Ministry of Education
The Democratic Republic of Timor-Leste

PREPARATORY SURVEY REPORT

ON

THE PROJECT FOR THE CONSTRUCTION OF NEW BUILDINGS FOR THE FACULTY OF ENGINEERING, SCIENCE AND TECHNOLOGY OF THE NATIONAL UNIVERSITY OF TIMOR-LESTE

IN

THE DEMOCRATIC REPUBLIC OF TIMOR-LESTE

DECEMBER 2015

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

YAMASHITA SEKKEI INC.
INTEM CONSULTING, INC.
PADECO CO., LTD.

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PREFACE

Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey and entrust the survey to the consortium of Yamashita Sekkei Inc., INTEM Consulting, Inc. PADECO Co., Ltd.

The survey team held a series of discussions with the officials concerned of the Government of the Democratic Republic of Timor-Leste, and conducted a field investigations. As a result of further studies in Japan, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of the Democratic Republic of Timor-Leste for their close cooperation extended to the survey team.

December, 2015

Mr. Takao Toda
Director General,
Human Developement Department
Japan International Cooperation Agency

Summary

1. Outline of the Recipient Country

The Democratic Republic of Timor-Leste (hereinafter referred to as “Timor-Leste”) is a country consisting of the eastern half of the island of Timor located in the northeast of Australia with Timor Sea, the neighboring islands of Atauro, Jaco, and Oecusse, and exclave on the western side of the island within Indonesian West Timor. It has a total landmass of about 14,900km^2 and a population of about 1.212 million[1]. The capital is the city of Dili.

Timor-Leste has a climate of tropical monsoon characterized by rainy and dry seasons. In the northern coast area, the rainy season is from November to April while the dry season is from June to September. The temperature is high throughout the year, the average maximum temperature ranging from 30 to 32°C. The average humidity is also high, ranging from 60 to 80%.

The economy of Timor-Leste is heavily dependant on petroleum. The oil industry accounted for 13.9% of the real GDP right after the independence in 2003 and grew considerably afterwards, accounting for 83.8% in 2007. While oil incomes have been stable after 2007, the ratio of non-oil industries to GDP grew steadily and the ratio of the oil industry to GDP fell to 76.4% in 2012, though it is still high. Among non-oil industries, the ratio of agriculture, forestry and fisheries to GDP is the highest, followed by the governmental sector, and wholesale and retail trade services. The ratio of construction to GDP is a only 7.3%, around one third of the ratio of agriculture, forestry and fisheries.

Timor-Leste suffered from severe damage amid confusion and tension before the official independence in 2002. Considerble amount of the physical infrastructure including educational facilities were destroyed at the time. In 2005, the Petroleum Fund of Timor-Leste was established, and since then the country’s economy has been steadily growing as a result of oil revenue, which led to the security stabilization of the country and success of gereral elections in 2012. Accordingly, the United Nations Integrated Mission in Timor-Leste, which had supported the government of Timor-Leste in consolidating stability since 1999, completed its mandate and left the country at the end of 2012, and the country is now shifting from the stage of national reconciliation to economic and social development. The buoyant economy, however, heavily depends on the oil industry, which accounts for about 80% of the GDP, and the country’s non-oil industries remain fragile and need to be improved urgently, but limited human resources and incomplete infrastructures (electricity, telecommunications, etc.) hinder appropriate economic and social development.

2. Background and Summary of the Project

In 2011, Timor-Leste published a Strategic Development Plan 2011-2030 (SDP), a mid-term plan covering the period until 2030, where it sought to become an upper middle income country by 2030. The SDP 2011-2030 shows that the country will discontinue excessive reliance on petroleum and

[1] Source: the World Bank (2014)

establish core industries; focus on agriculture, tourism and oil industries; and emphasize the importance of human resource and infrastructure development. As for human resource development, the country decided to improve public education and scholarships to international educational institutions.

Timor-Leste currently encourages higher education through granting funds for studying abroad and improving the quality of domestic universities. There are eleven higher educational institutions including the country's sole national public university, the Universidade Nacional de Timor-Lorosa'e (UNTL). The educational standard of UNTL is higher than any other institutions in Timor-Leste but still lag behind the international standards. Upgrading the Faculty of Engineering, Sciences and Technology of UNTL is a key to development of core infrastructure (electricity, telecommunications, etc.) and improvement of public education. In this regard, the Government of Japan has provided the university with assistance through an emergency grant aid program for rehabilitation of its facilities (2001-2003) and technical cooperation projects to improve the capacity of teaching staff of the faculty and the quality of education (2006-2010 and 2011-2016). In 2012, the faculty extended its degree programs from three years to four years, and increased the number of departments from four to five, however does not have enough faculty buildings to accommodate the increased number of students. UNTL announces in its Strategic Plan 2011-2020 to transform itself into an institution of the level with international standards by 2020. As a part of the plan, UNTL started relocation of all the faculties to Hera campus, prepared a master plan and construction project plans for the Faculties of Agriculture and the Faculty of Engineering, Sciences and Technology (FEST) with its own financial resources.

In such circumstances, the government of Timor-Leste formally requested the Government of Japan to provide grant aid cooperation to develop facilities of FEST of UNTL. Requested Items are as follows:

Table Ⅰ: Requested Items

Facilities	・Three-story building: approximate total of 9,000 sqm. (classroom, lecturers' room, meeting room, research project lab room, study area, clean room for precise equipment, temperature and humidity testing room, multipurpose room, lecture theater room, etc.) ・Two-story library: approximate total of 3,000 sqm. (library, reference corner, reception & office, storage for books, study area, lecture theater)
Equipment	・Equipment necessary for building facilities (temperature and humidity control system, dust control system, etc.) ・General-purpose equipment necessary for education at FEST (projector, screen, whiteboard, desk and chair, etc.)

3. Summary of the Survey Results and the Contents of the Project

Following the request from the government of Timor-Leste, JICA sent a preparatory survey team to Timor-Leste from February 27 to March 29, 2015. The Survey Team confirmed the contents of the request with parties concerned, decided the project site, specified the priority order of facilities,

equipment and components, and surveyed the natural conditions and the development projects in the surrounding area.

The Survey Team also confirmed short-, mid- and long-term plans set forth in the Strategic Plan 2011-2020 of UNTL and the Strategic Plan 2015-2025 of FEST, and agreed with the parties concerned that this grant aid project would target the short-term needs of the faculty until around 2025 when the number of faculty students would reach 1,600, and focus on improvements of functions that were insufficient at the existing facilities of FEST.

Based on these strategic plans, a master plan had been developed for Hera Campus by Portuguese consultants under FEST, and infrastructure and landscape design, covering areas for the Faculty of Agriculture and FEST, was developed by Spanish consultants. In addition, the university had arranged the design work for a part of faculty buildings of FEST in line with the said infrastructure and landscape design, with consultants from Phillipines. Although, the construction work for those projects are not planned yet, and this Grant Aid Project would precede these related development projects.

The project site and facility layout were determined in consideration with the masterplan of the area and the existing facility. As it is assumed to take considerable duration to start working on the utility development work for the entire Hera campus, the Project has been designed to have independent utility system .

The Survey Team finalized the facility and equipment plans based on analysis in Japan after the first field survey. During the period of August 29 – September 6, 2015, the Survey Team visited Timor-Leste to explain the draft of preparatory survey report, and then completed this report.

(1) Facility Plan

In accordance with the master plan for development of Hera Campus, the main building is designed to have a rectangular shape with its longer axis running along the east to west, and to have an void, staircases and slopes in the center of building footprints to reduce solar radiation.

The facility plan will include classrooms, which are currently insufficient in terms of number and size; lecturers' rooms, for which temporary buildings are currently used; laboratories for the Department of Petroleum and Geology Engineering, which currently has only one preparation room; laboratories for the Department of Information Engineering, which currently uses laboratories of other departments; library without space for further expansion at the current one; lecture theaters, which do not currently exist; and so on.

Necessary number of classrooms will be planned in accordance with curriculum of each of the five departments on the assumption that the number of students per class is 40, which is same at the present. Large classrooms will be planned to accommodate 80 students, which is the number of enrolment of each year in every department, as in some lectures, all students of same year may attend at once. The size of libraries has been determined by forecasting the future increase of the number of general books and academic thesis. The libraries will have general reference space as well

as computer space where students can refer various form of materials. Auditorium will have stepped section, and a seating capacity of 400, which corresponds to one entire year group of students in the FEST future plan by 2025.

(2) Equipment Plan

The Survey Team discussed with UNTL in Timor-Leste and obtained their request of necessary equipment. Based on the request, the Survey Team classified those equipment into two categories: equipment necessary for classrooms and other general rooms, such as computer, projectors and other items and educational equipment that is necessary for practice of undergraduate courses. The equipment necessary for the new laboratories of the departments of Information Engineering and Geology and Petroleum Engineering shall be planned as educational equipment of undergraduate courses. The minimum replacement and addition of the existing equipment shall be planned for three departments of Mechanical Engineering, Civil Engineering and Electrical and Electronics Engineering, on the assumption that the equipment procured shall be installed in the existing laboratories.

Table Ⅱ lists components that will be subjected to this grant aid cooperation project.

Table Ⅱ: Summary of the Project Coverage

<table>
<tr><th></th><th>Summary Plan</th></tr>
<tr><td>Facilities to be constructed</td><td>
(1) Facilities:
<table>
<tr><th>Buildings</th><th>Category</th><th>Total area</th><th>Structure of main part, floor number, etc.</th></tr>
<tr><td>Common & office bldg</td><td>new</td><td>1,935 sqm</td><td>RC structure, two-story</td></tr>
<tr><td>Classroom bldg</td><td>new</td><td>6,078 sqm</td><td>RC structure, three-story</td></tr>
<tr><td>Substation bldg</td><td>new</td><td>60 sqm</td><td>RC structure, one-story</td></tr>
<tr><td>Machine room bldg</td><td>new</td><td>25 sqm</td><td>RC structure, one-story</td></tr>
<tr><td colspan="2">Total</td><td>8,098 sqm</td><td></td></tr>
</table>
(2) Ancillary facilities:
・Electrical system: power supply system (receiving, transforming and distributing systems), emergency power generator, lighting fixtures and socket outlets, communication system, broadcasting system, fire detection system, and arrestor)
・Machinery equipment: air-conditioning and ventilation systems
・Water supply and drainage systems: sanitary fixtures, water supply system, drainage system, and fire-extinguishing installation)
</td></tr>
</table>

Equipment to be procured	(1) Fittings and equipment for new buildings: PC equipment, printer, projector, screen, etc. (2) Educational equipment for undergraduate courses: Draft chamber, electric oven, ph meter and a set of practical equipment for chemistry used for research activities (3) PC laboratory for Information Engineering: Desktop PC, network equipment, etc. (4) Laboratory for Geology and Petroleum Engineering: Minerals or crystals replica, jaw crusher, binocular microscope with camera, field measuring equipment, etc. (5) Laboratory for Mechanical Engineering (existing building): Replacement and additional equipment necessary for the fields for material testing, mechanical processing, energy conversion and automobile among the existing educational equipment for undergraduate course (6) Laboratory for Civil Engineering (existing building): Replacement and additional equipment necessary for the fields for Concrete, Asphalt, Field measurement and Structure among the existing educational equipment for undergraduate course (7) Laboratory for Electric and Electronics Engineering (existing building): Replacement and additional equipment necessary for the fields for Analog/digital circuits, Electrical facilities, Control, Power electronics and Communications among the existing educational equipment for undergraduate course

4. Project Schedule and Estimated Project Cost

According to the facility size, local circumstances affecting the construction work, the budgetary schemes of the governments of Japan and Timor-Leste, schedule of preparation of the project site and other factors, the Project will continue for approximately 29 months (8 months for detailed designing and tender, 18 months for construction of the buildings, and 1 month for installation of equipment). The estimated project cost of the Project to be covered by the government of Timor-Leste is approximately JPY 22.9 million.

5. Project Evaluation

(1) Relevance

The Project is considered reasonable as a project of Japanese grant aid from the following perspectives.

1) Beneficiaries of the Project

The Project will target the Faculty of Engineering, Sciences and Technology of UNTL in Hera, the city of Dili, and its direct beneficiaries are approximately 1,200 students of the faculty (FY2015) who use facilities and equipment to be upgraded under the Project. UNTL, a sole national university in Timor-Leste, is proud of the highest academic level in the country, and the tuition fees are inexpensive compared to private universities, therefore it has students from all over the country. Such students of the entire country can be regarded as beneficiaries of the Project. Moreover, graduates from UNTL mainly work for governmental ministries and agencies in charge of roads, electricity, communications and other kinds of infrastructure encouraged by the government of Timor-Leste, public and private companies in the similar fields, as well as public educational

institutions. For this reason, the entire land and people of the country can be regarded as beneficiary of the Project. Thus, the Project covers a wide area and a large number of people, and its importance is considered to be high.

2) Human Security

This Project aims to improve the academic environment of FEST of UNTIL, the sole national university in Timor-Leste. Thus, the Project will contribute to development of human resources who will help improve the infrastructure of the country and replenishment of teaching staff members in public institutions, who are currently insufficient. In this sense, the Project is compatible with the perspective of human security and thus is considered to be a project that directly helps the people to improve their livelihoods.

3) Contribution to Achievement of the Goals in the Mid- to Long-Term Development Plan of Timor-Leste

This Project is expected to directly improve the function of UNTL as the sole public higher educational institution, and directly contribute to improvements in various aspects including the quality of teachers at primary/secondary schools, infrastructure and oil industries. Accordingly, the Project is considered as highly relevant.

(2) Effectiveness

Expected effects of the Project are as follows;

1) Quantitative Effects

Table Ⅲ: Quantitative Effects

Indicator	Reference value (FY2015)	Target value (FY2021) [3 yrs after completion of the Project]
No. of students at FEST of UNTL	1,201 students	1,400 students
Number of graduate research papers at FEST of UNTL	0 ※	300 papers/year
Floor area per student	5.6 ㎡/person	10.2 ㎡/person

※The graduate system is upgrading from a 3 years to a 4 years course. Currently, for the year 2015, the number of research papers pertaining to the new system have not been submitted.

2) Qualitative Effects

・Implementation of quality and practical education, development of human resource that contributes to economic development.

Contents

Location Map

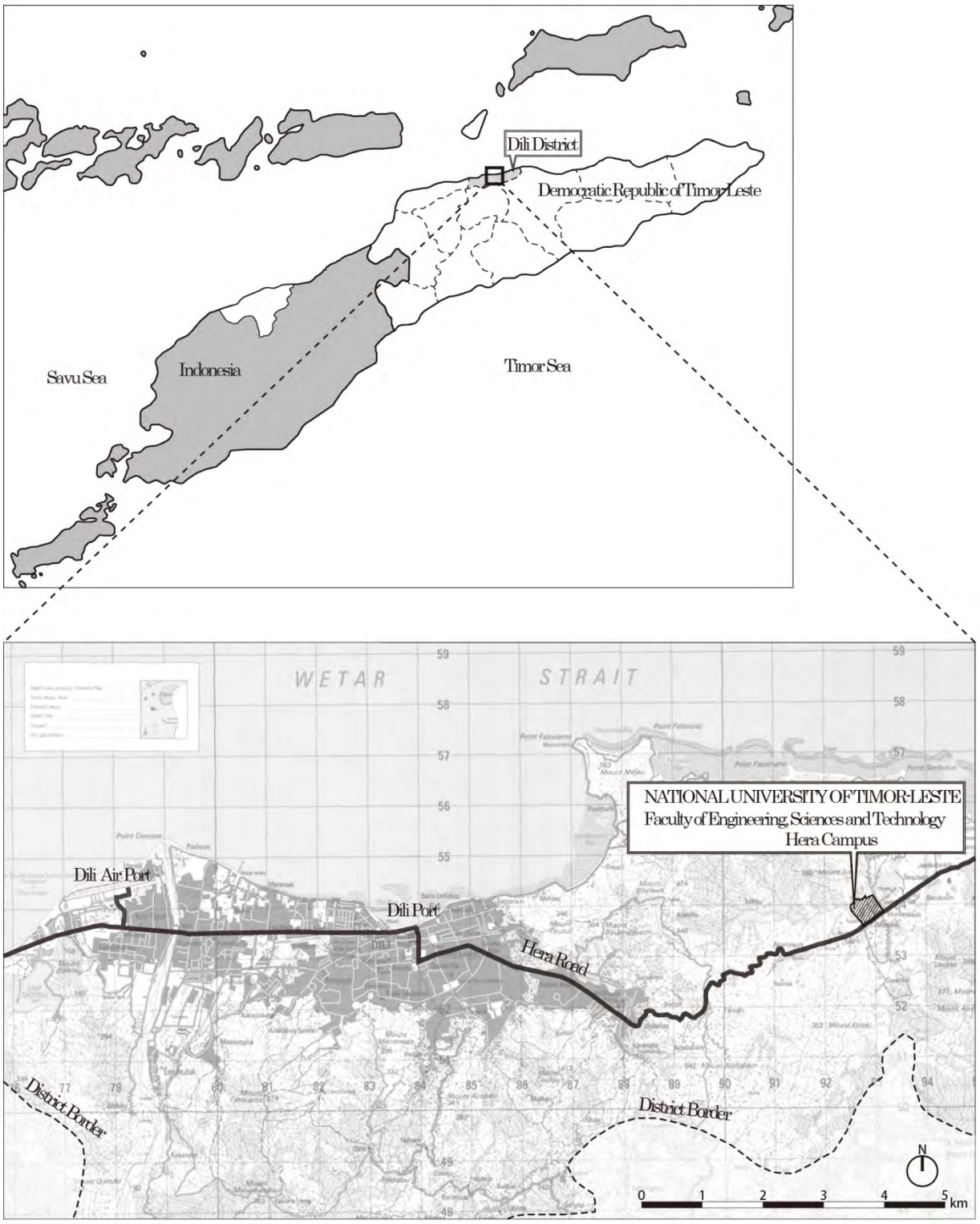

Figure i : Map of the Democratic Republic of Timor-Leste, and Project site map.

Perspective

Figure ii : Image of the Building Entrance

Figure iii : Birds' Eye View of the Campus

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Abbreviations

ANAAA	National Agency for Academic Assessment and Accreditation
CFTL	Consolidated Fund Timor-Leste
CNIC	Centro Nacional Investigacao Cientifica
FAO	Food and Agriculture Organization
FEST	Faculty of Engineering, Science, and Technology
GDP	Gross Domestic Product
HCDF	Human Capital Development Fund
IF	Infrastructure Fund
JICA	Japan International Cooperation Agency
NER	Net Enrollment Rate
SDP	Strategic Development Plan
UNDP	United Nations Development Programme
UNTL	National University of Timor-Leste

Chapter 1 Background of the Project

Chapter 1. Background of the Project

1-1. Background of the Project

The Democratic Republic of Timor-Leste (hereinafter referred to as “Timor-Leste) suffered from severe damage amid confusion and tension before the official independence in 2002. More than 70% of the physical infrastructure including educational facilities were destroyed at the time. In 2005, the Petroleum Fund of Timor-Leste was established, and since then the country’s economy has been steadily growing thanks to oil income, which helped the country stabilize its security situation and in 2012, a general election was successfully held. Accordingly, the United Nations Integrated Mission in Timor-Leste, which had supported the government of Timor-Leste in consolidating stability since 1999, completed its mandate and left the country at the end of 2012, and the country is now shifting from the stage of national reconciliation to construction of bases for economic and social development. Dispite of the booming economy, which heavily depends on the oil industry, and accounts for about 80% of the GDP, the country’s non-oil industries remain fragile and need to be improved urgently. However, limited human resources and basic infrastructures (electricity, telecommunications, etc.) interfere with appropriate economic and social development. As for human recources, 65% of the working population does not complete primary education and university graduates accounts for 5% only. In such circumstances, in 2011, Timor-Leste published a Strategic Development Plan (SDP) 2011-2030, a mid-term plan covering the period until 2030, which aspires to become an upper middle income country by 2030. The SDP 2011-2030 shows that the country will attempt to reduce excessive reliance on petroleum and establish core industries; focus on agriculture, tourism and oil industries; and emphasize the importance of human resource and infrastructure development. As for human resource development, the country decided to improve public education and scholarships to international educational institutions.

Timor-Leste currently encourages higher education through granting funds for studying abroad and improving the quality of domestic universities. There are eleven higher educational institutions including the country’s sole national public university, the Universidade Nacional de Timor-Lorosa’e (UNTL). The educational quality of UNTL is higher than any other institutions in Timor-Leste but far from the international standard. Upgrading of the Faculty of Engineering, Science and Technology (FEST) of UNTL is a key to development of core infrastructure (electricity, telecommunications, etc.) and improvement of public education. In this regard, the Government of Japan has provided urgent rehabilitation of its facilities (2001-2003) and implemented technical cooperation projects to improve the capacity of teaching staff of the faculty and the quality of education (2006-2010 and 2011-2016). In 2012, meanwhile, the faculty extended its programs from three years of study to four years, and increased the number of academic departments from four to five, but has insufficient number of buildings to accommodate the increased number of students. In such circumstances, the government of Timor-Leste formally requested the Government of Japan to provide grant aid cooperation to develop facilities of FEST of UNTL. Requested Items are as follows:

Table 1-1: Requested Items

Facilities	・Three-story building: approximate total of 9,000 sqm. (classroom, lecturers' room, meeting room, research project lab room, study area, clean room for precise equipment, temperature and humidity testing room, multipurpose room, lecture theater room, etc.) ・Two-story library: approximate total of 3,000 sqm. (library, reference corner, reception & office, storage for books, study area, lecture theater)
Equipment	・Equipment necessary for building facilities (temperature and humidity control system, dust control system, etc.) ・General-purpose equipment necessary for education at FEST (projector, screen, whiteboard, desk and chair, etc.)

1-2. Social and Environmental Considerations

（１）Environmental permits for Hera Campus Master Plan

According to UNTL, the environmental permits and approvals necessary for the Master Plan covering the entire Hera campus have already been submitted and are in progress. If these permits and approvals are issued, it will be unnecessary to apply for the environmental permits and approvals for the construction of new buildings so long as the construction plan complies with the development plan of the Master Plan.

（２）Procedures to apply for environmental permits in Timor-Leste

Table 1-2 lists laws and regulations related to environmental and social considerations.

Table 1-2: Environmental Laws and Regulations in Timor-Leste

Law	Summary
Decree Law No. 26 /2012 BASIC ENVIRONMENTAL LAW	A law stipulating fundamental rules for environmental protection. It pursues to prevent destruction of ecological systems due to development of natural resources and national land, and maintain a balance. The law also serves as a legal foundation of the country for environmental protection that complies with the relevant international agreements so that the country assumes responsibility and plays a certain role in the international society.
Decree Law No. 5 / 2011 ENVIRONMENTAL LICENSING	A law stipulating the procedures for environmental impact assessment (EIA) in Timor-Leste. It categorizes development projects, requires developers to conduct EIA and formulate environmental management plan (EMP) for certain categories, and requires the relevant authorities to issue environmental permits for projects in certain categories.

In Timor-Leste, the above-mentioned environmental permits need to be obtained for the implementation of construction works. For projects in Category A, conduct scoping, prepare terms of reference (TOR) and undergo an assessment of National Directorate for Environmental (NDE) (which takes at a maximum of 15 days). Then, prepare an environmental impact statement (EIS) and an environmental management plan (EMP), and submit them to NDE for assessment, which is followed by public consultation, and execution of EIS and EMP. All this requires a maximum of 50 days. After having relevant licenses issued, conduct monitoring.

For projects in Category B, prepare a simplified environmental impact statement (SEIS) and an EMP, and submit them to NDE for assessment, which is followed by public consultation (optional), and execution of SEIS and EMP. All this requires a maximum of 30 days. After having relevant licenses issued, conduct monitoring. Projects in Category C require no particular procedures to be made.

Considerations for each category is shown in table 1-3.

Table 1-3: Categories of Environmental and Social Considerations

Category A	Projects which are likely to have a significant adverse impact on the environment
Category B	Projects whose impacts on the environment and society are less adverse than those of Category A projects
Category C	Projects which are likely to have minimal or little adverse impact on the environment and society

(3) Environmental and social considerations of the Project

The environmental and social situations of the project site, which is summarized in Table 1-4 below, were confirmed by the authorities concerned.

Table 1-4: Environmental and Social Situations of Project Site

	Item	**Survey findings**
Anti-pollution measures	Air quality	Dust generated during construction will be able to be reduced by temporary fence and/or water sprinkle. After completion, volume of exhaust gas from vehicle carrying the student, whose number is planned to increase will increase. Though smoke generates because of incineration of the waste, it is deemed that it is minor.
	Water quality	Deep well developed by Emergency Grant Aid in 2003 has been used as main water source in Hera campus. It is confirmed that the well will be able to cover demand of the future expansion of FEST and has acceptable water quality.
	Waste	External businesses collect and incinerate general waste in Hera campus.
Natural environment	Weather	Hera area is located in the northern coastal region which is in a tropical monsoon. The area has the rainy season between November and April, and the dry season between June and September. Throughout the year, the temperature and humidity are high: the maximum temperature is 30-32 °C and the minimum temperature is 18-22°C with the average humidity of 60-80%. Wind directions vary depending on the season. Wind blows northwesterly in the rainy season and northeasterly in the dry season.
	Protected area	There is no protected area near Hera Campus.
	Ecosystem	The project site is an already developed land with secondary forest.
	Hydrology	Although the north side of the Project site is low in altitude and prone to floods, the construction site is relatively high in altitude and is less likely to be inundated by nearby rivers.
	Topography and geology	Geologically, the project site is on the Australian continental plate where the bedrock is made of accumulated lime. The surroundings of the project site are on a alluvial plateau with a number of rivers.
Social environment	Resettlement	Although there are residents occupying illegally in the Hera campus, the Project won't affect them.
	Local economy and livelihood	Residents occupying illegally in the Hera campus are mainly staff of the Faculty.
	Transport	Hera Campus is located in front of National Route A01 (Hera road) runs from city center of Dili to Hera campus. As public transportation a mini bus makes three round trips only. Trucks carrying students on rear decks also run.
	Cultural heritage	There is no cultural heritage near Hera Campus.
	Landscape	Faculty buildings destroyed during crisis in 1999 remain. Abandoned land in Hera campus is covered by weeds.

Chapter 2 Contents of the Project

Chapter 2. Contents of the Project

2-1. Basic Concept of the Project

2-1-1. Basic Concept

UNTL recognizes the importance of its presence in Timor-Leste and has formulated a strategic plan 2011-2020 to meet the international standard by 2020. As part of the strategy, UNTL formulated a master plan aiming to transfer all the faculties to Hera campus to improve the learning environment, and is currently planning buildings for the Faculties of Agriculture and FEST at its own expense. In this context, the new Grant Aid Project is aimed for "improving the learning environment of FEST" with overall goal of "UNTL becoming a university of the international standard by 2020".

To achieve the project objectives and goals for FEST, the Project consists of two buildings and procurement of equipment, corresponding to the facilities to be up-graded. The improved learning environment can accommodate demand for increased number of students, according to the strategic plan of FEST by 2025 (from 1212 in 2014 to 1600 in 2025).

The basic concept of the Project is to construct new buildings for FEST, UNTL and procure educational equipment, thereby contributing to an improvement in the learning environment and industrial human resources development of Timor-Leste. Specifically, the Project will build new buildings for FEST and procure equipment for the facilities.

2-2. Outline Design of the Requested Japanese Assistance

2-2-1. Design Policy

2-2-1-1. Basic Policy

（1）Basic Policy

Basic design policy is as follows;

- Consider the present situations and activities of FEST and existing facilities to make the scoping, size and contents of new facilities and equipment reasonable and appropriate for the management capacity.
- Consider consistency and a sense of unity with the Master Plan for the development of FEST Campus, and avoid redundancy with other projects. As pursued by the Master Plan, aim a refined exterior design so that the students, the teaching and administrative staff can be proud of the university.
- Consider heat insulation, ventilation and sun protection, to offer comfortable education and office environment against intense heat. Also, examine energy saving measures, which reduce the running costs of air conditioning and lighting systems.
- Install universal WC and slopes considering accessibility for people with disabilities according to the Japanese standards.
- Make maximum use of the limited land area provided for the Project.
- Consider pedestrians, the approach to the buildings should be recognizable, and accessible.
- Pay attention for easy maintenance suitable for current maintenance system of FEST.
- Since the construction work will take place while the existing facilities are being used, minimize the impact of construction such as vibration and noise. Assure safety of studnts/ staff

and appropriate educational environment.

- For the equipment plan, consider the present situations of existing equipment, and budget, technical level and capacity of operation and maintenance works of FEST to make the scope, size and contents of new facilities and equipment appropriate and efficient. Also, consider that FEST is to procure spare parts by themselves.

（２） Target facilities

・Future plans of FEST of UNTL

It has been confirmed that FEST has short-term, and medium- and long-term strategic plans, and this grant aid project will be addressed to the needs of its short term plan. It has also been confirmed that in FEST's short term plans of "Strategic Development Plan (FEST-UNTL) Hera Campus 2015-2025", the number of teaching staff will increase from 79 to 99 and that of students from 1212 to 1600 (40 students in each class, two classes in each academic year in each department).

Table 2-1 : Strategic Development Plan (FEST-UNTL) Hera Canpus 2015-2025

	2014	2025	After 2025
No. of departments	**5**	**5**	**7**
（Total No. of staff including teachers）			
No. of Academic staff	**79**	**99**	**152**
No. of Teachers	78	88	126
No. of Technicians	1	11	26
No. of Administration staff	**23**	**42**	**68**
Department Admin staff	9	13	19
Faculty Admin staff	14	29	49
No. of Students	**1212**	**1600**	**4480**
（No. of rooms）			
Teachers' rooms	5	30	43
Classrooms	18	20	52
Laboratories	10	18	28

Source：Presentation by Dean of FEST

・ Target facilities

The Project includes the construction of the facilities that are currently insufficient at FEST, to satisfy the needs of the expansion plan of FEST in 2025.

Facilities and functions including classrooms that are insufficient in terms of the number and size; teaching staff rooms that are using temporary buildings; and an auditorium that does not exist in the current FEST campus.

There is no room for expansion within the existing library, which contains all the functions of a library, such as open shelves, reception, work areas for administrators and librarians, computer and reading area in a size of a classroom. Thus, it cannot accomodate for future expansion, such as expansions in the reading and self-studying area as a result of an increase in the number of students or an increase in the number of shelves to meet an increase in the number of books and academic theses, and so on.

As for laboratories, Departments of Mechanical Engineering, Civil Engineering and Electrical and Electronic Engineering have enough room in the existing buildings, with minor modifications. On the other hand, the Department of Geology and Petroleum Engineering has currently a preparation room of only 36 m^2, so a laboratory for the department will be constructed under the Project. Laboratory for the Department of Information Engineering, a newly created department in 2008, occupies

classrooms in the Electrical and Electronic Engineering workshop building. The number of students per class will exceed current room capacity, in the future. Thus, laboratories for this department will be constructed under the Project.

Other than these, there is no building or facility in the faculty, which is suitable for installation of precise measurement equipment, so a research laboratory suitable for keeping sophisticated analytical machinery will be constructed under the Project.

Table 2-2 below lists facility components of the new buildings and functions which major existing buildings will be equipped.

Table 2-2 : Functions after completion of the Project

Facilities		Functions
New buildings（Grant Aid）		Classrooms：Classrooms、Large classrooms etc Laboratories：Laboratories（Geology and Petroleum Engineering, Information Engineering）、Computer Laoratories, Drafting room etc Library：Reference room、Open shelves etc. Meeting：Auditorium, Meeting rooms Administration：Lecturer's rooms, Administrative office, Printing room etc.
Exsiting Buildings	Existing department of technology building	Seminar room, Study room, Guest lecturer's room, Students affair, Cleaners' office
	Temporary building for staff	Do not rely on this function as it is a temporary building.
	Mechanical engineering workshop building	Laboratories, Thesis room, Lecturer's room for Mechanical Engineering
	Civil engineering workshop building	Laboratories, Thesis room, Lecturer's room for Civil Engineering
	Electrical & electronic, and Information Engineering workshop building.	Laboratories, Thesis room, Lecturer's room for Electrical & electronic, and Information Engineering
	Canteen	Canteen

（３） Selection of the Project Site

・ Situations of the site

Figure 2-1 illustrates the future block plan of the area including FEST. The Faculty of Agriculture, is created by a Spanish design company commissioned by the Government of Timor-Leste in accordance with the Master Plan for the development of Hera Campus. The planned site and facility layout of the Project must be determined in conformity with both the Master Plan, and the present existing facility layout, at the same time, because it is uncertain when the development of the overall infrastructure on campus is put into execution, the Project will provide infrastructure facilities independently of any other facilities.

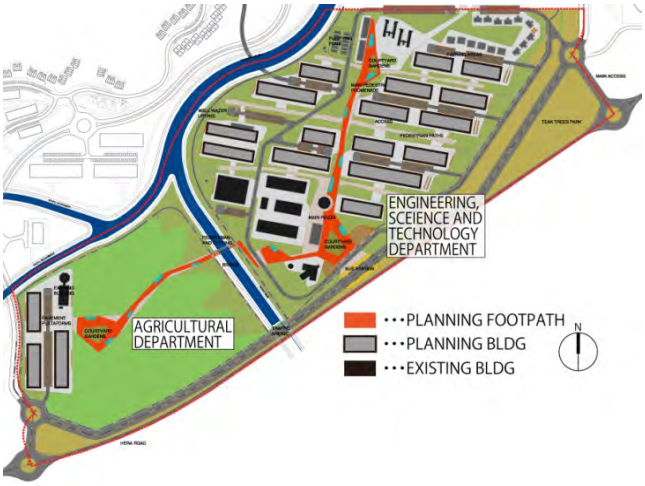


Figure 2-1: FEST and Faculty of Agriculture Campus Improvement plan

Source： UNTL infrastructure plan by Bernabad

Figure 2-2 shows the situation of the planned site under the Project.

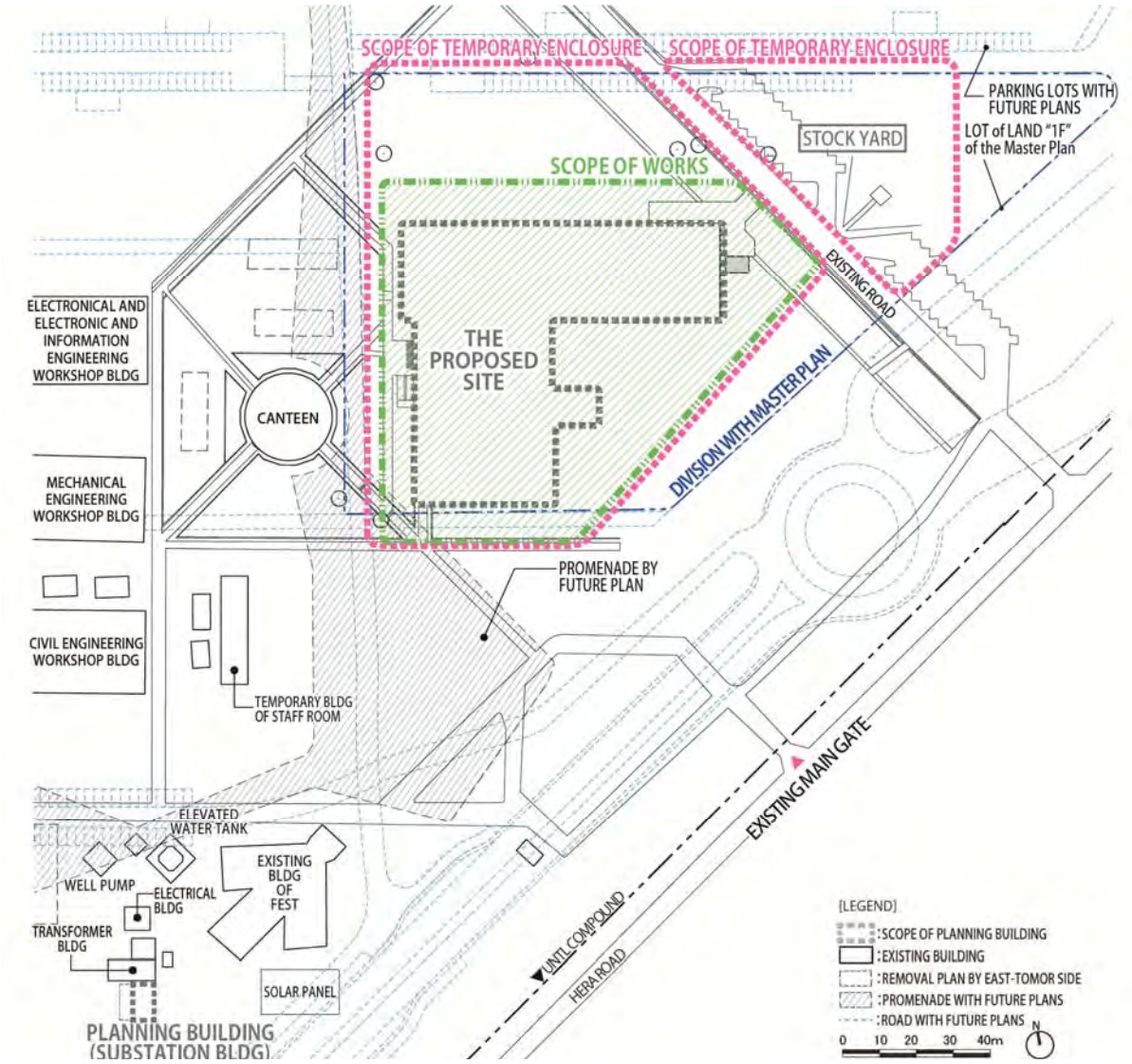


Figure2-2: Conditions of Projec site

The proposed site is a lot of land on "1F" of the Master Plan, and it was confirmed that the site is large enough for the construction of the new facilities considering the existing road. The site is easily accessible from the existing buildings of FEST, workshop buildings and the gate to the university. It also faces the center of the faculty campus together with the canteen, and thus is highly visible from anywhere on the campus. The trunk cables for electricity and water supply are all located near the construction site, so it is easy to secure the construction site. At the same time, there is vacant land in the east of the site, which can temporarily be used as workplaces during construction period.

Consequently, the site proposed by UNTL is concluded to be appropriate for construction of the new buildings for the faculty.

2-2-1-2. Policy for Natural Conditions

（1） Considerations on Natural Environmental Conditions

The project site is mostly in hot and humid climate. Thus, the construction of facilities will give priority to reduce heat load. Specifically, solar radiation through windows will be reduced, and

natural ventilation will be promoted. Connecting passageways and outdoor lobby will be equipped with roofs for protection from the sunlight.

(2) Measures against rain and high humidity

The site is moldy because of rain and high humidity, and exterior walls and eaves have deteriorated and got fouled. Materials for external finishing will be selected in consideration with these climate conditions. At the same time, openings and air-conditioning will be designed to control entry of dust.

2-2-1-3. Policy for Socio-economic Conditions

(1) Reductions in operating and maintenance costs

The following policies will be incorporated to secure the operating and maintenance (O&M) costs for many years and save resources and energy.

(i) Preferentially adopting LED lamps and other electric bulbs that consume less electricity and live longer for lighting fittings.

(ii) Preferentially adopt locally common and simple methods so that local third-party businesses can engage in O&M work.

(2) Consideration to the multi-lingual environment

Several languages are spoken in Timor-Leste, so displays and sign boards of the building will be designed in consideration of those local languages.

2-2-1-4. Policy on Construction Conditions

Timor-Leste has no particular law or regulation on construction works. Construction projects adopt standards of Indonesia, Australia, Portugal or elsewhere at the discretion of consultants in charge. Thus, Japanese standards can be adopted. The Project will be designed in conformity with these standards.

2-2-1-5. Policy on Procurement Conditions

Timor-Leste has no particular industrial standard. Majority of constructional materials are products imported from neighboring countries in Asia, Australia and elsewhere. The Project will use locally common work methods and materials in consideration of such circumstances.

Of materials and equipment to be procured under the Project, computer-related materials and equipment, photocopy machines and similar equipment will be in principle locally procured for easier maintenance. Products of Japanese or western manufacturers having distributors in Indonesia will be selected for learning materials and equipment, which will be procured in Japan or third countries. As for audio visual equipment including projectors and acoustic instruments, connections to facilities and other equipment must be carefully considered even at the designing stage. Thus, they will be procured via agents of Japanese manufacturers that can organize audio visual systems.

2-2-1-6. Policy on Use of Local Contractors

In Timor-Leste, locally registered global construction consultants and contractors are available and there are many facilities constructed by them with local public and private organizations. Development assistance projects such as grant aid projects, including Japan, have also used those

consultants /contractors. The Project will make maximum use of these companies in order to take smooth and effective operations.

2-2-1-7. Policy on Operation and Maintenance

The Project has no particular plan of stationing Operation and Maintenance (O&M) engineers at the facilities to be constructed, thus will not adopt any equipment that is not locally common and requires advanced O&M engineers. As for equipment that requires regular maintenance, select products whose consumable supplies and service parts can be easily procured locally and the O&M costs may not disturb the management of the facilities.

Currently, FEST of UNTL has neither administrative department in charge of maintenance of equipment nor engineering staff and technicians. The faculty has requested the UNTL headquarters to dispatch technicians for O&M work, but an urgent task for the faculty is to establish an administrative department in charge of maintenance. FEST was requested to create an O&M action plan for of the facilities and equipment, which is cited in an appendix of the M/M.

Along with this, consider implementation of detailed primary training on O&M as a part of the Project, or support through technical cooperation project currently carried out, so that FEST can receive full advantage of the facilities and equipment. Meanwhile, on the selection of equipment, it is reasonable to avoid equipment which requires advanced maintenance skills, or which uses spare parts or consumable supplies that are difficult to be obtained locally.

2-2-1-8. Policy on Grade Setting for Facilities and Equipment

The grades of facilities will be determined by referring to those in similar settings in Timor-Leste, those in other universities constructed with Japan's assistance, and those in public entities. At the same time, priority will be given to the durability and easiness of O&M work for a university. The Project will also adopt construction methods that are recently common in Timor-Leste, and construction materials that are easy to be used, operated and maintained with high durability.

As for the grade of equipment, equipment that can be operated by present local staff and maintained via agents in Indonesia will be selected.

2-2-1-9. Policy on Construction Schedule

The construction schedule will be determined in consideration of potential impacts of the rainy season, hot periods, and other local circumstances. If the planned ground level needs to be determined in conformity with the Master Plan for the development of Hera Campus, the construction schedule will include the period necessary for the land reclamation work.

2-2-2. Basic Plan (Construction Plan / Equipment Plan)

2-2-2-1. Site and Layout Plan

（1） Building form

In accordance with the the Master Plan for the development of Hera Campus to minimize the effects of solar radiation, the shorter sides of the rectangular shaped buildings are to be placed along east and west side. Furthermore, it contains central void connected with stairs and ramps to allow ventilation.

（２） Function

The two buildings (Common & Office Building, and Classroom Building) is connected by corridors as shown in Figure 2-3.

Common & Office Building contains Library on the first floor and Auditorium on the floor above, requires long span structure resulting column-free space. On the other hand, Classroom Building contains rooms necessary for under graduates. On the first floor, there are laboratories which use water and need plumbing work. Rooms for computers are placed on the second floor to avoid sand dust. On the third floor, there are rooms for lecturers. Administration office of FEST is located on the first floor of Common & Office Building.

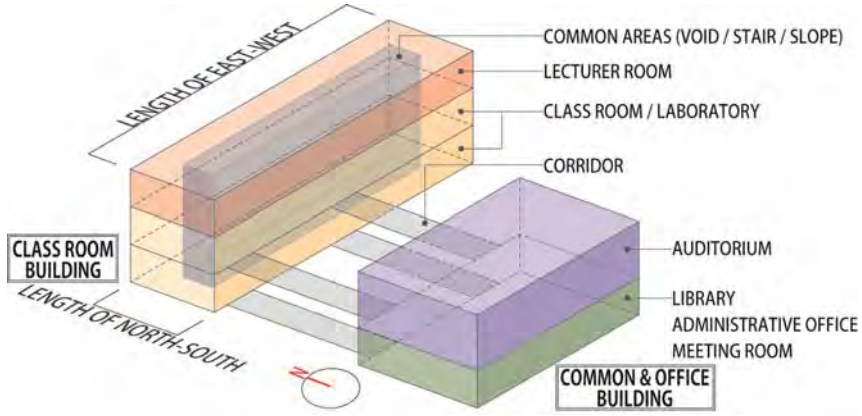


Figure 2-3: Functional concept

（３） Zoning and access plan

The access of students, lecturers, visitors, and service confirmed with UNTL is as follows.

- Location of the buildings: Common & Office Building is placed next to the existing canteen, which is also the center of the compound. The approach to the new facilities is at an easy access from the main entrance gate as well as from the other existing buildings. This is because these new buildings contain common rooms such as a library and an auditorium which will not only be used by the students but also visitors. Classroom Building, which requires quiet atmosphere is placed on the north side connected by corridors with the Common and Office Building.

- Access: The main entrance of the new buildings is facing the canteen keeping in view the access from the exsiting buildings. Even though the location of the main gate of the campus will be relocated in the future, the entrance of the building is still facing the promenade that runs through the centre of the campus. The vehicle entrance of the new building is located on the north east side , adjoining the existing road. This existing road leads to the residential area from a sub gate of the campus.

- Safety management during the construction： To secure the safety of students and staff of the university, enclose the construction site clearly. Ensure that vehicular movement and labours circulation does not intersect during construction period.Use the exsisting road at the back for vehicle entrance.

・ The layout is shown as below Figure 2-4.

