PROVINCE OF ALBAY
REPUBLIC OF THE PHILIPPINES

PREPARATORY STUDY REPORT
ON
THE PROJECT FOR
EVACUATION SHELTER CONSTRUCTION
IN DISASTER VULNERABLE AREAS
IN THE PROVINCE OF ALBAY
IN
THE REPUBLIC OF THE PHILIPPINES

MARCH 2011

JAPAN INTERNATIONAL COOPERATION AGENCY

MOHRI, ARCHITECT & ASSOCIATES, INC.
OYO INTERNATIONAL CORPORATION

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PREFACE

Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey on the Project for Evacuation Shelter Construction in Disaster Vulnerable Areas in the Province of Albay in the Republic of the Philippines, and organized a survey team headed by Hisafumi Michikawa of Mohri, Architect & Associates, Inc. (and consist of Mohri, Architect and Associates, Inc. and OYO International Corporation) between July, 2010 and March, 2011.

The survey team held a series of discussions with the officials concerned of the Government of the Philippines, and conducted 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 Philippines for their close cooperation extended to the survey team.

March, 2011

Shinya EJIMA
Director General
Global Environment Department
Japan International Cooperation Agency

SUMMARY

1. Outline of the Country

The Republic of the Philippines (hereinafter referred to as “the Philippines”) is a republic comprised of 7,109 islands with 299,404m^2 and a population of 88.57million. The official language is English and Filipino (Tagalog), with about 80 indigenous languages. Filipino is the language used in public education along with English, and is understood in wide areas. Gender discrimination deriving from religious and other reasons is scarce, and women with professions such as mayor or administrator are often found.

The Philippines consists of various topography since it is an archipelago, and Region V where the Province of Albay (hereinafter referred to as “the Province”) is located is a region particularly abundant in volcanoes. Above all, the volcano with the highest frequency of eruption in the Philippines is the Mayon Volcano, located in the Province.

The climate in the Philippines is tropical and maritime, with relatively high temperature and high humidity with abundant rainfall. The seasons can be divided into a dry season and a rainy season, but regions such as the Province, which faces the Philippine Sea, have no dry season, and experience rainfall throughout the year. The average monthly precipitation of Legazpi City, the capital of Albay is 204mm/month in the minor rainfall season and 428mm/month in the heavy rainfall season. Typhoon landfall is mainly between October and December.

The GDP per capita of the Philippines is 1,600 USD, and the proportion of primary industry is 15%, secondary industry is 30%, and tertiary industry is 55%. The major industry is agriculture and fisheries, and the major export item is electric machinery.

2. Background of the Project

The Province is one of the areas in the Philippines, where the frequency of disasters is high. The principal disasters are lava flow, pyroclastic flow, volcanic bomb, and ash fall caused by the eruption of Mayon Volcano situated in the center of the Province, as well as lahar (mud flow), mud flood, and flooding caused by typhoons. In addition, the Province is situated in the Pacific ring of fire, at the subduction zone of Pacific plate and Eurasian plate, causing high risk of earthquakes and tsunamis.

One of the recent damages is the disaster due to the eruption of Mayon Volcano in 1993, with 77 dead and evacuees of over 12,000 households, amounting to a damage of 77,000,000

PHP. Since 1993, Mayon Volcano has repeatedly erupted in 2000 and 2006, and has experienced volcanic activities in December 2009 when the high alert level obliged the nearby population to evacuate. Furthermore, the two massive typhoons Milenyo and Reming hit the area in 2006, causing damages to the public buildings and residences including the school sites of the "Project for Evacuation Shelter Construction in Disaster Vulnerable Areas in the Province of Albay" (hereinafter referred to as "the Project").

Since the Province has high disaster risks as demonstrated above, they have elaborated the "Integrated Disaster Preparedness Program in Albay Province/ Bicol Region, Philippines 2009-2013" (hereinafter referred to as "the Master Plan"), and has been working on disaster risk reduction (hereinafter referred to as "DRR") measures by physical structures represented by evacuation shelter construction and non-structural measures such as establishing early warning system and evacuation route plan. However, adding to the absolute insufficiency of evacuation shelters to take in the evacuees in times of calamities, many of the buildings at the schools which are designated as evacuation shelters are deficient in safety and adequacy due to deterioration, after more than 30 to 50 years since establishment. Furthermore, besides the congestion, the school facilities which are not designed to be used during the night lack necessary facilities for evacuation such as toilets, kitchen, waterworks, etc., causing some people to refuse the use of evacuation shelters.

Under the above-mentioned circumstances, only the project by the Spanish Agency for International Cooperation and Development (AECID) to construct 6 evacuation shelters (as of August 2010, 3 sites completed and 3 sites not started) is off the ground. Since the insufficiency of evacuation shelters rest as a problem, a Grant Aid was requested to Japan by the Government of the Philippines.

The 6 schools designated as evacuation shelters had been proposed as the project proposal site. However, since the risk of flooding at Libon Central School, the original site proposal in Libon has been disclosed, Libon Community College (LICOM) was proposed as an alternative site. Based on the results of the site survey and stakeholder meeting, Libon Community College proved to be adequate as an evacuation shelter and was selected as the final proposal site. The 6 final proposal sites and the order of priority is indicated below.

Final Proposal sites and their priorities

Priority	Municipality / City	Site name
1	Sto. Domingo	Sto. Domingo Central School
2	Legazpi City	Gogon Central School
3	Polangui	Polangui North Central School
4	Libon	Libon Community College
5	Manito	Manito Central School
6	Oas	Oas South Central School

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

In correspondence to the above-mentioned request, JICA has carried out the Preparatory Survey (Field Survey I) from August 1 to 28, 2010 and the Draft Report Explanation Survey (Field Survey II) from February 18 to 27, 2011.

3-1. Adequacy of the proposed sites

Although Sto. Domingo C/S and Gogon C/S were determined to be safe under certain conditions, all 6 sites have been to fulfill the evaluation criteria.

Evaluation results of the proposed sites

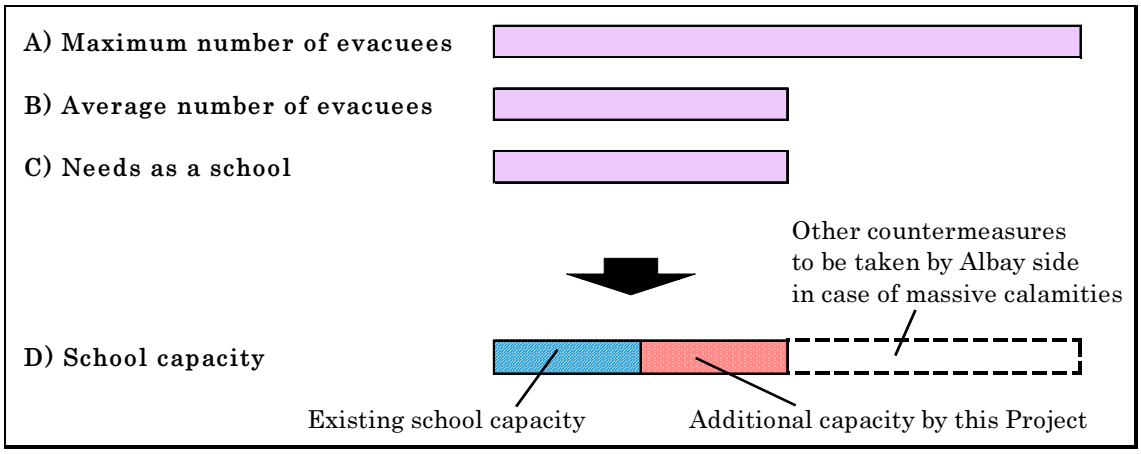
	LICOM	Polangui N. C/S	Oas S. C/S	Manito C/S	Sto. Domingo C/S	Gogon C/S	Notes
There is sufficient land for construction.	○	○	○	○	○	○	
The construction vehicles are accecible to the sites.	○	○	○	○	○	○	
There are no duplications with other donating agencies or private sector assistance.	○	○	○	○	○	○	
There is urgent need for classroom construction due to decrepitation or lack of classrooms.	○	○	○	○	○	○	LICOM has no decrepit buildings, but has serious lack of classrooms.
There is a substantial number of evacuees to utilize the shelter.	○	○	○	○	○	○	
The site does not suffer direct damage from disasters.	△	△	△	○	▲	▲	△= History of slight flooding within the site. ▲=Slight possibility of lahar.
Acces to the site has no obstables for evacuation.	○	○	○	○	○	○	
Increase in supply demand for water and electricity can be met during long-term evacuation.	○	○	○	○	○	○	

Furthermore, safety as evacuation shelters have been inspected, since the schools of the Project will be used as evacuation shelters. Consequently, the evacuation shelters at Sto. Domingo C/S and Gogon C/S which have been determined to be safe under certain conditions will be designed to be solid, and the ground floor level will be sufficiently elevated. Moreover, Albay Public Safety and Emergency Management Office (hereinafter referred to as "APSEMO") will sort out the correlation between explosiveness of the eruption and precipitation, clarify the conditions for designation as evacuation shelters, and prepare a manual regarding the below-mentioned articles.

- For highly explosive eruption based on long-term assumption, the facility will not be used as evacuation shelters, and the evacuees will be guided to wide area evacuation shelters.
- For eruption based on medium-term assumption, the evacuees will be evacuated to the sites. If the precipitation reaches a certain level during evacuation, the evacuees will be guided to wide area evacuation shelters.

3-2. Determination of the facility size

The Project works towards the construction of evacuation shelters, but the shelters will be used as educational institutions during normal times. Thus, if the numbers of estimated maximum number of evacuees were to be used as the basis of facility size determination, many classrooms will be vacant during normal time. Therefore the facility size was set with consideration for effective utilization of the facilities, owing to the fact that the average number of evacuees due to typhoons between 2006 and 2009 is relatively close to the needs as schools.



Concept of facility size determination

In case a massive typhoon hits the region, and the evacuation number becomes exceptionally high, APSEMO has the below-mentioned countermeasures based on past experiences in order to shelter the evacuees.

① Temporarily increase the accommodation number of each classroom
② The Disaster Coordinating Council of the municipality, city, or Province will set up evacuation tents in the schoolyards
③ Make use of other nearby buildings which are not officially designated as evacuation shelters (church, Barangay hall, and private schools, etc.)
④ Utilize the residences in nearby areas with no direct damage from the disaster
⑤ Stay in a relative's house

3-3. Components of the Project

Since the facilities to be built in the Project are evacuation shelters to be used day and night, unlike school facilities which are exclusively used during daytime, the necessity of facilities that are normally not in schools have been consulted, and reached an agreement with the Albay side. Whereas equipment (school furniture, school materials) were not included in the request, and the Albay side will be responsible for the procurement upon necessity. In addition, the soft component will not be included in the Project. The components of the Project and the quantities are as shown in the table below.

Project component plan

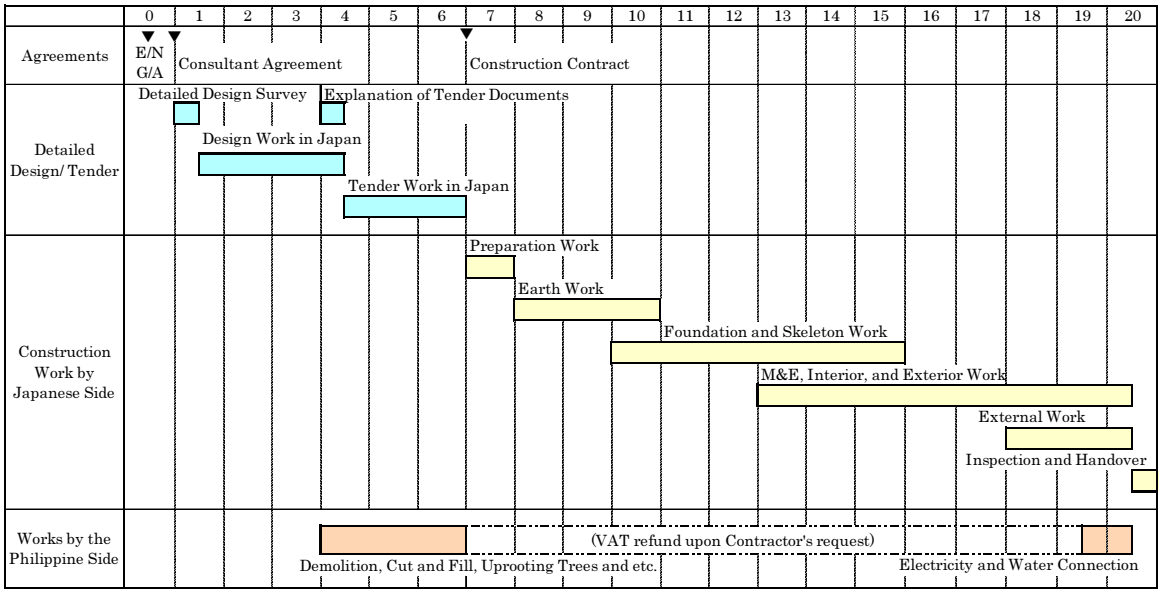
School sites	Components to be covered by the Project							Total floor area (m^2)
	Class-room	Office	Toilet	Shower unit	Kitchen	Laundry space	Machine room with generator	
LICOM	20	1	46	20	2	2	1	2,769
Polangui North C/S	11	1	28	12	1	1	1	1,649
Oas South C/S	11	1	28	12	1	1	1	1,625
Manito C /S	19	1	46	20	2	2	1	2,632
Sto. Domingo C/S	9	1	23	10	1	1	1	1,320
Gogon C/S	9	1	23	10	1	1	1	1,422
Total	79	6	194	84	8	8	6	11,417

4. Implementation Schedule and Cost Estimation

The implementation schedule of the Project presuppose the execution of construction and application procedures according to the process of the Grant Aid by both the Philippine side and the Japanese side without any delay. After the Exchange of Notes (E/N) and the Grant Agreement (G/A) between the two countries have been concluded, the implementation will be carried out in 3 stages; Detailed Design, Tender/Contract, and Construction/Procurement.

The construction period for 6 sites with two-story or three-story buildings is estimated to be a total of 14 months, composed of 1 month for preparation, 2 months for soil replacement work, 10.5 months for main construction, and 0.5 month for inspection and hand over. It would be preferable to avoid soil work and foundation work during the typhoon season (October to December), but it would be possible with sufficient preparation and curing period.

Implementation Schedule



The cost to be borne by the Philippine side is estimated to be PHP 36,592,700.

5. Project Evaluation

5-1. Adequacy

The objective of the Project is to improve the evacuation environment of the of the surrounding inhabitants in times of calamities, which correspond to the purpose of the Japanese Grant Aid, such as “Basic Human Needs” and “Stabilization of the People’s Livelihood”, and it will contribute to the achievement of the objectives of the “Strategic National Action Plan

2009-2019" of the Philippines and the Master Plan of the Province. Furthermore, the execution of the Project is practicable without difficulties, by the Japanese Grant Aid Scheme, and maintenance and operations of the target schools do not require high skills, and are feasible with the resource, personnel, and skills within the Philippines

In addition to the Grant Aid in DRR sector which began in 1972, Japan has constantly provided assistance to the Philippines where the natural/disaster environments are similar, through Development Survey, Technical Assistance, etc., regarding post-disaster recovery and DRR planning, and has superiority over the DRR sector.

Due to the above-mentioned reasons, the Project proves to be adequate for the Japanese Grant Aid.

5-2. Efficacy

The expected results by the execution of the Project is as indicated below.

(1) Quantitative results

Indicators and numerical targets of the Quantitative results

Indicators	Basis (2010)	Target (2013)
The accommodation capacity of the evacuation shelter	4,040 evacuees	7,200 evacuees
Congestion per room during evacuation (average)	94 persons	53 persons
The number of evacuees per toilet (average)	55 persons	26 persons
Number of classrooms which meet the standard size and is usable as evacuation shelters	101 rooms	180 rooms

(2) Qualitative results

1) By construction of evacuation shelters with special facilities, the consciousness of the inhabitants of the evacuation area toward DRR will rise, and the surrounding inhabitants will be more affirmative toward the use of evacuation shelters.
2) By establishing Toilets, Shower rooms, Laundry space, and hand-wash basins, the hygienic conditions of the evacuation shelters will be improved.
3) The consciousness of the school personnel, pupils, and students toward DRR will rise at the schools of the Project sites.
4) Due to enhancement of school facilities, enrolment and persistence in schools will be promoted, and the local education standard will make progress.

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V. References
VI. Other Relevant Data

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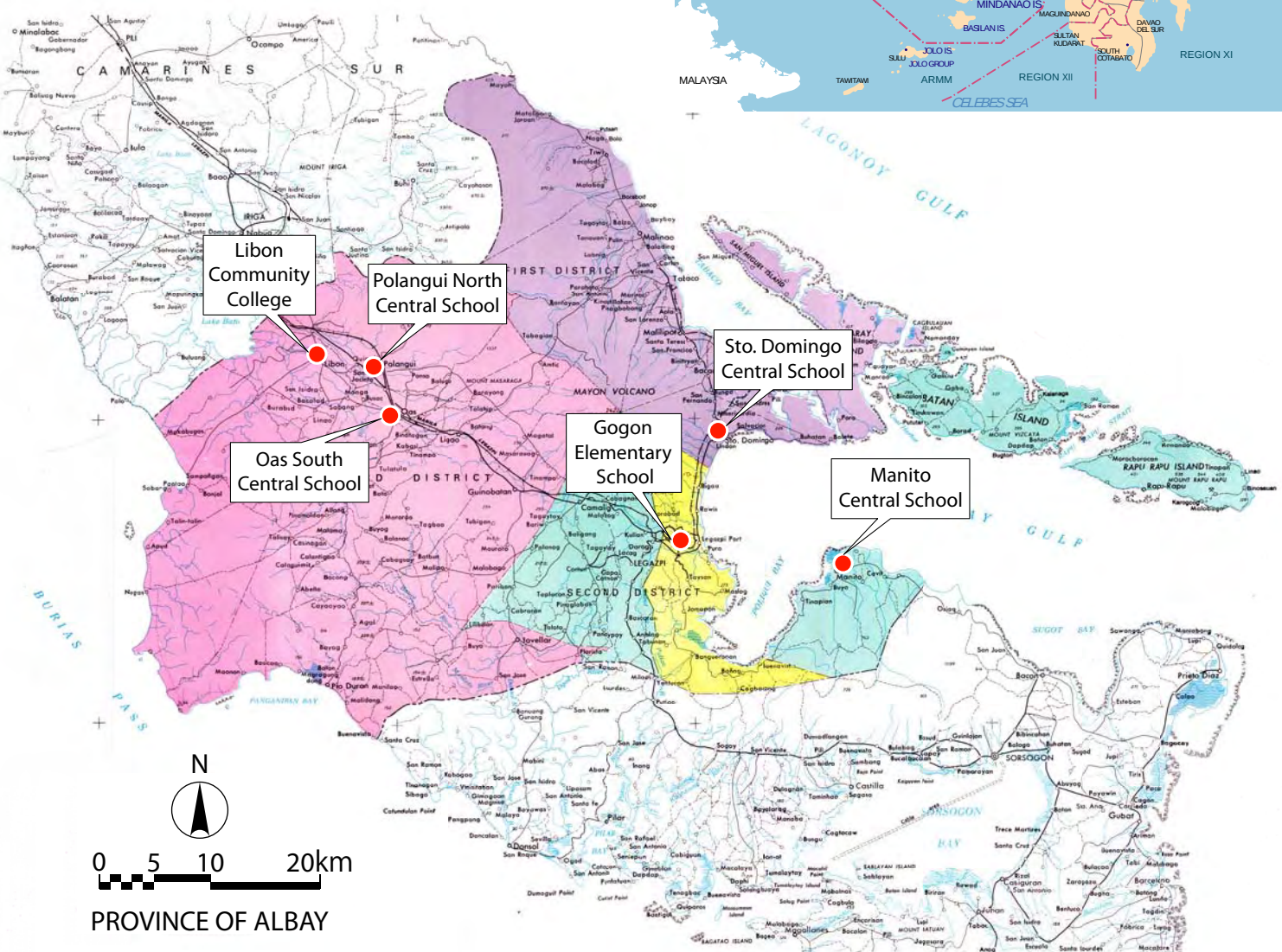
I. Outline Design Drawing
II. Topographical Survey Drawing/Geotechnical Survey Report


