1.- PRINCIPAL LABORATORY | A |
| 2.- AUXILIAR LABORATORY 1 | A |
| 3.- AUXILIAR LABORATORY 2 | A |
| 4.- SOCIAL AREA | B |
| 5.- DINNING ROOM AND APARTMENTS FOR VISITING SCIENTISTS. | B |
| 6.- DORMITORIES FOR STUDENTS AND LOCAL SCIENTISTS. | B |
| 7.- TV. SATELITE AND ACCESORIES. | C |
| 8.- PARKING AREA. | C |
| 9.- PUMPING STATION
WATER RESERVORIES
MACHINERY AREA:
GENERATOR
BLOWERS
BOILERS | A |
| 10.- FREE AREA | C |
| 11.- OUT DOOR FONDS SHRIMP-FISH-MOLLUSC. | B |
- PRIORITIES ORDER A
 B
 C

II 面会者リスト

在エクアドル日本大使館

中山 昭	全権特命大使
渡辺 透	参事官
芳賀 克彦	三等書記官

外務省

Sr Rasso	アジア・アフリカ・オセアニア局長
Sr Leonard Carrion	極東部長

国家開発審議会

Dr. Javier de la Torre	二国官技術協力調整官
Ec. Eduardo Castro Cevallos	漁業部門企画部長

漁業資源次官官房

Ing. Marco Cordova T	顧問
----------------------	----

ESPOL

Ing. Gustavo Galindo Velasco	学長
Ing. Sergio Flores Macias	副学長
Ing. Edgar Arellano M	エビふ化場所長
Ing. Dictor Osorio P	海洋学部教授
Ing. Paul Coello F	コーディネーター
Ing. Jarge Plaza	事務管理
Ing. Critobal Mariscal Diaz	海洋学部長
Ing. Ricard Gallegos Orta	コーディネーター

国立水産研究所

Ing. T Cucalon Kenck M	所長
------------------------	----

IMBIOSA (民間の稚エビふ化場)

Ing. Philippe Danigo	養殖エンジニア
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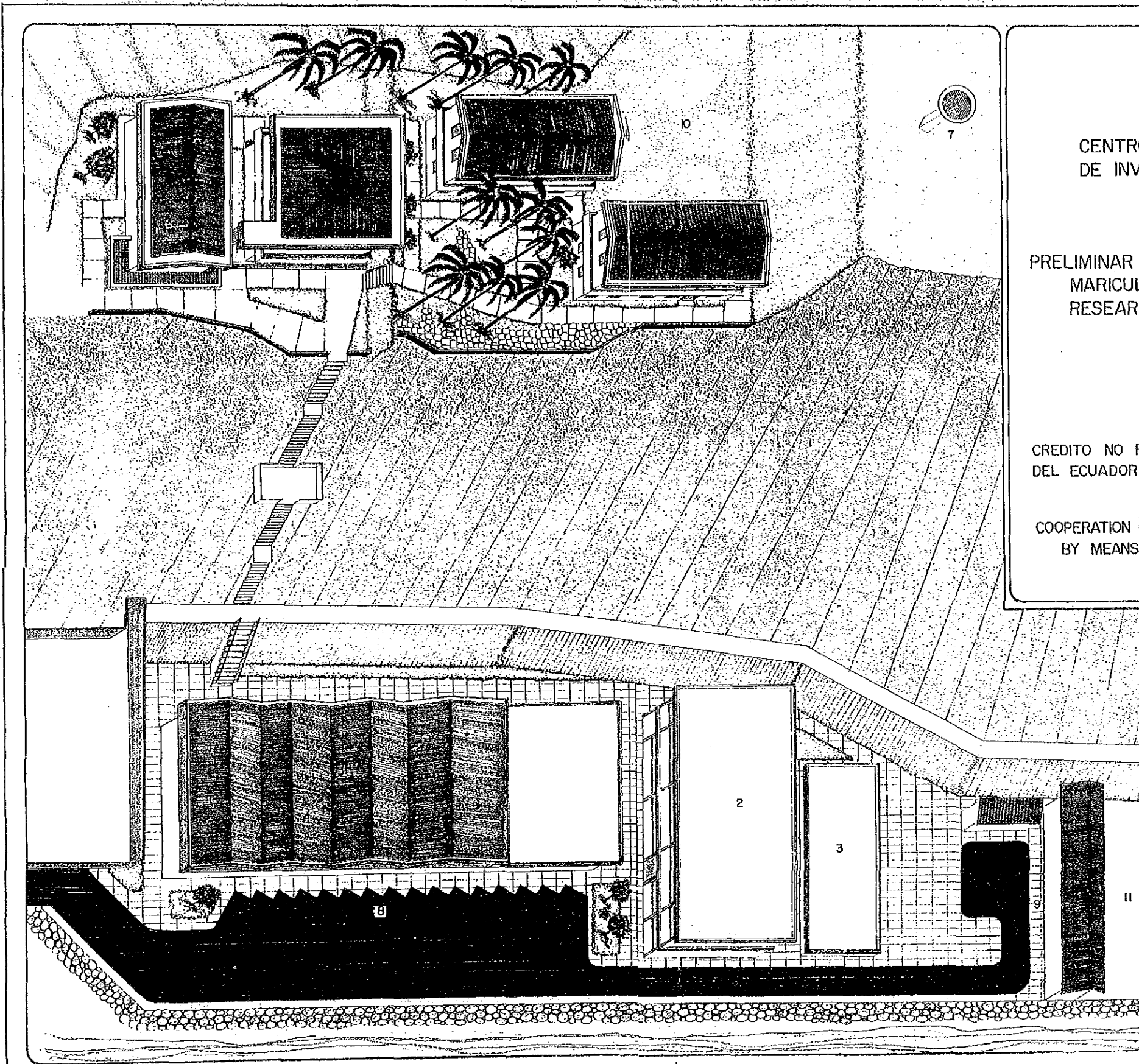
Ⅲ 研究棟，研修棟等施設の設計図面

CENTRO DE ACUACULTURA Y
DE INVESTIGACIONES MARINAS.

PRELIMINAR DESIGN OF THE COASTAL
MARICULTURE AND MARINE
RESEARCH LABORATORIES.

CREDITO NO REEMBOLSABLE AL GOBIERNO DEL
ECUADOR POR EL GOBIERNO DE JAPON 1988-89

COOPERATION OF THE JAPANESE GOVERNMENT
BY MEANS OF NON-REFUNDABLE FUND 1988-89



CENTRO DE ACUACULTURA Y
DE INVESTIGACIONES MARINAS.

