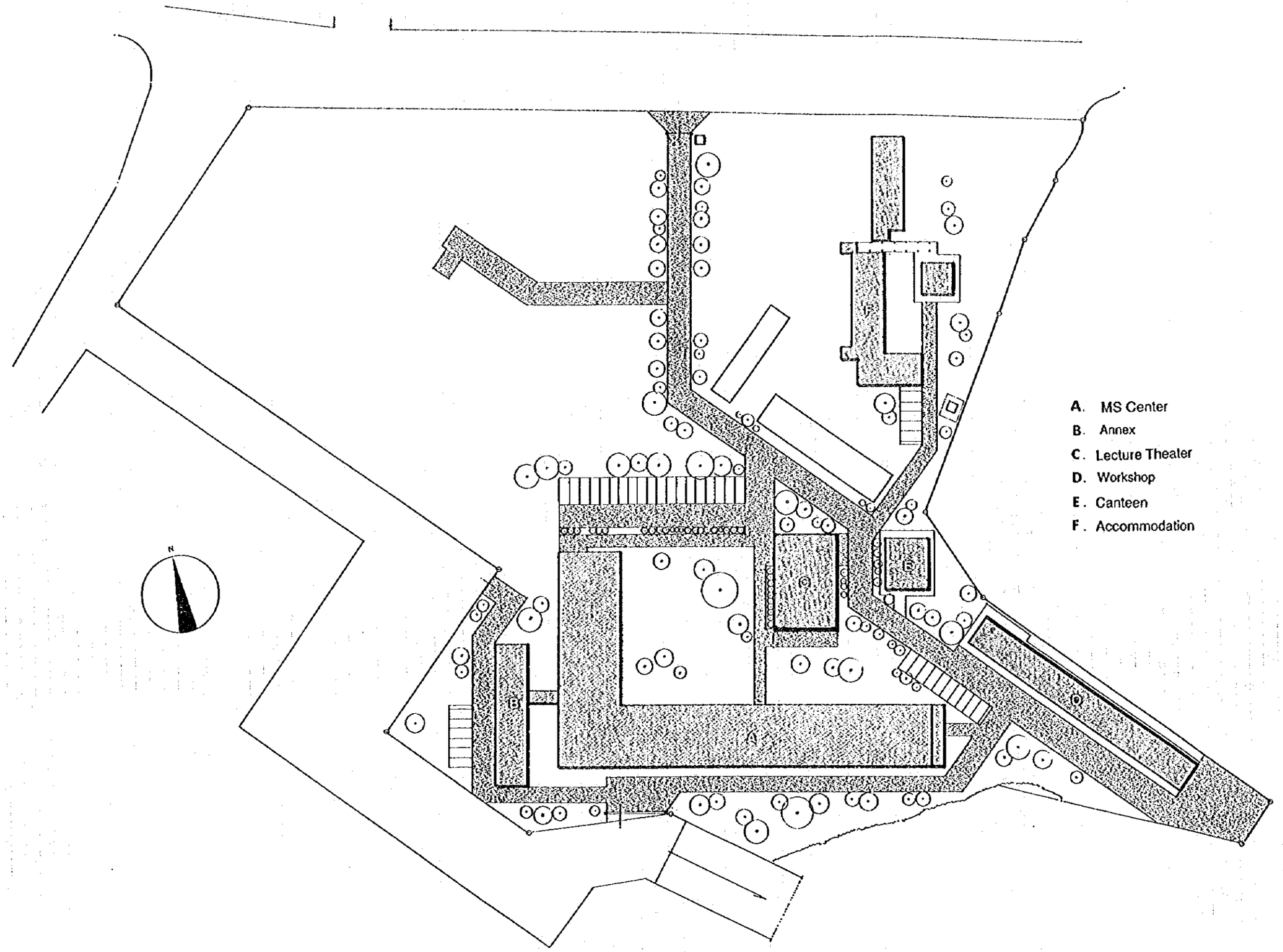
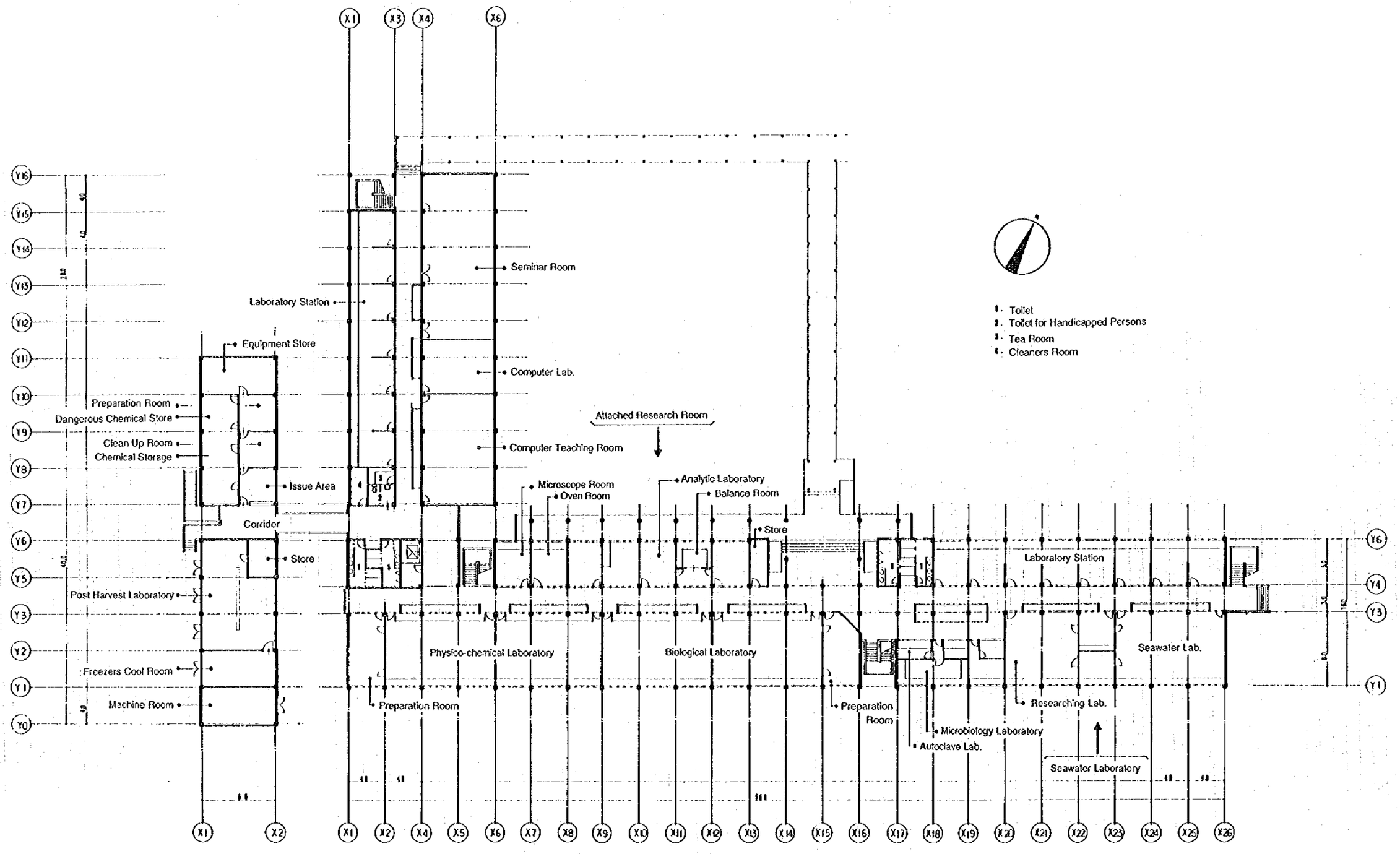
2.3.2.5 BASIC DESIGN PLAN



MS COMPLEX **SITE PLAN** 0 5 10 20 50



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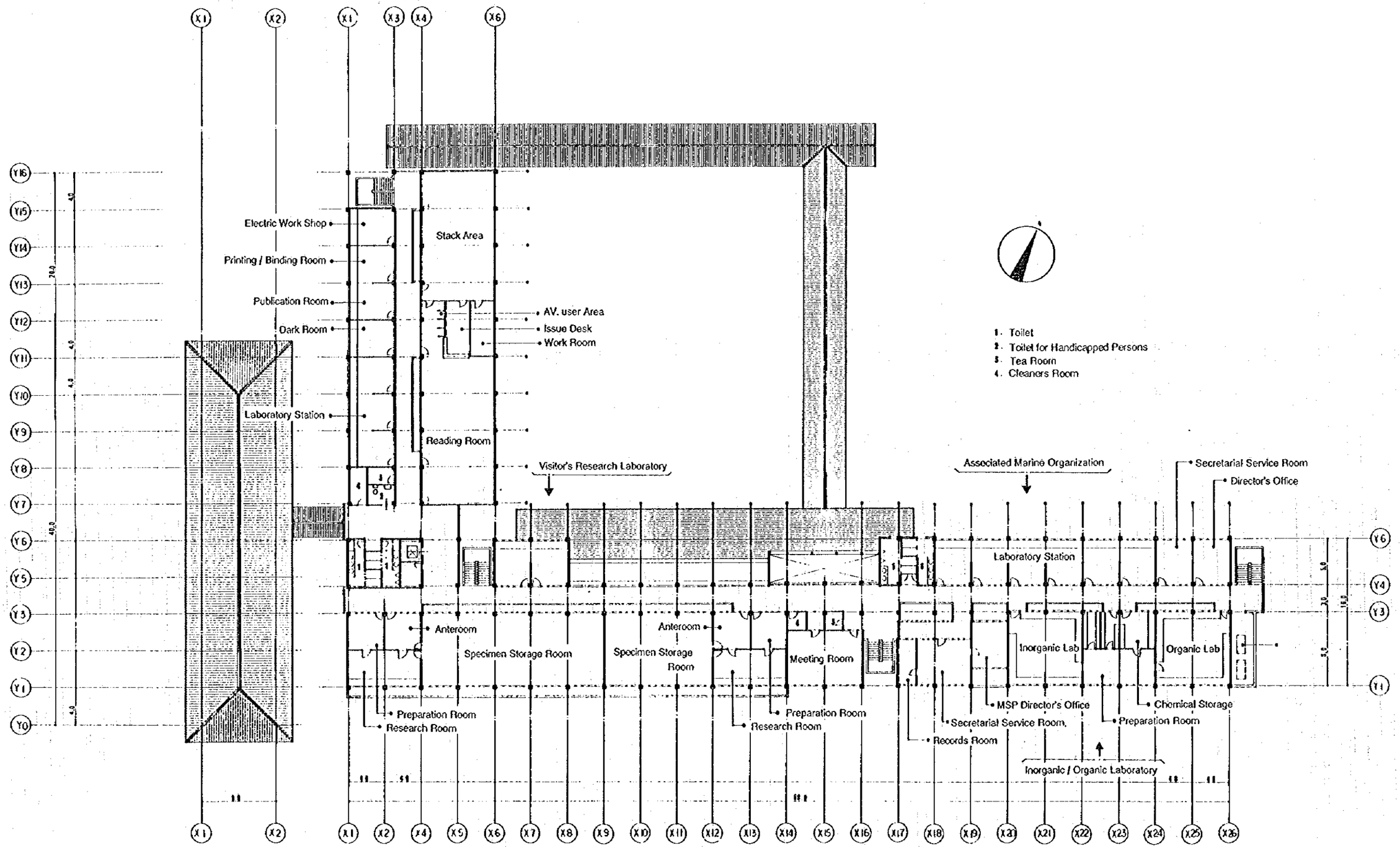

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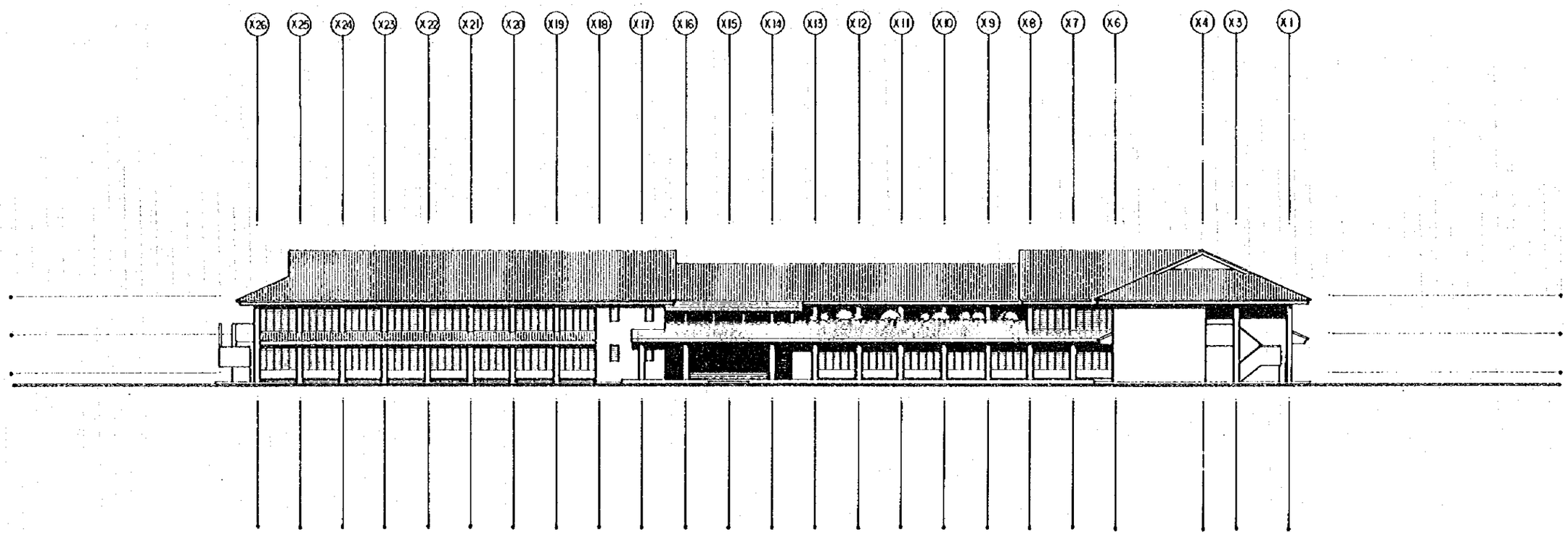

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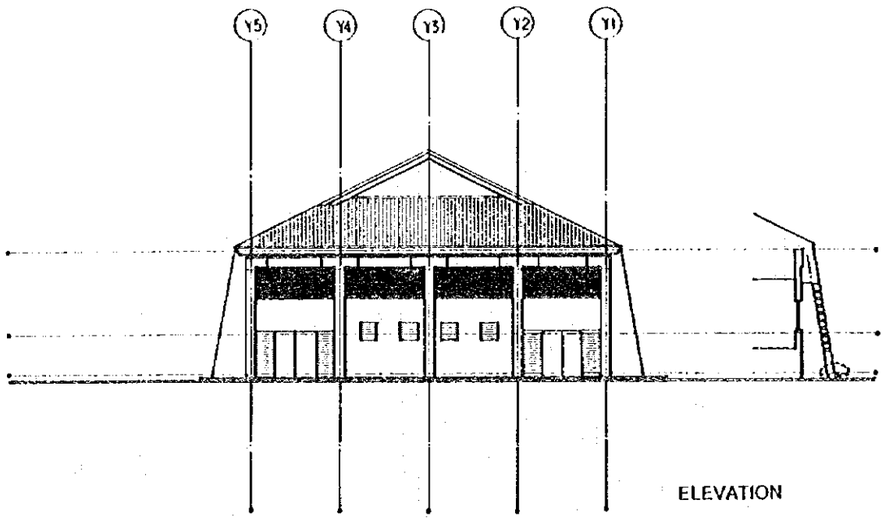

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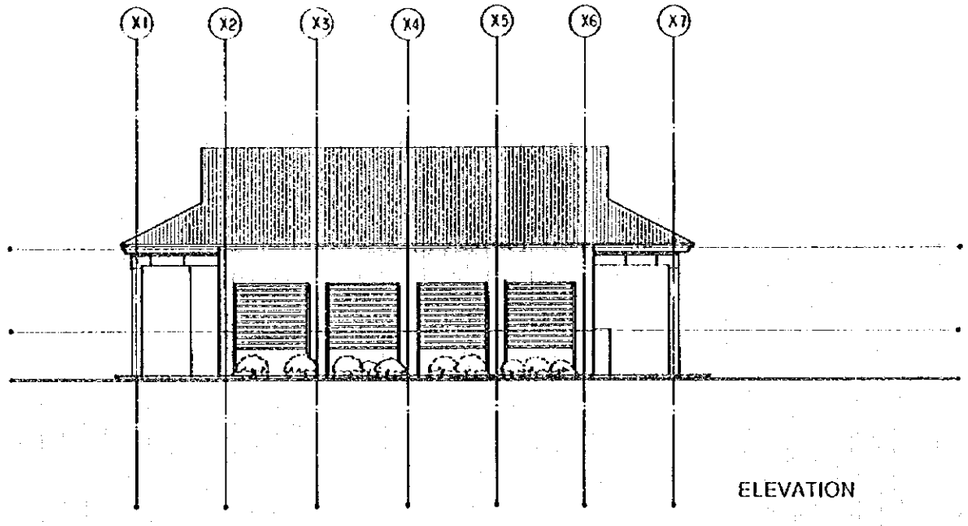

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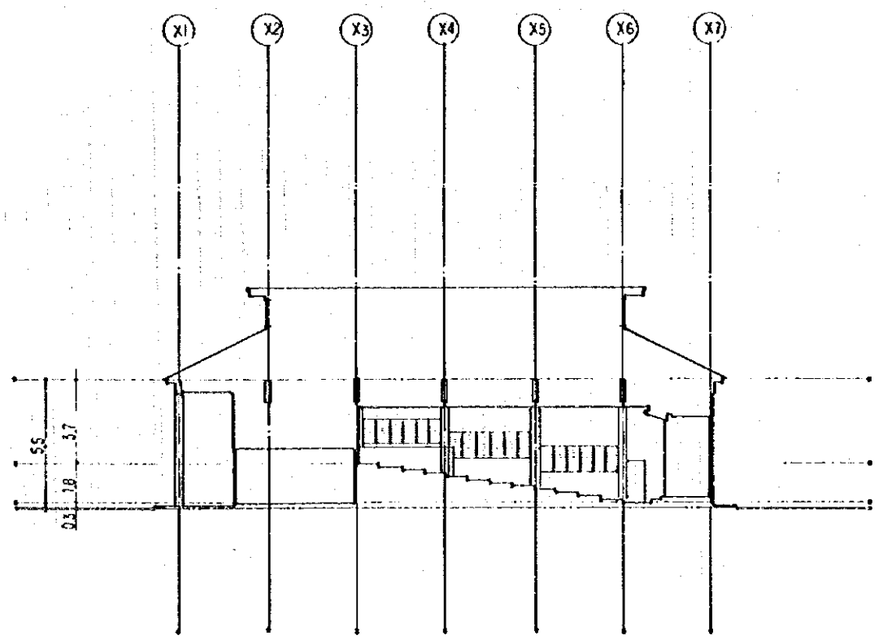
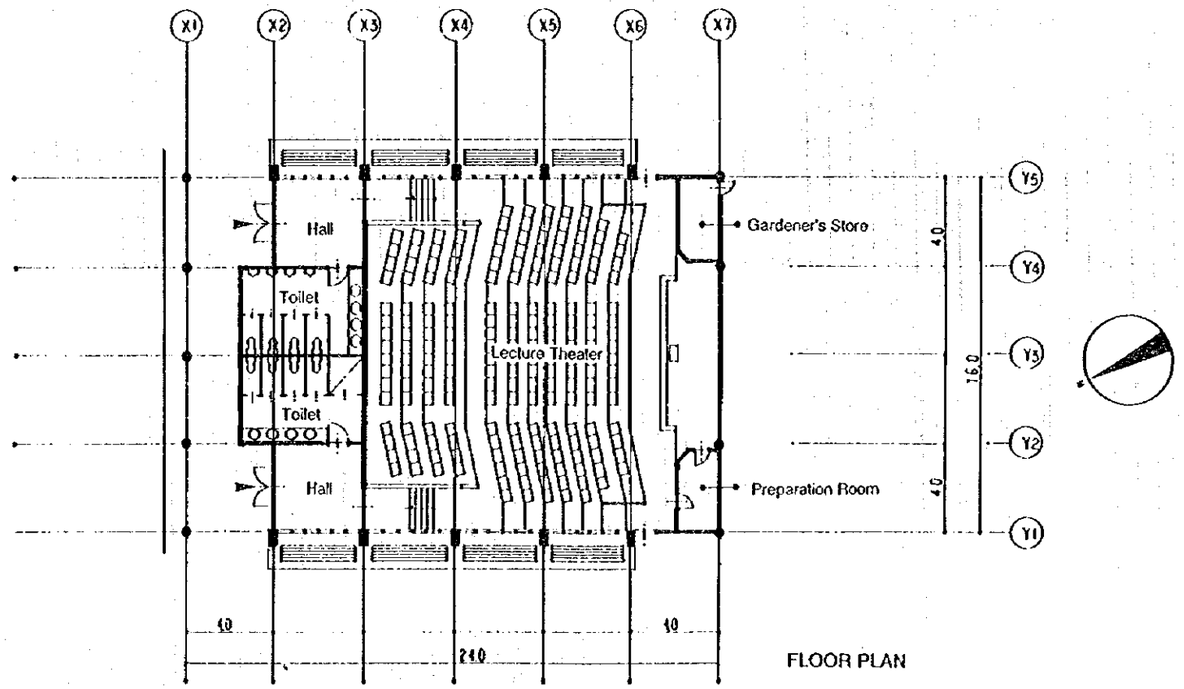
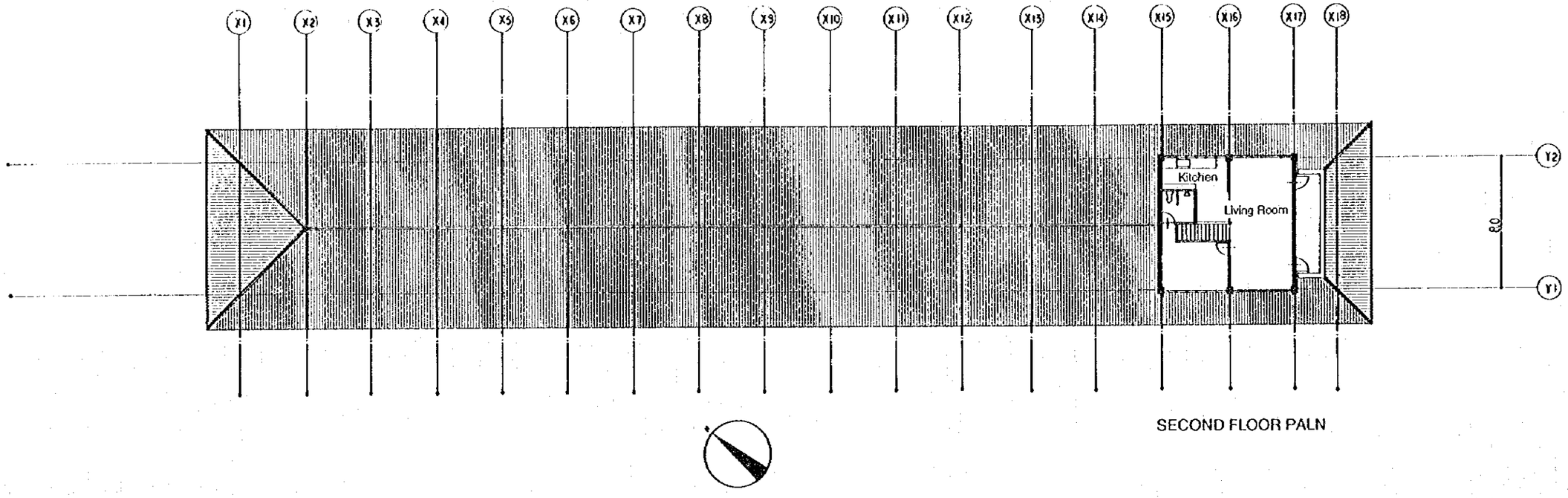