PEOPLE'S REPUBLIC OF CHINA
MYANMAR
LAOS
TAIWAN
THAILAND
PHILIPPINES SEA
VIET-NAM
CAMBODIA
PHILIPPINES
SOUTH CHINA SEA
BRUNEI DARUSSALAM
MALAYSIA
SINGAPORE
INDONESIA
INDIAN OCEAN


MAP OF THE PHILIPPINES
0 50 100 200km
Mayon Volcano
Province of Albay
PHILIPPINES SEA
SOUTH CHINA SEA
SULU SEA
CELEBES SEA
LUZON IS.
MINDORO IS.
PALAWAN IS.
MINDANAO IS.
REGION I
REGION II
REGION III
REGION IV
REGION V
REGION VI
REGION VII
REGION VIII
REGION IX
REGION X
REGION XI
REGION XII
NCR
ARMM
SAMAR IS.
BATAN IS.
MALAYSIA


Libon Community College
Polangui North Central School
Sto. Domingo Central School
Oas South Central School
Gogon Elementary School
Manito Central School
CAMARINES SUR
FIRST DISTRICT
SECOND DISTRICT
MAYON VOLCANO
LAGONOY GULF
ISLAND
SORSOGON
N
0 5 10 20km
PROVINCE OF ALBAY

PERSPECTIVE

Oas South Central School

List of Tables and Figures

Abbreviations and Acronyms

AECID	Spanish Agency for International Cooperation and Development
ALECO	Albay Electric Cooperative, Inc.
APSEMO	Albay Public Safety and Emergency Management Office
BDCC	Barangay Disaster Coordinating Council
CDCC	City Disaster Coordinating Council
CHED	Commission on Higher Education
C/S	Central School
DepED	Department of Education
DRR	Disaster Risk Reduction
DPWH	Department of Public Works and Highways
DSWD	Department of Social Welfare and Development
EFA	Education for All
GIS	Geographic Information System
JICA	Japan International Cooperation Agency
LGU	Local Government Unit
LICOM	Libon Community College
MDCC	Municipality Disaster Coordinating Council
MGB	Mines and Geosciences Bureau
MOOE	Maintenance and Other Operating Expenses
NDCC	National Disaster Coordinating Council
NPA	New People's Army
PDCC	Provincial Disaster Coordinating Council
PEO	Provincial Engineering Office
PHIVOLCS	Philippine Institute of Volcanology and Seismology
PHO	Provincial Health Office
PHP	Philippine Peso
PNP	Philippine National Police
PTCA	Parent-Teacher-Community Associations
SPED	Special Education
UN	United Nations
UNDP	United Nations Development Programme
VAT	Value Added Tax

Chapter1 Background of the Project

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1-1 Background and Outline of the Grant Aid

The Province of Albay (hereinafter referred to as "the Province") is one of the areas frequently met by disasters. The principal disasters are lava flow, pyroclastic flow, volcanic bomb, and ash fall caused by the eruption of the Mayon Volcano situated in the center of the Province, as well as lahar (mud flow), mud flood, and flooding caused by typhoons. In addition, the Province is situated in the Pacific ring of fire, at the subduction zone of the Pacific plate and the Eurasian plate, causing high risk of earthquakes and tsunamis.

One of the recent disasters is the eruption of the Mayon Volcano in 1993, with 77 dead and evacuees of over 12,000 households, amounting to a damage of 77,000,000 PHP. Since then, the Mayon Volcano has repeatedly erupted in 2000 and 2006, and has experienced volcanic activities in 2009 when the high alert level obliged the nearby population to evacuate. Furthermore, the two massive typhoons Milenyo and Reming hit the area in 2006, causing damages to public buildings and residences including the school sites of the "Project for Evacuation Shelter Construction in Disaster Vulnerable Areas in the Province of Albay" (hereinafter referred to as "the Project").

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2010 and the Draft Report Explanation Survey (Field Survey II) from February 18 to 27, 2011.

1-2 Natural Environmental Conditions

1-2-1 Natural Disasters

1-2-1-1 Mayon Volcano

The Mayon Volcano is a strato-volcano formed by alternate layers between lava consisting of andesite / basaltic andesite and pyroclastic material and flow. According to the past record, the Mayon Volcano erupted more than 50 times since 1616 (as of 2009) as demonstrated in Table 1-1, equaling to an eruption frequency of once every 8 years. The most disastrous eruption occurred on February 1st, 1814. The lava flow reached the town of Cagsawa located 10 km from the Mayon Volcano, and the eruption killed 1,200 people. After 1814, the highly explosive eruption of 1897 caused immense damage to the surrounding areas. Since the last deadly eruption on February 2nd, 1993 (77 dead), there has been no report of eruption with death, owing to the contribution by reinforcement of volcanic monitoring and enhancement of evacuation system.

There are two types of disasters caused by Mayon Volcano; one is the primary disaster caused by the eruption, and the other is the secondary disaster such as lahar (mudflow consisting of the pyroclast/lava flow deposit on the hillside slope and triggered by typhoon and/or heavy rain). The latest tremendous disaster occurred due to lahar and flooding caused by typhoon Reming with heavy rainfall (466.5 mm/ day, 135 mm/ hour in maximum) on November 30th, 2006. The Province suffered severe damage from this disaster with 620 dead and 92,581 totally collapsed houses according to the report by National Disaster Coordinating Council (NDCC).

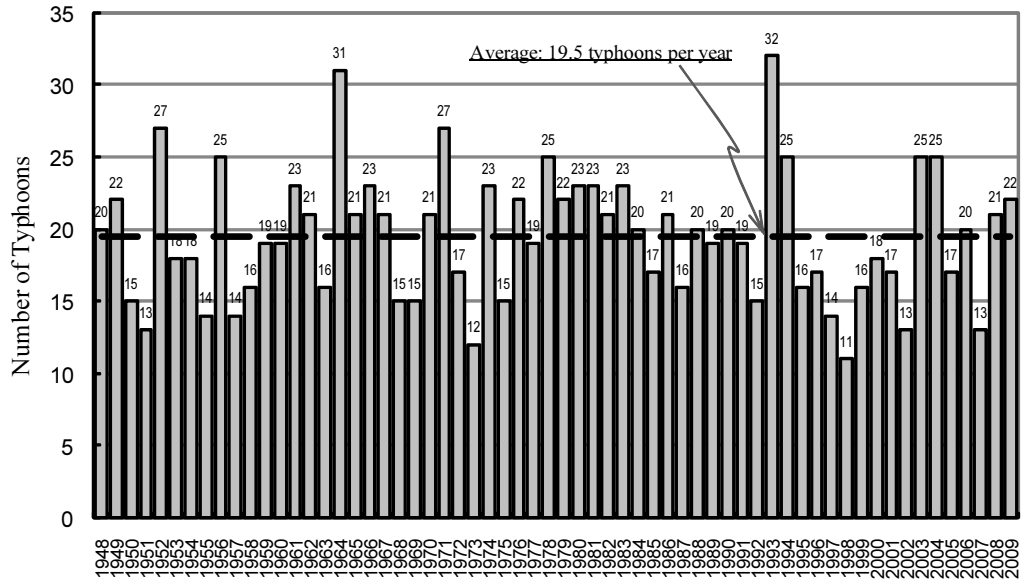
Table1-1 Eruption Record of Mayon Volcano

Year/Duration	Eruption Character
1616 Feb. 19 – 24	Explosive, pyroclastic flow, lava flow, lahar
1766 July 20 – 24 (Oct.20 - 25)	Vulcanian, lava flow, pyroclastic flows, bombs, ashfall; 10-15 m eruption column (Lahar)
1800 Oct 30 – 31	Vulcanian, lava flow, pyroclastic flows, bombs, ashfall
1811 Oct.5 – 6	Vulcanian, lava flow, pyroclastic flows, bombs, ashfall
1814 Feb. 01	Plinian, pyroclastic flows, volcanic lightning, lahar,bomb
1827 June 27 – 1828 Feb.	Vulcanian, pyroclastic flows, bombs, lava flows; 300 m high eruption column
1834 – 1835 May	Vulcanian, pyroclastic flows, ashfall, lahars, bombs
1839	Minor ash eruption
1845 Jan. 21	Vulcanian, ashfall, lava flow (15-30 minutes eruption)
1846 May 11	Vulcanian, pyroclastic flows, ashfall, lahar
1851 May 26 – June	Minor ash eruption
1853 July 7	Vulcanian, ashfall, pyrocalstic flow, lahar
1855 Mar. 22	Minor eruption with incandescent ash and Pele's hair, explosive, lava flow
1857	Probably ash eruption
1858 Jan.	Strombolian, lava flow, lahar; intial lava fountaining lasted until December
1859 – 1860	Central vent eruption
1861	Minor ash eruption
1862	Minor ash eruption, lahar
1868 Dec.17	Vulcanian, pyroclastic flows, lahar, bombs, volcanic lightning
1871 Dec. 8 – 1872 Jan	Vulcanian, ashfall, bombs, pyroclastic flows
1872 Sept. 5 – 9	Central vent eruption, Explosive eruption, Lava flow(s)
1873 June 20	Minor ash eruption
1876 Nov. 26	Minor ash eruption
1881 July 6 – 1882 Aug	Strombolian, ashfall, lava, pyroclastic flow, lahar (crateral outburst started 21 Nov. 1881)
1885 Nov. 21	Lava flow
1886 July 8 – 1887 Mar.	Strombolian, ashfall, lava and lahar
1888 Dec. 15	Minor ash eruption
1890 Sept. 10	Vulcanian-Strombolian, ashcloud, lava flow
1892 Feb. 3	Vulcanian, ashfall, pyroclastic flow, bombs, volcanic lightning
1893 Oct. 4 – 31	Minor ash, lapilli and bomb eruption, lava flow, lahar
1895 July 7 – Nov. 26	Ashfall, lava flow, lahar, volcanic lightning
1896 Aug. 31 – Sept. 27	Minor ash and lava eruption
1897 June 4 – July 23	Vulcanian (strong), tephra fall, pyroclastic flow, lava flow, lahar, volcanic lightning
1900 Mar. 1 - 6	Vulcanian, ashfall, pyroclastic flows, lava flow, lahar
1902	Minor ash eruption, with lahar (probably due to 1900 deposits)
1928 Jan.	Vulcanian, pyroclastic flow, lava flow, ashfall
1938 June 5	Vulcanian, ashfall, pyroclastic flow, lava flow
1939 Aug. 21	Minor explosion, ashfall
1941 Sept. 13	Minor ash/steam eruption
1943	Minor ash/steam eruption
1947 Jan. 8 – Feb.	Vulcanian, ashfall, lava flow, pyroclastic flow
1968 Apr. 20 – May 20	Vulcanian, ashfall, pyroclastic flow, lava flow; eruption column of as high as 10 km
1978 May 3 – July	Strombolian, ashfall, lava flow (lava emission lasted until July 4)
1984 Sept. 9 – Oct.	Strombolian-Vulcanian, ashfall, pyroclastic flow, lava flow, lahar, 1.7-16 km eruption column
1993 Feb. 2 – Apr. 4	Vulcanian-Strombolian, pyroclastic flow, lava flow, lahar, 1-5 km eruption column
2000 Feb. 24 - March 1	Strombolian-Vulcanian, pyroclastic flow, lava flow, ashfall, 0.5-17 km high eruption column
2001 June 1-22 2001 June 23 –24 2001 July 26	Mild eruption, quiet effusion of lava (lava flow) Strombolian-Vulcanian, lava fountaining, pyroclastic flow, 10 km high eruption column
2003 Jan. 31, March 17, April 05, May 06 & 14	Series of ash explosions; 0.4-1.5 km high column; Intermittent faint crater glow
2004 June 03, July 22	Ash explosions; not visually observed due to cloud cover; recorded as explosion type earthquake; 22 July event accompanied by rumbling sound
2005 Aug. 17	Central vent eruption, Lava dome extrusion
2006 Feb. 21-23 2006 July 14 - Oct. 01	Central vent eruption, Explosive eruption Lava flow; ash explosions – 800m high max.
2008 Aug. 10	Central vent eruption, Explosive eruption, Phreatic explosion(s)
2009 July 10 2009 Oct. 28 2009 Nov. 11 2009 Dec. 14 2009 Dec. 17 2009 Dec. 20 - 2010 Jan. 1	Low frequency volcanic earthquakes: Alert Level (A.L.) 2 Minor ash explosion, 13 volcanic earthquakes: A.L. 2 Minot ash explosion, incandescent rock fragments, 20 volcanic earthquakes: A.L. 2 83 volcanic earthquakes: A.L. 3 Five ash ejections, sulphur dioxide emission increased, lava flows: A.L. 3 Lava flows increased, sulphur dioxide emission increased, 460 volcanic earthquakes: A.L. 4

(Source: PHIVOLCS website)

1-2-1-2 Typhoon and Flood

Typhoons hit the Philippines frequently with an average number of 19.5 landfalls per year as shown in Figure 1-1, and causes damage in many cases.



In the past 62 years, the annual average of typhoon landfall is 19.5 per year in the Philippines. The most number of typhoons occurred in 1993 which recorded 32, while the least number of typhoons occurred in 1998 which recorded 11.

Figure1-1 Typhoon Record in the Philippines from 1948 to 2009

Since a typhoon is generally accompanied by heavy rain, in addition to the strong wind disaster, it causes flood and soil sediment disaster such as landslide, mud slide, lahar, etc., and its damage tends to spread. According to the data provided from Albay Public Safety and Emergency Management Office (hereinafter referred to as "APSEMO"), Table 1-2 shows the damage record in Albay due to typhoons, including heavy rain from the cold front, from 1994 to 2006. When the frequency of annual typhoons is high, such as between 2004 and 2006, there is an average of 3 typhoon disasters per year. Table 1-2 also indicates the fact that Albay has suffered a typhoon disaster once a year on a simple average (around 3 million US dollars damage per year).

Table1-2 Damage Record of Typhoon Disaster with Heavy Rain in Albay Province

Typhoon Occurences		Year	Affected Population				Total Damages (US$)
			Persons	Dead	Injured	Missing	
1	Typhoon Akang	1994	18,036	47	112	1	2,211,904
2	Typhoon Gading	1994	6,799	1	2	1	1,546,644
3	Typhoon Mameng	1995	10,126	0	0	0	1,588,884
4	Typhoon Rosing	1995	440,372	44	20	2	11,991,106
5	Typhoon Pining	1997	1,800	0	0	0	836,956
6	Typhoon Loleng	1998	201,834	1	7	1	6,754,448
7	Typhoon Sendang	1999	1,122	0	0	0	2,444
8	Typhoon Reming	2000	27,547	12	1	2	7,188,989
9	Typhoon Senyang	2000	22,882	0	0	0	91,111
10	Typhoon Dindo	2004	33,892	0	6	1	5,038,046
11	Typhoon Unding	2004	1,744	0	0	0	942,094
12	Typhoon Yoyong	2004	18,372	0	10	1	1,124,229
13	Active Low Pressure-ITCZ	2005	19,062	4	0	0	3,099,983
14	Tropical Storm Caloy	2006	47,065	0	5	0	2,207,708
15	Typhoon Milenyo	2006	698,460	14	176	0	37,007,025
16	Typhoon Reming	2006	1,060,875	604	1,465	419	71,787,460
Total			2,609,988	727	1,804	428	153,419,031

(Source: APSEMO)

1-2-2 Results of the Topographical and Geotechnical Surveys

Topographic surveys and geotechnical investigations have been executed at all 6 sites by the local consultants, and the results have been reflected in the design. From the geotechnical survey results, the necessity of soil improvement down to the layer where sufficient bearing capacity can be applied has been discovered, for the sites of Libon Community College (hereinafter referred to as “LICOM”) and Gogon Central School.

1-3 Considerations for Environmental and Social Issues

Although small-scale demolition and removal of existing buildings and trees are necessary, owing to the fact that the construction of the Project is either an extension or reconstruction of dilapidated classrooms within the properties of the existing schools, the Project does not have any negative impact on the surrounding environment. In addition, sewage will pass through a septic tank and will be either connected to the city drainage main, or be absorbed into the ground following the direction of the Provincial Health Office (hereinafter referred to as “PHO”).

Concerning the inhabitants within the LICOM site, the issue was peacefully settled at the end of August, 2010 with the inhabitants agreeing to settle at the relocation site in a nearby barangay, which was prepared by the municipality of Libon.

Chapter 2 Contents of the Project

Chapter 2 Contents of the Project

2-1 Basic Concept of the Project

2-1-1 Overall Goal and Project Objective

Albay is one of the leading provinces in the DRR sector, and is implementing DRR projects according to the Master Plan mentioned in Chapter 1. The Master plan is based on 3 components: 1) Risk and resource mapping and contingency plan formulation, 2) Construction of eighteen emergency evacuation shelters in Albay Province, and 3) Support of early warning systems and evacuation procedures. Although 19 projects are projected based on these 3 components, there are difficulties in realizing the implementation of all the projects with the budget of the Province. Therefore, the Province is requesting external assistance for some of the projects, including the improvement and construction of the evacuation shelters in disaster vulnerable areas surrounding the Mayon Volcano.

The Province experiences volcano-related disasters such as lava flow, ash fall, and mud flow of volcanic ashes (lahar) due to the volcanic activities of the Mayon Volcano, which is situated northwest of Legazpi City. In addition, the Province is close to the formation point of typhoons, and experiences damages caused by typhoons. In areas where land is at a low level, the heavy rain will cause lahar and flooding above floor level in some of the residences. Although the nearby elementary schools are used as evacuation centers in such cases, the lack of existing classrooms is a serious problem.

The latest volcanic activity was in December 2009, when the inhabitants spent 2 weeks at the elementary schools designated as evacuation shelters. However, the school buildings are not equipped with the necessary facilities for such an evacuation. Therefore, there is an urgent need for the construction of evacuation shelters that are designed and prepared for long-term evacuation.

For the above-mentioned reasons, the overall goal of the Project is that the risks of damages caused by disasters are reduced in the Province, as a result of DRR measures such as the construction of evacuation shelters. And in relation, the project objective is to improve the evacuation environment of the surrounding population by equipping the selected sites with relevant evacuation facilities.

2-1-2 Outline of the Project

The Project intends to construct evacuation shelters based on the above mentioned Master Plan, at the selected educational institutions, to improve the evacuation environments of the 6 municipalities / city in the Province. The selected construction sites are indicated below in Table 2-1.

Table2-1 Names of the Selected Sites

City / Municipality	Names of selected sites	Number of classrooms
Libon	Libon Community College	20
Polangui	Polangui North Central School	11
Oas	Oas South Central School	11
Manito	Manito Central School	19
Sto. Domingo	Sto. Domingo Central School	9
Legazpi City	Gogon Central School	9

2-2 Outline Design of the Japanese Assistance

2-2-1 Design Policy

For contribution to the Master Plan, the Project aims to construct evacuation shelters at the 6 selected educational institutions, with an objective being to improve the evacuation environment of the people in disaster vulnerable areas around the Mayon Volcano.

The design components have been developed in reference with the site survey results and discussions held with the stakeholders.

2-2-1-1 Basic Policy

After the examination following the 8 evaluation criteria shown in Table 2-3, the 6 proposed sites listed below (see Table 2-2) were identified to be appropriate for the Project.