ESPOL

PRELIMINAR DESIGN OF THE COASTAL
MARICULTURE AND MARINE
RESEARCH LABORATORIES

CREDITO NO REEMBOLSABLE AL GOBIERNO
DEL ECUADOR POR EL GOBIERNO DE JAPON
1988 - 1989

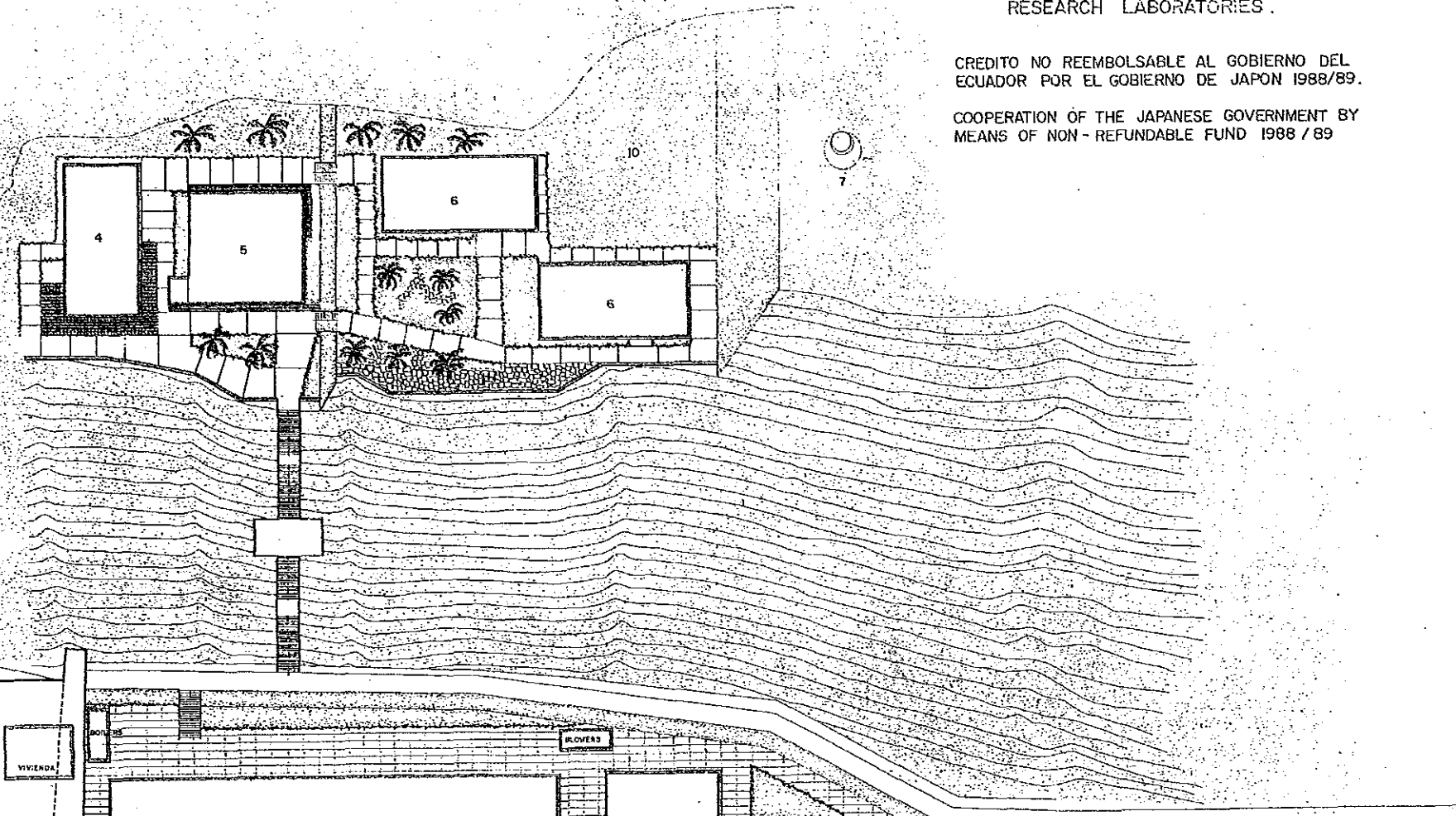
COOPERATION OF THE JAPANESE GOVERNMENT
BY MEANS OF NON-REFUNDABLE FUND
1988- 1989

- 1.. PRINCIPAL LABORATORY.
- 2.. AUXILIAR LABORATORY 1.
- 3.. AUXILIAR LABORATORY 2.
- 4.. SOCIAL AREA.
- 5.. DINNING ROOM AND APARTMENTS
FOR VISITING SCIENTISTS
- 6.. DORMITORIES FOR STUDENTS AND
LOCAL SCIENTIST.
- 7.. TV. SATELITE AND ACCESORIES .
- 8.. PARKING AREA .
- 9.. PUMPING STATION.
WATER RESERVORIES.
MACHINERY AREA :
GENERATOR
BLOWERS
BOILERS
- 10.. FREE AREA.
- 11.. OUT DOOR PONDS SHRIMP - FISH -
MOLUSC.

SAN PEDRO
 CARRETERA
 SAN PABLO

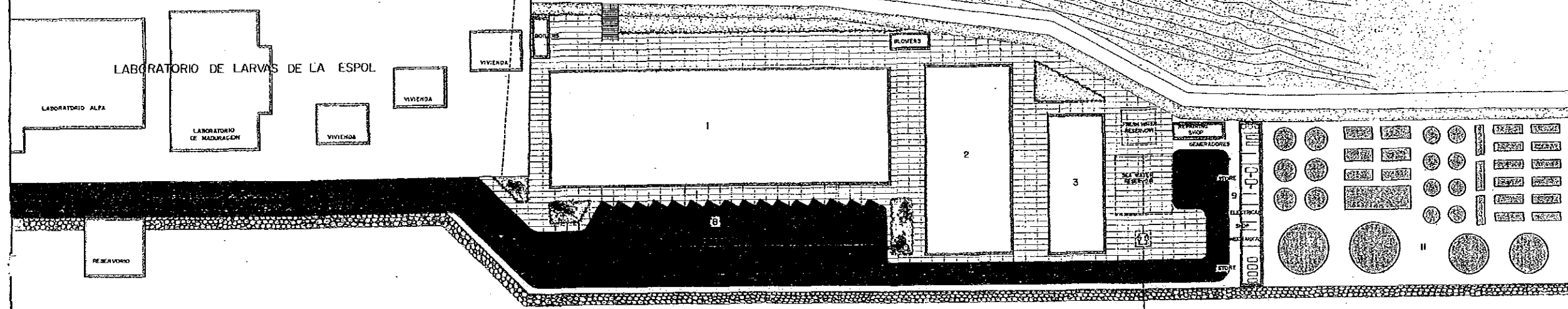


- 1. PRINCIPAL LABORATORY
- 2. AUXILIAR LABORATORY 1
- 3. AUXILIAR LABORATORY 2
- 4. SOCIAL AREA
- 5. DINNING ROOM AND APARTMENTS FOR VISITING SCIENTISTS
- 6. DORMITORIES FOR STUDENTS AND LOCAL SCIENTIST.
- 7. TV. SATELITE AND ACCESORIES.
- 8. PARKING AREA
- 9. PUMPING STATION
 WATER RESERVOIRES
 MACHINERY AREA: GENERATOR
 BLOWERS
 BOILERS
- 10. FREE AREA
- 11. OUT DOOR PONDS SHRIMP-FISH-MOLUSC

