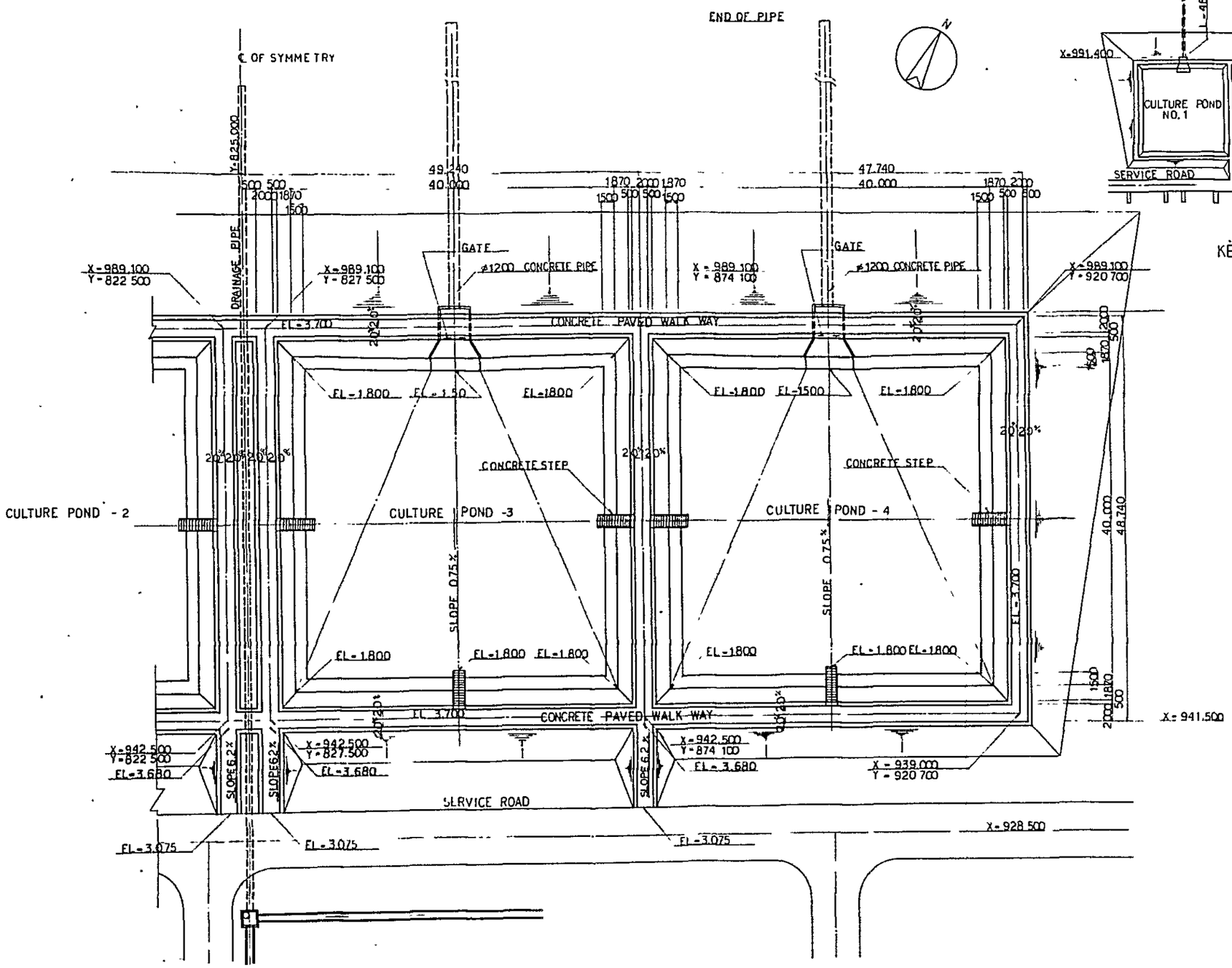
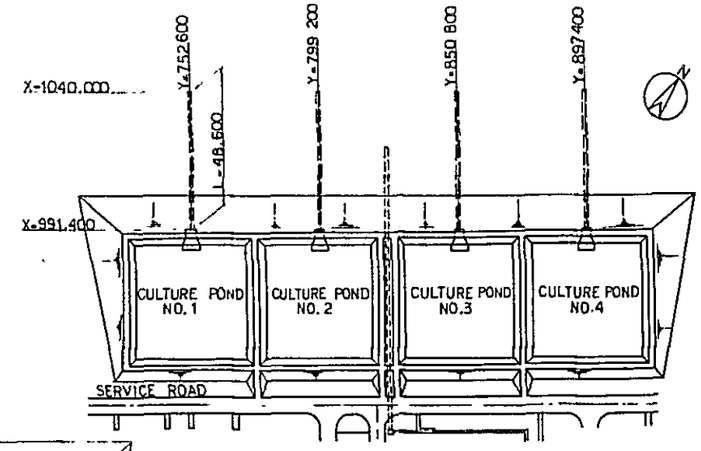


PLAN OF CULTURE POND SCALE 1 : 250



KEY PLAN SCALE 1 1000

NOTE:
THIS PLAN SHOWS THE EAST HALF BLOCK
THE PORTION OF WEST HALF BLOCK SYMMETRICAL
ABOUT AXIS Y 825.000.

2

REVISIONS	DATE	CHECK

MINISTRY OF AGRICULTURE AND FISHERIES

U.A.E. MARICULTURE CENTRE

UMM AL QUWAIN, U.A.E.

PLAN OF CULTURE POND

	SCALE 1 : 250	REV NO.	C2-1
	DATE	SQ NO 6	

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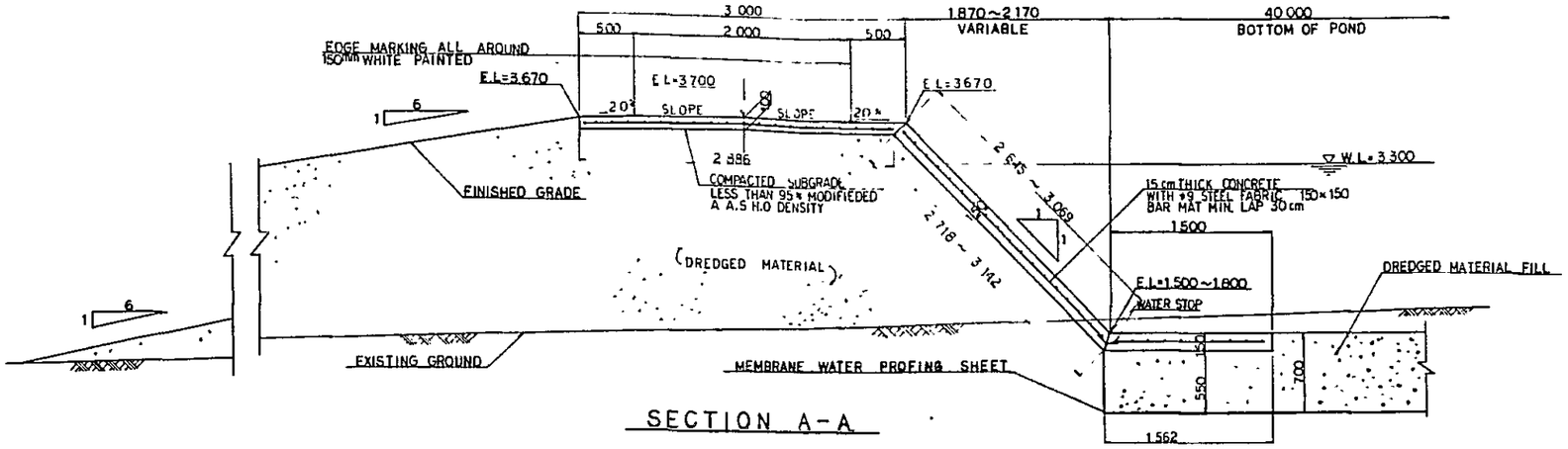
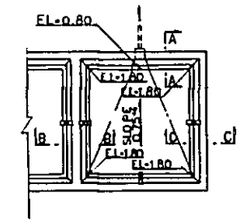


SECTION A-A



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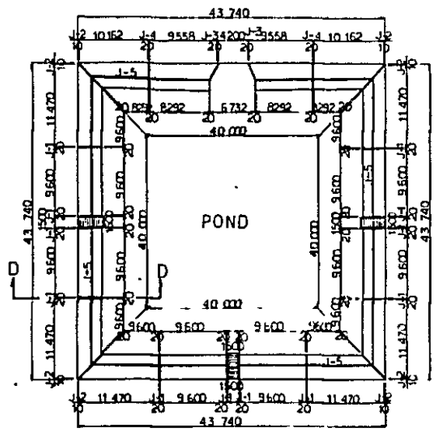
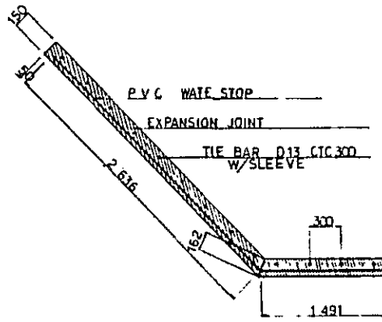
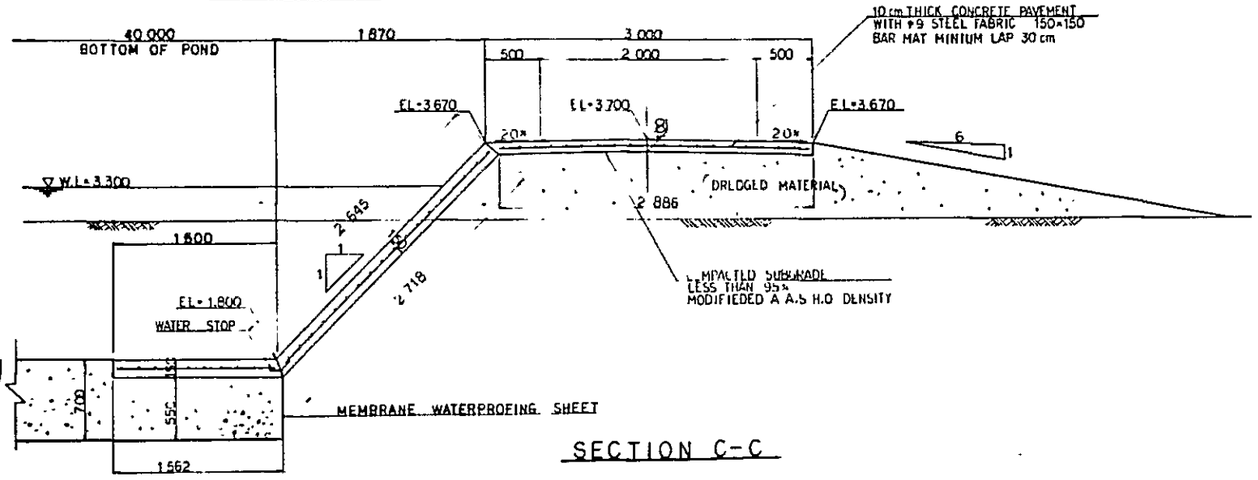