Table2-2 Proposed sites

City/Municipality	Names of sites
Libon	Libon Community College
Polangui	Polangui North Central School
Oas	Oas South Central School
Manito	Manito Central School
Sto. Domingo	Sto. Domingo Central School
Legazpi City	Gogon Central School

Table2-3 Site evaluation criteria

1) Enough land area is available for construction
2) The construction sites are accessible to construction vehicles
3) There is no duplication with other donating agencies or public sector assistance
4) The need for classroom construction is high, due to the dilapidated condition of the existing facilities or an absolute lack of classrooms
5) There is an adequate number of evacuees to utilize the facility
6) The site does not suffer direct damage from disasters
7) The evacuation route to the evacuation shelter does not have any obstacles that might hinder a safe evacuation
8) The site is capable of coping with the temporary increase of electricity / water supply demand while the facility is being used as a shelter

The demarcation of the components to be undertaken by the Japanese side and the Philippine side is as indicated in Table 2-4.

Table2-4 Components of the Project

Components to be undertaken by the Japanese side	• Classrooms (including blackboard) • Offices • Toilet and Shower rooms • Kitchens (cooking space and preparing space) • Electrical works (including generator) • Laundry space • Pluming and Sanitary works (including water tank and septic tank)
Components to be undertaken by the Philippine side	• Furniture • Educational equipment • Fire extinguishers • External works

2-2-1-2 Policy for Natural Environmental Conditions

(1) Climatic condition

There is rain throughout the year in the Province, and the minimum monthly precipitation even in the minor rain season is over 200mm, with the annual precipitation reaching around 4000mm. Furthermore, there is severe damage during the typhoon season, from October to December, since the Province is close to the formation point of typhoons. According to the National Structural Code of the Philippines, the design wind force of Albay Province is classified under Zone 1 (V=250kph). However, the Provincial Engineering Office (hereinafter referred to as "PEO") recommends V=275 or 300 for safety.

Taking into consideration the above-mentioned climatic conditions, the architectural design will be based on the following policies:

a) The roof will employ material and be designed to endure long-term leak-proof performance with minimum maintenance requirements.
b) The structure of the roof and the building frame will be constructed to withstand the wind pressure caused by typhoons.
c) The utilization of wooden materials will be minimized, and non-corrosive materials will be used instead.
d) The windows will be designed to allow sufficient ventilation regardless of rainy weather, to reduce humidity inside the classrooms.
e) The eaves will be deep, in order to avoid rain entering inside the classrooms or the hallways.
f) To avoid flooding above floor level, the ground floor will be adequately elevated.
g) The septic tank will employ a method using a combination of percolation pit and perforated pipe to allow enough underground absorption even when the underground water level is shallow
h) Water tanks capable of receiving rainwater throughout the year will be set up, to be utilized primarily for flushing the toilets.

(2) Earthquakes

Along with Japan, the Philippine archipelago is situated in the Pacific ring of fire, with numerous volcanoes and frequent occurrences of earthquakes. According to the earthquake zoning in the National Structural Code of the Philippines, Albay is classified under Zone 4, indicating a seismic coefficient of Z=0.40 for architectural design. An earthquake resistant design will be developed following the above-mentioned coefficient. As for the structural

design, the strong points of the Japanese method, namely the strictness on safety matters has been explained to the Albay side and both sides agreed to adopt the Japanese method for the Project.

(3) Volcanic Eruption

The selected sites for the Project are designated as evacuation shelters primarily in case of an eruption of the Mayon volcano. Be that as it may, all 6 sites have low direct disaster risks such as smoke, lava flow, pyroclastic flow, and mud flow. However, there is low susceptibility of indirect effect (lahar) of volcanic eruption at Sto. Domingo C/S and Gogon C/S. Also, depending on the direction and speed of the wind, there is a risk of ash fall. Therefore, to reduce the burden caused by volcanic ashes (an influence on load and waterproofing), it would be prudent to adopt a sloped roof style.

2-2-1-3 Policy for Social and Economic Conditions

(1) Security

In the past, the New People's Army (NPA) had been active in the Manito municipality, and there had been reports that the local contractors had been forced to provide money. However, there are few signs of recent NPA activities, and the Mayor of Manito has affirmed that he has not heard of any serious incidents in the last decade. Since peace and order has recovered, the former inhabitants are gradually returning to the area, causing a rapid population growth.

Nevertheless, according to the reports of the security advisor at JICA Philippines, the Manito area is listed as medium risk, although the Barangay It-ba where Manito C/S is situated is listed as low risk. Although requests were made in the Minutes of Discussion to take measures to assure the security of the Survey Team, this request is in effect only during the preparatory study period. For that reason, for the implementing period, further information from the JICA security advisor and the local personnel will be collected. Furthermore, after the signing of the Exchange of Notes (E/N), a memorandum should be made in order to secure the safety of the personnel taking part in the construction.

(2) Religious and Gender issues

In the Province, with the exception of a few residents of Chinese origin, almost 100% of the population practices Christianity (mainly Roman Catholic). In general, there is hardly any religion-related gender discrimination. Women in The Philippines have high status compared to other Asian countries, with relatively high female political participation. Therefore,

coeducation is the standard.

Taking into consideration the gender equality issue, toilets and shower rooms will be constructed separately for males and females.

(3) Measures for disabled persons

Based on the standard design of the Department of Education (hereinafter referred to as "DepED"), the Project will provide one toilet booth for the disabled in the male and female toilets respectively. In addition, a sloped path leading from the ground to the ground floor level will be established for wheel chairs.

2-2-1-4 Policy for the Utilization of Local Consultants and Contractors

The competence of the local contractors and consultants is sufficiently high, and so local contractors and consultants will be used for the Project under the direction and supervision of the Japanese engineer. As for contractors, it is possible to procure them within Albay Province, since there are numerous contractors, including some in the AA class[1]. Meanwhile, since high-quality consultants are based in Manila, procurement from Manila should be considered for the selection of local consultants.

2-2-1-5 Construction Policy

(1) Machinery and materials

Most of the construction equipment and materials for the Project are available within the Province. Special equipment such as generators and large-size water tanks are not regularly stocked, but they are easily procurable from Metropolitan Manila. As a result, imports from foreign countries are not necessary for the Project.

(2) Procurement of labor

In the Philippines, most construction work is done by local laborers. The same can be said for Albay, where most of the labor force is procurable from within the Province or from nearby provinces. However, since the wage level has been rising in recent years, the cost estimate will apply the latest information for calculation.

(3) Relevant Standards and Codes, Building Permit

In the Philippines, architectural design should follow the "National Building Code of the

[1] AA class is the second highest class in the Philippines contractor category.

Philippines". Furthermore, there are codes for structure, electrical, sanitation, sewage, and fire prevention. Since the Project contains large-scale construction, it is necessary to acquire building permits, in addition to meeting the above-mentioned codes. The PEO will be responsible for the applications needed for the building permits.

The design of the facility will follow the "Standard Design and Specification of the School Facilities" by DepED, for determining size and classroom accommodation capacity. However, for details specific to evacuation shelters or sections where improvements or cost reduction prove to be required, proposals for ameliorations will be made to the Albay side.

2-2-1-6 Policy for Maintenance and Operation

For the maintenance and operation of public elementary schools, a budget for Maintenance and Other Operating Expenditures (hereinafter referred to as "MOOE") is given to each school by the responsible Department of Education (DepED) division offices. However, the repair work done with the MOOE budget is limited to small-scale mending of furniture, doors and windows, as well as repainting. Budgets for large-scale repair works rely on the budget from the DepED central office, Special Education Fund (hereinafter referred to as the "SEF") of the municipality, or other donations. As a result, the execution of repair work is occasionally delayed, and dilapidated, unsafe classrooms are often utilized.

Unlike elementary schools, community colleges are run from the municipal budget with the assistance of the Commission on Higher Education (CHED) and the Province. Although capital outlays for extensions and reconstruction are also part of the municipality budget, major extension or rehabilitation is demanding, and there is a notable lack of classrooms due to the limitation of those budgets.

Taking the above-mentioned situation into consideration, the Project will make efforts to reduce the maintenance obligation on the Albay side. In other words, the facilities will be designed to require minimum maintenance, and utilize materials which are durable and easily procurable.

2-2-1-7 Policy for Facility Grade Setting

(1) Points of improvement on the AECID design

This project will apply a grade equivalent to the DepED standard design and the AECID design. However, taking into account the various disasters such as volcanic eruptions, typhoons, earthquakes, and tsunami encountered in the Province as well as the fact that the evacuation shelter will be utilized by crowds of evacuees, further considerations should be made

for the durability and safety of the facility. In view of the current situation where many of the existing school buildings have had their roofs blown away in times of strong winds during typhoons, necessary improvements concerning the selection of roof materials, the construction methods and the installation details will be carefully determined. The AECID design adopts the flat roof style, but there are concerns of future leaks caused by deterioration and the accumulation of volcanic ashes due to volcanic eruptions. Accordingly, as mentioned in 2-2-1-2 (3) the Project will adopt the sloped roof style.

(2) Architectural, Mechanical, and Electrical designs specific to evacuation shelters

Unlike educational facilities which are utilized exclusively during the daytime, evacuation shelters should be designed to operate 24 hours a day. For that reason, agreements have been made to install specific architectural, mechanical, and electrical facilities as listed below.

a) Toilets

From examinations and stakeholder meetings during the Site Survey, it has been discovered that there are serious conditions due to the lack of toilets. During evacuations, the DepED standard of 1 toilet per classroom is far from being sufficient. Thus, the Project will follow the recommendation made by the PHO of 1 toilet per 20 people as is indicated in the UN "Sphere Standard 2004". Nevertheless, the urinals in the male toilets will be exceptions, and will be determined at one fixture for every 70cm of width. In the Project, the squat type (Asian type) toilet will be used, with the exception of the toilets for the disabled, which will use the Western type.

b) Shower rooms

Shower rooms are an essential facility for an evacuation shelter since the evacuees will stay at the shelter overnight. Based on the estimated number of evacuees, one shower nozzle will be provided for every 40 persons.

c) Kitchen

Cooking facilities such as a kitchen sink, kitchen counter, cooking stove, and faucets are essential for long-term evacuations. Since firewood and charcoal are the main fuels used for cooking, the cooking stove will be located partially outdoors, with sufficient ventilation.

d) Laundry space

A laundry space with faucets and a sink will be established in a partially outdoor,

roofed space connected to a hanging space.

e） Water supply

The two types (indicated below) will be employed as the water supply system.

① City water: Water supply will be pumped up to an elevated water tank, and the water will lead to the kitchen, shower rooms, and faucets by gravity.

② Rainwater: Rainwater will be collected from the roof through the gutters, to an elevated water tank placed under the roof. The rain water supply will lead to the toilet and laundry space (in case the rain water tank is dried up, city water will be utilized as a second option).

f） Drainage system

The sewage from the toilets and other drains will lead to the septic tank. The design of the septic tank will follow the instructions of the PHO.

g） Electrical facilities

If Albay Electric Cooperative, Inc. (hereinafter referred to as "ALECO") instructs, transformers will be installed as part of the Japanese construction. In addition, hallway lights, ceiling fans, and outdoor lamps will be furnished, which are normally not installed in a school. Finally, one generator will be provided per site to meet the above-mentioned electric capacity (25KVA-50KVA).

h） Public Address system and telephone system

A Public Address (PA) system and a telephone system will be provided inside the office. However, since Manito has no telephone land line, only a conduit pipe will be installed for future application.

2-2-1-8 Construction Schedule

The construction period for 6 sites with two-story or three-story buildings is estimated to be a total of 14 months, composed of 1 month for preparation, 2 months for earthwork and soil replacement work, 10.5 months for main construction, and 0.5 month for inspection and hand over. It would be preferable to avoid soil work and foundation work during the typhoon season (October to December), but it would be possible with sufficient preparation and curing period.

2-2-2 Basic Plan

2-2-2-1 Component of the Request

(1) Proposed sites

1) Site selection in Libon

The original site proposal in Libon was Libon C/S, an elementary school situated in the center of town. However, since the central school has a risk of flooding, LICOM was proposed as an alternative site. Based on the results of the site survey and stakeholder meeting, LICOM proved to be adequate as an evacuation shelter and was selected as the final proposal site. The result of the studies is indicated in Table 2-5.

Table2-5 Site selection study for Libon

Article	Libon Central School	Libon Community College
Adjacent topography	Located on a sedimentary lowland. The northern end of the site is adjoining a creek which has risk of flooding due to heavy rain. The northern and eastern side is adjoining rice fields, which accelerate flooding.	Located on a sedimentary lowland. The southern edge is close to rice fields, but the residential area intervening the site and the rice field moderates the flooding damage.
Comparison between the site ground level and road	The site is about 1m lower than the road, so it is easily flooded.	Nearly the same level. The lowest area is about 20cm to 30cm lower than the road, so the influence of flooding is small.
Flooding level (Reming, 2006)	More than 1m (there has been report that the water level was higher than the height of younger pupils).	About 30cm (most of the reporters described as "1 foot"). The nearby gas station has no record of flooding, so there is low risk of flooding at the site.
Evaluation as an evacuation shelter	There have been records of evacuation, but evacuation may be difficult depending on the flooding level. Therefore, the adequacy as a shelter is not high.	LICOM moved to the site in 2008, so there is no record of evacuation yet. However, since it is less affected by flooding, its adequacy as an evacuation shelter is superior.

2) Final proposal sites

The 6 final proposal sites including LICOM, mentioned above, are shown in Table 2-6. The priority of the sites indicated below is based on the Minutes of Discussion.

Table2-6 Proposed sites

Priority	Municipality / City	Site name
1	Sto. Domingo	Sto. Domingo Central School
2	Legazpi City	Gogon Central School
3	Polangui	Polangui North Central School
4	Libon	Libon Community College
5	Manito	Manito Central School
6	Oas	Oas South Central School

(2) Facility components

The requested components are as follows: classrooms (including blackboards), offices (to be used as a Principal's office, storage space, and public address facility), male and female toilets, shower rooms, kitchen, laundry space, and machine room (including generator).

(3) Equipment component

Since the Project aims to construct evacuation shelters, the equipment (school furniture and education equipment) will not be included in the project component. It has been agreed that necessary educational equipment will be provided by the Philippine (Albay) side.

(4) Soft component

Technical assistance for activities which will promote effective utilization of the evacuation shelter (such as hazard maps and guidance signs) was requested as a soft component.

2-2-2-2 Evaluation of the Proposed Components

(1) Adequacy of the proposed sites

The adequacy of the six proposed sites is examined below.

1) Potentials of disaster risks

According to the hazard maps made by Philippine Institute of Volcanology and Seismology (hereinafter referred to as "PHIVOLCS") and the Mines and Geosciences Bureau (MGB), the potential of damage from disasters is indicated in Table 2-7. The gray-colored part indicates a low potential of disaster risk.

Table2-7 Potentials of damage from disasters at the sites

Site	Volcano			Tsunami	Flood	Land slide
	Lahar	Lava flow	Pyroclastic flow			
LICOM	safe	safe	safe	no risk	occasionally	safe
Polangui North C/S	safe	safe	safe	no risk	occasionally	safe
Oas South C/S	safe	safe	safe	no risk	occasionally	safe
Manito C/S	safe	safe	safe	Safe	safe	low
St. Domingo C/S	L.S*	safe	safe	Safe	safe	safe
Gogon C/S	L.S*	safe	safe	Safe	occasionally	safe

L.S.= Low susceptibility

2) Degree of safety as evacuation shelters

The degree of safety as evacuation shelters has been judged based on the site surveys. As a consequence, 4 sites were determined to be safe, and 2 sites were determined to be safe under certain condition, to be utilized for evacuation shelters. The results are demonstrated in Table 2-8.

Table2-8 Judgment on safety as evacuation shelters

Sites	Disaster type /Risk potential	Conditions / Examinations	Result
LICOM	Flood / low	From the hearings, information was collected that there has been flooding of about 30cm due to typhoon Reming (2006). The entire area of Libon is a lowland, but the zone around LICOM is known to be relatively safe, and the nearby gymnasium has been used as an evacuation shelter. For the new facilities, safety of the shelter can be secured by referring to the records of the past flooding level and the natural ground level of the area, for the determination of ground floor level.	Safe
Polangui North C/S	Flood / low	The highest recent flooding level was about 30cm caused by typhoon Reming (2006). The Polangui area is a lowland, but the school site is known to be relatively safe from flooding, and has been utilized as an evacuation shelter. For the new facilities, safety of the shelter can be secured by referring to the records of the past flooding level and the natural ground level of the area, for the determination of ground floor level.	Safe
Oas South C/S	Flood / low	The highest recent flooding level was about 30cm caused by typhoon Reming (2006). The Oas area is a lowland, but the school site is known to be relatively safe from flooding, and has been utilized as an evacuation shelter. For the new facilities, safety of the shelter can be secured by referring to the records of the past flooding level and the natural ground level of the area, for the determination of ground floor level.	Safe
Manito C/S	Land slide / low	The site is situated on a flat and mild slope surface of a terrace. The northern edge of the site is next to the level difference (about 5m), but the risk of land slide is low since it has no record or sign of collapsing. The safety of the new facility can be secured by leaving enough distance between the building and the edge of the gap.	Safe
Sto. Domingo C/S	Pyroclastic flow / low	Lahar is a phenomenon provoked in case of heavy rain after volcanic eruption. Although there has been no record of lahar reaching the site after the highly explosive eruption in 1897, the statistical possibility is not zero. Nonetheless, for medium-grade eruption, there is enough time until the occurance of lahar after the eruption and it is possible to provisionally evacuate to this shelter. Safety can be retained, if the evacuees are evacuated to the wide area evacuation shelters when heavy rain due to typhoon and other climatical conditions are anticipated. Since the Project assumes evacuation plan for medium-grade eruption, the construcion proves to be appropriate. Meanwhile, for highly exposive eruptions anticipated in units of centries, there are possibilities of pyroclastic flow and pyroclastic surge, in addtion to lahar. Yet, such highly explosive eruptions can be perceived from volcanic observation, so it is possible to evacuate the target population to safe sites such as wide area evacuation shelters in advance.	Safe
Gogon C/S	Pyroclastic flow / low	Same situation as Sto. Domingo C/S	Safe
	Flood / low	According to the hearing results, there has been no record of flooding within the school site. Therefore, the school site is a safe area for evacuation.	

3) Evaluation of the sites

All six sites were concluded to be appropriate as candidate sites for the Project, after evaluation using the site selection criteria indicated in Table 2-3 (p.2-3).

Table2-9 Evaluation results of the proposed sites

	LICOM	Polangui N. C/S	Oas S. C/S	Manito C/S	Sto. Domingo C/S	Gogon C/S	Notes
There is sufficient land for construction.	○	○	○	○	○	○	
The construction vehicles are accecible to the sites.	○	○	○	○	○	○	
There are no duplications with other donating agencies or private sector assistance.	○	○	○	○	○	○	
There is urgent need for classroom construction due to decrepitation or lack of classrooms.	○	○	○	○	○	○	LICOM has no decrepit buildings, but has serious lack of classrooms.
There is a substantial number of evacuees to utilize the shelter.	○	○	○	○	○	○	
The site does not suffer direct damage from disasters.	△	△	△	○	▲	▲	△= History of slight flooding within the site. ▲=Slight possibility of lahar.
Acces to the site has no obstables for evacuation.	○	○	○	○	○	○	
Increase in supply demand for water and electricity can be met during long-term evacuation.	○	○	○	○	○	○	

4) Measures for Sto. Domingo C/S and Gogon C/S

The two sites are ranked as first and second priority, and are highly effective as an evacuation site for eruptions within short-term assumption and typhoons. However, for eruptions based on medium and long-term assumption, and accompanied by heavy rain, there is slight risk of damage by lahar, although its susceptibility is low. To provide for this risk, APSEMO will sort out the correlation between the explosiveness of the eruption and precipitation, clarify the conditions for designation as evacuation shelters, and prepare a manual regarding the below-mentioned articles.