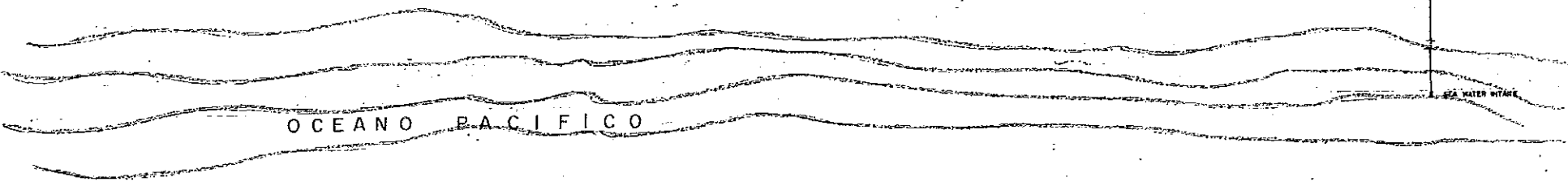


CENTRO DE ACUACULTURA Y DE INVESTIGACIONES MARINAS. ESPOL.
 PRELIMINAR DESIGN OF THE COASTAL MARICULTURE AND MARINE RESEARCH LABORATORIES.

CREDITO NO REEMBOLSABLE AL GOBIERNO DEL ECUADOR POR EL GOBIERNO DE JAPON 1988/89.
 COOPERATION OF THE JAPANESE GOVERNMENT BY MEANS OF NON-REFUNDABLE FUND 1988/89

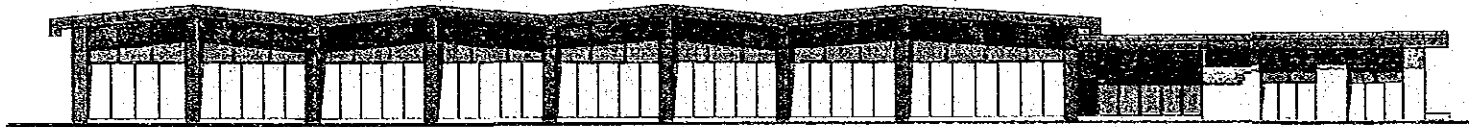
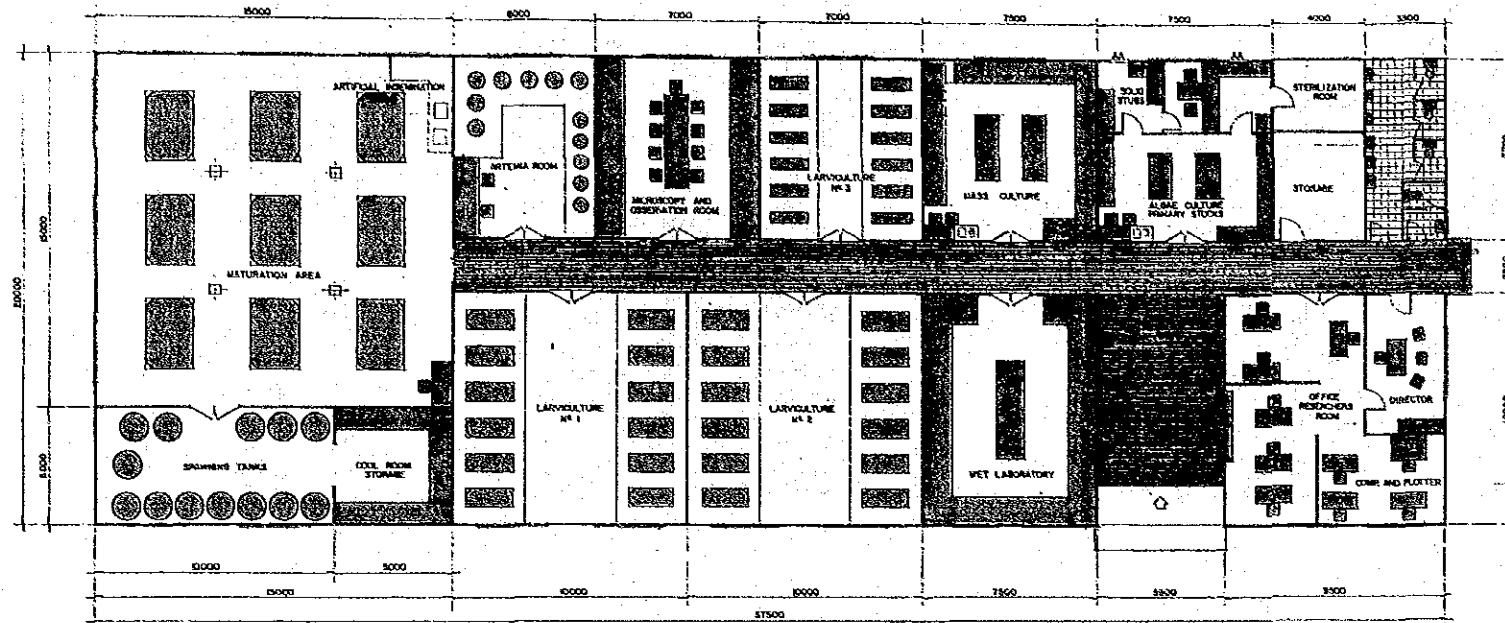


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 ESC. 1:1250



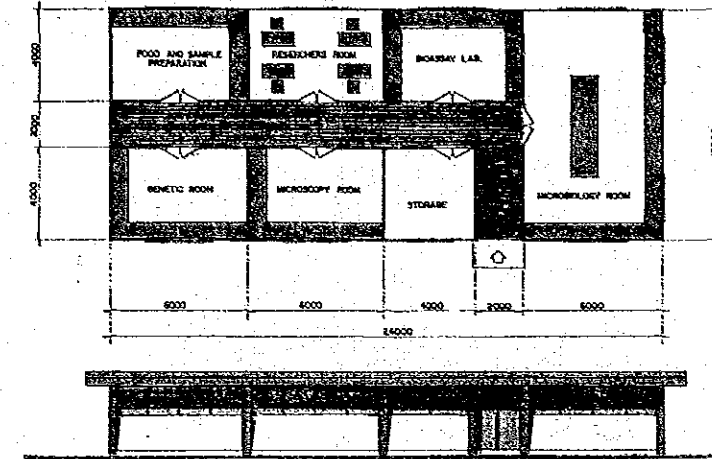
ESCUOLA SUPERIOR POLITECNICA DEL LITORAL		PROYECTO:	NO. 1250
C		PROYECTADO:	DR. EDU. MORALES
PRELIMINAR DESIGN OF THE COASTAL MARICULTURE AND MARINE RESEARCH LABORATORIES			
CONTENIDO:	PROYECTO:	LAYOUT:	NO. 1250
PROJECT LAY OUT	XII-87	1	ESP.