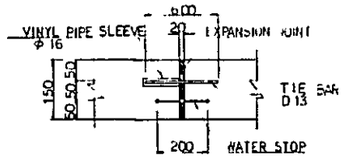
TYPICAL JOINT LAYOUT SCALE 1:100



SECTION D-D



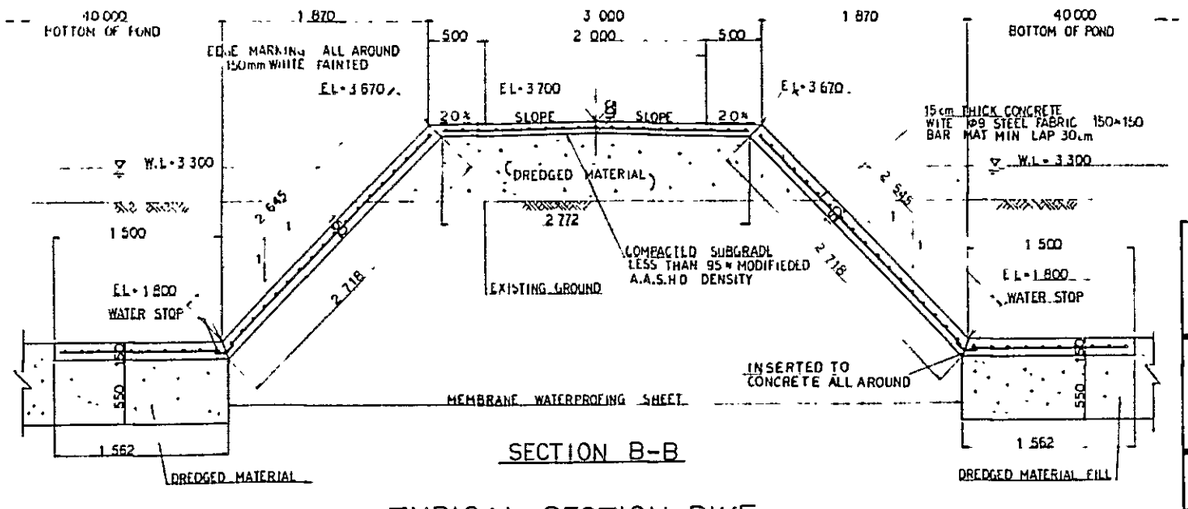
SECTION C-C



LIST OF WATER STOP JOINT

NO	NO'S	WATER STOP JOINT LENGTH	TOTAL LENGTH	REMARKS
J-1	12	4 127	[illegible]	
J-2	4	5 836	23 344	
J-3	2	5 083	10 166	
J-4	2	4 339	8 678	
J-5	1	—	148 768	

DETAIL OF JOINT



SECTION B-B

TYPICAL SECTION DIKE SCALE 1 25

NOTE:
THE EDGE OF MEMBRANE WATERPROFING SHEET SHALL BE INSERTED TO GATE STRUCTURE AND STEPS MINIMUM 15 CM WHEN CASTING CONCRETE.

3

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U.A.E. MARICULTURE CENTRE

UMM AL QUWAIN, U.A.E.

CULTURE POND CROSS – SECTION

	SCALE 1 : 25	REV NO	C2-2
	DATE	SQ NO 7	

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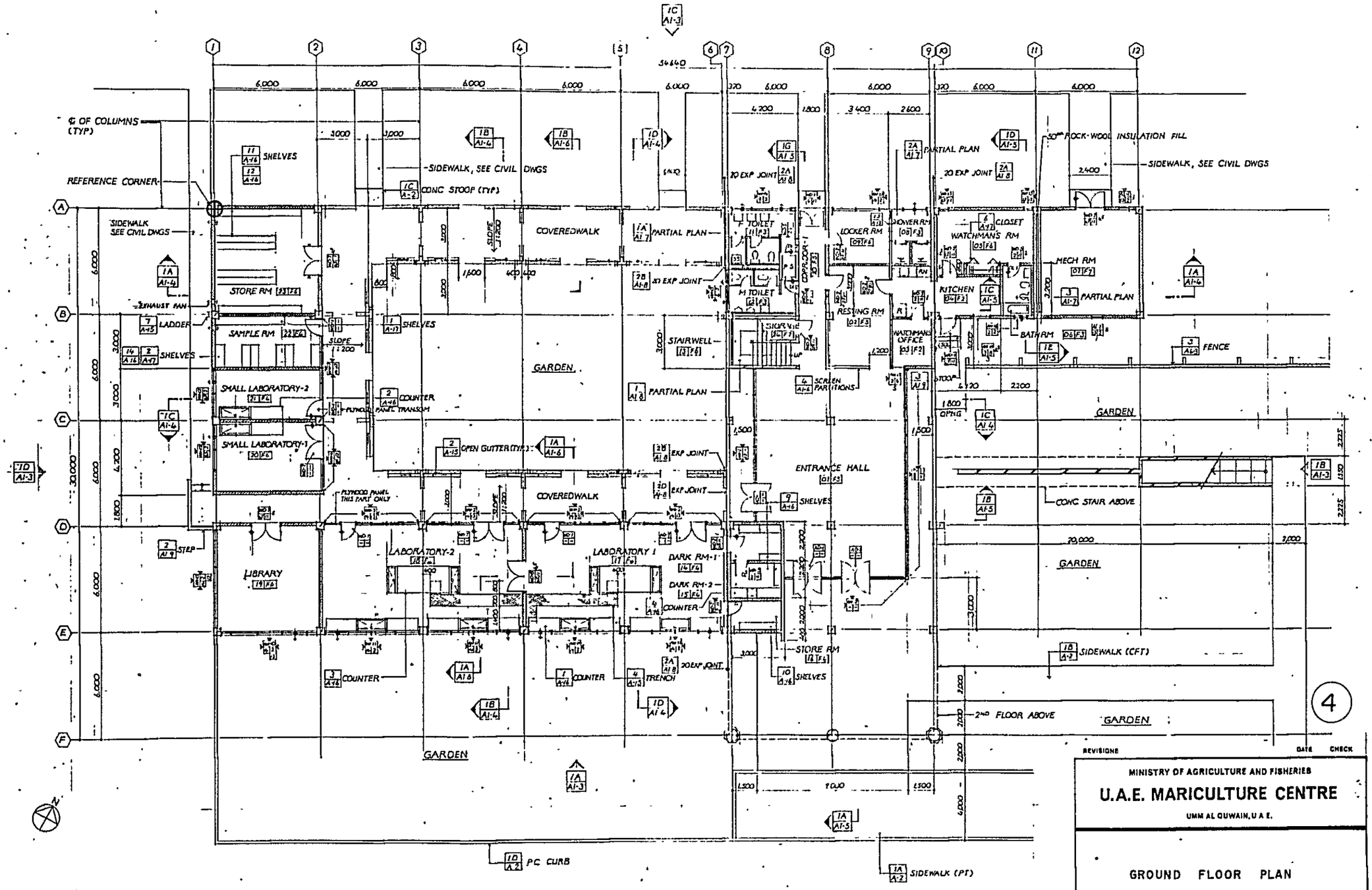

1 / A1-1 GROUND FLOOR PLAN
SCALE = 1:100

REVISIONS	DATE	CHECK

MINISTRY OF AGRICULTURE AND FISHERIES

U.A.E. MARICULTURE CENTRE

UMM AL QUWAIN, U.A.E.