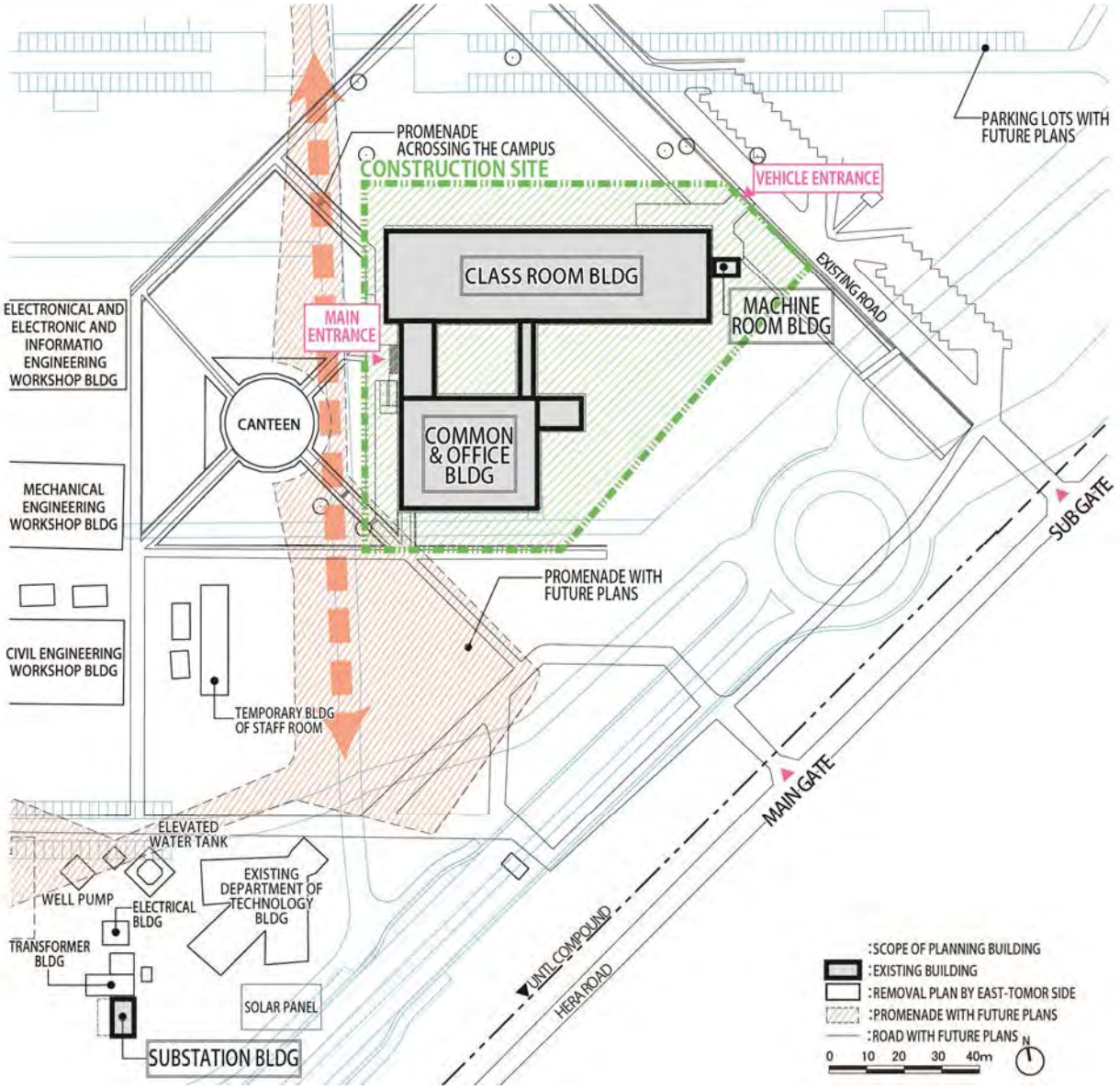


Figure 2-4 : Layout Plan

2-2-2-2. Facility Plan

(1) Floor plan

1) Facility components

Facility components have been designed in accordance with discussions with local parties concerned.

For smooth mobility among floors of the west-east long classroom building, three staircases will be installed. The common and administrative building will be designed compactly and thus equipped with one staircase. These two buildings will be connected with corridors on the second floor level for higher accessibility from classrooms to the auditorium and library. In front of the auditorium is a lobby which will be designed to be semi-open so that students and visitors can gather.

The Corridor of the Classroom Building will have open ceilings and slopes as presented in the

UNTL Master Plan. This will make the buildings comfortable with natural light and breeze. Each classroom will have openings not just to the outside but to this indoor open area to offer comfortable learning atmosphere with great care of air flow and ventilation.

The area efficiency will be improved by placing the two buildings close enough and linked to each other via corridors. This will also make it possible to install slopes that can be used from both sides. The corridors with large eaves will be designed to link the entrances of the buildings so that the corridors themselves can serve as a place to escape from extreme heat and abrupt rain, and to communicate with people.

The administrative sections (including teaching staff rooms) of the departments will be placed altogether on the third floor of the Classroom Building to facilitate communications among these academic departments.

The machine room and other administrative rooms will be placed altogether on the northeast corner, which is accessible to vehicles.

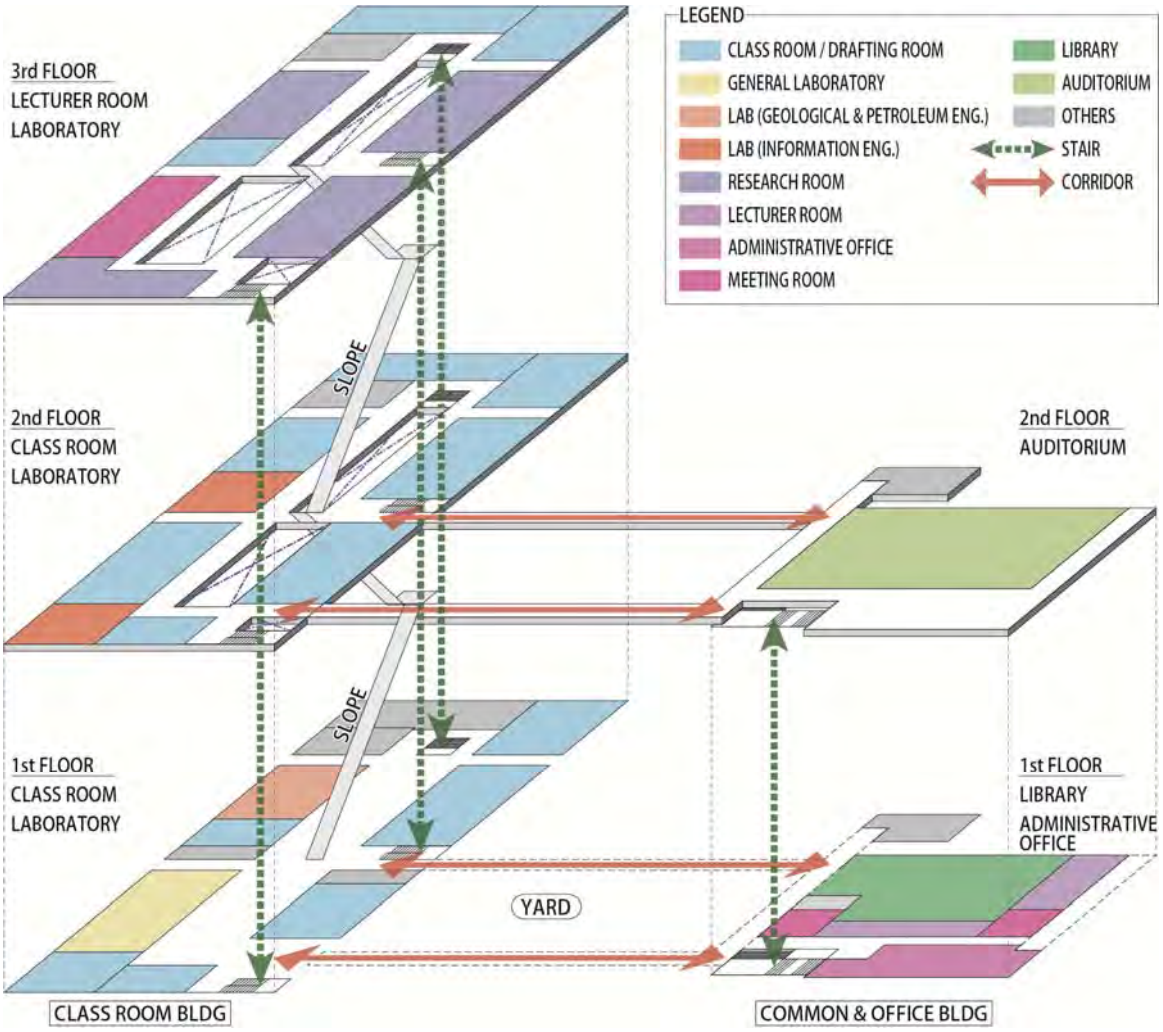


Figure 2-5 : Functional Diagram

2） Function and necessary facilities

The main components against activities of UNTL are in below tables 2-3、2-4、2-5.

Table 2-3: Rooms in Common & Office Building

Department	Room	Area	Usage, Function, Area, The basis of calculation, Attaching facilities
Library	Library	293 ㎡	Enables to store 13,000 books.Contains reference room, PC space, reception counter and locker
	Librarian room	20 ㎡	Office room for the librarians
Administration	Administrative office	58 ㎡	Office room
	Chief administrator office	10 ㎡	Office room
	Dean room	40 ㎡	Includes reception area, office room, and exclusive WC
	Print room	20 ㎡	Necessary area for printers and cabinets
	Recept office	75 ㎡	Office room, including reception counter and waiting area
	Secretariat	40 ㎡	Office room with a pantry
	Vice dean room 1～4	20 ㎡ each (Total 80 ㎡)	Office room
	Meeting room 1,2	40 ㎡ each (Total 80 ㎡)	Each meeting room is for 26 people
	Auditorium	554 ㎡	A stepped floor auditorium for 400 people
Common	WC	127 ㎡	WC for men,women, and universal in each floor
	Corridor, Storage, Machine room etc	538 ㎡	Storage (17 ㎡), Machine room (108 ㎡), Corridor(413 ㎡)
Total		1,935 ㎡	

Table 2-4: Rooms in Classroom Building

Department	Room	Area	Usage, Function, Area, The basis of calculation, Attaching facilities
Common class room, General	Class room 1～15	66 ㎡ each (Total 990 ㎡)	Each room is for 40 people
	Class room（L） 1～5	134 ㎡ each (Total 670 ㎡)	Each room is for 80 people
	General LAB 1,2	100 ㎡ each (Total 200 ㎡)	Each room is for 40 people
	Drafting room	100 ㎡	Each room is for 40 people
	PC room 1,2	100 ㎡ each (Total 200 ㎡)	Each room is for 40 people
	Distance learning room	66 ㎡	Each room is for 40 people
	Research PJ LAB	50 ㎡	Place draft chamber
	Prep room for Research PJ LAB	17 ㎡	Preperation room for Research PJ LAB
Geology & Petroleum	Geology & Petroleum workshop	100 ㎡	Each room is for 40 people
	Prep room for Geology & Petroleum	21 ㎡	Preparation room for Geology & Petroleum
	Sample room	12 ㎡	Layout display case and cabinet for fossil specimen
Informatics	PC LAB 1,2	100 ㎡ each (Total 200 ㎡)	Each room is for 40 people

Department	Room	Area	Usage, Function, Area, The basis of calculation, Attaching facilities
Administration	Director room 1～5	20 ㎡ each (Total 100 ㎡)	Office room
	Vice director room 1～5	13 ㎡ each (Total 65 ㎡)	Office room
	Secretariat room 1～5	20 ㎡ each (Total 100 ㎡)	Office rooms for secretaries of directors
	Lecturer room 1～13	33 ㎡ x10 rooms 14 ㎡ x1 room 34 ㎡ x1 room 37 ㎡ x1 room (Total 415 ㎡)	Satisfy the number of expecting lecturers of each department
	Guest lecturer room 1～3	14 ㎡ each (Total 42 ㎡)	Office room for 9 people
	Meeting room 3～5	48 ㎡ each (Total 144 ㎡)	Each room is for 26 people
	Server room	9 ㎡	
Common	WC	176 ㎡	WC for men and women on each floor. WC for the lecturer on the first and second floor. A universal WC on the third floor
	Corridor, Storage, Machine room etc	2,401 ㎡	Storage (120 ㎡), Machine room (82 ㎡), Corridor etc (2,199 ㎡)
Total		6,078 ㎡	

Table 2-5: Other rooms

Building	Area	Usage
Substation	60 ㎡	A facility for leading-in electricity and transformer near the existing FEST building
Machine room buildng	25 ㎡	A facility next to Classroom Building
Total	85 ㎡	

3） Scale of Facilities

・Number of Classrooms

Necessary number of classrooms will be decided in accordance with curriculum of each of the five departments. According to “Strategic Development Plan (FEST-UNTL) Hera Campus 2015-2025”, the number of overall students is to be 1,600, and each academic year is divided into two classes of 40 students per class. However, as the capacity of existing classrooms is only for 25 students, there would be a shortage of the classrooms in 2025. Therefore, the Project will cover all necessary classrooms based on above assumption.

Each necessary studying time in the curriculum is defined as number of unit of subjects, categorized in learning methoda. The learning methods are theory, practice, and self-study. In the class, theoretical instructions and practical study are carried out. The practical study consists of hands-on activity to be held in a specialized practice rooms, drafting rooms, classrooms using computers and some outdoor space.

The daily class schedule is set in each subject individually, but presently, most classes are conducted for two hours per class. Assumed schedule of a day referring the classes of the civil

engineering, as two classes in one academic year is shown in the table below. The necessary rooms is 19 classrooms, two general laboratories for physics as one liberal arts[1], two computer rooms[2], one drafting room[3].

There shall be 20 classrooms[4] considering the class schedule of each subject with one room for adjustment. Regarding a case of lectures for students as one grade year at one time, 5 classrooms out of 20 are to be large rooms capable of accomodating 80 students.

The practical rooms mainly for the 2nd year students and above, the three departments of Mechanical, Civil, and Electrical and Electronic Engineering, have enough area in the existing buildings. Only minor changes in usage is required. However, Petroleum and Geology engineering has only one preparation room of 36 ㎡ currently. At least a laboratory, a preparation room and a sample room are necessary in the new building.

Information Engineering Department was established in 2008. They are using some part of Electrical/Electronic workshop currently. Two rooms for computer practice for the 2nd till the 4th year are necessary in the future by looking at the number of students in one class.

Necessary weekly learning time and classroom occupation time (number of the units) for each course under the curriculum is as follows.

Table 2-6: A model of daily schedule

Hour	Class
8:00-10:00	1st Class
10:00-10:10	Break
10:10-12:10	2nd Class
12:10-13:00	Lunch Break
13:00-15:00	3rd Class
15:00-15:10	Break
15:10-17:10	4th Class

Source : refering the schedule of the Civil Engineering at the time of the survey.

① Department of Mechanical Engineering

In the Department of Mechanical Engineering, machine design lecture that uses drafting room at the 1st term, and all the practice except the CAD (Computer Aided Design) lecture at the 2nd term in the 2nd year are to be carried out in the existing workshop building apart from general education of the 1st year.

[1] As physic classes as a general education at 1st year, uses models for teaching theory. Therefore, it is assumed that both practice and theory are taught in a laboratory.

[2] Assuming the use of year 1-4 of Mechanical, Civil, Electrical Electronic, and Petroleum and Geology departments. As well as computer course of Information Engineering in the 1st year.

[3] Assuming the drafting practice for Mechanical, Civil, and Petroleum and Geology department.

[4] Assuming the use of the lecture class for the year 1-4 of 5 departments.

Table 2-7: Department of Mechanical Engineering
Weekly Learning and Classroom Occupation Time (no. of units)

Year	Term	Lecture	Learning Time (hr/Week)		The total weekly unit number of different types of rooms (unit, 1 unit=2 hours)				
			Theo -ry	Prac -tice	Class -room	Labora -tory	PC room	Drafting room	Special room
1	1	Portuguese I	4		2				
		Tetum I	4		2				
		English I	4		2				
		Basic Mathematics	6		3				
		Phyisics	4	3		3.5			
		Basic Informatics	1	5			3		
	2	Portuguese II	5		2.5				
		Tetum II	5		2.5				
		English II	5		2.5				
		Civic Education, Ethics & Moral	3		1.5				
		Chemistry	6		3				
		Introduction to Mechanical Engineering	5	1	2.5				0.5
2	3	Mechanic Design	1	4				2.5	
		Medication of Magnitude	1	1	0.5				0.5
		Mathematic for Engineering	2		1				
		Thermodynamic	2		1				
		Integrated Project Management	4		2				
		Laboratory Mechanic I	1	7					4
	4	Dynamic Engineering	3	2					2.5
		Welding Technology	3	1	1.5				0.5
		Basic Electricity Technology	4		2				
		Fluid Mechanics	5		2.5				
		Computer Aided Design	1	6			3.5		
		Laboratory Mechanic II	1	6	0.5				3
3	5	Energy Conversion	5		2.5				
		Elements of Machine	5		2.5				
		Heat Exchange	5		2.5				
		Resistance of Materials	5		2.5				
		Maintenance Management	2	3	1				1.5
		Laboratory Mechanic III	1	5.75	0.5				3
	6	Ergonomics & Work Safety	4		2				
		Production of Manufacturing Process	3	2	1.5			1	
		General Mechanic (StatisticsI)	5		2.5				
		Environmental & Energy Management.	5		2.5				
		Economics to Engineering	5		2.5				
		Laboratory Mechanic IV	1	7	0.5				3.5
4	7	The Automation System	4		2				
		Mechanic Vibration	5		2.5				
		Research Methodology	5		2.5				
		Canalization / Piping	3	3	1.5				1.5
		Mechanic Construction Materials	4	3	2				1.5
		Thermal Machine	3	1	1.5				0.5
	8	Supervised traineeship	2		1				
		Proposal and work completion	2		1				
Total number of units of 1st term					37	3.5	3	2.5	12.5
Total number of unit by 2nd term					34.5	0	3.5	0	11

Source : UNTL Curriculum

② Department of Civil Engineering

In the Department of Civil Engineering, all the practical study except general education in the 1st year and civil engineering design lecture carried out in drafting room at 2nd term, are to be held in existing workshop building.

Table 2-8: Department of Civil Engineering
Weekly Learning and Classroom Occupation Time (no. of units)

Year	Term	Lecture	Learning Time (hr/Week)		The total weekly unit number of different types of rooms (unit, 1 unit=2 hours)				
			Theo -ry	Prac -tice	Class -room	Labora -tory	PC room	Drafting room	Special room
1	1	Portuguese 1	3		1.5				
		English 1	3		1.5				
		Tetum 1	3		1.5				
		Basic Mathematics	4		2				
		Basic Physic	4			2			
		Basic Informatics	3				1.5		
	2	Portuguese 2	3		1.5				
		English 2	3		1.5				
		Tetum 2	3		1.5				
		Civic Education, Ethics & Moral	2		1				
		Chemistry	2		1				
		Introduction to Civil Enginering	3		1.5				
2	3	Calculus I	4		2				
		Statistics Applied on Engineering	3		1.5				
		Technique Design	2	4				3	
		Geology Engineering	3		1.5				
		Materials of Civil Construction	2	4	1				2
		General Mechanics I	5		2.5				
	4	General Mechanics II	4		2				
		Topography	3	3	1.5				1.5
		Calculus II	4		2				
		Resistance of Materials	5		2.5				
		Hydrology	2	2	1				1
		Soils Mechanics I	4		2				
3	5	Mechanics of Fluids	3	2	1.5				1
		Mechanics of Soils II	2	3	1				1.5
		Geometric Road	4		2				
		Structural Analysis I	4		2				
		Steel Structures I	4		2				
		Reinforced Concrete Structures	4		2				
	6	Hydraulics	2	2	1				1
		Reinforced Concrete Structures II	5		2.5				
		Steel Structures II	5		2.5				
		Paving Road	4		2				
		Project Management I	4		2				
		Structural Analysis II	4		2				
4	7	Irrigation and Hydro infrastructures	4		2				
		Project Management II	5		2.5				
		Engineering Economy	4		2				
		Foundations	2	2	1				1
		Optional Subjects	4		2				
		Water Supply and Sanitation	3	2	1.5				1
	8	Scientific Methodology & Professional Internship	1	8	0.5				4
		Final Project of Course	2		1				
Total number of units of 1st term					36.5	2	1.5	3	6.5
Total number of unit by 2nd term					32.5	0	0	0	7.5

Source : UNTL Curriculum

③ Department of Electrical and Electronic Engineering

In the Department of Electrical and Electronic Engineering, specified practical study after 2nd year is carried out in both exclusive PC room and existing workshop building.

Table 2-9: Department of Electrical and Electronic Engineering
Weekly Learning and Classroom Occupation Time (no. of units)

Year	Term	Lecture	Learning Time (hr/Week)		The total weekly unit number of different types of rooms (unit, 1 unit=2 hours)				
			Theo -ry	Prac -tice	Class -room	Labora -tory	PC room	Drafting room	Special room
1	1	Portuguese1	3		1.5				
		Tetum 1	3		1.5				
		English 1	3		1.5				
		Basic Mathematics	4		2				
		Fundamental Physics	4			2			
		Basic Informatics	5		2.5				
	2	Portguese 2	3		1.5				
		Tetum 2	3		1.5				
		English 2	3		1.5				
		Civic Education, Ethichs & Moral	2		1				
		Compliment of Physics	4		2				
		Introduction to Electrical Engineering	5		2.5				
2	3	Calculus I	5		2.5				
		Statistic and Probabilidade	5		2.5				
		Electronics Circuits	5		2.5				
		Electric Instalation	2	3	1				1.5
		Technique Design	2	3	1		1.5		
		Basic Program	3	2	1.5		1		
	4	Calculus II	5		2.5				
		Electronics Deposit	4	2	2				1
		System of Linear	4		2				
		Analysis of Signals and the System	5		2.5				
		Electric Materials	4		2				
		Instrument of Electronics	4.5		2.5				
3	5	Analogic Electronics	4	2	2				1
		Digital Electronics	4	2	2				1
		Measurement Electronic	3	1	1.5				0.5
		Electromagnetism	4		2				
		Control System	4		2				
		Electronics practice I	1	3	0.5				1.5
	6	Microprocessor	4	1	2		0.5		
		Numerical Analysis	3	1	1.5		0.5		
		Machine Electrical	4	1	2				0.5
		Power System	3	2	1.5				1
		Telecommunication System	4	1	2				0.5
		Electronic Practice II	1	3	0.5				1.5
4	7	Advanced Program	4	2	2		1		
		Analysisof System Potential	3	2	1.5				1
		System of High Voltage	3	1	1.5				0.5
		Power Electronic	4	2	2				1
		Microcontroler	3	1	1.5				0.5
		Renewable Energy	3	1	1.5				0.5
	8	Project of finalizing the course	30	8	15				4
Total number of units of 1st term					40	2	3.5	0	9
Total number of unit by 2nd term					48	0	1	0	8.5

Source : UNTL Curriculum

④ Department of Information Engineering

In the Department of Information Engineering, specified practical study after 2nd year is carried out in exclusive PC laboratory.

Table 2-10: Department of Imformation Engineering
Weekly Learning and Classroom Occupation Time (no. of units)

Year	Term	Lecture	Learning Time (hr/Week)		The total weekly unit number of different types of rooms (unit, 1 unit=2 hours)				
			Theo -ry	Prac -tice	Class -room	Labora -tory	PC room	Drafting room	Special room
1	1	Portuguese1	3.5		2				
		Tetum 1	3.5		2				
		English 1	3.5		2				
		Basic Mathematics	5		2.5				
		Fundamental Physics	5			2.5			
		Basic Informatics	3	2			2.5		
	2	Portguese 2	4		2				
		Tetum 2	4		2				
		English 2	4		2				
		Ethics & Moral	2.5		1.5				
		Compliment of Physics	5			2.5			
		Introduction to Information Engineering	3	2			2.5		
2	3	Mathematical Analysis 1	4		2				
		Linear Algebra and Ana lytic Geometry	4		2				
		Discrete Mathematics	2	2	1				1
		Digital Systems	2	2	1				1
		Architecture and Organizaion of Computer	2	2	1				1
		Introduction on Programming	2	2	1				1
	4	Mathematica1 Analysis 2	4		2				
		Probability and Statistics	2	2	1				1
		Numerical Methods	4		2				
		Databases 1	2	2	1				1
		Web Programming	2	2	1				1
		Programming Oriented to Objects	2	2	1				1
3	5	System Operation	2	2	1				1
		Multimedia System	2	2	1				1
		Interface Passo and Computer	2	2	1				1
		Databases 2	2	2	1				1
		Computer Network1	2	2	1				1
		Algorithms and Data Estururas	2	2					
	6	Operational Investigation	4		2				
		Theory of Automata	4		2				
		System of Information	4		2				
		Artificial Inteligence	2	2	1				1
		Computer Network 2	2	2	1				1
		Laboratory of Advanced Programming	2	2	1				1
4	7	Research Methodology	4		2				
		Technopreneurship	4		2				
		Software Engineering	4						
		Mobile Computing	2	2	1				1
		Cryptography	2	2	1				1
		Decision Support Systems	2	2	1				1
	8	Project of finalizing the course	3		1.5				
Total number of units of 1st term					31.5	2.5	2.5	0	13
Total number of unit by 2nd term					26	2.5	2.5	0	7

Source : UNTL Curriculum

⑤ Department of Petroleum and Geology Engineering

In the Department of Petroleum and Geology Engineering, specified practical study after 2nd year is mainly field work. Examination of samples collected in the field work, is carried out in a laboratory. Other practice is carried out in PC rooms and a drafting room.

Table 2-11: Department of Petroleum and Geology Engineering
Weekly Learning and Classroom Occupation Time (no. of units)

Year	Term	Lecture	Learning Time (hr/Week)		The total weekly unit number of different types of rooms (unit, 1 unit=2 hours)				
			Theo -ry	Prac -tice	Class -room	Labora -tory	PC room	Drafting room	Special room
1	1	Portuguese1	3.33		2				
		Tetum 1	3.33		2				
		English 1	3.33		2				
		Basic Mathematics	4.99		2.5				
		Fundamental Physics	4.16	0.83		2.5			
		Basic Informatics	3.32	1.66			2.5		
	2	Portguese 2	4.16		2.5				
		Tetum 2	4.16		2.5				
		English 2	4.16		2.5				
		Civic Education, Ethics & Moral	2.49		1.5				
		Introduction to Geology Engineering	4.16	0.83	2.5				
		Chemistry	4.99		2.5				
2	3	Mineralogy	4.16	0.83	2.5				
		Petrology	4.16	0.83	2.5				
		Introduction to Geophysics Applied Geology	3.32		2				
		Geomorphology	4.16	0.83	2.5			※	
		Introduction to Geochemistry	3.32		2				
		Emvironmental Geology	2.49	0.83	1.5				
	4	Hidrogiology	3.33	0.83	2				
		Optical Mineralogy and Petrography	4.16	0.83	2.5				
		Introduction to Engineering Geology	3.32		2				
		Strutural Geology	3.32	1.66	2				
		Introduction to Macropaleontologia	3.32	0.83	2				
		Introduction to Engineering of Oil	3.32		2				
3	5	Sedimentology and Stratigraphy	4.16	0.83	2.5			※	
		Geodynamics	2.5	0.83	1.5				
		Micropaleontology	3.32	0.83	2				※
		Systems of Information Geographic	4.16		2.5				
		Field Geology I	0.83	4.16	0.5				
		Marine Geology	2.49	0.83	1.5				
	6	Applied Geophysics	3.32	0.83	2				
		Applied Geochemistry	3.32	0.83	2			※	※
		Geology of Oil and Gas	3.33	0.83	2				
		Subsurface Geology (Polls Profile)	3.32	0.83	2				
		Fiels Geology II	0.83	4.16	0.5				
		Drilling Techniques of Petroleum Science	3.32		2				
4	7	Geology of Metal and Non Resources	3.33	0.83	2		※	※	
		Reservoir Geology	3.33	0.83	2				
		Geological	3.33	0.83	2				
		Production Technique in Science of Petroleum	3.33		2				

Year	Term	Lecture	Learning Time (hr/Week)		The total weekly unit number of different types of rooms （unit, 1 unit=2 hours）				
			Theo -ry	Prac -tice	Class -room	Labora -tory	PC room	Drafting room	Special room
		Introduction to Scientific Research	1.66	2.5	1				
		Regional Geology	3.32	1.66	2				
	8	Internship	1.66	15	1				
		Project of finalizing the course	1.66	6.66	1				
Total number of units of 1st term					43	2.5	2.5	0	0
Total number of unit by 2nd term					39	0	0	0	0

※Used after field work

Source：UNTL Curriculum

Calculate occupation time of each room by adding up the total number of units ①-⑤.

■Estimated number of of necessary classrooms in the 1st term.

The total necessary occupancy time of rooms in the 1st term in each Department ①～⑤ is summarized as below. Each class is for 40 students, consisting of two groups that addsup to a total of 80 students in 1 year.

Table 2-12：Weekly total occupation time of each room (1 st term)

	Number of total weekly unit of each room（unit, 1 unit=2 hours）						
	Class-room	Labor -atory	PC room	Drafting Room	Special Practice Room		
					Mechanical, Civil, Electrical/Electronic	Inform-ation	Petroleum and Geology
Mechanical Engineering	37	3.5	3	2.5	Use existing practice room	-	One each of laboratory, preparation room, sample room are to be planned
Civil Engineering	36.5	2	1.5	3		-	
Electrical and Electronic	40	2	3.5	0		-	
Information Engineering	31.5	2.5	2.5	0		13	
Petroleum and Geology	43	2.5	2.5	0		-	
Total --(1) (per 1 group)	188	12.5	13	5.5		13	
Total 2)=(1)x2 （per 2 groups）	376	25	26	11		26	

As 4 units/day x 5 day/week = 20 units/week, necessary number of the classroom in the 1st term is shown in below table.

Table 2-13：Necessary number of classrooms in the 1st term

	Class-room	Laborat -ory	PC room	Drafting Room	Special Practice Room		
					Mechanical, Civil Engineering, Electrical/Electronic	Inform-ation	Petroleum and Geology
(3) =(2) /20	18.8	1.25	1.3	0.55	Use existing practice room	1.3	One each of laboratory, preparation room, sample room are to be planned
Necessary number of classrooms in the 1st term (A)	19	2	2	1		2	

■Estimated number of necessary classrooms in the 2nd term.

The total necessary occupancy time of rooms in the 1st term in each Department ①～⑤ is summarized in table 2-12. Each class is for 40 students, consists of two groups that gives the total 80 students in 1 year.

Table 2-14: Weekly total occupation time of each room (2nd term)

	Number of total weekly unit of each room (unit, 1 unit=2 hours)						
	Class-room	Laborat-ory	PC room	Drafting Room	Special Practice Room		
					Mechanical, Civil, Electrical/Electronic	Inform-ation	Petroleum and Geology
Mechanical Engineering	34.5	0	3.5	0	Use existing practice room	0	One each of laboratory, preparation room, sample room are to be planned
Civil Engineering	32.5	0	0	0		0	
Electrical and Electronic	48	0	1	0		0	
Information Engineering	26	2.5	2.5	0		7	
Petroleum and Geology	39	0	0	0		0	
Total --(4) (per 1 group)	180	2.5	7	0		7	
Total (5)=(4)x2 (per 2 groups)	360	5	14	0		14	

As 4 units/day x 5 day/week = 20 units/week, necessary number of the classroom in the 2nd term is shown in below table.

Table 2-15: Necessary number of classrooms in the 2nd term

	Class-room	Laborat-ory	PC room	Drafting Room	Special Practice Room		
					Mechanical, Civil, Electrical/Electronic	Inform-ation	Petroleum and Geology
(6) =(5) /20	18	0.25	0.7	0	Use existing practice room	1	One each of laboratory, preparation room, sample room are to be planned
Necessary number of classrooms in the 2nd term (B)	18	1	1	0		1	

■Estimated number of of necessary classrooms through out a year.

The number of necessary rooms shall be a maximum number of whichever 1st or 2nd term. For classrooms, including one room for adjustment, total 20 regular classrooms are to be planned.

Table 2-16: Necessary number of classrooms through out the year

	Class-room	Laborat-ory	PC room	Drafting Room	Special Practice Room		
					Mechanical, Civil, Electrical/Electronic	Informa-tion	Petroleum and Geology
Necessary number of classrooms through out the year	20	2	2	1	Use existing practice room	2	one practice room to be planned

４）Design Considerations for the Main Rooms

・ Classrooms/ Laboratories etc.

The basic module of a room is on 8.1m x 8.1m. Multiply this size into one to two times to give larger rooms for classrooms, laboratories and large classrooms etc.

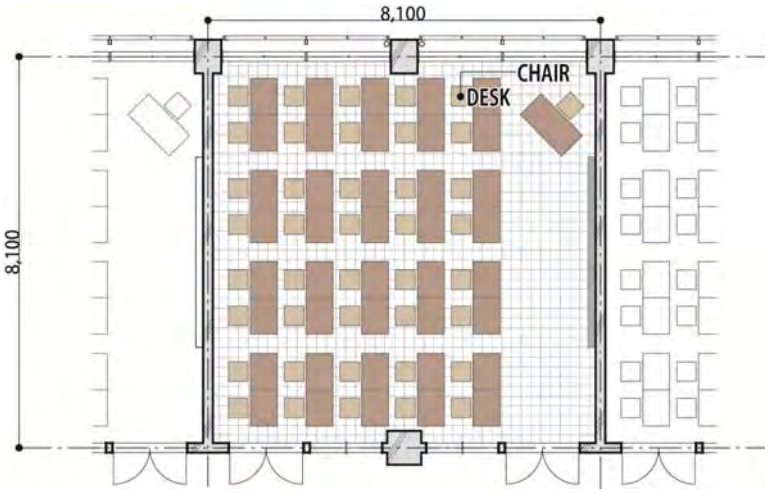


Figure2-6：Standard Dimension of Classrooms

A lecture is usually carried on by projecting teaching materials on a screen, as it is not mandatory for students to purchase textbooks. Therefore, a projector and a screen is to be installed in all the classrooms. Also, provide a strip of wooden bars along the wall to enable posting notices.

Provide a small platform dedicated for teaching physics, in the General Laboratory and in the special laboratory for Petroleum and Geology. This is for teachers to demonstrate the usage of models and equipments. Place necessary number of laboratory table based on five students per group, the grouping system that is currently in use.

・Auditorium and meeting rooms

The stepped auditorium is equipped with 400 seats, and is capable of accommodating an entire yearly b atch of students as forecasted in the FEST future plan by 2025. Five meeting rooms for 25 people are planned according to the common scale of meeting.

The meetings and seminars held in FEST, UNTL are in the table 2-17.

Table 2-17: Meetings and seminars held in FEST, UNTL

Meetings and Seminars	Attendee	No. of Person	Frequency	Remarks
1. Department Meeting	All teachers of all departments	7-27	1/week	Held by each department
2. Faculty Meeting	Dean, Vice deans ,Directors,Vise Directors, Head of Administration	16	1/week	
3. Academic Committee	Vice dean Ⅰ、Directors, Representative of master degree program, Representative of Student affairs, Representative of Special Study Department, Staff of Administration	25	1/2 month	Review of Syllabus, and evaluation of teaching etc.
4. Faculty Management committee	Vice dean Ⅱ、Directors, Head of Administration	7	1/2 month	Review of Faculty management
5. Research Cooperation Committee	Vice dean Ⅳ、Directors, Representative of Special Study Department	12	1/month	
6. Student Affairs	Representative of Student Affairs	7	1/month	
7. Special Research	Teachers	3-5	1/2 week	Held separately in each field and speciality of departments Total 15 groups
8. Individual Faculty Seminar	Teachers, Directors, Dean	80	1/term	Seminars held by JICA's Technical Cooperation Projects

Meetings and Seminars	Attendee	No. of Person	Frequency	Remarks
（International Cooperation）				
9. Individual Department Seminar （International Cooperation）	Teachers	7-27	1/term	Seminars held by JICA's Technical Cooperation Projects for each department
10. Special Lecture	Teachers, Students	Depends	1/term	Special seminar inviting lecturers from Public Works Department, Ministry of Petroleum and Mineral Resources, and other Government Agency
11. Presentation of Graduation Thesis	Judge, General audience (Open public presentation)	30	1/year	It needs one day per each 5 student
12. Meeting with private organiizations	Teachers, Guests	5-10	2/month	Meeting with corporations, the industrial world etc.
13. Scholarship Explanation	7 Students from each Department, Parents and Director of FEST etc.	85	1/year	Held 5 times
14. Industry Training	Teachers and Students	20-30	2/year	Training lecturer invited from various industries
New entrance students and staff of Department	New entrance students and staff of FEST	300	1/year	400 new student in year 2022
15. Department Graduation Ceremony	All Students and staff of FEST	300	1/year	400 new student in year 2025
16. New term Ceremony	All Students and staff of FEST	400	1/term	
17. Other Ceremony	All Students and staff of FEST	400	2/year	
18. Day of engineering (Student activity)	All Students and staff of FEST	400	1/year	Ceremony like school festival
19. Faculty Seminar	All Teachers of each Faculty	7-27	4/year	Research presentation of Departments
20. Department Seminar	All Teachers	80	1/term	Research presentation of Faculty
21. International Conference	All Teachers, guests from in and outside the country	150-200	1/year	
23. Joint Seminar	All Teachers, Person concerned with other schools, General guests	80-100	2/year	Joint seminar between the FEST, UNTL and other universities
22. Seminar/meeting of other Faculty	All Teachers		1/term	It is held at rental meeting rooms in hotels at present

Source：Inerview

・Library

6,566 general books, 770 thesis, 7,336 books in total were confirmed in the Library of FEST.

UNTL holds seven libraries including that of FEST. The central library is concerned in purchasing new books, referring each faculty's request. The changes in the number of books purchased in recent five years are shown in table 2-18.

Table 2-18: The changes in the number of books purchased in recent five years by UNTL

Library	2010		2011		2012		2013		2014		Pecentage of amount purchased in recent 4years
	increment (A)	(A/B)	increment (A)	(A/B)	increment (A)	(A/B)	increment (A)	(A/B)	increment (A)	(A/B)	
Faculty of Education	1068	33%	676	38%	50	12%	0	-	108	4%	22%
Faculty of Economics	301	9%	135	8%	50	12%	0	-	284	10%	10%
Faculty of Agriculture	64	2%	107	6%	50	12%	0	-	367	13%	8%
Faculty of Social and Politics	227	7%	315	18%	50	12%	0	-	1143	39%	19%
Faculty of Medical	11	0%	18	1%	50	12%	0	-	292	10%	6%
Faculty of Law	1138	35%	273	15%	50	12%	0	-	380	13%	19%
FEST	427	13%	270	15%	132	12%	0	-	361	12%	13%
TOTAL(B)	**3236**		**1794**		**432**		**0**		**2935**		

Source: UNTL Library

5 year's average number of the books purchased in UNTL libraries is 1,680 books. Since 13% are assigned to FEST library, it is assumed that 1,680 x 13% = 218 books will increase every year. Therefore, by 2025, the increase of books of FEST library will be 218 x 11 = 2,398 books.
On the other hand, the FEST submits request for list of new books of 949 titles as a total for 5 departments, to the central library in 2014. It is a principle to purchase three copies of each title, therefore the number of new books will become 949 x 3 = 2,847 books.
With regard to the thesis to be stored in the Library, it is assumed that the increase in the number of thesis would be 3,244, between 2015 and 2025. According to the the number of students growth shown in table 2-17.

Table 2-19: The changes in the number of new students in FEST and Number of Theses by 2025.

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
No. of Student	246	297	222	180	259	282	305	328	351	374	400	400	400	400	
No. of Thesis				246	297	222	180	259	282	305	328	351	374	400	3,244

Note) The No. of the students from 2012 until 2015 is a result.
The number of the students after 2016 is estimated under a hypothetical condition that the number of students lineally increases up to 1,600 by 2025. It is taken by mean student projection rate from 2012 to 2015 till the numbers of all students reach to 400 enrollments in 2022

It is considered that the number of books in the Library of FEST will approximately increase to 13,000 according to the Table 2-18. Therefore the library is planned to store such amount of books.

Table 2-20 : The estimated number of books in the Library of FEST at the year 2025

	Books (No.)	Thesis (No.)
Number of Books at the time of the survey in 2015	6,566	770
Estimated amount of books increase by 2025	2,398	3,244
Estimated number of Books in 2025	8,964	4,014

Total : 12,978books

In addition to the book space in the Library, PC corner, which enables browsing Web information shall be included.

(2) Elevation and Section

Design considerations of elevation and section of the facilities are to block direct sunbeam, and take natural breeze and light inside. Place sun-screen on exterior wall. Form of facilities, which enables enhance circulation of natural ventilation, and in receiving much indirect sunlight. Those sun-screens and roofs, are expected to make a specific form of the facilities.

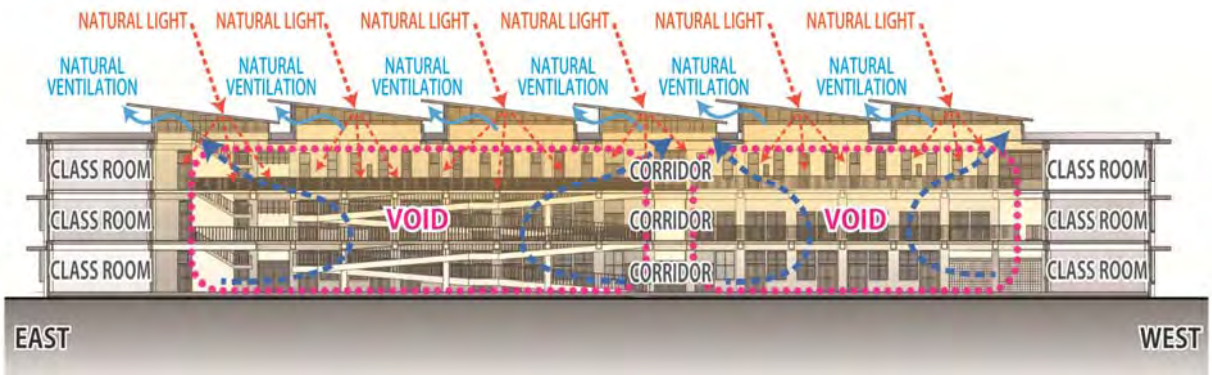


Figure 2-7: Design Concept

（３） Structural Design

１） Conditions of Ground and Foundation Structure Design

A geological survey of the proposed construction site revealed presence of predominantly granular soil consisting of Silty Sand and Clayey Sand, from the surface down to the bottom at 15m. In some intervals Sand with Gravel was also encountered. The SPT N value obtained at three boreholes varies from ranges of 2 to 54, down to the bottom at 15m depths.
The ground level after demolishing the existing foundation is assumed to be GL-2.5m. The bearing capacity at this depth is approximately 80kN/㎡. Taking into account the scale of the building, and the bearing capacity, spread foundation is adopted.

２） Superstructure Design

In principle, rigid-frame reinforced-concrete structure is adopted as a general construction method in Timor-Leste. The non-antiseismic walls are to be constructed of concrete blocks, which are common in Timor-Leste. Huge column free space of the auditorium is to be of steel roof truss structure.

３） Load

In the Project, the external forces and loads are assumed as follows; considering the local climate and geographical conditions as well as the building functions.

a) Dead Load

The dead load will be calculated by adding up the weight of all structural and finishing materials to be used for each building.

b) Wind Load

The wind load will be calculated in accordance with the Building Standards Act of Japan.

c) Live Load

The live load will be calculated in accordance with the Building Standards Act of Japan.

d) Seismic Load

Currently there are no structural design standards in Timor-Leste. Therefore, for the Project, the structural standards adopted are from Whole Building Design Guide of Unified Facilities Criteria by The Department of Defense in the USA, which determines global seismic factors.
According to the above guide, the design response spectrum at the structure's natural frequency of 0.2 secs, and 1.0 secs are Ss=0.93g, S1=0.37g. Design structure by using these factors.

（４） Electrical System Design

１） Service Drop and Transformer system

High voltage cable of 20kV is laid along the Hera Road, which is the main leading road to the UNTL campus from Dili city.

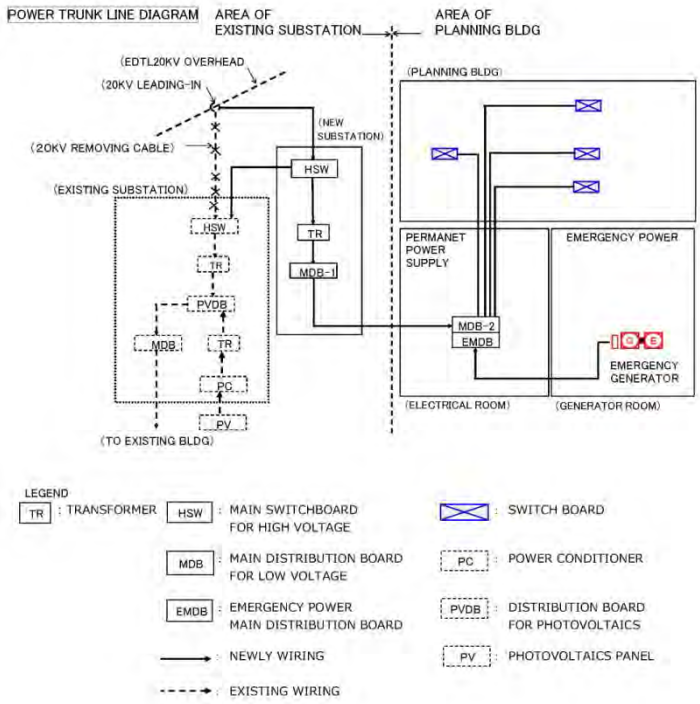


Figure 2-8: Electrical wiring diagram

During the survey, Electricity of Timor-Leste (EDTL), General Directorate of Public Works have confirmed that there should be only one electric supply point provided as a whole of UNTL campus, including the new construction.

Install an additional Main High Voltage Switch Board in a new substation, at the point of service drop. Devide high voltage cable that is coming out of this switch board into two destinations. One leading for existing switch board in existing substation and the other going to the new building of the Project. Convert to low voltage via new transformer of 500kVA, placed next to the new substation. Lead to the new building by underground cable.