PRINCIPAL LABORATORY



• FRONTAL VIEW

AUXILIAR LABORATORY

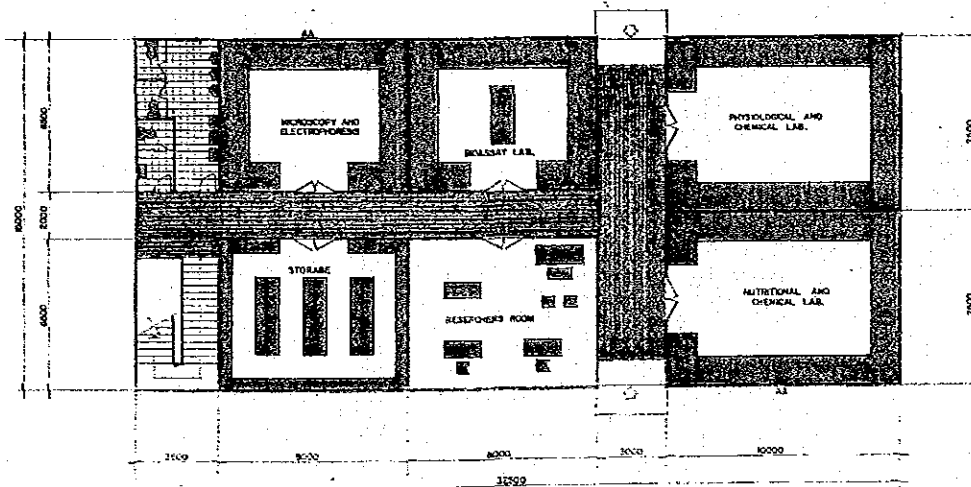


• FRONTAL VIEW

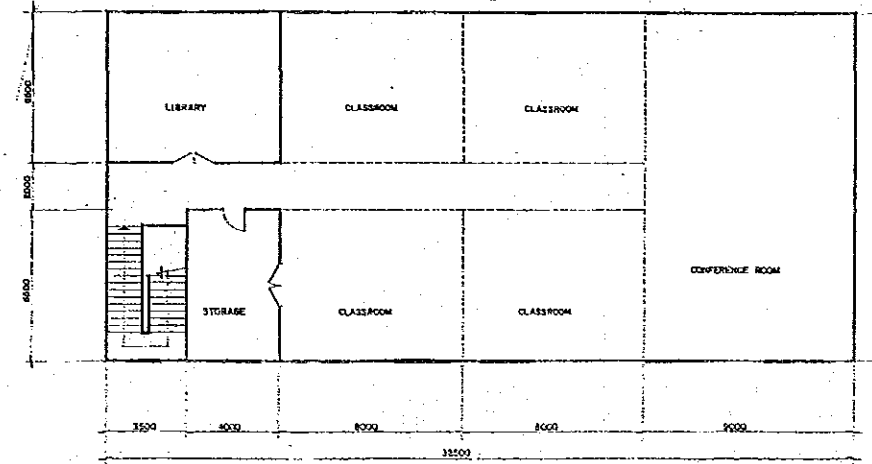
CENTRO DE ACUACULTURA Y DE INVESTIGACIONES MARINAS. ESPOL.
PRELIMINAR DESIGN OF THE COASTAL MARICULTURE AND MARINE RESEARCH LABORATORIES.

CREDITO NO REEMBOLSABLE AL GOBIERNO DEL ECUADOR POR EL GOBIERNO DE JAPON 1988/89
COOPERATION OF THE JAPANESE GOVERNMENT BY MEANS OF NON-REFUNDABLE FUND 1988/89

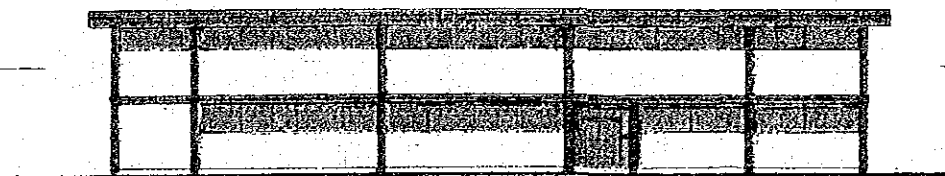
AUXILIAR LABORATORY



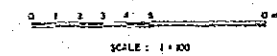
• 1ST. FLOOR



• 2ND. FLOOR

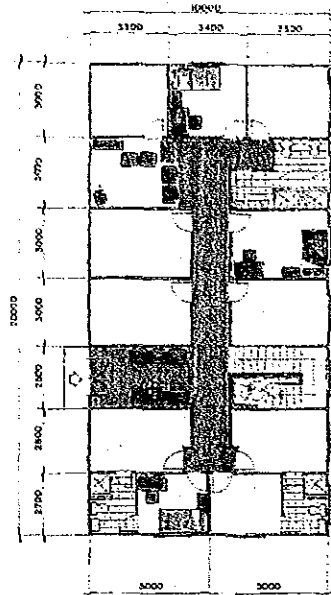


• FRONTAL VIEW

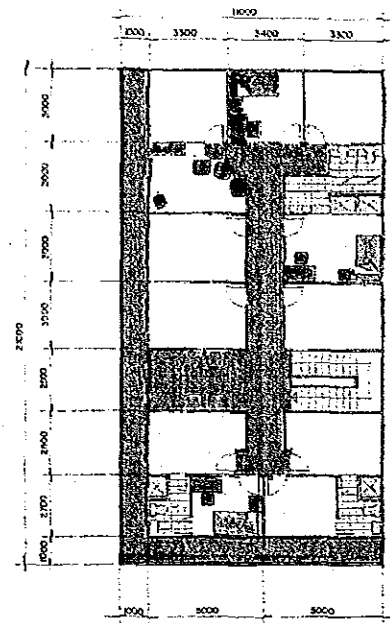


ESUELA SUPERIOR POLITECNICA DEL LITORAL		VIGILADO POR EL GOBIERNO NACIONAL	
ESPOL		VIGILADO POR EL GOBIERNO NACIONAL	
PRELIMINAR DESIGN OF THE COASTAL MARICULTURE AND MARINE RESEARCH LABORATORIES			
PROYECTO: LABORATORIES	FECHA: XII-87	LAMINA: 2	ESCALA: 1:100