- For highly explosive eruption based on long-term assumption, the facility will not be used as evacuation shelters, and the evacuees will be guided to wide area evacuation shelters.
- For eruption based on medium-term assumption, the evacuees will be evacuated to the sites. If the precipitation reaches a certain level during evacuation, the evacuees will be guided to wide area evacuation shelters.

Table2-10 Plan for conditions as evacuation shelters at Sto. Domingo C/S and Gogon C/S

	Eruption based on long-term assumption (Highly explosive)	Eruption based on medium-term assumption (medium-grade)
Precipitation less than ●mm	Unusable	Usable as evacuation shelter
Precipitation more than ●mm	Unusable	Usable as temporary evacuation shelter

In addition, implementation of the maintenance of riverbanks and dredging of riverbeds at Basud River and Yawa River by the Province will lead to risk reduction in advance.

(2) Validity of the proposed components

1) Classrooms

The classrooms will be utilized as accommodation space during an evacuation, so they are inevitably necessary for the Project. Although blackboards are educational equipment, it is reasonable for them to be included as a project component since their installation will be part of the construction.

2) Office

The office will be multi-purpose in normal times (ex. principal's office, first aid room, and storage room), but it will be utilized as the operation office for the evacuation shelter during emergencies. Also, taking into consideration that the principals of the designated schools are to be the chief of camp during an evacuation, and the considerable desk work the chief is charged with, it is very likely that the principal will utilize the office in the new building even if there is a principal's office in the existing building.

3) Toilets

During the site survey, the serious problem of a severe lack of toilets was repeatedly emphasized as a deficiency of the existing facilities. Thus, the number of toilets will be decided taking into consideration the fact that the toilets at evacuation shelters will be utilized 24 hours a day unlike those in normal schools.

4) Shower rooms

Shower rooms are not a requisite for an educational institution, but are essential to improve the hygienic conditions of the evacuees.

5) Kitchen

In general, the evacuees cook their meals inside the evacuation site. However, when there is no specific space for cooking, the schoolyard or the classrooms are utilized as temporary cooking spaces. Since such a cooking environment is not advisable from fire prevention, safety, and sanitary reasons, it is prudent to provide common kitchen facilities.

6) Laundry space

Owing to the fact that it is necessary to wash one's clothing often to keep them clean, especially where it is humid and warm throughout the year like Albay Province, a laundry space and hanging space will be included in the Project component.

7) Machine room（including generator）

To secure electricity even when there are frequent blackouts due to calamity, it is essential to set up a generator at the evacuation shelter. In order to guard the generator and water pumps from theft and vandalism, a machine room will be established.

(3) Consideration of the validity of the soft component

The main purpose of the soft component is to assist the maintenance of the facilities built by the Project. Concerning the development of hazard maps, the first activity of the requested soft component, there are existing maps created by the Province, and the development of those maps does not contribute directly to the maintenance of evacuation shelters. Also, the establishment of guidance signs was judged to be inessential since the nearby population is well aware of the role of proposed schools as evacuation shelters, and there is no need to notify them of the schools' locations using guidance signs. After consideration in Japan, the above-mentioned activities have been determined to be secondary to the intention of the soft component, and therefore were omitted from the project component.

2-2-2-3 Determination of the Facility Size

(1) Analysis of the needs for accommodation capacity

1) Estimated maximum number of evacuees

The past records of evacuation which have been disclosed during the stakeholder meetings are shown in Table 2-11.

When comparing the estimated number of evacuees from volcanic eruption and from strong typhoons, the larger number will be used as the estimated maximum number of evacuees. The details of the records utilized for comparison are as follows:

Table2-11 Records of evacuation

Shelter name	Barangay where evacuees come from	Distance to shelter	Latest barangay population	Barangay households	Typical calamities	Recent major calamities	Estimated maximum evacuees by typhoon		Estimated maximum evacuees by Mayon eruption		Population of evacuees to the other facilities, relatives or neighbors
							population	households	population	households	
LICOM	San Isidro	3km	1,804	408	flood by typhoon	Reming 2006, Pepeng 2009	265	60	Wide area evacuees: from Amtic (Ligao) No. evacuees: - Population =*1,655* - Households= *276*		130
	E. Carisac	1.5km	995	207			130	27			100
	W. Carisac	1km	1,024	224			324	72			96
	Zone 4	0km	1,768	334			300	80			525
	Bulsan	3km	2,240	410			459	84			100
	Bonbon	4km	4,038	804			678	135			1,470
	Sta. Cruz	7km	1,807	317			1,100	193			57
	S. Agustin	1.5km	2,984	506			307	52			130
	sub-total		*16,660*	*3,210*			*3,563*	*703*			*2,608*
Polangui North C/S	Centro Occ	1km	4,564	913	flood by typhoon	Reming 2006	280	56	Wide area evacuees: from Maninila (Guinobatan) No. evacuees: - Population =*1,872* - Households= *314*		2,000
	Centro Or.	500m	2,008	402			150	30			900
	Gabon	1.5km	3,533	707			750	150			1,300
	Sugcao	2.5km	3,427	685			575	115			1,400
	sub-total		*13,532*	*2,706*			*1,755*	*351*			*5,600*
Oas South CS	Talongog	1km	1,800	360	flood by typhoon	Reming 2006	280	40	Wide area evacuees: from Masarawag (Guinobatan) No. evacuees: - Population =*3,809* - Households= *496*		750
	Oblin-Rinas	80m	1,785	335			925	185			250
	Ilaor Norte	0m	1,800	444			260	52			250
	Iraya South	800m	800	200			80	20			30
	Mayao	1km	1,700	305			870	174			100
	C. Poblacion	500m	500	70			120	14			0
	Ilaor Sur	200m	2,500	500			500	100			250
	sub-total		*10,885*	*2,214*			*3,035*	*585*			*1,630*
Manito C/S	lt-ba	800m	4,832	918	flood by typhoon	Reming 2006	173	30	Wide area evacuees: from Buyuan (Legazpi) No. evacuees: - Population =*3,404* - Households= *780*		239
	Kawit	1km	1,151	200			1,151	200			0
	sub-total		*5,983*	*1,118*			*1,324*	*230*			*239*
Sto. Domingo C/S	Sto Nino	1.3km	1,613	382	flood by typhoon and eruption	Reming 2006 and Mayon eruption 1993, 2009	1,055	250	210	50	80
	Nagsiya	200m	1,156	283			700	170	0	0	160
	San Isidro	1.5km	2,298	612			2,180	580	2,180	580	0
	San Roque	700m	1,524	343			567	120	0	0	0
	Market Site	100m	245	59			0	0	0	0	60
	Fidel Surtida	2km	2,435	487			920	184	920	184	0
	Lidong	3.25km	3,750	745			2,050	410	1,860	410	650
	sub-total		*13,021*	*2,911*			*7,472*	*1,714*	*5,170*	*1,224*	*950*
Gogon C/S	Bonga	10km	3,840	699	flood by typhoon eruption	Reming 2006 eruption 1993,2009	0	0	3,840	699	0
	Padang	7km	2,002	570			2,002	570	290	85	0
	Gogon	200m	5,480	1,194			1,650	360	1,650	360	0
	sub-total		*11,322*	*2,463*			*3,652*	*930*	*5,780*	1,144	0
Total			*71,403*	*14,622*			*20,801*	*4,513*	*21,690*	*4,234*	*11,027*

① Estimated number of evacuees due to volcanic eruption

For evacuation needs in times of eruption, the actual records will be utilized for Gogon and Sto. Domingo. However, since the other four sites have not experienced evacuations due to eruptions, the estimated number for wide area evacuation[2] will be regarded as the demand.

② Estimated number of evacuees due to typhoon

The records of evacuation for typhoon Reming (2006) will be regarded as the maximum number of evacuees due to typhoon.

2) Average number of evacuees due to typhoon

The average number of evacuees for the 8 recent typhoons which hit the region

[2]In case there is a massive eruption of the Mayon Volcano, the impracticability of the nearby shelters to meet the needs is anticipated. For such cases, APSEMO has designated evacuation shelters with sufficient distance from the Mayon Volcano as wide area evacuation shelters.

between 2006 and 2009 is shown below.

Table2-12 Average number of evacuees due to typhoon (2006-2009)

Sites	2006			2007	2008	2009			Average
	Caloy May 11-13 152.8mm*	Milenyo Oct. 26-28 280.0mm	Reming** Nov. 29-30 495.8mm	Mina Nov. 15-21 452.7mm	TECF*** Feb. 21 269.2mm	Dante Apr.30-May 2 399.9mm	Pepeng Oct. 1-2 151.2mm	Santi Nov. 4-6 149.0mm	
LICOM	****	—	3,563	1,822	725	462	449	244	1,211
Polangui N. C/S	278	—	1,755	2,880	278	447	1,887	2,355	1,411
Oas S. C/S	116	—	3,035	1,193	285	881	463	—	996
Manito C/S	528	—	1,324	1,302	71	113	314	—	609
Sto. Domingo C/S	72	—	7,472	3,573	39	198	—	—	2,271
Gogon C/S	—	3,110	3,652	2,117	—	—	—	—	2,960

* total precipitation, ** from stakeholder meeting, ***Tail-end of a cold front, **** no info at APSEMO

3) Classroom needs as ordinary schools

① Classroom capacity

According to the DepED standard, the accommodation capacity as a classroom is 45 persons per room. As for evacuation purposes, the accommodation capacity will be set at 40 persons per room (8 households of 5 members) according to the standard of APSEMO.

② Joint Operation

Taking into considerations the serious classroom shortage at the adjoining schools of Gogon National High School and Manito Community College, joint operation by the two adjoining schools of the new facilities within those sites, have been decided at Gogon C/S and Manito C/S.

③ Estimated number of pupils /students in 2013

Based on the pattern of the past 5 years, the estimated number of pupils/students in 2013, the year of completion of the Project (including the number of pupils in kindergarten classes) has been projected.

Table2-13 Estimated number of pupils/students in 2013

School Year	LICOM	Polangui N. C/S	Oas S. C/S	Manio C/S	Sto. Domingo C/S	Gogon C/S	Total
2006	439	1,267	865	946	1,484	881	5,882
2007	527	1,208	843	948	1,588	906	6,020
2008	610	1,292	860	998	1,603	976	6,339
2009	801	1,279	903	983	1,545	1,006	6,517
2010	962	1,266	933	1,062	1,639	991	6,853
2011	995	1,266	952	1,094	1,738	1,021	7,066
2012	1,208	1,266	971	1,127	1,789	1,051	7,412
2013	1,494	1,266	990	1,160	1,841	1,083	7,834

4) Overview of the demands

The above-mentioned data are shown in Table 2-14.

Table2-14 Analysis results of the classroom demand for proposed sites

Items			LICOM	Polangui N. C/S	Oas S. C/S	Manito C/S	Sto. Domingo C/S	Gogon C/S	Total
1	Estimated maximum number of evacuees	Estimated evacuees caused by volcanic eruption	1,655	1,872	3,809	3,404	5,170	5,780	21,690
		Estimated evacuees caused by typhoon	3,563	1,755	3,035	1,324	7,472	3,652	20,801
		Larger number of evacuees (eruption or typhoon) (1)	3,567	1,872	3,809	3,404	7,472	5,780	25,904
		Accommodation capacity of nearby facilities(2)	1,000 Municipality Gymnasium	100 General comprehensive school	100 Municipal Hall	0	0	0	1,200
		(A) Maximum need of evacuees (1)－(2)	**2,567**	**1,772**	**3,709**	**3,404**	**7,472**	**5,780**	**24,704**
2	Average number of evacuees due to typhoon	**(B) Average number of evacuees based on the 8 typhoons from 2006-2009**	**1,211**	**1,411**	**996**	**609**	**2,271**	**2,960**	**9,458**
3)	Needs as a school	Estimated number of pupils / students in 2013 (1)	1,494	1,266	990	1,160	1,841	1,083	7,834
		Estimated student number at neighboring schools (2)	-	-	-	441	-	765	1,206
		(C) Total estimated student number (1)+(2)	**1,494**	**1,266**	**990**	**1,601**	**1,841**	**1,848**	**9,040**

(2) Determination of the facility size

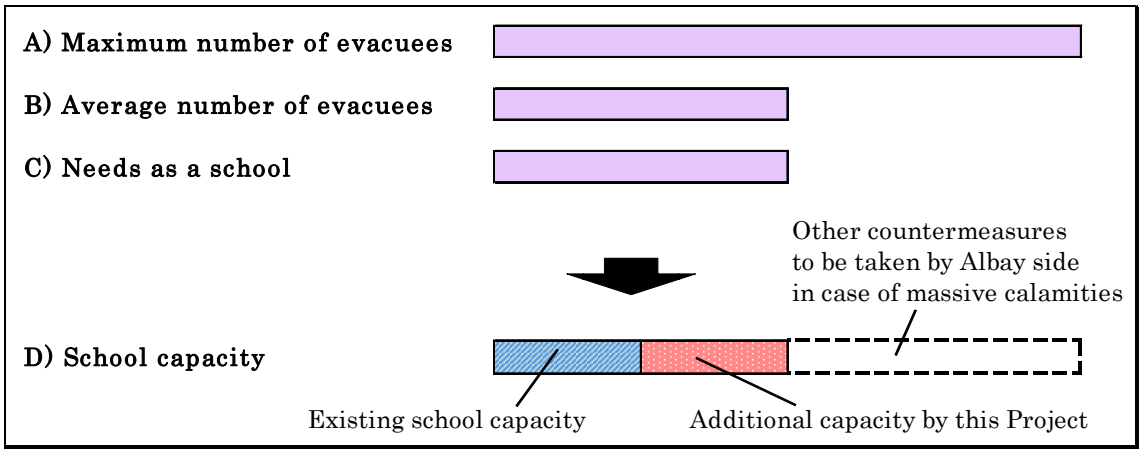


Figure2-1 Concept of facility size determination

1) Basis of facility size determination

The frequency of utilization for evacuation shelters is once or twice in a decade for volcanic eruptions, and once to several times a year for typhoons. The average number of evacuees in times of calamities considerably close to the number of pupils / students at the concerned schools, but it is exceedingly different from the estimated maximum number of evacuees. In other words, if the estimated maximum numbers of evacuees were to be utilized as the basis for facility size determination, there will be empty classrooms during most of the school year. That being the case, for efficient use of the facilities, it would be

more appropriate to determine the facility size for each site based on the average number of evacuees from recent typhoons and the classroom shortage as a school.

On the other hand, when a massive typhoon such as Reming hits the region, the anticipated evacuation number will be exceptionally high. In such cases, APSEMO has the below-mentioned countermeasures based on past experiences in order to shelter the evacuees.

① Temporarily increase the accommodation number of each classroom
② The Disaster Coordinating Council of the municipality, city, or Province will set up evacuation tents in the schoolyards
③ Make use of other nearby buildings which are not officially designated as evacuation shelters (church, Barangay hall, and private schools, etc.)
④ Utilize the residences in nearby areas with no direct damage from the disaster
⑤ Stay in a relative's house

2) Accommodation capacity of the existing facility and classroom shortage

The accommodation capacity of the existing school buildings were calculated using the below-mentioned methods.

① Usable classrooms = classrooms being used – unusable classrooms
② Even if a classroom is currently being utilized, it would be counted as an unusable classroom if in any of the following conditions:
- Temporary classrooms
- Classrooms with wooden structure
- Classrooms with corroded steel structure
- Classrooms with roofs that have been blown away by typhoons (currently being used with running repairs)
- Classrooms with thin concrete cover and corroded reinforcing steel
- Classrooms with records of flooding above the ground floor
- Classrooms with an exceedingly small size compared to the DepED standard (7m×9m)

③ Calculation of number of necessary classrooms
Estimated number of pupils / students in school year 2013 ÷ 45 = necessary classrooms
④ Kindergarten (pre-schooling) class is operated in a double shift (25+25=50 pupils per classroom is the standard), but the same calculation for elementary classes will be

applied for convenience.

⑤ Number of classrooms at Polangui North C/S

After the Field Survey, it has been brought to light that repair works for 29 classrooms will be done from the budget of DepED. However, these are running repairs to repair the damages by typhoon as part of daily maintenance, and do not improve the substantial durability of the building. Therefore, no changes, regarding the number of unusable classrooms described in ②, will be made owing to these repair works.

⑥ Number of classrooms at Sto. Domingo C/S

2 classrooms were added as usable classrooms, since the construction of 2 classrooms by the Chinese Chamber of Commerce was discovered during the Draft Report Explanation Survey in February, 2011[3].

Meanwhile, the number of necessary classrooms will be increased, since the additional needs for 2 classrooms due to the increase of kindergarten enrolment and the establishment of SPED (special education) class starting from school year 2011 have been identified. The expansion of kindergarten classes corresponds to the policy of DepED that was released in January 2011.

Table2-15 Calculation for Classroom Shortage

Items			LICOM	Polangui N. C/S	Oas S. C/S	Manito C/S	Sto. Domingo C/S	Gogon C/S	Total
1	Accommodation capacity at the existing facilities	Number of using classrooms (2010.8)	21 (including half-size)	29	25	25	51	29	180
		Usable (including constructing classrooms)	13 (conversion into standard size)	16	10	10	32	20	101
		Unusable classrooms	0	13	15	15	19	9	71
		Usable classrooms(1)	13	16	10	10	32	20	101
		Capacity of existing school for evacuees ※)	520	640	400	400	1,280	800	4,040
		Classrooms at neighboring school(2)	-	-	-	6	-	12	18
		(D) Total number of classrooms (1) + (2)	**13**	**16**	**10**	**16**	**32**	**32**	**119**
2	Classroom shortage	(C) Total estimated student number (Table 2-13)	1,494	1,266	990	1,601	1,841	1,848	9,040
		(E) Total classroom needs (C) ÷ 45 + SPED class	33.2	28.1	22.0	35.6	41.9	41.1	201.9
		(F) Classroom shortage (E) - (D)	**20.2**	**12.1**	**12.0**	**19.6**	**9.9**	**9.1**	**82.9**

※) The existing classrooms at the neighboring schools are not considered as evacuation shelters

3) Calculation for the number of classrooms to be constructed

The number of classrooms to be constructed in the Project will be decided according to the following conditions.

① Utilize the data on classroom demand indicated in Table 2-15.

② In compliance with the already mentioned Master Plan of the Province, the norm for maximum accommodation capacity of the new facilities will be more or less

[3] The construction of classrooms by the Chinese Chamber of Commerce is difficult to comprehend in advance at DepED level since the contractors go directly to the school sites, but the construction of classrooms correspond to the policy of DepED to provide necessary resources through Public Private Partnership (PPP).

150 families (750persons = 18.75 classrooms)

③ For sites where the design will be for two-story or three-story buildings, the number of classrooms will be adjusted in order to realize full two-story or three-story buildings

The plans for the number of stories and the number of classrooms to be constructed at each site are indicated in Table 2-16. At Polangui N. C/S and Oas S. C/S, the number of classrooms was adjusted to 11 classrooms, so that they will be full two-story buildings.

Table2-16 Planned numbers of classrooms and stories

Sites	Classroom shortage as a school	Planned classroom number	Capacity School/Evacuation shelter	Planed story level
LICOM	20.2	20	900/800	3
Polangui North C/S	12.1	11	495/440	2
Oas South C/S	12.0	11	495/440	2
Manito C /S	19.6	19	855/760	2
Sto. Domingo C/S	9.9	9	405/360	2
Gogon C/S	9.1	9	405/360	2
Total	82.9	79	3,555/3,160	-

(3) Project component plan

Based on the evaluation of the proposed components and the determination of facility size, the component plan of the Project is indicated in Table 2-17.