2） Power Supply System

The electricity is supplied to Distribution Boards in each buildings through underground cable, cable rack and pipes. A backup generator with capacity of 250kVA is to be installed to ensure the minimum necessary supply of electricity for the facilities in the case of a blackout.

The installations that are to be connected to Generator Power is in the table 2-21.

Table 2-21: Installations that are connected to Generator Power

Installations that are connected to Generator Power
• Power supply for Feed pumps and drainage pumps
• Power supply for Pumps for fire hydrants
• Server Power Supply
• LAN and PC power supply for administration related rooms and secretariat rooms.
• Power supply for a projector, acoustic systems, and lighting fixtures, in the auditorium
• Power supply for telephones, public address systems, and fire detection systems

3） Communication facilities

From the leading point in the east boundary of the site, install underground telephone line and

handhole to the main distribution frame (MDF) in the server room in Class Room Building. The laying work of the telephone line to MDF is to be done by telecommunication company (Timo-Leste side). Install telephone outlets and telephones for rooms such as, secretariat of both faculty and department, administrarive office, recept office, and library. Laying of cable work is to be done by telecommunication company (Timo-Leste side). Place Private automatic branch exchange (PBX) and construct the inner telephone system of the facilities.
For managing facilities, consider installation of telephone in administration related rooms. Include the existing guard house for PBX net work.

4） Lighting and Socket Outlets

Install distribution board for lighting in each floor. Ensure apropppriate line system and prepare secondary line for lighting fixtures and socket outlets.

Table 2-22: Lighting and socket outkets

Lighting fictures	General	: Common lighting fixtures such as fluorescent light is to be selected.
	Common	: Power-saving equipment such as LED lights is to be considered.
	Emmergrncy	: Battery-operated wall lights are to be installed in rooms and corridors for emergency purposes.
Socket Outlets	General	: All general electrical outlets are to be earthed. Prepare three-phase 400 volt power supply for some laboratories.

5） Local Area Network

LAN cables and outlets are to be installed in classrooms, laboratories and staff rooms. It was confirmed that considering the number of students increase in the future plan, new internet receiving antenna will be installed by UNTL, for additional internet capacity. Conduct designing work assuming that antenna is to be placed on the roof top of the new building.

6） Fire Alarm System

Fire alarm system is installed which enables early detection of fire and smooth evacuation. Place receiver in administrative office in Common and Office Building, detectors where necessary.

7） Public address system

Install public address system in the administrative office in Common and Office Building, and speakers in appropriate place. This is to announce emergency.

8） Lightning Protection

Install PDCE lightning conductor, which is the same type as in the existing building.

（5） Air Conditioning / Ventilation Design

1） Air-conditioning System

Considering enery saving and easy maintenance, Air-cooled packaged air conditioners (Split type, exclusive for cooling) is adopted, which allows individual control.
For auditorium with high ceiling, adopt Direct-expansion coil floor-standing air conditioners with single ducting system. Other rooms are to be equipped with either a ceiling cassette type or a wall hanging type air-conditioners. Provide a controller in each each room.

Next table 2-23 shows types of air-conditioning system for each zoning

Table 2-23: List of air-conditioning system

Building	Department	Room	Air-conditioning equipment
Common and Office Building	Library	Library, Librarian room	Air-cooled packaged air conditioners
	Administration	Administrative office, Chief administrator room, Dean room, Receipt office, Secretariat room, Vice dean room, Meeting room	Air-cooled packaged air conditioners
		Auditorium	Direct-expansion coil floor standing air conditioners
Class Room Building	Common	Distance learning room、Research project laboratory、PC room	Air-cooled packaged air conditioners
	Information Engineering	PC Laboratory	Air-cooled packaged air conditioners
	Administration	Director room, Vice director room, Secretariat room, Guest lecturer room, Meeting room, Server room	Air-cooled packaged air conditioners

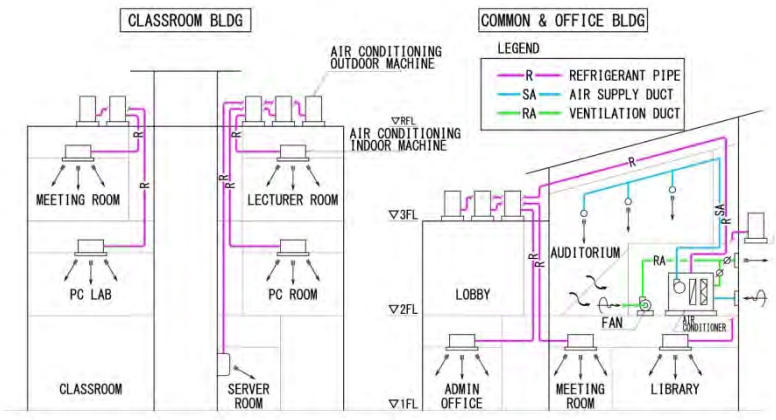


Figure 2-9 : Schematic diagram of Air-conditioning system

2） Ventilation System

Considering easy maintenance, the air supply in each room is naturally ventilated with fresh air. Some rooms such as WCs, electrical rooms, etc are to be equipped with exhaust fans to remove smell, heat, and dust.

（6） Plumbing System Design

1） Sanitary Equipment

Place appropriate sanitary equipment according to the function. Install Asian type toilets for WCs for students, and for other WCs install International style. Place hand shower and water tap in each booth.

2） Water Supply Facilities

The well and the elevated water tank of the existing building, is in a good enough condition for continuous use. As for the new construction, place water pipe leading to the new buildings, as

well as booster pump to assist water pressure.

Renew necessary equipments, as some failure was found in existing water pump and sand filtration device.

Table 2-24 shows the estimated amount of water needed for new construction.

Table 2-24: Estimated amount of water needed

Target	Estimated number of people (persons)	Amount of water needed per person/day (litters per person/day)	Daily amount of water needed (litters / day)
No. of students (estimated for yr.2025)	1,600	(55L/ person×0.5)	44,000L
No. of staffs (same as above)	141	(100L/ person×0.5)	7,050L
Subtotal			51,050L →52 m³

The necessary capacity of equipment is estimated as follows.

Reservoir	80m^3（Continuous use of existing tank. The daily amount of water needed: 52 m^{3}or over）
Elevated water tank	22 m^3（Continuous of existing tank.）
Water pump	733L/min×30mAq（Replace old. 30mins to fill the elevated water tank.）
Well Water	230L/min×80mAq（Replace old）
Booster pump	440L/min×26mAq （Install new）

3）Drainage Facilities

Sewerage water is treated by a unit-type combined septic plant, before being discharged in to the drain gutter. Rain water is discharged out of the site directly through the drain gutter.

Treatment ability of the unit-type combined septic plant

Quality of input water ：BOD 200mg/L、SS 200mg/L
Quality of output water：BOD 30mg/L、SS 50mg/L or less
Note: BOD＝ biochemical oxgen demand
SS＝ suspended solids

Table 2-25: Treatment capacity

Tank		Treatment capacity
Combined treatment tank	Waste water	52m^3/day x 1 tank

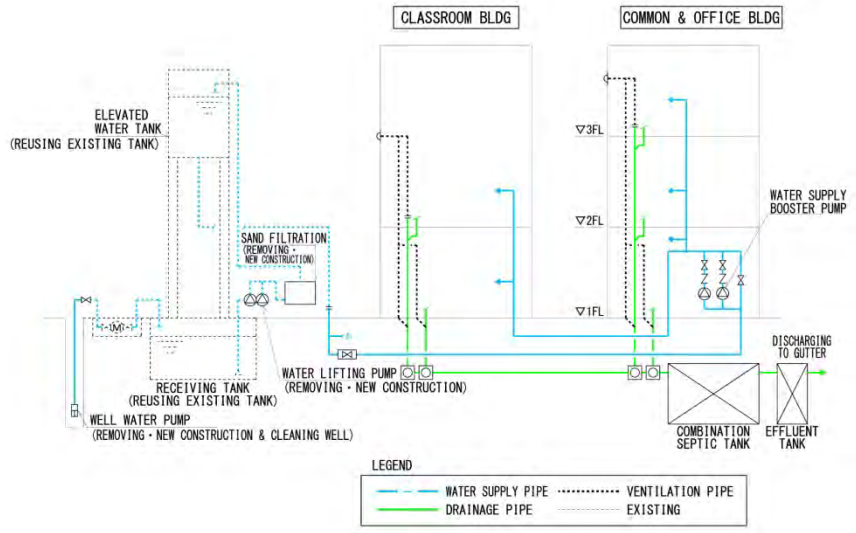


Figure 2-10 : Schematic diagram of Plumbing system

4） Firefighting System

Water resovoir for firefighting water, fire hydrants, firefighting pump, fire extinguisher are to be installed.

（7） Construction Material Plan

1） Basic Policy

The basic policy is as following; by considering the climate, natural weather, conditions of construction, schedule, costs and management systems of UNTL.

a） Use as many materials from Indonesia available in local market as possible to reduce the construction cost and period.

b） Select materials that are suitable for the Master plan and maintenance plan of UNTL.

2） Construction Materials

a） Structural Materials

The reinforced concrete pillars, beams, and floor slabs which are generally used in Timor-Leste will be used. The walls are to be constructed with concrete blocks. As for concrete, sand and gravel can easily be prepared locally.

b） Exterior Finishing Materials

Major exterior finishing materials are as shown below.

Exterior walls	:	Paint
Roof	:	Asphalt roofing, Corrugated metal sheet
Doors & windows	:	Aluminium doors and windows

c） Interior Finishing Materials

The interior finishing materials to be used for main rooms are shown below in table 2-26, as well as the reason for choosing the material.

Table 2-26: Interior finishing materials

Room	Floor	Wall	Ceiling	Notes
Class rooms・Other rooms	Tile	Paint	Acoustic board	For easy maintenance
Auditorium	Carpet	Acoustic panel	Acoustic panel	For acoustic effect
Corridor	Tile	Paint	Acoustic board	For easy maintenance
WC	Tile	Tile	Acoustic board	For water resistance

2-2-2-3. Equipment plan

（1） Equipment Plan

The following categories will be included in the equipment plan for the Project.

- The equipment categorized within the equipment work such as PC equipment and projectors etc. among the building services of the new facilities for the Project
- The educational equipment necessary for the practice of bachelor courses of 5 departments (Mechanical Engineering, Civil Engineering, Electric and Electronics Engineering, Information Engineering and Geology and Petroleum Engineering) in FEST

The main equipments necessary for classrooms and other rooms among the building services of the new facilities for the Project are as follows. For educational equipments of bachelor courses, the equipment necessary for the new laboratories will be planned for the departments of Information Engineering and Geology and Petroleum Engineering. The minimum equipment for replacement and addition of the existing equipment will be planned for 3 departments of Mechanical Engineering, Civil Engineering and Electric and Electronics Engineering, on the assumption that the equipments procured will be installed in the existing laboratories.

Table 2-27: The Contents of Equipment Planning

Name of Facilities	Main Contents of Equipment Planning
Classroom	A projector and a screen used for class will be planned in each room.
Large classroom	A projector and a screen used for class will be planned in each room
Distance learning room	A projector, a screen and a set of e-learning system used for seminars and other activities will be planned.
Computer room	Desktop PCs, printers, network equipment, projectors and screens used for class will be planned.
Meeting room	A projector, a screen and a white board used for meeting will be planned in each room.
Auditorium	A projector, a screen and a set of audio visual equipment used for conference will be planned.
Print room	A photocopier and a digital printer will be planned.
Library	Desktop PCs, a printer and a photocopier used for management works and looking up of books will be planned.
Drafting room	Sets of drawing equipment, a projector and a screen will be planned.
General Laboratory	A projector, a screen and basic practical equipment for physics used for class will be planned.
Research Project Laboratory	A draft chamber, an electric oven, a ph meter and a set of practical equipment for chemistry used for research activities shall be planned.
PC laboratory for Information Engineering	Desktop PCs for 2 PC laboratories and sets of network equipment for practice will be planned.
Laboratory for Geology and Petroleum Engineeing	The basic educational equipment for bachelor course such as Minerals or crystals replica, Jaw crusher, Binocular microscope with camera, Field measuring equipment and etc. shall be planned.
Existing laboratory for Mechanical Engineering	The minimum replacement and additional equipment necessary for the fields for material testing, mechanical processing, energy conversion and automobile among the existing educational equipment for bachelor course shall be planned.
Existing laboratory for Civil Engineering	The minimum replacement and additional equipment necessary for the fields for Concrete, Asphalt, Field measurement and Structure among the existing educational equipment for bachelor course will be planned.
Existing laboratory for Electric and Electronics Engineering	The minimum replacement and additional equipment necessary for the fields for Analog/digital cercuits, Electrical facilities, Control, Power electronics and Communications among the existing educational equipment for bachelor course will be planned.

（２）Criterea for Selecting the Equipment

Regarding the requested equipment list, the validity has been evaluated based on the following criterea.

Criterea for Selecting the Equipment

- The equipment of the building services of the new facilities constructed by the Project
- The minimum practical equipment necessary for implementing the educational curriculum of bachelor courses of 5 departments targeted for the Project (Mechanical Engineering, Civil Engineering, Electric and Electronics Engineering, Information Engineering and Geology and Petroleum Engineering) in FEST.
- The practical equipment which is currently used and forecasted to fall into the shortage of its quantity caused by increasing the number of students for 3 departments of Mechanical Engineering, Civil Engineering and Electric and Electronics Engineering among the 5 departments targeted by the Project.
- The existing equipment which is to be replaced by new one because of the damage and/or the fault for 3 departments of Mechanical Engineering, Civil Engineering and Electric and Electronics Engineering among the 5 departments targeted by the Project.

Criterea for Deleting the Equipment

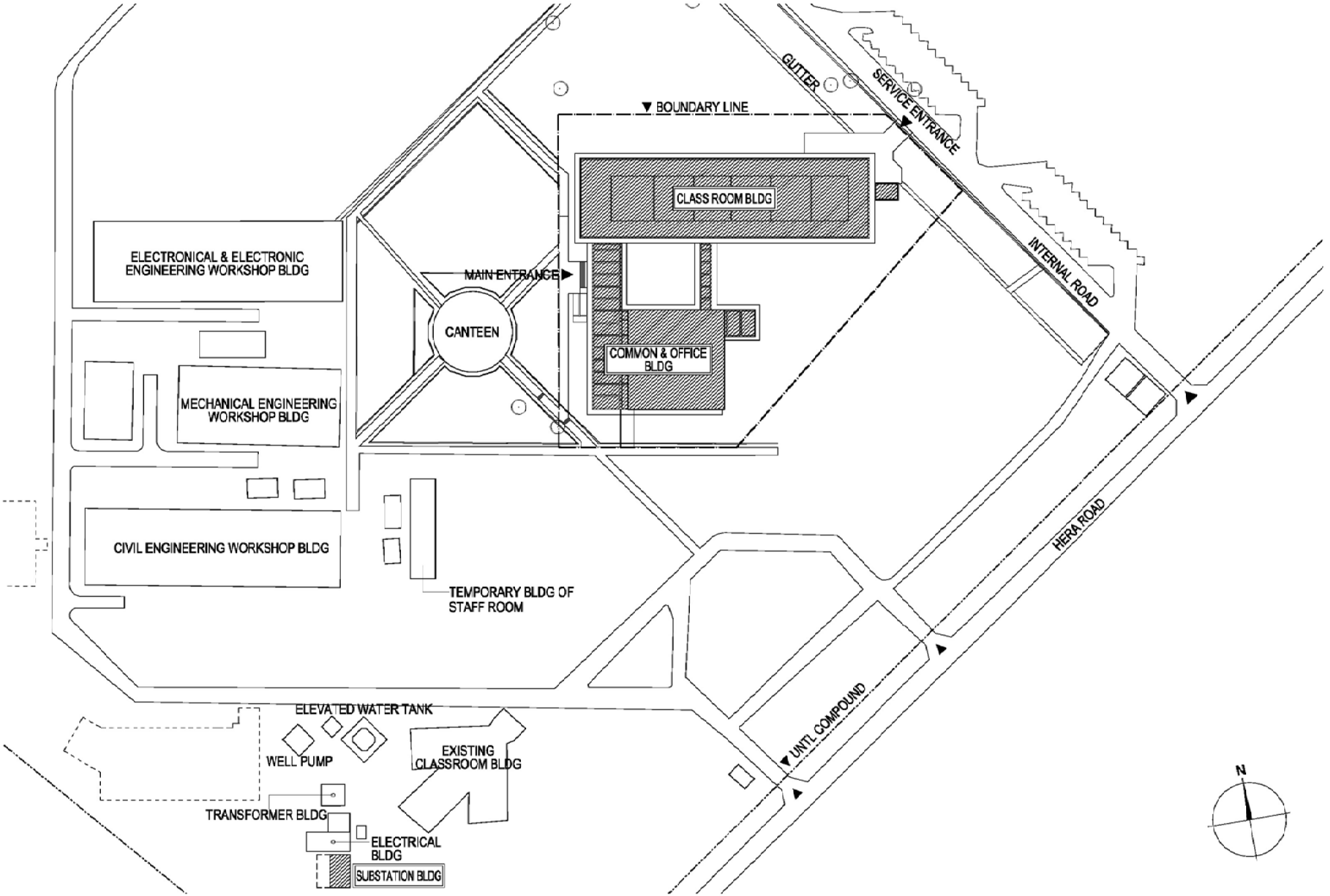
- The equipment which requires highly advanced knowledge and skills in comparison with the current level of the lecturers of UNTL.
- The equipment of which spare parts and consumable are difficult to procure in the market of Timore-Leste, and also difficult to procure from overseas.
- The equipment requiring advanced maintenance skills for sustainable use.
- The equipment which lecturers of UNTL have never used for.
- The equipment which can be substituted functionally with other equipment to be procured for the Project.
- The equipment which is relatively low priority in terms of cost effectiveness and frequency of use.
- The equipment which should be procured by TL in terms of the validity and the possibility.
- The equipment which currently exists at TL and is not in a shortage of its quantity.
- The equipment which shall be solely used for research purpose of lecturers.

Criterea for Setting the Quantity

- For the equipment installed in the new buildings constructed by the Project, the quantity has been set based on the purpose of use, the number of classroom per department/academic year, the number of student per department/class and etc.
- For the educational equipment for practice, the quantity has been set based on the purpose of use and the number of group per department/class.
- In case there is the existing equipment, the quantity has been set based on the necessary quantity which is calculated by subtracting the quantity of usable equipment.

The planned equipment list is shown in 5. Other Relevant Data.

2-2-3. Outline Design Drawing



LAYOUT PLAN

THE PROJECT FOR THE CONSTRUCTION OF NEW BUILDINGS FOR THE FACULTY OF ENGINEERING, SCIENCES AND TECHNOLOGY OF THE NATIONAL UNIVERSITY OF TIMOR-LESTE

S:1/1500

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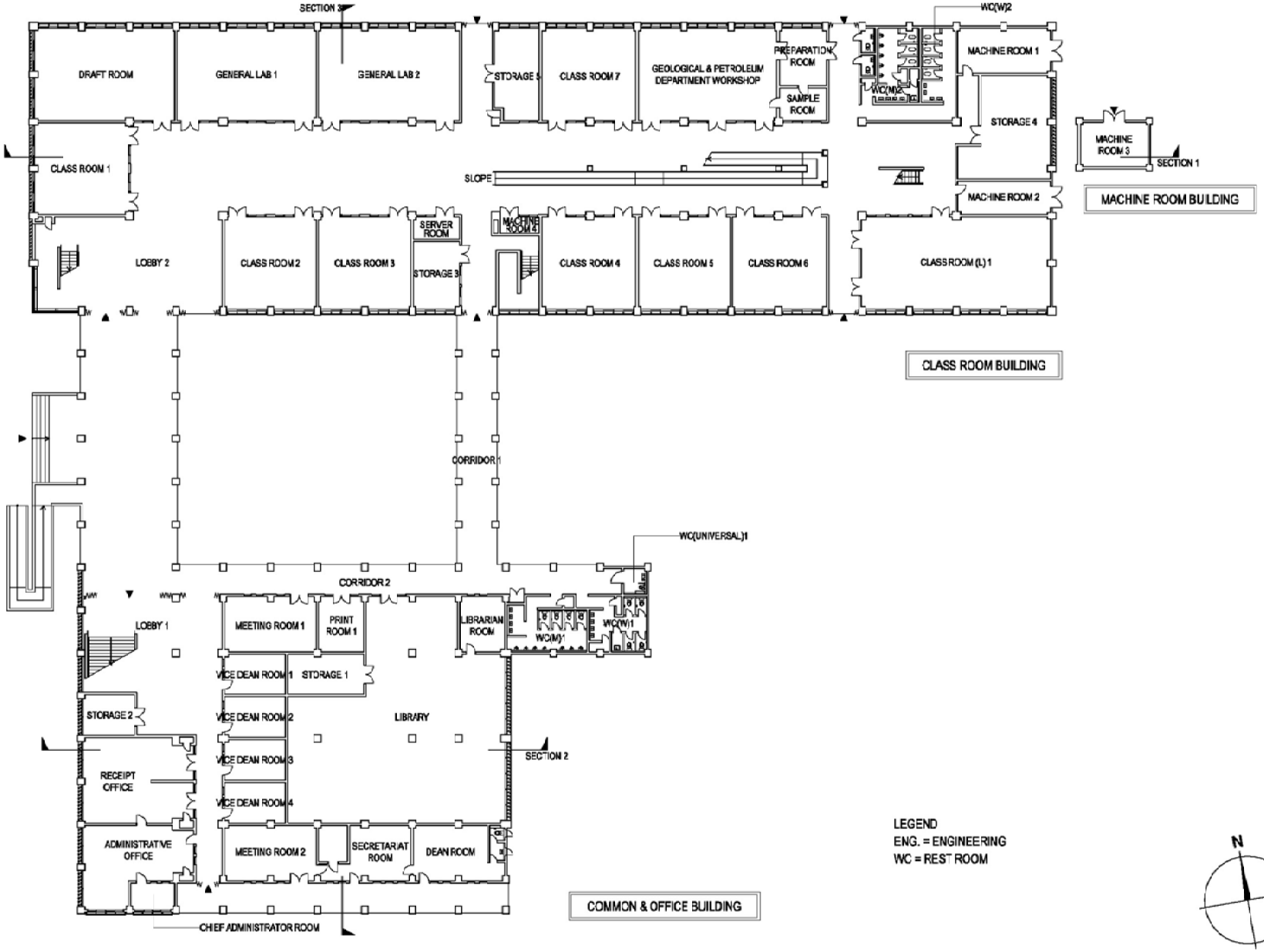

1st FLOOR PLAN

THE PROJECT FOR THE CONSTRUCTION OF NEW BUILDINGS FOR THE FACULTY OF ENGINEERING, SCIENCES AND TECHNOLOGY OF THE NATIONAL UNIVERSITY OF TIMOR-LESTE

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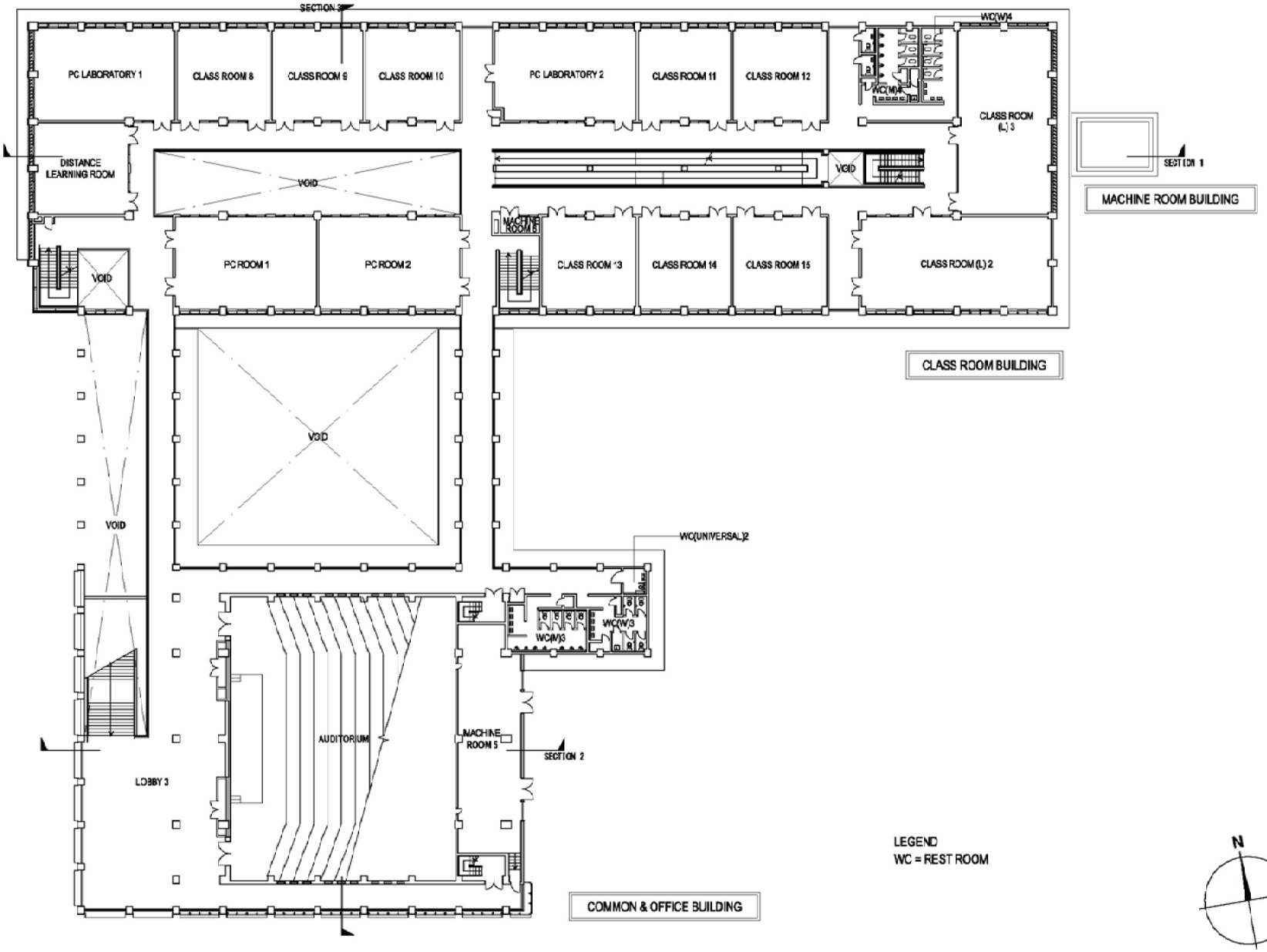

2nd FLOOR PLAN

THE PROJECT FOR THE CONSTRUCTION OF NEW BUILDINGS FOR THE FACULTY OF ENGINEERING, SCIENCES AND TECHNOLOGY OF THE NATIONAL UNIVERSITY OF TIMOR-LESTE

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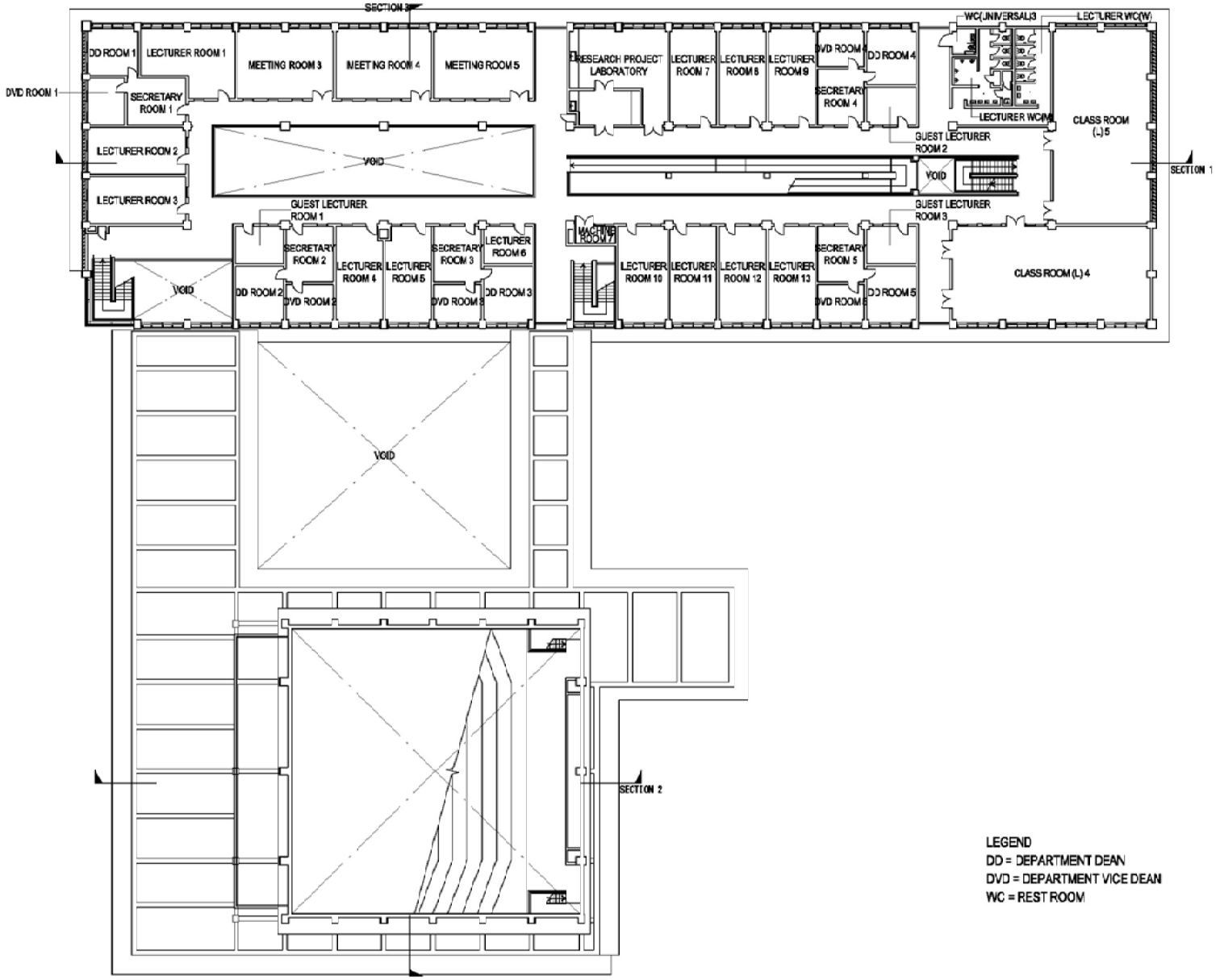

3rd FLOOR PLAN

THE PROJECT FOR THE CONSTRUCTION OF NEW BUILDINGS FOR THE FACULTY OF ENGINEERING, SCIENCES AND TECHNOLOGY OF THE NATIONAL UNIVERSITY OF TIMOR-LESTE

S:1/500

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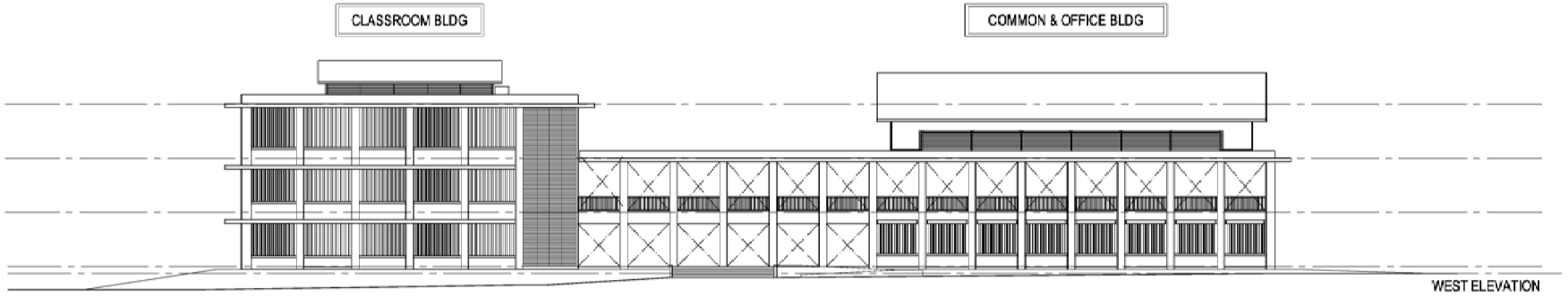
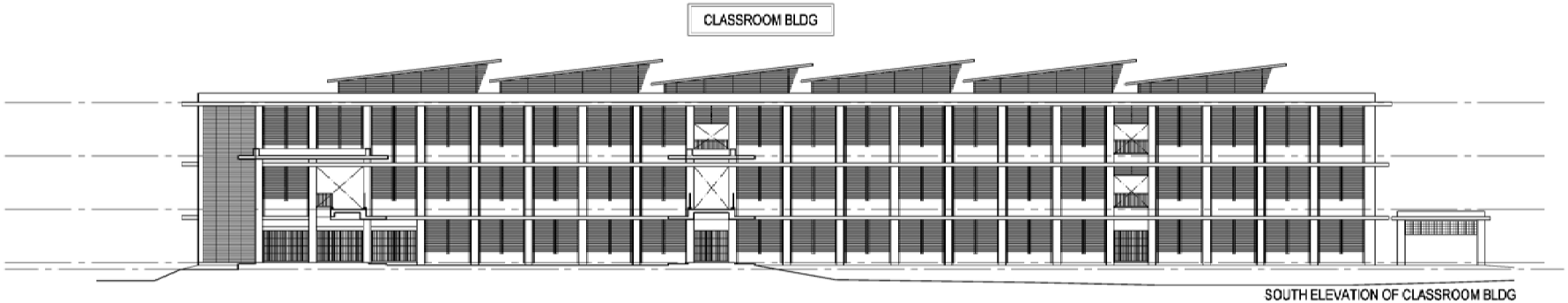
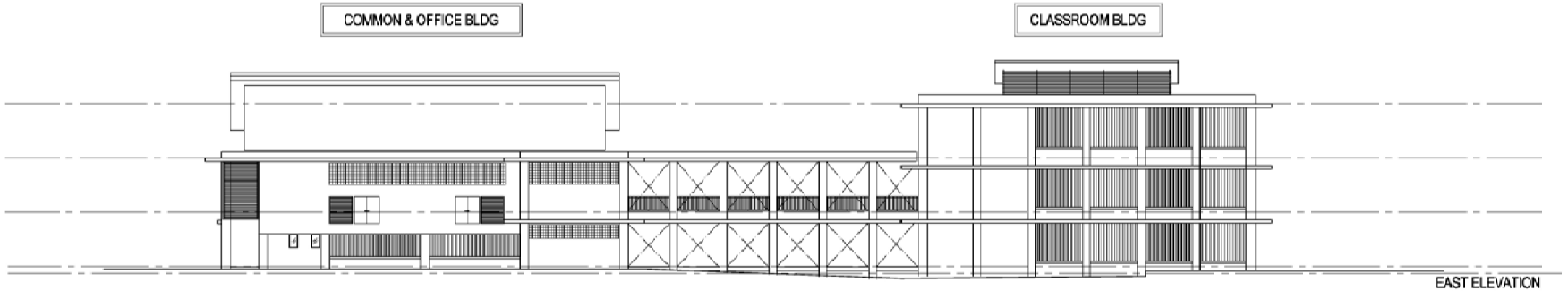


WEST ELEVATION



SOUTH ELEVATION OF CLASSROOM BLDG



EAST ELEVATION

ELEVATION 1

THE PROJECT FOR THE CONSTRUCTION OF NEW BUILDINGS FOR THE FACULTY OF ENGINEERING, SCIENCES AND TECHNOLOGY OF THE NATIONAL UNIVERSITY OF TIMOR-LESTE

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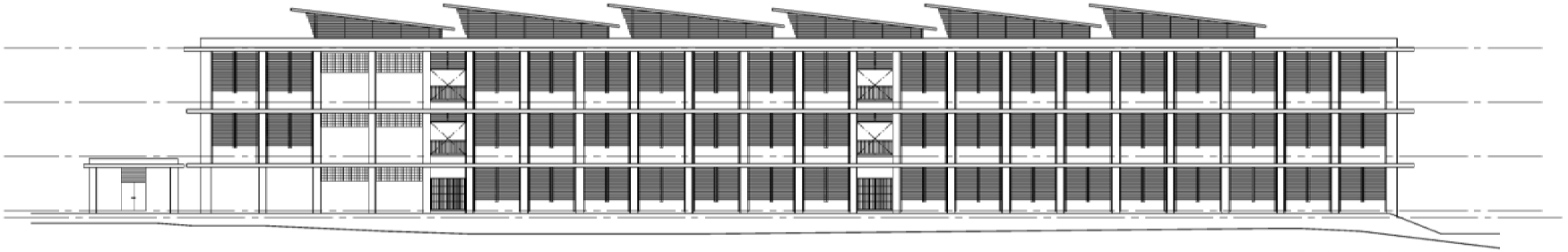
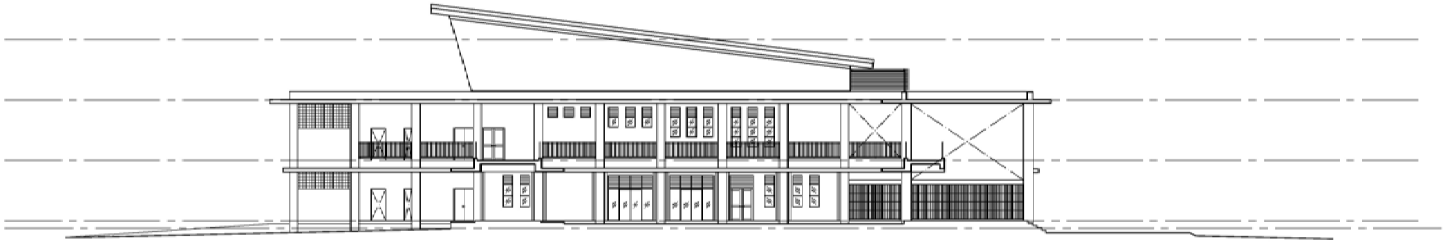
CLASSROOM BLDG



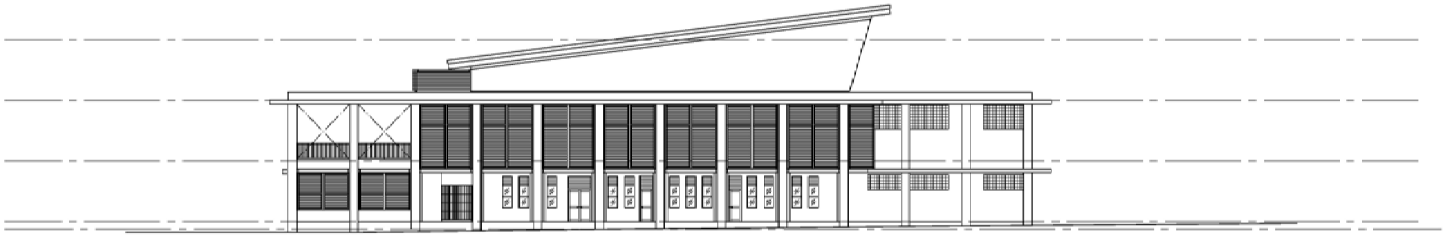
NORTH ELEVATION OF CLASSROOM BLDG

COMMON & OFFICE BLDG



NORTH ELEVATION OF COMMON & OFFICE BLDG

COMMON & OFFICE BLDG



SOUTH ELEVATION OF COMMON & OFFICE BLDG

ELEVATION 2

THE PROJECT FOR THE CONSTRUCTION OF NEW BUILDINGS FOR THE FACULTY OF
ENGINEERING, SCIENCES AND TECHNOLOGY OF THE NATIONAL UNIVERSITY OF TIMOR-LESTE

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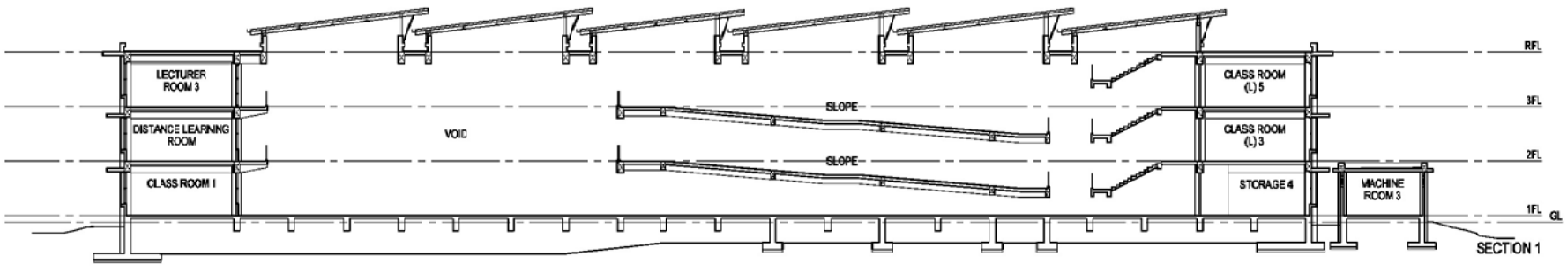
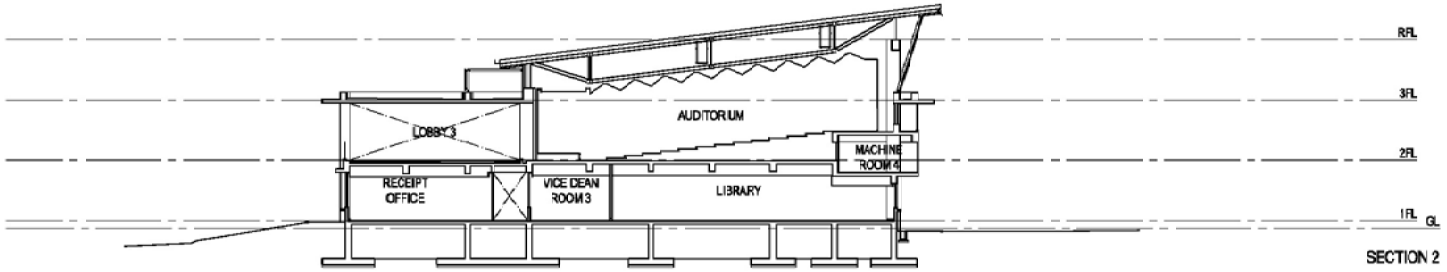


SECTION 1



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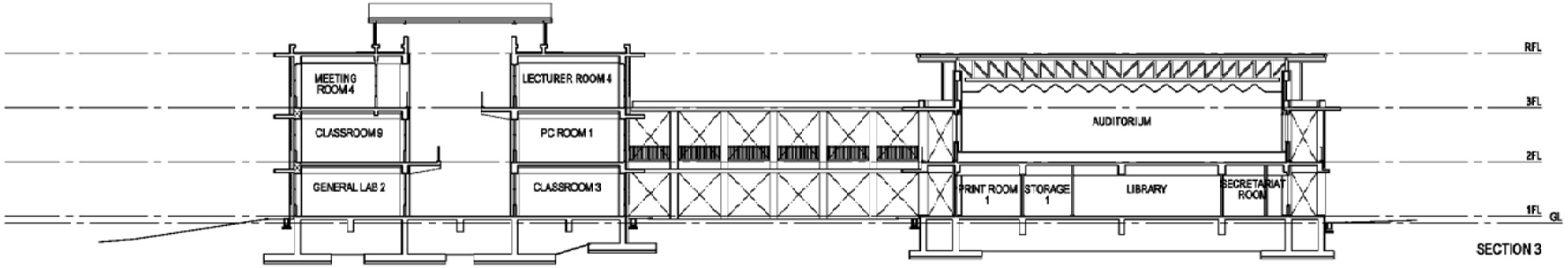

SECTION 3

SECTION

THE PROJECT FOR THE CONSTRUCTION OF NEW BUILDINGS FOR THE FACULTY OF ENGINEERING, SCIENCES AND TECHNOLOGY OF THE NATIONAL UNIVERSITY OF TIMOR-LESTE

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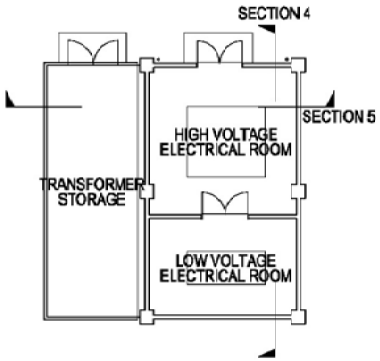
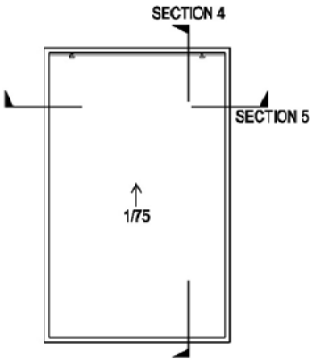
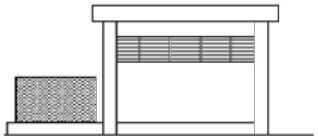


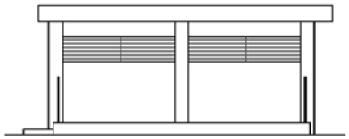
PLAN



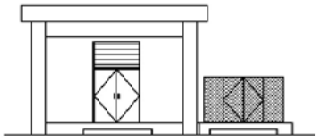
ROOF PLAN



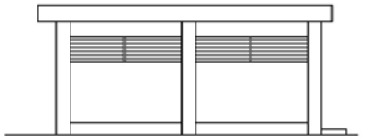
SOUTH ELEVATION



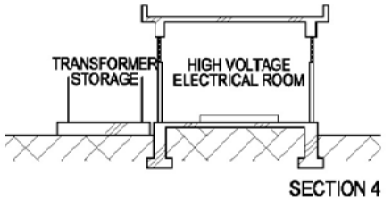
WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION



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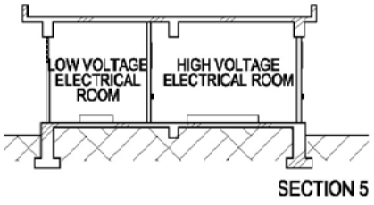

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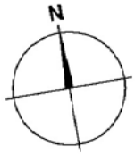

SUBSTATION BUILDING

THE PROJECT FOR THE CONSTRUCTION OF NEW BUILDINGS FOR THE FACULTY OF ENGINEERING, SCIENCES AND TECHNOLOGY OF THE NATIONAL UNIVERSITY OF TIMOR-LESTE

S:1/300

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2-2-4. Implementation Plan

2-2-4-1. Implementation Policy

This Project is to be implemented in accordance with Japan's Grant Aid Scheme.