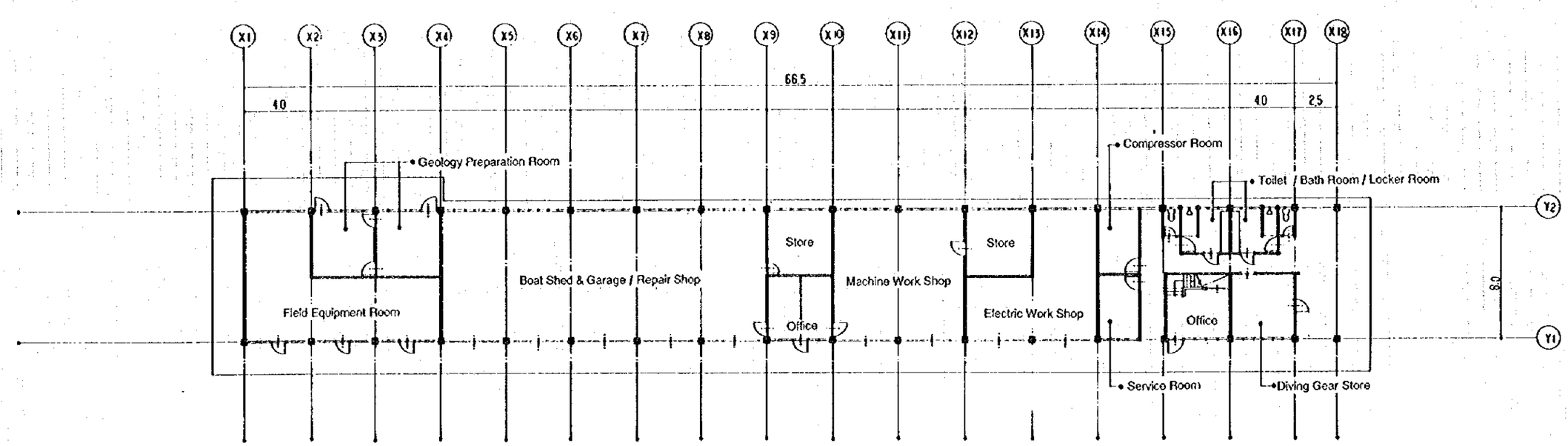


FLOOR PLAN

LECTURE THEATER

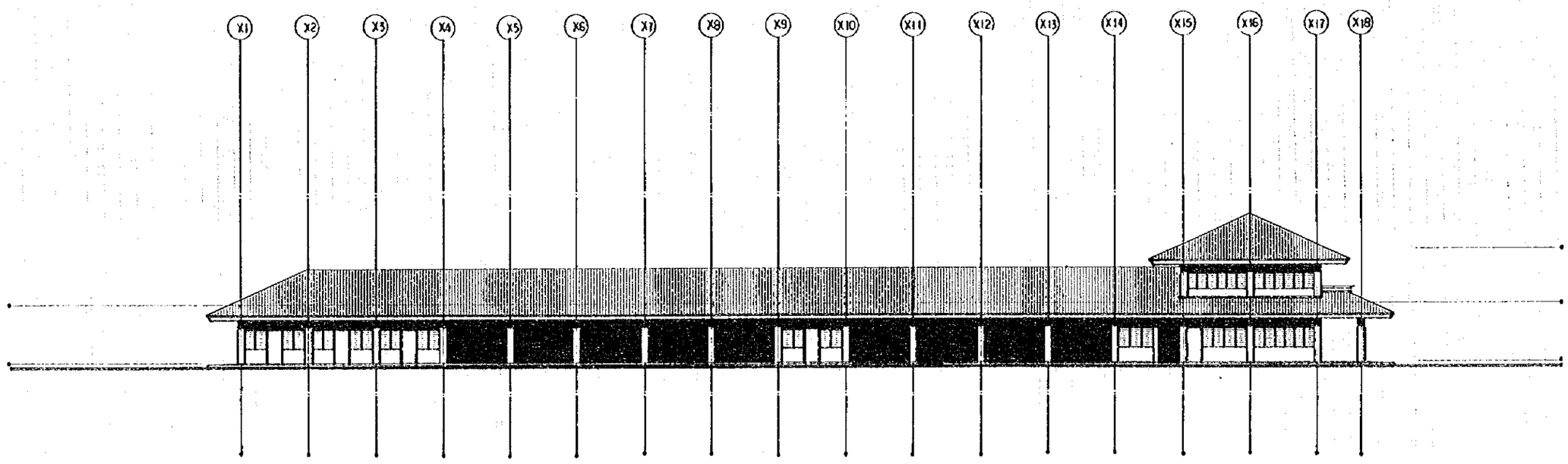


SECOND FLOOR PALN

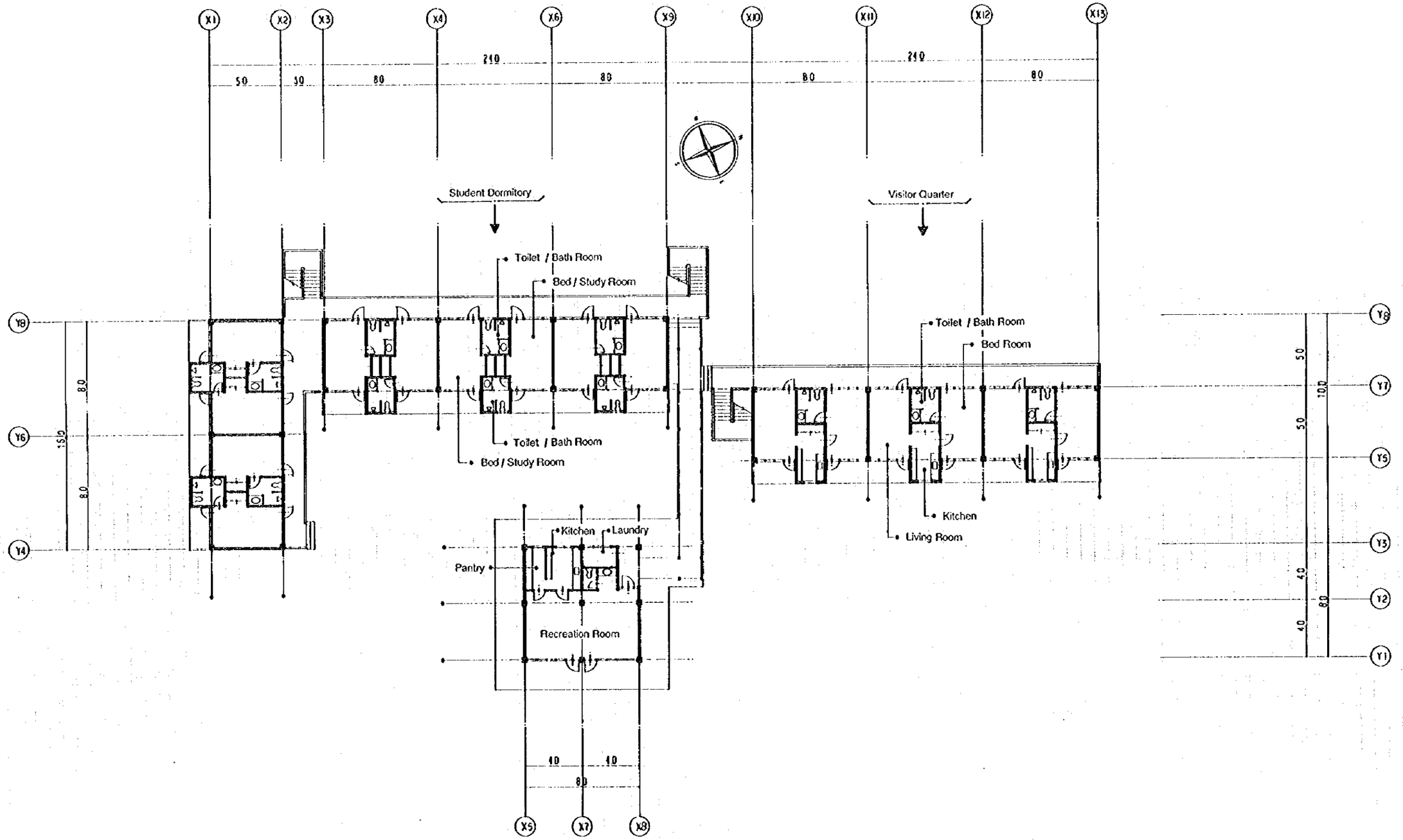


GROUND FLOOR PLAN

WORKSHOP

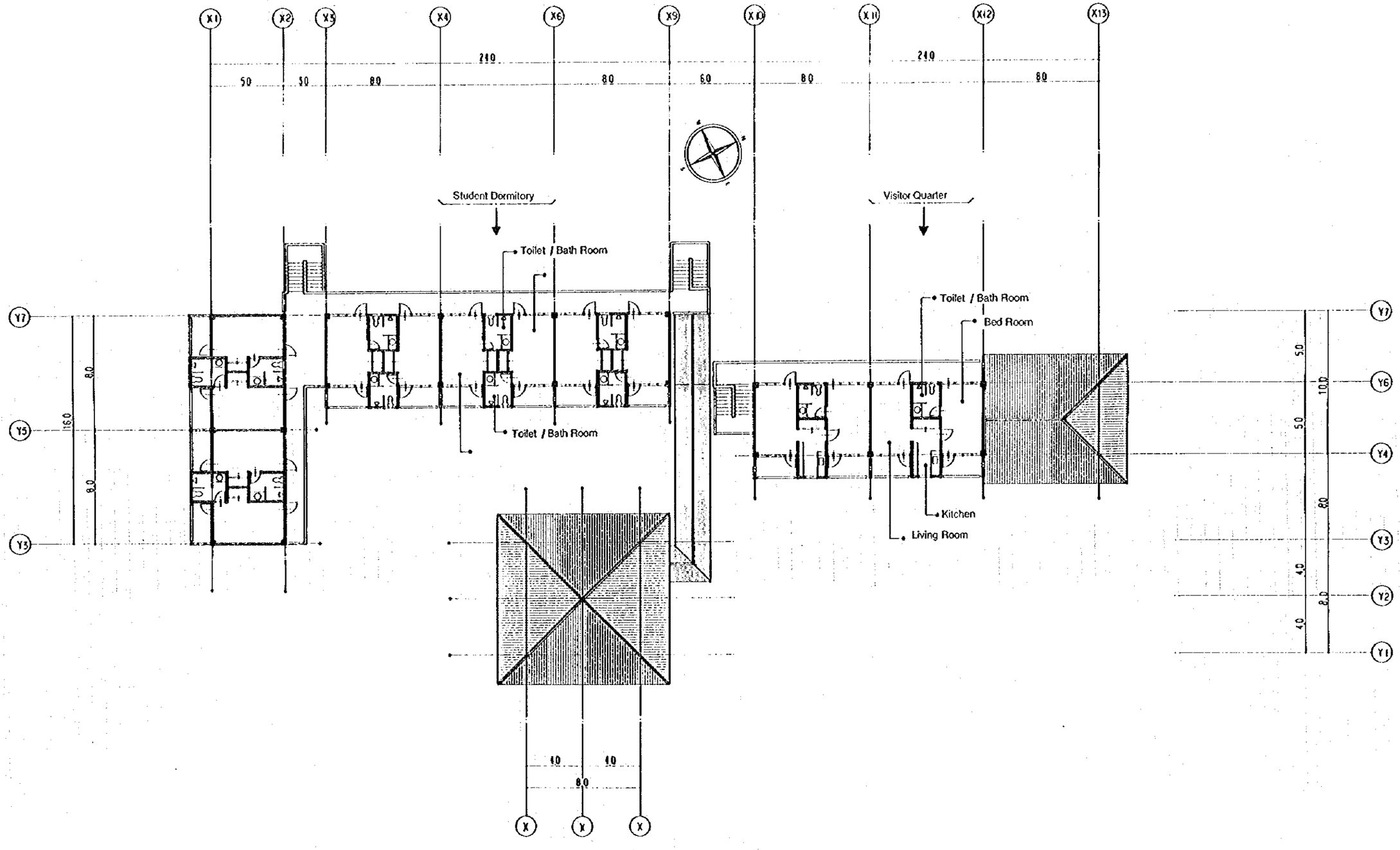


WORKSHOP **ELEVATION**

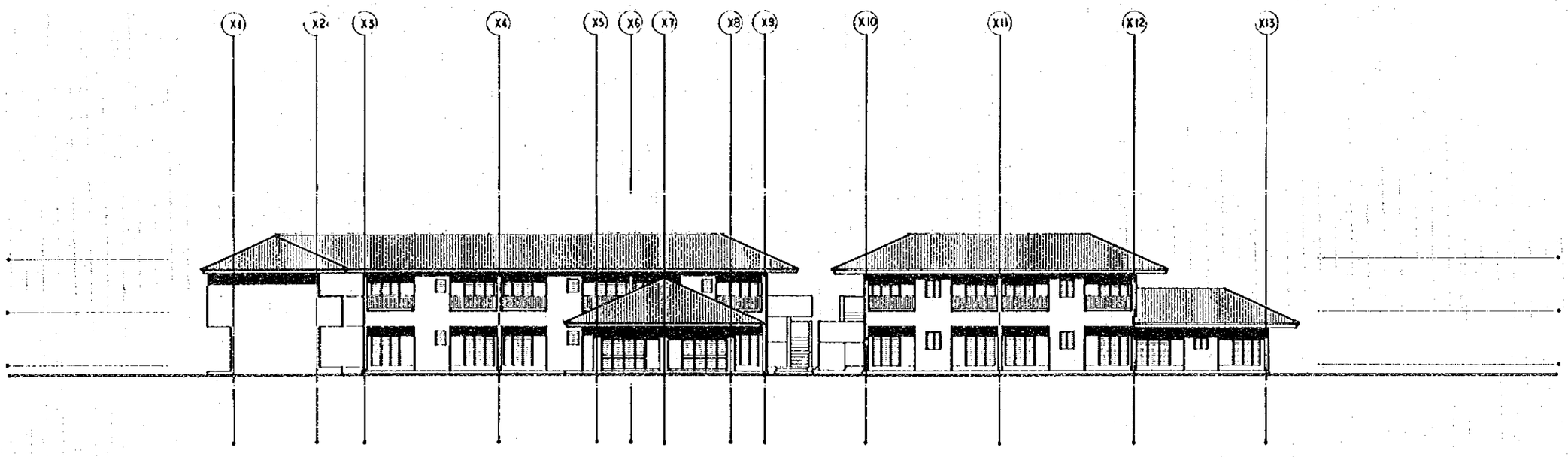


ACCOMMODATION

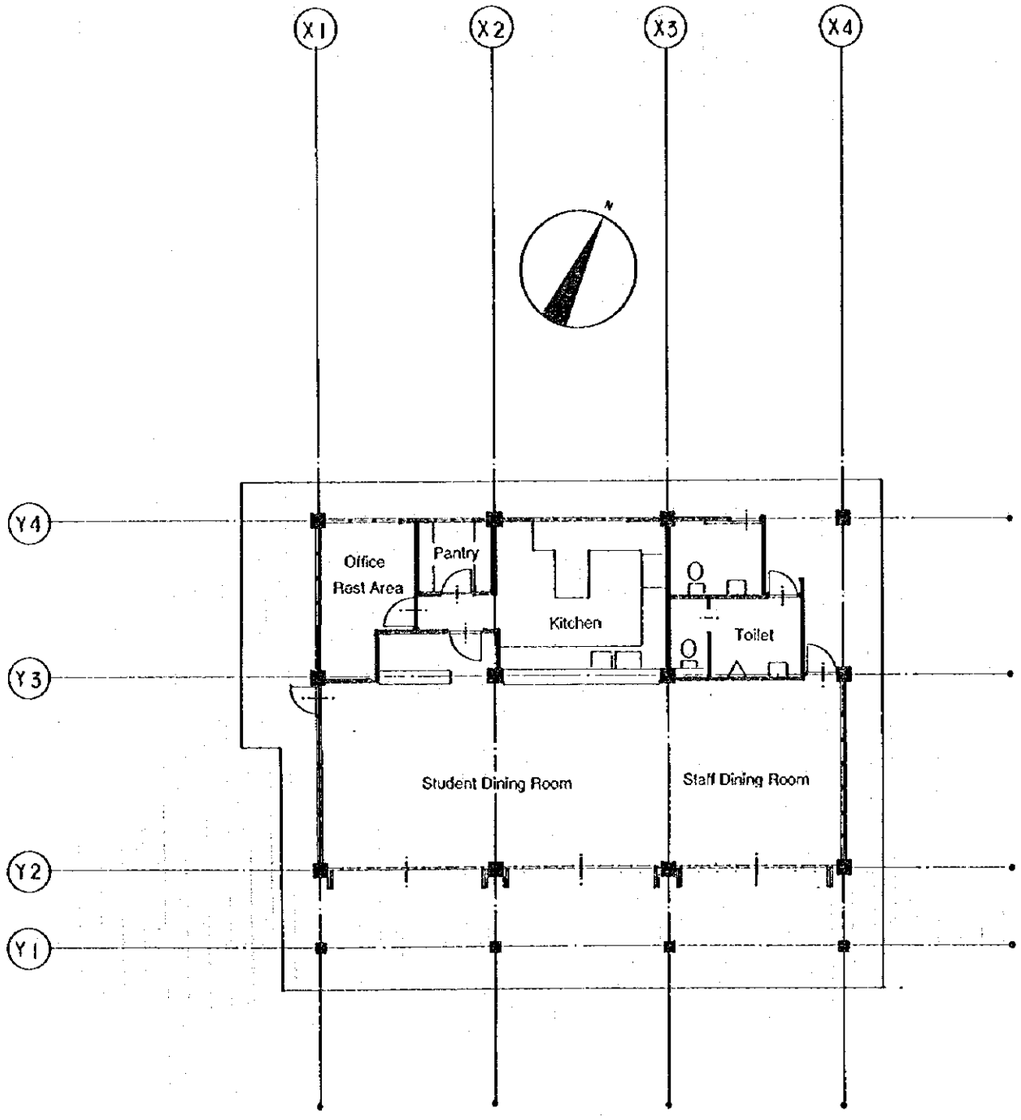
GROUND FLOOR PLAN



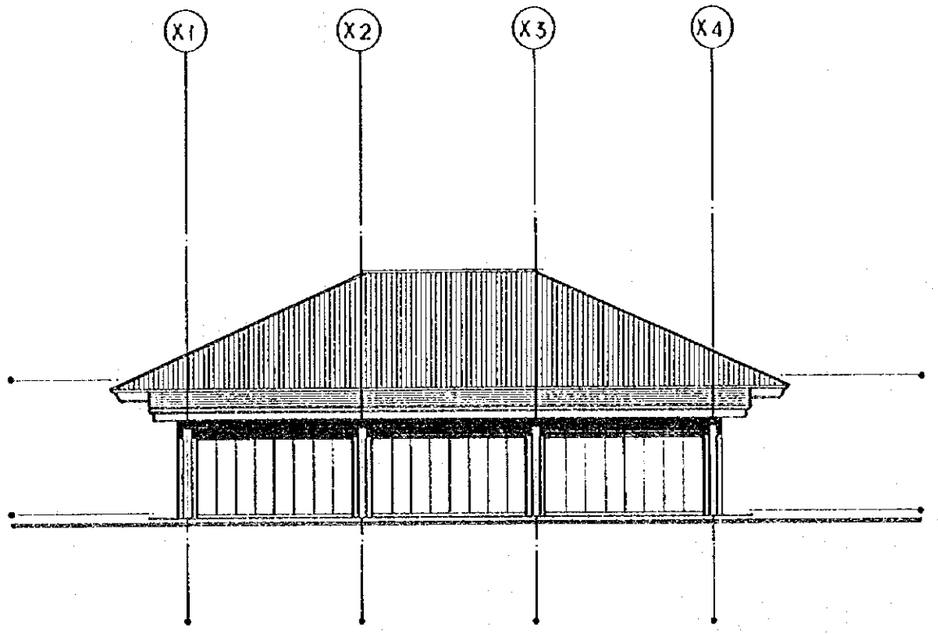
ACCOMMODATION **SECOND FLOOR PLAN**



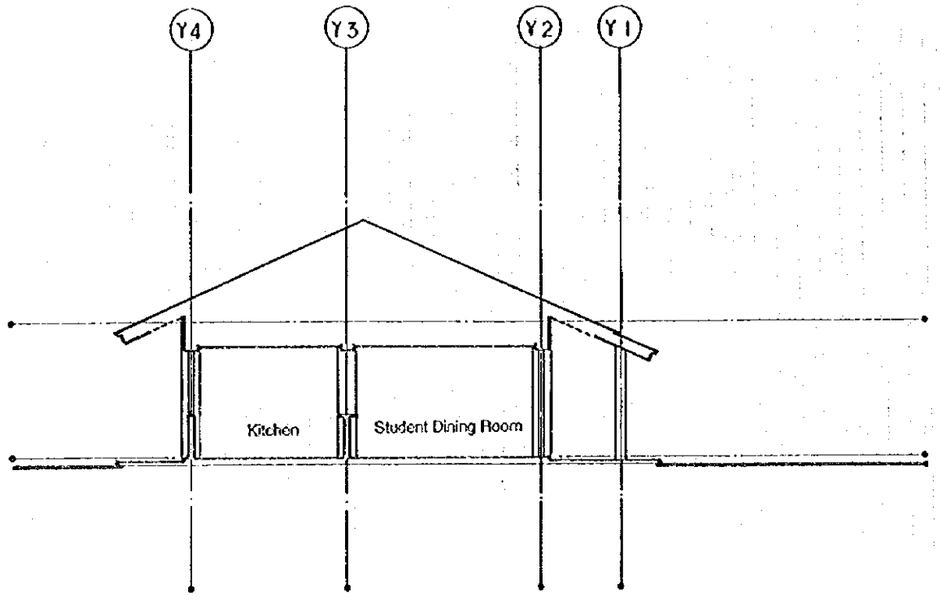
ACCOMMODATION ELEVATION 0 2 4 8



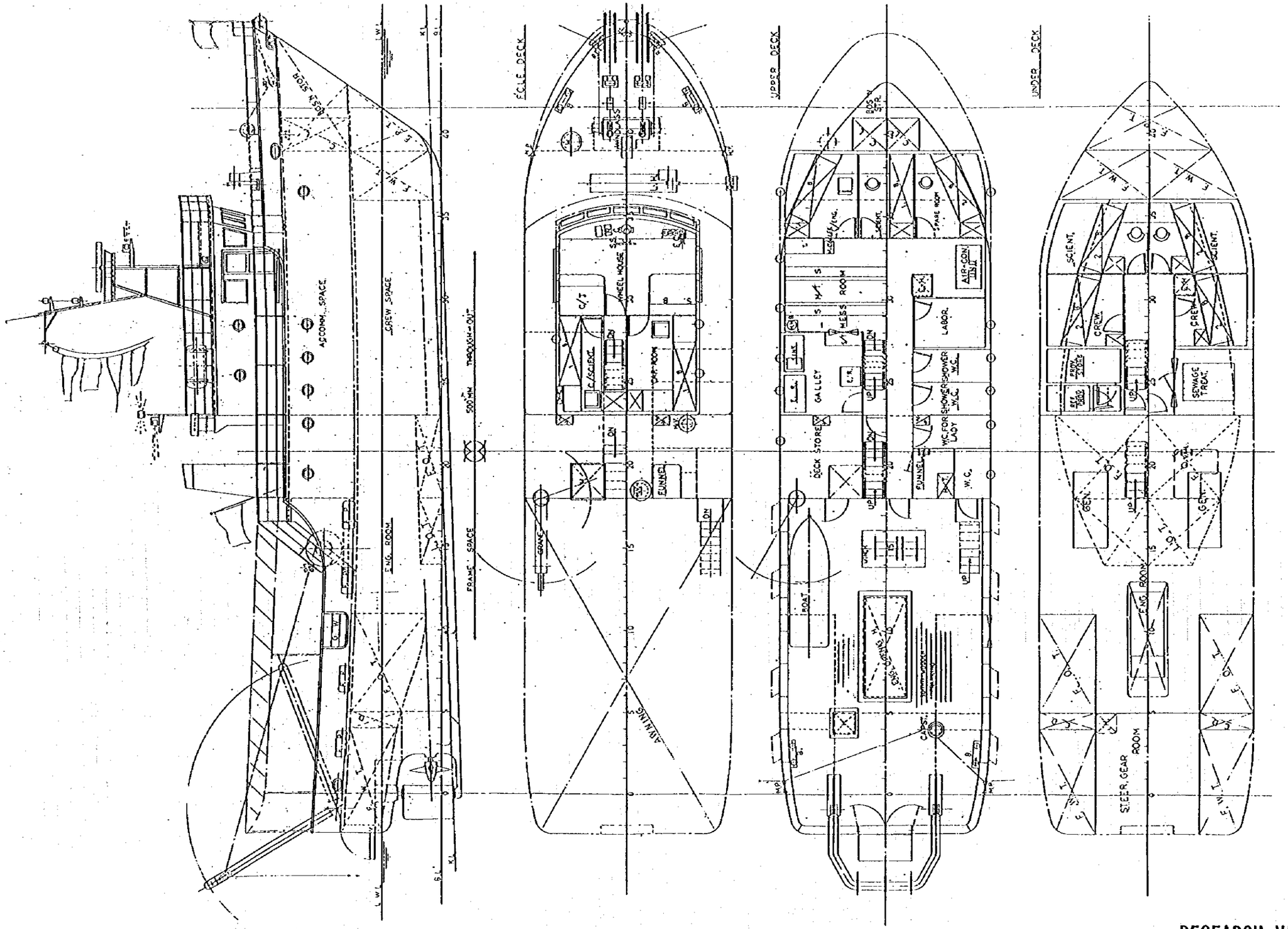
FLOOR PALN



ELEVATION



CANTEEN



RESEARCH VESSEL

2.4 Operational Structure:

2.4.1 Organization:

The Fiji Government will be the organization that places orders for and takes delivery of the facilities to be constructed and the equipment and materials to be procured under the subject Plan. We shall discuss later, in connection with the Construction Plan, the courtesies and facilities to be afforded and responsibilities to be assumed by the implementing body in connection with the construction and procurement activities, assuming the subject Plan is carried out under the grant-aid cooperation system of the Government of Japan. In this section, we shall consider the operating organization for the project, centering around MSP, which will have direct operational and management responsibilities for the Plan facilities after completion.

At the present time, the personnel making up the MSP organization and those in charge of the marine studies curriculum at USP are not necessarily in concert. Faculty conditions are reflected in the organization of the courses offered by MSP and other schools. To obtain a diploma or certificate in marine studies, students are required, in addition to MSP courses, to take courses given by SPAS and SSED, while the MSP courses include those which do not comprise the MSP diploma or certificate programs. It is true that, when comparing with rather fixed provision of curriculum by many other univercities, the form and substance of this USP curriculum offers considerable latitude in selecting courses within one's major field or other credit courses, but the situation is affected in part by the fact that MSP is still a very young institution, and it may be presumed that a number of matters will have to be resolved in tandem with MSP's future growth, such as where its acadimic staff will be attached.

Apart from the educational system, MSP, in line with its original charter, also incorporates PIMRIS and IOI - South Pacific and maintains an extensive program of information services and in- and off-campus instruction. The MSP organizational structure, including the above activities, will be continued in its present form even after the subject Plan is implemented. Furthermore, starting in 1996, students will be able to choose from two new degree programs, such as a Bachelor's Degree in Marine Science. In connection with this curricular and other institutional expansion, plans are already underway to employ lecturers in Ocean Law and Aquaculture, while, based on installation of the Plan facilities, a portion of the marine studies facility at SPAS will be moved to MSP.

It is also planned to transfer to MSP a portion of the acadimic staff at the Institute of Applied Science (IAS) which is currently in charge of courses in the SC300 level. As evidenced by these plans, a reorganization of the MSP organization may be anticipated as a direct or indirect outgrowth of Plan implementation.

2.4.2 Budget :

(1) The USP Operating Budget :

The USP activity plan and related budget are reviewed every 3 years. After study by the Finance Committee, consisting of finance Ministers from the member nations, the draft budget, together with the activity plan, is approved by the Council in the form of Triennial Submission (most recently for the 1994 to 1996 period). Deliberations on the draft plan for the next triennial period have already begun, with the plan expected to be finalized early in 1996.

The USP operating budget, as shown in the university's annual report for 1994, is presented in attached Table 2.4.2-1. In both 1993 and 1994, revenues exceeded expenditures, indicating that, judging at least by the accounts for these fiscal years, financial operations are being maintained on a sound basis. Looking at the income and expenditure accounts for 1993, the university had shown a cumulative deficit of F$5,020,000 through the previous year but, in 1993, based on offsets from an operating surplus, Deferred Revenue, and Asset Revaluation Reserve, the previous accumulated deficit had been pared down substantially during 1993-94 to a level of only F$360,000.

Contributions from member states account for close to 80% of USP revenues, with the remaining 20% derived from tuition and foreign aid. Contributions from member countries totaled F$13,366,004 in 1990, climbing to F$25,318,862 in 1994, with the annual rate of increase close to 20% over this period. Fiji accounts for about 70% of annual contributions, with the remaining 30% borne by the other 11 countries.

(2) The MSP Operating Budget :

Attached Table 2.4.2-2 shows a breakdown of the running expenses of MSP. As in the case of the USP budgets given above, the MSP figures for 1993 and 1994 are based on actual results, while those for 1995 and 1996 are understood to be budgeted, based on the present 3- year plan.

Operating expenses for MSP during 1994 totaled F$519,270, equivalent to only about 4% of the USP figure of F$13,959,375 for that year. Building maintenance and utility costs (light, water) are defrayed out of the general USP budget and so not shown in this table.

The decline from 1994 to 1995 in the operating budget, excluding personnel expenses, reflected a temporary increase during 1994 in the budgetary allotment for the Atoll Research Project (formerly ARDU). On a long-term basis, however, the operating budget (excluding personnel) will have risen at an average annual rate of about 40% from 1993 to projected 1996. This high rate of growth reflects the rapid expansion of MSP activities that is characteristic of such a young organization.

In order to carry out research projects funded by aid from various countries, MSP relies on outside funding apart from activities conducted on the basis of its recurrent budgets. The funding derived, or expected to be derived, directly from external sources over the period 1989 to 1999, is shown in attached Table 2.4.2-3. Direct outside funding is estimated to average some F$650,000 per year, which exceeds the size of the organization's annual operating budget. Based on the next 3-year plan covering the period 1997 to 1999, it is clear that MSP, which is still in a growth stage, will continue to need this external financial support for another 5 - 8 years.

As a portion of the funding to underwrite activity programs during the next 3 - year period (1997 to 1999), MSP expects to receive C$3,700,000 under Phase II of the South Pacific Development Plan, as well as US$500,000 of assistance from UNDP and other sources for the IOI- South Pacific.