GROUND FLOOR PLAN

LA	SCALE 1:100	REV NO.	A1-1
	DATE -	SQ NO 47	

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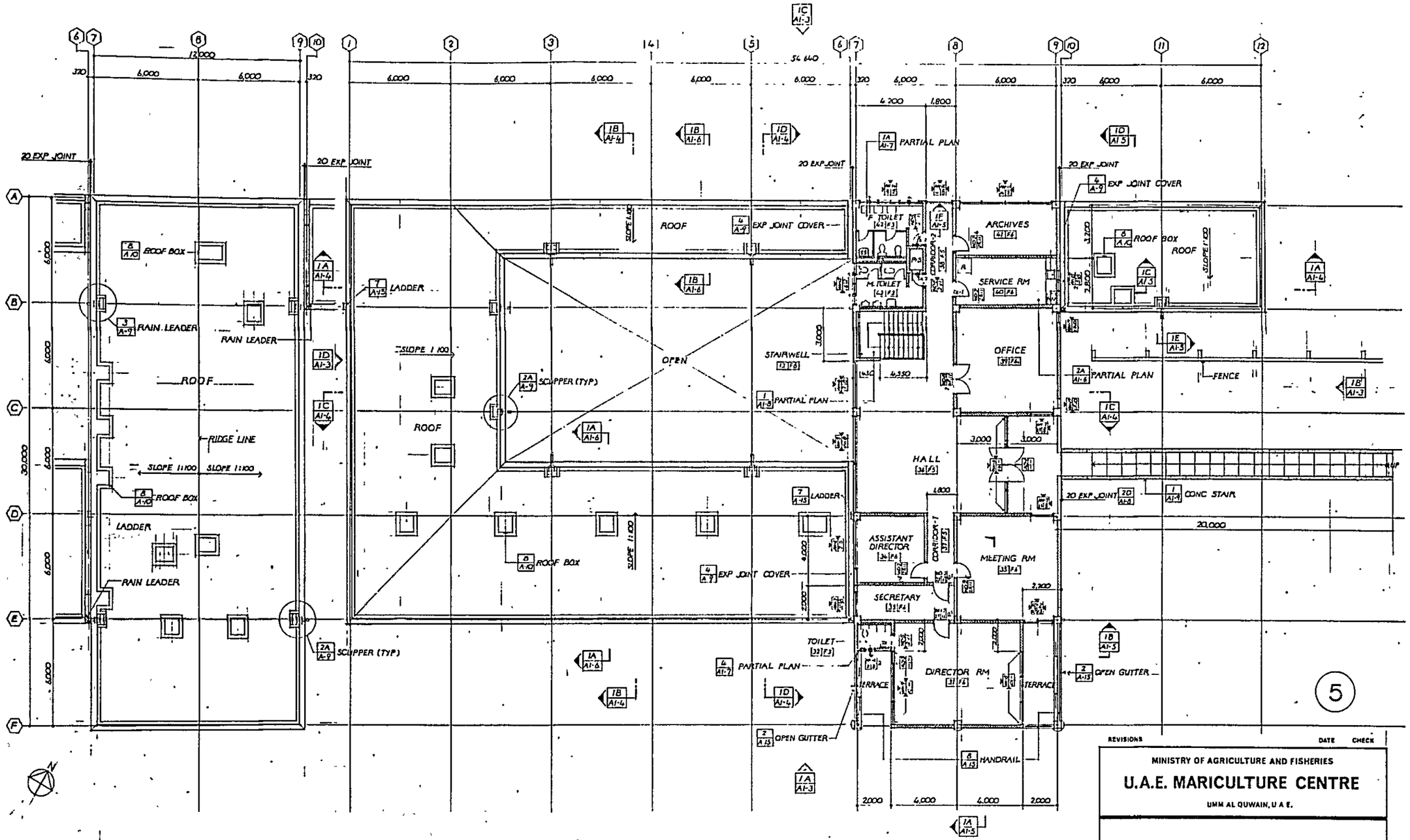
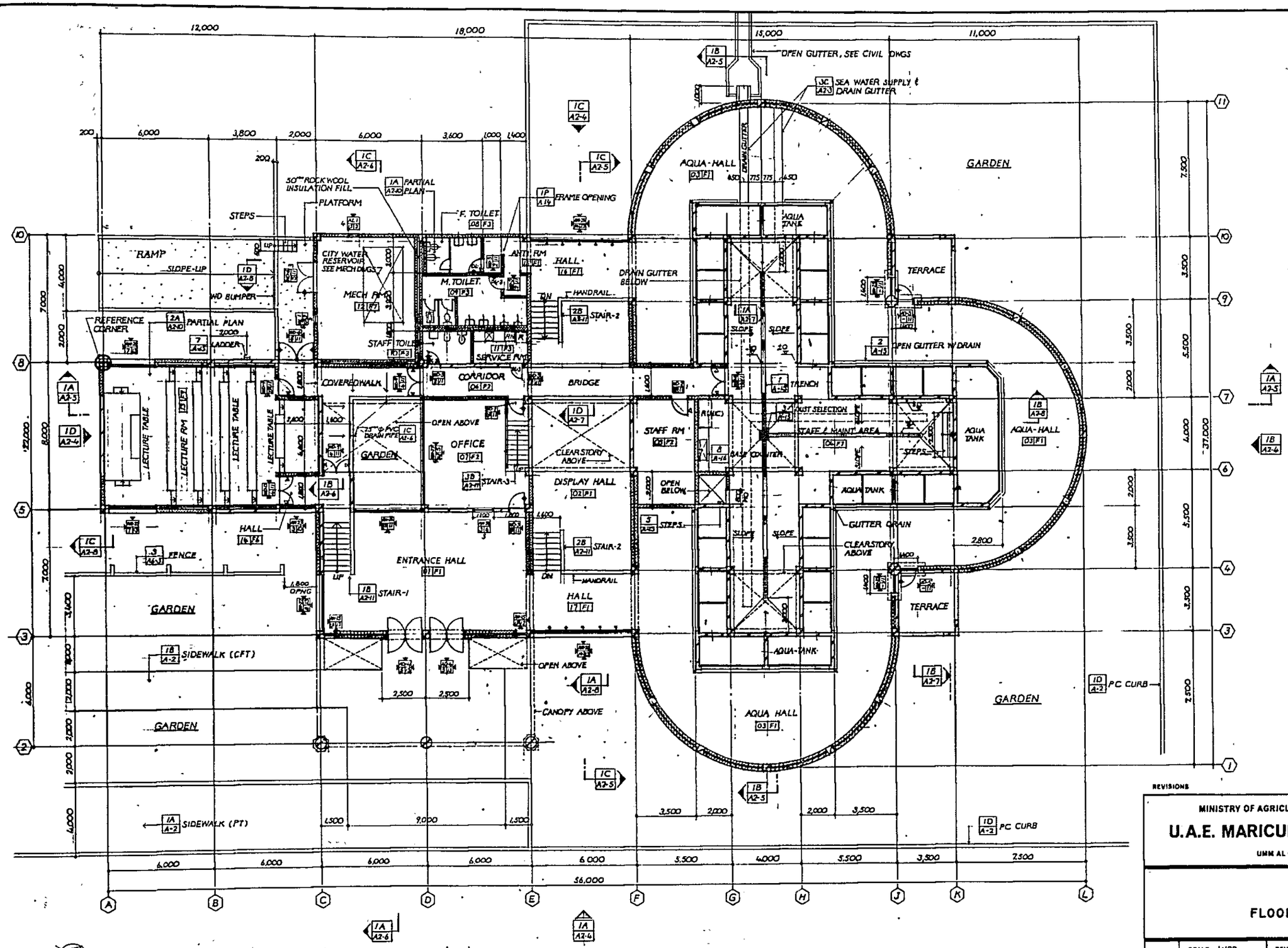
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)


ROOF PLAN
SCALE • 1:100
FIRST FLOOR PLAN
SCALE • 1:100
ROOF
ROOF BOX
RAIN LEADER
LADDER
RIDGE LINE
SLOPE 1:100
SCUPPER (TYP)
EXP JOINT COVER
OPEN GUTTER
PARTIAL PLAN
STAIRWELL
OPEN
F. TOILET
M. TOILET
ARCHIVES
SERVICE RM
OFFICE
HALL
CONC STAIR
FENCE
ASSISTANT DIRECTOR
CORRIDOR
MEETING RM
SECRETARY
DIRECTOR RM
TOILET
TERRACE
HANDRAIL
MINISTRY OF AGRICULTURE AND FISHERIES
U.A.E. MARICULTURE CENTRE
UMM AL QUWAIN, U.A.E.
FIRST FLOOR PLAN
LA
SCALE 1:100
DATE
SQ. NO 48
REV NO.
AI-2
DRAWN BY
CHECKED BY
APPROVED BY
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
REVISIONS
DATE
CHECK



1 A2-1 FLOOR PLAN
SCALE = 1:100

6

REVISIONS DATE CHECK

MINISTRY OF AGRICULTURE AND FISHERIES

U.A.E. MARICULTURE CENTRE

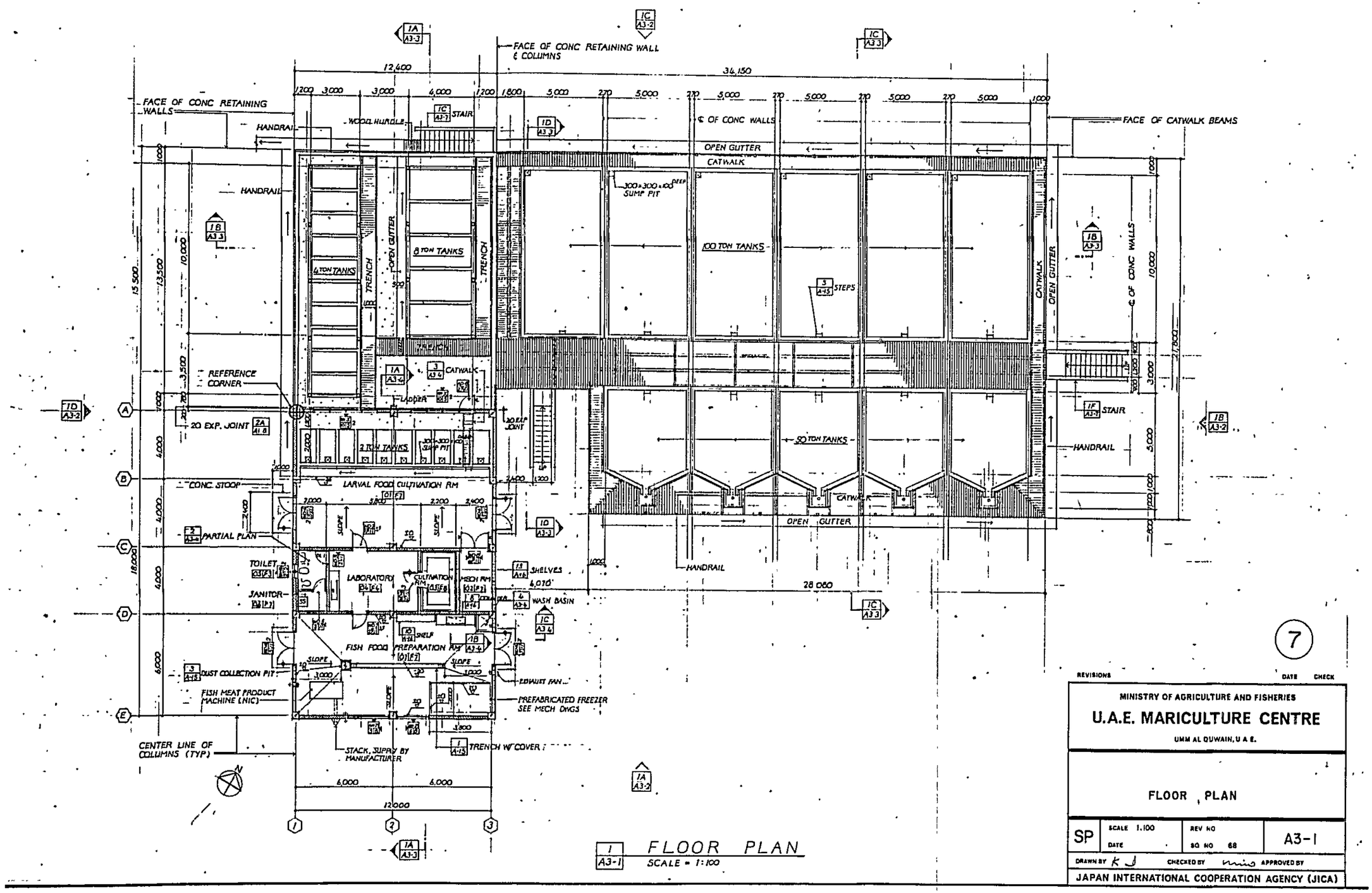
UMM AL QUWAIN, U.A.E.