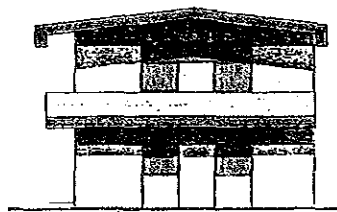
DORMITORIES FOR STUDENTS AND LOCAL SCIENTIST



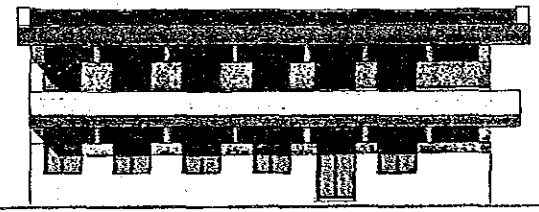
• 1ST. FLOOR



• 2ND. FLOOR

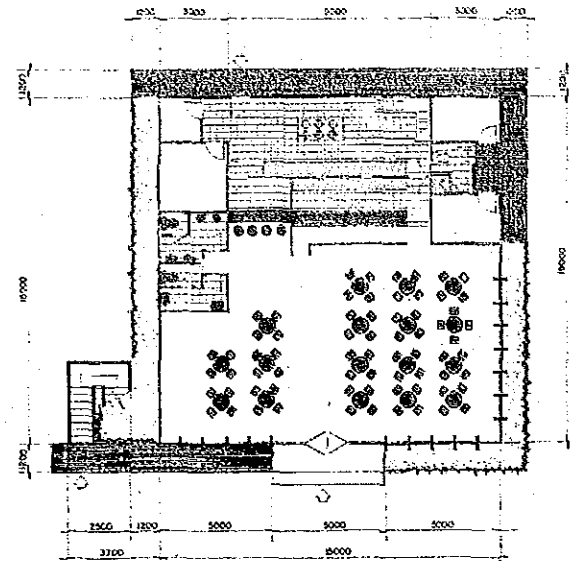


• LATERAL VIEW

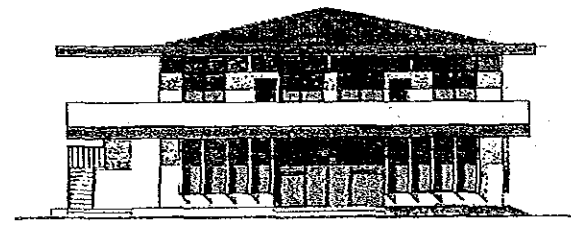


• PRINCIPAL ELEVATION

DINNING ROOM

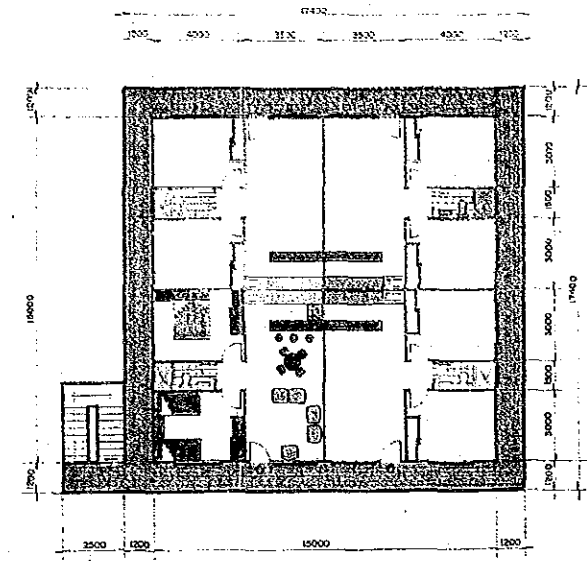


• 1ST. FLOOR

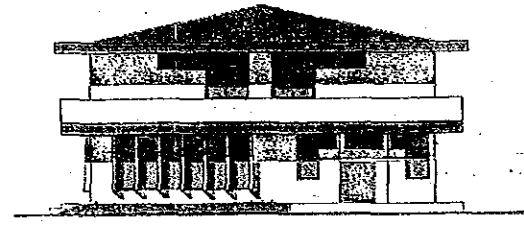


• PRINCIPAL ELEVATION

APARTMENTS FOR VISITING SCIENTIST

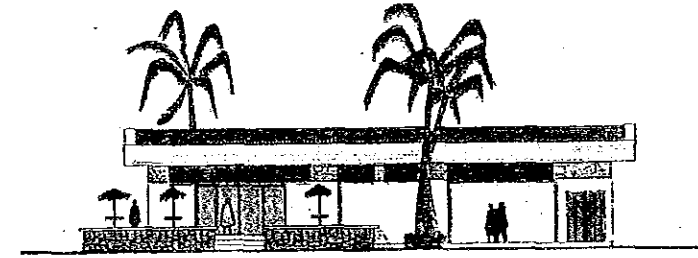
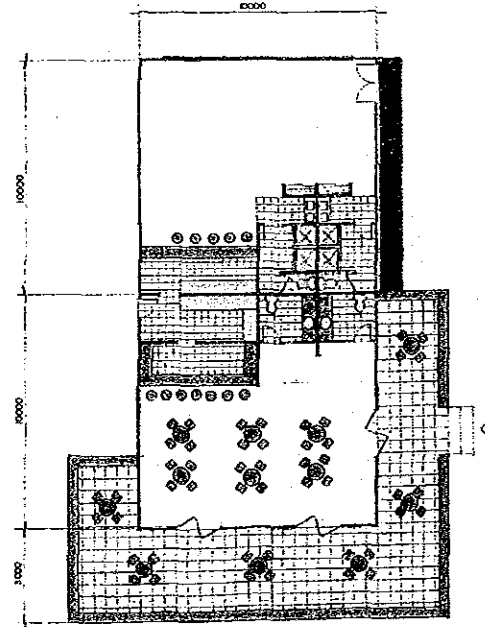