In connection with the facilities that are to be introduced under the subject Plan, MSP's operating expenditures will greatly expand, particularly the portions spent on facility and equipment maintenance and for operating the research vessel. While personnel expenses will also increase, from the overall perspective of USP, the incremental cost of filling the new positions that are to be established will be small, with the bulk of these increases being offset by decreases in the budgets of other schools transferring staff to MSP. By assessing the increase in the above operating costs, it will be possible to estimate the increase and burden of operating budgets that will be generated at USP as a result of Plan implementation.

Table 2.4.2-1
Income and Expenditure - Recurrent Funds for the Yesr Eended 31st December 1993/1994

	1993	1994
INCOME	ACTUAL	ACTUAL
Government Contributions	22,934,421	25,318,862
Student Fees	2,950,348	3,794,284
Overseas Aid	2,580,530	2,904,133
Other Income	689,058	880,950
TOTAL INCOME	**29,154,357**	**32,898,229**
EXPENDITURE		
Academic	(13,407,899)	(13,959,375)
School of Agriculture	1,073,443	1,059,687
School of Humanities	1,733,314	1,783,758
School of Pure and Applied Sciences	3,863,890	4,124,510
School of Social and Economic Dev	2,949,691	3,008,140
Marine Studies	454,766	519,270
Supernumerary	772,054	377,407
Outstanding Orders	-128,695	-99,572
Estimated COLA	197,200	140,000
Academic - Extension Centres	1,851,236	2,052,240
Acadamic - Institutes	641,000	993,935
Academic Support Service	4,186,469	4,657,809
Administration Support	4,883,612	4,770,773
Community Services	383,536	434,918
Utilities, Grounds & Maintenance	1,607,021	1,630,957
General Education Expenditure	1,290,299	1,534,937
Miscellaneous Expenditure	699,909	1,166,068
Medium Works	536,318	574,862
Contingency	-	-
TOTAL EXPENDITURE BEFORE DEPRECIATION	**26,995,083**	**28,729,699**
(SURPLUS) FOR THE YEAR	2,159,274	4,168,530
Depreciation	3,327,755	2,753,363
Add - Transfer from Asset Revaluation Revenue	-877,615	-877,615
Transfer from to Deferred Revenue:	-2,450,140	-1,875,748
Less - Income transferred to Deferred Revenue	-	1,290,969
Less - Expenditure transferred to Capital Expenditure	-	-1,290,969
Less - transfer to Specific Funds	-	2,400,000
(SURPLUS) TRANSFERRED TO RECURRENT RESERVE	**2,159,274**	**1,768,530**

Table 2.4.2-2 MSP Recurrent Budget

	1992	1993	1994	1995	1996
	ACTUAL	ACTUAL	ACTUAL	ESTIMATE	ESTIMATE
RECURRENT FUND					
SALARIES					
SEN STAFF ACADEMIC	124,031	177,028	193,799		
SEN STAFF ADMIN					
SEN STAFF TECHNICAL	11,931	37,991	39,485		
SEN STAFF OTHERS					
I&S STAFF ACADEMIC					
I&S STAFF ADMIN	26,526	45,768	41,136		
I&S STAFF TECHNICAL	4,155	17,761	14,603		
I&S STAFF OTHERS	18,623	41,082	39,912		
HOURLY PAID ACADEMIC					
HOURLY PAID TECHNICAL					
HOURLY PAID OTHER	4,831	37,626	33,427		
SUBTOTAL SALARIES	**190,097**	**357,256**	**362,362**		
NON SALARIES					
BOOKS & PERIODICALS	1,116	607	1,916	5,096	8,000
TEACHING MAT & EQUIP	2,869	9,157	30,564	20,280	40,000
REP & MAINT - OFF EQUIP	1,340	2,285	4,327	4,056	5,000
REP & MAINT - LAB EQUIP	4,473	4,015	3,538	5,096	6,000
SCHOOL EXPERIENCE				1,248	2,000
CURR RES UNIT				2,496	-
TRAVEL - LOCAL	428	673	1,110	1,040	3,000
TRAVEL - OTHER		2,000	3,654	4,051	6,000
EXCURSION					
HIRE OF FACILITIES		1,500	423		
HIRE OF BOATS	3,882	2,168	2,725		
OPERATION OF BOATS	2,250	23,450	28,817	37,232	40,000
MISCELLANEOUS	930	12,318		14,040	24,000
EX ARDU ALLOCATION	25,569	20,628	55,843	18,408	30,000
SCHOOL RESEARCH			6,851	1,040	5,000
VEHICLE OP EXPENSES	3,032	4,283	3,554	4,722	5,000
CLEAN MATERIAL		318	189	1,444	1,500
PRINT & STATIONERY	7,812	6,038	1,412	6,136	10,000
POSTAGE & CABLE	70	4,592	7,460	6,136	9,000
COMPUTER SOFT	475	70		1,040	8,000
HOSPITALITY & ENT	112	41	18	208	500
PUBLICATION					
TELEPHONE		259	735		
HERBARIUM		1,000			
DRAVUNI		2,108	3,754	3,120	4,000
ADDITIONAL ALLOCATION EQUIPMENT < $200				4,000	5,000
SUBTOTAL NON SALARIES	**54,358**	**97,510**	**156,890**	**131,100**	**212,000**
TOTAL	**244,455**	**454,766**	**519,252**		
EQUIPMENT LABORATORY					
EQUIPMENT OFFICE					
EQUIPMENT GENERAL			18		
SUBTOTAL	0	0	18		
REQUISITION OF FUNDS				2,400	
GRAND TOTAL	**244,455**	**454,766**	**519,270**	**133,500**	**212,000**

Table 2.4.2-3 Direct External Funding, USP Marine Studies Programme, 1989-1999

(Funds in thousands of Fiji Dollars)

FUNDING SOURCES	PROJECT	TITLE	YEARS	TOTAL
Canada	C-001	IMR Technical Support	1990-92	63.4
	C-005	Programme Development I	1990-93	244.0
	C-019	ORMP Training	1992	175.0
	C-025	ORMP Infrastructure	1992	100.0
	C-033	Post-graduate Scholarships	1991-94	341.6
	C-038	Marine Geology	1992-95	427.0
	C-043	Marine Public Education	1993-95	453.6
	C-045	Tilapia Aquaculture	1992-93	95.0
	C-046	Programme Development II	1993-96	275.0
	ICOD SP022	Seaweed Aquaculture	1992	70.0
	ICOD 860062	DTF Scholarships-Palau	1989-91	183.0
	ICOD 870130	PIMRIS Coordination Unit	1989-93	450.7
	ICOD 870160	DTF Scholarships-FSM	1989-91	211.6
	ICOD 880288	PIMRIS Outreash	1990-93	248.0
	ICOD 880229	IMR Tech. Enhancement	1991-92	85.4
	Canada Fund	Atoll Volunteer Program	1993	4.5
	Canada Fund	ARP Resarch Project Kiribati	1994	10.53
France	France	Coral Reef - equipment	1992-93	200.0
	France	Coral Reef - attachment	1992	11.5
	France	Coral Reef - travel	1991	40.0
	France	Programme Support	1993	14.0
Australia	AIDAB	Reference Coll. Upgrade	1992	30.0
	Volkswagon	Marine Geology (Schneider)	1992	5.0
	New Zealand Aid	ARP Ciguatera Research	1993-95	72.63
	USP	Research Grants (South, N'Yeurt, Raj and Gounder)	1992	12.0
USA	Astrolabe Inc. (USA)	Support to Dravuni Island Field Station and Astrolabe Research Projects	1989-94	133.71
	Marpat Foundation	Support of research by Dr.M.and D.Littler	1992-94	63.96
EEC	EEC	Grouper Research Project IMR, Honiara	1994-99	373.14
Taiwan	Taiwan	IMR Equipment	1995	150.00
	Grand Total 1989-1999			**4,544.27**

2.4.3 Personnel:

(1) Faculty and Research Staff:

When usage of the Plan facilities actually commences, the marine teaching and research programs at the Laucala Campus will be organized as shown below. The figures shown for the teaching and research staff include, in addition to the existing MSP staff of 8, increases reflecting personnel shifts from SPAS and IAS as well as newly established teaching positions.

Table 2.4.3- 1: Plan for Acadimic Staff

Organization	Staff	Planned (No.of persons)	Course (1996)
MSP:	Professor	2	UU, BI
	Senior Lecturer	1	CH
	Lecturer	13	UU,BI,PH,LA, other
	Chief Technician	1	-
	Projects Officer	1	-
PIMRIS :	Coordinator	1	-
IOI-South Pacific	Coordinator	1	In charge of off-campus education
IAS :	Manager	1	SC
SOPAC and other		3	UU,PHF,other
Total		24	

In addition to the above, it is anticipated that 2 visiting researchers will be residing at MSP throughout the year. Including these visitors, the total number of teachers and researchers using the subject facilities can, for the time being, be set at 26. It is also expected that the IAS Director will move over to the new facilities, since the present building he occupies is to be removed to make room for Plan construction.

As shown by a fact that the above organization plan includes, though limited only to the composition that can be presently identified, 4 members with doctorates and 2 with master's degrees, the staff at the refurbished MSP facility will all be at a high-powered academic level.