FLOOR PLAN

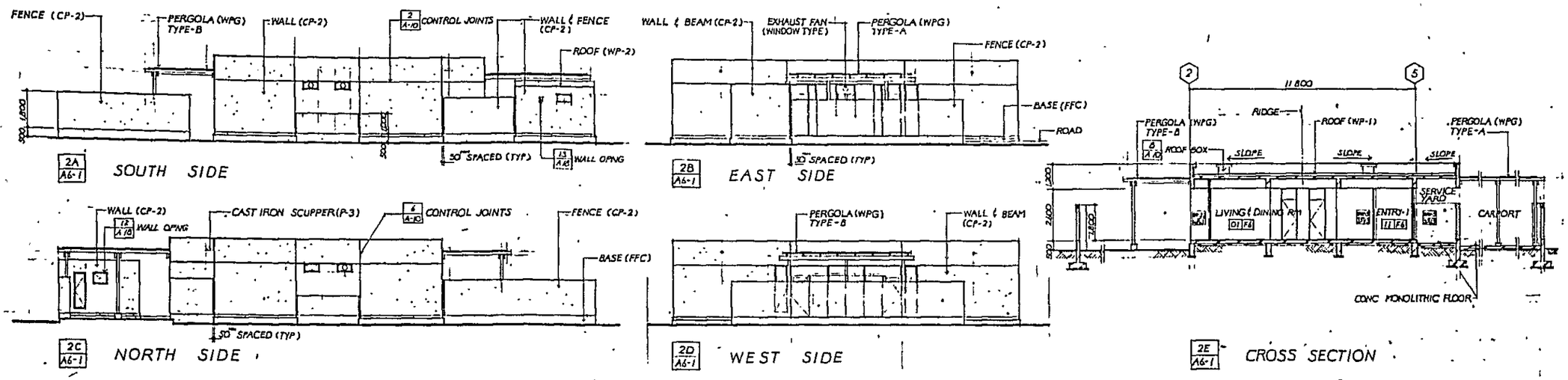
AQ	SCALE 1:100	REV NO.	A2-1
	DATE	SQ NO 56	

DRAWN BY J.J CHECKED BY APPROVED BY

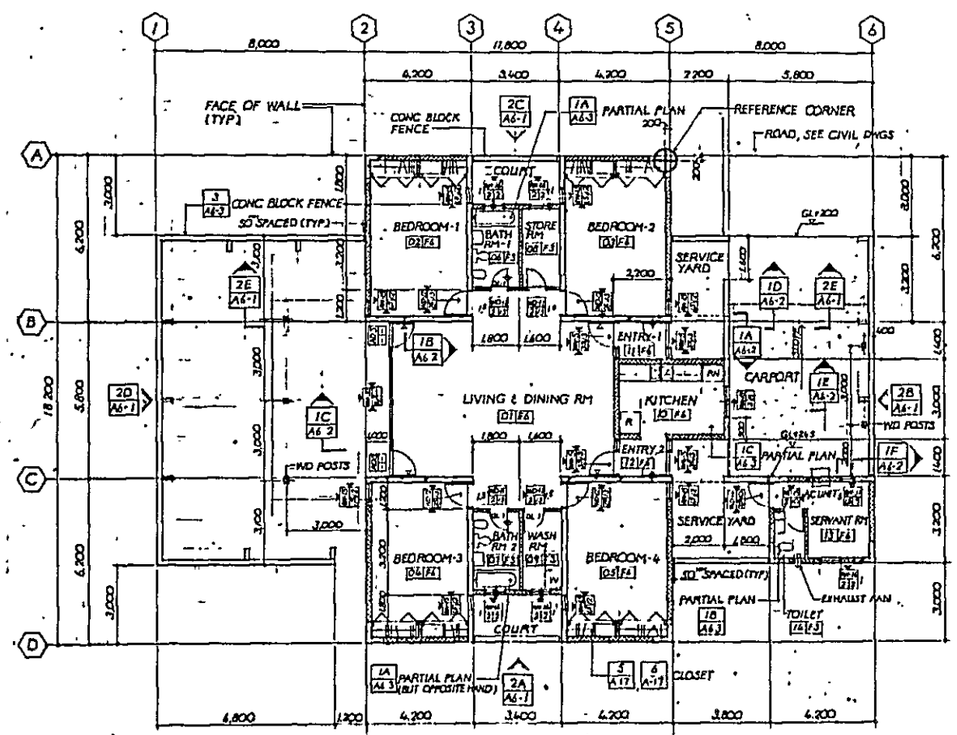
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



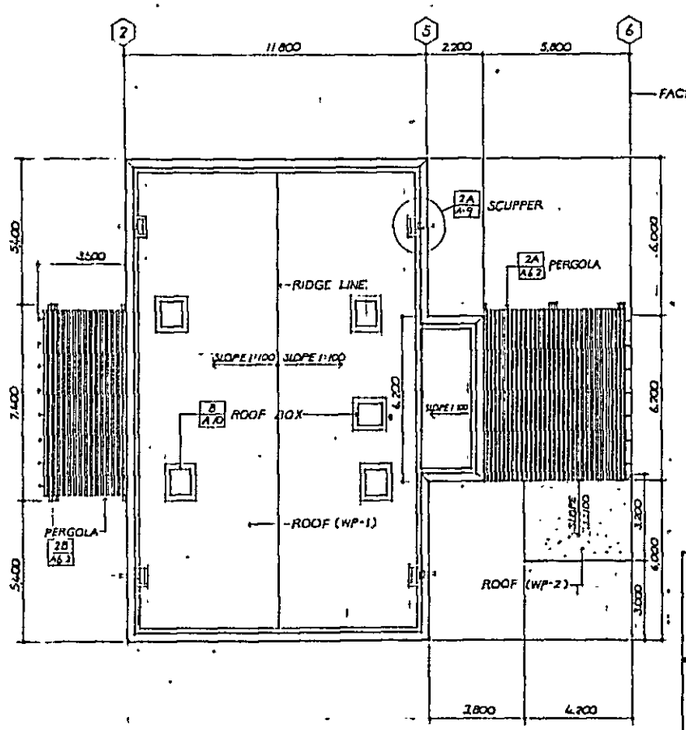
1 A3-1 FLOOR PLAN
SCALE = 1:100



2 A7-1 ELEVATIONS & CROSS SECTION
SCALE = 1:100



1 A6-1 FLOOR PLAN
SCALE = 1:100



3 A6-1 ROOF PLAN
SCALE = 1:100

8

REVISIONS	DATE	CHECK

MINISTRY OF AGRICULTURE AND FISHERIES

U.A.E. MARICULTURE CENTRE

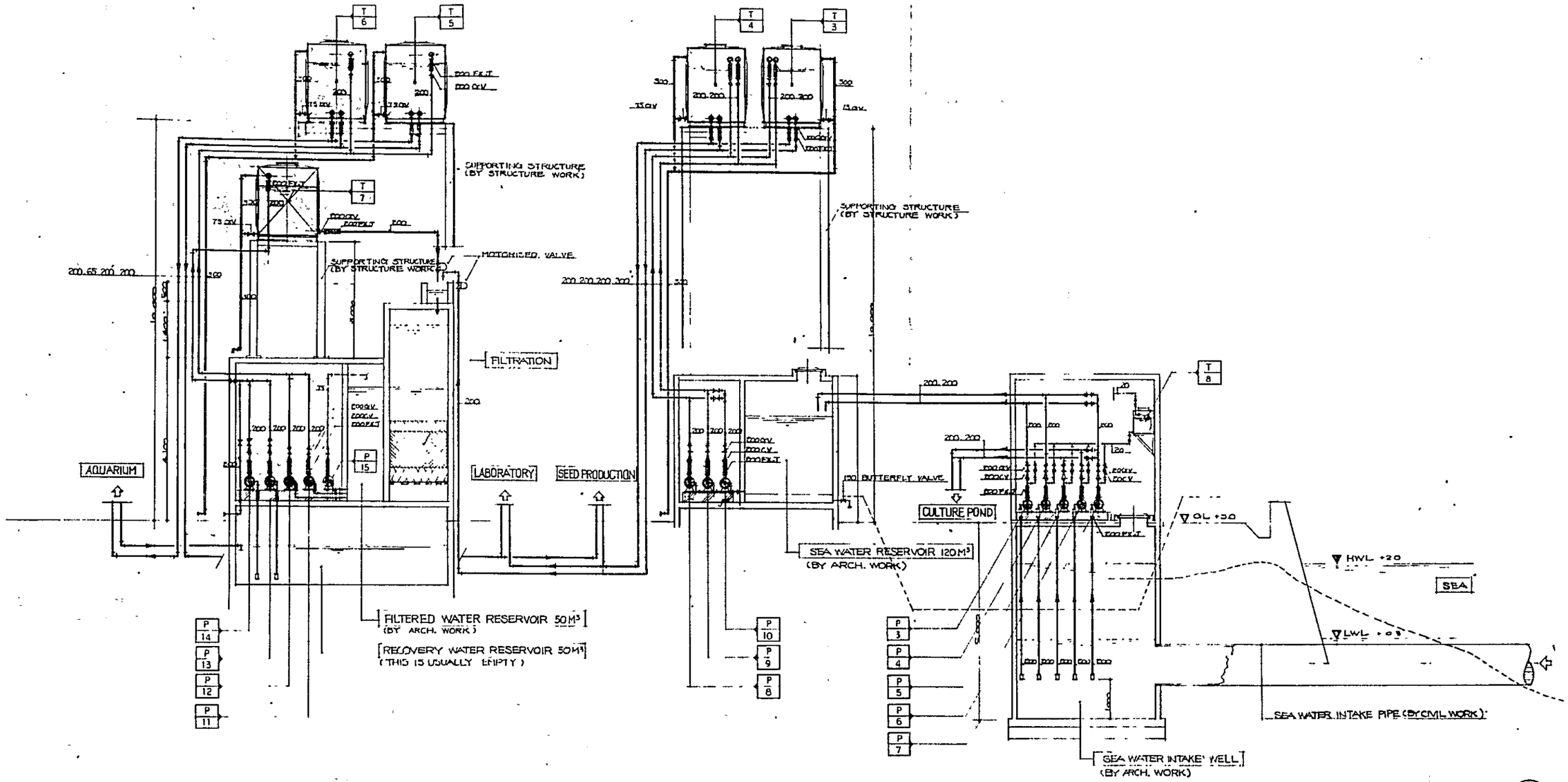
UMM AL QUWAIN, U.A.E.

FLOOR PLAN, ELEVATIONS AND CROSS SECTION

DM	SCALE 1:100	REV NO.	A6-1
	DATE	SQ NO. 78	

DRAWN BY K.J CHECKED BY APPROVED BY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



1 M-6 SEA WATER PIPING FLOW DIAGRAM

NOT TO SCALE

9

REVISIONS	DATE	CHECK

MINISTRY OF AGRICULTURE AND FISHERIES

U.A.E. MARICULTURE CENTRE

UMM AL QUWAIN, U.A.E.

SEA WATER PIPING FLOW DIAGRAM

G	SCALE NTS DATE - -	REV. NO. SQ NO 123	M-6

DRAWN BY Y. I CHECKED BY APPROVED BY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

附　属　資　料

土質調査及ボーリング報告書

（アラブ首長国連邦政府　農水産省より供与）

Gulf Testing Laboratory
P. O. Box No. 156, Dubai, U. A. E.
Tel : 257564

REPORT TO

MINISTRY OF AGRICULTURE AND FISHERS

SOIL INVESTIGATION PROPOSED MARICULTURE CENTRE, UMM AL QAWAIN, UNITED ARAB EMIRATES.

September, 1980.

Report No.771445/DRW-C.

REPORT ON SITE INVESTIGATION

FOR

PROPOSED MARICULTURE CENTRE,

AT

UMM AL QAWAIN, U.A.E

---

1. INTRODUCTION.

1.1. Proposed Development.

It is proposed to construct single storey offices and a laboratory for the Mariculture Centre to be developed here.

1.2. Object of Investigation.

The investigation was made to determine the soil and groundwater conditions for foundation design purposes.