Table2-17 Project component plan

School sites	Components to be covered by the Project							Total floor area (m^2)
	Class-room	Office	Toilet	Shower unit	Kitcen	Laundry space	Machine room with generator	
LICOM	20	1	46	20	2	2	1	2,769
Polangui North C/S	11	1	28	12	1	1	1	1,649
Oas South C/S	11	1	28	12	1	1	1	1,625
Manito C /S	19	1	46	20	2	2	1	2,632
Sto. Domingo C/S	9	1	23	10	1	1	1	1,320
Gogon C/S	9	1	23	10	1	1	1	1,422
Total	79	6	194	84	8	8	6	11,417

(4) Building types and combinations

The facilities will be adjusted to the sites by combining the building types indicated below.

Table2-18 Building Types

	Building type	Type code	Notes
1	Two-story, 4 classrooms	2-4A	
2	Two-story, 5 classrooms + office	2-5A+O	3 types according to the position of entrance and stairs
3	Two-story, 6 classrooms	2-6A	2 types according to whether or not there are entrances and stairs
4	Two-story, 9 classrooms + office	2-9A+O	2 types (with entrance/no entrance)
5	Two-story, 10 classrooms	2-10A	
6	Three-story, 9 classrooms	3-9A	
7	Three-story, 11 classrooms + office	3-11A+O	
8	Water Supply Block	KT	Kitchen, Toilet, Shower room, Laundry space 4 types according to the shapes of sites

Table2-19 Combination of building types per site

Site	Combination of building types
LICOM	3-9A、3-11A+O、KT、KT
Polangui North C/S	2-5A+O、2-6A、KT
Oas South C/S	2-5A+O、2-6A、KT
Manito C/S	2-9A+O、2-10A、KT、KT
Sto. Domingo C/S	2-9A＋O、KT
Gogon C/S	2-4A、2-5A+O、KT

2-2-2-4 Architectural Plan

(1) Design codes

In general, the Project will follow the below-listed design codes of the Philippines.

However, it has been agreed with the Albay side that the structural design will be partly designed according to the Japanese structural standard.

① National Building Code of The Philippines (NBC)
② National Structural Code of the Philippines (NSC)
③ Philippine Electrical Code (PEC)
④ Revised National Plumbing Code of the Philippines (RNPCP)
⑤ Fire Code of the Philippines
⑥ Standards for Wastewater Discharge (Department of Environment & Natural Resources)
⑦ Code on Sanitation of the Philippines (Department of Health)

(2) Standard design

The dimensions of the facilities will refer to the DepED standard plan, but refinement will be made when necessary. On the other hand, there is no standard for evacuation shelters. That being the case, the reference design of the PEO and the AECID model will be referred to as an example and efforts will be made to meet the Province's demand for secure buildings capable of withstanding earthquakes and typhoons.

(3) Building permit

The construction of facilities planed in the Project requires building permits from the respective municipalities and city. The PEO of Albay will be responsible for obtaining the required permits before the commencement of construction.

(4) Site situation and layout plan

Since the site conditions differ from site to site, the best layout plan possible will be determined after considering the shape of the site, the state of existing infrastructure, the schoolyard area, and the layout of the existing school buildings.

1) The reference design prepared by the Albay side is a square shaped building with the classrooms surrounding a courtyard in the center. The Project will also aim to maintain unity as newly built evacuation shelters by adopting the above-identified square shape, as long as the site conditions allow.
2) Taking into consideration the fact that tents will be utilized as alternative shelters for the evacuees, the building will be laid out to preserve the area of the existing schoolyard as much as possible. For that reason, the facilities will be two-story or three-story buildings to diminish the construction area.

3) In order to make use of natural ventilation, the layout plan will consider the expected wind direction as well as the distance from the existing school buildings.
4) The plot plan will take into account the existing trees at the construction site, and make an effort to minimize the removal of trees.
5) When possible, the layout plan will avoid locations where direct damages from flooding or collapsing trees due to typhoons are anticipated. When avoidance is not feasible, appropriate procedures will be executed such as removing trees, branch cutting, and elevating the floor level.
6) The toilets, shower rooms, kitchen, laundry space, and the machine room will be planed separately from the classrooms, as a "water supply block". Also, the connection of the "water supply block" to the existing buildings will be carefully considered.

(5) Floor plan

1) Classrooms

The size of rooms in the Project will be based on the DepED standard classroom size of 7m×9m (an accommodation capacity of 45 pupils). Therefore, the structural module unit will be set at 7m×4.5m. At each site, 2 sections will be designed to enable multi-purpose use by employing a movable partition wall between 2 classrooms.

2) Office

Following the AECID model, one room of the same size as a classroom will be equipped as an office. The mode of utilization will differ, depending on the conditions of existing facilities as well as the operational situation of each school. The assumed purposes are a combined use of the following: the principal's office, administration office, first aid room, and storage for educational equipment. Since it will be utilized as an office for the evacuation shelter, it should not be divided into small rooms at the design stage, to leave the ability for free arrangement by each school using furniture or other partitions. Also, because the office will be the center of the facility both in normal times and emergencies, a public address system and a telephone will be equipped.

3) Toilets

The number of toilet booths will be set at one booth for every 20 persons, following the instruction by the PHO and adopting the standard indicated in the UN Sphere Standard 2004. However, the urinals in the male toilet will be regarded as at one fixture for every 70cm width. The toilets will be western type for the disabled booths and squat (Asian) type for the rest.

4) Shower room

One shower fixture will be set up for each new classroom (or one shower fixture per

40 persons).

5) Kitchen

The kitchen will be partially outdoors, since it creates smoke and soot from using charcoal and firewood, and will be clearly separated from the other spaces for washing vegetables or dishes, preparing, and serving.

6) Laundry space

Space for laundry and hanging clothes will be set up on the second floor part of the water supply block. The laundry space will be roofed, and the hanging space will be partially roofed to enable clothes to be dried on rainy days.

7) Others

According to the DepED standard, the inside measurement of the hallway will be at least 2m. Following the National Building Code of The Philippines (NBC) and the Fire Code of the Philippines, at least two stair ways will be established for the evacuation from the second floor and the third floor. Also, a ramp from the ground level to the ground floor level will be established to meet the needs of the disabled.

(6) Section plan

1) Specified design height

The first floor level will be sufficiently raised, since there has been past records of flooding (to a maximum of around 30cm above ground level) at LICOM, Polangui North C/S, and Oas South C/S.

2) Ceiling height

The ceiling height of the DepED standard design is 3.0m, and the evacuation shelter constructed by the AECID has a ceiling height of 2.8m. For this Project, the ceiling height will be 2.8m except for the top floor. As for the top floor, the structure will be changed as indicated below, and the ceiling will be sloped (height of 2.7 to 3.7m, average height 3.2m), in order to attain more air volume as well as reduce construction cost.

3) Roof style and Structure

The AECID evacuation shelter uses a flat roof with water-repellent concrete slab. The fact that the roofs of school buildings have been blown away or peeled off due to massive typhoons in the Province, demands a roof type with no such risk. The DepED standard for typhoon-resistant design (by AECID) also adopts the flat roof type. On the other hand, the DepED standard (normal type) has an ordinary sloped roof, with a steel frame truss.

Taking into consideration that the annual precipitation reaches 4,000mm in the Province, there will be risk of leaking due to deterioration of the water repellent. For that

reason, the Project will employ a sloped roof (with galvalume steel plate). It has been proven in past projects by Japan that the sloped roof can be typhoon resistant if the details are accurately designed.

The structure will be changed from the ordinary steel truss to reinforced concrete slant beam. The slant beam can easily form a sloped ceiling since it has no horizontal beam. The slant beam structure can reduce the story height without changing the average ceiling height, and enable cost reduction (see Figure 2-2)

4) Safety measure

In order to reduce the risk of pupils/students falling from the second or third floor, the handrail will adopt a style without any footholds and that is not easily climbable. In addition, the windows on the opposite side from the hallway will use smaller awning windows, with 12 small windows.

The standard section drawing for two-story and three-story types is demonstrated in Figure 2-2.

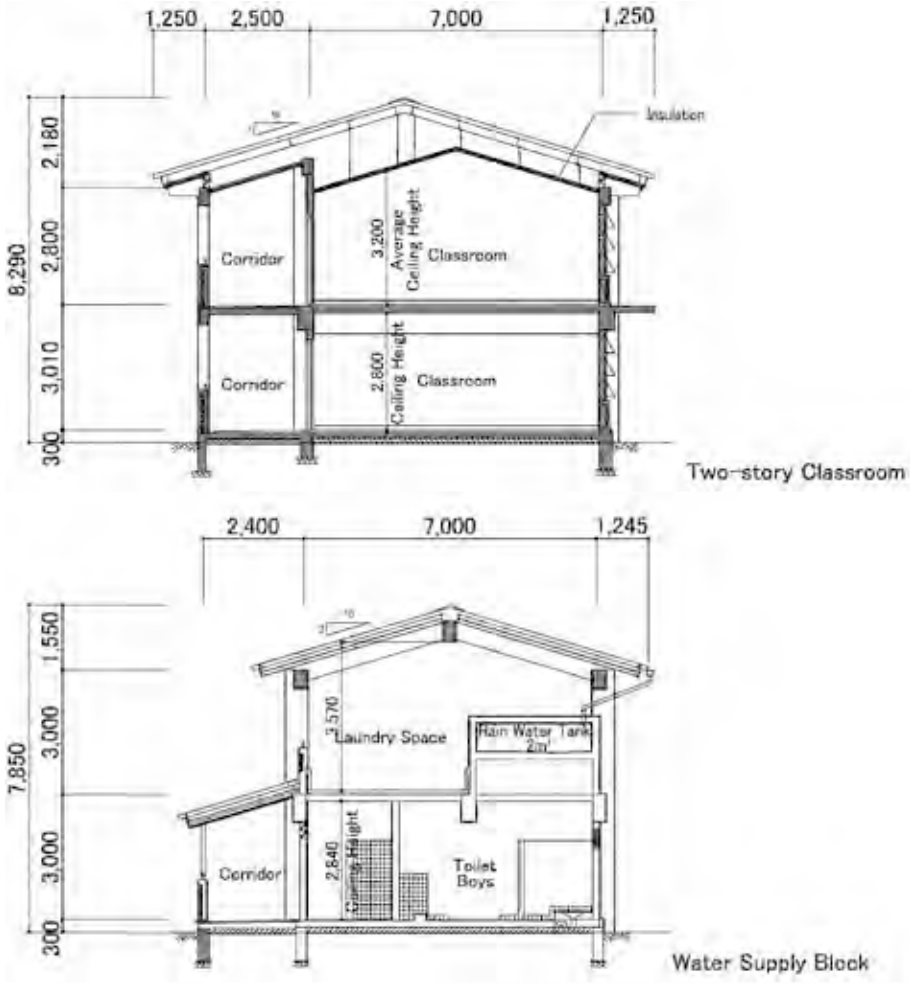


Figure2-2 Standard section plan

(7) Structure plan

1) Load and external forces

The structural design will be developed in accordance with the National Structural Code of the Philippines. In the Structural Code, the coefficients of seismic force and wind force are specified per region. Region V, the region the Project is concerned with, is categorized as Zone IV for the coefficient of seismic force, and Zone I for the coefficient of wind force, a rigorous condition within the Philippines. The Project will follow the above mentioned factors for structural design.

In addition, the Revised Building Code of Japan, including its Notice and Order of Enforcement, the Technical Manual for the Structure of Buildings, and various design standards of the Architectural Institute of Japan (hereinafter referred to as "AIJ"), containing the latest knowledge of Japan will be referred to.

Furthermore, for the live load, the numbers will be reviewed within the scope of safety

in order to implement a more rational and economical structural computation. The below indicated design loads will be adopted for the Project.

Table2-20 Structural design load

① Live load			② Wind load	③ Seismic force
Floor	Classroom	2300Pa	P＝λ×K×G×C×Iw×qh	V＝（2.5×Ca×I／R） W
	Hallway	3800Pa	P: Wind load per 1 ㎡ G : Building shape and environmental factor Iw: Strength coefficient for building use 1.15 qh : Wind pressure according to Area Coefficient 275KPH C: Wind force coefficient λ : Adjustment factor for building height K: Topographic factor	Z : Regional coefficient 0.4 I : Strength coefficient for building use 1.5 R : Coefficient for structural system 8.5 W: Dead load + live load Ca＝0.4 Na : Coefficient of subgrade reaction 0.4 Na : Hypocenter Coefficient 1.0

2) Structural material

The purlins to be placed on the 7m span gabled beam will be C-channel, the most familiar steel type in the Philippines. Also, since the quality of the reinforcing steel, concrete, and aggregates varies depending on the region, sufficient attention should be given to quality control. The strength indicated in Table 2-21 will be adopted for the Project.

Table2-21 Strength of material design

Concrete	Reinforcing bar	Structural steel
Fc＝24MPa（3480psi）	Fy＝415MPa（60,190psi） equivalent to GRADE60	Fy＝240MPa（34,776psi） ASTEM A36

3) Structural design of the super structure

Since, for reinforced concrete buildings, the seismic force can supersede the wind load, the seismic load will be used for the design of the super structure. The design for the external force in times of earthquakes will refer to the seismic force indicated in the National Structural Code of the Philippines. In addition, stress analysis and section design

will be executed based on the standards and guides of the AIJ. Moreover, computation for horizontal load-carrying capacity (conclusion analysis up to the collapse of the building) will be executed as a secondary design, to verify the safety of the building. The maximum deformation will be set at 1/100 of the building's story height.

Table2-22 Structural standards to be adopted in the Project

Standards	Issuance
Revised Building Code, Enforcement Act, Notice	Ministry of Land, Infrastructure, Transport and Tourism
Technical Manual for the Structure of Buildings	Ministry of Land, Infrastructure, Transport and Tourism (editorial)
Structural Computation Standard for Reinforced Concrete	Architectural Institute of Japan
Steel Structure Design Standard	Architectural Institute of Japan
Guide for Building Foundation Structure Design	Architectural Institute of Japan
National Structural Code of the Philippines 2010	

4) Foundation structure

The foundation structure will be a spread foundation. The ground bearing capacity indicated in the soil investigation report will be used as the design capacity, and at sites where the bearing stratum is deep, soil improvement will be implemented down to the layer where sufficient load bearing capacity exists. The sectional design of the spread foundation will follow the Guide for Building Foundation Structure Design issued by the AIJ. The ground bearing capacity of each site is indicated in Table 2-23.

Table2-23 Ground bearing capacity and necessity of soil improvement

Site	Bearing layer, N-value	Necessity of soil improvement	Ground bearing capacity
LICOM	Silt layer, N-value: 2	Soil improvement (depth 3.2m)	96 kPa (After improvement)
Polangui N. C/S	Consolidated silt layer, N-value: 13	Not necessary	96 kPa
Oas S. C/S	Silt layer, N-value: 10	Not necessary	96 kPa
Manito C/S	Consolidated silt layer, N-value: 23	Not necessary	150 kPa
Sto. Domingo C/S	Silty sand layer, N-value: 10	Not necessary	96 kPa
Gogon C/S	Silt layer, N-value: 8	Soil improvement (depth 2.1m)	96 kPa (After improvement)

5) Structural design of the roof

Owing to the fact that the uplift load on the roof will be at the maximum during a

strong wind force, the wind load in the Philippines will be utilized for the design of the roof structure.

(8) Mechanical and electrical plan

1) Electrical plan

① Power reception and lighting fixtures

If instructed by ALECO, transformers will be installed within the site to enable power reception as part of the Japanese construction. In addition to the regular electrical fixtures for school, hallway lighting, outdoor lamps and ceiling fans will be equipped.

Table2-24 Numbers of fluorescent light, switch, outlet, and ceiling fan in major rooms

Room		Fluorescent light	Switch	Outlet	Ceiling fan
Classroom		4	2	4	2
Office		4	2	4	2
Toilet		12	4	0	0
Kitchen	Cooking space (Large)	3	1	4	0
	Preparing space (Large)	4	2	4	2

② Emergency generator

A generator capable of operating the above mentioned electrical equipment in times of blackouts will be provided.

Power generating method：Diesel engine driven generator
Electrical method : Single phase two wire system 230V
Capacity : LICOM, Manito C/S 50 KVA
Others 25 KVA

③ Public address and telephone system

A public address system and a telephone line will be installed in the office. However, since there is no telephone service in Manito, only a conduit pipe will be equipped. In addition, following the instruction by the Office of Provincial Fire Marshal, a fire alarm system (emergency bell, emergency button) will be set up.

2) Mechanical plan

① Water supply

Two systems, namely public waterworks and rainwater will be utilized.

Public waterworks：

Since the water pressure tends to be generally low during the minor rain season, the water will be collected in the reservoir, and will be lifted to the elevated water tank by pump. The water will be lifted by a lifting pump to an elevated water tank. The water will be piped to the kitchen, shower room, and hand-wash basin space by gravity from the elevated water tank. As a countermeasure for the dry season, the pipes will also lead to the toilets and the laundry space.

Rainwater :

Rainwater will be collected through the gutter system, and stored in an elevated water tank established under the roof. The water will be piped to the toilet and laundry space by gravity.

② Drainage

The sewage and waste water will be separated, and be discharged into the respective septic tank. The design and discharging method will follow the instructions by the PHO, to assure sufficient capacity for an evacuation shelter. After passing through the septic tank, the water will be absorbed into the ground via a percolation pit. To complement the percolation pit, the waste water will be sent to perforated pipes laid between the ground surface and the underground water table to enable underground absorption.

Although there is a public drain set up at the road in front of Gogon C/S, the sewage treatment system is imperfect. Therefore, there has been an instruction not to discharge the waste water directly, but to connect to the overflow pipe of the percolation pit. The plan for water supply and drainage system is as demonstrated in Figure 2-3.

Principal equipments for water supply and drainage

Toilet bowl----------Squat type (Asian type)
Toilet bowl (for the disabled)----Western type
Urinal----------Trough-style urinal with ceramic tiles
Hand-wash basin----------Reinforced concrete tile work
(Ceramic fixtures for the disabled)
Piping material----------PVC pipe
Septic tank----------Reinforced concrete septic tank
Percolation trench----------Perforated pipe
Percolation pit----------Concrete blocks

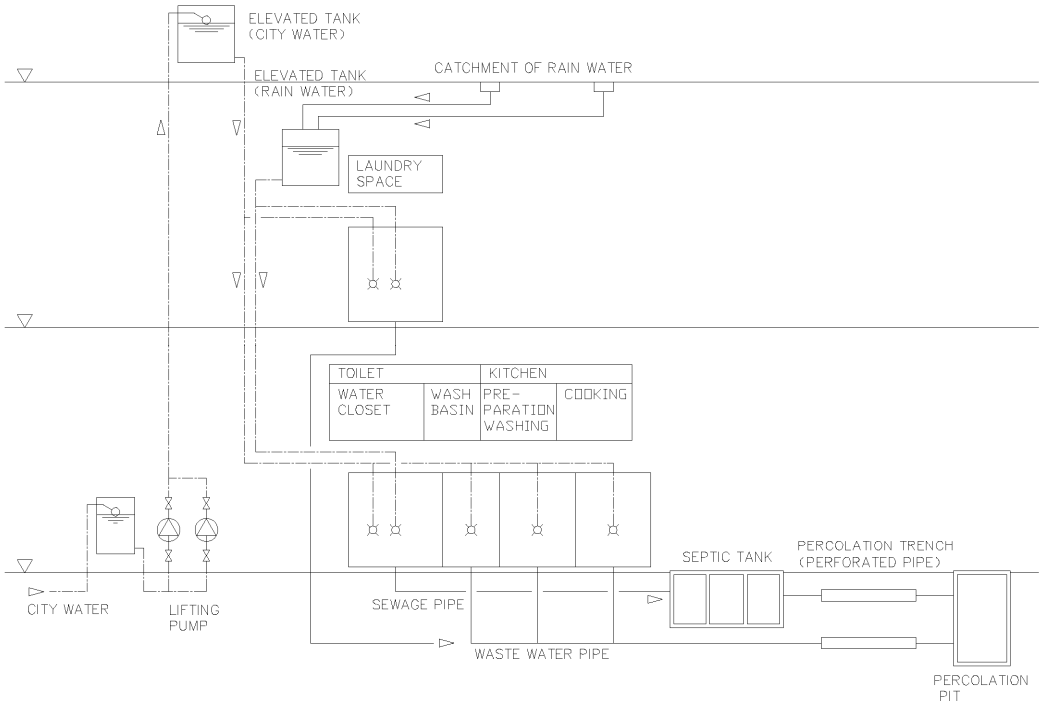


Figure2-3 Plan for water supply and drainage system

(9) Material plan

The construction methods and materials will be planned with regard to cost reduction possibilities. The standard design of the DepED and AECID will be used as reference.