After the Project is approved by the Japanese Cabinet, the Governments of Japan and Timor-Leste will sign an Exchange of Notes (E/N), which is followed by the conclusion of a Grant Agreement (G/A) between JICA and the Government of Timor-Leste. Subsequently, the Government of Timor-Leste will enter into a consulting services agreement for the Project, with a Japanese consulting firm, which will conduct a detailed design for the Project's facilities and equipment. Then, detailed design drawings and tender documents will be prepared for the tender. The Japanese contractor and equipment supplier awarded the contracts, will construct facilities and procure and install equipment for the Project.

The Agreement with the consultant and the contracts with the construction contractor and the equipment supplier, shall be verified by JICA in order to fulfill accountability to Japanese taxpayers.

Once the construction starts, a supervision structure will be formed consisting of the implementing agency of Timor-Leste as well as the Japanese consultants, contractor, and equipment supplier.

（１）Project Implementation Structure

The responsible implementing agency of the Government of Timor-Leste for the Project is UNTL, and UNTL will be a signatory of relevant agreements and contracts. The appointed staff members of UNTL will act as coordinators to manage operations during the implementation of the Project.

（２）Consultant

After the E/N and G/A are signed as mentioned above, UNTL will conclude a consulting services agreement for the detailed design and supervision of The Project with a Japanese consulting firm and obtain verification from JICA in accordance with the Grant Aid Scheme. After the agreement is verified, the consultants will prepare detailed design drawings and tender documents based on the Report. Eventually, these documents will be explained to UNTL to gain its consent.

During the tender and execution of the construction contract, the consultant is to assist in the tendering process and supervise the construction works based on the detailed design drawings and tender documents. For equipment procurement and installation, the consultant also to assist in the tendering process and supervise the installation, trial run, and commissioning of the equipment. The detailed tasks and responsibilities of the consultants are described as follows.

１）Detailed Design

Based on the Report, the consultant is to develope a detailed design, review the equipment plan, and prepare tender documents consisting of relevant drawings, specifications, instructions to tenderers, drafts of contracts for construction works and equipment works. The consultant is also to estimate the costs of the construction and equipment works.

２）Assistance in Tendering

The consultant is to assist the implementing agency of Timor-Leste in tendering to select a contractor and an equipment supplier, and in preparing necessary documents for the respective contracts. The consultant is also to assist reporting the results of the tender to the Government of Japan.

３）Construction Supervision

The responsibilities of the consultant is to confirm whether the contractor and equipment supplier are performing their respective works as specified in their contracts. Also to give them advice and guidance as well as coordinate all parties concerned from an impartial stance to facilitate the smooth implementation of the Project.

The major tasks of the consultant is described below:

- Examine and confirm the construction plans, working drawings, equipment specifications, and other relevant documents submitted by the contractor and equipment supplier;
- Conduct pre-shipment inspection to examine and confirm the quality and performance of the construction materials, furniture, and equipment delivered;
- Ensure that building installations and equipments are delivered and installed, and that the operating instructions are given and demonstrated;
- To monitor and to report the progress of the construction and equipment works;
- Witness the commissioning of the completed facilities and equipment.

In addition, the consulant is to report the progress of the Project, procedure of payment, circumstances of handover after completion, etc to the relevant agencies such as JICA.

（３）Contractor and Equipment Supplier

A contractor and an equipment supplier are to be selected by open tender in which only qualified Japanese corporations are eligible to participate. In principle, the lowest tenderers are to be awarded the contracts with UNTL for construction and equipment works, respectively. In accordance with their respective contracts, the building contractor is to construct facilities, and the equipment supplier is to procure, deliver, and install equipment as well as provide the Timor-Leste side with operation and maintenance training for the equipment. Additionally, the equipment supplier is to prepare for logistic support together with the relevant manufacturers and local agencies so that the Project's target organization can purchase spare parts and consumable supplies and receive paid technical training after the equipment is handed over to them.

（４）JICA

As the implementing agency of the Government of Japan for the Grant Aid, JICA provides necessary services for executing the Project in accordance with the Japan's Grant Aid Scheme.

（５）Local Consultants and Contractors

It is assumed that supervision of this construction scale requires more than one person. Therefore, local consultants are to be utilized effectively in order to cover the busy works.

Local leading construction companies have acceptable capability and manpower, and are expected to work on the Project as a subconstractor of the Japanese construction company.

2-2-4-2. Considerations for Construction Works/ Equipment Procurement

（１）Considerations for Construction

１）Schedule Management

The rainy season from November to April poses great challenges in scheduling construction

works. There will be a need to ensure that the temporary areas within and roads leading to the site, are not submerged during this season. Also, there is a need to devise an appropriate foundation and exterior construction plan. The Japanese contractor should complete these preparatory works as well as to make a practical construction schedule by taking the above-mentioned constraints into account. The progress of construction is to be monitored at regular meetings with the implementing agency of Timo-Leste, the consultants, and the construction contractor.

２） Safety Control

The construction site should be temporarily fenced to minimize the number of entrances during the construction. The contractor should control the circulation of construction vehicles and workers to ensure the safety of the neighborhood.

３） Security Measures

To prevent burglary of construction materials, 3 security guards are to take turns 24 hours on the site. It is necessary that the security management is allocated by UNTL, the Consultants, and the Constructors.

（２） Considerations for Equipment Procurement

１） Selecting Procurement Agents

- There are several sales agents for PC equipment, photocopiers and furniture in Dili, but the variation of the products in deal are limited. Therefore, the selection of equipment shall be very careful in terms of maintenance system including procurement of spare parts and consumables.
- Although, there is no sales agent for practical engineering products in TL, there are a lot of sales agents of Japanese, American and European manufacturers in Indonesia which is the neiboring country of TL. Therefore, Japanese products and the third country products shall be included in the Project. The engineer for those products shall be dispatched directly from the headquarters of the manufacturers and/or dispatched f terms of rom the agents in neighboring countries for installation and operation training.
- Although, a projector, a set of audio visual equipment and etc. for the international conference room shall be installed as a system, there is no an appropriate system integrator in Dili. Therefore, the equipment shall be procured in Japan in terms of securing the quality and proper installation.

２） Schedule Management

For the equipment procured for the Project, the installation works will be separated into 2 parts. The first part is for the equipment installed in the laboratories of the existing buildings and the other for the equipment installed in the new buildings constructed by the Project. For the installation of the equipment in the existing laboratories of departments of Mechanical Engineering, Civil Engineering and Electric and Electronics Engineering, the affects of the installation to the practice in class of each department will be minimized by adjusting the schedule of installation, initial instruction for operation and maintenance and operation training with UNTL. For the equipment installed in the new buildings, a coordination between UNTL and the Supplier on the demarcation of building services shall be fully conducted prior to the commencement of the procurement works so as not to occur any trouble at the site. The safety management shall be

thoroughly condidered during the installation by informing the installation work to the personnel of UNTL in advance.

３）The implementation of Operation Training

A proper guidance for operation and maintenance for the equipment procured for the Project shall be important in terms of a sustainable operation and an appropriate use of the equipment in a practice. Therefore, the contents of Tender Documents shall be carefully considererd for selecting skilled engineers with advanced knowledge for the installation work. Furthermore, operation training by engineers of manufacturers an/or its agents shall be included in the scope of the Project adding to an initial instruction for operation and maintenance in terms of securing an effective use of the equipment.

2-2-4-3. Scope of Works

The Project will be implemented through bilateral coorperaion between the Government of Timor-Leste and the Government of Japan. In case the Project is implemented under Japan's Grant Aid Scheme, the works borne by each government are as following,

（１）Works borne by the Grant Aid from the Government of Japan

Consulting services, construction of facilities, and procurement and installation of equipments are borne by the Government of Japan as the following details.

１）Consulting services

- Preparation of detailed design documents and tender documents of the facilities and equipments
- Assist in the selection of a contractor and an equipment supplier, and support contracts.
- Supervise facility consruction, procurement, installation, and training of initial and maintenance operation of equipments

２）Construction of facilities and Procurement and Installation of Equipments

- Demolition and clearance of foundation of existing facilities in the Project site
- Construction of facilities
- Procurement of construction materials and equipments, as well as transportation and deliverance to the facilities
- Trial operation and adjustment of equipment.
- Explanation and initial training of operation and maintenance of equipment

（２） Works borne by the Government of Timor-Leste

Table 2-28: Works borne by the Government of Timor-Leste

Construction
・ To secure the Project site ・ To clear and level the Project site (Demolishing of supers structure of existing buildings and felling of trees) ・ Procurement of soil for embankment ・ Landscaping works and planting ・ Laying of telephone and internet line to the Site ・ To obtain building permission and Environmental permits
Maintenance management
・ Procurement and installation of general furniture etc, which are not borne by Japan's Grant Aid ・ Procurement of consumables and spare parts ・ Appropriate and effective utilization and mainitenance management of the completed facilities and equipment
Procedures
・ Costs related to Banking Arrangement (B/A) and Authorization to Pay (A/P) ・ Applying and obtaining of the building permission and other relevant permissions ・ Prompt action for customs clearance, tax measures and internal transportation of the products for the Project ・ Bear custom duties, internal taxes and fiscal levies of the Project which Japanese Nationals and corporate entities are engaged ・ Logistical assistance necessary for Japanese nationals concerned to enter and stay in Timor-Leste ・ Bear all other expenses necessary that are not borne by Japan's Grant Aid

2-2-4-4. Consultant Supervision

（１） Supervision Policy

In accordance with Japan's Grant Aid Scheme, the consultant is to form a project team, thorough out the Project, including detail design phase, to ensure smooth implementation of the Project based on the Report. The principles for supervision of construction works and equipment works are as follows.

- To keep in close contact with the responsible officials of the relevant agencies of both countries to ensure that the construction of facilities and the installation of equipments are completed without delay.
- To give prompt and appropriate instructions and advice to the contractor and equipment supplier and their related members from an impartial position.
- To provide proper instructions and advice on the operation and maintenance of the facilities and equipments after their installation and commissioning. Confirm the completion of the facility construction and equipment installation in accordance with the respective contracts. Then complete the contracts by witnessing the commissioning of the facilities and equipments to confirm their acceptance by the UNTL.

（２） Supervision Plan

As the scale of the construction is moderately large, the consultant will dispatch a qualified Japanese engineer and local engineers to the site, all through the construction period. Furthermore, the consultant will keep dispatching the following engineers to the site when necessary.

- Chief Consltant/ Deputy Chief Consultant : Overall coordination and supervision of process and

quality control

- Architect：Explanation of design intent and examination of specification of materials
- Structural engineer： Analysis of bearing capacity of soil and examination of materials
- Mechanical engineer : Explanation of design intent, and midterm and final inspection of plumping and air-conditioning works
- Electrical engineer : Explanation of design intent, and midterm and final inspection of electrical works
- Furniture Planner：examination of materials, and midterm inspection of furniture
- Equipment planner : Supervision of installation, schedule coordination with the construction team, numerical examination, examination of operation manuals, etc.

（3） Construction Supervision by the Contractor

In order to complete the facilities within the scheduled period in comformity with the contract documents, the construction contractor needs to coordinate with local sub-constructors and manage the construction works. Moreover, resident supervisor need to be familiar with the local construction conditions in order to complete the Project in the required quality.

（4） Procurement Supervision Plan

1） Kick-off meeting/Confirmation of the equipment drawing in Japan

It is assumed that the schedule of equipment procurement such as ordering, inspection, shipment, transportation and installation, the organization of the Supplier for the Project such as staffs, reporting procedures and etc.,required documents in Tender Documents such as equipemt drawing, utility list and etc.and so on shall be confirmed.

2） Factory Inspection in Japan

A part of the practical equipment shall be delivered to the designated warehouse in an assembled package for exporting at a manufacturer’s factory. Therefore, a shop inspection shall be conducted before the delivery of the equipment at a manufacturer’s factory. Inspection engineer shall be in charge of the work.

3） Pre-shipment Inspection in Japan

The selection of an organization for inspection for pre-shipment inspection by a third-party organization, the preparation of necessary documents such as equipment specification for the pre-shipment inspection, the confirmation of the contents of the inspection report and the submission of the report of the completion of the pre-shipment inspection to the buyer shall be conducted.

4） Supervision for Equipment Procurement at the Project site

The supervising work such as for inspection, installation, adjustment, initial instruction for operation and maintenance and operation training implemented by the Supplier shall be conducted with the personnel of UNTL at the project site. The Consultant shall check the equipment procured if it is in accordance with the contract such as the name of manufacturer, model number, specifications and so on. For initial instruction for operation and maintenance and operation training, the check sheet including the signature of the completion of them shall be collected together with the name, title and section belonging to of persons who participated in it. A resident engineer for the supervision of equipment procurement shall conduct the work through the entire period of the whole works

implemented by the Supplier at the Project site.

５） Final Inspection and Handing-Over at the site

Upon having the completion of the works above, the Consultant shall report to a responsible person of UNTL on the completion of handing-over and proceed the necessary steps. A resident engineer for the supervision of equipment procurement shall conduct the work.

６） Inspection for defects before the expire of warranty at the site

The Consultant shall conduct the inspection for defects before the expire of warranty at the site and file a report for the inspection.

（５） Management for Equipment Procurement of the Supplier

１） Confirmation of Equipment Drawing

The schedule of equipment procurement such as ordering, inspection, shipment, transportation and installation, the organization of the Supplier for the Project such as staff, reporting procedures etc, required Tender Documents such as equipment drawing, utility list and etc. and so on, shall be explained by the Supplier and the Consultant shall approve it.

２） Shop Inspection Witness

A part of the practical equipment shall be delivered to the designated warehouse in an assembled package for exporting at a manufacturer’s factory. Therefore, a shop inspection shall be conducted before the delivery of the equipment at a manufacturer’s factory.

３） Pre-shipment Inspection Witness

The prepration of the inspection with manufacturers and the assistance of the inspection with a third-party organization for pre-shipment inspection shall be provided by the Supplier.

４） Management for Equipment Procurement at the site

The inspection, installation, adjustment, initial instruction for operation and maintenance and operation training for all the equipment procured for the Project shall be implemented by the Supplier with the Buyer at the site under the supervision by the Consultant.

2-2-4-5. Quality Control Plan

To ensure the quality level of the construction, the supervision of the Project site will be carried out according to the below mentioned standards of Timor-Leste and Japan.

The quality control plan of the main construction work is as shown in following table 2-26.

Table 2-29: Quality control plan

Work Type	Control Parameter	Control Value	Inspection Method	Quality standards	Inspection frequency	Analysis of results
Earth work	Bearing capacity of soil	long-term 98kN/㎡ (10ton/㎡)、or 196kN/㎡(20ton/㎡) or more	Plate bearingtest	International standards※	1 location at each site	Report
	Slope angle	Within planned range	Gauge, visual inspection		As needed	Photos, inspection documents
	Leveling tolerance	Within +0 ～-5cm				
	Height of foundation work	Within +0～-3cm	Level, visual inspection			
	Thickness of replaced soil	Within +5 ～0cm				
Reinforcement work	Reinforcement cover thickness	Places not in contact with soil: 30mm Footing with contact with soil:60mm Others:40mm	Visual inspection, measurement	International standards※	As needed	Photos, inspection documents
	Shape tolerance	Stirrup/hoop: ±5mm Others:±10mm				
	Tensile test	Standard strength or more	Sampling at the work site or at the time of shipment		Every 200t of steel bars of each diameter 3 test pieces at each test	Report
Concrete work (mixing at the site)	Compression strength	Designed strength: 21N/m ㎡ or more	Attendance at the work site (Anytime)	International standards※	3 or more test pieces per 50m^3 for each placing	Report
	Slump value	15cm±2.5cm	Attendance at the work site		For each placing	Photos, inspection documents
	Chloride content	0.3kg/m^3 or less	Test pieces, Attendance at the work site			
	Air content	45% ±1.5%	Attendance at the work site			
	Concrete temperature (at the time of delivery)	35Celsius degrees or less	Attendance at the work site			
	Performance accuracy	10mm per 1m or less	Measurement		At the time of form removal	
Masonry (Concrete block)	Compression strength	According to each plant's management value	Attendance at compression test	International standards※	once before shipment from the factory	Report
Plastering, painting, roofing, door and window works	Materials, storage methods, work methods, mixing, coating thickness, curing, tolerance	According to particular specifications	Same as left	Same as left	As needed	Photos, inspection documents
Plumping work	Water supply pipes	Leakage	Water pressure test (1.75Mpa for 60 min)	International standards※	Inspect each system at the completion of pipe laying work	Report
	Drainage pipes		Water filling test			
Electrical work	Cables	Within planned range	Insulation test Conductivity test	International standards※	Inspect each system at the completion of wiring	Report

※International standards; such as BS, ASTM, JIS, ACIS, SA

2-2-4-6. Procurement Plan

（1） Construction Materials

1）Procurement Policy

Most of the building materials can be procured locally. This is favorable for maintenance after completion of the Project.

The building materials which cannot be procured locally or need to be of a specific quality, and is necessary for the functioning of the facility, will be imported from Japan and/or third countries.

2）Procurement Plan

- Building structural work

  Structural materials, such as sand, gravel, concrete blocks for partition walls etc, are to be procured locally. Reinforcing bars, formwork materials, and cement from Indonesia or third countries can be procured in local construction markets.

- Finishing work

  Construction materials for interior and exterior, such as aluminum sashes, timber, tiles, colored metal sheets, paint, and glass, from Indonesia or third country can be procured in local markets.

- Plumbing work

  Submersible pumps, tanks, and sanitary ware, which are Indonesian or third country products, can be procured from local markets.

- Electrical work

  Electrical materials such as lighting fixtures, power panels, cables/wires, and conduits, from Indonesia or third country, can be procured in local markets.

Table 2-30: Procurement of major construction materials

Item	Procurement location			Notes
	Local	Japan	Third country	
[Temporary work]				
Scaffold	○			Single pipe scaffold is popular
Temporary fence	○			Corrugated metal sheet or paint on ply wood
Temporary office, storage, shed	○			Concrete block made is popular
[Materials]				
Portland cement	○		○	Indonesian products can be procured
Aggregate	○			Local products can be procured
Deformed bar	○	○	○	Indonesian products can be procured
Concrete formwork plywood	○		○	Indonesian products can be procured
Concrete block	○			Local products can be procured
Steel	○	○	○	Indonesian products can be procured
Waterproofing material	○		○	Indonesian products can be procured
Light gauge steel	○		○	Indonesian products can be procured
Colored metal sheet	○		○	Indonesian products can be procured
Aluminum door/window	○		○	Indonesian products can be procured
Wooden door/window	○		○	Indonesian products can be procured
Glass	○		○	Indonesian products can be procured
Tile	○		○	Indonesian products can be procured
Acoustic board	○		○	Indonesian products can be procured
Cement board	○		○	Indonesian products can be procured
Paint	○		○	Indonesian products can be procured
[Mechanical/Electrical works]				
Elevated tank	○		○	Indonesian products can be procured

Item	Procurement location			Notes
	Local	Japan	Third country	
Pump	○		○	Indonesian products can be procured
Conduit materials and fittings	○		○	Indonesian products can be procured
Sanitary ware	○		○	Indonesian products can be procured
Distribution panel	○		○	Indonesian products can be procured
Conduit and wire	○		○	Indonesian products can be procured
Lighting fixtures	○		○	Indonesian products can be procured
Lightning arrester	○		○	Indonesian products can be procured

2-2-4-7. Operational Guidance Plan

Carry out initial operation guidance and training, after equipments are delivered, adjusted, installed and commissioned. This is to be done by the equipment supplier, and the consultants may supervise this process. The contents and the progress of training are to be confirmed by UNTL and each staff, the consultants, and equipment supplier, at the time of handover.

2-2-4-8. Implementation Schedule

The implementation schedule until the commencement of construction, in the case the Project is implemented by the Japan's Grant Aid, is as follows.

- The E/N is signed between the Government of Timor-Leste and the Government of Japan, and the G/A is signed between the Government of Timor-Leste and JICA.
- A Japanese consultant is recommended by JICA.
- The agreement of consulting services for the Project is concluded between UNTL and the recommended consultant.
- The construction work is to be commenced after detailed design, assistance of tender in Japan, and conclusion of the contract for construction works.

（1） Detailed Design

The consultant prepares the detailed design document and the tender document, based on The Report. It consists of detailed design drawings, specifications, calculation, and tender summary, etc. The consultant has close talks and meetings, with UNTL at the beginning and at the end of the detailed design phase. The detailed design phase will be completed after submission of the final deliverables, with confirmation of UNTL.

（2） Tender

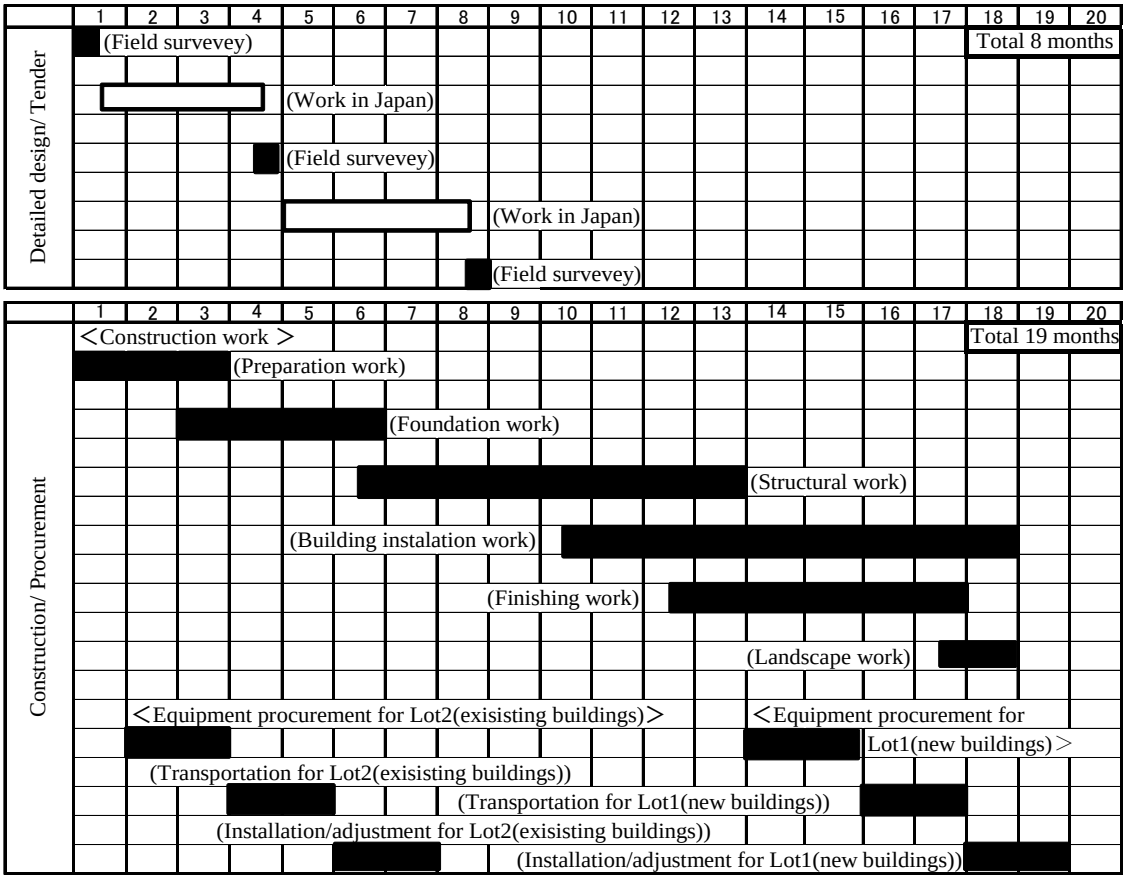
After detailed design, the prequalification (P/Q) of the tender for construction will be announced in Japan. According to the evaluation of the P/Q, UNTL will invite the qualified Japanese construction companies. In the case the equipment suppliers are tendered separately from the consruction, UNTL will invite Japanese equipment suppliers who declare the intent to participate. Then UNTL will conduct the tenders respectively under the presence of persons involved, and the tenderers who bid the lowest price within the ceiling price will make contract with UNTL.

（3） Construction and Equipment procurement

The construction and equipment works will be commenced, after the contract is verified by JICA. Considering the scale of the Project and the local conditions, the total period of construction and equipment procurement as well as installation and operational guidance will approximately be 19 months. On the premise that the smooth procurement of materials and equipments, prompt execution

of relevant procedures and implementation of works to be borne by the Timor-Leste side, are carried out.

Table 2-31: Implementation Schedule



2-3. Obligations of Recipient Country

This Project will be implemented under the Grant Aid Scheme of the Government of Japan, and the Government of Timor-Leste shall be responsible for the following tasks.

（１）Preparation Work

- Level the ground（Demolish existing building, levelling, cutting trees）
- Procure soil for embankment
- Plantation after the completion.
- Obtain relevant building permission and Environmental Permits
- Laying of telephone and internet line.

（２）Maintenance

- Procure general furniture and equipment other than those provided by the Japanese side
- Procure consumables and spare parts required to maintain the facilities and equipments
- Ensure appropriate and effective usage and maintenance of the facilities and equipments

（３）Administrative Procedures

- Bear commissions for the Banking Arrangement (B/A), payment to contractors, and notification of Authorizations to Pay (A/P) and amended A/P
- Acquire building permission (examination by Public Works)
- Obtain relevant permissions, licenses, and other authorizations necessary for the Project
- Ensure prompt unloading, customs clearance, tax measures, and internal transportation of the construction material and equipment imported for the Project
- Bear customs duties, internal taxes, and other fiscical levies and charges in Timor-Leste, incurring in the Project.
- Make necessary arrangements for the above-mentioned Japanese nationals to enter into and stay in Timor-Leste to engage themselves in the Project
- Bear all expenses, other than those covered by Japan’s Grant Aid, necessary for the completion of the Project

2-4. Project Operation Plan

2-4-1. Operation and Maintenance System

（1） Operation System

According to “Strategic Development Plan (FEST-UNTL) Hera Canpus 2015-2025”, the number of lecturers and staff will be 141 as shown in the table 2-32, considering increase in the number of students.

Table 2-32: No. of staff in Sterategic D

Items	2014	2025
Total No. of Lecturer	**102**	**141**
Subtotal No. of Academic staff	79	99
Total No. of Lecturer	78	88
Total No. of Technician	1	11
Subtotal No. of Admin staff	23	42
Total No. of Admin Staff (5 Dept)	9	13
Total No. of Admi Staff (Faculty)	14	29

Source Strategic Development Plan

（2） Maintenance System

According to the future plan of FEST, the number of technician will increase from 1 to 11, and they will be in charge of daily maintenance and minor repair work of equipment. Major repair work for equipment will be outsourced to manufacturer or agent. It is planned that the inventory data which has been managed by lecturers of each department, will be gathered and integrated as a master inventory data of FEST. Moreover, A daily management work such as listing necessary equipment, spare parts and consumable, constant update of inventory data will be enhanced. This master inventory data system will be utilized for the application of a budget for the procurement of new equipment and spare parts and consumable for the existing, which will be organized and submitted to the headquarters of UNTL by the Dean of the Faculty.

Malfunction of facility will be repaired by local contractor contracted with FEST.

2-4-2. Maintenance Plan

（1） Facilities

The maintenance of facilities is categorized into two types: (i) daily cleaning and (ii) repair of wearing parts, damage, and deterioration.

The repair of facilities mainly consists of the renovation and restoration of the interior and exterior finish on the structure. Facilities should be refurbished every decade to retain their functions.

Items for regular inspection and repair, which affect the lifespan of facilities, will be presented in the Maintenance Manuals submitted by the contractor at the commissioning of the facilities. Detailed inspection and cleaning methods will be also explained.

Regular inspection points are summarized in the table 2-33 below.

Table 2-33: Summary of Regular inspection

	Inspection and maintenance points	Frequency
Exterior	・ Restore and repaint exterior walls	Repaint: every 5 years, restore: every 3 years Inspect every 3 years; restore every 10 years
	・ Inspect and restore roofs	Every year
	・ Regular cleaning of drainage gutters and pipes	Every year
	・ Inspect and repair exterior door and window seals	Every year
	・ Inspect and clean ditches and manholes, etc. regularly.	Every year
Interior	・ Renovate the interior	As necessary
	・ Restore and repaint partition walls	As necessary
	・ Replace ceiling materials	As necessary
	・ Adjust doors and windows to fit the openings	Every year
	・ Replace door handles, hinges, etc.	As necessary

（2） Building Installations

It is important to maintain the building equipments with routine inspections before the defects and replacement occurs. Its lifespan can be extended by normal operation and daily inspection, lubrication, tune-up, cleaning, and repair, as well as reconsidering operation hours. Daily maintenance can prevent defects and accidents as well as mitigate their impacts.

Electricity-powered equipment such as water pumps needs periodical inspection and maintenance. It is important to have annual inspection. The general lifespan of major building equipments is shown below in table 2-34.

Table 2-34: The general lifespan of major building equipment

	Equipment	Lifespan
Electrical installations	・Distribution panel	20-30 years
	・Fluorescent light (lamp)	5,000-10,000 hours
	・ Incandescent light (lamp)	1,000-1,500 hours
	・ Generator	30 years
Plumbing installations	・Pump, pipe, and valve	15 years
	・Tank	20 years
	・Sanitary ware	25-30 years
Air-conditioning installations	・Pipe	15 years
	・Exhaust fan	20 years
	・Air conditioner	10 years

（3） Equipment

The procurement of the equipment by the Project is targeted for FEST of UNTL located at Hera campus. The operation and maintenance of the equipment shall be responsible of each department of the Faculty. However, since there is no skilled engineer for the operation and maintenance currently in the Faculty, the situation of the operation and maintenance is not enough in terms of its technical level though lecturers of each department are doing it instead of skilled engineer. The application for the assignment of skilled engineer has been submitted to the headquarters of UNTL in Dili by the Dean of the Faculty based on the requirement of each department. Even, the allocation of skilled engineers are expected to be implemented in near future, the building of systematic organization for the operation and maintenance should be urgently done by the Faculty. The application of a budget for the procurement of new equipment and spare parts and consumable for the existing equipment shall also be submitted to the headquarters of UNTL by the Dean of the Faculty based on the requirement of each department.

The proposal of a systematic structure for operation and maintenance at each level of UNTL headquarters, the Faculty and each department is shown as follows.

Table 2-35: The proposal of a systematic structure for operation and maintenance at UNTL

The role of the headquarters of UNTL	The role of the FEST	The role of each department
• Drafting of the policy for the implementation of operation and maintenance	• The application of the budget for operation and maintenance to the headquarters of UNTL based on the requirement of each department	• The role and responsibilities for the head of department, a person in charge for operation and maintenance and lecturers shall be defined
• Securing and allocation of the budget	• The application for the allocation of human resources	・ The management of inventory list of the equipment by each department
• Drafting of the allocation of human resources	• The management of inventory list of the equipment	・ The dissemination and instruction for students on how to use of the equipment
• Drafting of the planning for education of human resources	• The collection of information from each department	・ The daily checking for the shortage of spare parts and consumable of the equipment
	• The sharing of information with the headquarters of UNTL through a periodical meeting	・ The reporting and application for repair to the Faculty on a serious damage of the equipment
	• The implementation of seminars for the improvement of the technique for operation and maintenance targeting to lecturers and technicians	• The role and responsibilities of technicians for daily maintenance including the repair on simple trouble of the equipment shall be defined
	• Correspondence for the requirement of the repair of the equipment including the ordering to manufacturer's agent.	・ The implementation of daily maintenance including monitoring and record using a check list shall be done properly
		・ The shortage of spare parts and consumable shall be checked
		・ Adjustment and repairing of simple trouble of the equipment shall be done by a technician
		・ The judgement of the cause of serious damages shall be done by a technician

2-5. Project Cost Estimation

2-5-1. Initial Cost Estimation

The Project Cost to be borne by the Timor-Leste Side is estimated as follows.

Table 2-36: Esimated Project Cost to be borne by Timor-Leste Side

NO.	Items	Contents	Estimated Cost（USD）	Remarks
1	Leveling of the Site	Demolition of existing pavement, and grading	2,100	
2	Tree felling and stumping	Cutting obstacle trees, and roots	250	
3	Tree planting and landscape gardening	Tree planting and landscape gardening of the site	12,000	
4	Procurement of soil	Procurement of soil for embankment in the site	29,000	
5	Infrastructure	Wiring work and leading telephone line to the site	4,150	
6	Procurement of furniture	Procurement of general furniture which are not included in the work by the Grant Aid from the Government of Japan	21,250	
7	Comissions	Comissions of A/P and B/A	61,710	
8	Tax	Import Duty and Sales Tax applied to imported equipments and materials	62,150	5%of the customs value of the imported items
TOTAL			192,610	

Estimated condition: Estimated in March, 2015 with exchange rate of 1USD=119.79YEN.

2-5-2. Operation and Maintenance Cost

（1） Estimated Operation and Maintenance Cost

Estimated Annual Operation and Maintenance Cost for the Project, after the completion of the Project, is shown in the following table 2-37.

Table 2-37: Estimation of Annual Operation and Maintenance Cost

（Unit：USD/year）

Item	After the completion of the Project
1. Electricity	0
2. Fuel for Generator	6,110
3. Communication Expenses	19,960
4. Maintenance Cost of Facilities	8,800
5. Operation and Maintenance Cost of Equipments	20,158
TOTAL	55,028

【Conditions of Calculation】

1. Electricity

Average electricity consumption per month in FEST in the year 2014 was 19,100kWh. As total number of students was then 1,212, this calculates as 15.76 kWh/ month per student,
Accoring to “Strategic Development Plan (FEST-UNTL) Hera Campus 2011-2025”, the target

number of students by the year 2025 is 1,600. Using this number, the electricity consumption in the future is estimated as followings:

1,600 students ×15.76 kWh/ Month ＝ 25,216 kWh/ Month

On the other hand, the utility connected photovoltaic power generation system of 250kW, installed by “the Project for Introduction of Clean Energy by Solar Electricity Generation System” generates 27,800kWh/ month energy in average. Which exceeds estimated future consumption.

25,216 kWh/Month（estimated energy consumption）＜27,800kWh/Month（photovoltaic power generation）

From this, the electricity expenditure is not required.
（The electricity buy-and-sell system is not yet operated till March 2015. Therefore the income from energy generator is not considered.）

2. Fuel cost

・Generator

A generator is planned , and its operation cost is calculated as expenditure of oil. Assumed operation hours are 3hours in a week. Inflation rate of oil is 10.21%.

42litres×3.0hours×44weeks×$1.00 /litre×1.1021≒ 6,110USD/year

3. Communication expenses

Consider inflation rate as 10.21%.

・Internet

The IT Infrastructure Purchasing Budget in the year 2015 is $12,000, as shown in table 5-4, the Changes in UNTL Administration Budget. Currently, FEST takes 10MB of the communication capacity out of UNTL’s total capacity of 50MB. Assume this is increased to 20MB in the future, the budget will be as follows.

12,000x20/50 x 1.1021 =5,290USD/year …(a)

・Telephone

Monthly basic charge $10.00/Month×12months=120 USD/year …(b)
Call charge 300mins/day×$0.2/mins×220day×1.1021≒14,550 USD/year …(c)

(a)＋(b)＋(c)≒19,960 USD/year

4. Maintenance cost of facilities (10years average after the completion)

・Repairing cost of Facilities

Although the repairing cost of facilities varies year by year, the average annual cost for 10 years after the completion of the Project is assumed to be 0.1% of the direct construction cost.

2,900 USD/year …(d)

・Reparing cost of Facility Installations

The reparing cost of Facility Installations will be small for the first five years after the completion of the Project. However, after the five years, replacement of spare parts or installation itself will be necessary. The average annual cost of facility installation repairment for the first 10 years is assumed approximately 0.2% of the direct equipment cost.

5,900 USD/year …(e)

(d)＋(e)＝8,880 USD/year

5. Operation and Maintenance Cost of Equipments

The equipment requiring consumable for its daily operation for the Project are shown in Table 2-38.

Table 2-38: Equipment requiring consumable for its daily operation

Description (Unit:yen)	Name of Consumable	Unit Price	Quantity based on annual requirement	Amount (JPY)
Projector, normal size	Lamp unit	37,800	17	642,600
	Filter unit	11,745	17	199,665
Projector, medium size	Lamp unit	37,800	11	415,800
	Filter unit	11,745	11	129,195
Projector, large size	Lamp unit	37,800	5	189,000
	Filter unit	11,745	5	58,725
Projector for international conference room	Lamp unit	77,895	1	77,895
	Filter unit	12,420	1	12,420
Portable rock core drills	Core bit	28,000	1	28,000
Binicular microscope with camera	Halogen lamp	3,400	1	3,400
Polarization microscope	Halogen lamp	3,400	10	34,000
Rock cutting machine, middle size	Spare blade	80,000	1	80,000
cutting machine, small size	Spare blade	80,000	1	80,000
Bench type polishing apparatus	Diamond disc	45,500	2	91,000
	Sand disc	1,200	24	28,800
	Felt disc	3,100	8	24,800
CNC vertical milling machine	Milling tools	50,000	1	50,000
Band saw	Spare blade	18,000	2	36,000
	Bearings	100,000	1	100,000
Buff polishing machine	Buffing paper	1,000	12	12,000
	Buffing cloth	3,000	4	12,000
Metallography microscope	Halogen lamp	3,400	1	3,400
Vickers hardness tester	Hardness standard	39,000	1	39,000
	Diamond indenter	67,000	1	67,000
	Total			2,414,700

JPY2,414,700 devided by 119.79/exchange rate per USD= USD20,158.00 per year

（２）Operation and maintenance cost analysis

From the above, additional annual operating and maintenance expenses will be approximately 55,028USD as shown in table5-2.

The next table 5-4, the Changes in UNTL Administration Budget, shows the total budget of “utility charge”, “generation fuel cost”, “facility and equipment maintenance cost” in the operating year of 2018, which is $467,000. The total number of students of UNTL is 10,168, and the number of FEST is 1,212. From these numbers, it can be said that this operating and maintenance expenses are affordable, as shown in the calculation below.

FEST’s budget: $467,000x1212/10168=55,666USD

Table 2-39: the Changes in UNTL Administration Budget (US$’000)

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Salary & Wages	**2,674**	**6,616**	**6,713**	**6,697**	**6,697**	**6,965**	**7,243**	**7,533**	**7,835**
Salary	2,674	6,601	6,683	6,639	6,616	6,881	7,156	7,442	7,740
Overtime allowances		15	30	58	81	84	88	91	95
Goods & Services	**1,705**	**3,128**	**2,726**	**5,233**	**2,940**	**3,058**	**3,180**	**3,307**	**3,439**
Local Travel	65	102	228	200	160	166	173	180	187
Overseas Travel	65	204	129	100	140	146	151	157	164
Training & Workshops	16	26	16	997	200	208	216	225	234
Utilities	152	124	128	405	293	305	317	330	343
Vehicle Operation Fuel	44	124	215	294	313	326	339	352	366
Vehicle Maintenance	18	37	52	82	80	83	87	90	94
Vehicle Rental, Insurance & Service	-	-	-	-	-	-	-	-	-
Office Stationary & Supplies	97	110	195	197	197	204	213	221	230
Operational material and supplies	56	277	256	913	112	116	121	126	131
Fuel for generators	31	47	10	5	5	5	5	6	6
Maintenance of Equipment & Buildings	12	384	26	434	117	121	126	131	136
Operational Expenses	312	227	242	500	186	193	201	209	218
Professional Services	526	921	841	622	897	933	970	1,009	1,049
Translation Services	7	-	-	10	10	10	11	11	12
Other miscellaneous Services	301	544	387	474	231	240	250	260	270
Transfers	-	-	**0**	**2,205**	**3,974**	**4,133**	**4,298**	**4,470**	**4,649**
Minor Capital	**940**	**804**	**150**	**254**	**174**	**181**	**188**	**196**	**204**
Purchase of Vehicles	693	366	18	64	-	-	-	-	-
EDP Equipment (IT infrastructure)	-	21	15	28	12	12	13	13	14
Security Equipment	5	11	-	-	-	-	-	-	-
Communication Equipment	21	3	-	1	-	-	-	-	-
Other miscellaneous Equipment	3	32	66	137	125	130	135	141	146
Furniture & Fittings	48	263	-	6	35	36	38	39	41
Office equipment	96	105	50	18	2	2	2	2	2
Generators	74	-	-	-	-	-	-	-	-
Water Equipment	1	4	-	-	-	-	-	-	-
Capital & Development	-	-	**0**	**500**	**700**	**728**	**757**	**787**	**819**
Infrastructure Assets	-	-	-	500	700	728	757	787	819
TOTAL	5,320	10,548	9,589	14,890	14,485	15,064	15,667	16,294	16,945

Source : Rearranged by the survey team using following evidence: Data for 2013～2019 from State Budget2015,Book4. Data for 2012 from State Budget2014, Book4. Data for 2011 from State Budget2013, Book4

Chapter 3 Project Evaluation

Chapter 3. Project Evaluation

3-1. Preconditions

Because the Project intends to use the reserved area for future use, after removal of existing structures within the premises of Hera campus, there is no particular precondition for land acquisition. The responsible parties of the recipient country need to work on building permits, environmental lisences, procedures for tax measures and other necessary procedures without delay so that the Project can be implemented on schedule.

3-2. Necessary inputs by Recipient Country

The responsible parties of the recipient country are required to appropriately carry out or prepare for the following matters so that the Project can achieve its objective.

- Works done by the recipient country as stated in Chapter 2, are to be implemented without delay.
- Securing of budget necessary for use, maintenance and management of facilities to be constructed and equipment to be procured.
- Securing of area and utilities necessary to install equipment in the existing workshops (laboratories), and reinforcement of the floors of the workshops if necessary
- Improvement on curriculum and experiment manual related to procured equipment, in cooperation with technical cooperation projects currently under implementation.

3-3. Important Assumptions

The Project intends to improve the academic environment by constructing faculty buildings and procuring educational and research equipment necessary for the departments of FEST of UNTIL to carry out their curriculums and syllabuses, thereby contributing to the transformation of the university into an institution of repute matching with international standards. In order to achieve an effect of the Project, the facilities and equipment must to effectively be used by teaching staff members of FEST, UNTIL, and quality experiments and practical learning sessions must be continuously carried out. To this end, the responsible parties of the recipient country are expected to improve the curriculums and procedures for experiments using the equipment to be procured under the Project in collaboration with the technical coorporation project currently in progress.

3-4. Project Evaluation

3-4-1. Relevance

The Project is relevant as a project of Japan’s grant aid cooperation from the following perspectives.

3-4-1-1. Beneficiaries of the Project

The Project will target the FEST of UNTL in Hera, the city of Dili, and its direct beneficiaries are approximately 1,200 students of the faculty (Faculty Year 2015) who uses facilities and equipment to be upgraded under the Project. UNTL, a sole national university in Timor-Leste, is proud of the highest academic level in the country, and the tuition fees are inexpensive compared to private universities in the country, so it has students from all over the country. In this sense, students of the entire country can be regarded as beneficiaries of the Project. Moreover, graduates from UNTL chiefly work for

governmental ministries and agencies in charge of roads, electricity, communications and other forms of infrastructure encouraged by the government of Timor-Leste, public and private companies in the same fields, as well as public educational institutions. In this sense, too, the entire land and people of the country can be regarded as beneficiary of the Project. Thus, the Project covers a wide area and a large number of people, and its relevance is considered to be high.

3-4-1-2. Perspective of Human Security

Human security is a paradigm that aims to focus on each person, protect people from critical and pervasive threats to human lives, livelihoods and dignity, and enhance human fulfillment. For these objectives, human security promotes sustainable independence of individuals and social development through protection and capacity enhancement. Timor-Leste had confusion in security until the independence and even for a while after the independence, but is now, thanks to the economic stability as a result of the growth in the petroleum industry, shifting from the rehabilitation stage to the next stage to build the foundation for the true independence, and social and economic development. To make the peaceful state eternal, development of educational foundations and basic infrastructure is essential. This Project aims to improve the academic environment of FEST of UNTIL, the sole national university in Timor-Leste, through which it will contribute to development of human resources who will help improve the infrastructure of the country and replenishment of teaching staff members in public institutions, who are currently insufficient. In this sense, the Project is compatible with the perspective of human security and thus is considered to be a project that directly helps the people to improve their livelihoods.

3-4-1-3. Contribution to Achievement of the Goals in the Strategic Development Plan 2011-2030

In 2011, Timor-Leste published a Strategic Development Plan 2011-2030 (SDP), a mid-term plan covering the period until 2030, where it sought to become an upper middle income country by 2030. The SDP 2011-2030 shows that the country will establish core industries and focus on agriculture, tourism and oil industries, while seeking to give up excessive reliance on petroleum, on which it currently relies for 80% of the GDP. To this end, the SDP 2011-2030 emphasizes the importance of infrastructure and human resource development. As for human resource development, the plan refers to improvements in education (preschool, elementary, secondary and higher educational institutions in the public and private sectors), provision of knowledge from UNTL to the public, life-long education, vocational training, and scholarship programs. This Project is expected to directly improve the function of UNTL referred to as the sole public higher educational institution, and directly contribute to improvements in various aspects including the quality of teachers at primary and secondary schools, infrastructure and oil industries. Accordingly, the Project is considered to be appropriately relevant.