• 2ND. FLOOR

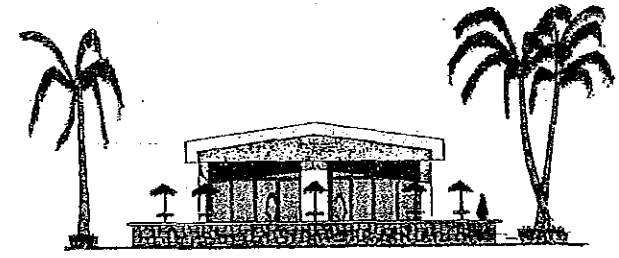


• LATERAL VIEW

SOCIAL AREA



• LATERAL VIEW



• PRINCIPAL ELEVATION

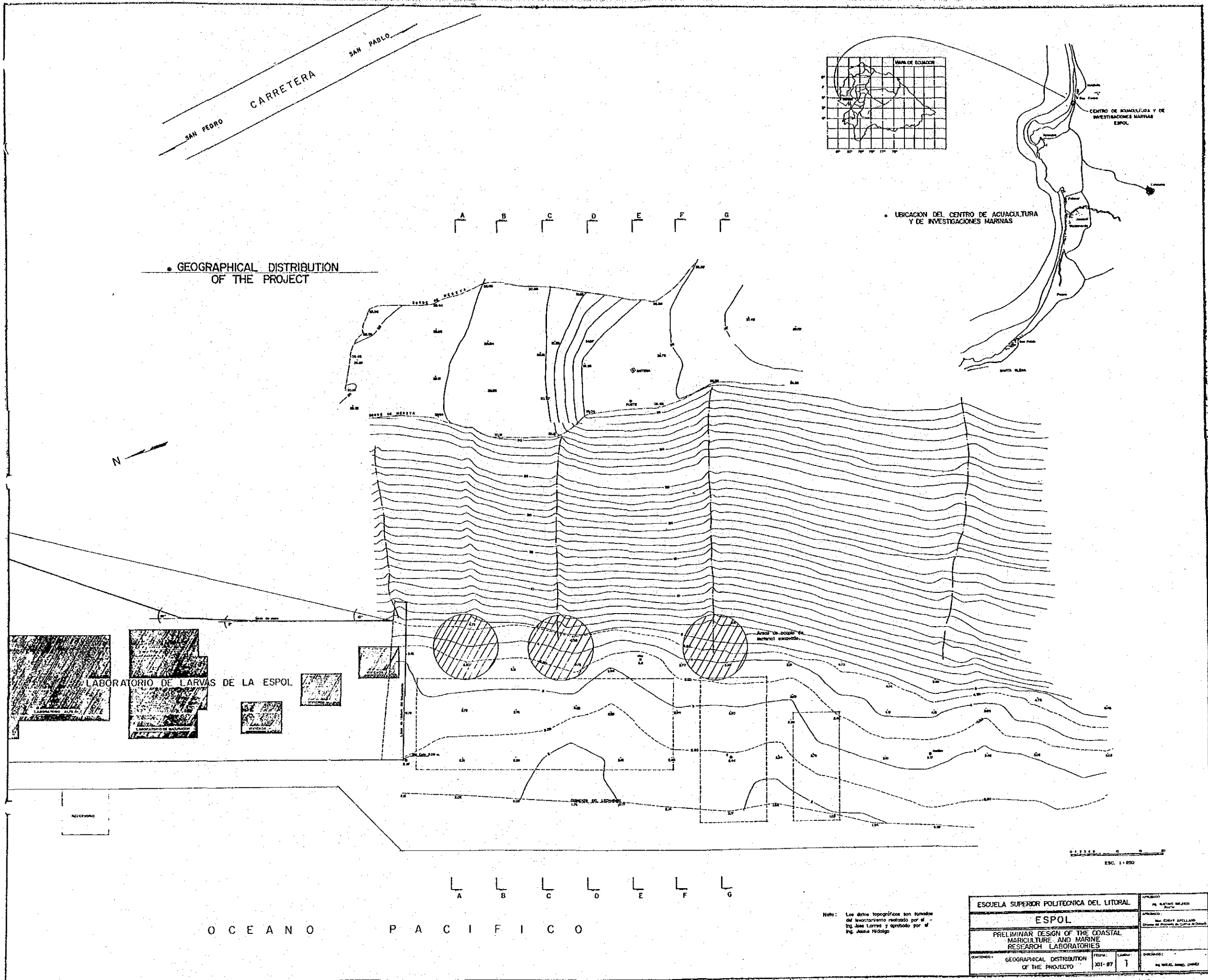
PRELIMINAR DESIGN OF THE APARTMENT, RESIDENCES AND SOCIAL AREA.

CREDITO NO REEMBOLSABLE AL GOBIERNO DEL ECUADOR POR EL GOBIERNO DE JAPON 1988/89

COOPERATION OF THE JAPANESE GOVERNMENT BY MEANS OF NON-REFUNDABLE FUND 1988 - 1989

ESC. 1:100

ESCUELA SUPERIOR POLITECNICA DEL LITORAL		PROYECTO: APARTAMENTOS PARA VISITANTES	
ESPOL		FECHA: XII-87	
PRELIMINAR DESIGN OF THE COASTAL MARICULTURE AND MARINE RESEARCH LABORATORIES		LUGAR: 3	
APARTMENTS FOR VISITING SCIENTIST		ESPOL	



• GEOGRAPHICAL DISTRIBUTION OF THE PROJECT

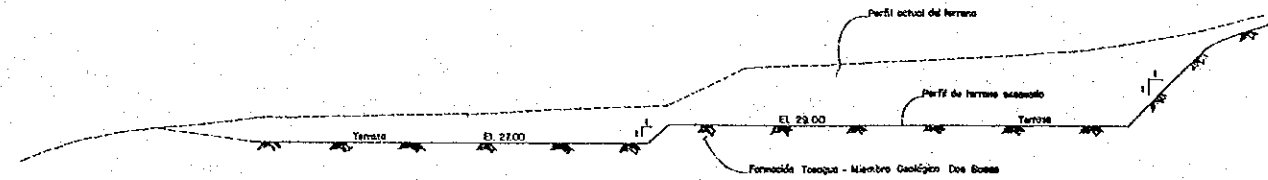
LABORATORIO DE LARVAS DE LA ESPOL

O C E A N O P A C I F I C O

Nota: Los datos topograficos son tomados del levantamiento realizado por el Ing. Jose Lora y aprobado por el Ing. Jaime Hidalgo

ESCUELA SUPERIOR POLITECNICA DEL LITORAL		APROBADO: DR. RUIZ DE MENDOZA	
ESPOL		APROBADO: DR. EDUARDO APOLLANO	
PRELIMINAR DESIGN OF THE COASTAL MARICULTURE AND MARINE RESEARCH LABORATORIES			
CONTENIDO: GEOGRAPHICAL DISTRIBUTION OF THE PROJECT	FECHA: XII-87	LAMINA: 1	PROYECTO: DR. MIGUEL ANGEL CHAVEZ