As already mentioned in the section plan, galvalume steel (55% Al-Zn alloy coated sheet steel) folded plates will be utilized as the roofing material. The galvalume steel plate was utilized in past Japanese Grant Aid projects in the Philippines, namely the Project for Constructing Primary and Secondary School Buildings (1988-1995) and the Project for Educational Facilities Improvement Program (1993-2005). It has proven its durability, requiring no maintenance for more than 20 years, and has gained the confidence of the DepED and Albay officials. For that reason, considering its durability and advantages for maintenance, galvalume will be used in the Project despite the fact that it is more costly than galvanized steel plate.

In addition, to promote cost reduction and an easily maintainable facility, the procurement of all materials will be from within the Philippines. The construction material for the Project is indicated in Table 2-25.

Table2-25 Comparison of DepED, AECID, and the Project by section

Item		DepED standard	AECID	The Project	Explanation of selection
Standard	Classroom size	7.0m×9.00m=63.0 ㎡	7.0m×9.00m=63.0 ㎡	7.00m×9.00m=63.0 ㎡	DepED standard
	Ceiling height	3.00m	2.80m	General floor 2.80m, Top floor 3.20m （average of gabled roof）	Cost reduction from 3.0 of DepED
Structure	Foundation	Individual footing	Individual footing	Individual footing	Local common method
	Floor	Slab-on-grade	Slab-on-grade	Slab-on-grade	Local common method
	Main structure	Reinforced concrete framed structure	Reinforced concrete framed structure	Reinforced concrete framed structure	Local common method
	Roofing structure	Steel frame truss	Concrete slab	Reinforced concrete (gabled framed roof)	To assure classroom space
	Roof shape	Gable roof	Flat roof + parapet	Gable roof	To prevent accumulation of volcanic ashes
	Structure module	7.00m×4.50m	7.00m×4.50m	7.00m×4.50m	Economical size
Interior finish	Roof	GI sheet (galvanized steel plate roofing)	Slab waterproofing	Galvalume steel folded plate roofing	Durability, weather resistance
	Exterior wall	Concrete block＋mortar＋paint	Concrete block＋mortar＋paint	Concrete block＋mortar ＋paint	Local common method
	Door	Wooden panel door	Steel panel door	Steel panel door	Crime prevention, weather resistance
	Window	Glass jalousie with aluminum flame	Hallway side : aluminum jalousie, Outer side: steel frame casement window	Hallway side : aluminum jalousie, Outer side : aluminum awning window	Ventilation during rain, rust prevention
	Hallway floor	cement rendering	cement rendering	cement rendering	Local common method
Interior finish	Floor	Cement rendering	Ceramic tiling	Ceramic tiling	Maintenance-free
	Wall	Mortar + paint	Mortar + paint	Mortar + paint	Local costomary method
	Ceiling	General floor :paint, Top floor : plywood + paint + thermal insulating material	Paint	General floor : paint, Top floor : gypsum board + Paint + thermal insulating material	Fire-preventive material, termite prevention
Movable partition		Plywood flush	Plywood flush	Plywood flush	Local standard
Blackboard		Plywood + blackboard paint	Plywood + blackboard paint	Plywood + blackboard paint	Local standard
Toilet	Floor	Tile	Tile	Tile	
	Toilet bowl	Western style low tank	Western style low tank	Asian style（western style for the disabled）	Sanitary and maintenance aspect
Electrical	Interior	Lighting, outlet	Lighting, outlet, ceiling fan, and generator	Lighting, outlet, ceiling fan, and generator	
	Exterior	Hallway lamp	Hallway lamp	Hallway lamp	

2-2-3 Outline Design Drawing

The list of drawings of each site is shown below. The drawings are attached at the end of the report.

-List of Drawings-

1. Site map of existing buildings (Libon Community College)
2. Site plan (Libon Community College)
3. Site map of existing buildings (Polangui North C/S)
4. Site plan (Polangui North C/S)
5. Site map of existing buildings (Oas South C/S)
6. Site plan (Oas South C/S)
7. Site map of existing buildings (Manito C/S)
8. Site plan (Manito C/S)
9. Site map of existing buildings (Sto. Domingo C/S)
10. Site plan (Sto. Domingo C/S)
11. Site map of existing buildings (Gogon C/S)
12. Site plan (Gogon C/S)
13. Two-story classrooms (Type 2-4A, 2-5A+O #1)
14. Two-story classrooms (Type 2-5A+O #2, 2-5A+O #3)
15. Two-story classrooms (Type 2-6A #1, 2-6A #2)
16. Two-story classrooms (Type 2-9A+O #1)
17. Two-story classrooms (Type 2-9A+O #2)
18. Two-story classrooms (Type 2-10A)
19. Three-story classrooms (Type 3-9A)
20. Three-story classrooms (Type 3-11A+O)
21. Water Supply Block (Type KT#1, KT#2)
22. Water Supply Block (Type KT#3, KT#4)

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

The official implementation of the Project will take place after approval by the Government of Japan (hereinafter referred to as "the GOJ"), followed by the signing of the E/N and Grant Agreement (G/A). After the signing of the E/N and G/A, the Japanese Consultant (hereinafter referred to as "the Consultant") will make an agreement for the Detailed Design and construction supervision work with the Province, which will act as the responsible and implementing agency for the Project. Subsequently, the Consultant will draw up the Detailed Design based on the Draft Design, and assist the Province on tendering and contract works.

The construction supervision will be executed through discussions with the Albay side, in order to implement smooth construction with a minimum of delay. The existing electric power will be utilized as the temporary power supply for the construction, but the permanent electricity supply for the new facility, to be undertaken by the Albay side, should be supplied before the completion of construction. The variety of construction materials will be kept to a minimum in order to enable rapid procurement. Furthermore, material and personnel will be used as efficiently as possible in order to determine an implementation plan that will minimize delays or stand by time.

The implementation plan of the Project will be set according to the following principals and policies.

(1) Principals for the implementation of the Project

After the cabinet approval by the GOJ, followed by the signing of the E/N and G/A, the Project will be implemented according to the following principals.

1) In principal, the Japanese commitment of the Project will be funded by the taxes collected from the Japanese people, and implemented under the budgetary system of Japan.
2) For the implementation of the Project, the Province will make an agreement with the Japanese Consultant to entrust the Detailed Design, assistance with contractor selection, and supervision based on this preparatory survey.
3) With the assistance of the above-mentioned Consultant, the Province will implement general tender with prequalification, select a Japanese contractor, and make a lump-sum contract for the construction of the Project.

(2) Policies for construction planning

1) For effective implementation including consideration of the local conditions and technology transfer to the local contractors, the Project will maximize the employment of local consultants as well as local contractors who are familiar with local construction matters.
2) The Project will give full attention to safety control, quality control, and schedule control, and utilize the skills of the Japanese contractor.
3) The security and theft prevention within the construction site for the overall construction work will be sufficiently considered.
4) Collaboration between the Japanese contractor and the local sub-contractor is essential for effective implementation of construction. Therefore, for smooth site management, demarcation of the responsibilities between the Japanese contractor and the local sub-contractor will be clearly defined, and appropriate disposition of personnel will be organized.

2-2-4-2 Implementation Conditions

The successful implementation of the construction to be undertaken by the Philippine (Albay) side is indispensable for the successful implementation of the Project as a whole. In order to assure the clearance of the construction sites by the Albay side, a detailed construction schedule will be discussed between the Japanese side and the personnel from APSEMO and the PEO.

Furthermore, it is essential to work toward completion according to the construction schedule, by setting the schedule for procurement and transportation, with special consideration to the period of time necessary for procurement in order to prevent any delays. In addition to the above mentioned aspects, further points to be considered for the Project are listed below.

① The construction plan will be determined in view of the peculiarities of each site, such as varying size, shape, condition of the adjacent road, and location of the school gate in relation to the construction site.
② Since the construction will be either an extension or reconstruction in the existing school sites, safety measures will be taken by separating the traffic related to construction and that of the school, and by separating the entrances as much as possible.
③ The storage yard as well as the processing base for materials for LICOM and Oas South C/S will consider using land outside of the construction sites due to limited

space within the sites.

④ For material which is to be procured from a distant city such as Manila, the confirmation of the procurement schedule and stock quantity as well as quality warrant should be assured in accordance with the construction plan.

2-2-4-3 Scope of Works

The demarcations between the Japanese side and the Philippine side in the Project are as follows.

(1) Construction to be implemented by the Japanese side

① Construction of the facilities in the Project (6 evacuation shelters at the selected sites)

(2) Construction and procurement to be undertaken by the Philippine side

① Acquisition of the construction sites
② Leveling and developing the land
③ Dismantling and clearing obstacles at the construction sites (including underground obstacles)
④ Arrangement for a storage yard for construction material
⑤ Application for and supply of temporary electricity
⑥ Installation of permanent electricity and city water connections
⑦ Establishment of connection from the percolation pit to the drainage main
⑧ Procurement of furniture and materials
⑨ Procurement of fire extinguishers

2-2-4-4 Construction Supervision Plan

The Project involves a large-scale construction in a limited period of time, at 6 separate sites which are spread out throughout the Province. Thus, close coordination and discussion with the implementing agencies as well as appropriate instruction and direction to the contractor are necessary. That being the case, the supervision of the Project will be put into practice using a two-fold system of general supervision and resident supervision.

(1) General supervision in Japan

To supervise the overall construction process, a Japanese consultant with relevant supervising experience will collaborate with the Japanese architect in charge of the Detailed

Design of the Project. In other words, the Japanese consultant will be responsible for the overall technical decisions including the issues outside of the resident supervisor's field, advising the resident supervisor, and submitting monthly reports to JICA headquarters.

(2) Supervision in the Philippines

A Japanese architect with relevant supervising experience will be stationed in the Province and work with a local engineer to supervise the construction. To be specific, the resident supervisor will supervise the construction schedule, examine and direct the production of the working drawings and instructions regarding work procedures, approve the construction materials, give technical advice to the contractor, implement the interim inspection and final inspection, produce monthly reports, and report regularly to the responsible agency as well as the implementing agency of the Albay side.

The resident supervision office will be set up in Legazpi City, and the resident supervisor will report the progress regularly to the JICA Philippine Office and the Embassy of Japan.

In addition to the above-mentioned supervision, engineers specializing in architectural, structural, mechanical and electrical fields will visit the Project sites for spot supervision, to support the resident supervisor.

2-2-4-5 Quality Control Plan

In compliance with the supervision plan and the drawings and specifications, an examination of the implementation plan, shop drawings, and samples, as well as the execution of various inspections and site visits will be carried out. The items of quality control at the structural work stage are as indicated in Table 2-26.

Table2-26 Principal quality control items during the structural work stage

Construction type	Items	Inspection method	Frequency
Earth work	Confirmation of finished grade	Visual inspection	At the completion of excavation
Reinforcement work, Form work	Reinforcing bar material	Checking mill sheets & tensile strength test	Per lot, per size
	Bar arrangement	Bar arrangement inspection	Before casting concrete
	Form	Form work inspection	Before casting concrete
Concrete work	Material	Cement: test result Aggregate: sieve analysis Water: quality analysis	At the time of mixing design
	Trial mixing	Performance test	Per concrete type
	Casting	Slump, temperature, amount of air, chloride	Per spot
	Strength	Compression test for test pieces	Per spot
Concrete block work	Material	Plant inspection (cement, aggregate, water, operation competence, etc.)	Per plant
	Concrete block	Compression test	Per plant
Steel work	Steel material	Product quality check	At the completion of steel framing

The strength check inspection for the concrete and concrete blocks (CB) is to be done at the PEO office. Taking into consideration the construction scale and distance from the batching plants, concrete will be mixed at the sites, and after test pieces are cured in a water tank, they will be transported to the PEO office for a compression test.

Until now, the tensile strength test for reinforcing bars was performed in Manila. However, since the PEO office is supposed to acquire an inspection device in 2011, if the installation of that device is completed in time, the test will be manageable within Albay Province.

2-2-4-6 Procurement Plan

The majority of the construction materials to be used in the Project are domestic products. Furthermore, since all of the materials, including imports, are widely distributed throughout the Province, there is no concern about procurement. In case particular items are out of stock, they could easily be procured by land from Metropolitan Manila. For the selection of material, comparisons of costs will be prioritized, followed by the quality and supply capacity, accuracy of delivery date, and future ease of maintenance.

The material intended to be utilized in the Project based on the Site Survey is listed in Table 2-27.

Table2-27 List of material to be locally procured

Items	Domestic	Import	Original country
Architectural material			
Portland cement	○		
Plaster	○		
Concrete aggregate	○		
Deformed steel bar	○		
Steel	○		
Form material	○		
Concrete block	○		
Galvalume steel plate for roof	○		
Ceramic tile	○	○	China
Wood	○		
Stainless steel	○		
Steel door and window	○		
Aluminum door and window	○		
Glass material	○		
Paint and coating material	○	○	China
Material for electrical work			
Electrical Panel	○	○	China, South Korea
Cable and wire	○	○	China
Lighting fixture	○	○	China
Communication device	○		
Generator	○		
Material for plumbing work			
Galvanized steel pipe	○		
Valve	○		
PVC pipe	○		
Sanitary ware	○	○	China
Water pump	○	○	China, Italy
Elevated water tank	○	○	China

2-2-4-7 Operational Guidance Plan

The generators to be equipped in the Project will be utilized in case of blackouts during evacuation. Because such equipment must be functional whenever the need arises, its daily maintenance is extremely significant. However, it would be difficult to include its maintenance as an additional duty of the schools, since the generators will not be utilized in normal times. Therefore, the municipalities/city shall be responsible for its maintenance and inspection budget, under the supervision of APSEMO.

Respecting the above-mentioned situation, seminars concerning the operation and maintenance of generators will be held by a Japanese expert. The contents of the seminar are as follows:

① Distribution of manuals
② Instructions for the operation of generators
③ Instructions concerning maintenance (regular test operation, procurement/ transportation/storage of the fuel, etc.)
④ Assignment of the person in charge at each site

2-2-4-8 Implementation Schedule

The implementation schedule of the Project presupposes smooth implementation of construction and application procedures by both the Japanese side and the Philippine side without delay, following the mechanism of the Japanese Grant Aid. After the Exchange of Notes (E/N) and the Grant Agreement (G/A) between the two countries have been concluded, the implementation will be carried out in 3 stages; Detailed Design, Tender/Contract, and Construction/Procurement.

(1) Detailed Design stage

Based on the Draft Design, the Consultant will plan the Detailed Design consisting of the drawings, specifications, and bill of quantities. During this stage, the Consultant will make arrangements at the proper time and obtain the approval for the final tender documents by the Albay side before going on to the tender stage. The Detailed Design stage is estimated to take three months.

(2) Tender and contract stage

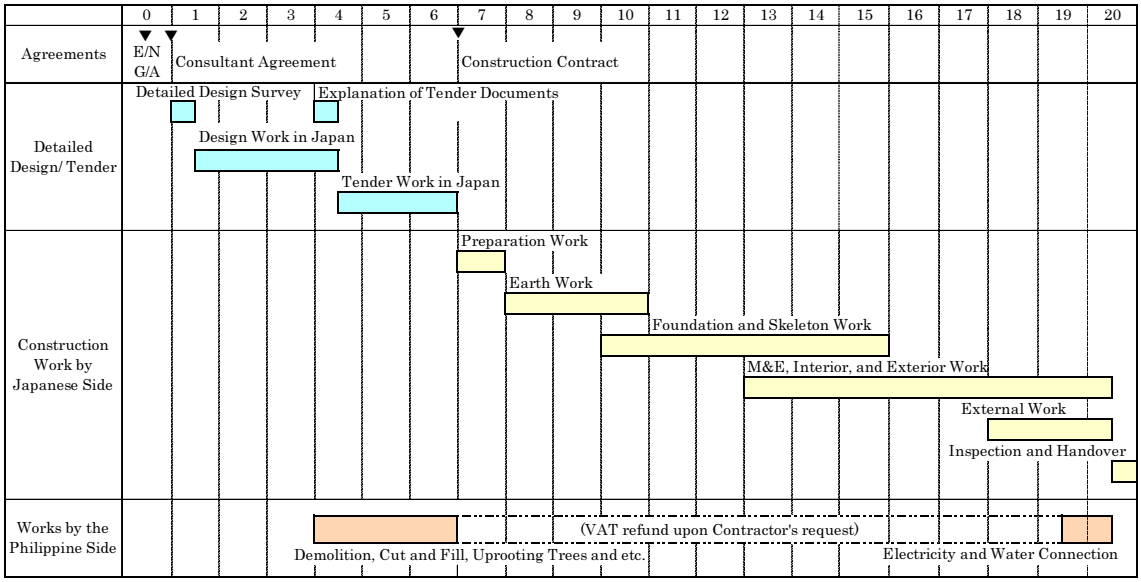
After the Detailed Design stage, pre-qualification screening for the tender will take place in Japan. Based on the results, the Province will invite the participating contractors and carry out the tender in the presence of the people concerned. The bidder who proposes the lowest price will be the successful bidder, and enter into a construction contract with Albay Province. The time period necessary for the tender stage is estimated to be two months.

(3) Construction stage

After the verification of the construction contract by the GOJ, construction will commence. With the presupposition that the construction to be undertaken by the Philippine side is completed smoothly, the construction stage is estimated to take 14 months.

The implementation schedule is indicated in Table 2-28.

Table2-28 Implementation Schedule



2-3 Obligations of the Recipient Country

The Japanese Grant Aid is based on the policy of supporting the effort of the recipient country. For that reason, not only the GOJ, but the recipient government is expected to undertake adequate responsibilities for the realization of the Project. This policy will be equally applied to all recipient countries under the Japanese Grant Aid scheme. Therefore, in the case that the implementation of the Project is officially decided, the Philippine side shall take the following measures.

2-3-1 Measures concerning Various Agreements

(1) According to banking arrangements with a bank based in Japan, the recipient side should pay the necessary handling charge for the issuance of Authorization to Pay (A/P) and the bank commission.

(2) The Philippine side shall exempt all companies, organizations, and individuals from any customs duties, internal taxes and levies with respect to the supplies, products, and services under the contracts of the Project.

(3) The Philippine side shall take measures to authorize all individual's entry into the country and staying therein according to the contracts of the Project.

2-3-2 Measures to be Undertaken for the Implementation of Construction

The Philippine side should take the following measures to support smooth implementation of construction.

(1) To prepare the necessary land for the Project and to provide a copy of the land ownership or lease certificates.
(2) To implement cutting and filling, and to remove the below-mentioned obstacles within the construction sites:
   1) LICOM: dismantlement of the old residences of the inhabitants, clearance of iron fencing, concrete blocks, uprooting the trees, and concrete paving of the approach
   2) Polangui North C/S: cutting, dismantlement of the unusable Gabaldon building and the concrete stage, concrete paving of the approach and pathways within the site
   3) Oas South C/S: dismantlement of the decrepit classrooms and stage, clearance of the concrete slab, uprooting the trees, concrete paving of the courtyard and pathways within the site
   4) Manito: cutting and filling, concrete paving of the approach
   5) Sto. Domingo C/S: cutting and filling, dismantlement of the foundation and the concrete columns of the decrepit building, and removal of swings, horizontal bars, and slide, concrete paving of the approach and pathways within the site
   6) Gogon C/S: dismantlement of the decrepit classroom, uprooting the pine trees, concrete paving of the approach
(3) To acquire the building permit. The PEO is responsible for this matter, including the application fee charged by the Local Government Units (hereinafter referred to as the "LGUs").
(4) To prepare space for a temporary office and storage yard in a place as near as possible to the site, and to offer the space to the contractor free of charge during the construction period.
(5) To provide the connection for electricity, waterworks, telephone lines, and other installations necessary for the new facilities.
(6) To furnish one fire extinguisher for each classroom, office and kitchen (both preparing space and cooking space).