3-4-1-4. Consistency with Japan's Asistance Measures and Policy

The Ministry of Foreign Affairs of Japan states in its official document called "Japan's Country Assistance Policy for Timor-Leste" that a priority area of the assistance is "establishing a foundation for promoting economic activities", and that "since promoting economic activities is the main challenge for Timor-Leste's stable development, our main focus will be on improving infrastructure, including soft

infrastructure, as well as developing industrial human resources". The policy matches with the overall goal of the Project "transforming UNTL into an institution of repute matching with international standards by 2020". Therefore, the Project is fully consistent with Japan's official assistance measures and policy.

3-4-2. Effectiveness

The following are outputs that the Project is expected to produce.

3-4-2-1. Quantitative Effects

Table 3-1: Quantitative Effects

	Reference value (FY2015)	**Target value (FY2021) [3 yrs after completion of the Project]**
No. of students at FEST of UNTL	1,201 students	1,400 students
No. of pieces of graduate research at FEST of UNTL	0 ※	300 papers/year
Floor area per student	5.6 ㎡/person	10.2 ㎡/person

※The graduate system is upgrading from a 3 years to a 4 years course. Currently, for the year 2015, the number of research papers pertaining to the new system have not been submitted.

3-4-2-2. Qualitative Effects

・Implementation of quality and practical education, development of human resource that contributes to economic development.

Appendices

1. **Member List of the Study Team**
2. **Study Schedule**
3. **List of Parties Concerned in the Recipient Country**
4. **Minutes of Disscussions**
5. **Other Relevant Data**
6. **References**

1. Member List of the Study Team

Member List of the Study Team

Field Survey Ⅰ (Feb.27th～Mar.29th, 2015)

Name	Position	Period of Stay	Organization
Mr. Daisuke UEDA	Mission Leader	Mar.13th～ Mar.22nd	Japan International Cooperation Agency
Mr. Atsushi TSUJIMOTO	Cooperation Planning	Mar.13th～ Mar.22nd	Japan International Cooperation Agency
Mr. Tadayoshi TSUMOTO	Chief Consultant / Architectural Design	Mar.6th～ Mar.22nd	Yamashita Sekkei Inc.
Mr. Shingo KURODA	Deputy Chief Consultant / Architectural Design 1	Feb.27th～ Mar.29th	Yamashita Sekkei Inc.
Ms. Yuka KOBAYASHI	Architectural Design 2	Feb.27th～ Mar.29th	Yamashita Sekkei Inc.
Mr. Hiroshi TADA	Structural Design / Natural Condition Survey	Feb.27th～ Mar.27th	Yamashita Sekkei Inc.
Mr. Yoshiyuki FUKUMOTO	MEP Design 1	Mar.20th～ Mar.29th	Yamashita Sekkei Inc.
Mr. Kazuma TAKEISHI	MEP Design 2	Mar.20th～ Mar.29th	Yamashita Sekkei Inc.
Mr. Hiroaki MOCHIZUKI	Construction Planning/ Cost Survey	Feb.27th～ Mar.20th	Yamashita Sekkei Inc.
Mr. Paulo AGUAIR	University Facility Design	Mar.9th～ Mar.13th	Yamashita Sekkei Inc.
Mr. Akihiro OKAMOTO	Equipment Planning	Feb.27th～ Mar.22th	INTEM Consulting, Inc.
Mr. Ryoji OKAMOTO	Equipment Procurement/ Cost Survey	Feb.27th～ Mar.29th	INTEM Consulting, Inc.
Mr. Tatsuya NAGUMO	Higher Education Planning	Mar.7th～ Mar.29th	PADECO Co., Ltd.

Field Survey Ⅱ (Aug.28th～Sept.6th, 2015)

Name	Position	Period of Stay	Organization
Mr. Takemichi Kobayashi	Mission Leader	Aug.28th～Sept.6th	Japan International Cooperation Agency
Mr. Atsushi TSUJIMOTO	Cooperation Planning	Aug.28th～Sept.6th	Japan International Cooperation Agency
Mr. Tadayoshi TSUMOTO	Chief Consultant / Architectural Design	Aug.28th～Sept.6th	Yamashita Sekkei Inc.
Mr. Shingo KURODA	Deputy Chief Consultant / Architectural Design 1	Aug.28th～Sept.6th	Yamashita Sekkei Inc.
Mr. Akihiro OKAMOTO	Equipment Planning	Aug.28th～Sept.6th	INTEM Consulting, Inc.

2. Study Schedule

Study Schedule

Field Survey Ⅰ (Feb.27th～Mar.29th, 2015)

NO.	Date	Day	JICA	Consultant Team										
				1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)
			Officials	Chief Consultant / Architectural Design	Deputy Chief Consultant / Architectural Design 1	Architectural Design 2	Structural Design / Natural Condition Survey	MEP Design 1	MEP Design 2	Construction Planning/ Cost Survey	University Facility Design	Equipment Planning	Equipment Procurement/ Cost Survey	Higher Education Planning
				Mr. Tadayoshi TSUMOTO	Mr. Shingo KURODA	Ms. Yuka KOBAYASHI	Mr. Hiroshi TADA	Mr. Yoshiyuki FUKUMOTO	Mr. Kazuma TAKEISHI	Mr. Hiroaki MOCHIZUKI	Mr. Paulo AGUAIR	Mr. Akihiro OKAMOTO	Mr. Ryoji OKAMOTO	Mr. Tatsuya NAGUMO
1	2/27	Fri.			Narita→					Same as 2)		Same as 2)	Narita→ Denpasar	
2	2/28	Sat.			Singapore→Dili					Same as 2)		Same as 2)	Denpasar→Dili	
3	3/1	Sun.			Arrangement					Same as 2)		Same as 2)		
4	3/2	Mon.			Courtesy call to FEST UNTL, Survey at UNTL					Same as 2)		Same as 2)		
5	3/3	Tue.			Survey at UNTL, Courtesy call to UNTL HQ					Same as 2)		Same as 2)		
6	3/4	Wed.			Survey at UNTL, TV Conference at JICA	Survey at UNTL	Survey at UNTL, Survey on construction condition			Same as 4)		Same as 2)	Same as 3)	
7	3/5	Thu.			Survey at UNTL		Survey on Construction condition and Natural conditions			Same as 4)		Same as 2)		
8	3/6	Fri.		Narita→	Survey at UNTL, Courtesy call to MOE		Survey on Construction condition and Meteorological Survey			Same as 4)		Survey at UNTL		
9	3/7	Sat.		Singapore→ Dili	Reporting, Team meeting		Construction condition survey			Same as 4)		Procurement condition survey		Narita→ Denpasar
10	3/8	Sun.		Team Meeting	Reporting, Team meeting					Same as 2)		Same as 2)		Denpasar→Dili, Team Meeting
11	3/9	Mon.		Courtesy call to FEST UNTL, Survey at UNTL			National Directorate for Environment, Secretary of State for Land and Property, General Directrate of Electricity, Survey on fire regulations			Same as 4)	Survey at UNTL			Same as 1)
12	3/10	Tue.		Survey on Building permits and Construction condition	Construction condition survey, UNTL Survey		Ministry of Public Works, Construction condition survey			Same as 4)	Same as 1)	Evaluation of requested equipments	Survey at UNTL	Survey on education conditions
13	3/11	Wed.		Survey at UNTL			National Directorate for Environment, Ministry of Public Works, Survey on Building permits			Same as 4)	Same as 1)		Same as 3)	Survey on education conditions
14	3/12	Thu.		Survey at UNTL		Dili Institute of Technology, UNTL Central Library	Discussion on water test, Construction condition survey			Same as 4)	Same as 1)		Survey at UNTL	Same as 3), Survey on education conditions
15	3/13	Fri.	Haneda→	Survey at UNTL	Library of UNTL Department of Education, UNTL Central Library		Construction condition survey			Same as 4)	Same as 1)		Survey at UNTL	USAID, Chamber of Commerce and Industry,Same as 1)
16	3/14	Sat.	Singapore→Dili	Reporting, Team meeting						Same as 1)		Same as 1)		
17	3/15	Sun.	Team Meeting	Reporting, Team meeting						Same as 1)		Same as 1)		
18	3/16	Mon.	Courtesy call to JICA office, Discussion at FEST UNTL and UNTL HQ			Survey at UNTL	Same as 7)、Request cost			Survey at UNTL, Attend discussion of New building of UNTL Department of Agricaulture, Survey on Duty-free procedure at Tax office		Same as 1)	Same as 3)	Survey on education conditions
19	3/17	Tue.	Discussion on Minute of Meeting			UNTL Central Library, Survey at UNTL	Construction condition survey			Same as 4)		Same as 1)	Survey at UNTL	Survey on education conditions
20	3/18	Wed.	Discussion on Minute of Meeting, Discussion at MOE			Survey at UNTL	Construction condition survey			Same as 4)		Same as 1)	Same as 3)	Survey on education conditions
21	3/19	Thu.	Discussion at UNTL	Construction condition survey, Discussion on Master plan of UNTL			Construction condition survey			Construction condition survey Dili→Singapore→		Survey at UNTL	Same as 9)	Survey on education conditions
22	3/20	Fri.	Discussion at UNTL, Report to Japanese Embassy	Survey at UNTL, Report to Japanese Embassy		Survey at UNTL	Construction condition survey	Narita→		Narita		Finalising requested equipments, Report to Japanese	Same as 3)	Survey on education conditions
23	3/21	Sat.	Dili→Singapore→		Preparing basic design, Contract of Water survey			Singapore→Dili				Same as 1)	Preparing draft of technical notes	
24	3/22	Sun.	Narita		Preparing basic design and report			Team meeting				Same as 1)	Preparing draft of technical notes	Reporting, Team meeting
25	3/23	Mon.			Confirmation of water survey at the site, Discussion on technical notes		Confirmation of water survey at the site, Construction condition survey	Survey on UNTL infrastructure					Preparing draft of technical notes	Survey at UNTL
26	3/24	Tue.			Survey on UNTL infrastructure	Preparing basic design and report	Construction condition survey	Survey on UNTL infrastructure					Preparing draft of technical notes	Survey at UNTL
27	3/25	Wed.			Discussion on technical notes, Preparing basic design		Witness examination of water survey, collection of cost estimation of geological survey	Survey on infrastructure, Discussion on technical notes, Preparing basic design					Same as 2)	Survey on education conditions
28	3/26	Thu.			Negotiation of geological survey, Confimation at the site, signing of technical notes		Negotiation of geological survey, Dili→ Singapore→	Survey on infrastructure					Dili→Denpasar →Jakarta, Construction condition survey	Survey on education conditions
29	3/27	Fri.			Survey on customs survice at Tax office, Report to JICA	Tax office, Construction condition survey	Narita	Survey on infrastructure	Same as 2)				Construction condition survey	Survey on education conditions
30	3/28	Sat.			Dili→Singapore→			Same as 2)					Construction condition survey, Jakarta→	Dili→ Denpasar→
31	3/29	Sun.			Narita			Same as 2)					Narita	Narita

Field Survey Ⅱ (Aug.28th～Sept.6th, 2015)

NO.	Date	Day	JICA	Consultant Team		
			Officials	1)	2)	9)
				Chief Consultant / Architectural Design	Deputy Chief Consultant / Architectural Design 1	Equipment Planning
				Mr. Tadayoshi TSUMOTO	Mr. Shingo KURODA	Mr. Akihiro OKAMOTO
1	8/28	Fri.			Narita→	
2	8/29	Sat.	Narita→Singapore	Haneda →Jakarta → Denpasar	→Singapore→Dili	
3	8/30	Sun.	Singapore→Dili	Singapore→Dili	Preperation	
4	8/31	Mon.	Courtesy call to JICA, MOE, Discussion at UNTL			
5	9/1	Tue.	Discussion at UNTL			
6	9/2	Wed.	Discussion at UNTL			
7	9/3	Thu.	Discussion at UNTL			
8	9/4	Fri.	Signing of Minute of Meeting,Report to JICA and Japanese Embassy			
9	9/5	Sat.	Dili→Singapore		Dili→Singapore→	
10	9/6	Sun.	Singapore→Narita	Singapore→Yangon	→Narita	

3. List of Parties Concerned in the Recipient Country

List of Parties Concerned in the Recipient Country

Organization	Position	Name
Ministry of Education		
higher education	Director General	Mr. Abrao dos Santos
	National coodinator for Sci. and Tech. Devision	Mr. Aquiles S. Guterres
	Director of technical higher education	Mr. Rui Amandio Gomes Ferreira
	The head of implementation	Mr. Higino Alves
National Agency for Academic Assessment and Accreditation	Executive Director	Constantino Godinho, M.Si
National University of Timore-Leste	Rector	Prof. DR. Aurelio Guterres
	Pro. Rector	Mr. Ananias Barreto
postgraduate and research affairs	Pro. Rector	Prof. Doutor Francisco Miguel Martins, M.Hum
Cooperation Affairs	Pro. Rector	Ms. Eng Linga Tomas Correia, M.Sc.
	Advisor	M r .Diowo Freitas Da Silva
Student Affair	Pro. Rector	Eng. Zeferino Viegas Tilman, M.Appl.Sc
Planning and Financial Department	Chief of Department	Mr. Amancio H
FEST	DEAN	Mr. Renato M.da Cruz
	Chief of Administration	Eduardo R.Ximenes, L.Ec
Administration affairs	VICE DEAN (Academic Affair)	Mr. Paulo da Silva, M.Eng
	VICE DEAN (Administration and Finance Affairs)	Mr. Justino da Costa Soares
	VICE DEAN (Student Affair)	Vital Cruz Malai Araujo, ST.M.SC
Mechanical Engineering	Director	Mr. Felix de Oliveira
	Vice director	Mr. Mario M. Cabrol
	Lecturer	Mr. Evangelio C. Gaio
	Lecturer	Mr. Domingos de Sausa Freitas
	Lecturer	Mr.Valerio de Sousa Gama
	Lecturer	Mr.Marfim Guimaraes
	Lecturer	Mr. Joviano Antonio da Costa
Civil Engineering	Director	Mr. Tomas Soares X.
	Lecturer	Mr. Leandro madeina Bnune
	Lecturer	Mr. Benjamin H Martins
Electrical Engineering	Director	Mr. Joao Bosco RF. Cabral, M.Eng.
	Vice director	Ms. Olga Maria de sousa
	Laboratory Assistant	Mr. Bonifacio da Costa, S.T
	Lecturer	Mr. Frederico de Carvalho, M.Eng
	Lecturer	Mr. Rui Manuel Sarmento
	Lecturer	Mr. Vital Ximenes
Informatic Engineering	Director	Mr. Cartito Pinto
	Vice Director/Lecturer	Mr. Borja P. Antonino
	Lecturer	Marcelino Caetano Noronha, M.Cs.
	Lecturer	Mr. Frederico S.C.
Geology and Petroleum	Director/Lecturer	Mr. Gabriel G.A. de Oliveira
	Lecturer	Mr. Agostinho Andy, B. Spt., M.MT
	Lecturer	Mr. Jovita Elisa Fatima da Costa
	Lecturer	Mr. Aquiles Tomas Freitas
	Lecturer	MR.Apolinário Eusébio Alves, M.Geo.Sc.
	Lecturer	Mr. Maria Elias
Central Library	Directore	Mr.Aleandrino de Araujo
	Secretary	Mr. Anibal de Andrade
	A Trainer of librarian (former director)	Mr. Vencenslau do Rego
Library of Faculty of Engineering	Chief	Mr. Jose da Silva
Department of Mega Project	staff	Mr.Egidio D. S. Faipe
Ministry of Finace	National Advisor for MOF	Afonso Heivo

Organization	Position	Name
	Scholarship	
General Directorate of Statistics		
System and Reports	National Director	Silvino Lopes
Tax office		
Tax payer service	Officer	Mr. Luis Norberto
General Directrate of Customs		
Operational of Customs	National Director	Mr. Juliao José Ximenes
	Custom Adviser	Mr. Alejandro Gracia
Ministry of Petroleum and Mineral Resources (MPMR)		
Scholarship & International Relation	staff	Ana Lucinga
Ministry of Public Works		
General Directrate of Public Works, National Direcrate of Building		
Department of Private Building	Head of Department	Mr. Jose Vincente Martins Fontes
Department of Public Building	Chief of Department	Mr. Hermenegildo Guterres
Department of Projects	Head of Department	Mr. Octavio Pereira Monteiro Marques
General Directrate of Electricity	Director General	Mr. Januario da Costa Pereira
Electrical power transmission	National Director	Mr. Roberto M. Marcal
National Directorate of Distribution of Electrical power	Technician	Mr. Domingos X. Amaral
Ministry of Commerce,Industry and Environment		
State Secretariat for Environment, National Directorate for Environment		
EIA Department	Chief	Mr. Francisco Poto
Ministry of Transport and Communication		
National Directorate of Meteorology and Geophysics		
Meteorology	Director	Mr. Sebastian du Silos
	Climatology	Mr. Ebidib Buterres
Ministry of the Interior		
State for Security/ National dos Bombeiros	The Secretariat	Mr. Claúdio Da Silva
Ministry of Justice		
Secretary of State for Land and Property	Director	Mr. Romão Guterres
Land and Property Registration department	Chief of department	Mr. Jaime Dias Fern F.
ANP(Autoridade Nacional do Petróleo)	Training & Development Officer	Zulficar Pires
Australian Embassy		
Department of Foreign Affairs and Trade (Australian Aid Program)		
Education	Coordinator	Adelaide Neves de Camoes
	Senior Coordinator	Ester Correia
Institute of Petroleum and Geology	Director	Mr. Maximiano
	staff	Mr.Joao Paulo Pires, ST
Dili Institute of Technology	Pro-Rector of Academic	Mr. Marito De Menezes
Engineering and Sciences/Civil Engineering	Lecturer of Civil Engineering	Ms.Bernadete N. Magalhaes
UNPAZ (Universidade da Paz)		
Department of Industry	Acting Deputy Director	TITO M. Benjamin
National Institute for Training of Teachers and Educational Professionals	Vice President, INSET	Domingos Maia
	Coordinator, English	Feliciano
UNTL CENTRO NACIONAL DE INVESTIGAÇÃO CIENTIFICA	Director	Mr. Afonso De Almeida
Program Office, USAID	Director	Ms.Melissa Francis
	Aid Manager	Ms. Alison Carlin
Embassy of Portugal	Technical Secretary of Cooperation	Vanessa Spencer
EDTL (Electricidade De Timor Leste)	Chief of Department, Hera	Mr. Gilberto c de Jesus
Chamber of Commerce and Industry of Timor – Leste (CCI-TL)	CEO	Mr. Nuno de Rasario Trindade

4. Minutes of Disscussions

4-1. Field Survey

MINUTES OF DISCUSSIONS
BETWEEN
JAPAN INTERNATIONAL COOPERATION AGENCY
AND
THE AUTHORITIES CONCERNED OF
THE GOVERNMENT OF THE DEMOCRATIC REPUBLIC OF TIMOR-LESTE
ON
THE PREPARATORY SURVEY ON THE PROJECT
FOR THE CONSTRUCTION OF NEW BUILDINGS
FOR THE FACULTY OF ENGINEERING, SCIENCES AND TECHNOLOGY
OF THE NATIONAL UNIVERSITY OF TIMOR-LESTE

Based on a previous discussion with Government of the Democratic Republic of Timor-Leste (hereinafter referred to as "Timor-Leste"), the Government of Japan decided to conduct a Preparatory Survey on the Project for Construction of New Buildings for the Faculty of Engineering, Sciences and Technology of the National University of Timor- Leste (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Timor-Leste a Preparatory Survey Team (hereinafter referred to as "the Team"), which is headed by Mr. Ueda Daisuke, Director, Human Development Department, JICA Headquarters from March 14th to March 21st, 2015.

The Team held discussions with the officials concerned of the Timor-Leste side and conducted a field survey at the study area.

In the courses of discussions and field survey, both sides confirmed the main points described in the attachment. The Team will proceed to further works and prepare the Preparatory Survey Report.

Dili, 2 - 9 - , 2015

Mr. Daisuke Ueda
Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan

Ministry of Education
Democratic Republic of Timor-Leste

Witness

Professor Dr. Aurélio Guterres
Rector
National University of Timor-Lorosa'e
Democratic Republic of Timor-Leste

Cancio de Jesus Oliveira
Director of DPMU
Ministry of Finance
Democratic Republic of Timor-Leste

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve quality and condition of the education and training delivered at the Faculty of Engineering, Sciences and Technology (hereinafter referred to as "FEST") of the National University of Timor-Leste (hereinafter referred as "UNTL"), through the construction of new buildings as well as provision of research and educational equipment.

2. Target Departments

Mechanical Engineering; Civil Engineering; Electric and Electronics Engineering; Informatics Engineering; and Geology and Petroleum Engineering

3. Responsible and Implementing Agency

(1) Responsible Agency: Ministry of Education

(2) Implementing Agencies: UNTL

Organization structures are shown in ANNEX-1.

4. Items requested by the Government of Timor-Leste

4-1. Both sides confirmed new buildings plan and tentative list of equipment to be provided to FEST-UNTL, and confirmed the selection/consideration process to be taken as follows:

(1) New buildings

Both sides agreed on the Project site, the outline and components of the new buildings to be developed as shown in ANNEX-2.

(2) Equipment and its priority

The tentative list of requested equipment and its priority is shown in ANNEX-3. The equipment is divided into two categories: i) facilities for the new buildings and ii) equipment for educational purpose. The first priority is given to the category i). The Team will consider selection of equipment of Category ii) according to the following criteria:

- Consistency with curriculum
- Appropriateness in view of technical capacity of academic staff
- Availability of spare parts and supplies within Timor-Leste (including availability of imports from other countries)
- Necessary number of equipment in relation with the projected number of students

4-2. JICA will assess the appropriateness of the request and will report the findings to the Government of Japan for approval.

5. Japan's Grant Aid Scheme

5-1. Timor-Leste side understood the Japan's Grant Aid Scheme explained by the Team, as described in ANNEX-4 and ANNEX-5.

5-2. Timor-Leste side will take the necessary measures, as described in ANNEX-6, for smooth implementation of the Project, as a condition for the Japanese Grant Aid to be implemented.

6. Tentative Schedule of the Survey

6-1. The Team will prepare the draft Preparatory Survey Report and will dispatch a mission team around August 2015, in order to explain its contents to Timor-Leste side and make the Minutes of Discussions between both sides.

6-2. In case that the contents of the draft report are accepted in principle by Timor-Leste side, the Team will complete the final Preparatory Survey Report and send it to the Government of Timor-Leste around late-October 2015.

7. Other relevant issues

7-1. Environmental Category

Both sides acknowledged that new buildings would be categorized at "Category B" under the Decree Law No.5 /2011 of Timor-Leste on Environmental Licensing. UNTL will take necessary measures to obtain environmental license before August 2015.

7-2. Clearing of Project site

UNTL will clear the Project site by demolishing all existing buildings and removing trees within the Project site before August 2015. Japanese side will remove the underground objects of the Project site in the implementation phase of the Project. UNTL will provide the soil for the additional embankment as necessary in case high ground elevation is required according to the on-going development plan of UNTL Hera Campus.

7-3. Books for Library

UNTL will secure sufficient budget for the purchase of books for the Library.

7-4. Debris flow

UNTL will take necessary measures to prevent debris flow (e.g. river-bed excavation) which could damage the new buildings and equipment of the Project.

7-5. Operation and maintenance

Timor-Leste side agreed to secure and allocate necessary budget and appropriate staff for the proper operation and maintenance of the equipment and facilities to be provided by the Project. UNTL will take necessary actions to improve the operation and maintenance of the new buildings and equipment provided by the Project as shown in ANNEX-7.

7-6. Accessibility

Both sides agreed to take into consideration the accessibility to the new buildings in

accordance with the Master Plan of UNTL Hera Campus.

7-7. Collaboration with the ongoing Technical Cooperation Project by JICA

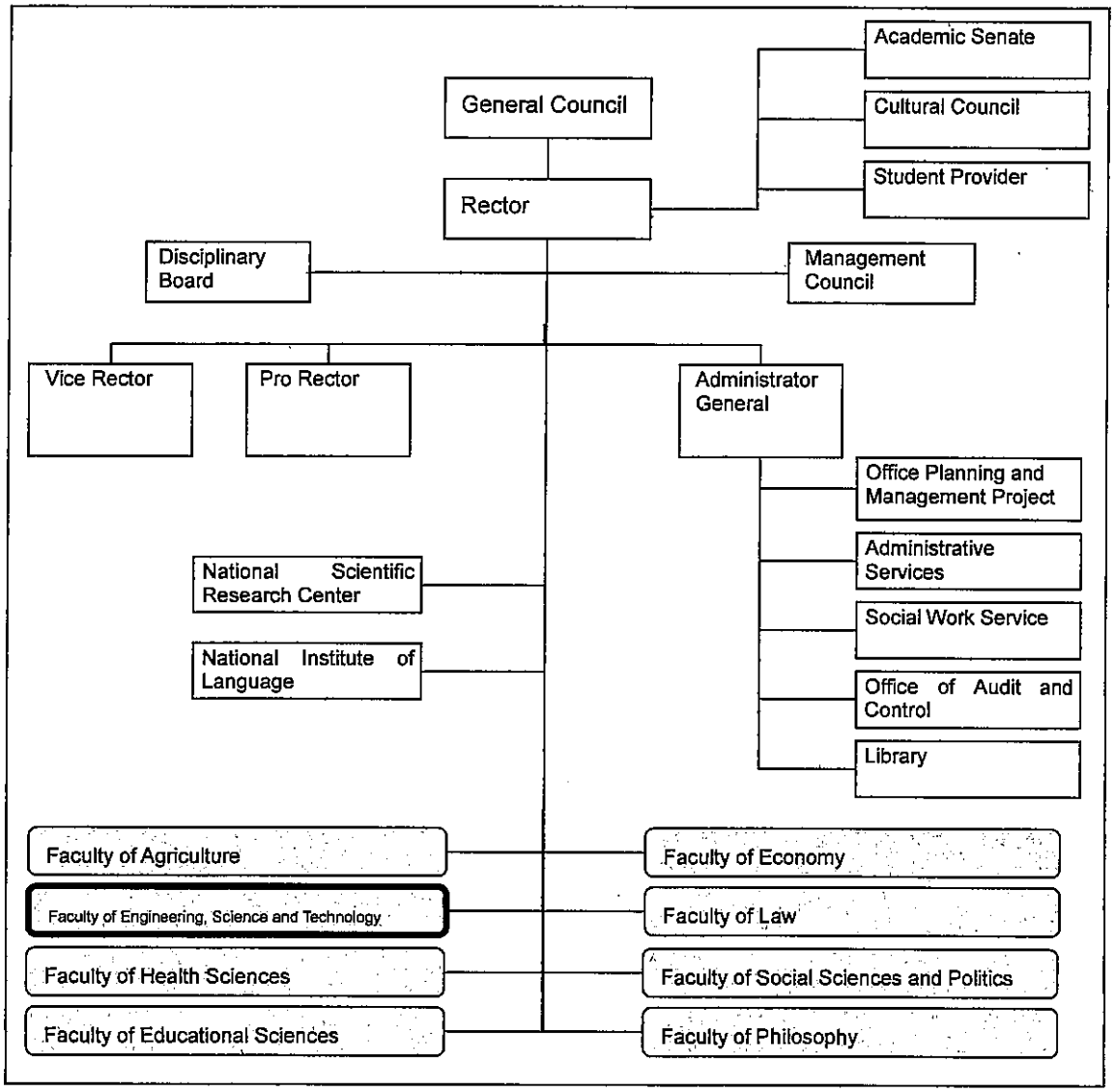
Both sides agreed that the Project will be prepared and implemented in collaboration with ongoing Technical Cooperation Project "the Project for Capacity Development of Faculty of Engineering, Sciences and Technology, The National Univeristy of Timor-Lorosa'e" by JICA.

(END)

ANNEX-1	Organization structure of the Project
ANNEX-2	Tentative concept of new buildings
ANNEX-3	Tentative list of equipment requested
ANNEX-4	Japan's Grant Aid Scheme
ANNEX-5	Flow Chart of Japan's Grant Aid Procedures
ANNEX-6	Major Undertakings to be taken by Each Government
ANNEX-7	UNTL/FEST action plan for operation and maintenance

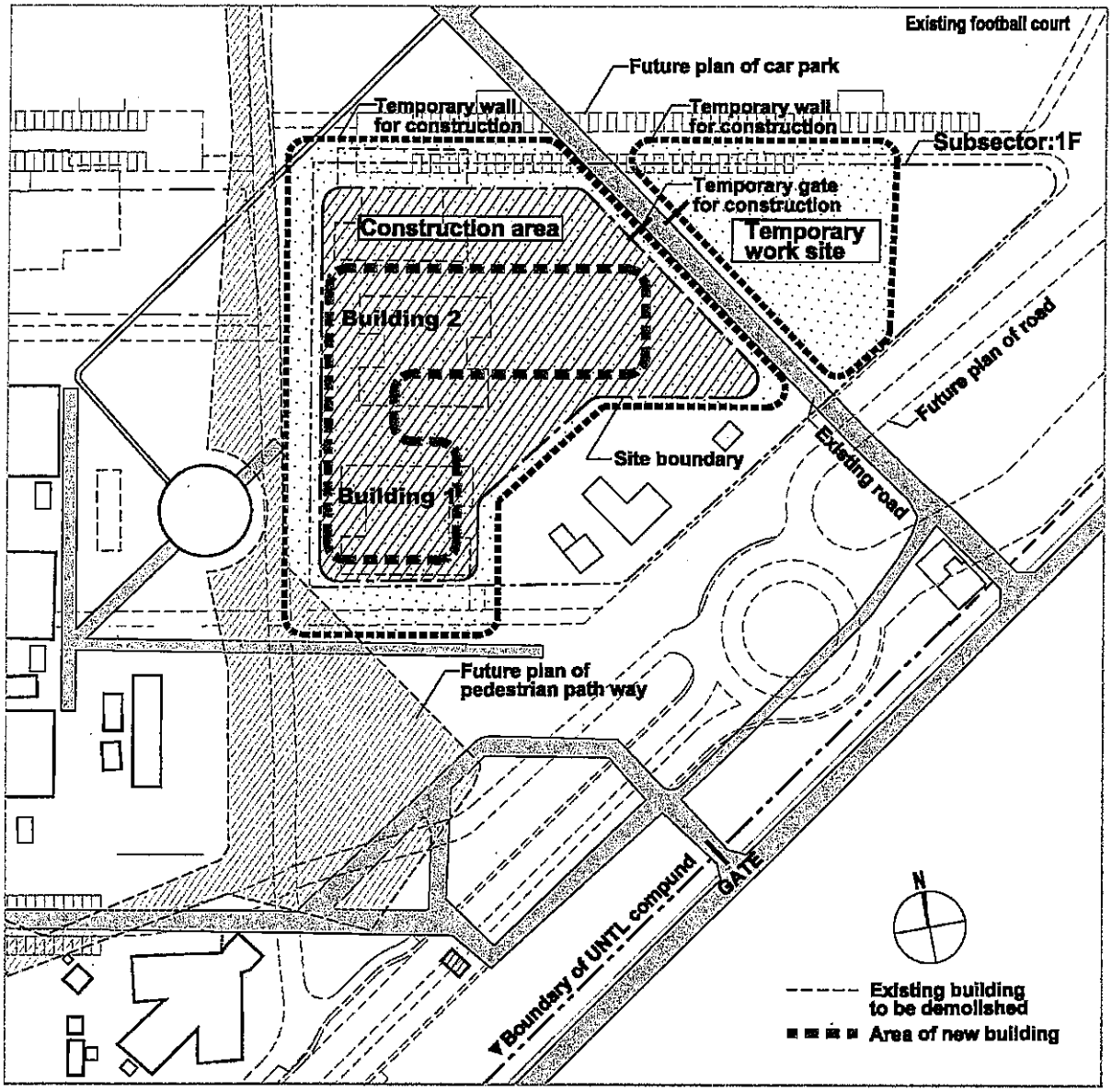
Annex-1

Organization Structure of the Project

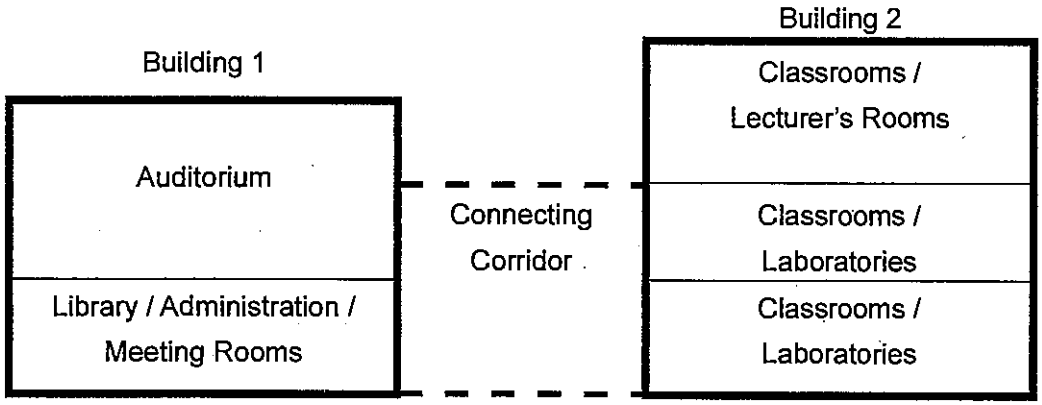


Tentative Concept of New Buildings

1. Project Site



2. The Outline of New Buildings



3. The Components of New Buildings

Category	Room Name	Prioity	No.	Furniture
Staff Room	Dean room	B		
	Vice dean room	B		
	Guest lecturer room	B		
	Director room	B		
	Vice director room	B		
	Reception and office	B		
	Secretariat faculty room	B		
	Academic administration staff room	B		
	Financial administration staff room	B		
	Lecturer room	B		
Supporting Room	Copy and printing room	A		Cabinet
	Documents storage room	A		Ditto
	Big size logistic room	C		
Meeting and Seminar Room	Small size meeting room	A		Table /chair
	Big size meeting room	C		Ditto
	Seminar room	B		Ditto
	Seminar room (big size)	C		Ditto
	Auditorium	A		Ditto
Classroom and Laboratory	Normal size classroom	A	15	Desk/chair/lecture table/white board
	Big size classroom	A	5	Ditto
	Video conference room	A	1	Ditto
	Normal size laboratory	A	2	Laboratory table/chair/lecture table/white board/cabinet
	Research project laboratory	B	1	Laboratory table /chair /cabinet/ draft chamber
	Computer room	A	2	PC desk/chair/lecture table/white board
	Special laboratory (mathematical)	C	1	Laboratory table/chair/lecture table/white board/cabinet
	Special laboratory (physics)	C	1	Ditto
	Special laboratory (chemistry)	C	1	Ditto
	Drafting room	B	1	Desk/chair/lecture table/white board
	PC laboratory for Informatics Engineering	A	2	PC desk/chair/lecture table/white board/cabinet
	Laboratory for Geology and Petroleum Engineering	A	1	Laboratory table/chair/lecture table/white board/cabinet
Library	Big size library	A		Locker, book shelf, table, carrels, chair, trolley, magazine rack
Others	WC	A		
Machine Room	Electrical room	A		
	Pump room	A		
	The other incidental facilities	A		

Note: The components of buildings shall be finalized subject to the further study and justification in Japan.

Equipment List Requested

No.	Description	Qty Request	Priority Request
Normal Size Classroom			
1	Projector	19	A
2	Screen	19	A
Big Size Classroom			
1	Projector	5	A
2	Screen	5	A
Video Conference Room			
1	Projector	1	A
2	Screen	1	A
3	Video Conference System	1	A
Computer Room			
1	Desktop PC	80	A
2	Printer	4	A
3	LAN Equipmet	2	A
4	Projector	2	A
5	Screen	2	A
Meeting Room			
1	Projector	1	A
2	Screen	1	A
3	White Board	1	A
Auditorium			
1	Projector	1	A
2	Screen	1	A
3	TV Conference System	1	A
4	Audio Visual Equipment	1	A
Copy and Printing Room			
1	Photocopier	1	A
2	Digital Printer	1	A
Library			
1	Desktop PC	11	A
2	Printer	1	A
3	Photocopier	1	A
4	Library Management System	1	A
Drafting Room			
1	Drawing Board Set	40	A
2	Projector	1	A
3	Screen	1	A
Nomal Size Laboratory			
1	Projector	2	A
2	Screen	2	A
3	Equipment for Physics	2	A
PC Laboratory for Informatics Engineering			
1	Desktop PC	125	A
2	Router A	5	A
3	Router B	5	A
4	Switch	5	A
5	Access Point	5	A
6	Server, rackmount	2	A

No.	Description	Qty Request	Priority Request
7	Server, tower	3	A
8	Disk Storage System	1	A
9	IP Phone	10	A
10	IP Camera A	5	A
11	IP Camera B	10	A
12	IP Printer	2	A
13	Network Tester	5	A
14	LAN Equipment	5	A
15	Rack	2	A
16	Microsoft Visual Studio	125	A
17	Delphi	125	A
18	SQL Server	125	A
19	Adobe	125	A
20	SPSS	125	A
21	Oracle	125	A
22	Matlab	125	A
23	Projector	2	A
24	Screen	2	A
Laboratory for Geology and Petroleum Engineering			
1	Carbon,Sulphur Determinator	1	A
2	Rock-Eval Pyrolysis Analyzer	1	C
3	Gas-Chromatography	1	C
4	Mass-Spectrometer	1	C
5	X-Ray Fluorescence Spectrometry	1	C
6	Instrument for Neutron Activation Analysis (INAA)	1	C
7	Instrument for Radiochemical Neutron Activation Analysis (RNAA)	1	C
8	Inductively Coupled Plasma Emission Spectrometry	1	C
9	Atomic absorption Spectrophotometry (AAS)	1	C
10	Isotope Dilution Mass Spectrometry (IDMS)	1	C
11	Inductively Coupled Emission Mass Spectrometry (ICP-MS)	1	C
12	Spark Source Mass Spectrometry	1	C
13	Electron Microprobe	1	C
14	The Ion Microprobe Tool	1	C
15	Garret Deluxe gold Panning Kit	5	A
16	Hand Held XRF analyzer X-MET7000	1	C
17	Stereoscope , Complete system	20	C
18	Photo satelite	1	A
19	Topography Map	1	C
20	Aerial Photography	1	C
21	Settling-Tube Analyzer	1	C
22	Particle Size Analyzer	1	C
23	Oven	1	C
24	Sieving and Shaker	1	C
25	Jaw Crusher	1	C
26	Scanning Electron Microscope	1	C
27	Jacob-Staff	10	A
28	Measuring-Tape	5	C
29	Drawing Table	40	B
30	Technical drawing tools	40	B

No.	Description	Qty Request	Priority Request
31	Tracing Paper	40	C
32	Colouring Pencils	40	C
33	Ruler	40	C
34	Portable flowmeter	1	A
35	Multiparameter Meter	1	A
36	Water Quality Monitoring System	1	B
37	pH/ORP/Conductivity meter	1	C
38	Portable Water Flow Meter Sensor	1	A
39	Automatic Resistivity system	1	A
40	Standard Proton Magnetometer	1	A
41	Exploration Seismograph	1	A
42	Gamma Spectrometer	1	A
43	Gravitymeter	1	A
44	Water Level Indicator and Borehole TV camera	1	A
45	Ground Penetrating Radar	1	A
46	Portable Rock core drills Pomeroy EZ core drill	2	B
47	Planetary ball mill lab grinding to 0.1 µm chemical ceramics	2	B
48	Diomand drill pomeroy BSS-1E drill bit	2	C
49	Electronic balance	2	A
50	Sieve Shaker	2	A
51	Binocular Microscope with camera	10	A
52	Jaw Crusher	2	A
53	Jar	5	A
54	Soil mortar	5	A
55	Soil pestle	5	A
56	Fossil Collection	1	C
57	Box of Fossils Sample	10	A
58	Minerals or Crystals Replica (crystals model)	5	A
59	Polarization Microscope	20	A
60	Reflection Polarizing Microscope	5	A
61	Scratcher	20	C
62	Hands Lens	20	A
63	Pencil with Pivot Magnet	20	A
64	Porcelain streak plate	20	A
65	Glass plate	20	A
66	Rocks sample	1	C
67	Mineral thin section	1	C
68	Compas	50	A
69	Rock Hammer	50	A
70	Mineral Scratcher	50	C
71	Particle Size Comparator Chart	50	A
72	Global Positioning System (GPS)	10	A
73	Triaxial Testing Machine	1	B
74	Load Frame for Triaxial Testing	1	B
75	Compactin Testing Machine	1	B
76	Soil Consolidation Tesing Machine	1	A
77	Data Acquisition System	1	B
78	Direct Shear Testing Apparatus	1	A
79	Erosion Function Apparatus	1	C

No.	Description	Qty Request	Priority Request
80	Consolidation Meter for Expansion and Swell	1	A
81	Hydrometer Analysis Set	1	A
82	Liquid Limit Set	1	A
83	Permeability Meter	1	A
84	Pin Hole Dispersion Erodibility Test	1	B
85	Plastic Shrinkage Limit	1	A
86	Relative Density of Soil	1	A
87	Sample Ejector	1	B
88	Sand Equivalent Test Set and Shaker	1	A
89	Soil Processor	1	A
90	Soil Strength Classifier	1	B
91	Soil Volume Change Meter	1	A
92	Time Domain Reflectometer	1	A
93	Inclinometer	1	A
94	Extensiometer	1	A
95	Piezometer	1	A
96	Crack Meter	1	A
97	Diferential Global Positioning System	1	A
98	Acoustic Emission Sensor 3D Laser	1	A
For Mechanical Engineering Laboratory (Existing)			
1	CNC Milling Machine	1	A
2	Vertical milling machine	1	A
3	AC Welder	1	A
4	Barometer	1	A
5	Manometer	1	A
6	Hdyrometer	1	A
7	Brookfield Viscomoter	1	A
8	Capillary Viscometer	1	A
9	Surface Tensiometer	1	A
10	U-Tube Manometer	1	A
11	Well Reservoir Manometer	1	A
12	Inclined Manometer	1	A
13	Venturi Meter	1	A
14	Hastings Meter	1	A
15	Orifice Meter	1	A
16	Sluice Gate	1	A
17	Bourdon Pressure Gauge	1	A
18	Westphal Balance	1	A
19	Posittive Displacement Pumps	1	A
20	Dynamic Pumps	1	A
21	Gear Pumps; Internal Gear Pumps and External Gear Pumps	1	A
22	Lobe Pumps	1	B
23	Vane Pumps	1	B
24	Screw Pumps	1	A
25	Cavity Pumps	1	B
26	Pistons Pumps	1	B
27	Hydraulic Brakes	1	A
28	Hydraulic Lift	1	A
29	Ball Pinton Pump	1	A

No.	Description	Qty Request	Priority Request
30	Bent Axis Pump	1	A
31	Radial Piston Pump	1	A
32	Rotary cam pump	1	A
33	Radial Pump	1	A
34	Jet Pumps	1	A
35	Ram Pump	1	A
36	Air Lift Pump	1	A
37	Impulse Turbine Prototype (Pelton Turbine Wheel)	1	A
38	Reaction Turbine Prototype (Francis and Kaplan)	1	A
39	Reversible Francis Turbine Prototype	1	A
40	Francis (Prototype)	1	A
41	Propeller (Prototype)	1	A
42	Kaplan (Prototype)	1	A
43	Cross Flow Turbine (Prototype)	1	A
44	Turgo (Prototype)	1	A
45	Pelton, 1-Jet (Prototype)	1	A
46	Pelton, 2-Jet (Prototype)	1	A
47	Desktop PC	31	A
48	Projector	1	A
49	Screen for projector	1	A
50	AutoCAD Software	31	A
51	Solidwork Software	31	A
52	Matlab	31	A
53	Smoke Meter (Multi Gas Analyser)	1	A
54	Desktop waste plastic oiling system	1	A
55	Prototype of Solar power (PV)	1	A
56	Prototype of wind energy	1	A
57	Prototype of geothermal energy	1	A
58	Band Saw	2	A
59	Gear Hobbing Machine	2	A
60	Broaching Machine	2	A
61	Buff Polishing Machine	2	A
62	Metallurgical microscopes	2	A
63	Electric devices wiring & Test operation Trainer	2	A
64	Electric devices operation Trainer	2	A
65	Metallography Microscope	1	A
66	Camera and Film	2	A
67	Saw	1	A
68	Specimen Shaper	1	A
69	Specimen Dryer	1	A
70	Digitally Controlled Closed Loop Servo Hydraulic Dynamic Testing Machine	1	A
71	Universal Testing Machine	1	A
72	Impact Tester	1	A
73	Torsion Tester	1	A
74	Hardness Tester	1	A
75	Diffused Light Research Polariscope	1	A
76	Strain Measurement Module	1	A
77	Fatigue Testing Machine	1	A
78	Bending Stress in a Beam Tester Machine	1	A

No.	Description	Qty Request	Priority Request
79	Thin Cylinder Tester Machine	1	A
80	Buckling Tester Machine	1	A
81	Pillar Drill Machine	1	A
82	Jigsaw Machine	1	A
83	Toyota Engine	4	A
84	Mitsubishi Engine	4	A
85	Automotive Frame Practical	2	A
86	Sound Level Meter (SLM)	2	A
87	Gun Speed Velocity	1	A
88	Smoke Tester	1	A
89	RPM Tester and and Ohm Meter	1	A
90	Volt Meter	1	B
91	Ohm Meter	1	B
92	Ampere Meter	5	B
93	Test Pen	5	A
94	Tools Box	5	A
95	Dwell Tester	5	A
96	Timing Light	1	A
97	Tune up Tester Computer Translation	1	A
98	Two Stroke Engine Cycle (Prototype)	1	A
99	Four Stroke Engine Cycle (Prototype)	1	A
100	External Compression (Prototype)	1	A
101	Electric devices wiring & Test operation Trainer	1	A
102	Band Saw	1	A
103	Pneumatic Machine	2	A
104	Hydraulic Machine	2	A
For Civil Engineering Laboratory (Existing)			
1	Data Logger	1	A
2	Strain gauges	6	A
3	Displament Gauge	5	A
4	Air Content test	1	A
5	Spliting tensile test Accessoris	1	A
6	Flexural test Accessoris	1	A
7	Vibrating Table For Precision Mold	1	A
8	Compating Factor Apparatus	2	A
9	Bar molds	4	A
10	GPR Surveys	3	A
11	Total station	6	A
12	Auto level	5	A
13	GPS	4	A
14	Thedolite	2	A
15	Open channel model and Pipe line	1	A
16	Current meter	1	A
17	Reynolds Numbers measuring instrument	1	A
18	Manometer and orifice test equipment	1	A
19	Popular flow test equipment	1	A
20	Water hammer phenomenon equipment	1	A
21	Drainage and Seepage Tank Apparatus	1	A
22	Hydraulic Becnh	1	A