The faculty and research staff at USP are all employed on short-term 3-year contracts, with empty posts filled via open recruiting on the international market, geared at employing qualified individuals from around the world. So long as this sort of system is maintained, we have absolutely no concern about MSP's continuing ability to attract and retain its present high-caliber, professional organization.

(2) Administrative and Technical Personnel:

At the present time (1995), there are 13 MSP employees on the Laucala Campus: 3 clerical workers, 4 technicians and ordinary workers, 4 vessel workers, and 2 supplementary staff members

for PIMRIS and IOI. With the organizational expansion, 2 additional clerical workers are planned, with the positions to be filled by transfers from other parts of the university or by new hire. A total of 6 permanent crew members will be required to operate the Plan research vessel, but MSP has no special plans to employ full-time crews for this purpose, intending instead to man the vessel with shore-based technical staff when long voyages are scheduled.

CHAPTER THERE : IMPLEMENTATION PLAN

3.1 Construction Plan :

3.1.1 Construction Guide Lines :

The subject Plan will be implemented based on the following procedures. After the Exchange of Notes between the Government of Japan and the Fiji Government, a Consultant contract will be concluded between a consultant recommended by JICA and the Fiji Government.

The Consultant will prepare all detailed plans and drawings, specification sheets, project cost estimates, along with tender and contract documents, as required for Plan implementation, subject to approval of the Fiji Government, the Consultant will carry out all procedures relating to tender qualification and evaluation of tenders and tender documents and will select the general contractor, which must be a construction company of Japanese national.

Following the signing of a construction contract with the Fiji Government, the Contractor will implement the facility construction program and arrange for the building of the research vessel and procurement and of equipment.

The following basic considerations will be borne in mind during implementation of the construction program .

(1) Implementing Organization :

The implementing organization on the Fiji side for the subject Plan will be the Ministry of Agriculture, Fisheries and Forests, which will be the contracting party for both the Consultant and Construction contracts. The counterpart party for project implementation will be the Marine Studies Program (MSP) of The University of the South Pacific (USP); in addition to handling all procedures with concerned government agencies, the MSP will review and approve project contents and, in connection with technical guidance and similar matters, will take advice from the Physical Planning and Facilities Department of the USP.

(2) Consultant :

Since this Plan is to be implemented on the basis of a grant-aid from the Government of Japan, after the Exchange of Notes, a Consultant Contract will be signed between the Japanese Consultant and the Fiji Government. As representative of the Fiji Government, the Consultant will prepare tender documents, conduct the tender process, and oversee the construction phase. The Consultant will dispatch a construction supervision to the Plan area, who will remain there throughout the entire construction period. In addition, technical specialists will be dispatched for

short periods, as required, in connection with the construction, facilities, and equipment phases of the project.

(3) Contractor :

The Contractor in charge of construction work and equipment and material procurement will be selected on the basis of open tenders. After this choice is approved by both governments, a contract will be signed between the successful Contractor and the Fiji Government. The Contractor will then undertake the construction of the facilities and research vessel, along with the procurement, installation and delivery of the subject equipment and materials.

(4) Construction Plan :

The bulk of the construction work for the Plan facilities can be accomplished satisfactorily using local construction methods, with the project stages to progress in the following sequence: temporary construction, foundation work, structural and framing work, finishing work, delivery of equipment, and installation. The construction plan should, in our view, gave full consideration to the following points.

1) With respect to the materials, the great bulk can be locally procured. The principal items that can be locally soured include concrete, steel bar, and finishing materials. While these can all be procured in Fiji from either local production or imports, the procurement program must be carefully planned, based on advance consultation, so as to ensure the timely arrival of specialized materials and avoid material shortages owing to a concentration of large volume orders during a limited period of time.
2) There is an adequate supply of both skilled and unskilled labor in the Plan area.
3) Rainfall in the Plan area runs about 2,800 mm per year, but, as cyclones are concentrated during the summer season, from November to April, close attention should be paid to climatic factors in the Implementation Schedule for the initial foundation phase and the concluding finishing stage, which are both greatly influenced by weather conditions.
4) Since education and research activity will continue at existing facilities in the Plan area throughout the construction period, careful consideration needs to be given to noise abatement, dust prevention , and similar problems during the construction work.

5) Dispatch of a construction supervisor :

Since this project will be carried out under a grant-aid from the Government of Japan, strict adherence to the construction schedule is a basic premise of the Plan, along with the requirement for maintaining uniform quality. We feel, accordingly, that it is incumbent on suppliers of

construction and other key equipment to dispatch construction specialists and electricians during the construction stage as well as supervisors to oversee the installation and provide briefings on the operation of research equipment.

3.1.2 Special Cautions with regard to the Construction Program

The Plan involves the constructions of such facilities as an MS Center, Annex, Lecture Theater, Workshop, Accommodation, and a canteen. The construction plan will utilize conventional local building methods for all facilities, while the bulk of the materials and labor for the project will also be sourced locally, excluding only a portion of the construction materials and equipment and the electrical materials. Thus, few technical problems are anticipated in this project. The construction site is in the suburbs of the capital, making it relatively easy to procure labor and materials during the construction phase. However, in view of the fact that the Plan is being implemented with a grant-aid from Japan, meticulous controls must be established over construction progress with respect to adhering strictly to the overall Implementation Plan, proper quality controls, and construction accuracy. The understanding of local cooperators will be a vital element in this control system, and so close liaison and coordination will be required with these firms.

3.1.3 Allocation of Construction Responsibility :

(1) Responsibilities to be Assumed by the Government of Japan

In the event that this Plan is carried out on the basis of a grant-aid from Japan, the obligations of the Government of Japan will be as follows :

1) Construction of the Plan facilities, including the MS Center, Annex, Lecture Theater, Workshop, Accommodation, and Canteen.
2) Procurement and installation of teaching and research equipment.
3) Construction of the research vessel, delivery to the Plan area.
4) Consulting services, including an Implementing Design, assistance in tender operations, and construction supervision.

(2) Responsibilities to be Assumed by the Fiji Government.

If this Plan is implemented under a grant-aid from Japan, the Fiji Government will be responsible for the following:

1) Securing and preparing the Plan construction site and completing the required gardening and landscaping work following project completion.
2) Obtaining all permits and approvals in connection with the construction program as well as any other permits required for Plan Implementation.
3) The cost of intake construction for bringing power including installation of transformer and

water lines into the construction site, along with the required procedures and formalities for this work.

4) Obtaining exemptions from duties and other taxes on all equipment and materials imported into Fiji in connection with this Plan and expediting prompt custom clearance thereof.
5) Obtaining exemptions from taxes and surcharges for Japanese nationals resident in Fiji who are rendering services related to this project.
6) Any other items not included in the responsibilities assumed by the Government of Japan that are deemed necessary to Plan implementation.

3.1.4 Construction Supervision Plan :

Following the signing of the Construction Contract, the Consultant will approve the construction plans and conduct inspections on the equipment being produced in Japan, based on the Implementation Design Contract concluded with the Fiji Government. In addition, one supervisor will be dispatched to the Plan area to oversee the construction work and maintain liaison with related agencies of the Fiji Government as well as the Japanese Embassy and the JICA office in Fiji. And as construction proceeds, persons involved in the structural, mechanical, electrical, and equipment phases will be dispatched to the Plan area for short periods to perform inspection, sit in on meetings, and provide technical assistance within their specialized areas.

In connection with the construction of the research vessel, after approval of the construction design, as the work proceeds, engineers will be sent for short periods to the shipbuilding yard for inspections, attendance at meetings, and guidance in order to ensure construction accuracy.

The Contractor in Japan will prepare construction designs for approval use as well as a list of the equipment and materials to be procured, based on the Construction Contract with the Fiji Government, and will then proceed to source these items. Several supervisors will be dispatched to Fiji throughout the construction period by the construction contractor to assure that the construction work is properly completed within the contract period, in accordance with the contract specifications. The company in charge of the equipment phase will, following procurement and inspections in Japan, arrange for ocean shipment, and, upon arrival at the Plan site, will dispatch engineers for short periods to install the equipment, conduct test operations, and provide operating guidance. After construction of the research vessel, it will be sailed from Japan to the Plan area, with the shipbuilding yard dispatching technicians for short periods to conduct pilot (shakedown) cruises and provide operational guidance.

The number and categories of personnel to be dispatched to Fiji for project implementation, based

on the scale and nature of the Plan facilities, are as shown Table 3.1.4.

Table 3.1.4 Number and Categories of Personnel

Categories of Personnel	No.of psn
1. Consultant	
Construction Supervisor	1
2. Contractor	
1) Facilities	
General Manager (construction)	1
Architectural Engineer A	1
Architectural Engineer B	1
Mechanical Engineer	1
2) Equipment	
General Manager (Equipment)	
Research equipment	1
Mechanical equipment	1
3) Research Vessel	3

3.1.5 Procurement Breakdown by Country of Origin for Equipment and Materials :

(1) Main Materials :

The building materials for this Plan will, in principal, be sourced in Fiji whenever possible. Sand, gravel, cement, H.C. concrete blocks, and wood materials, are all produced within the country.

Steel components and fittings, aluminum sash, doors, glass, tile, electrical materials, sanitary fixtures and other imported materials are distributed on the local market. In our judgment, the quantities of such items required for a project of this size can be adequately sourced on the Fiji market.

In the case of the elevator facilities, we plan to use locally available American products, as used in existing USP buildings, in the interest of service and maintenance, Items which are not produced or imported locally, as well as such electrical components as switchboards, where system reliability is a prime requisite, will be sourced in Japan, along with certain other products for which Japanese sources were found to offer a distinct advantage in terms of quality, stability of supply, or price. The procurement breakdown, by country of origin, for the principal building materials which are to be used in this Plan will be as shown Table 3.1.5.

Table 3.1.5 Principal Building Materials

Main Construction Materials	Sources
Construction Material	
Sand	Fiji
Gravel	Fiji
Cement	Fiji
Steel frames	Fiji
Wood products	Fiji
Fittings	Fiji
Paint	Fiji
Main Equipment Items	
Elevator	Fiji
Electric wire	Fiji
Lighting fixtures	Fiji
Ceiling fans	Fiji
Switches and sockets	Fiji
Main / branch powerboards	Fiji
Air Conditioner	Japan
Water and drainage pipes	Japan / Fiji
Sanitary equipment	Japan / Fiji
Pumps and valve	Fiji

(2) Main Items of Construction Equipment :

While no special types of construction equipment will be required for the construction plan, such equipment will be needed for the foundation phase and for moving materials around the site. Since a construction equipment has been popularizing in Fiji, it has been determined that the required equipment can be procured locally when needed, with no particular constraints on length of usage. Accordingly, construction equipment will not have to be brought in from Japan.

(3) Equipment :

Equipment items will, in principle, be supplied from Japan. However, in the case of certain products, such as computer systems, copiers, and research fixtures, when there is a distinct advantage in terms of maintenance or price, the equipment will be sourced on the local Fiji market.

3.1.6 Shipping Plan :

The main equipment and materials for the subject Plan that are to be sourced in Japan include certain major equipment items, research apparatus, and the vehicle. Several shipping companies offer a number of scheduled sailing from Japan to Suva port. While voyage times vary, depending on the service, the anticipated shipping time may be estimated at about one month. Imported equipment will be shipped overland from Suva to the Plan site.

3.1.7 Implementation Stages :

The implementation stages for this Plan may be classified as follows, in the sequence shown: implementation design, including tender operations; construction phase, incorporating the MS Center, Annex, Lecture Theater, workshop, and other facilities; and provision of research and teaching equipment along with the research vessel. Since the Plan area is located in the Suva metropolitan area, based on present conditions in Fiji, no particular problems are foreseen in terms of securing skilled labor or procuring equipment for the construction phase. However, considering the strict construction schedule, reflecting the nature of this project, the procurement plan for materials, equipment, and labor and the Project Implementation Schedule must be meticulously prepared, taking into account natural conditions in the Plan area.

In developing this Implementation Schedule, consideration will be given to establishing a realistic schedule for each segment of facility construction, classifying the construction phases into those that must precede the other work, those that can be done simultaneously, and those that can be carried out independently.

An optimum construction period has been determined, based on the time requirements for the temporary facilities, material sourcing, and the actual construction work, Allowance must also be made for procurement of the main items of teaching and research equipment, along with the research vessel, from Japan as well as installation, adjustment, and pilot operation of certain key equipment items at the Plan site.

The main construction phases and operations may be broadly classified as follows :

1) Building Construction :
   MS Center, Annex, Lecture Theater, Workshop, Accommodation, Canteen
2) Electricity, water supply / drainage, and sanitary equipment :
   Intake construction, construction of truck line, wiring, piping, and installation of instruments and equipment
3) Equipment supply :
   Transport and installation of equipment to be used in the project
4) Construction Research Vessel :
   Construction of Research Vessel in Japan, trial running, transportation, technical instruction

The time required to construct the MS Center is estimated at about 11.5 months, the Accommodation at 7 months, and the Annex and other facilities at about 6 months each.

Delivery of the teaching and research equipment will require about 6 months, and construction,

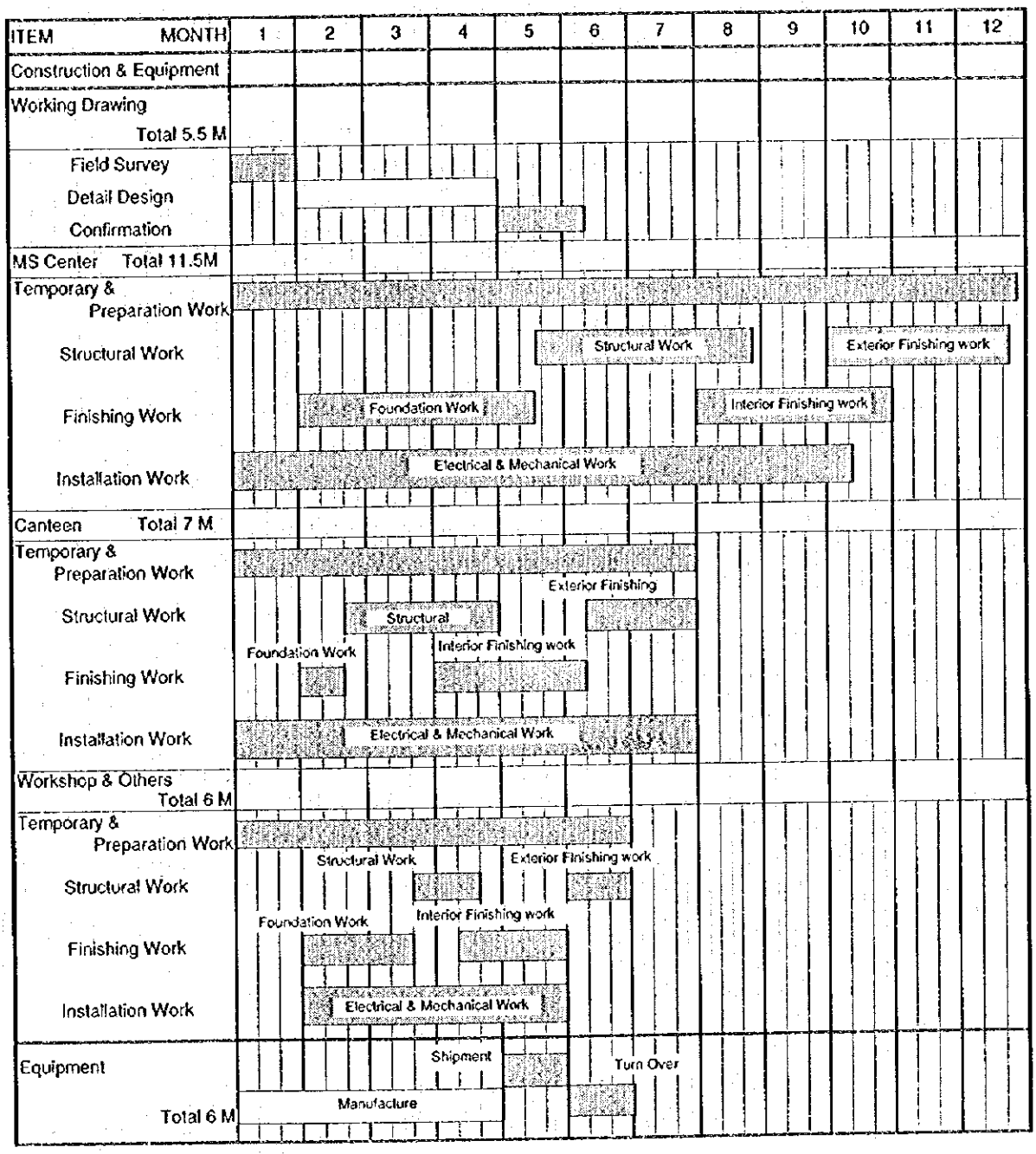
delivery cruise, and turnover of the research vessel some 8 months.

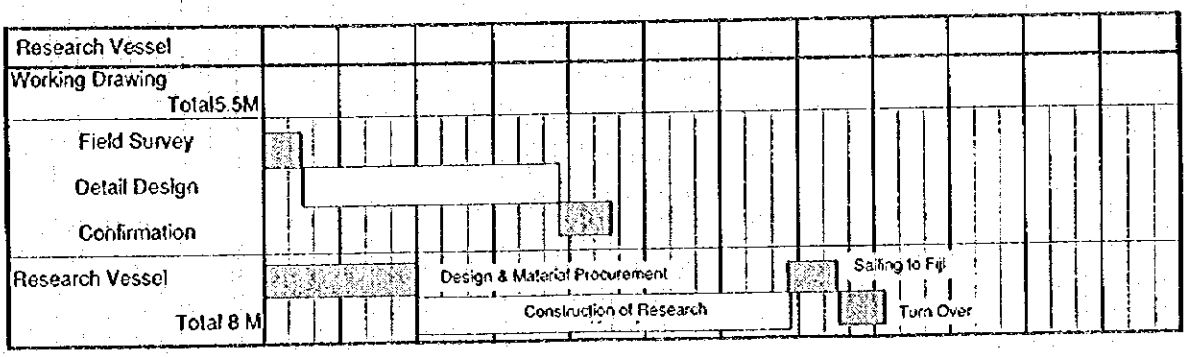
The construction program incorporates a cumulative total of over 6,000 m of floor area, spread over a number of individual buildings. Nevertheless, considering the length of the construction period as well as the favorable construction environment in the Plan locality, it would not be difficult, in our judgment, to complete all of the construction work within the designated construction period. Accordingly, the Plan construction program and equipment delivery phase will both be implemented within the same period. However, with regard to the construction of the research vessel, it has been determined that it would be proper to implement this work after confirmation of vessel appropriateness.

The Project Implementation Schedule is shown in Table 3.1.7-1

Table 3.1-7 Construction Schedule

THE PROJECT CONSTRUCTION SCHEDULE





3.2 Maintenance and Operating Plan:

Maintenance and administration of the new Plan facilities will be implemented in accordance with the present system at USP. That is to say, maintenance, repair, and utility expenses will be defrayed out of the general university budget, while equipment maintenance costs, including expendable and spare stores as well as research and other expenses specifically related to facility activities will be covered out of MSP's operating budget. In this section, we shall consider maintenance and administration costs for the Plan facilities as benchmark figures for making appropriate budgetary arrangements for this purpose at both USP and MSP.

However, provision has not been made in this analysis for personnel costs, since no additional staff is anticipated in connection with Plan implementation, while MSP is fully capable of calculating the necessary operation budgets for future activity programs. Similarly, no estimates have been included for utility costs at the Accommodation and Canteen, since the revenue from user charges at there facilities is expected to cover their power, lighting, and water consumption.

Following are the parameters that have been applied in calculating maintenance and operating costs for the Plan facilities :

Number of days of facility operation :	250 days per year
Number of teaching days :	200 days per year
Total annual cruising distance for the research vessel:	5,000 nautical miles per year
Power rate	F$ 0.20 / kW
Water rate	F$ 0.12 / m³
Diesel fuel	F$ 0.62 / liter
Propane gas	F$ 1.60 / kg

(1) Power :

The anticipated power consumption, based on operating rates of the Plan facilities, is as estimated in Table 3.3-1.

Table 3.3-1 Estimated Power Consumption at the Plan Facilities

Equipment :Consumption Area	Capacity (kW):	Demand Ratio :	Hours of Use per Day:	Operating Days per Year :	Annual Power Consumption (KW):
Room lighting	700	0.4	4	250	28,000
Exterior lighting	10	1.0	10	365	36,500
Continuously operating equipment *	30	0.5	24	350	126,000
Other equipment **	300	0.2	6	250	90,000
Climate control (air-conditioning) equipment	90	0.5	24	365	394,200
Total :					674,700

* Continuously operating equipment :will include basically:
a:dehumidifying heater, computers, blowers, and freezer. These items will operate 350 days / year, excluding maintenance periods.

**Other equipment items include :lab equipment, office equipment, workshop equipment, and other intermittent equipment

(2) Water :

Water usage has been estimated as shown in Table 3.3-2.

Table 3.3-2 Estimated Water Usage Classification

Object	Estimating Basis	Annual Usage
Staff, post-graduate students, and other resident personnel	200 liters / person / day x 40 persons x 250 days	2,000 m^3 / year
Students and other non-resident	100 liters / person / day x 300 persons x 200 days	6,000 m^3 / year
Total		8,000 m^3 / year

(3) Facility Maintenance Costs :

Based on past experience at USP, facility maintenance expenses, including personnel costs, have averaged F$ 11.66 per m^2 of floor area, with the cost of materials alone running F$ 6.49 /m^2. Since the total floor area for the Plan facilities has been set at about 6,600 m^2, an annual maintenance budget of approximately F$77,000 will presumably be required to cover purchases of materials.