SAN PEDRO
CARRETERA
SAN PABLO



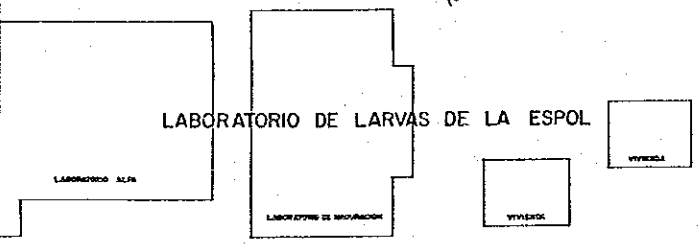
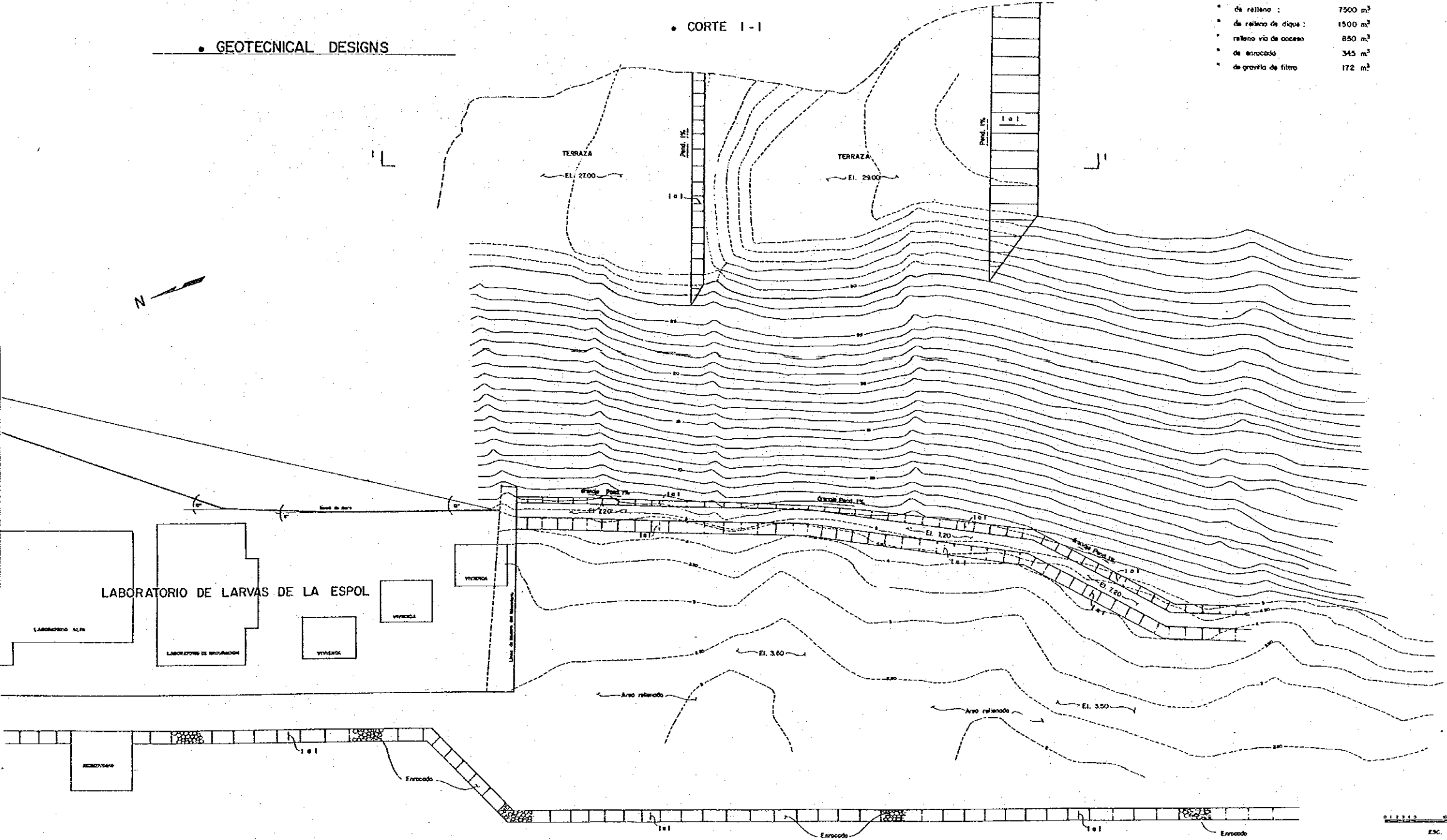
• CARACTERÍSTICAS DEL MATERIAL ROCOSO :
Lutita color chocolate con concreciones calcáreas de tipo disconformable; fracturas concavas con eventos de relieve de yeso y concretos micromorfológicos.
Edad Mioceno Medio - Superior

• DATOS DE VOLUMENES :

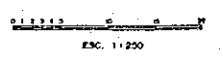
Volumen total de excavación :	11300 m ³
• de relleno :	7500 m ³
• de relleno de dique :	1500 m ³
• relleno vía de acceso :	850 m ³
• de enrocado :	345 m ³
• de grava de filtro :	172 m ³