1.3. Method.

Two boreholes were drilled on the site to determine the succession of strata and observe the groundwater conditions. Samples were taken for examination and laboratory testing.

1.4. Scope of Report.

The report gives the borehole records, the test results and an analysis of the ground conditions with reference to bearing capacity, settlement and concrete design for foundation purposes. It also includes information on the depth of the water at position 5 as indicated on figure 1, and the distance from line XY to the road centre line at either end of the site.

Report No.771445/DRW-C.

The analysis is based on the information obtained from the boreholes and an examination of the site. The ground conditions were found to be similar in the two boreholes. Little variation in soil conditions is expected away from these borehole locations, but, if substantial variation is found during excavation for foundation purposes, then, Gulf Testing Laboratory should be informed.

2. BORING AND GROUND CONDITIONS.

2.1. Location of Site.

The site is located at the far end of the Umm Al Qawain Peninsula, Umm Al Qawain, United Arab Emirates.

2.2. Location of Boreholes.

Figure 1 is a site plan reproduced from the drawing supplied by the Ministry of Agriculture and Fisheries showing the locations of the boreholes. Figure 1a indicates the location of the local datum to which the elevations of the boreholes are related. The measurements were taken from point Y and the line YZ. Borehole 2 was located clear of the Rocks.

2.3. Dates and Boring.

Two nominally 150mm diameter boreholes were drilled on the site on the 14th and 15th of September 1980, using a Picon 1500 drillrig. The borehole locations were established in the field by Mr. White-Cooper of Gulf Testing Laboratory.

2.4. Sampling and site Tests.

In each of the boreholes standard penetration tests were carried out at 0.5 and 1.0m intervals of depth with the

water level in the boreholes being kept at or above the natural standing water level. Samples were obtained using conventional split spoon sampling equipment.

The field work was supervised by an engineeer from our staff, who located the boreholes in the field, directed the drilling and sampling operations and logged the boreholes. All the samples obtained during the investigation were brought to our laboratory for detailed examination and testing.

2.5. Borehole Records.

The borehole section sheets give the descriptions depth and thicknesses of the different strata encountered. They also show the depths at which the different samples were taken and the ground water conditions observed during drilling.

The elevations of the boreholes have been related to a Halcrow bench mark as indicated on figure 1a. This bench mark, No.C-2, has an elevation of 4.304m.R.L.

2.6. Site and Soil Conditions.

The site is open and essentially flat. Access is easy along the existing sand road as indicated on figure 1.

Figure 2 shows sections through the boreholes. The general sequence of strata is:

Made ground

Loose to compact sand.

The near surface soil consists of a well graded slightly silty to silty very gravelly to slightly gravelly sand. The material reporting in the gravel fraction consists mostly of lumps of cemented sand with some shells. These lumps of cemented sand show the soil to be made ground. This soil is said to be derived from the dredged channel next to the site and placed hydraulicly on the site. This extends down to approximately 3.0m below ground level where it rests on natural soil.

The top portion of the natural soil in borehole 2 is a loose very shelly grey sand. In borehole 3 the top portion of the natural soil is a well graded sand with some shells. The loose soil passes down into compact to dense sand with some shells.

Water was encountered in both boreholes. After allowing the water to reach equilibrium, the standing water level was observed between 1.9 and 2.0m below ground level which is equivalent to 1.32m.R.L. The standing water level may be expected to vary with tidal conditions.

3. TESTING.

3.1. Laboratory Tests.

These were:-

Soil classification - Sieve analyses
Sulphate analyses
pH determinations.

3.2. Test Results.

Table 1 and the grading curves figures 4 and 5 give the results of the laboratory tests.

3.3. Discussion of Test Results.

The results of the in-situ penetration resistance tests are given on the borehole logs and are plotted against depth below ground level on figure 3. The near surface soil is compact to dense with the penetration resistance decreasing slightly with increasing depth below ground level. The top of the natural soil at 3.0m below ground level is loose. Below 3.5m below ground level the natural soil is compact, the penetration resistance increasing with increasing depth below ground levelbecoming dense below 5.0m below ground level.

The sieve analyses show the near surface made ground to be a slightly silty to silty well graded sand with shells and lumps of cemented sand reporting in the gravel fraction. The natural soil below the made ground in borehole 2 is a well graded sand with abundant shells and shell fragments reporting in the gravel and coarse sand fraction. The natural soil in borehole 3 was found to be a well graded sand with some shells and shell fragments.

The significance of the sulphate analyses and pH determinations is discussed in a later paragraph under concrete design for foundation purposes.

4. FOUNDATION DESIGN.

4.1. General Observations.

It is assumed that finished ground level will be at or slightly above the existing ground level. It is also assumed that foundations will be placed at least 0.5m below ground level to avoid the risk of undermining.

TABLE 2

CHEMICAL ANALYSES

Borehole	Sulphate (as SO_3) Parts per 100,000	pH	Class
1	274	6.9	4
2	271	7.0	4

Report No.771445/DRW-C.

TABLE 1

PRESUMED BEARING VALUES (q_p=kg/cm^2)

FOR SQUARE BASES

Depth of footing (m)	q_p for width				
	0.6m	0.8m	1.0m	1.5m	2.0m
0.5	2.0	2.5	3.0	2.9	2.7

Note: 1. Water table about 2.0m below ground level.

2. A design bearing value of 2.5 kg/cm^2 may be adopted.

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4.2. Shallow Footings.

Table 1 gives the presumed bearing values for shallow footings placed at 0.5m below ground. These values are based on the penetration resistance values and grading of the soil and incorporate a factor of safety at least 3 on the estimated ultimate values.

The estimated total settlement of a square base of side 2.0m loaded to 2.5 kg/cm^2 is estimted to be about 10mm. For lesser loading the settlement will be proportionatly less. For smaller bases the settlement would be less in proportion to the length of side of the square base.

Such settlement is considered acceptable & for this reason the presumed bearing values may be used for design purposes. A design bearing value of 2.5 kg/cm^2 would thus be apropriate for foundations placed at 0.5m below ground level. No advantage would be gained by placing the foundations at greater depth. It should be noted that these bearing values ensure that the loose soil at 3.0m below ground will not be overstressed.

4.3. Concrete Design for Foundation Purposes.

Table 2 gives the results of the chemical analyses. The sulphate analyses fall within class 4 of table 1 of the Building Research Establishment Digest 174 of February 1975. Concrete for foundation purposes should thus be designed according to the recommendations for class 4. A minimum of 370 kg/m^3 of sulphate resisting cement should be used for concrete made with a 20mm nominal maximum size aggregate. The maximum free water to cement ratio should be 0.45.

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In order to avoid the physical attack of concrete and blockwork near to ground level, we would advise that the concrete should be protected by bituthene or bituminous emulsion which should extend upto or a little above finished ground level.

for GULF TESTING LABORATORY

D.R. White-Cooper

D.R. White-Cooper, B.A., D.I.C., M.I.M.M.
(TECHNICAL MANAGER)

GULF TESTING
LABORATORY
DUBAI
DATE: 22 Sept 1980

Report No.771445/DRW-C.

APPENDIX 1

BOREHOLE SECTIONS

NOTES ON SAMPLING AND SITE TESTS

Disturbed samples (D) CP 2001 (1957)

Representative samples of the different strata are taken from the boring tools and placed in pollythene bags which are then sealed. After examination, the samples are sent to the Client if required for correlation with the descriptions given on the borehole section sheets, otherwise they are retained in the laboratory.

Undisturbed core samples (U) - CP 2001 (1957)

Undistrubed core samples of cohesive soils are taken in the standard 102 mm diameter sampling tube. This is a thin-walled steel tube about 500 mm long fitted with a cutting shoe of slightly smaller internal diameter (area ratio about 22%). The samples are thus obtained in as undisturbed condition as possible. After being taken, the ends of the samples are packed to prevent damage in transit to the laboratory and the tubes sealed to make them airtight.

Bulk samples (B) - CP 2001 (1957)

The bulk samples are generally about 7 to 9 kg, but vary according to the grading of the sample. They are transported in stout plastic bags to avoid loss of the fine fraction.

Standard penetration test (DO =open shoe, SC = cone)
B.S. 1377 (1967)

The penetration resistance of granular soils, chalk or hard soils in which core samples cannot be taken is measured with the standard penetration tool. This is a thick-walled tube

about 51 mm outside diameter or a solid cone. It is driven into the soil with blows from a 65 kg hammer with a free fall of 760 mm. The number of blows required for each 150 mm penetration is recorded. The penetration resistance (N) is the number of blows required for penetration from 150 to 450 mm below the bottom of the borehole . If the number of blows exceeds 100, the total penetration is measured and the test discontinued.

Water samples (W) - CP 2001 (1957)

Duplicate samples of ground water are taken in plastic bottles of about 1000 ml capacity.

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MARICULTURE CENTRE — GULF TESTING LABORATORY

LOCATION: UMM AL QAWAIN. — BOREHOLE NO. 2 — PROJECT NO.771445

Standing Water Level ..1.9m..... Drilling Method ..SHELL.....

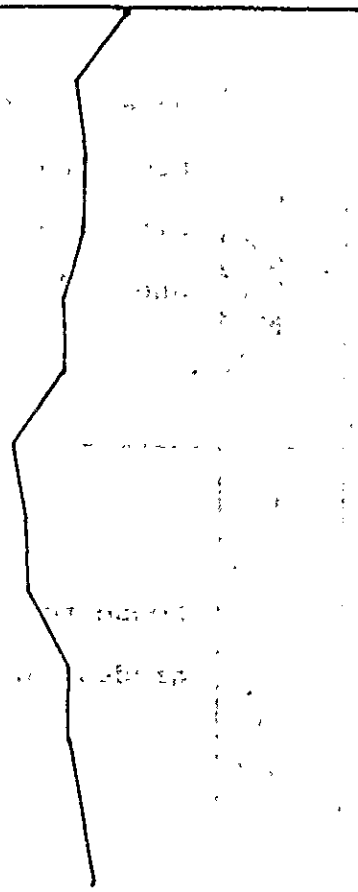
Water Struck ..... Diameter .....150mm.....

Standpipe ..... Start 15-9-1980 Finish 15-9-1980.

REMARKS: 6.0m of casing used. Surface Elevation 3.22m.R.L.....

DEPTH (m)	ELEVATION (m)	STRATA PLOT	DESCRIPTION	SAMPLES NUMBER	TYPE	BLOWS/FT
			Made ground (compact brown well graded sand with shells and cemented lumps)	1	DO	41
				2	DO	28
				3	DO	31
				4	DO	30
				5	DO	23
3.1	0.1			6	DO	23
			Loose very shelly grey well graded sand.	7	DO	10
4.0	0.8			8	DO	14
			Compact to dense grey well graded sand.	9	DO	16
				10	DO	24
				11	DO	24
6.4	3.2			12	DO	33

DYNAMIC PENETRATION RESISTANCE BLOWS/FT.