(4) Vehicle Operating Costs :

The pickup truck is expected to be driven an average of 60 km per day, with the number of survey days set at 100 days per year. Operation costs for this vehicle have been calculated on this basis. Assuming fuel efficiency (diesel) of 8 km / liter, annual fuel consumption will be about 750 liters. Allowing for replacement parts and repairs, the total operation cost for the pickup truck may be estimated at approximately F$ 1,800 / year.

(5) Cruising and Maintenance Costs for the Research Vessel :

In calculating cruising costs for the Plan research vessel, it is assumed that this vessel will cover a distance of 5,000 nautical miles per year. Assuming a normal cruising speed of 10 knots and a main engine output of 750 HP, fuel costs for this engine have been calculated on the basis of 500 cruising hours per year.

Fuel costs for the auxiliary engine have been based on a 100 HP output and assume that this engine will run at 50% of rated capacity over the same 500 cruising hours. The cost rations for the research vessel, based on the operating history of the Aphareus, have been estimated on the basis of both operating hours and a projected increase in crew size. While maintenance costs for the new vessel may be expected to decline, at least for the time being, from previous levels, in this analysis, we have chosen to set the overall vessel maintenance budget on the basis of actual 1994 costs for the Aphareus. The final total includes the cost of one dry dock overhaul per year for the superstructure.

Table 3.3-3 Estimated Cruising Expenses for Research Vessel

Cost Item :	Annual Expense (F$):	Remarks :
Fuel	F$ 38,000	Main engine : 150 ml / ps / hr x 750 ps x 500 hrs = 56.25 m^3 Auxiliary engine : 200 ml / ps / hr x 100 ps x 50% x 500 hrs = 5m^3 Total :61.25 m^3 (diesel)
Lubricating oil	F$ 3,800	calculated at 10% of fuel cost
Rations	F$ 7,300	Crew complement : 6 persons -estimated from actual record of the Aphareus, based on the number of cruising hours per year
Maintenance	F$ 23,000:	Actual records of the Aphareus for 1994, including cost of superstructure (dry dock) inspection.
Total :	F$ 72,100	

(6) Equipment Maintenance Costs :

Maintenance costs for the Plan equipment entail chiefly the purchase of expendable and repair parts. Based on total equipment value, and with reference to operating experience for comparable equipment in use at USP, we have estimated the equipment maintenance budget at about F$ 60,000 per annum.

(7) Other Costs :

The estimated cost of propane gas, for use in experiments and training programs, has been based on projected consumption of about 2,000 kg per year. As to the cost of fuel for the emergency generator, since it may be assumed that this will be offset by the savings in power costs during blackout periods, no special provision is necessary for this item.

Based on the above analysis, anticipated maintenance and operating costs, based on Plan implementation, may be estimated at a total of F$ 351,000 per year, with the share to be borne out of the USP core budget set at F$ 216,000 and that to be defrayed out of the MSP recurrent budget at F$ 135,000.

Table 3.3-4 Estimated Maintenance and Operating Costs Based on Plan Implementation

Cost Item :	Itemization & Operating Expenses :(in F $)	Annual Expense
Portion to be Funded from the USP Budget	(Fractional amounts of 5 or more have been raised to the next highest F$ 1,000 unit.)	F$216,000
Power	674,700 kw x F$ 0.20 / kw	134,940
Water	8,000m^3 x F$ 0.12 / m^3	960
Propane gas	2,000 kg x F$ 1.60 / kg	3,200
Facility maintenance & administration	6,600 m^2 x F$ 11.66 / m^2	76,956
Portion to be Funded from the MSP Budget:	(Fractional amounts of 5 or more have been raised to the next highest F$ 1,000 unit.)	135,000
Vehicle operation including repairs	60 km / day x 100 days,	1,800
Maintenance of Research Vessel	5,000 NM / year, including research vessel superstructure maintenance	73,000
Equipment maintenance and repairs	including wear and tear	60,000
Total		F$ 351,000

At USP, utility and building maintenance costs for the entire university facilities are paid by the Utilities, ground & Maintenance Unit.
The utility bill for fiscal 1994 totaled about F$ 945,000, while facility maintenance expenses ran F$ 676,000 (neither figure includes labor costs), resulting in overall expenditures for these purposes of F$ 1,631,000. Based on Plan implementation, the USP maintenance budget can then be expected to increase by some F$ 216,000. Accordingly, it will presumably be necessary for the Utilities, ground & Maintenance Unit to supplement its total maintenance budget by about 13% to cover these incremental costs related to the Plan facilities.

MSP operating costs, on the other hand, are funded both from the USP core budget and from direct external funding. In fiscal 1994, MSP's share of total current operating expenses at USP came to about F$ 519,000. While external funding at MSP, derived as it is from ad hoc projects and other activities, cannot be translated into annual fiscal year budgets, based on past performance, these outside revenues have averaged about F$ 650,000 per year. It would, therefore, be proper to consider the total of these two figures (some F$ 1,100,000) as MSPs effective annual operating budget. While the maintenance budget at MSP for the equipment to be provided under the subject Plan may be estimated at F$ 135,000, since the Aphareus is expected to be retired following introduction of the Plan research vessel, the true net increment in vessel maintenance expense under this Plan should be held to only about F$ 9,900, after deducting the F$ 36,000 (excluding labor costs) that was incurred for operating the present vessel during fiscal 1994 .

This sum would be equivalent to about 9% of overall MSP operating costs, and MSP would, accordingly, be obliged to seek an additional budget appropriation to cover the incremental Plan expenses.

CHAPTER FOUR : PROJECT EVALUATION AND RECOMMENDATIONS

4.1 Demonstration and Verification of Project Appropriateness and Effective Benefits:

The University of the South Pacific (USP) is an international institution, comprising 12 island countries. It is the highest seat of learning in its region and plays a key role in developing leadership personnel at government levels.

At the time of its founding in 1968, student enrollment was 154, while the faculty numbered 31, with an operating budget of less than F$ 1,000,000. The number of graduates in 1971 was reported to be just 17. In 1968, only three of the member countries of the USP had confirmed their political status: Western Samoa and Nauru, which had already become independent, and the Cook Islands, which had gained autonomy in free association with New Zealand. In 1970, Fiji acquired its independence, with most of the other member countries attaining their independence before the end that decade. There is a wide disparity in the per-capita gross national products (GNP) of the constituent nations, ranging from a high of over US$ 10,000 per year in Nauru to as little as $650 in Tuvalu. The population of the Republic of Fiji totals 750,000, with a per-capita GNP of $2,010 and a total land area of 18,270.00m², giving the country a leading presence in the USP region. One can readily understand why the USP headquarters were established in Suva, Fiji's capital.

With 28 years having passed since the university opened its doors in 1968, the economic and political environment of the Pacific island states has undergone profound changes. In 1989, for example, Western Samoa, one of the founding countries of the USP, established its own national university, while there has been a steady increase in the number of area students using the scholarship programs offered by Australia and New Zealand. Thus, residents of the USP member of countries, apart from those on Fiji itself, no longer find it necessarily advantageous to commute to USP. Against the backdrop of these changes, the nature of the demands from the various member countries vis- -vis the USP, as an institution of higher education, has been diversifying. In particular, as a result of the advances of recent years in data and telecommunications systems, access to information from advanced nations has become much easier, which will surely lead to strong demands by member countries for more responsiveness on the part of USP toward change. These demands may be grouped into 3 main categories: responsiveness to changing needs, the impartial distribution and use of resources, and provision of equal opportunities. These expectations are synonymous with a strong desire that the educational facilities of the university not be concentrated in Suva but rather spread among the component countries so as to provide curricula sensitive to local needs.

Nevertheless, despite the emphasis on program individuality among the member states and the strong demand for a shift from centralization to dispersion, it can be said that these nations continue to recognize the inherent constraints that they would inevitably confront as a result of a major decentralization of USP facilities over such a vast expanse of ocean; that it is difficult and inefficient for a individual countries to independently manage their 200 mile exclusive economic zones, as established pursuant to the United Nations' Law of the Sea; and that cooperative action by all nations of the region is indeed the most effective means of protecting their mutual interests. In light of the above considerations, and given the extremely stringent financial situation afflicting these member countries, it is likely that they will now be increasingly motivated to support the need for strengthening and expanding the marine educational and research programs at USP.

In 1991, the Marine Research Commission at USP, which had been formed in 1988, drew up a Marine Studies Program (MSP) in response to these research and educational needs in the area of marine resources, which is the common developmental key for the island nations of the South Pacific. MSP was officially launched in 1993 as an independent organization. Its objectives are to strengthen solidarity within the USP area and thereby provide opportunities for marine research, education, and training at international levels so as to cultivate the knowledge and skills required to conserve, develop, and utilize marine resources among the peoples of the region.

The subject Plan is intended to provide facilities and equipment for MSP's marine research program with a view to improving the marine research and teaching environment, for which the existing facilities have become seriously superannuated and physically cramped, and, through dynamic invigoration of this activity, to contribute to the development of marine research, educational, and training programs at a world-class level while helping to develop leadership resources in this region. Support for MSP's research and educational programs on marine resources, along with the cultivation of human resources, will generate major benefits not only for the Republic of Fiji but also for the surrounding island nations of the South Pacific.

USP, as the Counter part for this Plan, already has some 20 years of solid accomplishments and so may be expected to have ample ability to manage the Plan facilities after completion. However, with the ongoing operating expenses for the project facilities estimated at about F$ 351,000 per annum, the USP authorities will be obliged to secure continuing budgets to meet this funding requirement.

The research and teaching equipment and the research vessel to be provided under this Plan will not include any sophisticated items requiring technical guidance or training, nor will the

equipment call for special measures or personnel to prevent any adverse environmental impact. It has, therefore, been determined that the present MSP staff is amply equipped to handle facility operations and management.

Based on the above evaluation, it may be concluded that implementation of the subject Plan in the form of grant-aid cooperation from Japan is highly meaningful, necessary, and appropriate.

4.2 Technical Cooperation and Cooperation with Other Donors :

(1) Technical Cooperation

Teaching and research activities in the marine studies program at MSP cover a broad spectrum, with virtually all of the subject fields requiring a fair degree of specialized academic preparation. MSP has filled its personnel needs on this level through open international recruitment and the reassignment of staff from regional and international bodies. Accordingly, no particular problems should be encountered in securing qualified teaching and research personnel for the Plan facilities.

Based on the 3-year MSP Operating Plan (1997 - 1999), the specialties for which additional faculty is to be recruited, starting in 1997, include marine biology (with special expertise in aquaculture), planktonology, vertebral biology, inorganic chemistry, and marine chemistry. These positions will, as in the past, be filled on the basis of international recruitment. In terms of teaching and research personnel, therefore, technical cooperation from Japan will not be required in connection with the ongoing Marine Studies Program.

(2) Cooperation wilt Other Donors

Assuming that the subject Plan is implemented on the basis of a grant-aid from Japan, pursuant to the Basic Design findings, cooperation from other aid organizations will not be required in connection with facility construction, construction of the research vessel, or procurement of equipment or materials. So long as the USP and the Fiji Government smoothly carry out the functions for which they are responsible, all project phases can be implemented within the framework of Japan's existing grant-aid cooperation system.

Following completion of the Plan facilities, the Marine Study Program will continue the teaching and research activities currently underway at MSP. Certain portions of the curriculum, however, such as those in the fields of tropical fishery science and marine geology, are predicated on the seconding of faculty from SPC, SOPAC, and other regional or international bodies, while various research projects as well are dependent on external funding from the Canadian Government and UNDP. Thus, assistance from these organizations, at least at the present stage, will be a vital element in terms of maintaining and expanding MSP activity programs.

4.3 Recommendations:

As discussed above, the subject Plan can be expected to produce extensive benefits, while also contributing, through its educational programs, to raising the levels of Basic Human Needs (BHN) among inhabitants of the island countries scattered across the vast [South] Pacific area. Accordingly, the appropriateness of carrying out this project under a grant-aid has been confirmed. We would, however, like to call attention to the following problems in connection with Plan implementation that will have to be solved, if the Plan facilities are to run smoothly.

(1) Securing adequate personnel and ongoing budgets to ensure efficient operation and maintenance of the building facilities and equipment that are to be furnished under this Plan.

(2) Curricula must be developed that will effectively utilize the Plan facilities and equipment.

(3) Efforts must be made to train MSP staff in the effective use of the above facilities and equipment.

(4) Fulfilling all of the responsibilities undertaken by the Fiji side in connection with Plan implementation.

APPENDICES:

1. Members of the Survey Team
2. Survey Itinerary
3. List of Party Concerned in the Percipient Country
4. Minutes of Discussion
5. Estimated Cost to be borne the Fiji Government
6. Equipment List
7. Topographic Survey Map
8. Results of Geotechnical Investigations

APPENDIX - 1 MENBER LIST (Field Survey)

FUNCTION	NAME	ORGANIZATION
Leader	Eiji ISHIHARA	Director of the Office of the Overseas Fisheries Cooperation, Oceanic Fishery Department, Fisheries Agency
Cooperation Planner	Shigeru SHIMURA	Fisheries Development Specialist, Japan International Cooperation Agency (JICA)
Coordinator	Toshiho RYO	Legal Affairs Division, General Affairs Department, JICA
Technical Advisor	Yusuke SUDA	Assistant Professor, Laboratory of Fishery Management, Department of Fisheries Science & Technology, National Fisheries University
Chief Consultant	Toshiya OGASAWARA	Fisheries Engineering Co., Ltd.
Marine Studies Planner	Toyomitsu TERAO	Fisheries Engineering Co., Ltd.
Architect & Facility Planner	Taizo KANEKO	Fisheries Engineering Co., Ltd.
Equipment Planner	Michio TORII	Fisheries Engineering Co., Ltd.

APPENDIX - 1 MENBER LIST (Consultation of Draft Report)

FUNCTION	NAME	ORGANIZATION
Leader	Shigeru SHIMURA	Fisheries Development Specialist, Japan International Cooperation Agency (JICA)
Coordinator	Toshiho RYO	Legal Affairs Division, General Affairs Department, JICA
Technical Advisor	Yusuke SUDA	Assistant Professor, Laboratory of Fishery Management, Department of Fisheries Science & Technology, National Fisheries University
Chief Consultant	Toshiya OGASAWARA	Fisheries Engineering Co., Ltd.
Architect & Facility Planner	Taizo KANEKO	Fisheries Engineering Co., Ltd.
Equipment Planner	Michio TORII	Fisheries Engineering Co., Ltd.

APPENDIX - 2 Survey Itinerary (Field Survey)

DAY	DATE	MOVEMENT	ACTIVITIES
1	Aug. 21 (Mon)	Lv. Tokyo (FJ303)	
2	Aug. 22 (Tue)	Ar. Nadi, Mov to Suva	Visit to JICA, Courtesy call on Embassy of Japan
3	Aug. 23 (Wed)		Courtesy call on MOFAET, MAFF and USP Discussion Meeting with USP
4	Aug. 24 (Thu)		In-house tour to USP
5	Aug. 25 (Fri)		Joint meeting with USP and Fisheries Division: Discussion on the implementing frame work of the Project Visit to USP: Discussion meeting on the request items
6	Aug. 26 (Sat)		Survey of proposed site, visit to Laotoka fishing port
7	Aug. 27 (Sun)		Discussion within the study team members
8	Aug. 28 (Mon)		Information and data collection from UNDP, FAO, OFCF and so on organizations
9	Aug. 29 (Tue)		Discussion meeting on the basic concept and plan of the Project with agencies concerned
10	Aug. 30 (Wed)		Wrap-up meeting with agencies concerned : Drafting of Minutes of Discussion
11	Aug. 31 (Thu)		Signing of Minutes of Discussion Visit to Embassy of Japan and JICA
12	Sep. 1 (Fri)	Lv. Suva (FJ443), Ar. Auckland (Mr. Ishihara, Mr. Ryo and Dr. Suda)	Discussion with USP / MSP lecturers and staffs
13	Sep. 2 (Sat)	Ar. Tokyo (Ditto)	Visit to Draveni Island Field Station
14	Sep. 3 (Sun)		Discussion within the study team members
15	Sep. 4 (Mon)		Joint meeting with Media Center and Computer Center
16	Sep. 5 (Tue)		Interview and discussion with USP / MSP lecturers, Construction survey
17	Sep. 6 (Wed)	Mv. to Nadi (Mr. Terao)	Ditto
18	Sep. 7 (Thu)	Lv. Nadi (FJ302), Ar. Tokyo (Ditto)	Ditto
19	Sep. 8 (Fri)		Joint meeting with USP/MSP and agencies concerned
20	Sep. 9 (Sat)		Information and data analysis
21	Sep. 10 (Sun)		Discussion within the study team members
22	Sep. 11 (Mon)	Mv. to Nadi, Lv. Nadi (NZ023) - Ar. Tokyo (Dr. Shimura)	Survey for construction, procurement, transportation, and so on conditions in Fiji, Site survey
23	Sep. 12 (Tue)		Ditto
24	Sep. 13 (Wed)		Ditto
25	Sep. 14 (Thu)		Joint meeting with USP/MSP and agencies concerned
26	Sep. 15 (Fri)		Collection of supplemental information and data, Visit to Embassy of Japan and JICA
27	Sep. 16 (Sat)		Collection of supplemental information and data
28	Sep. 17 (Sun)	Mv. to Suva (Mr. Ogasawara, Mr. Kaneko and Mr. Torii)	Ditto
29	Sep. 18 (Mon)	Lv. Nadi (NZ023) - Ar. Tokyo	

APPENDIX - 2 Survey Itinerary (Consultation of Draft Report)

DAY	DATE	MOVEMENT	ACTIVITIES
1	Nov. 9 (Thu)	Lv. Tokyo (FJ303)	(Dr.Suda, Mr. Ogasawara, Mr. Kaneko and Mr. Torii)
2	Nov. 10 (Fri)	Ar. Nadi, Mov to Suva	Courtesy call on JICA, MOFAET& MAFF Discussion meeting with USP: draft BD report Visit to OFCF: Collection of supplemental information & data
3	Nov. 11 (Sat)		Collection of information & data
4	Nov. 12 (Sun)	Lv. Tokyo (FJ303) (Dr.Shimura)	Discussion with USP Lecturers
5	Nov.13 (Mon)	Ar. Nadi, Move to Suva (ditto)	Discussion within the study team members
6	Nov.14 (Tue)		Joint Meeting with USP: draft BD report Courtesy call on Embassy of Japan and JICA: Draft Report
7	Nov.15 (Wed)		Joint meeting with JICA, USP and ALTA: Discussion on the implementation plan of the project
8	Nov.16 (Thu)		Discussion meeting with JICA, USP and ALTA: Drafting of Minites of Discussions
9	Nov.17 (Fri)		MAFF & ALTA: Signing of Minites of Discussions Visit to Embassy of Japan, Min. of Foreign Affairs and JICA
10	Nov.18 (Sat)		Discussion within the study team members Collection of supplemental information & data
11	Nov.19 (Sun)	Lv. Suva - Ar. Nadi	
12	Nov.20 (Mon)	Lv. Nadi - Ar. Tokyo	

APPENDIX - 3 List of Party Concerned in the Percipient Country (Field Survey)

Name	Title / Organization
Mr. Ratu Tui Cavuilati	Permanent Secretary, Ministry of Foreign Affairs and External Trade (MOFAET)
Ms. Sivia Tora	Principal Assistant Secretary, MOFAET
Mr. Sefanaia Dalobogidua	Acting Senior Assistant Secretary, MOFAET
Mr. John Teaiwa	Permanent Secretary, Ministry of Agriculture, Fisheries and Forests (MAFF)
Mr. Peniasi Kunatuba	Deputy Permanent Secretary, MAFF (Operation)
Mr. Maciu Lagibalavu	Acting Director of Fisheries, MAFF
Mr. Esekia Solofa	Vice-Chancellor, The University of the South Pacific (USP)
Dr. Wadan L. Narsey	Director of Planning and Development, USP
Mr. Ian Banner	Director of Buildings and Grounds, USP
Dr. G. Robin South	Professor of Marine Studies Programme (MSP) and Director, Institute of Marine Resources, USP
Dr. Veikila Vuki	Lecturer (Oceanography), MSP, USP
Dr. Timothy D. Pickering	Lecturer (Fishbiology & Aquaculture), MSP, USP
Mr. Jone Maiwelagi	Fisheries Training Officer, MSP, USP
Mr. Sunia Biu Lavaki	Chief Technician, MSP, USP
Mr. Vilimoni Lavelawa	Manager, Dravuni Island Field Station, MSP, USP
Ms. Sereana Kubuabula	Manager, Analytical Services, Institute of Applied Science (IAS),USP
Dr. Yogendra Singh	Fellow, IAS, USP
Dr. Peter Newell	Professor and Head of Biology Dept., School of Pure and Applied Sciences (SPAS), USP
Dr. S. Southeeswaran	Professor and Head of Chemistry Dept., SPAS, USP
Dr. Gary M. Yeo	Senior Lecturer, Marine Geology, SPAS, USP
Mr. William Peter	Chief Technician, Chemistry, SPAS, USP
Mr. Stanley Flavel	Chief Technician, Biology, SPAS, USP
Mr. Prakash C. Narayan	Chief Technician, Physics, SPAS, USP
Dr. Takashi Soma	Visiting Research Professor, Dept. of Mathematics & Computing Science, USP
Dr. Kevin O mara	Professor, Dept. of Mathematics & Computing Science, USP
Dr. John Clayton	Director of Computer Services, Computer Centre, USP
Mr. Kapeni Matatia	Manager Technical, Computer Centre, USP
Mr. Gerald A. A. Farkas	Director, University Media Centre, USP
Mr. Arno Schulz	Chief Technician, University Media Centre, USP
Mr. Richard T. U. Wah	Deputy Director/Head of Distance Education, USP
Ms. Sylvie Schosseler	Programme Management Officer, United Nations Development Programme