• GEOTECHNICAL DESIGNS

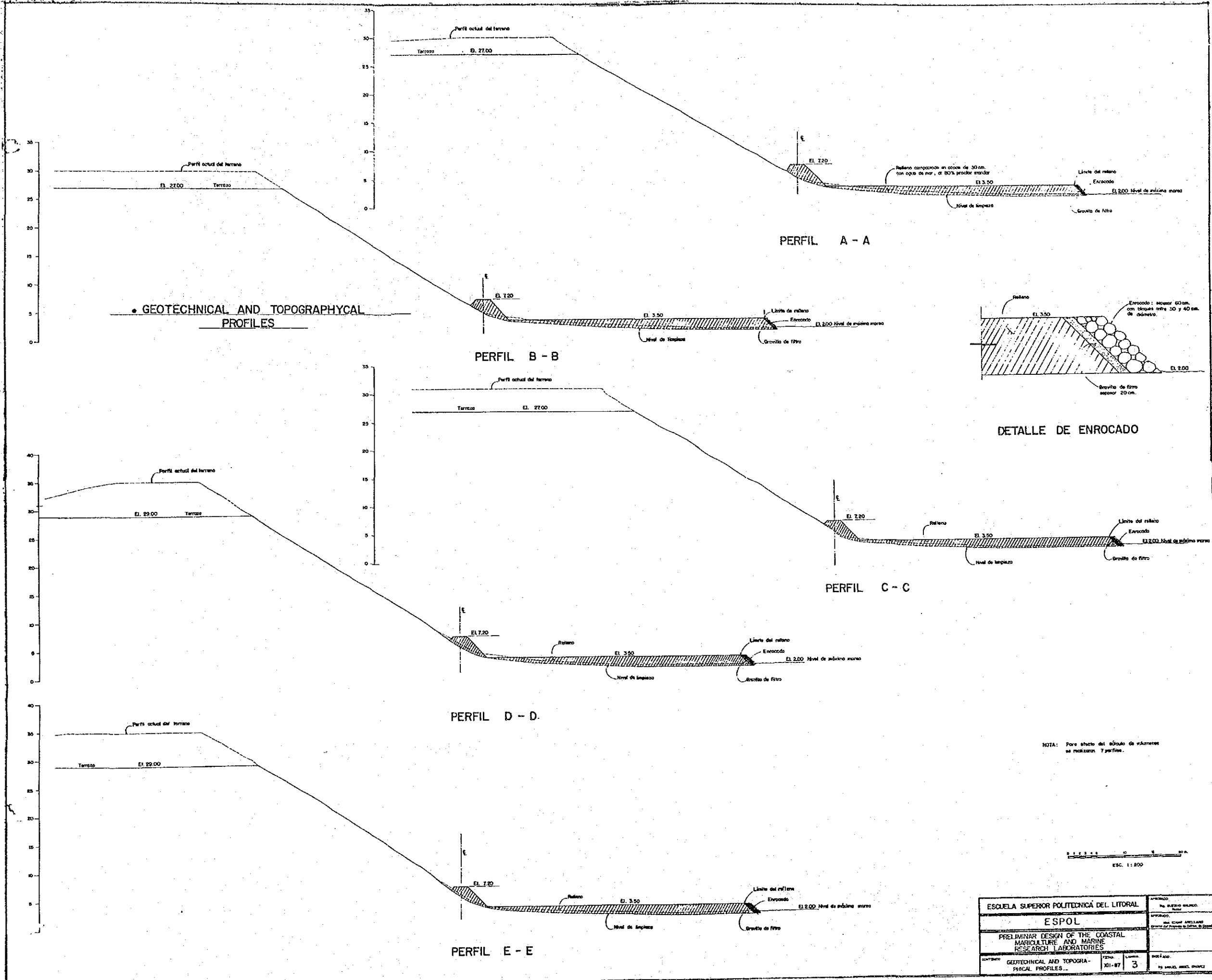
• CORTE I-I



OCEANO PACIFICO



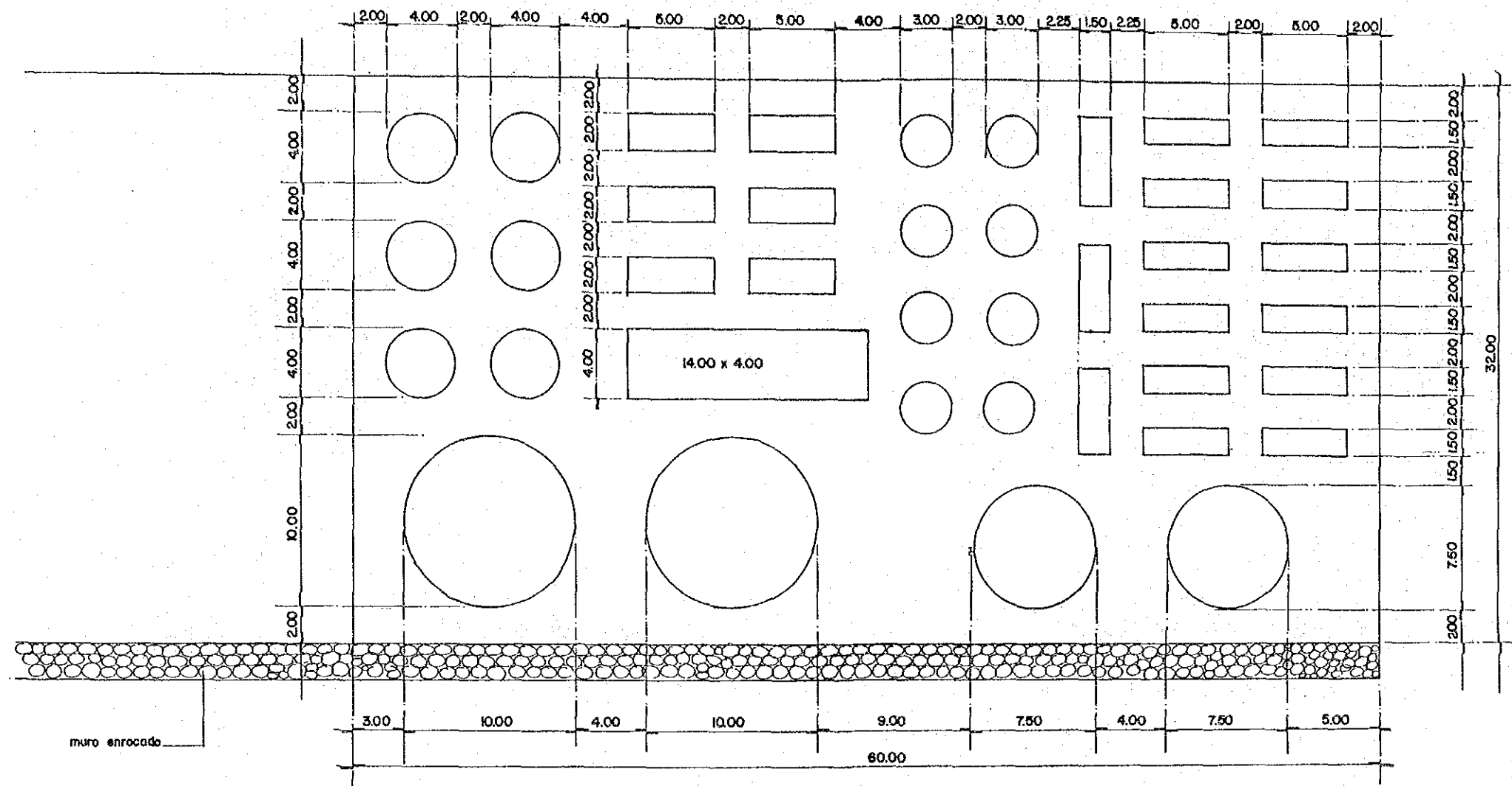
ESCUOLA SUPERIOR POLITECNICA DEL LITORAL		APROBADO	
ESPOL		APROBADO	
PRELIMINAR DESIGN OF THE COASTAL MARICULTURE AND MARINE RESEARCH LABORATORIES			
PROYECTO	GEOTECHNICAL DESIGN	FORMA	LAMINA
		XI-87	2



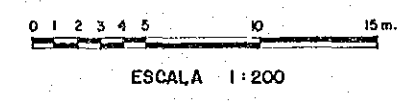
• GEOTECHNICAL AND TOPOGRAPHICAL PROFILES

NOTA: Para efecto del cálculo de estabilidad se utilizarán 7 perfiles.

ESQUELA SUPERIOR POLITÉCNICA DEL LITORAL		DISEÑADO POR: ALBERTO MORALES	
ESPOL		APROBADO POR: EDUARDO ARELLANO	
PRELIMINAR DESIGN OF THE COASTAL MARICULTURE AND MARINE RESEARCH LABORATORIES			
CONTENIDO	FECHA	LÁMINA	DISEÑADO
GEOTECHNICAL AND TOPOGRAPHICAL PROFILES...	10/1-87	3	BY: ALBERTO MORALES



OUT DOOR PONDS SHRIMP - FISH - MOLUSC.



ESCUELA SUPERIOR POLITECNICA DEL LITORAL		APROBADO: Ing. GUSTAVO GALINDO Rector
E S P O L		APROBADO: Msc. EDGAR ARELLANO Director del Proyecto de Cultivo de Corvón
PRELIMINAR DESIGN OF THE COASTAL ... MARICULTURE AND MARINE RESEARCH LABORATORIES.		
CONTENIDO: OUT DOOR PONDS SHRIMP - FISH - MOLUSC.	LAMINA: 4	DISEÑADO E S P O L

JICA