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MARICULTURE CENTRE GULF TESTING LABORATORY

LOCATION: UMM AL QAWAIN. BOREHOLE NO. 1 (3) PROJECT NO. 771445

Standing Water Level 2.0m Drilling Method SHELL

Water Struck ..... Diameter 150mm

Standpipe ..... Start 14-9-1980 Finish 14-9-1980

REMARKS: 6.0m of casing used. Surface Elevation 3.32m.R.L.

DEPTH (m)	ELEVATION (m)	STRATA PLOT	DESCRIPTION	SAMPLES NUMBER	TYPE	BLOWS/FT
			Made ground (compact pale brown-grey well graded sand with cemented lumps and shells.)	1	DO	26
				2	DO	30
				3	DO	19
				4	DO	20
				5	DO	25
				6	DO	22
3.0	3.0					
			Loose to compact grey well graded sand with shells.	7	DO	9
				8	DO	9
				9	DO	16
				10	DO	10
				11	DO	28
				12	DO	34
6.4	-3.2					

DYNAMIC PENETRATION RESISTANCE BLOWS/FT 20 40 60 80 100

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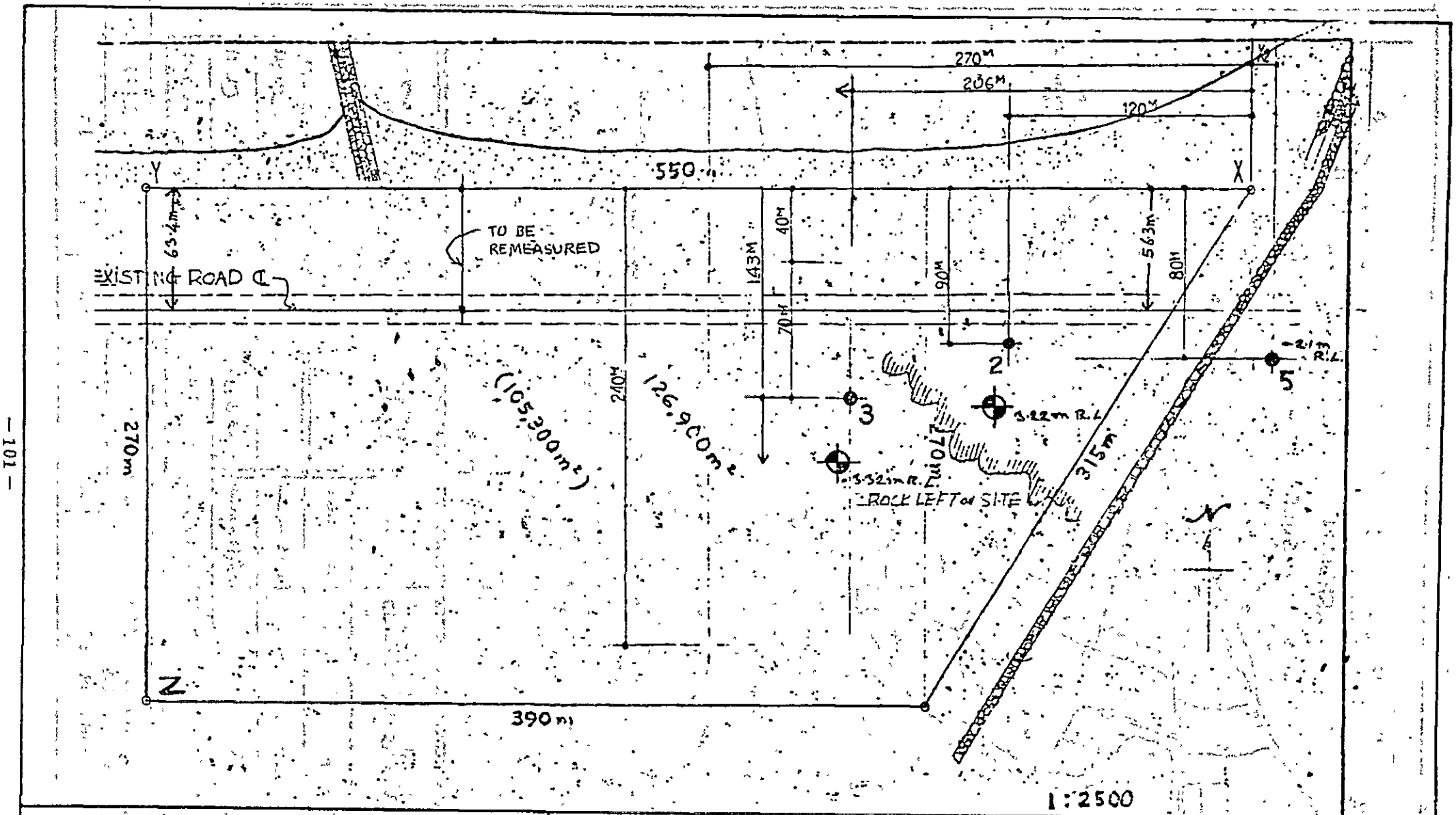
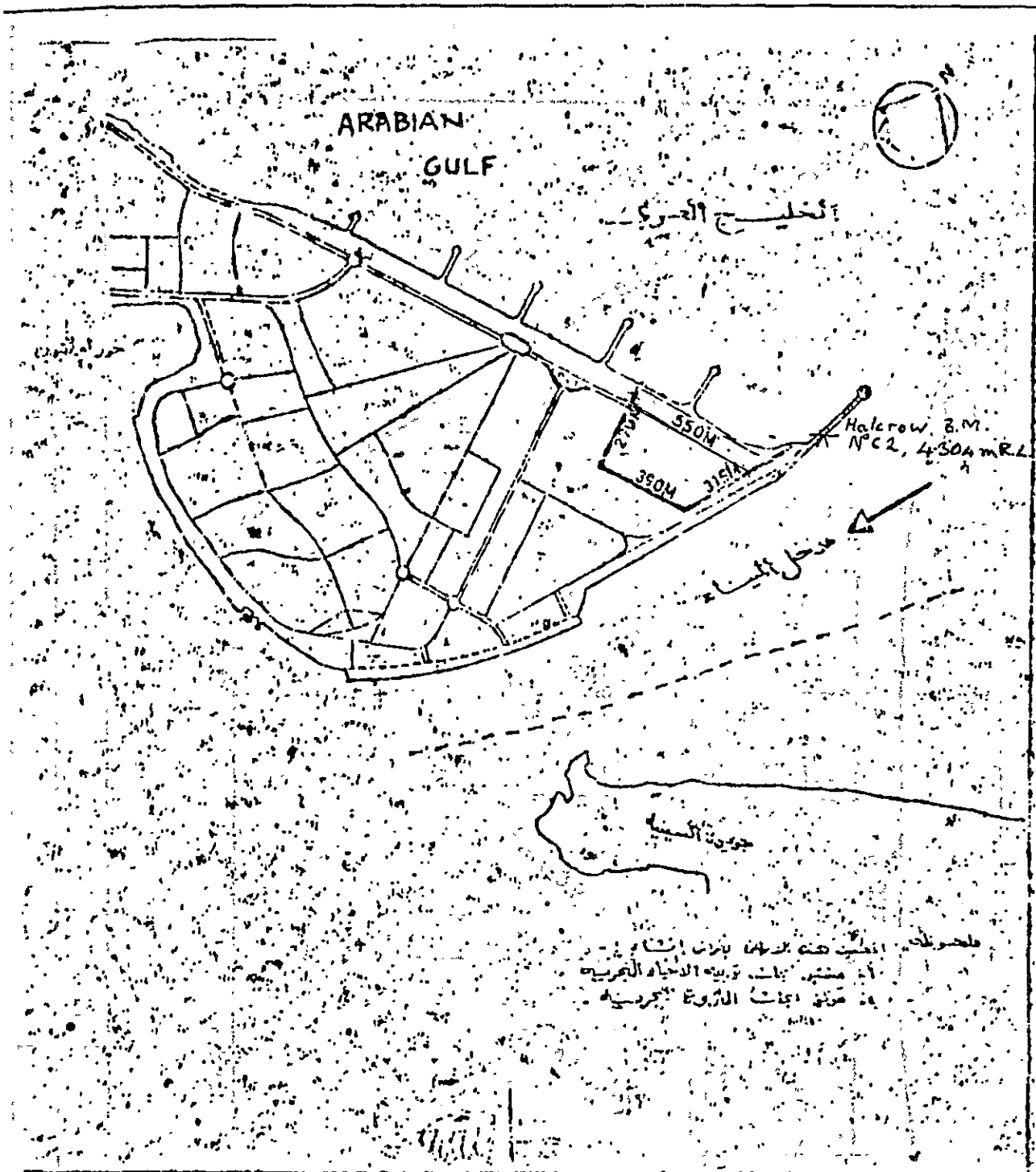
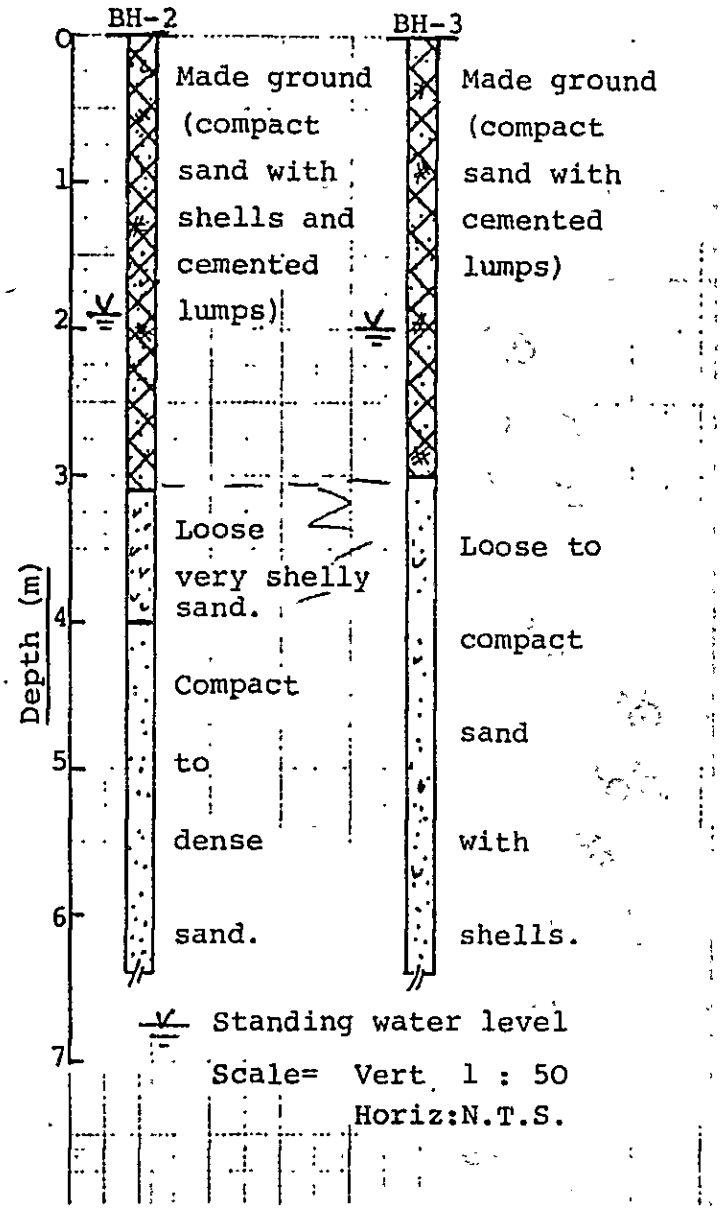