Name	Title / Organization
Mr. Hideyuki Tanaka	Project Manager, Food and Agriculture Organization South Pacific Aquaculture Development Project (II)
Mr. Yasunori Kikuchi	Ambassador, Embassy of Japan
Mr. Yoshiaki Kotaki	Councellor, Embassy of Japan
Mr. Hiroyuki Onishi	First Secretary, Embassy of Japan
Mr. Yasuhiro Tojo	Second Secretary, Embassy of Japan
Mr. Masataka Matsumi	Resident Representative, Overseas Fishery Cooperation Foundation (OFCF) Suva Office
Dr. Masateru Anraku	Chief Fisheries Advisor, OFCF Suva Office
Mr. Eiji Umeno	Fisheries Adviser, OFCF Suva Office
Mr. Shiro Kinouchi	Resident Representative, Japan International Cooperation Agency (JICA)
Mr. Hajime Watanabe	Assistant Resident Representative, JICA
Mr. Takayuki Jimbo	Assistant Resident Representative, JICA

APPENDIX - 3 List of Party Concerned in the Perclpient Country

(Consultation of Draft Report)

Name	Title / Organization
Mr. G. Nand	Deputy Permanent Secretary (Political), Ministry of Foreign Affairs and ExternalTrade (MOFAET)
Ms. Lailun Khan	Chief Assistant Secretary, MOFAET
Mr. John Teaiwa	Permanent Secretary, Ministry of Agriculture, Fisheries and Forests and ALTA (MAFF & ALTA)
Mr. Peniasi Kunatuba	Deputy Permanent Secretary, MAFF & ALTA (Operation)
Mr. Saimone Tuilaucala	Principal Fisheries Officer, MAFF & ALTA
Mr. Esekia Solofa	Vice-Chancellor, The University of the South Pacific (USP)
Dr. Wadan L. Narsey	Director of Planning and Development, USP
Mr. Ian Banner	Director of Buildings and Grounds, USP
Dr. G. Robin South	Professor of Marine Studies Programme (MSP) and Director, Institute of Marine Resources, USP
Dr. Veikila Vuki	Lecturer (Oceanography), MSP, USP
Dr. Timothy D. Pickering	Lecturer (Fishbiology & Aquaculture), MSP, USP
Mr. Sunia Biu Lavaki	Chief Technician, MSP, USP
Ms. Sereana Kubuabula	Manager, Analytical Services, Institute of Applied Science (IAS), USP
Dr. Edward P. Anderson	Fellow, IAS,USP
Dr. Peter Newell	Professor and Head of Biology Dept., School of Pure and Applied Sciences (SPAS), USP
Dr. S. Southeeswaran	Professor and Head of Chemistry Dept., SPAS, USP
Dr. Kanayathu C. Koshy	Leader in Chemistry, Marine Geology, SPAS, USP
Dr. Gary M. Yeo	Senior Lecturer, Marine Geology, SPAS, USP
Dr. Micheal F. Doyle	Curator, South Pacific Regional Herbarrium, Lecturer in Biology, SPAS, USP
Mr. Stanley Flavel	Chief Technician, Biology, SPAS, USP
Mr. Prakash C. Narayan	Chief Technician, Physics, SPAS, USP
Dr. Takashi Soma	Visiting Research Professor, Dept. of Mathematics & Computing Science, USP
Dr. Kevin O mara	Professor, Dept. of Mathematics & Computing Science, USP
Mr. Yasunori Kikuchi	Ambassador, Embassy of Japan
Mr. Yoshiaki Kotaki	Councellor, Embassy of Japan
Mr. Hiroyuki Onishi	First Secretary, Embassy of Japan
Mr. Yasuhiro Tojo	Second Secretary, Embassy of Japan
Mr. Masataka Matsumi	Resident Representative, Overseas Fishery Cooperation Foundation (OFCF) Suva Office
Dr. Masateru Anraku	Chief Fisheries Advisor, OFCF Suva Office
Mr. Biji Umeno	Fisheries Adviser, OFCF Suva Office
Mr. Shiro Kinouchi	Resident Representative, Japan International Cooperation Agency (JICA)
Mr. Hajime Watanabe	Assistant Resident Representative, JICA
Mr. Takayuki Jimbo	Assistant Resident Representative, JICA

APPENDIX - 4 Minutes of Discussion

MINUTES OF DISCUSSIONS

BASIC DESIGN STUDY
ON THE
PROJECT FOR THE CONSTRUCTION OF MARINE STUDIES FACILITIES,
THE UNIVERSITY OF THE SOUTH PACIFIC
IN THE REPUBLIC OF FIJI

(Consultation on the Draft Basic Design)

In August 1995, the Japan International Cooperation Agency (JICA) dispatched a Basic Design Study Team on the Project for the Construction of Marine Studies Facilities, The University of the South Pacific (hereinafter referred to as "the Project") to the Republic of Fiji, and through discussions, field survey, and technical examination of the results in Japan, has prepared the Draft Basic Design of the Project.

In order to explain and to consult the Fijian side on the components of the Draft Basic Design, JICA has sent to Fiji a Study Team headed by Dr. Shigeru SHIMURA, Fisheries Development Specialist, and the Team is scheduled to stay in the country from November 10 to November 20, 1995.

As a result of discussions, both parties have confirmed the main items described on the attached sheets. The Team is to proceed to further works and finalize the Basic Design Study Report.

Suva, November 17, 1995

SHIGERU SHIMURA
Leader
Explanation Team for the
Draft Basic Design
JICA

JOHN TEAIWA
Permanent Secretary
Ministry of Agriculture, Fisheries,
Forests and ALTA
The Government of Fiji

ESEKIA SOLOFA
Vice-Chancellor
The University of the South Pacific

ATTACHMENT

1. Components of the Draft Basic Design

The Government of Fiji and The University of the South Pacific (USP) have in principle accepted the components of the Draft Basic Design proposed by the Team, with some changes agreed during the discussions. These amendments are described in ANNEX I and will be incorporated into the Basic Design Study Report.

2. Japan's Grant Aid System

1) The Government of Fiji has understood the system of the Japan's Grant Aid explained by the Team; the main feature is described in ANNEX II.
2) The Government of Fiji will take the necessary measures, described in ANNEX III for smooth implementation of the Project on condition that the Grant Aid Assistance by the Government of Japan is extended to the Project.

3. Framework of the Project Implementation

1) The Ministry of Agriculture, Fisheries, Forests and ALTA (MAFF & ALTA) will act as executing agency of the Project, and be responsible for the administration and implementation of the Project from tendering, contracting, ground-breaking, supervising and to the completion of work. In the respective stages of the Project implementation, MAFF & ALTA will perform such duties in close coordination with USP.
2) USP will act as managing and operating body of the facility constructed and equipment purchased under the Japan's Grant Aid, while remaining the property of the Government of Fiji, in accordance with due arrangement and agreement to be set fourth between MAFF & ALTA and USP.
3) MAFF & ALTA shall be responsible for monitoring the proper and effective use of such facility and equipment as well as maintenance of those through well-coordination with USP.

4. Further Schedule

JICA will finalize the Basic Design Study Report in accordance with the confirmed items, and send it to the Government of Fiji by January, 1996.

5. Other Relevant Issues

USP in collaboration with the Government of Fiji will formulate the detailed operational plan of the research vessel and send it to the Government of Japan.

ANNEX I: AMENDMENTS OF THE DRAFT BASIC DESIGN

Agreed Changes to the Equipment List

Item No.	Name of Equipment	Quantity	
		Original	Revised
	Laboratory Equipment		
28	Stereoscopic microscope	11	21
30	Biological microscope	11	21
	(Polarizer)	0	20
49	Spectrophotometer, U V-VIS	2	1
-	Spectrophotometer, A A	0	1
54	Fume cupboard	8	10
-	Drying cabinet, specimen	0	2
	Oceanographic Research Equipment		
1	Current meter	1	0
8	Winch, manual	1	0
14	GPS, handheld	1	0
-	Differential GPS	0	1
15	Fluorometer, field use	1	0

ANNEX II: JAPAN'S GRANT AID SCHEME

1. **Grant Aid Procedure**

1) Japan's Grant Aid Program is executed through the following procedures.

Application	(Request made by a recipient country)
Study	(Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and Approval by Cabinet)
Determination of Implementation	(The Notes exchanged between the Governments of Japan and the recipient country)

2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using Japanese consulting firms.

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

2. **Basic Design Study**

1) Contents of the Study

The aim of the Basic Design Study (hereinafter referred to as "the Study"), conducted by JICA on a requested project (hereinafter referred to as "the Project"), is to provide a basic document necessary for the appraisal of the Project by the Government of Japan. The contents of the Study are as follows:

a) confirmation of the background, objectives and benefits of the Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation;
b) evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from the technical, social and economic points of view;

c) confirmation of items agreed on by both parties concerning the basic concept of the Project;
d) preparation of a basic design of the Project; and
e) estimation of costs of the Project.

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even through they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

2) Selection of Consultants

For the smooth implementation of the Study, JICA uses a consulting firm selected through its own procedure (competitive proposal). The selected firm participate the Study and prepare a report based upon the terms of reference set by JICA.

At the beginning of implementation after the Exchange of Notes, for the services of the Detailed Design and Construction Supervision of the Project, JICA recommends the same consulting firm which participated in the Study to the recipient country, in order to maintain the technical consistency between the Basic Design and Detailed Design as well as to avoid any undue delay caused by the selection of a new consulting firm.

3. Japan's Grant Aid Scheme

1) What is Grant Aid?

The Grant Aid Program provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

3) "The period of the Grant" means the one fiscal year which the Cabinet approves the project for. Within the fiscal year, all procedure such as exchanging of the Notes, concluding contracts with consulting firms and contractors and final payment to them must be completed.
However, in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

4) Under the Grant, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country.

However, the prime contractors, namely consulting, contracting and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

5) Necessity of " Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This " Verification" is deemed necessary to secure accountability of Japanese taxpayers.

6) Undertakings required to the Government of the recipient country

a) to secure a lot of land necessary for the construction of the Project and to clear the site;
b) to provide facilities for distribution of electricity, water supply and drainage and other incidental facilities outside the site;
c) to ensure prompt unloading and customs clearance at ports of disembarkation in the recipient country and internal transportation therein of the products purchased under the Grant Aid;
d) to exempt Japanese nationals from customs duties, internal taxes and fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contracts;
e) to accord Japanese nationals whose services may be required in connection with the supply of the products and services under the verified contracts such as facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work;
f) to ensure that the facilities constructed and products purchased under the Grant Aid be maintained and used properly and effectively for the Project; and
g) to bear all the expenses other than those covered by the Grant Aid, necessary for the Project.

7) "Proper Use"

The recipient country is required to maintain and use the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign the necessary staff for operation and maintenance of them as well as to bear all the expenses other than those covered by the Grant Aid.

8) "Re-export"

The products purchased under the Grant Aid shall not be re-exported from the recipient country.

9) Banking Arrangement (B/A)

a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank". The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the verified contracts.

b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an Authorization to Pay (A/P) issued by the Government of recipient country or its designated authority.

ANNEX III: UNDERTAKINGS BY THE GOVERNMENT OF FIJI

1. To secure a lot of land, at the respective site, necessary for the Project;

2. to clear, level and reclaim the site for the Project prior to the commencement of the construction;

3. to secure yard for stocking materials and constructing temporary facilities at the respective Project site;

4. to provide a proper access road to the Project sites;

5. to provide necessary permissions, licenses and other authorization for smooth implementation of the Project;

6. to undertake incidental outdoor works, such as gardening, fencing and other incidental facilities in and around the Project site, if necessary;

7. to provide the following incidental facilities in connection with the site:
   1) Electricity distributing line to the site,
   2) City water distribution main to the site,
   3) Drainage main to the site,
   4) Telephone trunk line to the site, and
   5) General furniture such as carpet, curtain and others;

8. to ensure prompt unloading, tax exemption and customs clearance at ports of disembarkation in Fiji and internal transportation therein of the products purchased under the Japan's Grant Aid;

9. to exempt Japanese nationals from customs duties, internal taxes and fiscal levies which may be imposed in Fiji with respect to the supply of the products and services under the verified contracts;

10. to accord Japanese nationals whose services may be required in connection with the supply of the products and services under the verified contracts such facilities as may be necessary for their entry into Fiji and stay therein for the performance of their work;

11. to bear commissions, namely advising commissions of an Authorization to Pay (A/P) and payment commissions, to the Japanese foreign exchange bank for the banking services based upon the Banking Arrangement (B/A);

12. to ensure that the facilities constructed and equipment purchased under the Japan's Grant Aid be maintained and used properly and effectively for the Project;

13. to bear all the expenses, other than those covered by the Japan's Grant Aid, necessary for the Project; and

14. to coordinate and solve any matters which may arise with third parties in the Project site during the implementation of the Project.

MINUTES OF DISCUSSIONS

BASIC DESIGN STUDY

ON THE PROJECT

FOR THE CONSTRUCTION OF MARINE STUDIES FACILITIES,

THE UNIVERSITY OF THE SOUTH PACIFIC

IN THE REPUBLIC OF FIJI

In response to a request from the Government of the Republic of Fiji, the Government of Japan has decided to conduct a Basic Design Study on the Project for the Construction of the Marine Studies Facilities, The University of the South Pacific (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA has sent to the Republic of Fiji a Basic Design Study Team headed by Mr. Eiji ISHIHARA, Director of the Office of the Overseas Fisheries Cooperation, Oceanic Fishery Department, Fisheries Agency, and the Team is scheduled to stay in the country from August 22 to September 17, 1995.

The team held a series of discussions with the officials concerned of the Government of the Republic of Fiji and The University of the South Pacific, and conducted a field survey at the study area.

In the course of the discussions and field survey, the parties have confirmed the main items described in Attachment with Annex I - IV. The Team will proceed to further works and prepare the Basic Design Study Report.

Suva, August 31, 1995

Eiji ISHIHARA
Leader
Basic Design Study Team
JICA

John TEAIWA
Permanent Secretary
Ministry of Agriculture,
Fisheries and Forests
The Government of the
Republic of Fiji

Esekia SOLOFA
Vice-Chancellor
The University of the South Pacific

ATTACHMENT

1. Objective

The objective of the Project is to provide necessary support for the Republic of Fiji and other Pacific Island nations in the development of human resources in the field of marine and fisheries science, and development and management of their marine resources by constructing and equipping the marine studies facilities at The University of the South Pacific (USP).

2. Project Sites

The site is located at Laucala campus of USP in Suva, as shown in ANNEX I.

3. Executing Agency

The Ministry of Agriculture, Fisheries and Forests (MAFF), through the Fisheries Division, is responsible for administration and execution of the Project.

4. Items requested by the Government of the Republic of Fiji

The items requested by the Government of the Republic of Fiji for the marine studies facilities at USP are listed in ANNEX II.

5. Japan's Grant Aid System

1) The Government of the Republic of Fiji has understood the system of the Japan's Grant Aid explained by the Team; the main feature is described in ANNEX III.
2) The Government of the Republic of Fiji will take the necessary measures, described in ANNEX IV for the smooth implementation of the Project on condition that the Grant Aid by the Government of Japan is extended to the Project.

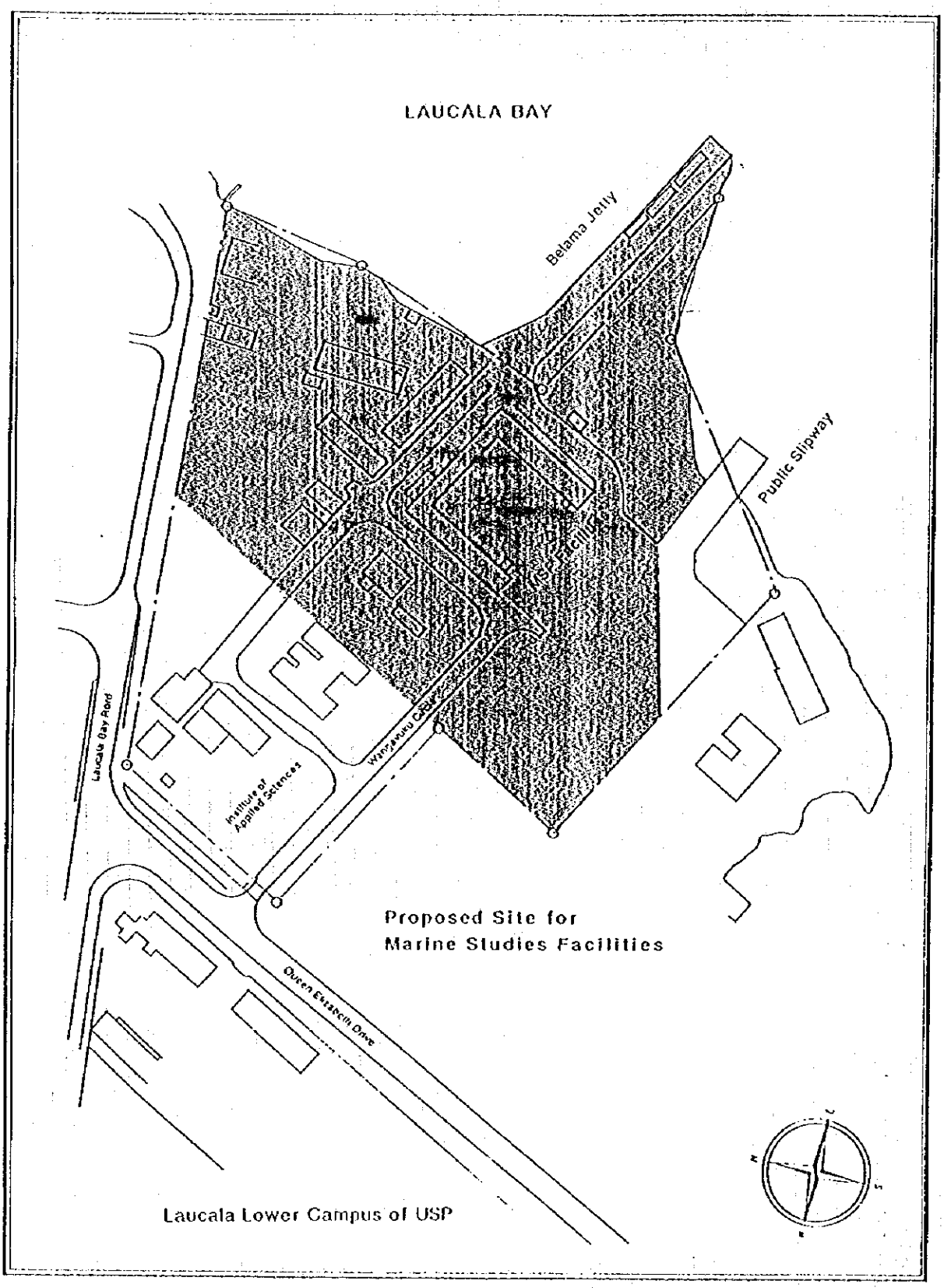
6. Framework of the Project Implementation

1) MAFF is requested to take whatever measures are necessary to ensure proper implementation of the Project.
2) In accordance with due arrangement and agreement to be set forth between the Government of the Republic of Fiji and USP, the facility constructed and equipment purchased under the Japan's Grant Aid, while remaining the property of the Government of the Republic of Fiji, will be managed and operated by USP in order to attain the Project objectives.
3) MAFF will be responsible for monitoring the proper and effective use of such facility and equipment as well as maintenance thereof through appropriate coordination with USP.

7. **Further Schedule of the Study**

1) The consultants of the Team will proceed to further studies in the Republic of Fiji until September 17, 1995.
2) JICA will prepare the Draft Basic Design and dispatch a mission in order to explain its contents.
3) In case that the contents of the Design is accepted in principle by the Government of the Republic of Fiji and USP, JICA will complete the Basic Design Study Report and send it to the Government of the Republic of Fiji.

ANNEX I PROJECT SITE LOCATION PLAN



ANNEX II ITEMS REQUESTED BY THE GOVERNMENT OF THE REPUBLIC OF FIJI FOR THE MARINE STUDIES FACILITIES AT USP

1. Building and Facilities

1) Marine Studies Center
2) Workshop
3) Accommodation
4) Canteen
5) Mooring facility

2. Equipment

1) Diving equipment
2) Post-harvest fisheries equipment
3) Laboratory equipment
4) Field research equipment
5) Workshop equipment
6) Training and education equipment
7) Computer and local area network
8) Vehicle(s)
9) Extension service equipment

3. Research Vessel

1)	Navigational area	- Within the Fiji waters
2)	Complement	- Maximum 6 scientists and 6 crews
3)	Cruising speed	- Maximum 12 knots
4)	Equipment	- Navigational and research devices
		- Fishing gear

ANNEX III JAPAN'S GRANT AID SCHEME

1. Grant Aid Procedure

1) Japan's Grant Aid Program is executed through the following procedures.