No.	Description	Qty Request	Priority Request
23	Impact of jet	1	A
24	Impact of jet	1	A
25	Tilting Flume	1	A
26	Sediment Transport Apparatus	1	A
27	GPR Survey Investigation	1	A
28	Laser Auto Level	1	A
29	GPS	1	A
30	Total Stations	1	A
31	Total Stations	1	A
32	Total Stations	1	A
33	Specific Gravity of Semi-Solid Bitumenous Materials	1	A
34	Distillation of Cutback Asphalts	1	A
35	Water Content in Petroleum Products	1	A
36	Saybolt Viscosimeter	1	A
37	Flash and Fire point by Cleveland Open Cup	2	A
38	Softening Point Test Set	1	A
39	Loss on Heating / Thin-Film Test	1	A
40	Laboratory Penetration Test Set	1	A
41	Laboratory Penetration Test Set	1	A
42	Ductility of Bituminous Material Test Set	1	A
43	Centrifuge Extractor Test Set	2	A
44	Reflux Extractor Test Set	1	A
45	Marshall Test Set	1	A
46	Core Drilling Test Set	1	A
47	Benkleman Beam	1	A
48	Mot straight Edge	2	A
49	Dutch Cone Penetrometer	3	A
50	Hand Auger	2	A
51	Standard Penetrometer Test	1	A
52	Sample Extruder	2	A
53	Dynamic Cone Penetration	1	A
54	Soil Surface Sampler	1	A
55	Duct Cone Electrometer	1	A
56	Plate Bearing Test set	1	A
57	Field CBR Test Set	1	A
58	Proving Ring Penotrometer	1	A
59	TVA Penetrometer	1	A
60	Liquid limit Test set	3	A
61	Plastic Limit Test Set	1	A
62	Shrinkle Limit Test Set	1	A
63	Hydrometer Analysis Test Set	1	A
64	Mechanical End Over End Shaker	1	A
65	Vacuum Stand	1	A
66	Specific Gravity (Heating Method)	1	A
67	Specific Gravity (Vacuum Method)	2	A
68	Compaction Test Set	1	A
69	Laboratory CBR Test Set	2	A
70	Combination Permeameter	1	A
71	Compaction Permeameter Test Set	2	A

No.	Description	Qty Request	Priority Request
72	Sand Cone Test Set	2	A
73	Speedy Moisture Tester	1	A
74	Moisture Content Test Set	1	A
75	Unconfined Compression Mechine	2	A
76	Consolidation Test Set	1	A
77	Direct Shear Test set	1	A
78	Triaxial Test Set	1	A
79	Automatic Triaxial Test Set	1	A
80	Vane test	2	A
81	Soil Sampler	2	A
82	Arch Bridge Modelling for demonstration	1	A
83	Prestressed beams modelling for demonstration	1	A
84	Beams flexural test mechine,200kN	1	A
85	Portable Data Logger	1	A
86	Digital Load Meter	1	A
87	Dial Gauge	4	A
88	Concrete Radar Imaging Solution (C.R.I.S.)	1	A
89	Pressure gauge	1	A
90	Load (cap. 500 KN)	3	A
91	Statics Load Experimental	1	A
For Electric and Electronics Engineering Laboratory (Existing)			
1	Assembly Set for Analog and Digital Electronics	1	B
	Resistor	2000	
	Capacitor	2000	
	Diode	1000	
	Transistor	400	
	IC	300	
	Potentiometer	100	
	LED	200	
	DC Lamp	20	
	Mini Box	15	
2	Resistance Box	20	A
3	Bread Board for analog system	10	A
4	Bread Board for digital system	10	B
5	Dual Tracking Power Supply	6	B
6	Single Type Power Supply	10	B
7	Oscilloscope	6	B
8	Tool Set	12	B
9	Transformer	20	B
10	Analog AVO Meter	15	A
11	Digital AVO Meter	15	A
12	Assembly Set for Electrical Installation	1	A
	Socket for Bulb	100	
	Three-way Switch	100	
	Intermediate Switch	100	
	Single Switch	100	
	Magnetic Starter	50	
	Overload Relay	50	
	MCB	50	

No.	Description	Qty Request	Priority Request
	MCB	50	
	Connection Box	50	
	Button Switch A	30	
	Button Switch B	30	
	Stop Contact	50	
	Panel Box	10	
	Cable NYMHY	4	
13	Assembly Set for Control System	1	A
	Contactor	30	
	Timer	30	
	Relay	30	
14	PLC, 48 ports	6	A
15	Microprocessor Kit	5	A
16	Sensor PIR	40	A
17	sensor Ultrasonic	30	A
18	Robo-C	10	A
19	Labview	30	A
20	Microcontroller Kit	2	A
21	FPGA Kit	2	A
22	DC Stepper Motor with driver	15	A
23	Microcontroller	6	A
24	Escada System	4	A
25	Circuit Board Processing Machine	1	A
26	Incremental Encoder	10	A
27	Assembly Set for Power Electronics	1	A
	Power Diode	50	
	Power MOSFET	50	
	IGBT	50	
	Thyristor	40	
	Ferrite Core	40	
	Toroida Core	40	
	Battery	5	
28	PV Panel	6	A
29	Power Variable Resistance	5	A
30	Digital Oscilloscope	2	A
31	MOSFET Gate Driver	30	A
32	Effect Hall Current Sensor A	25	A
33	Effect Hall Current Sensor B	25	A
34	AM Module	5	A
35	FM Module	5	A
36	Fiber Optic	6	C
37	Transcieber Module	5	C
38	Security Camera System	2	A
39	Converter Motor Training System	1	A

JAPAN'S GRANT AID

1. Japan's Grant Aid

GOJ is implementing the organizational reforms to improve the quality of ODA operations, and as a part of this realignment, a new JICA law was entered into effect on October 1, 2008. Based on this law and the decision of the GOJ, JICA has become the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

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

1-1 Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures:

- Preparatory Survey
  - The Survey conducted by JICA
- Appraisal & Approval
  - Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
  - The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (G/A)
  - Agreement concluded between JICA and a recipient country
- Implementation
  - Implementation of the Project on the basis of the G/A

1-2 Preparatory Survey

(1) Contents of the Survey

The aim of the Preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of a outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Outline Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve 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 of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of

Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

1-3 Japan's Grant Aid Scheme

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes(hereinafter referred to as "the E/N") will be singed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority 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, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) 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 JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex.

(6) "Proper Use"

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

(7) "Export and Re-export"

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

(8) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA 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 JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

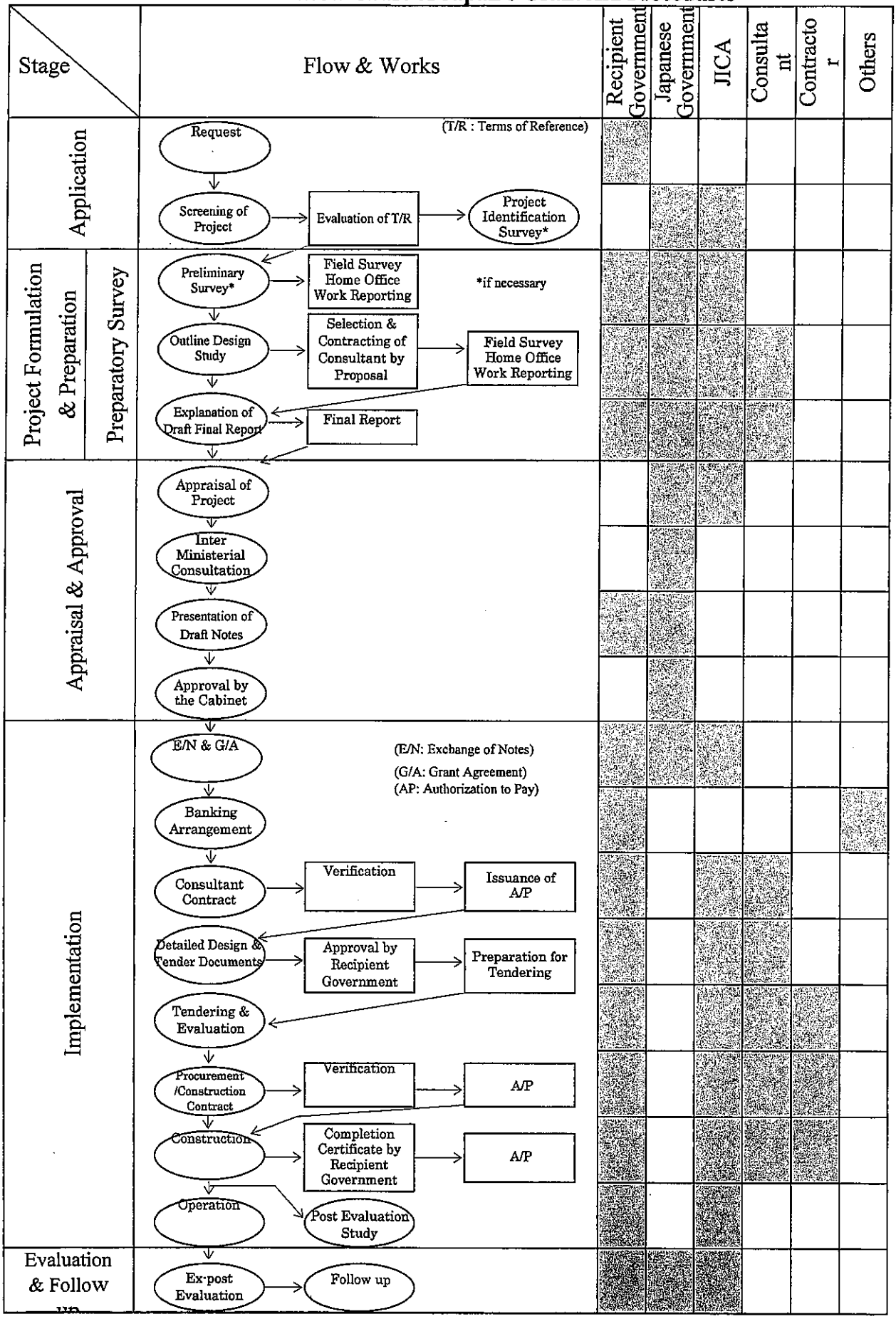
The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA socio-environmental guidelines.

GRANT AID PROCEDURES

Flow Chart of Japan's Grant Aid Procedures



Major Undertakings to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	to secure lot(s) of land necessary for the implementation of the Project and to clear the site(s)	(●) underground objects	●
2	To construct the following facilities		
	1) The building	●	
	2) The gates and fences in and around the site		●
	3) The parking lot within the site	●	
	4) The road within the site	●	
	5) The road outside the site		●
3	To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities necessary for the implementation of the Project outside the site(s)		
	1) Electricity		
	a. The distributing power line to the site		●
	b. The drop wiring and internal wiring within the site	●	
	c. The main circuit breaker and transformer	●	
	2) Water Supply		
	a. The city water distribution main to the site		●
	b. The supply system within the site (receiving and elevated tanks)	●	
	3) Drainage		
	a. The city drainage main (for storm sewer and others to the site)		●
	b. The drainage system (for toilet sewer, common waste, storm drainage and others) within the site	●	
	4) Gas Supply		
	a. The city gas main to the site		●
	b. The gas supply system within the site	●	
	5) Telephone System		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		●
	b. The MDF and the extension after the frame/panel	●	
	6) Furniture and Equipment		
	a. General furniture		●
	b. Project equipment	●	
4	To ensure prompt unloading and customs clearance of the products at ports of disembarkation in the recipient country and to assist internal transportation of the products		
	1) Marine (Air) transportation of the Products from Japan to the recipient country	●	
	2) Internal transportation from the port of disembarkation to the project site	●	
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services be exempted		●
6	To accord Japanese physical persons and / or physical persons of third countries whose services may he required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
7	To ensure that the Facilities and the products be maintained and used properly and effectively for the implementation of the Project		●
8	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project		●
9	To bear the following commissions paid to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
10	To give due environmental and social consideration in the implementation of the Project.		●

(B/A : Banking Arrangement, A/P : Authorization to pay)

ANNEX-7

UNIVERCIDADE NACIONAL DE TIMOR LORO SA'E

FACUL DADE ENGINHARIA CIENCIA E TECNOLOGIA

Avelinda Hera, Cristro Rei - Dili - Timor Leste: Tel: 77327449

TENTATIVE ACTION PLAN FOR MAINTENANCE REPAER OF LAB. EQUIPMENTS

NO	DESCRIPTION	PERIODS 2015												2016												REMARKS
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
1	FEST Operation and Management Policy				■																					
2	List of Responsibility, Maintenance Schedule of each Departement and Regulation.					■																				
3	Lab. Database System	■	■	■	■	■	■	■																		
4	Prposal of Tecnician recruitments						■																			
5	**Capacity Development foroperation & Maintenance**																									
a	Capacity Development foroperation & Maintenance for Lecturers & Tech.							■			■					■			■			■				
b	Instruction operation & Maintenance for students			■	■	■	■			■	■	■				■	■	■				■	■	■		
6	Maintenance Record							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
7	**Proposal budget Annual Action Plan (AAP) 2016**																									
	a). Preparation & workshop AAP & budget alocation 2016		■																							
	b). Submition AAP & budget alocation 2016 per each Faculty			■																						
	c). Presentation AAP 2016 to general council UNTL			■																						
	d). Submition AAP 2016 to PM						■																			
	e). Delegate UNTL Team AAP 2016							■																		
	f) Final Revision AAP 2016								■																	
8	Select some estudents to make maintenance with staff or Lectures per each division of each Departement			■	■	■																				
9	Proposal Maintenance for tools, materials and or equipments						■																			
9	**Implemtation of maintenance activities:**																									
	a). Daily																									
	b). Periodic							■			■			■			■			■			■			

Annex-7

4-2. Field Survey Ⅱ

Minutes of Discussions
on the Preparatory Survey for the Project for
The Construction of New Buildings for
The Faculty of Engineering, Science and Technology of
The National University of Timor-Leste
(Explanation on Draft Preparatory Survey Report)

On the basis of the discussions and field survey in the Democratic Republic of Timor-Leste (hereinafter referred to as "Timor-Leste") in March 2015, and the subsequent technical examination of the results in Japan, the Japan International Cooperation Agency (hereinafter referred to as "JICA") prepared a draft Preparatory Survey Report on the Project for The Construction of New Buildings for The Faculty of Engineering, Science and Technology of The National University of Timor-Leste (hereinafter referred to as "the Draft Report").

In order to explain the Draft Report and to consult with the concerned officials of the Government of Timor-Leste on its contents, JICA sent to Timor-Leste the Preparatory Survey Team for the explanation of the Draft Report (hereinafter referred to as "the Team"), headed by Mr. Takemichi Kobayashi, Director, Human Development Department, JICA Headquarters from 31st August to 4th September, 2015.

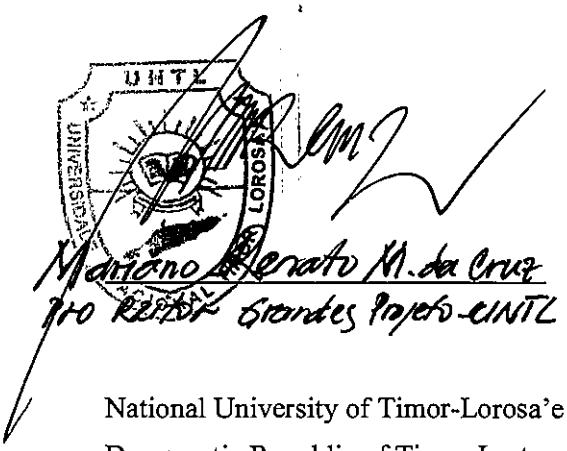
As a result of the discussions, both sides confirmed the main items described in the attached sheets.

Dili, 4 September, 2015

Mr. Takemichi Kobayashi
Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan

Ministry of Education
Democratic Republic of Timor-Leste

Witness



Mariano Renato M. da Cruz
Pro Reitor Grandes Projeto-UNTL

National University of Timor-Lorosa'e
Democratic Republic of Timor-Leste

Carlos de Jesus Ximenes
Director of DPMU

Ministry of Finance
Democratic Republic of Timor-Leste

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve quality and condition of the education delivered at the Faculty of Engineering, Science and Technology (hereinafter referred to as "FEST") of the National University of Timor-Leste (hereinafter referred as "UNTL"), through the construction of new buildings as well as provision of research and educational equipment, thereby contributing to develop human resource that contribute to economic development.

2. Title of the Preparatory Survey

Both sides confirmed the title of the Preparatory Survey as "the Preparatory Survey for the Project for The Construction of New Buildings for The Faculty of Engineering, Science and Technology of The National University of Timor-Leste.

3. Project Site

Both sides confirmed that the site of the Project is in UNTL Hera campus, which is shown in Annex 1.

4. Line Agency and Executing Agency

Both sides confirmed the line agency and executing agency as follows:

4-1. The line agency is Ministry of Education, which would be the agency to supervise the executing agency.

4-2. The executing agency is UNTL. The executing agency shall coordinate with all the relevant agencies to ensure smooth implementation of the Project and ensure that the Undertakings are taken by relevant agencies properly and on time. The organization charts are shown in Annex 2.

5. Contents of the Draft Report

After the explanation of the contents of the Draft Report shown in Appendix by the Team, the Timor-Leste side agreed in principle to its contents.

6. Cost Estimation

Both sides confirmed that the Project cost estimation shown in Annex 3 was provisional and would be examined further by the Government of Japan for its final approval.

7. Confidentiality of the Cost Estimation and Specifications

Both sides confirmed that the Project cost estimation and technical specifications in the Draft Report should never be duplicated or disclosed to any third parties until all the contracts of the Project are concluded.

8. Japanese Grant Scheme

The Timor-Leste side understands the Japanese Grant Scheme and its procedures as described in Annex 4 and Annex 5, and necessary measures to be taken by the Government of Timor-Leste.

9. Project Implementation Schedule

The Team explained to the Timor-Leste side that the expected implementation schedule is as attached in Annex 6.

10. Expected outcomes and Indicators

Both sides agreed that key indicators for expected outcomes are as follows. The Timor-Leste side has responsibility to monitor the progress of the indicators and achieve the target in year 2021.

[Quantitative Effect]

Indicator	Baseline (actual 2015)	Target (2021)
the Number of students of UNTL FEST	1,201	1,400
the Number of graduate thesis by 4th year students	0	300/year
Floor area per student	5.6 ㎡/person	10.2 ㎡/person

[Qualitative Effect]

Implementation of quality and practical education, development of human resource that contributes to economic development

11. Undertakings Taken by Both Sides

Both sides confirmed to undertakings described in Annex 7. The Timor-Leste side assured to take the necessary measures and coordination including allocation of the necessary budget which are preconditions of implementation of the Project. It is further agreed that the costs are indicative, i.e. at Outline Design level. More accurate costs will be calculated at the Detailed Design stage. Contents of Annex 8

will be updated, and will finally be the Attachment to the Grant Agreement.

12. Monitoring during the Implementation

The Project will be monitored every 3 months by the executing agency and using the Project Monitoring Report (PMR) as shown in Annex 8. The first PMR will be attached to the Grant Agreement.

13. Ex-Post Evaluation

JICA will conduct ex-post evaluation three (3) years after the project completion with respect to five evaluation criteria (Relevance, Effectiveness, Efficiency, Impact, Sustainability) of the Project. Result of the evaluation will be publicized. The Timor-Leste side is required to provide necessary support for them.

14. Schedule of the Study

JICA will complete the Final Report of the Preparatory Survey in accordance with the confirmed items and send it to the Timor-Leste side around November 2015.

15. Environmental and Social Considerations

The project is likely to have minimal adverse impact on the environment under the 'JICA Guidelines for Environmental and Social Considerations (April 2010)'.

16. Other Relevant Issues

16-1. Operation and Maintenance of the Equipment and Facilities

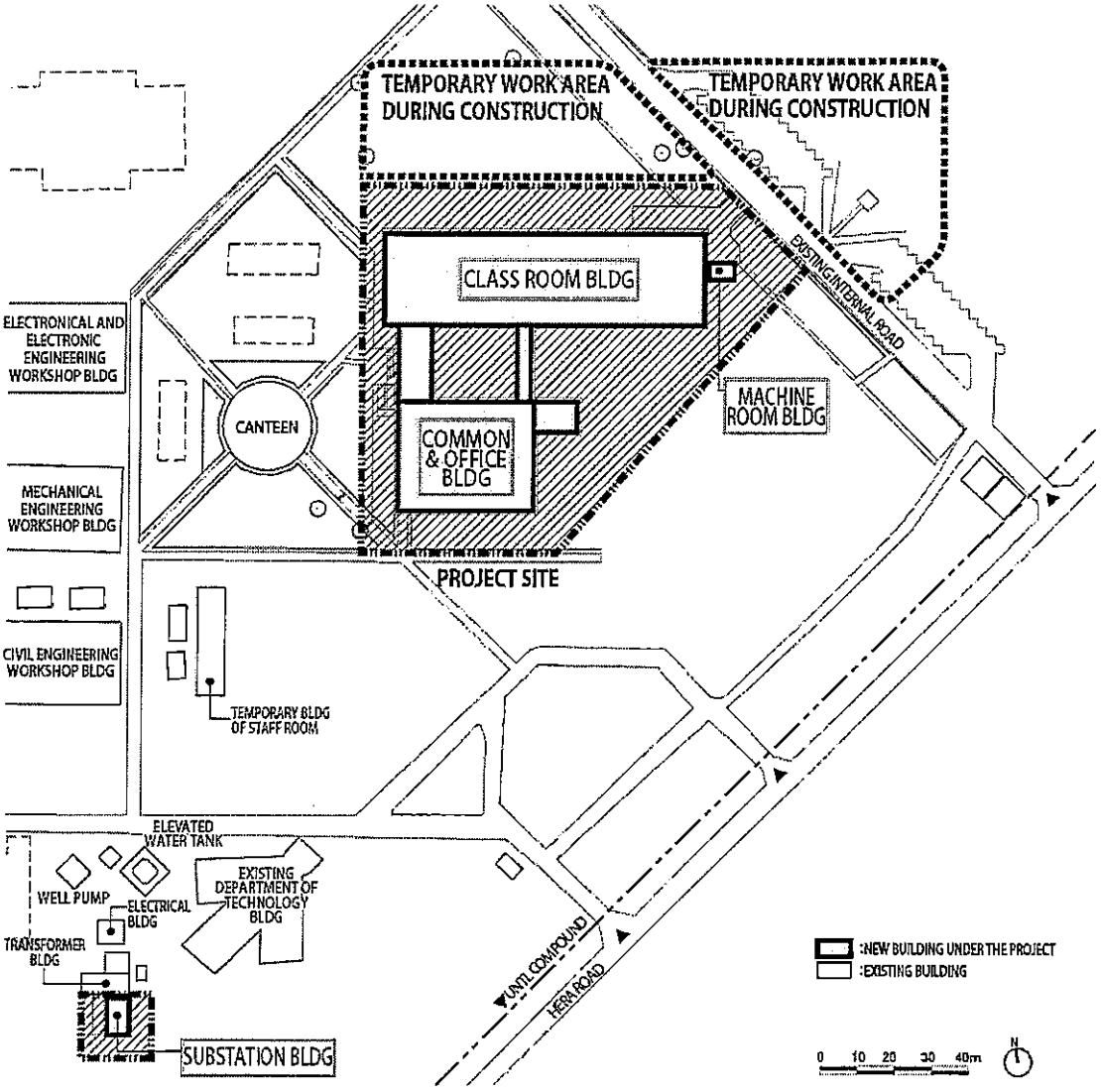
The team explained the importance of operation and maintenance of the equipment and facilities constructed by the Project considering that proper asset management impacts greatly on life-span of the equipment and facilities and its maintenance cost. The Timor-Leste side shall secure enough staff and budgets necessary for appropriate operation and maintenance of the facilities. UNTL will take necessary actions to improve the operation and maintenance of the new buildings and equipment provided by the Project as shown in Annex 9. The annual operation and maintenance costs are estimated and shown in Annex 10.

16-2. Disclosure of Information

Both sides confirmed that the study results excluding the Project cost will be disclosed to the public after completion of the Preparatory Survey. All the study results including the project cost will be disclosed to the public after all the contracts for the Project are concluded.

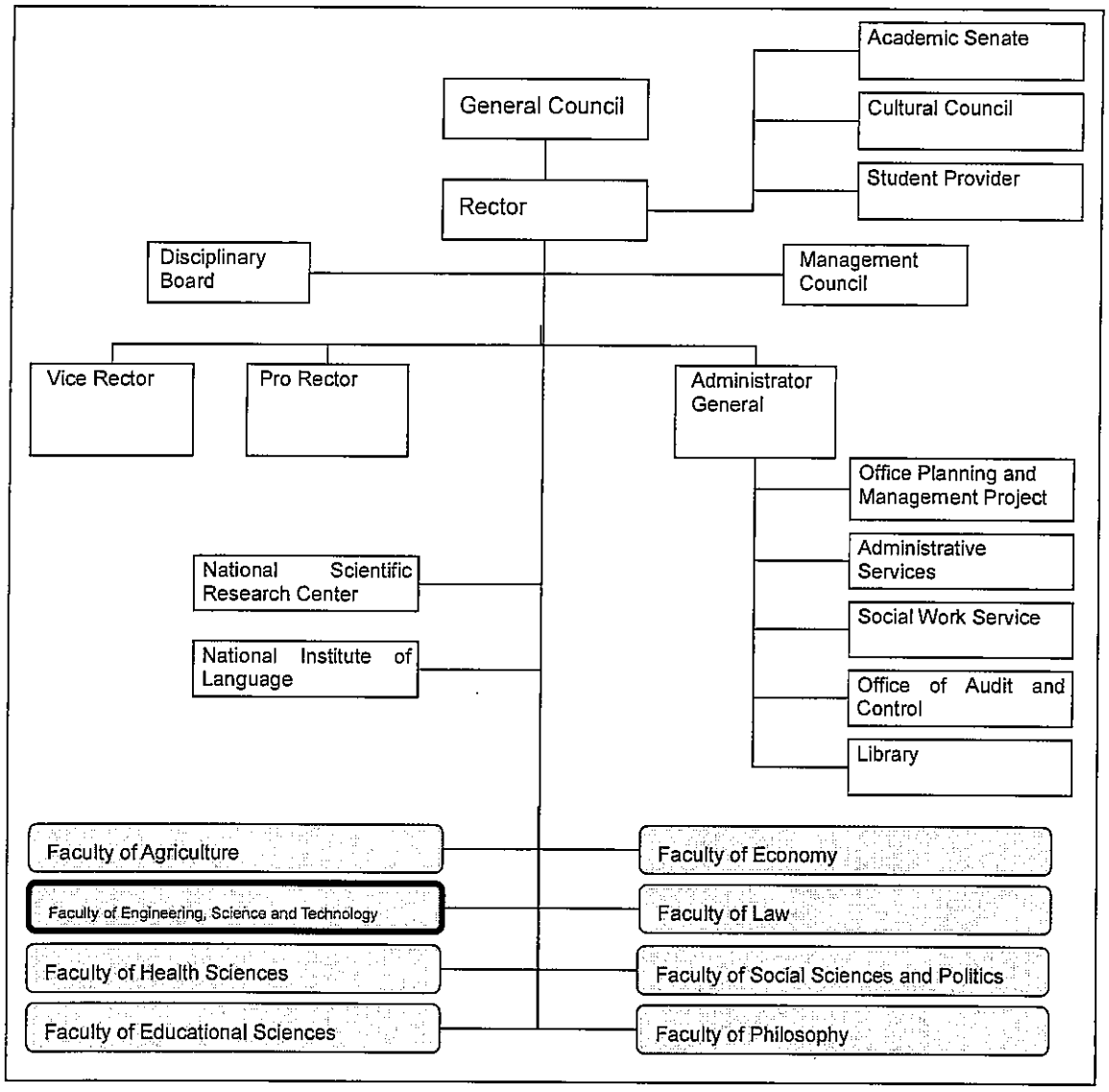
Annex1

Project Site



Annex 2

Organization Chart



Annex 3

Project Cost Estimation

(1) Cost to be borne by the Japanese side

Items	Estimated Cost (million JPY)
1) Building Construction	
2) Equipment	
3) Consultancy fee	
4) Contingencies	
Total	

This Page is closed due to the confidentiality .

Note: 1) Date of estimation: March, 2015
2) Exchange rate: 1USD=119.79JPY

(2)Cost to be borne by the Timor-Leste side

Items	Contents	Estimated Cost (USD)
1) Leveling of the Site	Demolition of existing pavement, and Grading	2,100
2) Tree felling and stumping	Cutting obstacle trees, and roots	250
3) Tree planting and landscape gardening	Tree planting and landscape gardening of the site	12,000
4) Procurement of soil	Procurement of soil for embankment in the site	29,000
5) Infrastructure	Wiring work and leading telephone line to the Site	4,150
6) Procurement of furniture	Procurement of general furniture which are not included in the work by the Grant Aid from the Government of Japan	21,250
7) Commissions	Commissions of A/P and B/A	61,710
8) Tax	Import Duty and Sales Tax applied to imported equipments and materials	62,150
	Total	192,610

Note: 1) Date of estimation: March, 2015
2) Exchange rate: 1USD=119.79JPY

JAPANESE GRANT

The Japanese Grant (hereinafter referred to as the "Grant") is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. The Grant is not supplied through the donation of materials as such.

Based on a JICA law which was entered into effect on October 1, 2008 and the decision of the GOJ, JICA has become the executing agency of the Japanese Grant for Projects for construction of facilities, purchase of equipment, etc.

1. Grant Procedures

The Grant is supplied through following procedures :

- Preparatory Survey
  - The Survey conducted by JICA
- Appraisal &Approval
  - Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
  - The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as "the G/A")
  - Agreement concluded between JICA and a recipient country
- Implementation
  - Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Scheme from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.

- Preparation of an outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant project. The Outline Design of the Project is confirmed based on the guidelines of the Japanese Grant scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve 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 of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

3. Japanese Grant Scheme

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes(hereinafter referred to as "the E/N") will be singed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles, in accordance with the E/N, to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Grant, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. The Grant may be used for the purchase of the products or services of a third country, if necessary, taking into account the quality, competitiveness and economic rationality of products and services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals", in principle.

(4) Necessity of "Verification"

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

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Project, the recipient country is required to undertake such necessary measures as Annex. The Japanese Government requests the Government of the recipient country to exempt all customs duties, internal taxes and other fiscal levies such as VAT, commercial tax, income tax, corporate tax, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract, since the Grant fund comes from the Japanese taxpayers.

(6) "Proper Use"

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

(7) "Export and Re-export"

The products purchased under the Grant should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"), in principle. JICA will execute the Grant 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 JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

(10) Environmental and Social Considerations

The Government of the recipient country must carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the recipient country and JICA Guidelines for Environmental and Social Consideration (April, 2010) .

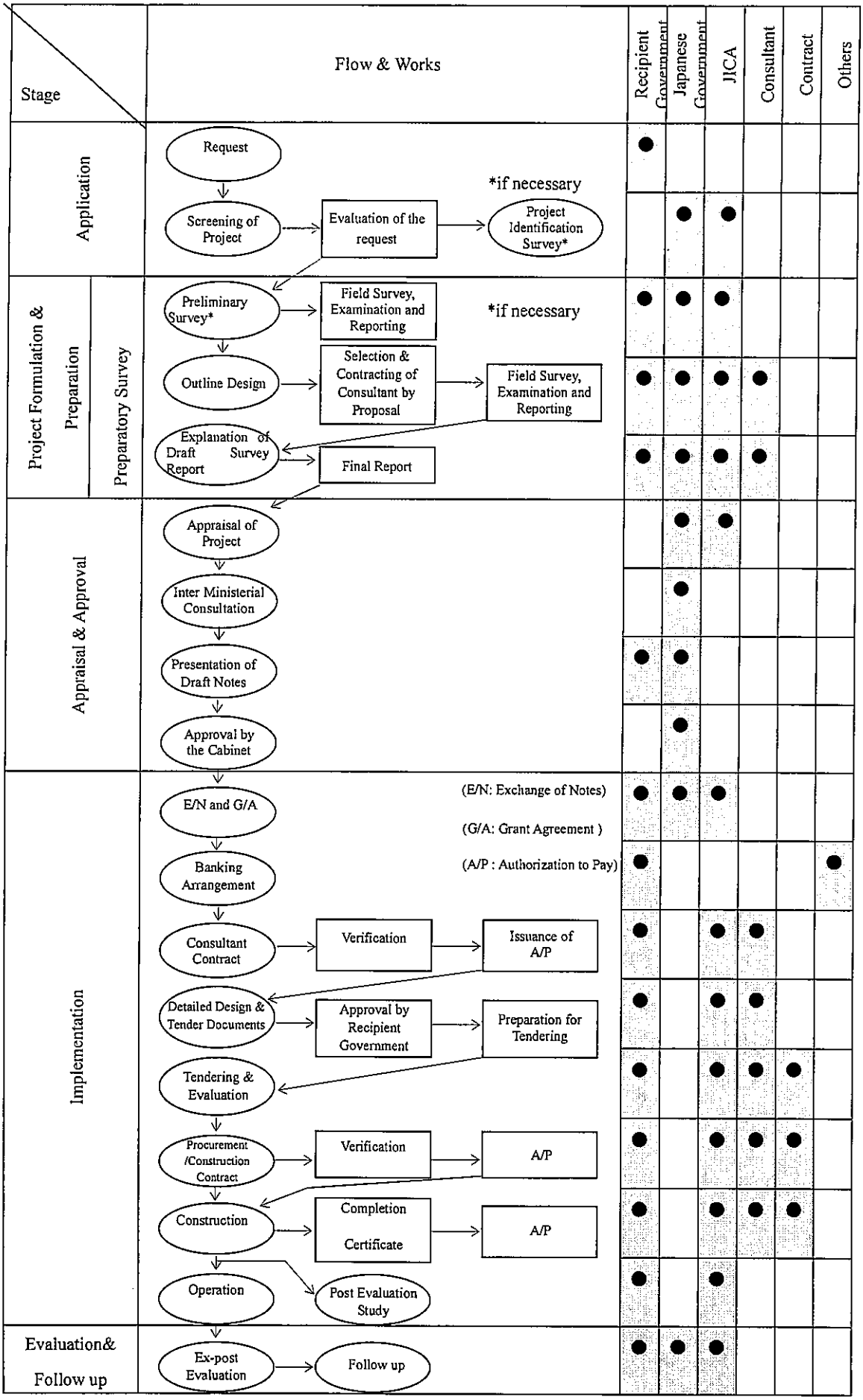
(11) Monitoring

The Government of the recipient country must take their initiative to carefully monitor the progress of the Project in order to ensure its smooth implementation as part of their responsibility in the G/A, and must regularly report to JICA about its status by using the Project Monitoring Report (PMR).

(12) Safety Measures

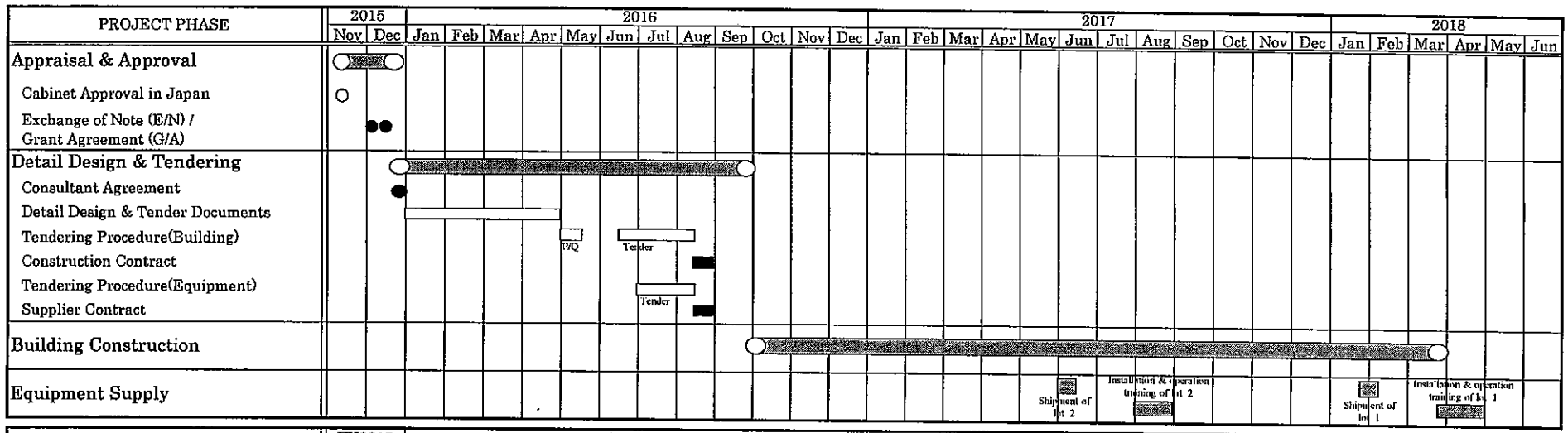
The Government of the recipient country must ensure that the safety is highly observed during the implementation of the Project.

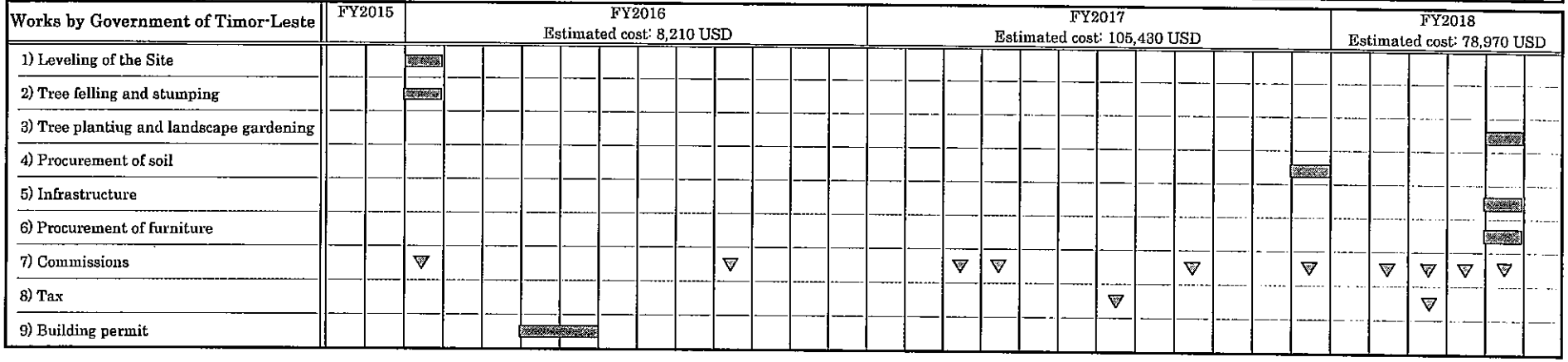
FLOW CHART OF JAPANESE GRANT PROCEDURES



PROJECT IMPLEMENTATION SCHEDULE

PROJECT IMPLEMENTATION SCHEDULE





※ schedule may be subject to change.

Annex 7

Major Undertakings to be taken by Recipient Government

1. Before the Tender

NO	Items	Deadline	In charge	Cost (USD)	Ref.
1	To open Bank Account (Banking Arrangement (B/A))	within 1 month after G/A	Ministry of Finance		
2	To obtain environmental license	within 1 month after G/A	UNTL		
3	To implement EIA (If applicable)	before start of the construction	UNTL		
4	To secure the following lands 1) project site (9,500m^2) for building construction at Hera. 2) temporary construction yard and stock yard near the Project area 3) disposal site near the Project area	before notice of the tender document	UNTL		
5	To obtain the building permit	before notice of the tender document	UNTL		
6	To clear, level and reclaim the sites 1) Tree felling and stumping 2) Leveling and reclaiming the site (9,500m2) for building construction at Hera.	before notice of the tender document	UNTL	2,350	

2. During the Project Implementation

NO	Items	Deadline	In charge	Cost	Ref.
1	To bear the following commissions to a bank of Japan for the banking services based upon the B/A				
	1) Advising commission of A/P	within 1 month after the singing of the contract	UNTL	150	
	2) Payment commission for A/P	every payment	UNTL	61,560	
2	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country				
	1) Tax payment and customs clearance of the products at the port of disembarkation	during the Project	UNTL	62,150	
3	To accord Japanese nationals and/or physical persons of third countries whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work	during the Project	UNTL		
4	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the Products and/or the Services be borne by its designated authority without using the Grant; Such customs duties, internal taxes and other fiscal levies mentioned above include VAT, commercial tax, income tax and corporate tax of Japanese nationals, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract	during the Project	UNTL		
5	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for construction of the facilities as well as for the transportation and installation of the equipment	during the Project	UNTL		
6	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities				
	1) Electricity The distributing line to the site	before start of the construction	UNTL		
	2) Water Supply The city water distribution main to the site	6 months before completion of the construction	UNTL		

	3) Drainage The city drainage main (for storm, sewer and others) to the site	6 months before completion of the construction	UNTL		
	4) Furniture and Equipment General furniture	1 month after completion of the construction	UNTL	21,250	
	5) Telephone and internet line Connections between new facilities and existing facilities	1 month after completion of the construction	UNTL	4,150	
	6) To procure soil	before commencement of embankment work	UNTL	29,000	
7	To implement EMP and EMoP (If applicable)	during the construction			
	To submit results of environmental monitoring to JICA, by using the monitoring form, on a quarterly basis as a part of Project Monitoring Report (If applicable)	during the construction	UNTL		
	To implement RAP (livelihood restoration program, if needed) (If applicable)	for a period based on livelihood restoration program	UNTL		
	To implement social monitoring, and to submit the monitoring results to JICA, by using the monitoring form, on a quarterly basis as a part of Project Monitoring Report - Period of the monitoring may be extended if affected persons' livelihoods are not sufficiently restored. Extension of the monitoring will be decided based on agreement between UNTL and JICA. (If applicable)	- until the end of livelihood restoration program (In case that livelihood restoration program is provided) *- for two years after land acquisition and resettlement complete (In case that livelihood restoration program is not provided)*	UNTL		

3. After the Project

NO	Items	Deadline	In charge	Cost	Ref.
1	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid 1) Allocation of maintenance cost 2) Operation and maintenance structure 3) Routine check/Periodic inspection	After completion of the construction	UNTL	55,028 / year	
2	To implement EMP and EMoP (if applicable)	for a period based on EMP and EMoP	UNTL		
	To submit results of environmental monitoring to JICA, by using the monitoring form, semiannually (if applicable) - The period of environmental monitoring may be extended if any significant negative impacts on the environment are found. The extension of environmental monitoring will be decided based on the agreement between UNTL and JICA.	for three years after the Project	UNTL		

(B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable)

Major Undertakings to be Covered by the Japanese Grant

No	Items	Deadline	Cost Estimated (Million Japanese Yen)*	
1	To construct building.	within 19 months after construction contract	This Page is closed due to the confidentiality	
	- construction of new buildings			
	1) To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country			
	a) Marine(Air) transportation of the products from Japan to the recipient country			
	b) Internal transportation from the port of disembarkation to the project site			
	2) To remove underground buried objects			
	a) Within the site			
	3) To construct the temporary building			
	4) To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities			
	a) Electricity			
	- The drop wiring and internal wiring within the site			
	- The main circuit breaker and transformer			
	b) Water Supply			
	- The supply system within the site			
	c) Drainage			
	- The drainage system (for toilet sewer, ordinary waste, storm drainage and others) within the site			
	d) Furniture and Equipment			
	- Project equipment			
2	To provide equipment	within 1 months after completion of the construction		
	1) To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country			
	a) Marine(Air) transportation of the products from Japan to the recipient country			
	b) Internal transportation from the port of disembarkation to the project site			
	2) To provide equipment with installation and commissioning			
3	To implement detailed design, tender support and construction and procurement supervision (Consultant)	within 29 months after GA		
4	Contingencies			
	Total			

*; The cost estimates are provisional. This is subject to the approval of the Government of Japan.

Project Monitoring Report
on
The Construction of New Buildings for The Faculty of Engineering, Science and Technology of The National University of Timor-Leste
Grant Agreement No. XXXXXXX

20XX, Month

Organization Information

Authority (Signer of the G/A)	Person in Charge _____ (Division) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____
Executing Agency	National University of Timor-Leste Person in Charge _____ (Division) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____
Line Agency	Ministry of Education Person in Charge _____ (Division) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____

Outline of Grant Agreement:

Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of (_____): _____
Project Title	
E/N	Signed date: Duration:
G/A	Signed date: Duration:

1: Project Description

1-1 Project Objective

1-2 Necessity and Priority of the Project

- Consistency with development policy, sector plan, national/regional development plans and demand of target group and the recipient country.

1-3 Effectiveness and the indicators

- Effectiveness by the project

2: Project Implementation

2-1 Project Scope

Table 2-1-1a: Comparison of Original and Actual Location

Location	**Original:** *(M/D)* **UNTL Hera campus** **Attachment: Map**	**Actual:** *(PMR)* **Attachment(s):Map**

Table 2-1-1b: Comparison of Original and Actual Scope

Items	Original	Actual
1. 2.		*(PMR)*

2-1-2 Reason(s) for the modification if there have been any.