2-3-3 Measures for the Maintenance and Operation of the New Facilities

(1) The Philippine side is expected to secure the budget and personnel for the maintenance and

operation of the new facilities, so that the new facilities will be effectively utilized.

(2) The Philippine side is responsible for the procurement of furniture and equipment required for the operation of the facility.

(3) The Philippine side shall draw out a medium and long-term evacuation manual regarding the relation between volcanic eruption and Sto. Domingo C/S as well as Gogon C/S, and regularly implement maintenance and cleaning of the banks and riverbeds of Basud River and Yawa River.

(4) Gogon C/S and Manito C/S, which have been decided to implement joint operation with the adjoining schools, shall conclude a respective agreement regarding joint operation after the E/N.

2-4 Project Operation Plan

2-4-1 Operation Plan

2-4-1-1 Operation of the Facility

(1) Operations in normal times

The facilities will be constructed within the sites of selected educational institutions. Thus, the facility will be operated as an elementary school or a community college during normal times. At the 5 public elementary schools, school operation will be executed by the principal, under the supervision of the DepED division offices[4]. In addition, one of the teachers is assigned as the physical facility officer at each school, to look after the facility condition. LICOM, which is a municipal institution, is operated by the college administrator and the dean under the supervision of the municipality.

(2) Operations during evacuation

1) Operation

When the facilities are utilized as an evacuation shelter during emergencies, the School Disaster Preparedness Committee will lead the operation with the collaboration of the municipal officers and the concerned barangays. The roles of the key personnel are as follows.

① School Disaster Preparedness Committee

- Under the direction of the Camp Chief[5], teachers will assign rooms, and make a

[4] Gogon C/S belongs to the Legazpi City Division, and the other 4 schools belong to Albay Division.

[5] In general, the principal will preside as Camp Chief, but in the absence of the principal, the Officer in Charge (OIC) or the deputy teacher will take the lead.

master list of evacuees.

- The Camp Chief will preside over the operation, and manage the activities at the evacuation shelter.

② Municipal officers

- Several officers from the Municipal Social Welfare and Development (MSWD) division will be stationed at the shelter during evacuation for management and distribution of relief goods.
- The health officers and medical staff will take charge of health care and medical check-up.

③ Barangay

- The first day's meals at the shelter will be covered by the calamity funds[6] of the barangays[7].
- Barangay captains will visit the shelter every day to collaborate with the School Disaster Preparedness Committee and the municipal officers to ensure smooth operation[8].
- The Barangay Police will collaborate with the PNP to maintain peace and order at the shelter.

2) Life at the evacuation shelter

Unlike schools, evacuation shelters are utilized by people of all ages as a common facility. Therefore, there are particular rules such as curfews, no drinking, and no smoking. Furthermore, those who need special care (sick persons, pregnant women, and babies), are placed in special rooms so that they can stay in their rooms undisturbed, throughout the day.

When evacuation becomes long-term, various activities are carried out at the evacuation shelter in addition to the daily routines such as laundry and cooking. These activities are mainly hosted by the Province, municipality, or NGOs and organized by the Camp Chief. The principal activities are as listed below.

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[6] The LGUs and provinces are obliged to put aside 5% of their budget (general fund) as a "calamity fund" for emergency use. Based on the Philippine Disaster Risk Reduction and Management Act of 2010, the fund has been renamed to "Disaster Risk Reduction and Management Fund", and the usage of up to 70% of the fund for pre-disaster operation has been authorized.

[7] From the second day, food will be supplied by the Municipal Disaster Coordinating Council (MDCC), City Disaster Coordinating Council (CDCC), Provincial Disaster Coordinating Council (PDCC), or NGOs.

[8] Barangay captains submit the evacuee list to the municipality, maintain cleanliness, and look after the health condition of the villagers.

① Recreations (games, movies, and singing contests)
② Seminars (disaster preparedness, reproductive health, nutrition, livestock)
③ Medical check-up
④ Handicraft (for income)

3) Class / lecture

Generally, for short-term evacuations due to typhoons or flooding, classes are cancelled while the schools are utilized as evacuation shelters. However, volcanic eruptions cause long-term evacuations from 2 weeks to several months. In such cases, "emergency classes" are carried out at elementary schools. Emergency classes are double-shift lessons where the original pupils are taught in the morning, and the evacuated pupils from other schools are taught by their own teachers in the afternoon.

Since high school students usually commute further than elementary school pupils, they will commute to their schools from the evacuation shelter when their regular schools are located outside the danger zone or affected areas. Yet, when the high schools are situated within the danger zone, measures will be taken to temporally transfer the students into other high schools during evacuation.

The same can be said about community colleges, where lectures will be canceled if the classrooms are to be utilized as evacuation shelters. Owing to the fact that Libon has not experienced an evacuation caused by a volcanic eruption, there are no specific plans for emergency classes at LICOM at the moment. Be that as it may, lectures are given on disaster preparedness so that the students are capable of assisting the operation of the evacuation shelter in times of calamities.

2-4-1-2 Electricity, Water, and Telephone Expenses

During normal times and short-term evacuation, the bills for electricity, water, and telephone are covered by the MOOE allocated to each school. Yet, when the expenses swell up due to long-term evacuation, the school is entitled to request financial support from the MDCC or CDCC. Moreover, if the municipality or city has difficulty taking over the full cost, it is possible to request assistance from the PDCC.

2-4-1-3 Need for Additional Teachers and Staffs

Although five of the six selected sites are relatively large-scale central elementary schools, there has not been much of a increase in pupils in recent years. For Polangui N. C/S and Oas S.

C/S, there is no need for additional teachers, since the construction is limited to the reconstruction of unusable dilapidated classrooms. For Manito C/S, Sto. Domingo C/S and Gogon C/S, several supplementary teachers are necessary due to the construction of additional classrooms. As for LICOM, which is planning to open several new courses in the coming years and therefore large-scale expansion is expected, there is a necessity for supplementary staff, including the teaching staff for the new courses[9].

The estimated numbers of additional staff to be required in each school by 2013 are as indicated below.

Table2-29 Additional teachers / staffs to be employed due to increase of classrooms

	Number of classes*	Number of usable classrooms after the Project	Increase in number of school personnel**
LICOM		33	**27**
Polangui North C/S	31	27	**0**
Oas South C/S	25	21	**0**
Manito C/S	27	29	**2**
Sto. Domingo C/S	35	41	**6**
Gogon C/S	26	29	**3**

* Kindergarten will be counted as 1 class for 2 classes (50 pupils), since the curriculum is half-day

** Instead of increase in classes, subject teachers have been taken into consideration for LICOM

2-4-2 Maintenance

In general, the facilities to be constructed as part of the Project are designed to require minimum maintenance and make use of locally procurable materials. Be that as it may, the school personnel should acknowledge the necessity of regular inspections and make efforts to implement proper maintenance. Moreover, special facilities which are not used during normal times such as the generator, shower room, kitchen, and laundry spaces, should be maintained properly to be prepared for emergency use. Even so, because the maintenance of special facilities requires additional duties and expenses, making it difficult for the school to cover the cost, the MDCC/CDCC and the PDCC is expected to collaborate with school personnel for effective maintenance.

The maintenance plan for the Project is as follows.

[9] According to the LICOM plan, 4-year courses for Pre-school Education and Secondary Education will be opened by 2013. In addition, the 2-year Entrepreneurship course will be replaced by a 4-year ladderized course with Bicol University.

2-4-2-1 Maintenance Cost

Public elementary schools receive MOOE (PHP207.00 per pupil) from the DepED division offices[10]. Also, based on the needs of each school, financial assistance from the SEF may be allocated for repair works by the LGUs. Since the principals at the selected sites are entrusted to operate a central school, their abilities are presumed to be adequate for the management and application of the above-mentioned budgets.

LICOM is run by the municipality, and its maintenance is shouldered likewise. According to the tendency of the past several years, the maintenance budget has been increased in proportion to the expansion of facilities and students. The Mayor is supportive of the development of the only institution for higher education in the municipality, and the establishment of new courses is promoted. For that reason, sufficient allocation of LICOM's maintenance budget is presumed to be achievable without hardship.

Furthermore, the Implementing Agencies have reassured their commitment and arrangement of the MOOE for the new facilities to be built as part of the Project. The contents of the received letters are as follows.

① DepED Albay Division

"・・・Should the construction of Typhoon and Earthquake Proof JICA Emergency Facilities in the Division of Albay will materialize, allocation of MOOE to the recipient schools will be increased to ensure that the facilities will be properly maintained and taken care of periodically."

② DepED Legazpi City Division

"As school principal of Gogon C/S and in behalf of our School Governing Council, this agreement letter is binding for these conditions: There is Budget Allocation for the Operation and Maintenance of the JICA building upon turn-over to Gogon C/S, That lighting facilities or the like as fuel for generator will be available, That maintenance of the building will be our foremost concern."

③ Libon municipality

"・・・The Local Government Unit of Libon will increase the budget appropriation for the MOOE of the Libon Community College if and when the construction of the 20 classrooms cum evacuation center project of JICA will materialize."

[10] The annual MOOE amount is calculated according to the number of pupils (×PhP207.00), but the actual allocation is divided into 12 months, and requires monthly application. The MOOE covers all the regular maintenance and operation expenses except for personnel cost, including electricity, water, and telephone bills.

2-4-2-2 Daily Maintenance and Cleaning

In elementary schools, the pupils (weekly assigned "daily sweepers") will take turns cleaning the classrooms, and the janitor is in charge of the common space. For the kindergartners, daily sweepers' mothers assist their children. In some schools, the PTCA members voluntarily take charge of clean-up activities on Saturdays. Regarding the cleaning practice and voluntary approach of the parents, the daily maintenance at the elementary schools is assured and durable.

At LICOM, there are two janitors employed by the municipality who are in charge of the upkeep of the facilities. In addition, a few students work as part-time cleaning assistants to assist the janitors with daily cleaning.

2-4-2-3 Repair Costs

In case the school buildings are damaged by disasters, the cost for repair works is expected to be shouldered by DepED Central Office and not by the Province. However, it is difficult to cover the costs of all the damaged schools at once, so repair costs are occasionally covered by the SEF from the LGUs.

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

The breakdown of the cost to be borne by the Philippine (Albay) side based on the allocation of works between the two countries is estimated as follows in accordance with the conditions described in (2) on the following page.

(1) Cost of the Philippine (Albay) side PHP36,592,700（approx. 73.3 million yen）

Table2-30 Breakdown of the Philippine (Albay) cost

Item	Amount (thousand PHP)	Japanese conversion (thousand yen)
Demolition of existing facilities	3,283.0	6,572.6
Cutting and filling	336.0	672.7
Concrete paving	1,705.0	3,413.4
Electricity connection	42.0	84.1
Telephone connection	5.0	10.0
Water connection	140.0	280.3
Fire extinguisher	155.2	310.7
VAT	30,540.5	61,142.1
Bank commission	386.0	772.7
Total	36,592.7	73,258.6

(2) Conditions of cost estimation

① Time of Estimation ：August, 2010
② Exchange rates ：1 US$ =91.76 yen, 1 local currency（PHP）=2.002 yen
③ Construction period：The construction period is as indicated in the implementation schedule.
④ Others ：Estimation will be executed following the Japanese Grant Aid system.

2-5-2 Operation and Maintenance Cost

2-5-2-1 Normal Times (educational facility)

(1) Salaries

Due to the expansion of the facilities, needs for additional personnel costs arise in 4 sites (see Table 2-29, p.2-48). The increase of salaries for additional employment is demonstrated below.

Table2-31 Increase in salaries for additional employment (PHP)

Site	Employment Type	Intake	Average annual salary	Additional cost (annual)	Covered by
LICOM	Teaching staff	23	61,000	1,403,000	Libon
	Non-teaching staff	4	46,000	184,000	Libon
Manito C/S	Teacher	2	247,000	494,000	DepED
Sto. Domingo C/S	Teacher	6	247,000	1,482,000	DepED
Gogon C/S	Teacher	3	247,000	741,000	DepED
TOTAL		38		4,304,000	

(2) Water and electricity costs

The increase in water and electricity costs for the Project due to the expansion of the facilities is indicated below.

Table2-32 Water and electricity cost for the new facility

Item	Monthly cost（PHP）	Annual cost（PHP）
Electricity bill	100,000	1,200,000
Water bill	42,000	504,000
TOTAL	142,000	1,704,000

(3) Maintenance cost

The facilities planed in the Project are presumed to require no maintenance for the first several years after the handover. However, repainting expenses will be required after several years. The assumed frequency and expense is shown below.

Table2-33 Maintenance cost of the Project sites

Item		Frequency	Annual expense (PHP)
Repainting	Interior/exterior wall, ceiling	Once every 5 years	1,500,000
	Fittings	Once every 5 years	40,000
Removal of sludge in the septic tank		Once every 3 years	10,000
TOTAL			1,550,000

2-5-2-2 During Calamity (evacuation shelter)

(1) Personnel costs

The personnel responsible for the operation of evacuation shelters are school teachers,

municipality staff, and APSEMO officers. Since these personnel are generally performing their given tasks during emergency evacuations, additional personnel costs are not anticipated.

(2) Water and electricity costs

When utilized day and night as an evacuation shelter, the hours of operation will vastly increase, automatically raising the costs for water and electricity. Also, the unavoidable use of generators will require fuel oil, especially when the electricity supply is stopped due to massive typhoons[11].

Furthermore, unlike typhoons which only last for several days, long-term evacuations are foreseen for volcanic eruptions. Seeing that the increase in water and electricity expenses will largely differ depending on the type of disasters, the monthly estimated costs will be demonstrated separately for typhoons and volcanic eruptions.

Table2-34 Increase in water and electricity cost due to volcanic eruption

<evacuation: 1 month>

Item	Monthly cost（PHP）
Electricity charge	400,000
Water charge	110,000
TOTAL	510,000
Difference compared to normal times	368,000

Table2-35 Increase in water and electricity cost due to typhoon

<evacuation: 3 days (the rest will be normal operation as schools）>

Item	Monthly cost（PHP）
Electricity charge	100,000
Water charge	55,000
Fuel (generator)	34,000
TOTAL	189,000
Difference compared to normal times	47,000

2-6 Other Relevant Issues

Owing to the fact that the VAT of the Project will be shouldered by the Province, which is a local government, attention should be paid for the smooth execution of exemption measures. Coordination with the Province is important, in order to implement necessary procedures at relevant time.

[11] In addition to blackouts, electricity will be deliberately stopped when the typhoon warning signal is 3 or higher.

Chapter 3 Project Evaluation

Chapter 3 Project Evaluation

3-1 Recommendations

3-1-1 Prerequisite Conditions for the Implementation of the Project

(1) The sites necessary for construction are prepared by the Philippine side, and a copy of the land ownership or lease certificates are submitted.
(2) The uprooting of existing trees and the demolition of existing facilities as well as ground leveling is implemented, before the commencement of construction by the Japanese side.
(3) VAT is borne by the Albay side, so that the customs duties and taxes concerned with the Project will be exempted.

3-1-2 Prerequisite and External Conditions for the Achievement of the Overall Project

The conditions listed below are prerequisite and external conditions that cannot be controlled by the Project, although they are essential for the effectuation and endurance of the effects of the Project.

(1) There is no modification to the principals and implementation of the “Strategic National Action Plan 2009-2019” and the Master Plan.
(2) The Disaster Coordinating Councils of all levels and schools concerned with the operation of the evacuation shelters are operational without disorder.
(3) The maintenance and operation of the facilities in normal times is implemented without any problem.

3-2 Project Evaluation

3-2-1 Relevance

The Project proves to be adequate for the Japanese Grant Aid, due to the justifications mentioned below.

(1) The beneficiaries of the Project are normal citizens such as school teachers, pupils/students, and evacuees.
(2) The project objective is to improve the evacuation environment of the surrounding

inhabitants in times of calamities, which correspond to the purpose of the Japanese Grant Aid, such as "Basic Human Needs" and "Stabilization of the People's Livelihood".

(3) The maintenance and operations of the target schools do not require high skills, and are feasible with the resource, personnel, and skills within the Philippines.

(4) The Project is projected to contribute to the achievement of the objectives of the "Strategic National Action Plan 2009-2019" of the Philippines and the Master Plan of the Province.

(5) The Project does not involve any revenue.

(6) There is hardly any negative influence on the environmental and social aspects by the implementation of the Project.

(7) The implementation of the Project is practicable without difficulties, by the Japanese Grant Aid Scheme.

(8) In addition to the Grant Aid in DRR sector that began in 1972, Japan has constantly provided assistance to the Philippines where the natural/disaster environments are similar, through Development Survey, Technical Assistance, etc., regarding post-disaster recovery and DRR planning, and has superiority over the DRR sector.

3-2-2 Effectiveness

The expected results by the implementation of the Project is as indicated below.

(1) Quantitative results

Table3-1 Indicators and numerical targets of the Quantitative results

Indicators	Basis (2010)	Target (2013)
The accommodation capacity of the evacuation shelter	4,040 evacuees	7,200 evacuees
Congestion per room during evacuation (average)	94 persons	53 persons
The number of evacuees per toilet (average)	55 persons	26 persons
Number of classrooms which meet the standard size and is usable as evacuation shelters	101 rooms	180 rooms

(2) Qualitative results

1) By construction of evacuation shelters with special facilities, the awareness of the inhabitants of the evacuation area toward DRR will rise, and the surrounding inhabitants will be more affirmative toward the use of evacuation shelters.

2) By establishing toilets, shower rooms, laundry spaces, and hand-wash basins, the hygienic conditions of the evacuation shelters will be improved.
3) The awareness of the school personnel, pupils, and students toward DRR will rise at the schools of the Project sites.
4) Due to enhancement of school facilities, enrolment and persistence in schools will be promoted, and the local education standard will make progress.

Appendices 1

I. Member List of the Study Team

(1) Field Survey I (Republic of the Philippines) August 1-28, 2010

Name	Assignment(s)	Organization
Mr. Masafumi Nagaishi	Team Leader	JICA Philippine Office
Mr. Chiaki Kobayashi	Project Planning	Disaster Management Division I, Water Resource and Disaster Management Group, Global Environment Department, JICA
Mr. Hisafumi Michikawa	Chief Consultant/Architectural Planning/Operation and Maintenance Planning	Mohri, Architect & Associates, Inc.
Mr. Nobuhiro Mohri	Architectural Design	Mohri, Architect & Associates, Inc.
Mr. Shinichi Yamamoto	Facility Planning	Mohri, Architect & Associates, Inc.
Mr. Ryo Miyazaki	Disaster and Natural Condition Survey	OYO International Corporation
Mr. Yoshiaki Ichibagase	Construction Planniing/Procurement Planning/Cost Estimation	Mohri, Architect & Associates, Inc.
Ms. Yukiko Okada	Coordinator/Educational Planning/Operation and Maintenance Planning Assistant	Mohri, Architect & Associates, Inc.