Application	(Request made by a recipient country)
Study	(Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and Approval by Cabinet)
Determination of Implementation	(The Notes exchanged between the Governments of Japan and the recipient country)

2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using Japanese consulting firms.

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

2. Basic Design Study

1) Contents of the Study

The aim of the Basic Design Study (hereinafter referred to as "the Study"), conducted by JICA on a requested project (hereinafter referred to as "the Project"), is to provide a basic document necessary for the appraisal of the Project by the Government of Japan. The contents of the Study are as follows:

a) confirmation of the background, objectives and benefits of the Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation;
b) evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from the technical, social and economic points of view;

c) confirmation of items agreed on by both parties concerning the basic concept of the Project;
d) preparation of a basic design of the Project; and
e) estimation of costs of the Project.

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

2) Selection of Consultants

For the smooth implementation of the Study, JICA uses a consulting firm selected through its own procedure (competitive proposal). The selected firm participate the Study and prepare a report based upon the terms of reference set by JICA.

At the beginning of implementation after the Exchange of Notes, for the services of the Detailed Design and Construction Supervision of the Project, JICA recommends the same consulting firm which participated in the Study to the recipient country, in order to maintain the technical consistency between the Basic Design and Detailed Design as well as to avoid any undue delay caused by the selection of a new consulting firm.

3. Japan's Grant Aid Scheme

1) What is Grant Aid?

The Grant Aid Program provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

3) "The period of the Grant" means the one fiscal year which the Cabinet approves the project for. Within the fiscal year, all procedure such as exchanging of the Notes, concluding contracts with consulting firms and contractors and final payment to them must be completed.
However, in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

4) Under the Grant, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country.

However, the prime contractors, namely consulting, contracting and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

5) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability of Japanese taxpayers.

6) Undertakings required to the Government of the recipient country

a) to secure a lot of land necessary for the construction of the Project and to clear the site;
b) to provide facilities for distribution of electricity, water supply and drainage and other incidental facilities outside the site;
c) to ensure prompt unloading and customs clearance at ports of disembarkation in the recipient country and internal transportation therein of the products purchased under the Grant Aid;
d) to exempt Japanese nationals from customs duties, internal taxes and fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contracts;
e) to accord Japanese nationals whose services may be required in connection with the supply of the products and services under the verified contracts such as facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work;
f) to ensure that the facilities constructed and products purchased under the Grant Aid be maintained and used properly and effectively for the Project; and
g) to bear all the expenses other than those covered by the Grant Aid, necessary for the Project.

7) "Proper Use"

The recipient country is required to maintain and use the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign the necessary staff for operation and maintenance of them as well as to bear all the expenses other than those covered by the Grant Aid.

8) "Re-export"

The products purchased under the Grant Aid shall not be re-exported from the recipient country.

9) Banking Arrangement (B/A)

a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank". The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the verified contracts.

b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an Authorization to Pay (A/P) issued by the Government of recipient country or its designated authority.

ANNEX IV UNDERTAKINGS BY THE GOVERNMENT OF THE REPUBLIC OF FIJI

1. To secure a lot of land necessary for the Project;

2. to clear, level and reclaim the site for the Project prior to the commencement of the construction;

3. to provide a proper access road to the Project site;

4. to undertake incidental outdoor works, such as gardening, fencing, exterior lighting, and other incidental facilities in and around the Project site, if necessary;

5. to provide the following incidental facilities in connection with the site:
   1) Electricity distributing line to the site,
   2) City water distribution main to the site,
   3) Drainage main to the site,
   4) Telephone trunk line to the site, and
   5) General furniture such as carpet, curtain and others;

6. to ensure prompt unloading, tax exemption and customs clearance at ports of disembarkation in the Republic of Fiji and internal transportation therein of the products purchased under the Japan's Grant Aid;

7. to exempt Japanese nationals from customs duties, internal taxes and fiscal levies which may be imposed in the Republic of Fiji with respect to the supply of the products and services under the verified contracts;

8. to accord Japanese nationals whose services may be required in connection with the supply of the products and services under the verified contracts such facilities as may be necessary for their entry into the Republic of Fiji and stay therein for the performance of their work;

9. to bear commissions, namely advising commissions of an Authorization to Pay (A/P) and payment commissions, to the Japanese foreign exchange bank for the banking services based upon the Banking Arrangement (B/A);

10. to provide necessary permissions, licenses, and other authorization for implementing the Project, if necessary;

11. to ensure that the facilities rehabilitated and equipment purchased under the Japan's Grant Aid be maintained and used properly and effectively for the Project; and

12. to bear all the expenses, other than those covered by the Japan's Grant Aid, necessary for the Project.

APPENDIX - 5 Estimated Cost to be borne the Fiji Government

Description o f Work	FS
(1) Site Preparation	25,000
(2) Electric Power leading	40,000
(3) Landscape	40,000
(4) Connection to the LAN system	35,000
Total	140,000

APPENDIX - 6 Equipment List

No.	Item	Description	Quantity
	Laboratory Equipment		
1	Drying oven	100 liters, 300℃	1
2	Drying oven	200 liters, 250℃	1
3	Drying oven	75 liters, 400℃	1
4	Freeze drier	-45℃, vacuum 100 liters/min, pre-freeze bath 10 liters, trap 8 liters, 9 ports w/drying chamber	1
5	Drying cabinet, glass ware	1,000 liters (1,165 x 590 x 1,430mm), 4 shelves, 2.5 kW	2
6	Hotplate	310 x 610 mm, 310 ℃, 2.75 kW	5
7	Muffle furnace	7 liters, 1,150 ℃	1
8	Incubator	200 liters, 3 - 45 ℃, fluorescent lamp 20 W x 4	4
9	Ultracold freezer	-85℃, 300 liters, upright	1
10	Refrigerator	2-door 300 liters	7
11	Freezer	-15℃, 350 liters, chest type	7
12	Water bath, 10 liters	Ambient +5℃ - 100℃ ±0.1℃ w/rack	5
13	Magnetic stirrer	3 liters capacity, 100 - 1,500 rpm, 250 x 250mm	1
14	Aeration pump	1 liter/min, 35 kPa, piston type, delivery x 2	5
15	Vacuum pump	31 liters/min at 0 mmHg - 0.6 liters/min at 635 mmHg	4
16	Distillation deionizer	10 liters/h, distilled water tank 100 liters w/fittings	1
17	Distillation deionizer	1.8 liters/h, distilled water tank 20 liters w/fittings	1
18	Water purifier, ultrapure	30 liters/h, 0.2 μm filtered w/connector	1
19	Rotary evaporator	20 - 250rpm, lifting 1.6cm/sec, 1,000W heater, 20 - 240 ℃	5
20	Centrifuge	6,000 rpm, swing rotor & assembly for 40 x 15 ml,	2
21	Centrifuge	200 - 6,000 rpm, 0 - 30 ℃	1
22	High speed centrifuge	20,000 rpm, 0 - 30 ℃, rotors: 10 ml x 16, 50 ml x 8	1
23	Autoclave	80 liters, horizontal w/stainless steel container x 2	2
24	Glass washer, full automatic	120 liters w/accessories (racks, baskets, connection, etc.)	1
25	Ultrasonic bath	3 liters tank, 28kHz w/cover & earth lead	1
26	Stereoscopic microscope	Trinocular w/photomicrographic function, zoom 6.3 : 1,	2
27	Stereoscopic microscope	Trinocular w/TV camera attachment, zoom 6.3 : 1	1
28	Stereoscopic microscope	Binocular, zoom 6 : 1, total magnification 7x - 40x w/polarizer	21
29	Biological microscope	Trinocular w/photomicrographic function	1
		Nomarski differential interference contrast condenser	1
		Reflected light fluorescence set w/mirror units	1
		Automatic exposure photomicrographic system w/camera	1
		T/V camera attachment	1
		CCD camera w/control system, 15" color monitor	1
30	Biological microscope	Binocular, eyepieces 10x, objectives: 4x, 10x, 40x, 100x oil	21
31	Inverted microscope	Binocular w/photomicrographic function, 40x - 400x	2
		Automatic exposure photomicrographic system w/camera	1
		Reflected light fluorescence set w/10x, 20x, 40x objectives	1
		Nomarski differential interference contrast attachment	1
32	Slide warmer	200W, electronic temp. controlled, hot plate 10 cm x 7 cm	1
33	Wax heater/dispenser	200 mm dia. x 160 mm internal, 4.5 liters, 40 ℃ - 100℃	1
34	Rock crusher	Crushing particle: below 5 mm, 30 kg/h w/spare parts	1
35	Rock slicer	24" dia. x 0.075", arbor 1"	1
36	Polisher grinder	8" dia., 300 - 600 rpm	1
37	Electric sieve shaker	Capacity: nine 8" sieves plus bottom pan	2
38	Sieve set	Stainless steel 100 mm dia., 0.25, 0.5, 1, 2, 4 mm mesh	5
39	Ice machine	Cube ice, 100 kg/24 hrs	1
40	Balance	0 - 4,000 g : 0.1 g, 0 - 400 g : 0.01 g change over	1

No.	Item	Description	Quantity
41	Balance, analytical	0 - 2,000 g, minimum reading 0.1mg, plate 80 mm dia.	4
42	pH meter, benchtop	Digital, 0.000 - 14.000	3
43	Conductivity meter, benchtop	0 - 20 μS/cm: 0.01 μS, 0 - 200 μS/cm: 0.1 μS, 0 - 2000 μS: 1 μS, 0 - 20mS/cm: 0.01mS, 0 - 200mS/cm: 0.1mS	2
44	Dissolved oxygen meter	0.00 - 2.00 mg/liter	2
45	Salinometer	0 - 6%, resolution 0.01 at 0.00 - 1.00%	1
46	Water quality analyzer	pH, DO, conductivity, salinity, turbidity, temp. 0 - 50 ℃	1
47	Salinity refractometer	0 - 100 ‰, minimum reading 1 ‰	6
48	Brix refractometer	0 - 32%, minimum scale 0.2%, auto temp. compensation	2
49	Spectrophotometer, UV-VIS	Wavelength range 190 - 900nm, resolution 0.1nm, bandwidth 0.1 - 5nm, WL accuracy ±0.3nm	1
50	Spectrophotometer, AA	Flame-furnance, wavelength range 190 - 900nm, bandwidth 0.1 - 5nm w/auto sampler	1
51	Colorimeter	0 - 100T%, 0 - 2.0Abs	5
52	Protein analyzer	Nitrogen 0.1 - 100.0 mg	1
53	Electrophoresis chamber	For agarose gels 60 x 90mm	2
54	Electrophoresis power supply	O - 500DCV, 0 - 500mA	2
55	Fume cupboard	1,500 x 750 x 2,300(H) mm	10
56	Laminar flow unit	1,600 x 900 x 1,800(H) mm	4
57	Anti-vibration stand	530 x 430 x 60(H) mm, 20 kg	4
58	Cabinet, acid bottle	750 x 600 x 1,800(H) mm	6
59	Cabinet, sterilized apparatus	1,200 x 450 x 1,700(H) mm, stainless steel	1
60	Dryer, specimen	Inner dimension 820 x 470 x 1250mm, max 100°C	2
61	Stainless steel mesh shelves	1,800 x 450 x 1,900(H) mm, 5 shelves	2
62	Membrane filtration set	47 mm filter holder set: 300 ml funnel x 3	4
63	Dehumidifier	10 liters/day, 1 kW	2
64	Multi timer	Set time ranges 1 - 120 min,	5
65	Brine hydrometer	Baume 0 - 30	2
66	Primary standard thermometer	0 - 50℃, subdivision 1/10	1
	Oceanography Research Equipment		
1	CSTD	C: 0 - 100 mS ±0.25 mS, S: 0 - 100 ‰ ±0.25‰, T: -5 - +45 ℃ ±0.2℃, D: 200 m w/reel	1
2	Core sampler	5 cm dia. x 3.6 cm dia. x 50 cm w/accessories	1
3	Bottom sampler	Ekman-Berge type 150 x 150 x 150mm, 8kg	1
4	Sledge, soft bottom	170mm dia. x 420mm, 14kg	1
5	Water sampler, Niskin	1.7 liters w/thermo frame & spare messenger x 1	10
6	Reversing thermometer	Protected -2 - +30 ℃, unprotected -2 - +35 ℃ w/frame	10
7	Tide gauge, logging type	0 - 10 m ±2 cm, 0 - 20 m ±0.5 cm w/interface	1
8	Plankton net		
	NORPAC type	45 cm dia. x 180 cm, 334 μm nylon	5
	International standard	50 cm dia. x 235 cm, 334 μm nylon	2
	International standard	50 cm dia. x 235 cm, 72 μm nylon	2
	Nylon netting	20 μ, 40 μ, 72 μ, 100 μ, 200 μ, 334 μ, 400 μ, 500 μ	1
9	Plankton sample divider	100, 200, 600 ml	1
10	Anemometer, handheld	3m/sec - 30m/sec, 16 directions	1
11	Thermo-hygrometer	-10.0℃ - 60.0℃ ±0.5℃, 20.0% - 99.9% ±3%	1
12	Real time defferencial GPS	5 m accuracy, w/reference station	1
13	Turbidity meter, portable	0 - 200 ppm, accuracy 2%	1
14	DO meter, portable	0.00 - 20.00 mg/liter, auto temp./salinity compensation	1
15	pH meter, portable	0 - 14.00pH, auto temp. compensation	1
16	Salinometer, portable	0.00 - 6.00%, auto temp. compensation	1
17	Conductivity meter, portable	0 - 1990 μS/cm, 0 - 19900 μS/cm, auto temp. compensation	1

No.	Item	Description	Quantity
	Fishing Gear and Materials		
1	Beach seine net	1" str., 1 - 2 m depth x 50 m	2
2	Trammel net	Nylon multi-filament, 4" x 8" str., 3 m depth x 100 m	5
3	Gill net	Nylon mono-filament, 3" str., 3 m depth x 100 m	5
4	Nylon netting	Rachel type	
	10 mm stretched	210d/6, 400 md x 150 m	1
	20 mm stretched	210d/9, 200 md x 150 m	1
	30 mm stretched	210d/9, 130 md x 150 m	1
	40 mm stretched	210d/12, 100 md x 150 m	1
	50 mm stretched	210d/15, 80 md x 150 m	1
5	Cast net	Nylon mono-filament, 3/4" str., 10 ft height	5
6	Fish trap net		
	Rectangular type	80 x 60 x 25(H) cm	10
	Semi-oval type	70 x 50 x 30 (H) cm	10
7	Bottom fishing line	Nylon braided line 2mm dia. x 500m	2
	Diving Gear and Equipment		
1	Buoyancy compensator	MISTRAL 3 BC or equivalent	15
2	Regulator	4 LP ports, 1 HP port	15
3	Air tank	14 litters, 200 kg/cm ^{2}	15
4	Diving assist gauge	Tank pressure, temp., depth, time, compass, etc.	15
5	Oxygen breathing equipment	Portable oxygen units for emergency use	2
6	Air compressor, water cooling	200 kg/cm^2, 13 m^3/h, 5.5 kW, reservoir 200 kg/cm ^{2}, 10 m^3	1
7	Air compressor, air cooling	200 kg/cm^2, 8 m^3/h, diesel engine 5 ps	1
	Equipment for Post Harvest Fisheries		
1	Chill store	6 m^3, 0°C	1
2	Cold store	6 m^3, -25°C	1
3	Quick freezer	370 liters, -30°C to -35°C	1
4	Ice Maker	Cube ice, 100 kg/day, w/crusher	1
5	Filleting tables	Stainless steel, 3,600 x 1,500 mm	1
6	Packing table	Stainless steel, 1,200 x 2,500 mm	1
7	Filleting board	High density PE, 900 x 500 x 12 mm	8
8	Fish knives	Stainless steel, 270mm	10
9	Fish box	PP 60 liters, 860 x 520 x 200 mm w/handle	10
10	Fish basket	PP 35 liters, 650 x 450 x 170 mm w/ handle	10
11	Insulated fish box	PE 120 liters, 910 x 510 x 470 mm	5
12	Weighing scale, 120 kg	Platform dial scale, stainless steel	1
13	Weighing scale, 15 kg	Platform digital scale, stainless steel	1
14	Hand truck	Stainless steel 500 kg, 1,200 x 750 mm	2
15	Vacuum packing machine	Seal length 570 mm, 2-3 cycle/min, chamber 610 x 440x 80 mm	1
16	Vacuum packing material	15 x 20, 15 x 25, 20 x 30, 24 x 35, 30 x 40, 35 x 48 cm	1
17	Band saw	Cutting height 400 mm, stainless table 870 x 900 mm	1
18	Fish smoker/drier	50kg capacity, microchip controlled	1
19	Cooker	Stainless steel, 700 mm dia., 55 liters, 4 kg/cm2	1
20	Microwave	1 kW	1
21	Food Processor	4 liters, 10,000 - 20,000 rpm	1
22	Fly zapper	960 x 70 x 210 mm	1
23	Heat sealer	Impact type, seal length 400 mm	1

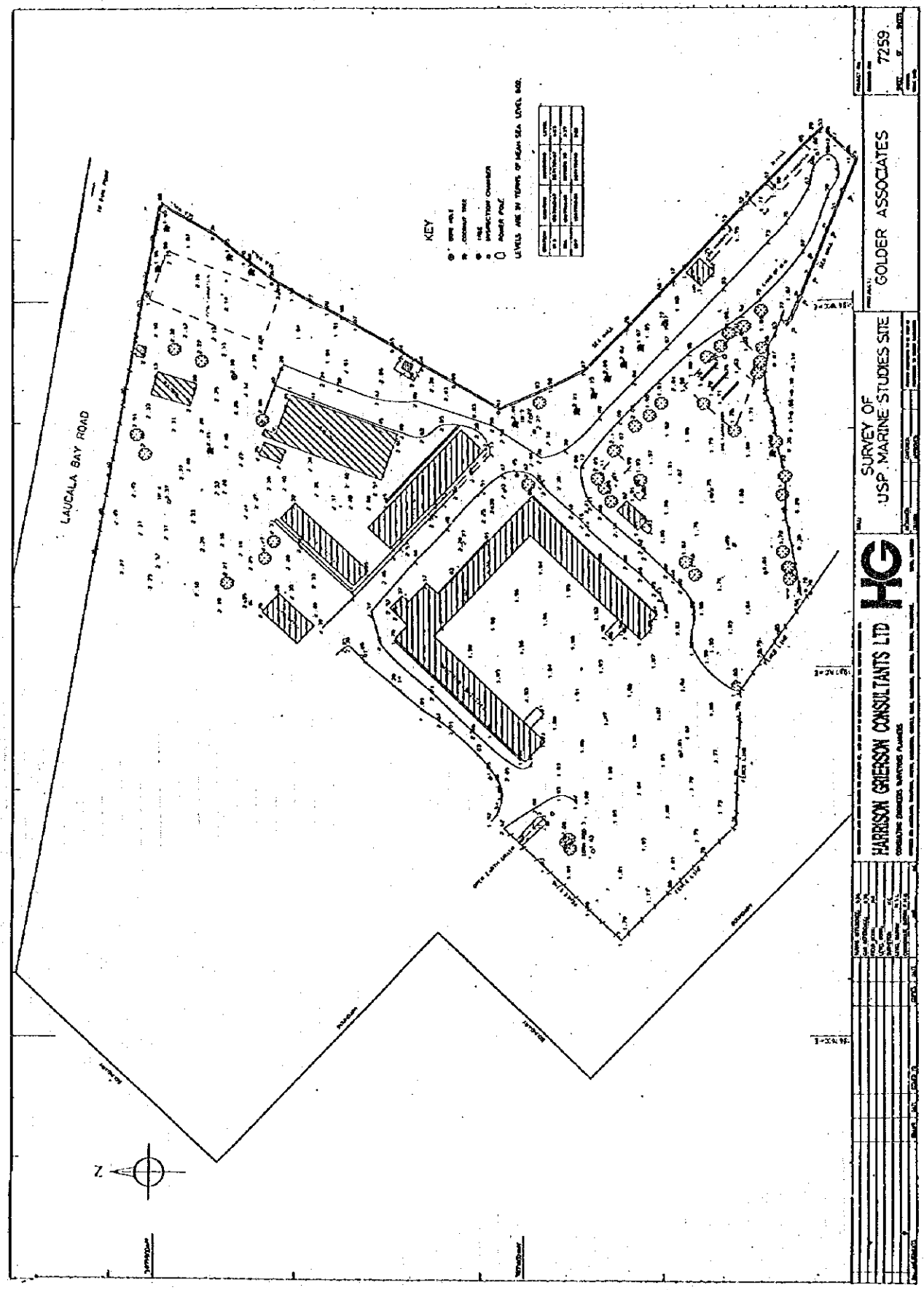
No.	Item	Description	Quantity
	Seawater Laboratory Equipment		
1	Polycarbonate tank, clear	500 liters, 1170mm dia. x 770H mm	5
2	Aquarium	35 liters, 450 x 300 x 300H mm	10
3	Submersible pump	DC 12V, 70 liters/min	1
4	Cartridge filter	Polypropylene wound 5 μm, 250mm x 20 pcs	10
5	Filter housing	Polycarbonate, 250mm filter x 1	5
6	Aeration materials	Air stones, air hoses, joint fittings	1
7	Piping materials	PVC pipes, hoses, joint fittings, flow meter, valves	1
	Audio Visual Equipment		
1	Projection panel	1800 x 1800mm w/tripod stand	4
2	Overhead projector	Stage aperture 285 x 285mm, magnification 3x - 10x	2
3	Slide projector	Lens f3.5 - 100mm w/rotary magazine 100 slides x 5	2
4	Video presentation stand	Projectable object size: 60 x 40mm - 340 x 250mm	1
5	Video projector	70 - 200" w/3000 x 2200 mm" screen	1
6	Video camera	Hi 8mm, 1 CCD, 10x zoom w/under water video housing	1
7	PA system, lecture theatre	Power amplifier/mixer, microphone x 2, speaker x 2	1
8	Video monitor	14" color monitor w/video cassette player	2
9	Video monitor	29" color monitor w/video cassette player	3
	Computers and Network		
1	Workstation	64 bit, 100MHz, RAM 16MB, HD500MB, 15" monitor	16
2	Printer	Laser 600dpi	2
3	Local area network	Within MSP new facilities	1
	Workshop Equipment		
1	Drill press	13 mm dia., 360 mm swing, 80 mm stroke	1
2	Bench grinder	200 mm dia., 600W, spare grinding wheel x 10	1
3	Bench planer, wood	Cutting width 170mm, 15,000rpm	1
4	Metal saw	300 mm dia., capacity: 60 mm, spare metal saw x 10	1
5	Welding set	Argon welding set including gas	1
6	Battery charger	High current multi volt	1
7	Pressure cleaner	40 kg/cm^2, 10 liters/min, 10 m hose w/nozzle & reel	1
8	High pressure washer	70 kg/cm^2, 16 liters/min, 10 m hose w/nozzle & reel	1
9	Compressor	5.5 - 7 kg/cm^2, tank 25 liters	1
10	Chain block	1.5 tones, manual plane	3
11	Multiscope meter	30 measurements inc. volt, ampere, waveform etc.	1
12	Solder station	300 - 540°C, add-on fume extractor, w/5 kinds tips	1
13	Tools	Drivers, wrenches, pliers, etc.	1
14	Hand pallet carrier	1,000 kg loading, 520 W x 1,150 L	1
15	Hand truck	Stainless steel 500 kg, 1,200 x 750 mm	2
	Vehicle		
1	Pick-up truck, double cabin	4WD, diesel engine 2,600cc	1