GULF TESTING LABORATORY	Drawn by: Ckd.by:	Project No. 771445
P.O.Box 156 Dubai, United Arab Emirates.	Date: September 1980.	Figure No. 1

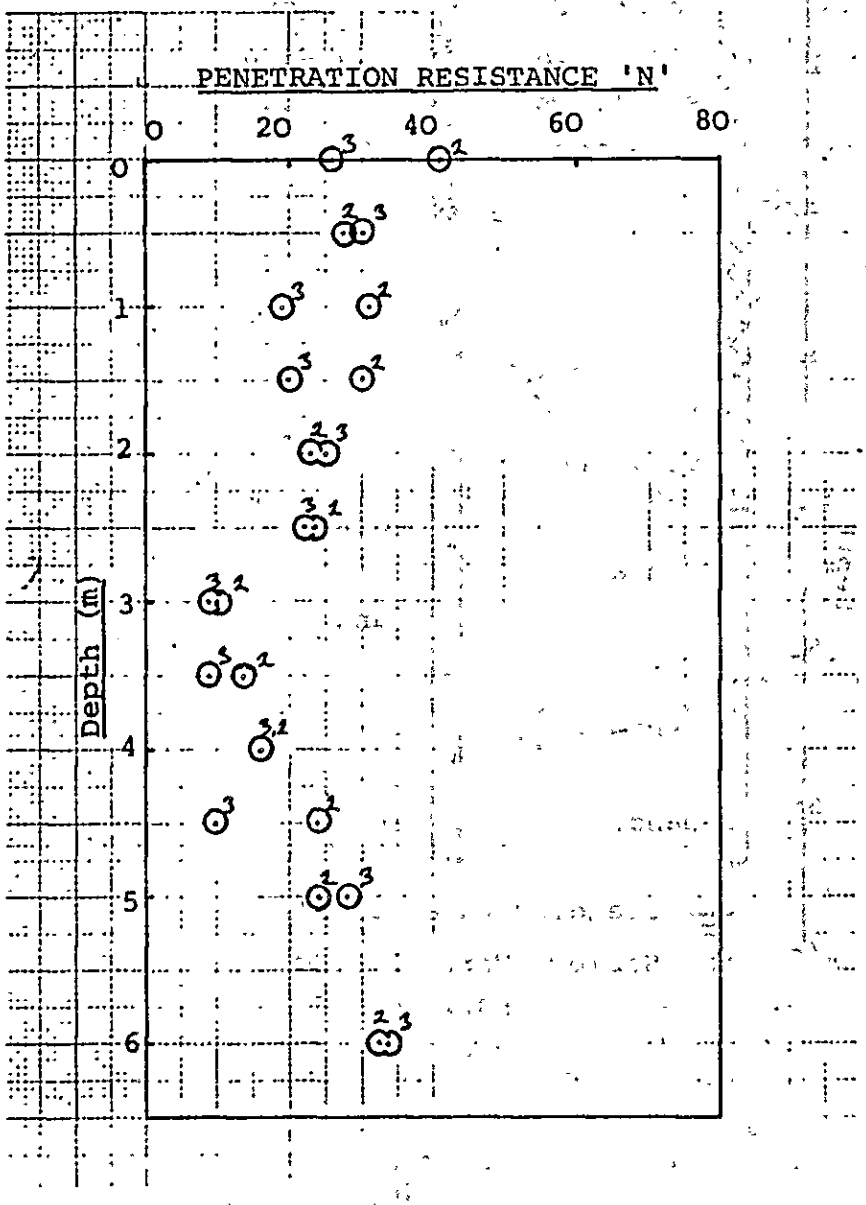


الاسم:	وزارة الزراعة والثروة السمكية	جاري تيار الفيتين وملحقاتها	
المساحة الاصلية	متر مربع	دائرة البلدية	
المساحة المكتوبة	متر مربع	المهندس: محمد نبيل شحاده	
المساحة الزائدة	متر مربع	المساح: ماثيو الانكي	الرسام: توماس ق ف
رقم الملف	التاريخ: ١٩٨٠/٩/٤	المنطقة: (الميناء)	

GULF TESTING LABORATORY P. O. Box 156 DUBAI UNITED ARAB EMIRATES,	Drawn by.: Ckd. by:	Project No : 771445
	Date : September 1980	Figure No : 1a



GULF TESTING LABORATORY P.O. Box 156 DUBAI UNITED ARAB EMIRATES.	Drawn by Ckd. by	Project No: 771445
	Date: September 1980	Figure No: 2



GULF TESTING LABORATORY P.O. Box 156 DUBAI UNITED ARAB EMIRATES.	Drawn by: Ckd. by:	Project No: 771445
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APPENDIX 2

TEST RESULTS

SOIL CLASSIFICATION TESTS

(a) Moisture Content (B.S. 1377 - Test 1)

The moisture content is determined by weighing the sample before and after oven drying at 105 - 110°C. It is defined as the percentage weight of water to dry soil.

(b) Liquid Limit (B.S. 1377 - Test 2)

This is defined as the moisture content at which the soil changes from a plastic solid to a liquid, measured as described in B.S. 1377.

(c) Plastic Limit (B.S. 1377 - Test 3)

This is the moisture content at the change from brittle to plastic solid.

(d) Plasticity Index (B.S. 1377 - Test 4)

This is the difference between liquid and plastic limits.

(e) Specific Gravity (B.S. 1377 - Test 6)

This refers to the dry soil and is measured by weighing the soil and measuring its volume by displacement of kerosene.

(f) Particle Size Distribution- Granular Soils (Sieve analysis)

If the sample contains little or no fines, it is dried and passed through a series of sieves of succeedingly finer mesh (B.S. 1377 - Test 7B). If fines are present, the fines are washed through the B.S.200 sieve and the remainder dried and sieved as before (B.S. 1377 - Test 7A)

(g) Particle Size Distribution - Fine grained Soils

A suspension of soil in water is made, using a deflocculant. The coarse particles settle quicker, so by taking measurements of the specific gravity of the suspension at different times, the particles size distribution is obtained. A correction is made for the temperature of the suspension.

(h) Classification

Soils are classified by their liquid limits/plasticity indices or their grading curves, based on the Casagranade classification (C.P.2001 : 1957 - Table 3).

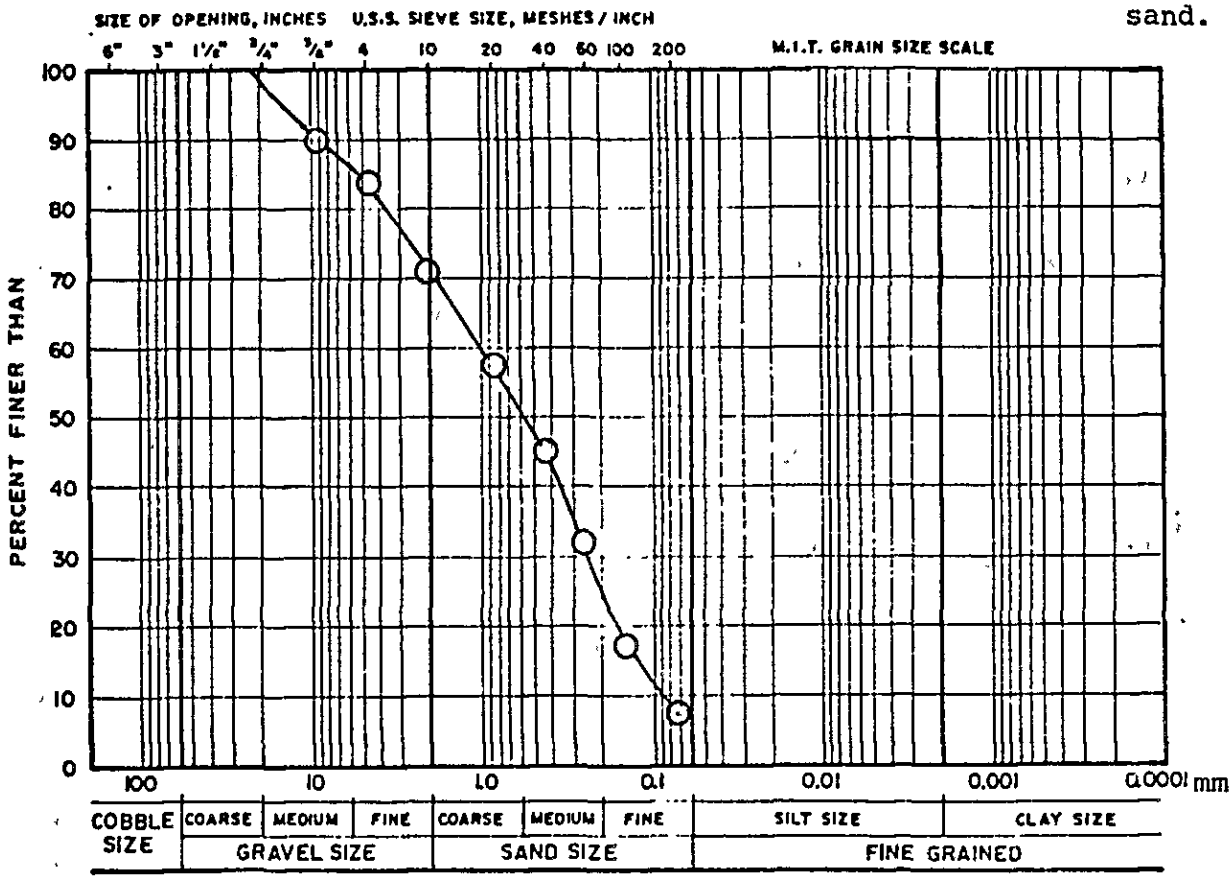
A increase in liquid limit indicates an increase in clay content. The range of moisture contents at which a soil remains plastic is shown by the plasticity index.

Granular soils are described as poorly-graded or uniform when their particles sizes fall within a small range. Conversely, a well-graded soil contains a large range of particle size. Step-graded soils contain two groups of particles size with little soil intermediate between the two groups.