(PMR)

2-2 Implementation Schedule

2-2-1 Implementation Schedule

Table 2-2-1: Comparison of Original and Actual Schedule

Items	Original		Actual
	DOD	G/A	
Cabinet Approval	11/2015		
E/N	12/2015		
G/A	12/2015		
Detailed Design	1/2015 - 4/2016		
Tender Notice	5/2016		
Tender	8/2016		
Construction Period	10/2016 - 3/2018		
Installarion of Equipement	8/2017, 4//2018		
Project Completion Date*	4/2018		
Defect Liability Period	4/2019		

*Project Completion was defined as _____ at the time of G/A.

2-2-2 Reasons for any changes of the schedule, and their effects on the project.

2-3 Undertakings by each Government

2-3-1 Major Undertakings

See Attachment 2.

2-3-2 Activities

See Attachment 3.

2-3-3 Report on RD

See Attachment 4.

2-4 Project Cost

2-4-1 Project Cost

Table 2-4-1a Comparison of Original and Actual Cost by the Government of Japan
(Confidential until the Tender)

Items			Cost (Million Yen)	
	Original	Actual	Original	Actual
Construction Facilities	Building Construction			Please state not only the most updated schedule but also other past revisions chronologically.
Equipment	Equipment			
Consulting Services	- Detailed design -Procurement Management			

	-Construction Supervision			
Total				

Note: 1) Date of estimation: March 2015
2) Exchange rate: 1 US Dollar =119.79Yen

Table 2-4-1b Comparison of Original and Actual Cost by the Government of Timor-Leste

Items			Cost (Million USD)	
	Original	Actual	Original	Actual
1) Leveling of the Site	Demolition of existing pavement, and Grading			
2) Tree felling and stumping	Cutting obstacle trees, and roots			
3) Tree planting and landscape gardening	Tree planting and landscape gardening of the site			
4) Procurement of soil	Procurement of soil for embankment in the site			
5) Infrastructure	Wiring work and leading telephone line to the Site			
6) Procurement of furniture	Procurement of general furniture which are not included in the work by the Grant Aid from the Government of Japan			
7) Commissions	Commissions of A/P and B/A			
8) Tax	Import Duty and Sales Tax applied to imported equipments and materials			
Total				

Note: 1) Date of estimation: March, 2015
2) Exchange rate: 1 US Dollar = 119.79JPY

2-4-2 Reason(s) for the wide gap between the original and actual, if there have been any, the remedies you have taken, and their results.

(PMR)

2-5 Organizations for Implementation

2-5-1 Executing Agency: the National University of Timor-Leste

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

Original:
Actual, if changed: *(PMR)*

2-6 Environmental and Social Impacts

3: Operation and Maintenance (O&M)

3-1 O&M and Management

- Organization chart of O&M
- Operational and maintenance system (structure and the number ,qualification and skill of staff or other conditions necessary to maintain the outputs and benefits of the project soundly, such as manuals, facilities and equipment for maintenance, and spare part stocks etc)

Original:
Actual: *(PMR)*

3-2 O&M Cost and Budget

- The actual annual O&M cost for the duration of the project up to today, as well as the annual O&M budget.

Original:
Actual: *(PMR)*

4: Precautions (Risk Management)

- Risks and issues, if any, which may affect the project implementation, outcome, sustainability and planned countermeasures to be adapted are below.

Original Issues and Countermeasure(s): *(M/D)*	
Potential Project Risks	Assessment
1.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
2.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
3.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
Actual issues and Countermeasure(s)	
(PMR)	

5: Evaluation at Project Completion and Monitoring Plan

5-1 Overall evaluation

Please describe your overall evaluation on the project.

5-2 Lessons Learnt and Recommendations

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

5-3 Monitoring Plan for the Indicators for Post-Evaluation

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.

Attachment

1. Project Location Map
2. Undertakings to be taken by each Government
3. Monthly Report
4. Report on RD
5. Environmental Monitoring Form / Social Monitoring Form
6. Monitoring sheet on price of specified materials (Quarterly)
7. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (Final Report Only)

ANNEX-9

UNIVERCIDADE NACIONAL DE TIMOR LORO SA'E

FACUL DADE ENGINHARIA CIENCIA E TECNOLOGIA

Avelinda Hera, Cristro Rei - Dili - Timor Leste: Tel: 77327449

TENTATIVE ACTION PLAN FOR MAINTENANCE REPAER OF LAB. EQUIPMENTS

NO	DESCRPTION	PERIODS 2015 1	2	3	4	5	6	7	8	9	10	11	12	2016 1	2	3	4	5	6	7	8	9	10	11	12	REMARKS
1	FEST Operation and Management Policy																									done
2	List of Responsibility, Maintenance Schedule of each Departement and Regulation.																									under going (ME/EEE done)
3	Lab. Database System																									
4	Prposal of Tecnician recruitments																									- employment of new tecnisian did not approved in 2015 - train the current staff for tecnisian
5	**Capacity Development foroperation & Maintenance**																									
a	Capacity Development for operation & Maintenance for Lecturers & Tech.																									- applied 2016 budget for training
b	Instruction operation & Maintenance for students																									- as daily class activities
6	Maintenance Record																									- to be introduced
7	**Proposal budget Annual Action Plan (AAP) 2016**																									
	a). Preparation & workshop AAP & budget alocation 2016																									done (proposed 50,000 USD)
	b). Submission AAP & budget alocation 2016 per each Faculty																									done
	c). Presentation AAP 2016 to general council UNTL																									done
	d). Subinission AAP 2016 to PM																									done
	e). Delegate UNTL Team AAP 2016																									done
	f) Final Revision AAP 2016																									waiting for approval
8	Select some students to make maintenance with staff or Lectures per each division of each Departement																									Undergoing (ME/IE done)
9	Proposal on Maintenance for tools, materials and or equipments																									
10	**Implemtation of maintenance activities:**																									
	a). Daily																									- under the support of CADEFEST project
	b). Periodic																									

Dili, September

Annex 9

Annex 10

The Annual Operation and Maintenance Cost

Items	Estimated Cost (USD/year)
1) Electricity*1	0
2) Fuel for Generator	6,110
3) Communication Expenses	19,960
4) Maintenance Cost of Facilities	8,800
5) Operation and Maintenance Cost of Equipments	20,158
Total	55,028

*1 It is assumed that the electricity for the project facilities could be covered by photovoltaic power generation system of 250kW, already installed by "the Project for Introduction of Clean Energy by Solar Electricity Generation System" under Japan's Grant Aid

5. Other Relevant Data

5-1. List of Equipment

Study for Requested Equipment

No.	Description	Requested Qty	Planned Qty	Requested Priority	Planned Priority	No.	Final Qty	Allocation														
								Normal class room	Large class room	Distance learning class room	Computer room	Meeting room	Auditorium	Print room	Library	Drafting room	General lab.1	General lab.2	Lab.for research project	Lab.for Information Engineering	Lab.for Geology and Petroleum Engineering	Existing Lab.for Mechanical Engineering	Existing Lab.for Civil Engineering	Existing Lab.for Electric and Electronics Engineering
Normal Size Classroom																								
1	Projector	19	15	A	A	1	17	15									2							
2	Screen	19	15	A	A	2	17	15									2							
Large Size Classroom																								
1	Projector	5	5	A	A	3	11		5	1	2					1				2				
2	Screen	5	5	A	A	4	11		5	1	2					1				2				
Distance Learning Class Room																								
1	Projector	1	1	A	A																			
2	Screen	1	1	A	A																			
3	E-Learnng System	1	1	A	A	5	1			1														
Computer Room																								
1	Desktop PC	80	80	A	A	6	171				80				11					80				
2	Printer	4	4	A	A	7	3				2				1									
3	LAN Equipmet	2	2	A	A	8	5				2				1					2				
4	Projector	2	2	A	A																			
5	Screen	2	2	A	A																			
Meeting Room																								
1	Projector	1	5	A	A	9	5					5												
2	Screen	1	5	A	A																			
3	White Board	1	5	A	A	10	5					5												
Auditorium																								
1	Projector	1	1	A	A	11	1						1											
2	Screen	1	1	A	A	12	1						1											
3	TV Conference System	1	1	A	A																			
4	Audio Visual Equipment	1	1	A	A	13	1						1											
Print Room																								
1	Photocopier	1	1	A	A	14	2							1	1									
2	Digital Printer	1	1	A	A	15	1							1										
Library																								
1	Desltop PC	11	11	A	A																			
2	Printer	1	1	A	A																			
3	Photocopier	1	1	A	A																			
4	Library Management System	1	1	A	A																			
Drafting Room																								
1	Drawing Board Set	40	40	A	A	16	40									40								
2	Projector	1	1	A	A																			
3	Screen	1	1	A	A																			
General Laboratory																								
1	Projector	2	2	A	A																			
2	Screen	2	2	A	A																			
3	Equipment for Physics	2	2	A	A																			
	Mechanical Energy Apparatus	-	-	-	-	17	1										1							
	Free Fall Apparatus	-	-	-	-	18	1										1							
	Inclined Plane Apparatus	-	-	-	-	19	1										1							
	Deflection Bending Stiffness Apparatus	-	-	-	-	20	1										1							
	Pendulum Apparatus	-	-	-	-	21	1										1							
	Measuring Equipment for Length	-	-	-	-	22	8											8						
	Measuring Equipment for Weight	-	-	-	-	23	8											8						
	Stop Watch	-	-	-	-	24	8											8						
	Digital Thermometer	-	-	-	-	25	8											8						
	Digital Multimeter	-	-	-	-	26	8											8						
	Electric Circuit Trainer	-	-	-	-	27	8											8						
Research Project Laboratory																								
1	Projector	1	1	A	A																			
2	Screen	1	1	A	A																			
3	Draft Chamber	1	1	A	A	28	1												1					
4	Equipment for Research Project	1	1	A	A																			
5	Equipment Set for Chemical Practice	1	1	A	A	29	1												1					
	Electric Furnace	-	-	-	-	30	1												1					
	ph Meter	-	-	-	-	31	1												1					
PC Laboratory for Informatics Engineering																								
1	Desktop PC	125	80	A	A																			
2	Router A	5	5	A	A	32	2													2				
3	Router B	5	5	A	A																			
4	Switch	5	5	A	A	33	2													2				
5	Access Point	5	5	A	A	34	2													2				
6	Server, rackmount	2	2	A	A	35	2													2				
7	Server, tower	3	3	A	A	36	2													2				
8	Disk Storage System	1	1	A	A	37	2													2				
9	IP Phone	10	10	A	A	38	4													4				
10	IP Camera A	5	5	A	A	39	4													4				
11	IP Camera B	10	10	A	A																			
12	IP Printer	2	2	A	A	40	2													2				
13	Network Tester	5	5	A	A	41	2													2				
14	LAN Equipment	5	2	A	A	42	2													2				
15	Rack	2	2	A	A	43	2													2				
16	Microsoft Visual Studio	125		A	C																			
17	Delphi	125		A	C																			
18	SQL Server	125		A	C																			
19	Adobe	125		A	C																			
20	SPSS	125		A	C																			
21	Oracle	125		A	C																			
22	Matlab	125		A	C																			
23	Projector	2	2	A	A																			
24	Screen	2	2	A	A																			
Laboratory for Geology and Petroleum Engineering																								
1	Carbon,Sulphur Determinator	1		A	C																			
2	Rock-Eval Pyrolysis Analyzer	1		C	C																			
3	Gas-Chromatography	1		C	C																			
4	Mass-Spectrometer	1		C	C																			
5	X-Ray Fluorescence Spectrometry	1		C	C																			
6	Instrument for Neutron Activation	1		C	C																			
7	Instrument for Radiochemical Neutron	1		C	C																			

No.	Description	Requested Qty	Planned Qty	Requested Priority	Planned Priority	No.	Final Qty	Allocation															
								Normal class room	Large class room	Distance learning class room	Computer room	Meeting room	Auditorium	Print room	Library	Drafting room	General lab.1	General lab.2	Lab.for research project	Lab.for Information Engineering	Lab.for Geology and Petroleum Engineering	Existing Lab.for Mechanical Engineering	Existing Lab.for Civil Engineering	Existing Lab.for Electric and Electronics Engineering
8	Inductively Coupled Plasma Emission	1		C	C																			
9	Atomic absorption Spectrophotometry	1		C	C																			
10	Isotope Dilution Mass Spectrometry	1		C	C																			
11	Inductively Coupled Emission Mass	1		C	C																			
12	Spark Source Mass Spectrometry	1		C	C																			
13	Electron Microprobe	1		C	C																			
14	The Ion Microprobe Tool	1		C	C																			
15	Garret Deluxe gold Panning Kit	5	4	A	A																			
16	Hand Held XRF analyzer X-MET7000	1	1	A	B	44	1														1			
17	Stereoscope , Complete system	20		A	C																			
18	Photo satelite	1		A	C																			
19	Topography Map	1		C	C																			
20	Aerial Photography	1		C	C																			
21	Settling-Tube Analyzer	1		C	C																			
22	Particle Size Analyzer	1		C	C																			
23	Oven	1	1	A	A	45	1														1			
24	Sieving and Shaker	1		C	C																			
25	Jaw Crusher	1		C	C																			
26	Scanning Electron Microscope	1		C	C																			
27	Jacob-Staff	10	10	A	A																			
28	Measuring-Tape	5		C	C																			
29	Drawing Table	40		B	C																			
30	Technical drawing tools	40		B	C																			
31	Tracing Paper	40		C	C																			
32	Colouring Pencils	40		C	C																			
33	Ruler	40		C	C																			
34	Portable flowmeter	1	1	A	B																			
35	Water Quality Analyzer	1	1	A	A																			
36	Water Quality Monitoring System	1		B	C																			
37	pH/ORP/Conductivity meter	1		C	C																			
38	Portable Water Flow Meter Sensor	1		A	C																			
39	Automatic Resistivity system	1	1	A	A	46	1														1			
40	Standard Proton Magnetometer	1		A	C																			
41	Exploration Seismograph	1		A	C																			
42	Gamma Spectrometer	1		A	C																			
43	Gravitymeter	1		A	C																			
44	Water Level Indicator and Borehole TV	1		A	C																			
45	Ground Penetrating Radar	1		A	C																			
46	Portable Rock core drills Pomeroy EZ	2	1	B	A	47	1														1			
47	Planetary ball mill lab grinding to 0.1 um	2	1	B	A	48	1														1			
48	Diomand drill pomeroy BSS-1E drill bit	2		C	C																			
49	Electronic balance	2	2	A	A	49	2														2			
50	Sieve Shaker	2	1	A	A	50	1														1			
51	Binocular Microscope with camera	10	1	A	A	51	1														1			
52	Jaw Crusher	2	1	A	A	52	1														1			
53	Jar	5	10	A	A																			
54	Soil mortar	5	10	A	A																			
55	Soil pestle	5	10	A	A																			
56	Fossil Collection	1		C	C																			
57	Box of Fossils Sample	10	1	A	A	53	1														1			
58	Minerals or Crystals Replica (crystals	5	1	A	A	54	1														1			
59	Polarization Microscope	20	10	A	A	55	10														10			
60	Reflection Polarizing Microscope	5		A	C																			
61	Scratcher	20		C	C																			
62	Hands Lens	20	20	A	A																			
63	Pencil with Pivot Magnet	20	20	A	A																			
	Tool for Specimen	-	-	-	-	56	1														1			
	Tool for Field Research	-	-	-	-	57	1														1			
	Hardness Measuring Plate	-	-	-	-	58	20														20			
64	Porcelain streak plate	20	20	A	A																			
65	Glass plate	20	20	A	A																			
66	Rocks sample	1		C	C																			
67	Mineral thin section			C	C																			
68	Compas	50	20	A	A																			
69	Rock Hammer	50	20	A	A																			
70	Mineral Scratcher	50		C	C																			
71	Particle Size Comparator Chart	50	20	A	A																			
72	Global Positioning System (GPS)	10		A	C																			
73	Triaxial Testing Machine	1		B	C																			
74	Load Frame for Triaxial Testing	1		B	C																			
75	Compactin Testing Machine	1		B	C																			
76	Soil Consolidation Tesing Machine	1		A	C																			
77	Data Acquisition System	1		B	C																			
78	Direct Shear Testing Apparatus	1		A	C																			
79	Erosion Function Apparatus	1		C	C																			
80	Consolidation Meter for Expansion and	1		A	C																			
81	Hydrometer Analysis Set	1		A	C																			
82	Liquid Limit Set	1		A	C																			
83	Permeability Meter	1		A	C																			
84	Pin Hole Dispersion Erodibility Test	1		B	C																			
85	Plastic Shrinkage Limit	1		A	C																			
86	Relative Density of Soil	1		A	C																			
87	Sample Ejector	1		B	C																			
88	Sand Equivalent Test Set and Shaker	1		A	C																			
89	Soil Processor	1		A	C																			
90	Soil Strength Classifier	1		B	C																			
91	Soil Volume Change Meter	1		A	C																			
92	Time Domain Reflectometer	1		A	C																			
93	Inclinometer	1		A	C																			
94	Extensiometer	1		A	C																			
95	Piezometer	1		A	C																			
96	Crack Meter	1		A	C																			
97	Diferential Global Positioning System	1		A	C																			

No.	Description	Requested Qty	Planned Qty	Requested Priority	Planned Priority	No.	Final Qty	Allocation															
								Normal class room	Large class room	Distance learning class room	Computer room	Meeting room	Auditorium	Print room	Library	Drafting room	General lab.1	General lab.2	Lab.for research project	Lab.for Information Engineering	Lab.for Geology and Petroleum Engineering	Existing Lab.for Mechanical Engineering	Existing Lab.for Civil Engineering	Existing Lab.for Electric and Electronics Engineering
98	Acoustic Emission Sensor 3D Laser	1		A	C																			
99	Rock Cutting Machine, middle size	1	1	A	A	59	1														1			
100	Rock Cutting Machine, small size	1	1	A	A	60	1														1			
101	Bench Type Polishing Apparatus	2	2	A	A	61	2														2			
102	Slide Glass Set	1	1	A	A																			
For Mechanical Engineering Laboratory (Existing)																								
1	CNC Vertical Milling Machine	1	1	A	A	62	1															1		
2	Vertical milling machine	1		A	C																			
3	AC Welder	1	1	A	A	63	1															1		
4	Barometer	1		A	C																			
5	Manometer	1		A	C																			
6	Hdvrometer	1		A	C																			
7	Brookfield Viscomoter	1		A	C																			
8	Capillary Viscometer	1		A	C																			
9	Surface Tensiometer	1		A	C																			
10	U-Tube Manometer	1		A	C																			
11	Well Reservoir Manometer	1	1	A	A	64	1															1		
12	Inclined Manometer	1		A	C																			
13	Venturi Meter	1		A	C																			
14	Hastings Meter	1		A	C																			
15	Orifice Meter	1		A	C																			
16	Sluice Gate	1		A	C																			
17	Bourdon Pressure Gauge	1		A	C																			
18	Westphal Balance	1		A	C																			
19	Posittive Displacement Pumps	1		A	C																			
20	Parallel and Serial Pump Trainer	1	1	A	A	65	1															1		
21	Gear Pumps: Internal Gear Pumps and	1		A	C																			
22	Lobe Pumps	1		B	C																			
23	Vane Pumps	1		B	C																			
24	Screw Pumps	1		A	C																			
25	Cavity Pumps	1		B	C																			
26	Pistons Pumps	1		B	C																			
27	Hydraulic Brakes	1		A	C																			
28	Hydraulic Lift	1		A	C																			
29	Ball Pinton Pump	1		A	C																			
30	Bent Axis Pump	1		A	C																			
31	Radial Piston Pump	1		A	C																			
32	Rotary cam pump	1		A	C																			
33	Radial Pump	1		A	C																			
34	Jet Pumps	1		A	C																			
35	Ram Pump	1		A	C																			
36	Air Lift Pump	1		A	C																			
37	Francis and Pelton Turbin Trainer	1	1	A	A	66	1															1		
38	Reaction Turbine Prototype (Francis and	1		A	C																			
39	Reversible Francis Turbine Prototype	1		A	C																			
40	Francis (Prototype)	1		A	C																			
41	Propeller (Prototype)	1		A	C																			
42	Kaplan (Prototype)	1		A	C																			
43	Cross Flow Turbine (Prototype)	1		A	C																			
44	Turgo (Prototype)	1		A	C																			
45	Pelton, 1-Jet (Prototype)	1		A	C																			
46	Pelton, 2-Jet (Prototype)	1		A	C																			
47	Desktop PC	31		A	C																			
48	Projector	1		A	C																			
49	Screen for projector	1		A	C																			
50	AutoCAD Software	31		A	C																			
51	Solidwork	31		A	C																			
52	MATLAB	31		A	C																			
53	Smoke Meter (Multi Gas Analyser)	1		A	C																			
54	Deskton waste plastic oiling system	1		A	C																			
55	Prototype of Solar power (PV)	1		A	C																			
56	Prototype of wind energy	1		A	C																			
57	Prototype of geothermal energy	1		A	C																			
58	Band Saw	2	1	A	A	67	1															1		
59	Gear Hobbing Machine	2		A	C																			
60	Broaching Machine	2		A	C																			
61	Buff Polishing Machine	2	1	A	A	68	1															1		
62	Metallurgical microscopes	2		A	C																			
63	Electric devices wiring & Test operation	2		A	C																			
64	Electric devices operation Trainer	2		A	C																			
65	Metallography Microscope	1	1	A	A	69	1															1		
66	Camera and Film	2		A	C																			
67	Saw	1		A	C																			
68	Specimen Shaper	1		A	C																			
69	Specimen Dryer	1	1	A	A	70	1															1		
70	Digitally Controlled Closed Loop Servo	1		A	C																			
71	Universal Testing Machine	1	1	A	B	71	1															1		
72	Impact Tester	1	1	A	B	72	1															1		
73	Torsion Tester	1		A	C																			
74	Vickers Hardness Tester	1	1	A	A	73	1															1		
75	Diffused Light Research Polariscope	1		A	C																			
76	Strain Measurement Module	1		A	C																			
77	Fatigue Testing Machine	1		A	C																			
78	Bending Stress in a Beam Tester Machine	1		A	C																			
79	Thin Cylinder Tester Machine	1		A	C																			
80	Buckling Tester Machine	1		A	C																			
81	Pillar Drill Machine	1		A	C																			
82	Jigsaw Machine	1		A	C																			
83	Surface Roughness Measuring Instrument	1		A	C																			
84	3D Scanning Microscope	1		A	C																			
85	FTT Analyzer	1		A	C																			
86	Vibration Meter	1		B	C																			
87	Sound Level Meter	1	1	A	A	74	1															1		

Study for Requested Equipment

No.	Description	Requested Qty	Planned Qty	Requested Priority	Planned Priority	No.	Final Qty	Allocation															
								Normal class room	Large class room	Distance learning class room	Computer room	Meeting room	Auditorium	Print room	Library	Drafting room	General lab.1	General lab.2	Lab.for research project	Lab.for Information Engineering	Lab.for Geology and Petroleum Engineering	Existing Lab.for Mechanical Engineering	Existing Lab.for Civil Engineering	Existing Lab.for Electric and Electronics Engineering
88	Cutting Tool	1		A	C																			
89	Instrument for Temperature Tool Tip	1		C	C																			
90	3D Laser Scanning Microscope Performs	1		C	C																			
91	Strong Alkaline Water Generator	1		C	C																			
92	Toyota Engine	4	1	A	A	75	1															1		
93	Mitsubishi Engine	4		A	C																			
94	Automotive Frame Practical	2		A	C																			
95	Sound Level Meter (SLM)	2		A	C																			
96	Gun Speed Velocity	1		A	C																			
97	Smoke Tester	1	1	A	A	76	1															1		
98	RPM Tester and and Ohm Meter	1		A	C																			
99	Volt Meter	1		B	C																			
100	Ohm Meter	1		B	C																			
101	Ampere Meter	5		B	C																			
102	Test Pen	5		A	C																			
103	Tools Box	5		A	C																			
104	Dwell Tester	5		A	C																			
105	Timing Light	1		A	C																			
106	Tune up Tester Computer Translation	1		A	C																			
107	Two Stroke Engine Cycle (Prototype)	1	1	A	A	77	1															1		
108	Four Stroke Engine Cycle (Prototype)	1	1	A	A	78	1															1		
109	External Compression (Prototype)	1		A	C																			
110	Electric devices wiring & Test operation	1	1	A	A	79	1															1		
111	Band Saw	1		A	C																			
112	Pneumatic Machine	2		A	C																			
113	Hydraulic Machine	2		A	C																			
114	Thermal Cycle Apparatus	1	1	A	A	80	1															1		
For Civil Engineering Laboratory (Existing)																								
1	Data Logger	1		A	C																			
2	Strain gauges	6		A	C																			
3	Displament Gauge	5		A	C																			
4	Air Content test	1		A	C																			
5	Spliting tensile test Accessoris	1	1	A	A	81	1																1	
6	Flexural test Accessoris	1		A	C																			
7	Vibrating Table For Precision Mold	1		A	C																			
8	Compating Factor Apparatus	2		A	C																			
9	Bar molds	4		A	C																			
10	GPR Surveys	3	1	A	A																			
11	Total station	6	1	A	A	82	1																1	
12	Auto level	5	1	A	A	83	1																1	
13	GPS	4	2	A	A	84	2																2	
14	Thedolite	2	2	A	A	85	2																2	
15	Open channel model and Pipe line	1		B	C																			
16	Current meter			A	C																			
17	Reynolds Numbers measuring instrument	1		B	C																			
18	Manometer and orifice test equipment	1		A	C																			
19	Popular flow test equipment	1		A	C																			
20	Water hammer phenomenon equipment	1		A	C																			
21	Drainage and Seepage Tank Apparatus	1		A	C																			
22	Hydraulic Becnh	1		A	C																			
23	Impact of jet	1		A	C																			
24	Impact of jet	1		A	C																			
25	Tilting Flume	1		A	C																			
26	Sediment Transport Apparatus	1		A	C																			
27	GPR Survey Investigation	1		A	C																			
28	Laser Auto Level	1		B	C																			
29	GPS	1		C	C																			
30	Total Stations	1		B	C																			
31	Total Stations	1		C	C																			
32	Total Stations	1		B	C																			
33	Specific Gravity of Semi-Solid	1		A	C																			
34	Distillation of Cutback Asphalts	1		A	C																			
35	Water Content in Petroleum Products	1		A	C																			
36	Saybolt Viscosimeter	1		A	C																			
37	Flash and Fire point by Cleveland Open	2		A	C																			
38	Softening Point Test Set	1		A	C																			
39	Loss on Heating / Thin-Film Test	1		A	C																			
40	Laboratory Penetration Test Set	1		A	C																			
41	Laboratory Penetration Test Set	1		A	C																			
42	Ductility of Bituminous Material Test Set	1		A	C																			
43	Centrifuge Extractor Test Set	2		A	C																			
44	Reflux Extractor Test Set	1		A	C																			
45	Marshall Test Set	1		A	C																			
46	Core Drilling Test Set	1		A	C																			
47	Benkleman Beam	1		A	C																			
48	Mot straight Edge	2		A	C																			
49	Dutch Cone Penetrometer	3		A	C																			
50	Hand Auger	2		A	C																			
51	Standard Penetrometer Test	1		A	C																			
52	Sample Extruder	2		A	C																			
53	Dynamic Cone Penetration	1		A	C																			
54	Soil Surface Sampler	1		A	C																			
55	Duct Cone Electrometer	1		A	C																			
56	Plate Bearing Test set	1	1	A	B	86	1																1	
57	Field CBR Test Set	1	1	A	B	87	1																1	
58	Proving Ring Penotrometer	1	1	A	B	88	1																1	
59	TVA Penetrometer	1		A	C																			
60	Liquid limit Test set	3		A	C																			
61	Plastic Limit Test Set	1		A	C																			
62	Shrinkle Limit Test Set	1		A	C																			
63	Hydrometer Analysis Test Set	1		A	C																			
64	Mechanical End Over End Shaker	1		A	C																			
65	Vacuum Stand	1		A	C																			

Study for Requested Equipment

No.	Description	Requested Qty	Planned Qty	Requested Priority	Planned Priority	No.	Final Qty	Allocation															
								Normal class room	Large class room	Distance learning class room	Computer room	Meeting room	Auditorium	Print room	Library	Drafting room	General lab.1	General lab.2	Lab.for research project	Lab.for Information Engineering	Lab.for Geology and Petroleum Engineering	Existing Lab.for Mechanical Engineering	Existing Lab.for Civil Engineering	Existing Lab.for Electric and Electronics Engineering
66	Specific Gravity (Heating Method)	1		A	C																			
67	Specific Gravity (Vacuum Method)	2		A	C																			
68	Compaction Test Set	1		A	C																			
69	Laboratory CBR Test Set	2		A	C																			
70	Combination Permeameter	1		A	C																			
71	Compaction Permeameter Test Set	2		A	C																			
72	Sand Cone Test Set	2		A	C																			
73	Speedy Moisture Tester	1		A	C																			
74	Moisture Content Test Set	1		A	C																			
75	Unconfined Compression Mechine	2		A	C																			
76	Consolidation Test Set	1		A	C																			
77	Direct Shear Test set	1		A	C																			
78	Triaxial Test Set	1		A	C																			
79	Automatic Triaxial Test Set	1		A	C																			
80	Vane test	2		A	C																			
81	Soil Sampler	2		A	C																			
82	Arch Bridge Modelling for demonstration	1		B	C																			
83	Prestressed beams modelling for	1		B	C																			
84	Beams flexural test mechine,200kN	1		A	C																			
85	Portable Data Logger	1		A	C																			
86	Digital Load Meter	1		A	C																			
87	Dial Gauge	4		B	C																			
88	Concrete Radar Imaging Solution	1		A	C																			
89	Pressure gauge	1		B	C																			
90	Load (cap. 500 KN)	3	1	B	A	89	1																1	
91	Statics Load Experimental	1		B	C																			
92	Bridge Model	1		A	C																			
For Electric and Electronics Engineering Laboratory (Existing)																								
1	Assembly Set for Analog and Digital	1		B	C																			
2	Resistance Box	20		A	C																			
3	Bread Board for analog system	10	24	A	A	90	24																	24
4	Bread Board for digitak system	10		B	C																			
5	Dual Tracking Power Supply	6	8	B	A	91	8																	8
6	Single Type Power Supply	10		B	C																			
7	Oscilloscope	6		B	C																			
8	Tool Set	12		B	C																			
9	Transformer	20	24	B	A	92	24																	24
10	Analog AVO Meter	15		A	C																			
11	Digital AVO Meter	15		A	C																			
12	Assembly Set for Electrical Installation	1	1	A	A	93	1																	1
13	Assembly Set for Control System	1	1	A	A	94	1																	1
14	PLC	6	8	A	A																			
15	Microprocessor Kit	5		A	C																			
16	Sensor PIR	40	40	A	A																			
17	sensor Ultrasonic	30	40	A	A																			
18	Robo-C	10		A	C																			
19	Labview	30		A	C																			
20	Microcontroller Kit	2		A	C																			
21	FPGA Kit	2		A	C																			
22	DC Stepper Motor with driver	16	16	A	A																			
23	Microcontroller	8	8	A	A																			
24	Escada System	4		A	C																			
25	Circuit Board Processing Machine	1		A	C																			
26	Incremental Encoder	10	8	A	A																			
27	Assembly Set for Power Electronics	1	1	A	A	95	1																	1
28	PV Panel	6	8	A	A	96	8																	8
29	Power Variable Resistance	5	8	A	A	97	8																	8
30	Digital Oscilloscope	2		A	C																			
31	MOSFET Gate Driver	30	32	A	A																			
32	Effect Hall Current Sensor A	25	16	A	A																			
33	Effect Hall Current Sensor B	25	16	A	A																			
34	AM Module	5		A	C																			
35	FM Module	5		A	C																			
36	Fiber Optic	6		C	C																			
37	Transcieber Module	5		C	C																			
38	Security Camera System	2		A	C																			
39	Converter Motor Training System	1		A	C																			

5-2. Result of Geological Survey

TEST LOCATION PLAN

Not to Scale

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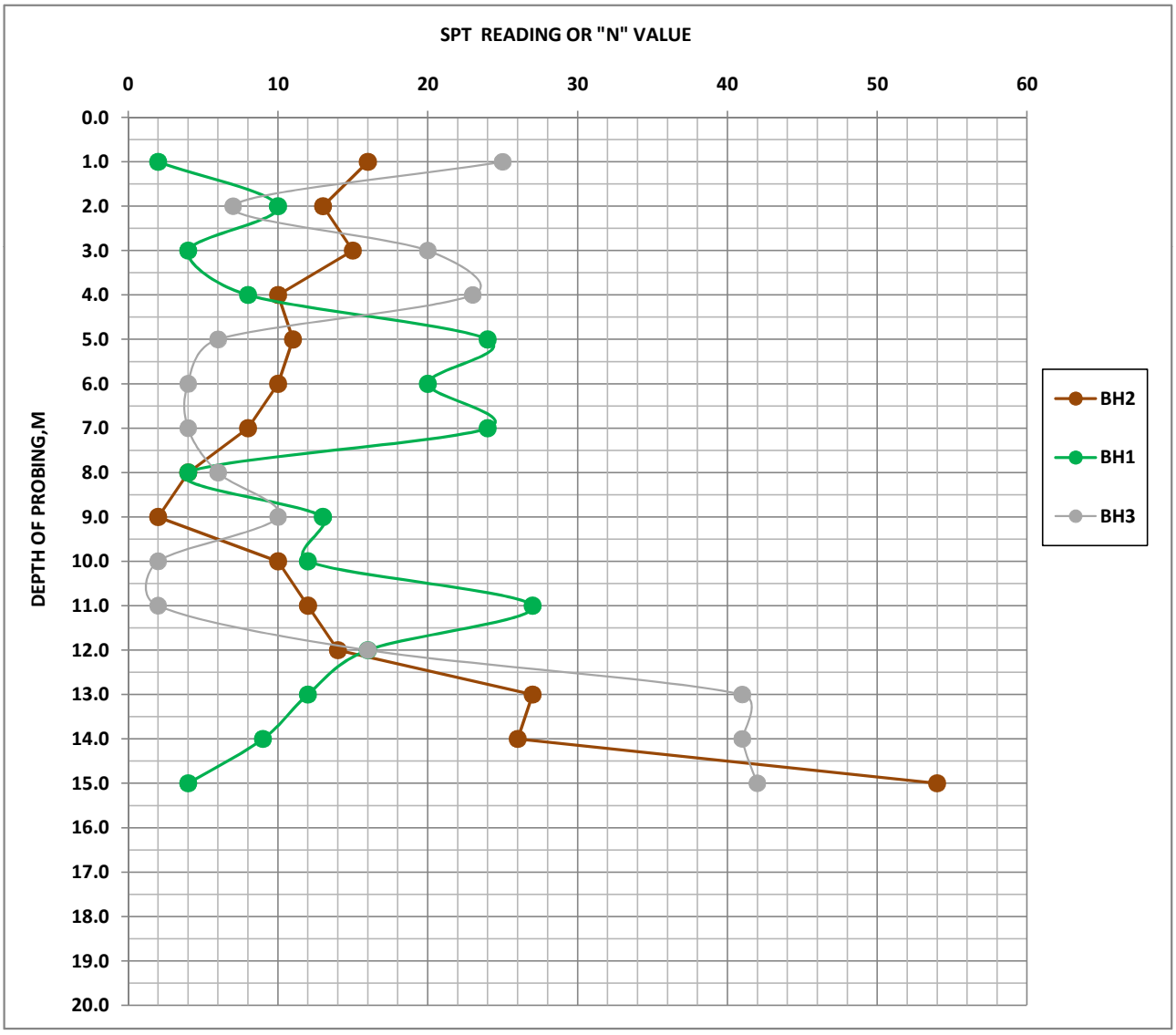
MATERIALS TESTING CENTRE

STANDARD PENETRATION TEST SUMMARY READING

CLIENT:	**YAMASHITA SEKKEI INC.**	TEST REPORT NO:	**RMS-QC-LAB-2015 183**
PROJECT:	**Faculty of Engineering, Science & Technology**	DATE OF REPORT:	**6-May-15**
PROJECT REF. NO:	**Not Applicable**	DATE RECEIVED	**27-Mar-15**
LOCATION:	**UNTL, Hera**	DATE TEST STARTED	**14-Apr-15**
IDENTIFICATION:	**Boreholes 1, 2 & 3**	DATE TEST FINISHED	**30-Apr-15**
ACTIVITY PERIOD:	**14 to 16 April 2015**	TEST PERFORMED BY:	**Rui, Jose, Jeri**
SUPERVISED BY:	**BENNY & ABILIO** TEST METHOD:	**Please see remarks.**	



REMARKS:

1) SPT procedure to ASTM D1586 : Standard Penetration Test (SPT) and Split-Barrel Samplingof Soils.

2) All N-Values are raw SPTs taken every meter of progressive depth using hollow stem auger and mud-rotary combined procedure.

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MATERIALS TESTING CENTRE

CLIENT:	YAMASHITA SEKKEI INC.	BORE ID:	BH1		
PROJECT:	Faculty of Engineering, Science & Technology	SIZE,mm:	95	SPT TYPE:	TRIP
LOCATION:	UNTL, Hera	TYPE:	NW	WT, kg./HT,cm:	63 76
DRILLING METHOD:	Hollow stem auger and mud rotary	DATE START/TIME:	14-Apr-15	13:04	
SAMPLING METHOD:	Split Spoon Barrel Sampler	DATE FINISH/TIME:	15-Apr-15	14:23	
BORING DEPTH,M:	15	WATER TABLE,M:	-8.5m from surface of borehole		
CASING DEPTH,M:	None	LOGGER:	BENNY, ABILIO		

BORE LOG RECORD

DEPTH, m	SAMPLER	RECOVERY,%	STP READING			N-VALUE	STRATIGRAPHY DESCRIPTION (Please see table below for density an consistency of soil)	USCS CLASS	-0.075, PERCENT PASSING	M.C.,%	UNIT WT. OF SOIL WET & DRY (γ), kN/m3	LL, %	PL, %	PI, %
0.0														
0.1														
0.2														
0.3														
0.4														
0.5			SPT1											
0.6	X	7	1	1	1	2	Soft, clayey sand fine to medium; light brown in color; USCS: Silty sand	SM	27	13	none	NL	NP	NP
0.7	X													
0.8	X													
0.9	X													
1.0	X													
1.1														
1.2														
1.3														
1.4														
1.5			SPT2											
1.6	X	62	4	5	5	10	Medium, Gravelly sand fine to medium size; traces of silt ; light brown in color USCS : Silty sand with gravel	SM	14	6.1	none	45	36	9
1.7	X													
1.8	X													
1.9	X													
2.0	X													
2.1														
2.2														
2.3														
2.4														
2.5			SPT3											
2.6	X	33	1	2	2	4	Soft, Silty Clay; light brown in color; USCS : Silt with sand	ML	78	31.6	none	38	27	11
2.7	X													
2.8	X													
2.9	X													
3.0	X													
3.1														
3.2														
3.3														
3.4														
3.5			SPT4											
3.6	X	56	2	4	4	8	Medium, Silty clay; light-brown in color. USCS : Silty sand with gravel	SM	34	15.3	none	NL	NP	NP
3.7	X													
3.8	X													
3.9	X													
4.0	X													
4.1														
4.2														
4.3														
4.4														
4.5			SPT5											
4.6	X	29	5	15	9	24	Medium silty sand with gravel; light-brown in color. USCS : Silty sand with gravel	SM	23	15.3	none	NL	NP	NP
4.7	X													
4.8	X													
4.9	X													
5.0	X													

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MATERIALS TESTING CENTRE

CLIENT:	YAMASHITA SEKKEI INC.	BORE ID:	BH1		
PROJECT:	Faculty of Engineering, Science & Technology	SIZE,mm:	95	SPT TYPE:	TRIP
LOCATION:	UNTL, Hera	TYPE:	NW	WT, kg./HT,cm:	63 76
DRILLING METHOD:	Hollow stem auger and mud rotary	DATE START/TIME:	14-Apr-15	13:04	
SAMPLING METHOD:	Split Spoon Barrel Sampler	DATE FINISH/TIME:	15-Apr-15	14:23	
BORING DEPTH,M:	15	WATER TABLE,M:	-8.5m from surface of borehole		
CASING DEPTH,M:	None	LOGGER:	BENNY, ABILIO		

BORE LOG RECORD

DEPTH, m	SAMPLER	RECOVERY,%	STP READING			N-VALUE	STRATIGRAPHY DESCRIPTION (Please see table below for density an consistency of soil)	USCS CLASS	-0.075, PERCENT PASSING	M.C.,%	UNIT WT. OF SOIL WET & DRY (γ), kN/m3	LL, %	PL, %	PI, %
5.1														
5.2														
5.3														
5.4														
5.5			SPT6											
5.6		77.8	9	11	9	20	Medium Gravelly sand; fine to medium	SP-SM	12	5.7	none	NL	NP	NP
5.7							light-brown in color;							
5.8							USCS: Poorly graded sand with silt and gravel							
5.9														
6.0														
6.1														
6.2														
6.3														
6.4														
6.5			SPT7											
6.6		66.7	6	11	13	24	Medium Gravelly sand; fine to medium	GW	2	3.9	none	33	27	6
6.7							light-brown in color;							
6.8							USCS: Well graded gravel							
6.9							Day 2, started at 8:00AM with SPT at 8:20AM							
7.0														
7.1														
7.2														
7.3														
7.4														
7.5			SPT8											
7.6		24.4	2	2	2	4	Soft clay with silty sand (fine to medium)	ML	71	6.7	none	37	30	7
7.7							light-brown in color;							
7.8							USCS: Silt with sand							
7.9														
8.0														
8.1														
8.2														
8.3														
8.4														
8.5			SPT9				**Observed level of water table**							
8.6		77.8	3	6	7	13	Soft clay with silty sand (fine to medium)	SC	34	14.1	none	23	15	8
8.7							light-brown in color;							
8.8							USCS: Clayey sand							
8.9							SPT commenced at 09:55AM							
9.0														
9.1														
9.2														
9.3														
9.4														
9.5			SPT10											
9.6		100	2	6	6	12	Medium gravelly sand with traces of clay;	SC	17	15	none	26	17	9
9.7							light-brown in color;							
9.8							USCS: Clayey sand with gravel							
9.9							SPT commenced at 11:20AM							
10.0														
10.1														

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MATERIALS TESTING CENTRE

CLIENT:	YAMASHITA SEKKEI INC.	BORE ID:	BH1
PROJECT:	Faculty of Engineering, Science & Technology	SIZE,mm:	95 SPT TYPE: TRIP
LOCATION:	UNTL, Hera	TYPE:	NW WT, kg./HT,cm: 63 76
DRILLING METHOD:	Hollow stem auger and mud rotary	DATE START/TIME:	14-Apr-15 13:04
SAMPLING METHOD:	Split Spoon Barrel Sampler	DATE FINISH/TIME:	15-Apr-15 14:23
BORING DEPTH,M:	15	WATER TABLE,M:	-8.5m from surface of borehole
CASING DEPTH,M:	None	LOGGER:	BENNY, ABILIO

BORE LOG RECORD

DEPTH, m	SAMPLER	RECOVERY,%	STP READING			N-VALUE	STRATIGRAPHY DESCRIPTION (Please see table below for density an consistency of soil)	USCS CLASS	-0.075, PERCENT PASSING	M.C.,%	UNIT WT. OF SOIL WET & DRY (γ), kN/m3	LL, %	PL, %	PI, %
10.2														
10.3														
10.4														
10.5			SPT11											
10.6		100	4	12	15	27	Medium gravelly sand with traces of clay;	SM	8	9.4	none	NL	NP	NP
10.7							light-brown in color;							
10.8							USCS: Silty sand with gravel							
10.9														
11.0														
11.1														
11.2														
11.3														
11.4														
11.5			SPT12											
11.6		100	7	7	9	16	Medium sand with gravel; traces of clay;	SP-SM	9	11.8	none	38	27	11
11.7							light brown in color;							
11.8							USCS: Poorly graded sand with silt and gravel							
11.9							SPT commenced 12:15PM							
12.0														
12.1														
12.2														
12.3														
12.4														
12.5			SPT13											
12.6		100	5	6	6	12	Medium sand with gravel	SM	23	12	none	37	31	6
12.7							light brown in color;							
12.8							USCS: Silty sand							
12.9							SPT commenced 13:15PM							
13.0														
13.1														
13.2														
13.3														
13.4														
13.5			SPT14											
13.6		100	3	4	5	9	Loose clayey sand (fine to medium)	SM	34	12.4	none	34	25	9
13.7							light brown in color							
13.8							USCS: Silty sand							
13.9							SPT commenced 13:40PM							
14.0														
14.1														
14.2														
14.3														
14.4														
14.5			SPT15											
14.6		100	1	2	2	4	Loose clayey sand;	SC	7	11.9	none	35	27	8
14.7							light-brown in color.							
14.8							USCS: Clayey sand							
14.9							SPT commenced 14:05PM							
15.0							Finished at 14:23PM moved to BH2							

NOTES:

SPT ESTIMATED SOIL FRICTION AND COHESION

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MATERIALS TESTING CENTRE

CLIENT:	**YAMASHITA SEKKEI INC.**	BORE ID:	**BH1**		
PROJECT:	**Faculty of Engineering, Science & Technology**	SIZE,mm:	**95**	SPT TYPE:	**TRIP**
LOCATION:	**UNTL, Hera**	TYPE:	**NW**	WT, kg./HT,cm:	**63 76**
DRILLING METHOD:	**Hollow stem auger and mud rotary**	DATE START/TIME:	**14-Apr-15**	**13:04**	
SAMPLING METHOD:	**Split Spoon Barrel Sampler**	DATE FINISH/TIME:	**15-Apr-15**	**14:23**	
BORING DEPTH,M:	**15**	WATER TABLE,M:	**-8.5m from surface of borehole**		
CASING DEPTH,M:	**None**	LOGGER:	**BENNY, ABILIO**		

BORE LOG RECORD

DEPTH, m	SAMPLER	RECOVERY,%	STP READING	N-VALUE	STRATIGRAPHY DESCRIPTION (Please see table below for density an consistency of soil)	USCS CLASS	-0.075, PERCENT PASSING	M.C.,%	UNIT WT. OF SOIL WET & DRY (γ), kN/m3	LL, %	PL, %	PI, %

1) No water table encountered during the whole course of boring process.
2) Steel casing to 100mm diameter were installed to prevent extensive fluid loss during boring. Gel was used to aid return of large chippings.
3) Site description of soil during sampling to ASTM D2487.
4) No qualified undisturbed sample recovered due to granularity of soil and limitation of equipment accessories.
5) Borehole advancement using tri-cone bit and wash-out boring.
6) NL = No Liquid Limit; NP = None Plastic
7) USS = Undisturbed Soil Sampling; unable to recover.
8) * - No recovery, classified similar to previous and judgement basing from observed soil carried by return water.