No.	Item	Description	Quantity
	Others		
1	Guillotine	Max. cutting width 480mm, manual	1
2	Photocopier	A4 - A3, 50 - 200% zoom	2
3	Facsimile	10 sec/A4 transmission speed, thermal paper reception	1
4	Copystand	45 x 60 cm baseboard w/two 150W bulbs	1
5	Enlarger, black and white	Negative 110 - 6x6cm, base 45 x 36cm, lens 50, 75 mm	1
6	Enlarger, color	Negative 110 - 6x6cm, base 45 x 36cm, lens 50, 75 mm	1
7	Dryer	Max. print size 28 x 35 cm	1
8	Chibachrome processor	Max. print size: 420mm, min. print size : 180mm	1
9	Print processor	35mm x 5 films or 30 x 40cm print w/accessories	1
10	Viewer	Viewing surface 300 x 400mm	1
11	Marine VHF tranceiver	5 W, rechargeable battery x 3	2
12	Marine VHF radio telephone	25W	1
13	Furniture	Desks, chairs, cabinets, lockers, shelves, etc.	1

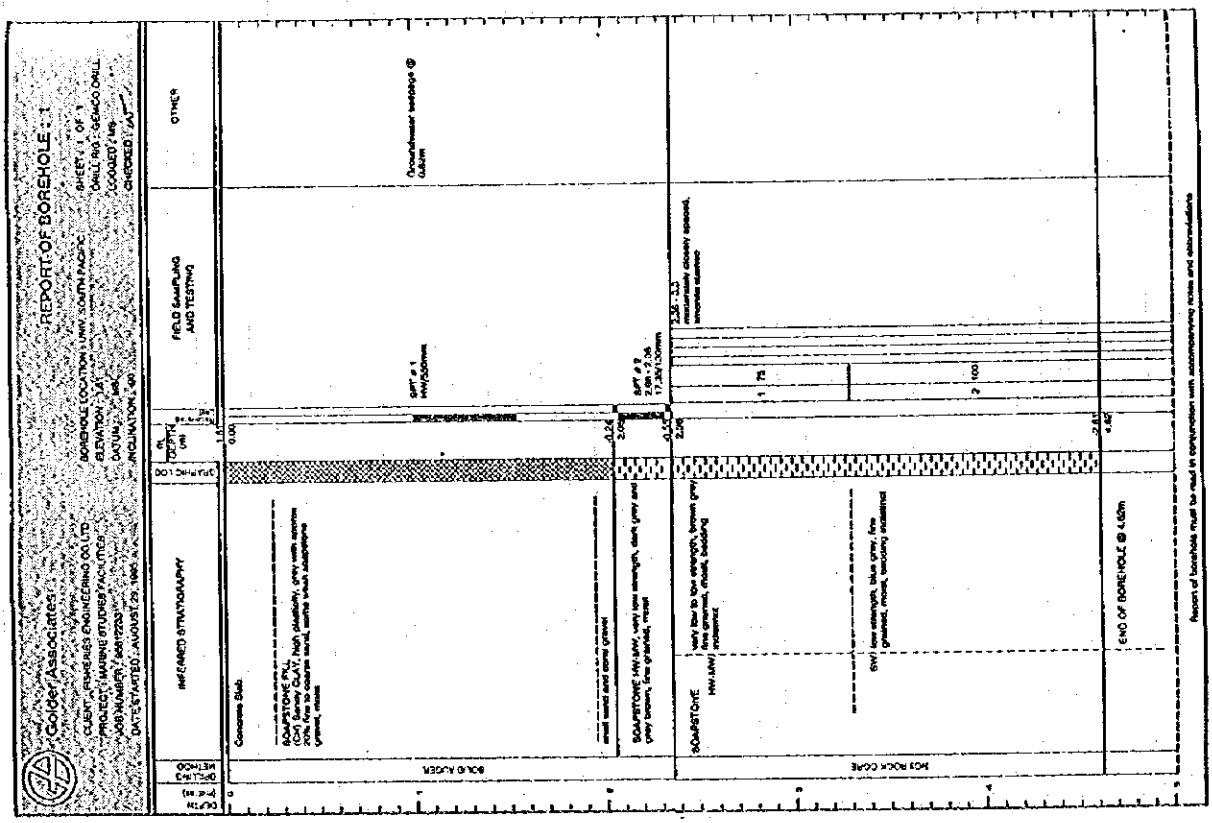
List of Equipment to be Planed with the Research Vessel

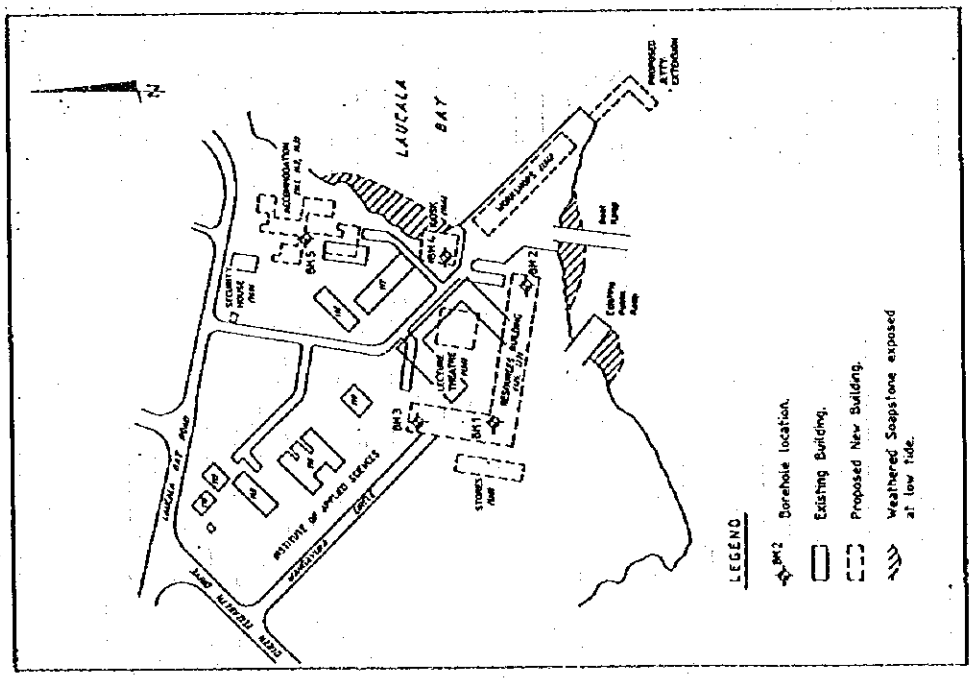
No.	Item	Description	Quantity
	Oceanography Research Equipment		
1	CTD	For 2,000 m, conductivity, temp., depth, salinity, DO, pH, transmissometer, fluorometer, ambient light, water sampler 1.7 l x 12 & r-thermometer w/deck unit, memory unit & software	1
2	Core sampler		
	Middle	9 cm dia. x 7.6 cm dia. x 1 m, lead 60 kg	1
	Large	9 cm dia. x 7.6 cm dia. x 2 m, lead 120 kg	1
3	Bottom sampler	Smith Macintyre, 33 x 33 cm, weight 60 kg	1
4	Mini box x corer	30 x 30 x 120cm	1
	Fishing Gear		
1	Longline	Main line: nylon mono 3 mm, 45 m interval x 11, connection line: 1 m x 10, branch line: nylon mono 2 mm, 20 m x 10, leader: nylon 2 mm, 3 m x 10, hook #3.4, float line: 30 m x 1, float 270 mm dia.	4
2	Vertical longline	Main line rope: PP 8mm, 100m x 4, main line: nylon mono 3mm x 20m interval x 15 pcs x 3 sets, snood: nylon mono 2mm x 3m x 14 pcs/set, hook #3.4, float 350mm dia.	2
3	Bottom fishing line		
	Nylon braided line	2 mm dia. x 500 m	5
	Box swivels	#3/0, 2/0, 1/0, 200 pcs each	1
	Triangle swivels	#2 x 3, 3 x 5, 5 x 6, 200 pcs each	2
	Nylon monofilament lines	0.4, 0.5, 0.7, 1.0 mm dia., 100 m each	10
	Hooks	Ringed "Kirby" type, #1, 3, 5, 6, 7, 8, 100 pcs each	5
	Sinker	Lead 450 g w/ring	20
4	Otter trawl net	Head rope 10 m, 2" x 1" str., 200 m depth operation	1

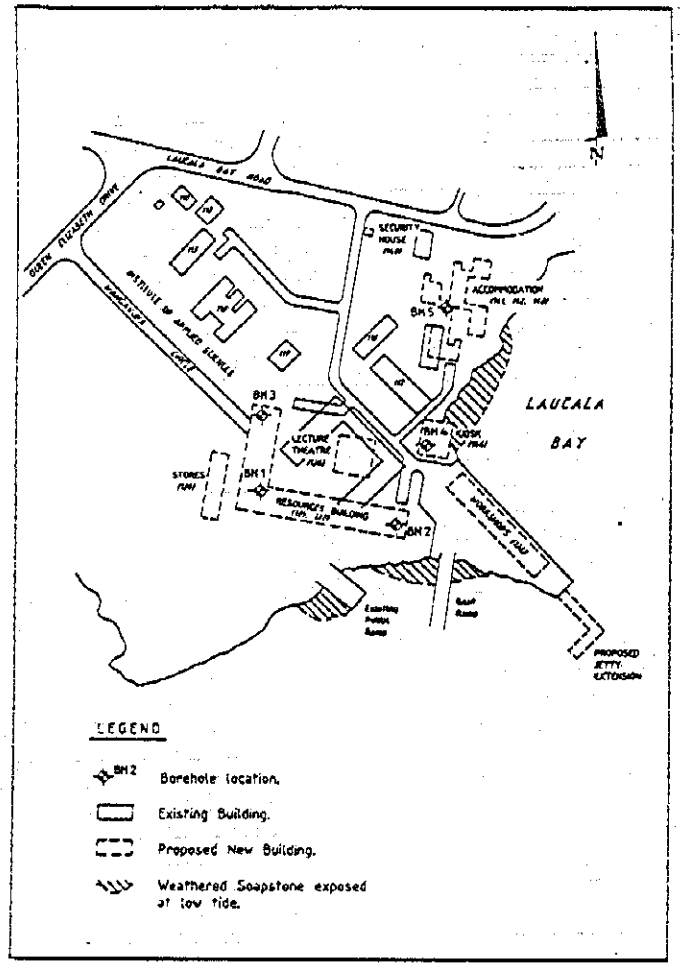
APPENDIX - 7 Topographic Survey Map



APPENDIX - 8 Result of Geotechnical Investigations







Golder Associates

REPORT OF BOREHOLE : 1

CLIENT : FISHERIES ENGINEERING CO LTD
PROJECT : MARINE STUDIES FACILITIES
JOB NUMBER : 95812233
DATE STARTED : AUGUST 29, 1995

BOREHOLE LOCATION : UNIV. SOUTH PACIFIC
ELEVATION : 1.81
DATUM : m MSL
INCLINATION : 90°

SHEET : 1 OF 1
DRILL RIG : GEMCO DRILL
LOGGED : MS
CHECKED :

DEPTH (m)	DRILLING METHOD	INFERRED STRATIGRAPHY	GRAPHIC LOG	RL (DEPTH) (m)	FIELD SAMPLING AND TESTING	OTHER
0	SOLID AUGER	Concrete Slab		1.81 (0.00)		
		SOAPSTONE FILL (CH) Sandy CLAY, high plasticity, grey with approx 20% fine to coarse sand, some weak soapstone gravel, moist			SPT # 1 HW/550mm	Groundwater seepage @ 0.82m
		shell sand and coral gravel		(0.25)		
2		SOAPSTONE HW-MW, very low strength, dark grey and grey brown, fine grained, moist		2.00 (-0.19)	SPT # 2 2.08 - 2.36 17 blr/130mm	
	ROCK CORE	SOAPSTONE HW-MW		2.30		2.30 - 3.3 moderately closely spaced, limonite stained
3		very low to low strength, brown grey, fine grained, moist, bedding indistinct			1 75	
		SW low strength, blue grey, fine grained, moist, bedding indistinct			2 100	
		END OF BOREHOLE @ 4.62m		2.81 (-1.00) 4.62		
5						

Report of borehole must be read in conjunction with accompanying notes and abbreviations

Golder Associates — REPORT OF BOREHOLE : 2

CLIENT : FISHERIES ENGINEERING CO LTD
PROJECT : MARINE STUDIES FACILITIES
JOB NUMBER : 95612233
DATE STARTED : AUGUST 29, 1995
BOREHOLE LOCATION : UNIV. SOUTH PACIFIC
ELEVATION : 1.74
DATUM : MSL
INCLINATION : -90°
SHEET : 1 OF 1
DRILL RIG : GEMCO DRILL
LOGGED : MS
CHECKED :

DEPTH (metres)	DRILLING METHOD	INFERRED STRATIGRAPHY	RL DEPTH (m)	FIELD SAMPLING AND TESTING	OTHER
0	SOLID AUGER	FILL (SC) Clayey SAND, fine to coarse grained, grey brown, approx 30% medium plasticity fines, some coarse grained shell fragments, moist	1.74 / 0.00		
	SOLID AUGER	SOAPSTONE FILL CH Sandy CLAY, high plasticity, brown grey, moist			
1	SOLID AUGER	SC/CH Clayey Gravelly SAND/Sandy CLAY fine to coarse, blue grey, approx 30%, fine to medium, weak Soapstone Gravel, approx 30%, medium plasticity fines, some coarse shell fragments, wet		SPT # 1 1.0 - 1.35 HW/80mm HW/40mm 1/450mm	Groundwater seepage @ 1.0m
2	WASHBORE	SOAPSTONE EW extremely low to very low strength, blue grey, fine grained, moist	-0.30 / 2.04	SPT # 2 2.04 - 2.50 HW/40mm 1,21,31 N = 52	
3	NQ3 ROCK CORE	SOAPSTONE EW-HW extremely low to very low strength, blue grey, fine grained, moist, bedding indistinct	-1.46 / 3.20	1 100; 2.35 - 4.58 drill core breaks inferred to be drilling induced	
4		END OF BOREHOLE @ 4.88m	-3.14 / 4.88		

Report of borehole must be read in conjunction with accompanying notes and abbreviations

Golder Associates — REPORT OF BOREHOLE : 3

CLIENT : FISHERIES ENGINEERING CO LTD
PROJECT : MARINE STUDIES FACILITIES
JOB NUMBER : 95612233
DATE STARTED : AUGUST 30, 1995
BOREHOLE LOCATION : UNIV. SOUTH PACIFIC
ELEVATION : 1.95
DATUM : MSL
INCLINATION : -90
SHEET : 1 OF 1
DRILL RIG : GEMCO DRILL
LOGGED : MS
CHECKED :

DEPTH (metres)	DRILLING METHOD	INFERRED STRATIGRAPHY	RL DEPTH (m)	FIELD SAMPLING AND TESTING	OTHER
0	SOLID AUGER	FILL - GC Clayey Sandy GRAVEL, fine to coarse subangular gravel, grey brown approx 15% low plasticity fines, moist	1.95 / 0.00		
	SOLID AUGER	SC Clayey SAND, fine to coarse, pale brown, approx 30% low plasticity fines, moist			
	SOLID AUGER	SOAPSTONE FILL - CH Gravelly Sandy CLAY, high plasticity, blue grey, weak soapstone gravel, moist			
1	SOLID AUGER			Sa # 4 0.95 - 1.29 U63	Groundwater seepage @ 0.9m
	SOLID AUGER	Probable gravel layer in the fill			
2	SOLID AUGER	MH Sandy SILT, dark brown approx 15% fine to coarse shell sand, some coral gravel, moist			
	WASHBORE	SP Shell SAND, fine to coarse, white			
3	WASHBORE	SOAPSTONE HW-MW, very low strength, blue grey, fine grained	-1.05 / 3.00	Sa # 1 HW/40mm 4,31/140mm	
	NQ3 ROCK CORE	SOAPSTONE SW, low strength, blue grey, bedding indistinct	-1.27 / 3.22	1 100	
4	NQ3 ROCK CORE			2 100	
5	NQ3 ROCK CORE	SOAPSTONE SW, very low strength, blue grey, fine grained, moist; low strength to very low strength, pale grey, fine to medium grained sandstone, bedding indistinct	-3.05 / 5.00	2 100	
		END OF BOREHOLE @ 5.76m	-3.81 / 5.76		
6					

Report of borehole must be read in conjunction with accompanying notes and abbreviations

Golder Associates — REPORT OF BOREHOLE : 4

CLIENT : FISHERIES ENGINEERING CO LTD
PROJECT : MARINE STUDIES FACILITIES
JOB NUMBER : 956 12233
DATE STARTED : AUGUST 30, 199[illegible]

BOREHOLE LOCATION : UNIV. SOUTH PACIFIC
ELEVATION : 2.27
DATUM : MSL
INCLINATION : -90

SHEET 1 OF 1
DRILL RIG : GEMCO DRILL
LOGGED : MS
CHECKED : [illegible]

DEPTH (m)	DRILLING METHOD	INFERRED STRATIGRAPHY	RL DEPTH (m)	FIELD SAMPLING AND TESTING	OTHER
0	SOLID AUGER	FILL - (SC) Gravelly Clayey SAND, fine to coarse, pale grey brown, approx 70% assorted gravel, approx 30% medium plasticity fines, moist	2.27 / 0.00	SPT # 6 HW/140 2,3,8 N = 11	
		SOAPSTONE EW extremely low to very low strength, grey brown, fine grained, moist	0.90 / 1.20		Groundwater seepage @ 1.4m
	NQ3 ROCK CORE	SOAPSTONE HW-MW: very low strength, blue grey, fine grained, moist; EW: low strength, bedding indistinct	0.73 / 1.54	1 100	
		END OF BOREHOLE @ 3.79m	-1.52 / 3.79		

Report of borehole must be read in conjunction with accompanying notes and abbreviations

Golder Associates — REPORT OF BOREHOLE : 5

CLIENT : FISHERIES ENGINEERING CO LTD
PROJECT : MARINE STUDIES FACILITIES
JOB NUMBER : 9561 2233
DATE STARTED : AUGUST 31, 1995

BOREHOLE LOCATION : UNIV. SOUTH PACIFIC
ELEVATION : 2.15
DATUM : MSL
INCLINATION : -90

SHEET 1 OF 1
DRILL RIG : GEMCO DRILL
LOGGED : MS
CHECKED : [illegible]

DEPTH (m)	DRILLING METHOD	INFERRED STRATIGRAPHY	RL DEPTH (m)	FIELD SAMPLING AND TESTING	OTHER
0	SOLID AUGER	FILL - CH Sandy CLAY, high plasticity, grey brown, approx 25% fine to coarse sand, some concrete cobbles, moist	2.15 / 0.00		
		SOAPSTONE EW - HW extremely low to very low strength, grey brown, fine grained, moist	1.35 / 0.80	SPT # 1 5a # 7 26,30/80mm	
	NQ3 ROCK CORE	SOAPSTONE HW-SW: very low to low strength, blue grey, fine grained, moist, bedding planes indistinct (near horizontal); low strength, pale grey, fine to medium grained	0.73 / 1.41	1 100; 2 100	
		END OF BOREHOLE @ 3.35m	-1.17 / 3.35		

Report of borehole must be read in conjunction with accompanying notes and abbreviations