GRAIN SIZE DISTRIBUTION

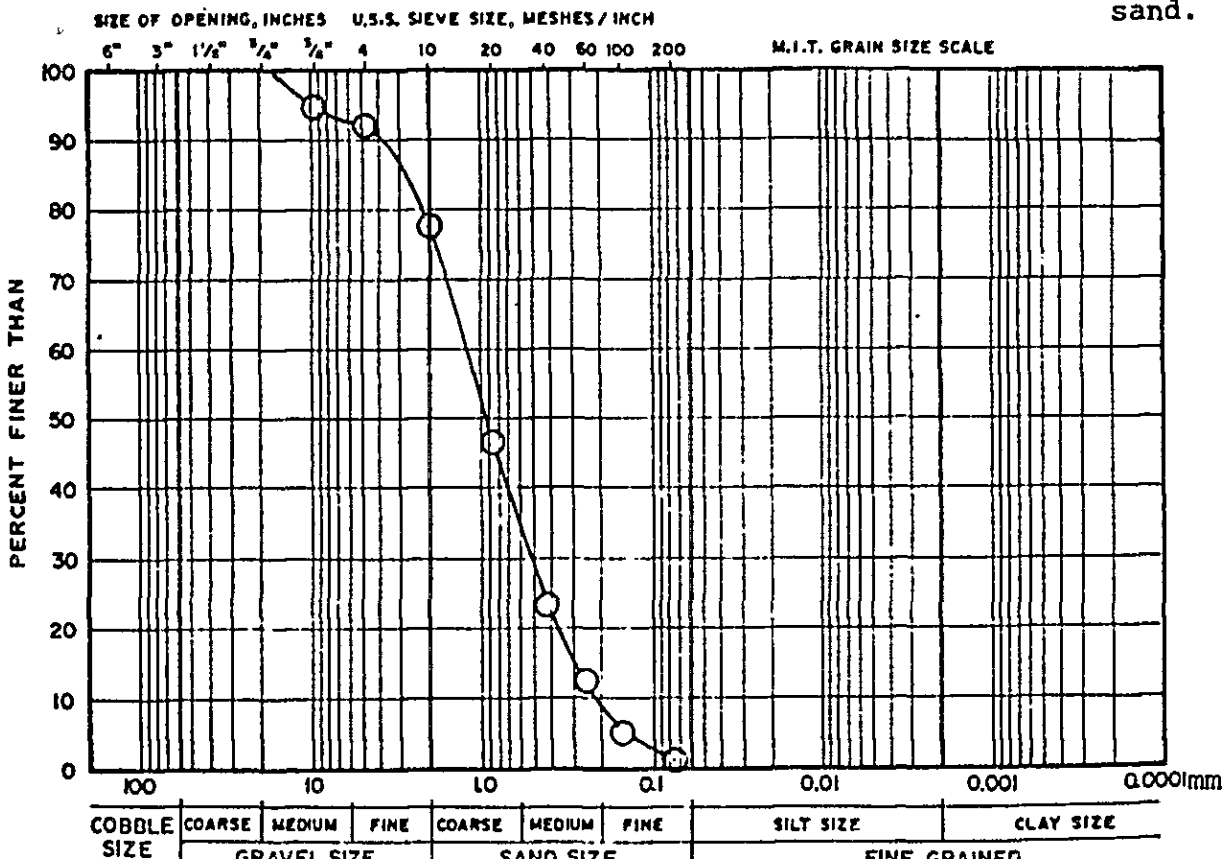
Borehole No.....2.... Sample No. ..3.....

Depth 1.0 to 1.4m..... Description Slightly silty very gravelly sand.



Borehole No. ..2..... Sample No. 7.....

Depth 3.0 to 3.4m..... Description Very shelly well graded sand.



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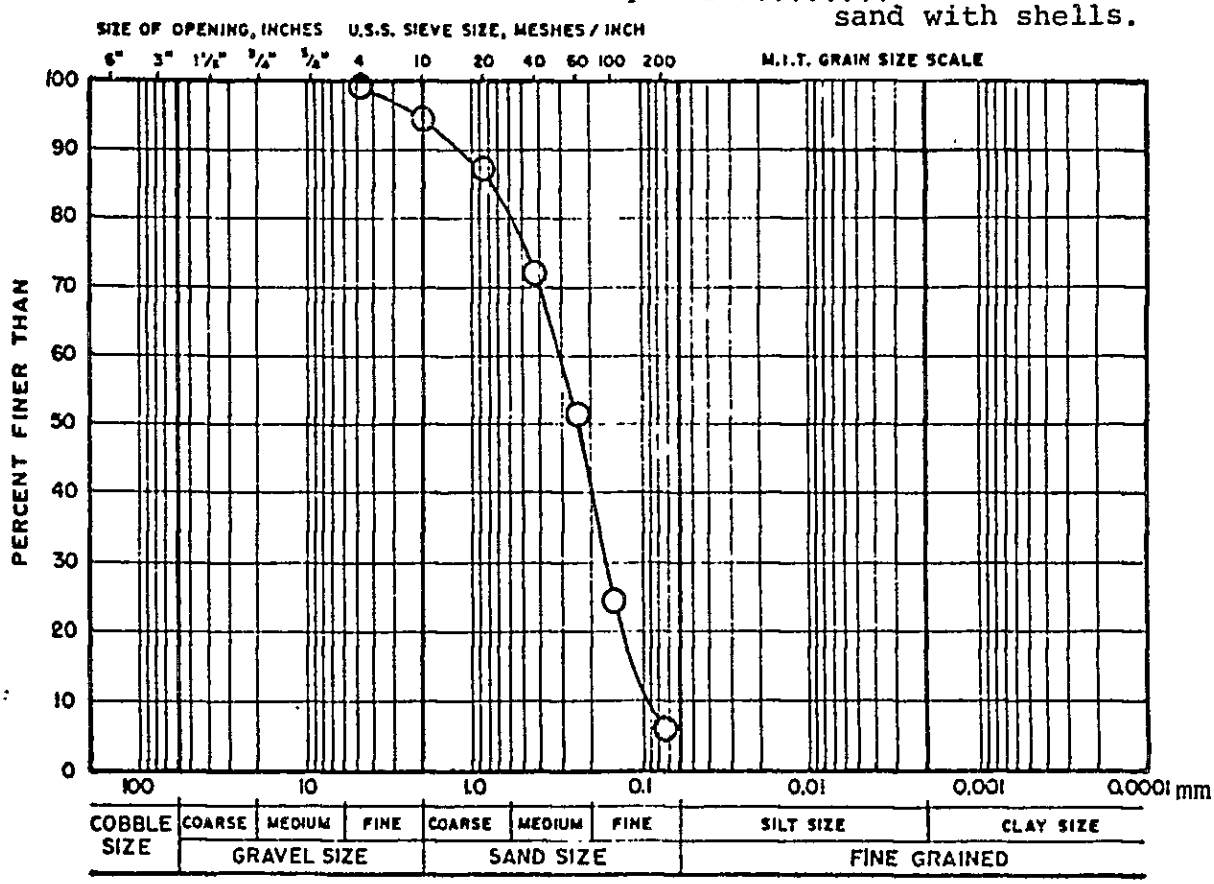
GRAIN SIZE DISTRIBUTION

25

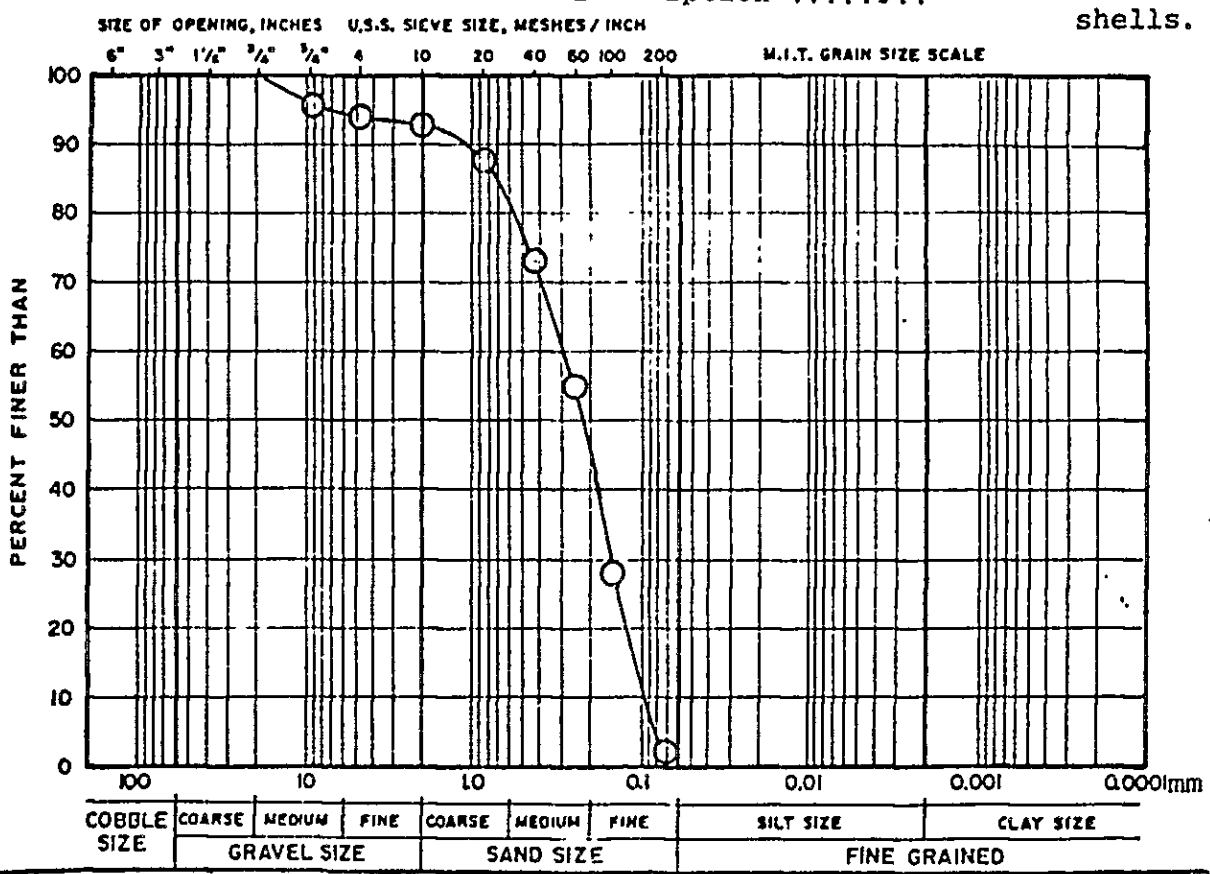
Borehole No.....3..... Sample No. ..3.....

Depth 1..0 .to .1..4m .... Description .Well graded slightly silty sand with shells.



Borehole No. ....3..... Sample No. .8.....

Depth 3.5.to.3.9m..... Description Well graded sand with shells.



Gulf Testing Laboratory P.O. Box 156, Dubai, U.A.E.	Drawn ..DRWR. Checked DRWR	PROJECT NO771445 FIGURE NO. 5