Based on uncorrected Standard Penetration Test (SPT) blow counts, taken from Karol (1960).

Soil Type and SPT Blow Counts		Undisturbed Soil: Cohesion (psf)	Undisturbed Soil: Friction Angle (°)
Cohesive soils			
Very soft	(<2)	250	0
Soft	(2–4)	250–500	0
Firm	(4–8)	500–1,000	0
Stiff	(8–15)	1,000–2,000	0
Very stiff	(15–30)	2,000–4,000	0
Hard	(>30)	4,000	0
Cohesionless soils			
Loose	(<10)	0	28
Medium	(10–30)	0	28–30
Dense	(>30)	0	32
Intermediate soils			
Loose	(<10)	100	8
Medium	(10–30)	100–1,000	8–12
Dense	(>30)	1,000	12

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MATERIALS TESTING CENTRE

CLIENT:	YAMASHITA SEKKEI INC.	BORE ID:	BH2		
PROJECT:	Faculty of Engineering, Science & Technology	SIZE,mm:	95	SPT TYPE:	TRIP
LOCATION:	UNTL, Hera	TYPE:	NW	WT, kg./HT,cm:	63 76
DRILLING METHOD:	Hollow stem auger and mud rotary	DATE START/TIME:	15-Apr-15	16:20	
SAMPLING METHOD:	Split Spoon Barrel Sampler	DATE FINISH/TIME:	16-Apr-15	14:28	
BORING DEPTH,M:	15	WATER TABLE,M:	-7.0m from surface of borehole		
CASING DEPTH,M:	None	LOGGER:	BENNY, ABILIO		

BORE LOG RECORD

DEPTH, m	SAMPLER	RECOVERY,%	STP READING	N-VALUE	STRATIGRAPHY DESCRIPTION (Please see table below for density an consistency of soil)	USCS CLASS	-0.075, PERCENT PASSING	M.C.,%	UNIT WT. OF SOIL WET & DRY (γ), kN/m3	LL, %	PL, %	PI, %
0.0												
0.1												
0.2												
0.3												
0.4												
0.5			SPT1									
0.6		67	4 8 8	16	Medium Sand with gravel; fine to medium; light brown in color; USCS: Poorly graded sand with silt and gravel SPT starts at 16:40 at an observed hot weather	SP-SM	7	5.7	none	NL	NP	NP
0.7												
0.8												
0.9												
1.0												
1.1												
1.2												
1.3												
1.4												
1.5			SPT2									
1.6		56	6 6 7	13	Medium, Gravelly sand fine to medium size; light brown in color USCS : Silty sand with gravel	SM	13	6.1	none	45	37	8
1.7												
1.8												
1.9												
2.0												
2.1												
2.2												
2.3												
2.4												
2.5			SPT3									
2.6		67	4 8 7	15	Medium, Gravelly sand fine to medium size; light brown in color; USCS : Silty sand with gravel	SM	13	5.4	none	NL	NP	NP
2.7												
2.8												
2.9												
3.0												
3.1												
3.2												
3.3												
3.4												
3.5			SPT4									
3.6		67	5 5 5	10	Medium, Gravelly sand; light-brown in color. USCS : Silty sand with gravel	SM	8	5	none	NL	NP	NP
3.7												
3.8												
3.9												
4.0												
4.1												
4.2												
4.3												
4.4												
4.5			SPT5									
4.6		100	4 5 6	11	Medium clay with gravel and sand; light-brown in color. USCS : Silty sand with gravel Day 3, drilling commenced 8:15AM	SM	14	5.3	none	NL	NP	NP
4.7												
4.8												
4.9												
5.0												

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MATERIALS TESTING CENTRE

CLIENT:	YAMASHITA SEKKEI INC.	BORE ID:	BH2		
PROJECT:	Faculty of Engineering, Science & Technology	SIZE,mm:	95	SPT TYPE:	TRIP
LOCATION:	UNTL, Hera	TYPE:	NW	WT, kg./HT,cm:	63 / 76
DRILLING METHOD:	Hollow stem auger and mud rotary	DATE START/TIME:	15-Apr-15	16:20	
SAMPLING METHOD:	Split Spoon Barrel Sampler	DATE FINISH/TIME:	16-Apr-15	14:28	
BORING DEPTH,M:	15	WATER TABLE,M:	-7.0m from surface of borehole		
CASING DEPTH,M:	None	LOGGER:	BENNY, ABILIO		

BORE LOG RECORD

DEPTH, m	SAMPLER	RECOVERY,%	STP READING	N-VALUE	STRATIGRAPHY DESCRIPTION (Please see table below for density an consistency of soil)	USCS CLASS	-0.075, PERCENT PASSING	M.C.,%	UNIT WT. OF SOIL WET & DRY (γ), kN/m3	LL, %	PL, %	PI, %
5.1												
5.2												
5.3												
5.4												
5.5			SPT6									
5.6		100	2 4 6	10	Medium clayey gravelly sand; fine to medium	SM	14	5.2	none	NL	NP	NP
5.7					light-brown in color;							
5.8					USCS: Silty sand with gravel							
5.9												
6.0												
6.1												
6.2												
6.3												
6.4												
6.5			SPT7									
6.6		67	4 4 4	8	Firm clay with sand and silt;	SM	49	21.7	none	32	24	8
6.7					light-brown in color;							
6.8					USCS: Silty sand							
6.9					**Observed water table**							
7.0												
7.1												
7.2												
7.3												
7.4												
7.5			SPT8									
7.6		100	1 2 2	4	Soft clay with silty sand and traces of gravel	SC-SM	16	16.9	none	24	17	7
7.7					light-brown in color;							
7.8					USCS: Silty-clayey sand with gravel							
7.9												
8.0												
8.1												
8.2												
8.3												
8.4												
8.5			SPT9									
8.6		78	1 1 1	2	Soft clay with silty sand (fine)	SM	20	16.8	none	NL	NP	NP
8.7					light-brown in color;							
8.8					USCS: Silty sand							
8.9												
9.0												
9.1												
9.2												
9.3												
9.4												
9.5			SPT10									
9.6		100	2 2 8	10	Medium clayey sand with traces of silt;	SM	32	16.7	none	22	NP	NP
9.7					light-brown in color;							
9.8					USCS: Silty sand							
9.9												
10.0												
10.1												

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MATERIALS TESTING CENTRE

CLIENT:	YAMASHITA SEKKEI INC.	BORE ID:	BH2		
PROJECT:	Faculty of Engineering, Science & Technology	SIZE,mm:	95	SPT TYPE:	TRIP
LOCATION:	UNTL, Hera	TYPE:	NW	WT, kg./HT,cm:	63 76
DRILLING METHOD:	Hollow stem auger and mud rotary	DATE START/TIME:	15-Apr-15	16:20	
SAMPLING METHOD:	Split Spoon Barrel Sampler	DATE FINISH/TIME:	16-Apr-15	14:28	
BORING DEPTH,M:	15	WATER TABLE,M:	-7.0m from surface of borehole		
CASING DEPTH,M:	None	LOGGER:	BENNY, ABILIO		

BORE LOG RECORD

DEPTH, m	SAMPLER	RECOVERY,%	STP READING	N-VALUE	STRATIGRAPHY DESCRIPTION (Please see table below for density an consistency of soil)	USCS CLASS	-0.075, PERCENT PASSING	M.C.,%	UNIT WT. OF SOIL WET & DRY (γ), kN/m3	LL, %	PL, %	PI, %
10.2												
10.3												
10.4												
10.5			SPT11									
10.6		100	2 8 4	12	Medium clayey sand with traces of silt;	SM	17	18.8	none	NL	NP	NP
10.7					light-brown in color;							
10.8					USCS: Silty sand							
10.9					SPT commenced at 11:20AM							
11.0												
11.1												
11.2												
11.3												
11.4												
11.5			SPT12									
11.6		100	6 7 7	14	Medium clay with fine sand;	SC-SM	30	17.5	none	23	16	7
11.7					light-brown in color;							
11.8					USCS: Silty clayey sand							
11.9					SPT commenced 11:45AM							
12.0												
12.1												
12.2												
12.3												
12.4												
12.5			SPT13									
12.6		100	10 13 14	27	Medium clayey sand with gravel	SC-SM	35	16.3	none	23	16	7
12.7					light brown in color;							
12.8					USCS: Silty clayey sand							
12.9												
13.0												
13.1												
13.2												
13.3												
13.4												
13.5			SPT14									
13.6		100	9 13 13	26	Medium clayey sand with gravel	SC-SM	33	16.8	none	24	18	6
13.7					light brown in color							
13.8					USCS: Silty clayey sand							
13.9												
14.0												
14.1												
14.2												
14.3												
14.4												
14.5			SPT15									
14.6		100	8 20 34	54	Hard clay with sand;	SC	35	16	none	24	16	8
14.7					light-brown in color.							
14.8					USCS: Clayey sand with gravel							
14.9					SPT commenced 12:35PM							
15.0					Finished at 14:28PM							

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MATERIALS TESTING CENTRE

CLIENT:	YAMASHITA SEKKEI INC.	BORE ID:	BH2		
PROJECT:	Faculty of Engineering, Science & Technology	SIZE,mm:	95	SPT TYPE:	TRIP
LOCATION:	UNTL, Hera	TYPE:	NW	WT, kg./HT,cm:	63 76
DRILLING METHOD:	Hollow stem auger and mud rotary	DATE START/TIME:	15-Apr-15	16:20	
SAMPLING METHOD:	Split Spoon Barrel Sampler	DATE FINISH/TIME:	16-Apr-15	14:28	
BORING DEPTH,M:	15	WATER TABLE,M:	-7.0m from surface of borehole		
CASING DEPTH,M:	None	LOGGER:	BENNY, ABILIO		

BORE LOG RECORD

DEPTH, m	SAMPLER	RECOVERY,%	STP READING	N-VALUE	STRATIGRAPHY DESCRIPTION (Please see table below for density an consistency of soil)	USCS CLASS	-0.075, PERCENT PASSING	M.C.,%	UNIT WT. OF SOIL WET & DRY (γ), kN/m3	LL, %	PL, %	PI, %

NOTES:

1) No water table encountered during the whole course of boring process.
2) Steel casing to 100mm diameter were installed to prevent extensive fluid loss during boring. Gel was used to aid return of large chippings.
3) Site description of soil during sampling to ASTM D2487.
4) No qualified undisturbed sample recovered due to granularity of soil and limitation of equipment accessories.
5) Borehole advancement using tri-cone bit and wash-out boring.
6) NL = No Liquid Limit; NP = None Plastic
7) USS = Undisturbed Soil Sampling; unable to recover.
8) * - No recovery, classified similar to previous and judgement basing from observed soil carried by return water.

SPT ESTIMATED SOIL FRICTION AND COHESION

Based on uncorrected Standard Penetration Test (SPT) blow counts, taken from Karol (1960).

Soil Type and SPT Blow Counts		Undisturbed Soil	
		Cohesion (psf)	Friction Angle (°)
Cohesive soils			
Very soft	(<2)	250	0
Soft	(2–4)	250–500	0
Firm	(4–8)	500–1,000	0
Stiff	(8–15)	1,000–2,000	0
Very stiff	(15–30)	2,000–4,000	0
Hard	(>30)	4,000	0
Cohesionless soils			
Loose	(<10)	0	28
Medium	(10–30)	0	28–30
Dense	(>30)	0	32
Intermediate soils			
Loose	(<10)	100	8
Medium	(10–30)	100–1,000	8–12
Dense	(>30)	1,000	12

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MATERIALS TESTING CENTRE

CLIENT:	YAMASHITA SEKKEI INC.	BORE ID:	BH3		
PROJECT:	Faculty of Engineering, Science & Technology	SIZE,mm:	95	SPT TYPE:	TRIP
LOCATION:	UNTL, Hera	TYPE:	NW	WT, kg./HT,cm:	63 76
DRILLING METHOD:	Hollow stem auger and mud rotary	DATE START/TIME:	16-Apr-15	16:09	
SAMPLING METHOD:	Split Spoon Barrel Sampler	DATE FINISH/TIME:	17-Apr-15	16:00	
BORING DEPTH,M:	15	WATER TABLE,M:	-10.0m from surface of borehole		
CASING DEPTH,M:	None	LOGGER:	BENNY, ABILIO		

BORE LOG RECORD

DEPTH, m	SAMPLER	RECOVERY,%	STP READING	N-VALUE	STRATIGRAPHY DESCRIPTION (Please see table below for density an consistency of soil)	USCS CLASS	-0.075, PERCENT PASSING	M.C.,%	UNIT WT. OF SOIL WET & DRY (γ), kN/m3	LL, %	PL, %	PI, %
0.0												
0.1												
0.2												
0.3												
0.4												
0.5			SPT1									
0.6		56	10 12 13	25	Medium sand with gravel; light brown in color; USCS: Silty sand with gravel Starts at 16:09PM	SM	14	4.8	none	NL	NP	NP
0.7												
0.8												
0.9												
1.0												
1.1												
1.2												
1.3												
1.4												
1.5			SPT2									
1.6		56	1 3 4	7	Loose, clayey fine sand; light brown in color USCS : Silt with sand	ML	78	23.1	none	29	23	6
1.7												
1.8												
1.9												
2.0												
2.1												
2.2												
2.3												
2.4												
2.5			SPT3									
2.6		58	3 8 12	20	Medium, clayey sand with gravel; light brown in color; USCS : Clayey sand with gravel SPT at 16:40	SC	24	9.6	none	27	19	8
2.7												
2.8												
2.9												
3.0												
3.1												
3.2												
3.3												
3.4												
3.5			SPT4									
3.6		64	2 11 12	23	Medium, Clayey sand with gravel; light-brown in color. USCS : Clayey sand with gravel Day 4, drilling starts at 8:25	SC	28	9.9	none	28	20	8
3.7												
3.8												
3.9												
4.0												
4.1												
4.2												
4.3												
4.4												
4.5			SPT5									
4.6		49	6 4 2	6	Loose clayey sand with gravel; light-brown in color. USCS : Silty clayey sand with gravel SPT commenced 8:55	SC-SM	19	7.1	none	26	19	7
4.7												
4.8												
4.9												
5.0												

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MATERIALS TESTING CENTRE

CLIENT:	YAMASHITA SEKKEI INC.	BORE ID:	BH3		
PROJECT:	Faculty of Engineering, Science & Technology	SIZE,mm:	95	SPT TYPE:	TRIP
LOCATION:	UNTL, Hera	TYPE:	NW	WT, kg./HT,cm:	63 76
DRILLING METHOD:	Hollow stem auger and mud rotary	DATE START/TIME:	16-Apr-15	16:09	
SAMPLING METHOD:	Split Spoon Barrel Sampler	DATE FINISH/TIME:	17-Apr-15	16:00	
BORING DEPTH,M:	15	WATER TABLE,M:	-10.0m from surface of borehole		
CASING DEPTH,M:	None	LOGGER:	BENNY, ABILIO		

BORE LOG RECORD

DEPTH, m	SAMPLER	RECOVERY,%	STP READING	N-VALUE	STRATIGRAPHY DESCRIPTION (Please see table below for density an consistency of soil)	USCS CLASS	-0.075, PERCENT PASSING	M.C.,%	UNIT WT. OF SOIL WET & DRY (γ), kN/m3	LL, %	PL, %	PI, %
5.1												
5.2												
5.3												
5.4												
5.5			SPT6									
5.6		80	2 2 2	4	Loose clayey sand; fine to medium with silt;	ML	72	22.3	none	31	24	7
5.7					light-brown in color;							
5.8					USCS: Silt with sand							
5.9					SPT start at 9:49							
6.0												
6.1												
6.2												
6.3												
6.4												
6.5			SPT7									
6.6		53	2 2 2	4	Loose clayey sand with silt;	CL-ML	60	22.3	none	24	17	7
6.7					light-brown in color;							
6.8					USCS: Sandy silty clay							
6.9					SPT commenced at 10:05							
7.0												
7.1												
7.2												
7.3												
7.4												
7.5			SPT8									
7.6		89	2 2 4	6	Loose clayey fine sand with silt	CL	64	21.2	none	28	19	9
7.7					light-brown in color;							
7.8					USCS: Sandy lean clay							
7.9					SPT commenced at 10:10							
8.0												
8.1												
8.2												
8.3												
8.4												
8.5			SPT9									
8.6		87	2 4 6	10	Medium clayey silty sand (fine)	CL-ML	52	18.7	none	27	20	7
8.7					light-brown in color;							
8.8					USCS: Sandy silty clay							
8.9					SPT commenced at 10:38							
9.0												
9.1												
9.2												
9.3												
9.4												
9.5			SPT10									
9.6		33	3 1 1	2	Loose clayey sand ;	SC	42	22.6	none	28	NP	8
9.7					light-brown in color;							
9.8					USCS: Clayey sand							
9.9					**Observed water table**							
10.0												
10.1												

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MATERIALS TESTING CENTRE

CLIENT:	YAMASHITA SEKKEI INC.	BORE ID:	BH3		
PROJECT:	Faculty of Engineering, Science & Technology	SIZE,mm:	95	SPT TYPE:	TRIP
LOCATION:	UNTL, Hera	TYPE:	NW	WT, kg./HT,cm:	63 76
DRILLING METHOD:	Hollow stem auger and mud rotary	DATE START/TIME:	16-Apr-15	16:09	
SAMPLING METHOD:	Split Spoon Barrel Sampler	DATE FINISH/TIME:	17-Apr-15	16:00	
BORING DEPTH,M:	15	WATER TABLE,M:	-10.0m from surface of borehole		
CASING DEPTH,M:	None	LOGGER:	BENNY, ABILIO		

BORE LOG RECORD

DEPTH, m	SAMPLER	RECOVERY,%	STP READING	N-VALUE	STRATIGRAPHY DESCRIPTION (Please see table below for density an consistency of soil)	USCS CLASS	-0.075, PERCENT PASSING	M.C.,%	UNIT WT. OF SOIL WET & DRY (γ), kN/m3	LL, %	PL, %	PI, %
10.2												
10.3												
10.4												
10.5			SPT11									
10.6	X	62	2 1 1	2	Loose sand with gravel;	SM	17	27.4	none	NL	NP	NP
10.7	X				light-brown in color;							
10.8	X				USCS: Silty sand							
10.9	X				SPT commenced at 12:08							
11.0	X											
11.1												
11.2												
11.3												
11.4												
11.5			SPT12									
11.6	X	44	2 7 9	16	Medium clayey sand with gravel;	SM	27	13	none	NL	NP	NP
11.7	X				light-brown in color;							
11.8	X				USCS: Silty sand							
11.9	X				SPT commenced 12:30							
12.0	X											
12.1												
12.2												
12.3												
12.4												
12.5			SPT13									
12.6	X	49	8 15 26	41	Dense clayey sand with gravel;	SM	20	7.8	none	29	23	6
12.7	X				light brown in color;							
12.8	X				USCS: Silty sand with gravel							
12.9	X				SPT commenced 13:45							
13.0	X											
13.1												
13.2												
13.3												
13.4												
13.5			SPT14									
13.6	X	44	7 16 25	41	Dense clayey sand with gravel;	SM	28	16.2	none	NL	NP	NP
13.7	X				light brown in color							
13.8	X				USCS: Silty sand with gravel							
13.9	X				SPT commenced 14:00							
14.0	X											
14.1												
14.2												
14.3												
14.4												
14.5			SPT15									
14.6	X	49	12 19 23	42	Dense clayey sand with gravel;	SC-SM	18	10.6	none	23	16	7
14.7	X				light-brown in color.							
14.8	X				USCS: Silty clayey sand with gravel							
14.9	X				SPT commenced 16:00							
15.0	X											

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MATERIALS TESTING CENTRE

CLIENT:	**YAMASHITA SEKKEI INC.**	BORE ID:	**BH3**		
PROJECT:	**Faculty of Engineering, Science & Technology**	SIZE,mm:	**95**	SPT TYPE:	**TRIP**
LOCATION:	**UNTL, Hera**	TYPE:	**NW**	WT, kg./HT,cm:	**63 76**
DRILLING METHOD:	**Hollow stem auger and mud rotary**	DATE START/TIME:	**16-Apr-15**	**16:09**	
SAMPLING METHOD:	**Split Spoon Barrel Sampler**	DATE FINISH/TIME:	**17-Apr-15**	**16:00**	
BORING DEPTH,M:	**15**	WATER TABLE,M:	**-10.0m from surface of borehole**		
CASING DEPTH,M:	**None**	LOGGER:	**BENNY, ABILIO**		

BORE LOG RECORD

DEPTH, m	SAMPLER	RECOVERY,%	STP READING	N-VALUE	STRATIGRAPHY DESCRIPTION (Please see table below for density an consistency of soil)	USCS CLASS	-0.075, PERCENT PASSING	M.C.,%	UNIT WT. OF SOIL WET & DRY (γ), kN/m3	LL, %	PL, %	PI, %

NOTES:

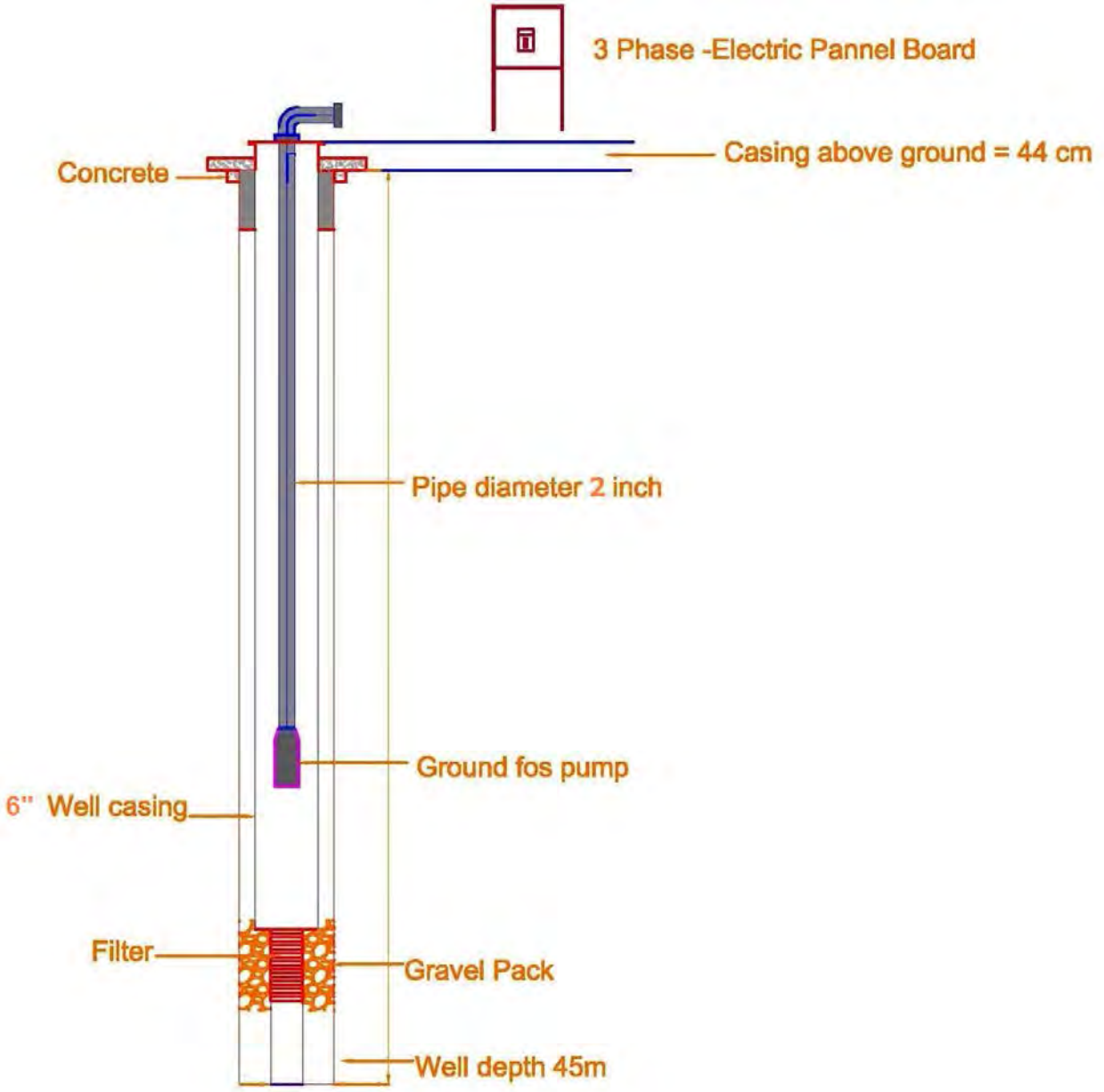
1) No water table encountered during the whole course of boring process.
2) Steel casing to 100mm diameter were installed to prevent extensive fluid loss during boring. Gel was used to aid return of large chippings.
3) Site description of soil during sampling to ASTM D2487.
4) No qualified undisturbed sample recovered due to granularity of soil and limitation of equipment accessories.
5) Borehole advancement using tri-cone bit and wash-out boring.
6) NL = No Liquid Limit; NP = None Plastic
7) USS = Undisturbed Soil Sampling; unable to recover.
8) * - No recovery, classified similar to previous and judgement basing from observed soil carried by return water.

SPT ESTIMATED SOIL FRICTION AND COHESION

Based on uncorrected Standard Penetration Test (SPT) blow counts, taken from Karol (1960).

Soil Type and SPT Blow Counts		Undisturbed Soil	
		Cohesion (psf)	Friction Angle (°)
Cohesive soils			
Very soft	(<2)	250	0
Soft	(2–4)	250–500	0
Firm	(4–8)	500–1,000	0
Stiff	(8–15)	1,000–2,000	0
Very stiff	(15–30)	2,000–4,000	0
Hard	(>30)	4,000	0
Cohesionless soils			
Loose	(<10)	0	28
Medium	(10–30)	0	28–30
Dense	(>30)	0	32
Intermediate soils			
Loose	(<10)	100	8
Medium	(10–30)	100–1,000	8–12
Dense	(>30)	1,000	12

5-3. Result of Water Quality Survey



Schematic of Pump Test
Report of Pump Test
Ground Water Survey for construction
New Building UNTL Hera, TIMOR LESTE

PLATE – 2a

Geotechnik Ltd

Client: YAMASHITA SEKKEI INC	Water pump Rate: 5.5 L/ sec
PROJECT: Ground water survey for Construction	Pump START Time/ Date: 26-03-2015 / 12:59 pm
New Building UNTL Hera ,TIMOR LESTE	Pump STOP Time/ Date: 26-03-2015
WATER LEVEL MONITORING DURING PUMPING	Pipe above gound: 2 m Water level at start : 8.90m
CONSTANT RATE TEST METHOD AND ANALYSIS	Pumping Duration: 24-hours

GROUND WATER LEVEL

Mins	DATE	TIME (AM/PM)	Period of Measurement (minute)	WATER LEVEL (metre)	0	10.9	Remark / Observation
1	26-03-2015	12:59 PM	**1 (mins)-interval**	**10.66**	**0.00**		
2		1:00 PM		**10.69**	**0.03**		
3		1:01 PM		**10.70**	**0.04**		
4		1:02 PM		**10.72**	**0.06**		
5		1:03 PM		**10.73**	**0.07**		
6		1:04 PM		**10.74**	**0.08**		
7		1:05 PM		**10.74**	**0.08**		
8		1:06 PM		**10.74**	**0.08**		
9		1:07 PM		**10.74**	**0.08**		
10		1:08 PM		**10.74**	**0.08**		**Stage (10 minutes)**
12		1:10 PM	**2 (mins)- interval**	**10.74**	**0.08**		
14		1:12 PM		**10.75**	**0.09**		
16		1:14 PM		**10.76**	**0.10**		
18		1:16 PM		**10.76**	**0.10**		
20		1:18 PM		**10.76**	**0.10**		**Stage (10 mins to 20 mins)**
25		1:23 PM	**5 (mins)-interval**	**10.76**	**0.10**		
30		1:28 PM		**10.76**	**0.10**		
35		1:33 PM		**10.77**	**0.11**		
40		1:38 PM		**10.77**	**0.11**		
45		1:43 PM		**10.77**	**0.11**		
50		1:48 PM		**10.77**	**0.11**		
55		1:53 PM		**10.77**	**0.11**		
60		1:58 PM	**1- HOUR COMPLETED**	**10.77**	**0.11**		**Stage (20 mins to 60 mins)**
70	**26/03/2015**	**2:08 PM**	**10 (mins) - interval**	**10.77**	**0.11**		**Stage After 60 mins**
80		**2:18 PM**		**10.77**	**0.11**		
90		**2:28 PM**		**10.77**	**0.11**		
100		**2:38 PM**		**10.77**	**0.11**		
110		**2:48 PM**		**10.77**	**0.11**		
120		**2:58 PM**		**10.78**	**0.12**		**(2 hours - recorded)**
140		**3:18 PM**	**20(MINS)- INTERVAL**	**10.78**	**0.12**		
160		**3:38 PM**		**10.78**	**0.12**		
180		**3:58 PM**		**10.79**	**0.13**		**(3 hour completed)**
210		**4:28 PM**	**30 (MINS)- INTERVAL**	**10.79**	**0.13**		
240		**5:58 PM**		**10.26**	**-0.40**		**(4 HOURS COMPLETE)**
300		**6:28 PM**		**10.26**	**-0.40**		**(5 HOURS COMPLETE)**
360		**6:58 PM**	**1 - HOUR INTERVAL**	**10.26**	**-0.40**		**(6 HOURS COMPLETE)**
420		**7:58 PM**		**10.24**	**-0.42**		**(7 HOURS COMPLETE)**
480		**8:58 PM**		**10.26**	**-0.40**		**(8 HOURS COMPLETE)**
540		**9:58 PM**		**10.25**	**-0.41**		**(9 HOURS COMPLETE)**
600		**10:58 PM**		**10.26**	**-0.40**		**(10 HOURS COMPLETE)**
660		**11:58 PM**		**10.25**	**-0.41**		**(11 HOURS COMPLETE)**
720	**27/03/2015**	**12:58 AM**		**10.25**	**-0.41**		**(12 HOURS COMPLETE)**
780		**1:58 AM**		**10.25**	**-0.41**		**(13 HOURS COMPLETE)**
840		**2:58 AM**		**10.24**	**-0.42**		**(14 HOURS COMPLETE)**
900		**3:58 AM**		**10.25**	**-0.41**		**(15 HOURS COMPLETE)**
960	**27/03/2015**	**4:58 AM**	**1 -HOUR - INTERVAL**	**10.24**	**-0.42**		**(16 HOURS COMPLETE)**
1020		**5:58 AM**		**10.23**	**-0.43**		**(17 HOURS COMPLETE)**
1080		**6:58 AM**		**10.25**	**-0.41**		**(18 HOURS COMPLETE)**
1140		**7:58 AM**		**10.25**	**-0.41**		**(19 HOURS COMPLETE)**
1200		**8:58 AM**		**10.25**	**-0.41**		**(20 HOURS COMPLETE)**
1260		**9:58 AM**		**10.24**	**-0.42**		**(21 HOURS COMPLETE)**
1320		**10:58 AM**		**10.23**	**-0.43**		**(22 HOURS COMPLETE)**
1380		**11:58 AM**		**10.22**	**-0.44**		**(23 HOURS COMPLETE)**
1440 1140		**12:58 PM**		**10.22**	**-0.44**		**(24 HOURS COMPLETE)**

Plate-3i

Geotechnik Ltd

Client: YAMASHITA SEKKEI INC	RECOVERY TEST AFTER 24 HOUR PUMPING
PROJECT: Ground water survey for Construction New Building	CONSTANT RATE TEST
UNTL Hera ,TIMOR LESTE	
WATER LEVEL MONITORING AFTERPUMPING	Pipe above gound: (m)
RECOVERY TEST METHOD AND ANALYSIS	

				GROUND WATER LEVEL			
Mins		DATE	TIME	Period of Measurement	WATER LEVEL		Remark / Observation
1440	1440		(AM/PM)	(minute)	(metre)		
1	1441	27/03/2015	12:59 PM	1 (mins)-interval	10.22	-0.44	
2	1442		1:00 PM		10.22	-0.44	
3	1443		1:01 PM		10.22	-0.44	
4	1444		1:02 PM		10.22	-0.44	
5	1445		1:03 PM		10.22	-0.44	
6	1446		1:04 PM		10.22	-0.44	
7	1447		1:05 PM		10.22	-0.44	
8	1448		1:06 PM		10.22	-0.44	
9	1449		1:07 PM		10.84	0.18	
10	1450		1:08 PM		10.84	0.18	Stage (10 minutes)
12	1452		1:10 PM	2 (mins)- interval	10.83	0.17	
14	1454		1:12 PM		10.82	0.16	
16	1456		1:14 PM		10.82	0.16	
18	1458		1:16 PM		10.81	0.15	
20	1460		1:18 PM		10.82	0.16	Stage (10 mins to 20 mins)
25	1465		1:23 PM	5 (mins)-interval	10.81	0.15	
30	1470		1:28 PM		10.81	0.15	
35	1475		1:33 PM		10.81	0.15	
40	1480		1:38 PM		10.81	0.15	
45	1485		1:43 PM		10.81	0.15	
50	1490		1:47 PM		10.81	0.15	
55	1495		1:52 PM		10.81	0.15	
60	1500		1:57 PM	60 minutes	10.81	0.15	Stage (20 mins to 60 mins) completed done

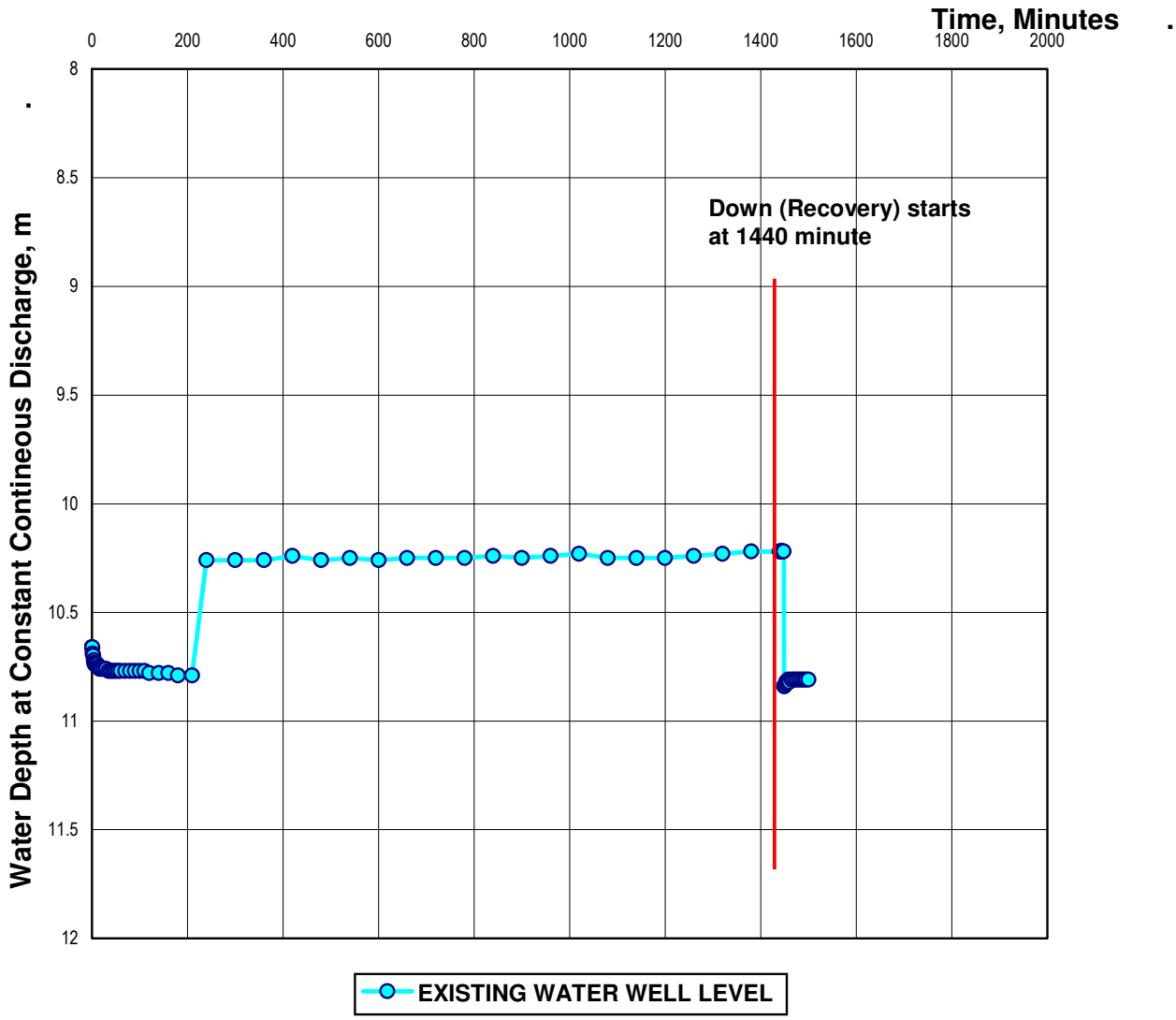
Plate-3j

Geotechnik Ltd

DRAW-DOWN CURVES

Report No. GET 15 8017

Client: YAMASHITA SEKKEI INC **PROJECT: Ground water survey for Construction New Building UNTL Hera ,TIMOR LESTE**	**Water pump Rate: 5.5 L/ sec**
	Pump START Time/ Date: 26-03-2015 / 12:59 pm
	Pump STOP Time/ Date: 26-03-2015
WATER LEVEL MONITORING DURING PUMPING **CONSTANT RATE TEST METHOD AND ANALYSIS**	**Pipe above gound: 2 m** **Water level at start : 8.90m**
	Pumping Duration: 24-hours



Water Depth Vs Time at Constant Pumping Curves
Ground Water Survey for construction
New Building UNTL Hera, TIMOR LESTE

PLATE – 4a

MINISTÉRIO DAS OBRAS PÚBLICAS
TRANSPORTE E COMUNICAÇÕES

DIRECÇÃO NASIONAL DOS
SERVIÇOS DE ÁGUA (DNSA)

Request for Water Quality Testing

Sample analysis reference : **000004657**						
Requesting Organization : **GEOTECHNIK LTD**						
Description of the organization: **PROJECT FOR CONTRUCTION OF NEW BLDG**						
Contact Person : **Mr. SYED ABBAS**				Telephon : **77232786**		
On behalf of organization, I agree to pay the cost of test request below: Signature: √						
Data and time sample was taken : **27 / 03 / 2015**				Date and Time sample was received: **27 / 03/ 2015**		
Sample location specification : **UNTL HERA**						
Water Source:	River	Mountain stream	Spring	Well √	Others	
Sampled by : **Mr. ABBAS**			Received in laboratory by: **MARIO SOARES**			
Approved to test by: **ESTELA SALDANHA**						

Cost (US$)	Parameter	Unit	Request test	Result	WHO/East Timor Guideline	Testing method
Physical test						
1.00	pH value	-	√	7.0	6.5-8.5	pH Meter
1.00	E.Conductivity	(µs/cm	X	NT	NS	Conductivity meter
1.00	TSS	(mg/L)	X	NT	NS	Gravimetry
1.00	TDS	(mg/L)	√	556	1000	Gravimetry
1.00	Salinity	(‰)	X	NT	NS	Conductivity meter
1.00	Temperature	(°C)	X	NT	NS	Conductivity meter
1.00	Turbidity	NTU	√	1.7	5 (NTU)	Turbidity meter
Chemical test						
2.00	NH_3-N	mg/L	X	NT	1.5	Spectrophotometer
2.00	NO_3-N	mg/L	√	0.4	10 (as NO_3-N)	Spectrophotometer
2.00	NO_2-N	mg/L	X	NT	1 (as NO_2-N)	Spectrophotometer
1.00	Iron (Fe)	mg/L	√	0.2	0.3	Spectrophotometer
2.00	Manganese (Mn)	mg/L	√	0.3	0.5	Spectrophotometer
1.00	Fluoride	mg/L	X	NT	1.5	Spectrophotometer
2.00	Free chlorine	mg/L	X	NT	0.5	Comparator,
2.00	Ca.hardness	mg/L	X	NT	NS	Titration
2.00	Arsenic	mg/L	X	NT	0.01	Comparator
2.00	T. Hardness	mg/L	√	160	200	Titration
2.00	Total alkalinity	mg/L	X	NT	NS	Titration
2.00	Sulphate (SO_4^{2-})	mg/L	√	19	250	Spectrophotometer
Bacteriological test						
16.00	Total Coliform	CFU/100mL	X	NT	0	Membrane filtration
16.00	E.Coli	CFU/100mL	X	NT	0	Membrane filtration

Total cost	Remark	
$.15.00 USD	**NO PROBLEM.**	**Inspected by:**
		Head of DNSA Laboratory

Legend: 1. **NS**: not set; **ND**: not detectable; **NT**: not tested; **NR**: not result; **CFU**: Colony Formed Unit; **TNC:** too numerous to count.

DIRECÇÃO NACIONAL DO SERVIÇOS DNSA RDTL

Plate - 9

MINISTÉRIO DAS OBRAS PÚBLICAS
TRANSPORTE E COMUNICAÇÕES

DIRECÇÃO NASIONAL DOS
SERVIÇOS DE ÁGUA (DNSA)

Request for Water Quality Testing

Sample analysis reference : **000004664**						
Requesting Organization : **GEOTECHNIK LTD**						
Description of the organization: **PROJECT FOR CONTRUCTION OF NEW BLDG, YAMASHITA SEKKEI**						
Contact Person : **Mr. SYED ABBAS**				Telephon : **77232786**		
On behalf of organization, I agree to pay the cost of test request below: Signature: √						
Data and time sample was taken : **09 / 04 / 2015**				Date and Time sample was received: **09 / 04 / 2015**		
Sample location specification : **UNTL HERA**						
Water Source:	River	Mountain stream	Spring	Well √	Others	
Sampled by : **Mr. ABBAS**			Received in laboratory by: **MARIO SOARES**			
Approved to test by: **ESTELA SALDANHA**						

Cost (US$)	Parameter	Unit	Request test	Result	WHO/East Timor Guideline	Testing method
Physical test						
1.00	pH value	-	X	NT	6.5-8.5	pH Meter
1.00	E.Conductivity	(µs/cm	√	536	NS	Conductivity meter
1.00	TSS	(mg/L)	√	0.01	NS	Gravimetry
1.00	TDS	(mg/L)	√	268	1000	Gravimetry
1.00	Salinity	(‰)	√	0.3	NS	Conductivity meter
1.00	Temperature	(°C)	√	23.4	NS	Conductivity meter
1.00	Turbidity	NTU	X	NT	5 (NTU)	Turbidity meter
Chemical test						
2.00	NH_3-N	mg/L	√	0.1	1.5	Spectrophotometer
2.00	NO_3-N	mg/L	√	0.5	10 (as NO_3-N)	Spectrophotometer
2.00	NO_2-N	mg/L	√	0.007	1 (as NO_2-N)	Spectrophotometer
1.00	Iron (Fe)	mg/L	X	NT	0.3	Spectrophotometer
2.00	Manganese (Mn)	mg/L	X	NT	0.5	Spectrophotometer
1.00	Fluoride	mg/L	√	1.2	1.5	Spectrophotometer
2.00	Free chlorine	mg/L	√	0.0	0.5	Comparator,
2.00	Ca.hardness	mg/L	√	100	NS	Titration
2.00	Arsenic	mg/L	√	0.0	0.01	Comparator
2.00	T. Hardness	mg/L	X	NT	200	Titration
2.00	Total alkalinity	mg/L	√	110	NS	Titration
2.00	Sulphate (SO_4^{2-})	mg/L	X	NT	250	Spectrophotometer
Bacteriological test						
16.00	Total Coliform	CFU/100mL	√	**8**	0	Membrane filtration
16.00	E.Coli	CFU/100mL	√	0	0	Membrane filtration
	Total cost	Remark				
	$.52.00 USD	**Total Coliform is Problem.**				

Inspected by:

Head of DNSA Laboratory

Legend: 1. **NS**: not set; **ND**: not detectable; **NT**: not tested; **NR**: not result; **CFU**: Colony Formed Unit; **TNC**: too numerous to count.

DIRECÇÃO NACIONAL DO SERVIÇOS DE AGUA DNSA RDTL

Plate – 9A

6. References

List of collected evidence

NO.	Name of evidence	Form of copy	Publisher (year of publish)
1.	UNTL Strategic Plan 2011-2020	Soft copy	UNTL (2011)
2.	STERATEGIC DEVELOPMENT PLAN (FEST-UNTL) Hera Campus 2015-2025	Soft copy	FEST,UNTL (2015)
3.	FEST Organization	Soft copy	FEST,UNTL (2015)
4.	Total Student Number	Soft copy	FEST,UNTL (2015)
5.	Lecture schedule of each faculty	Soft copy	FEST,UNTL (2015)
6.	Syllabus of each faculty	Soft copy	FEST,UNTL (2015)
7.	Lieflet of EIA	Hard copy	Ministry of Commerce,Industry and Environment (no data)
8.	List of books in UNTL Libray	Soft copy	UNTL Central Libray (2015)
9.	Record of no. of books in UNTL Libray 2003-2014	Soft copy	UNTL Central Libray (2015)
10.	ADN Standard Method of Measurement	Soft copy	National Development Agency (2015)