(2) Field Survey II Philippines (Republic of the Philippines) February 18-27, 2011

Name	Assignment(s)	Organization
Mr. Kazuhiko Ueno	Team Leader	JICA Philippine Office
Mr. Kenji Tanaka	Project Planning	Disaster Management Division I, Water Resource and Disaster Management Group, Global Environment Department, JICA
Mr. Hisafumi Michikawa	Chief Consultant/Architectural Planning/Operation and Maintenance Planning	Mohri, Architect & Associates, Inc.
Mr. Nobuhiro Mohri	Architectural Design	Mohri, Architect & Associates, Inc.
Mr. Shinichi Yamamoto	Facility Planning	Mohri, Architect & Associates, Inc.
Ms. Yukiko Okada	Coordinator/Educational Planning/Operation and Maintenance Planning Assistant	Mohri, Architect & Associates, Inc.

II. Study Schedule

I. Field Survey I

date			(A) JICA Team Leader	(B) JICA Project Management	(a) Chief Consultant /Architectural Planning /Operation and Maintenance	(b) Architectural Design	(c) Facilities, M & E Planning	(d) Disaster/ Natural Condition	(e) Construction/ Procurement/ Cost Estimate	(f) Arrangement/ Education/Operation and Maintenance
			Masafumi NAGASHI	Chiaki KOBAYASHI	Hisafumi MICHIKWA	Nobuhiro MOHRI	Shinichi YAMAMOTO	Ryo MIYAZAKI	Yoshiaki ICHIBAGASE	Yukiko OKADA
			4days	11days	28days	22days	26days*	28days	22days	28days
1	1-Aug	Sun		Narita→Manila				Narita→Manila		Narita→Manila
2	2-Aug	Mon	Courtesy visits to JICA Philippine Office, Embassy of Japan, NEDA, and PHIVOLCS					Accompany (a)		Accompany (a)
3	3-Aug	Tue	Manila→Legazpi, Joint meeting on the Inception Report (Governor of Albay Province, APSEMO, PEO, DepED Albay Division, DepED Legazpi Division, MGB, AECID, and the principals of the proposed sites), Site visits, Visits to AECID sites				Narita→Manila	ditto		ditto
4	4-Aug	Wed	Courtesy visits to the PEO, NEDA Region 5, and Libon town hall, Site visits, consultation on the Minutes of Discussions				Survey in Manila	ditto		ditto
5	5-Aug	Thu	Signing of the Minutes of Discussion Legazpi→Manila	Accompanying the signing of the Minutes of Discussions, Site visits, Visits to AECID sites			ditto	ditto		ditto
6	6-Aug	Fri		Visits to PHIVOLCS Observatory, Interview at AECID Legazpi office			Survey on building codes	ditto		ditto
7	7-Aug	Sat		Legazpi→Manila	Data Analysis	Narita→Manila	ditto	ditto	Narita→Manila	ditto
8	8-Aug	Sun			Inner meeting, Data Analysis	Manila→Legazpi		Inner meeting, Data Analysis	Manila→Legazpi	Inner meeting, Data Analysis
9	9-Aug	Mon		Consultation with DepED on the VAT issue, Reports to JICA Philippine Office and the Embassy of Japan	Preparation for the Stakeholder meetings (SHM)	Preperation for the site surveys		Accompany (a)	Survey on construction, procurement, and cost estimate	Accompany (a)
10	10-Aug	Tue		Meetings at JICA	SHM (Libon)	Site Survey (Libon)		ditto	ditto	ditto
11	11-Aug	Wed		Manila→Narita	SHM (Polangui)	Site Survey (Polangui)		ditto	ditto	ditto
12	12-Aug	Thu			SHM (Oas)	Site Survey (Oas)		ditto	ditto	ditto
13	13-Aug	Fri			SHM (Manito)	Site Survey (Manito)		ditto	ditto	ditto
14	14-Aug	Sat			Data Analysis					
15	15-Aug	Sun			Data Analysis					
16	16-Aug	Mon			SHM (Sto. Domingo)	Site Survey (Sto. Domingo)		Accompany (a)	Procurement survey	Accompany (a)
17	17-Aug	Tue			SHM (Gogon)	Site Survey (Gogon)		Accompany (a)	ditto	Accompany (a)
18	18-Aug	Wed			Architectural Survey		Survey on Facilities and M & E	Disaster Survey	ditto	Education Survey
19	19-Aug	Thu			ditto	ditto	ditto	ditto	ditto	ditto
20	20-Aug	Fri			ditto	ditto	ditto	ditto	ditto	ditto
21	21-Aug	Sat			ditto	ditto	ditto	ditto	ditto	ditto
22	22-Aug	Sun			Data Analysis	Data Analysis	Legazpi→Manila	Data Analysis	Data Analysis	Data Analysis
23	23-Aug	Mon			Discussions with APSEMO, Additional survey		Facility planning survey	Disaster survey	Cost estimate survey	Accompany (a)
24	24-Aug	Tue			Signing of the Technical Notes		ditto	Legazpi→Manila	ditto	ditto
25	25-Aug	Wed			Additional survey	Legazpi→Manila	Contract for Natural condition surveys	Discussions at PHIVOLCS	ditto	ditto
26	26-Aug	Thu			Legazpi→Manila Architectural survey	Architectural survey	ditto	ditto	Legazpi→Manila	ditto
27	27-Aug	Fri			Reports to JICA Philippine Office and Embassy of Japan		ditto	Accompany (a)	Cost estimate survey	ditto
28	28-Aug	Sat			Manila→Narita					

*Yamamoto: 8/3 to 8/6 is voluntary reinforcement

II. Field Survey II

date			JICA Leader Ueno, Project Planning1 Tanaka, Project Planning 2 Catherin	(a) Chief Consultant	(b) Architectural Design	(c) Facility, M&E planning	(d) Arrange/Ed/M&O
				Hisafumi MICHIKAWA	Nobuhiro MOHRI	Shinichi YAMAMOTO	Yukiko Okada
			7days	10days	10days	10days	8days
1	18-Feb	Fri		Narita0930→1330Manila(JL741), additional survey			
2	19-Feb	Sat		additional survey			
3	20-Feb	Sun	Narita→Manila Internal meeting	Internal meeting	Manila0630→0730Legazpi(PR277)		Narita0930→1335Manila (PR431), Internal meeting
4	21-Feb	Mon	JICA /EOJ/NEDA/PHIVOLCS/MGB/DepED		Courtesy call to APSEMO, additional site surveys		acompany (a)
5	22-Feb	Tue	Manila0630→0730Legazpi, meeting w/APSEMO, Discussion on M/M, site visits (Libon, Polangui, Oas)		Discussion on M/M	additional survey	acompany (a)
6	23-Feb	Wed	Courtesy call to NEDA Region V, site visits (Sto. Domingo, Gogon), site visit (AECID building),			ditto	acompany (a)
7	24-Feb	Thu	Discussion with the Governor, site visit (Manito), DepED Albay Division Office, Discussion on M/M at APSEMO				acompany (a)
8	25-Feb	Fri	Legazpi→Manila, JICA/EOJ	Legazpi0800→0900Manila(PR278), additional survey			Legazpi→Manila1450→ 2010Narita(PR432)
9	26-Feb	Sat	Manila→Narita	additional survey			
10	27-Feb	Sun		Manila0910→1420Narita(JL 746)			

III. List of Parties Concerned in the Recipient Country

Province of Albay

Mr. Joey Salceda	Government of the Province of Albay	Governor
Mr. Cedric B. Daep	Albay Public Safety and Emergency Management Office	Department Head
Mr. Jukes Nunez	Albay Public Safety and Emergency Management Office	Special Operations Officer IV
Mr. Roderick P. Mlendoza	Albay Public Safety and Emergency Management Office	Planning Officer II
Mr. Dante B. Baclao	Provincial Engineering Office	Provincial Engineer
Mr. Joseph Paul Ronda	Provincial Engineering Office	Engineer III
Mr. Rommel M. Millena	Provincial Engineering Office	Engineering Assistant
Mr. Alfred A. Artiaga	Provincial Engineering Office	Architectural Assistant
Mr. Alain B. Mape	Provincial Health Office	Sanitary Engineer IV
Mr. Noel. P. Penarubia	Office of Provincial Fire Marshal	Deputy Provincial Fire Marshal
Mr. Joseph M. Martinez	Office of Provincial Fire Marshal	Chief of Fire Safety Enforcement
Mr. Jesus U. Reyes	Office of Provincial Fire Marshal	Chief of Operations

Department of Education (DepED)

Mr. Jesus L.R. Mateo	DepED	Assistant Secretary
Mr. Dexter N. Pante	DepED	Senior Education Specialist
Ms. Mariel C. Bayangos	DepED	Project Development Officer II
Ms. Alice I. Terrell	DepED Albay Division	School Division Superintendent
Mr. Edison L. Mallapre	DepED Albay Division	Chief of Physical Facilities Division
Ms. Aida Santos Noora	DepED Albay Division	Planning Officer II
Mr. Albert N. Bonagua	DepED Albay Division	Budget Officer designate
Mr. Alexander Z. Oloteo	DepED Albay Division	Administrative Aide
Ms. Zenaida Andes	DepED Albay Division Manito District	Public School District Supervisor
Mr. Epifano B. Buela	DepED Legazpi City Division	School Division Superintendent
Mr. Nicolas M. Revale	DepED Legazpi City Division	Public School District Supervisor
Mr. Vincent B. Bejo	DepED Legazpi City Division	Education Program Specialist I
Mr. Jean R. Baloloy	Sto. Domingo Central School	Principal II (former)
Ms. Aileen P. Manzenilla	Sto. Domingo Central School	Principal I (new)
Ms. Malve R. Serranilla	Oas South Central School	Pricipal I
Ms. Zenaida P. Ruivivar	Polangui North Central School	Principal II
Mr. Bayani L. Saez	Manito Central School	Principal II
Ms. Maria Cecilia Betiz	Gogon Central School	Officer in Charge

Philippine Institute of Volcanology and Seismology (PHIVOLCS)

Dr. Renato U. Solidum	Director
Dr. Bartolome C. Bautista	Deputy Director
Ms. Ma. Lynn Melosantos	Senior Science Research Specialist
Ms. Mabelline Cahulogan	Science Research Specialist I
Ms.Ma. Hannah Mirabueno	Science Research Specialist
Mr. Edwardo P. Laguerta	Senior Science Research Specialist
Ms. Ma. Antonia V. Bornas	Senior Science Research Specialist
Ms. Perla J. Delos Reyes	Supervising Science Research Specialist and Officer in Charge

National Economic and Development Authority (NEDA)

Mr. Joseph N. Y. Capistrano	NEDA	Supervising Economic Development Specialist
Ms. Rohna B. Caoli-Rodrigez	NEDA	Senior Economic Development Specialist
Ms. Loida G. Panopio	NEDA	Senior Economic Development Specialist
Mr. Joseph Paglingayen	NEDA	Senior Economic Development Specialist
Ms. Kathleen Virtusio	NEDA	Economic Development Specialist II
Mr. Orvhil Edcarson Cardenas	NEDA	Senior Economic Development Specialist
Ms. April M. Mendoza	NEDA	Senior Economic Development Specialist
Ms. Ameta B. Benjamin	NEDA	Chief Economic Development Specialist
Mr. Vziel T. Corcuera	NEDA	Economic Development Specialist I
Mr. Vykmon B. Gasco	NEDA	Economic Development Specialist II
Mr. Luis Banua	NEDA (Region 5)	Officer in Charge
Ms. Edna Cynthia S. Berces	NEDA (Region 5)	Chief Economic Development Specialist

Mines and Geosciences Bureau (MGB)

Mr. Sevillo David Jr.	Officer in Charge Chief, Lands Geology Division
Mr. Ramon D. Quebral	Geologist
Ms. Arlene E. Dayao	Supervising Geologist

City / Municipality

Ms. Galadin B. Rosal	Legazpi City	Mayor
Mr. Noel E. Rosal	Legazpi City	City Administrator
Mr. Felos B. Intia	Legazpi City Disaster Coodinating Council (CDCC)	CDCC Action Officer
Ms. Agnes P. Dycoco	Municipality of Libon	Mayor
Ms. Ela P. Pavilanido	Municipality of Libon	Chef of Staff
Ms. Jesusa C. Cambaling	Libon Community College	College Administrator
Mr. Edwin Villanueva	Libon Community College	Program Coordinator of Computer

		Hardware Services Course
Mr. Caesar S. Daep	Municipality of Manito	Mayor
Ms. Maria Loida D. Espinas	Municipality of Manito	Adiministration Aide IV
Ms. Myrwa S. Ferrer	Manito Municipal Social Welfare and Development (MSWD)	MSWD Officer
Mr. Roberto Alvarez	Municipality of Manito	Municipal Engineer
Mr. Arnold B. Calsina	Manito Municipality Disaster Coodinating Council (MDCC)	MDCC Action Officer
Ms. Hayne M. Baloloy	Manito Community College	Dean
Ms. Marjorie D. Paga	Manito Community College	Registrar
Mr. Saluador B. Ustsardante	Oas Municipality Disaster Coordinating Council (MDCC)	MDCC Action Officer
Mr. Norberto S. Sabaybay	Polangui Municipality Disaster Coordinating Council (MDCC)	MDCC Action Officer
Mr. Jesus B. Peralta	Municipality of Sto. Domingo	Municipal Engineer
Mr. Romeo Cabria	Municipality of Sto. Domingo	Chief of Planning and Development /MDCC Action Officer

Albay Electric Cooperative

Mr. Ramil R. Sanchez	Technical Service Department Manager

Legazpi City Water District

Mr. Nestor Y. Rico	Officer in charge of Technical Division

Office of Civil Defense

Ms. Emila Tadeo	Operation Director

Radio Station DZGB

Mr. Edgar Barrameda	Station Manager

Red Cross

Mr. Hilaru B. Andes	Administrator

Spanish Agency for International Development Cooperation (AECID)

Ms. Glena D. Drogo	Administration and Finance Officer

Embassy of Japan in the Republic of the Philippines

Mr. Hirosato Yoshino	Second Secretary

JICA Philippine Office

Mr. Masafumi Nagaishi	Senior Representative (former)
Mr. Kazuhiko Ueno	Senior Representative (new)
Mr. Naoto Kuwae	Representative
Ms. Yoko Nomura	Project Formulation Advisor (Disaster Management)
Mr. Hayato Nakamura	Project Formulation Advisor (Disaster Management)
Mr. Akihisa Okuda	JICA River Management Advisor
Ms. Catherine Palanca	Program Officer

IV. Minutes of Discussions

(1) Field Survey I

Minutes of Discussions
on
The Preparatory Survey
on
the Project for Evacuation Shelter Construction in Disaster Vulnerable Areas in Province of Albay, in the Republic of the Philippines

In response to a request from the Government of the Philippines (hereinafter referred to as "the GOP"), the Government of Japan (hereinafter referred to as "the GOJ") decided to conduct a Preparatory Survey on the Project for Evacuation Shelter Construction Project in Disaster Vulnerable Areas in Province of Albay (hereinafter referred to as "the Project") in the Republic of the Philippines (hereinafter referred to as "the Philippines") and entrusted the survey to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to the Philippines the Preparatory Survey Team (hereinafter referred to as "the Team"), which is headed by Mr. Masafumi Nagaishi, Senior Representative, JICA Philippines Office and is scheduled to stay in the country from 1st to 28th August 2010.

The Team held discussions with the concerned GOP officials and conducted a field survey at the study area. As a result of discussions and field survey, both parties confirmed the main items described in the attached sheets. The Team will proceed to further works and prepare the Preparatory Survey report.

Legazpi, 5th August, 2010

Mr. Masafumi Nagaishi	Mr. Joey Sarte Salceda
Leader	Governor
Preparatory Survey Team	Province of Albay
Japan International Cooperation Agency	The Republic of the Philippines

ATTACHMENT

1. Name of the Project

Both sides agreed to name the title of the Project as "The Project for Evacuation Shelter Construction in disaster vulnerable areas in Province of Albay"

2. Objective of the Project

Both side agreed that the objective of the Project is to construct emergency evacuation shelters with related facilities in project sites referred as 5. to mitigate the risks of damage from the disaster to protect lives and properties.

3. Responsible and Implementing Agency

The responsible agency for the Project is the Provincial government of Albay represented by Albay Pubic Safety and Emergency Management Office (APSEMO). As for the implementation phase, the implementing agencies are Department of Education (Legazpi City Division and Division of Albay), Municipality of Libon and Provincial Engineers Office of Albay. They are responsible for operation and maintenance of the facilities implemented by the Project after completion of the Project. The organization charts of responsible and implementing agencies are shown in **Annex-1**

4. Project Site

The Project site is located in the Province of Albay. The Project site is marked in the map shown in **Annex-2.**

5. Project Components

In the course of the discussions, the Project components were confirmed to construct evacuation shelters with related facilities in the following project sites.

The Team explained that the budget for the Project would be considered by the GOJ by evaluating result of the Preparatory Survey. Both sides agreed that the Project components as below would be prioritized and selected from the technical consideration as well as in accordance with the budget allocated for the Project.

Since there is a limit of budget for the Project, when the realization of the complete request will not be impracticable, the diminution of the sites will be necessary. Both side agreed with the proposed priority of the requested sites, to be used as reference when eliminations of the sites are necessary. When the priority of the requested sites are changed Philippine side inform to GOJ as soon as possible.

-List of project sites and the proposed priority;

(1) Sto. Domingo Central School
(2)Gogon Elementary school, Legazpi City
(3) Polangui North Central School
(4)Libon Community College
(5) Manito Central School
(6) Oas South Central School

6. Japan's Grant Aid Scheme

The Philippine side understood the Japan's Grant Aid scheme and the necessary measures to be taken by the Philippine side as shown in **Annex-3 and 4.**

7. Schedule of the Survey

7-1 The Team will proceed for further studies in the Philippines until 28th August, 2010.

7-2 The Team will prepare the draft report of the Preparatory Survey in English. JICA will dispatch a mission to explain its contents around January 2011.

7-3 In case that the contents of the report are accepted in principle by the GOP, JICA will finalize the report and submit it to the GOP around April 2011.

8. Other Relevant Issues

8-1 Demolishing Work and Provision of Disposal Area of Demolished Construction Debris

Both sides confirmed that the demolishing work of the existing school construction and disposal of construction debris will be undertaken by the Philippine side before commencement of the construction work by the Japanese side.

The Philippine side (i.e. Provincial Government of Albay) agreed to provide the disposal area of demolished construction debris of the existing school construction at own cost and take necessary measures according to the related law before commencement of the construction work by Japanese side..

8-2 Operation and Maintenance

The Philippine side (i.e. Provincial Government of Albay, Department of Education (Legazpi City Division and Division of Albay) and Municipality of Libon) agreed to allocate sufficient budget and qualified staff for proper and effective operation and maintenance of the Project.

8-3 Value Added Tax (VAT)

The Philippine side (i.e. Provincial Government of Albay) secure the budget or take necessary procedures for exemption of VAT.

8-4 Removal of residences within the site

The Philippine side (i.e. Provincial Government of Albay/Municipality of Libon) side agreed to remove the residences within the project site (Libon Community College) before September 2010.

8-5 Arrangements for the Survey

As a response to the request by the Team, The Philippine side agreed to arrange following:

8-5-1 To provide the Team with available relevant data, information and materials necessary for the execution of the Survey;

8-5-2 To provide the office space and its facilities to the Team;

8-5-3 To prepare the answers for the Questionnaires presented by the Team;

8-5-4 To assign full-time counterparts to the Team during their stay in the Philippines and to take the following roles as the coordinator to the Team;

(1) To make the appointments and to set up the meetings with the authorities, departments and all other factories and firms whatever the Team intends to visit

(2) To attend the site survey and any other visiting places with the Team and to make any convenience on accommodation, working room, adequate transportation, getting the permissions if required, etc., and

(3) To assist and to advise the Team for their collection of data and information as much as possible

8-5-5 To secure the permission to photograph and enter into private properties and restricted areas for the Team for proper execution of the Survey, if necessary;

8-5-6 To take any necessary measures deemed necessary to secure the safety of the members of the Team; and

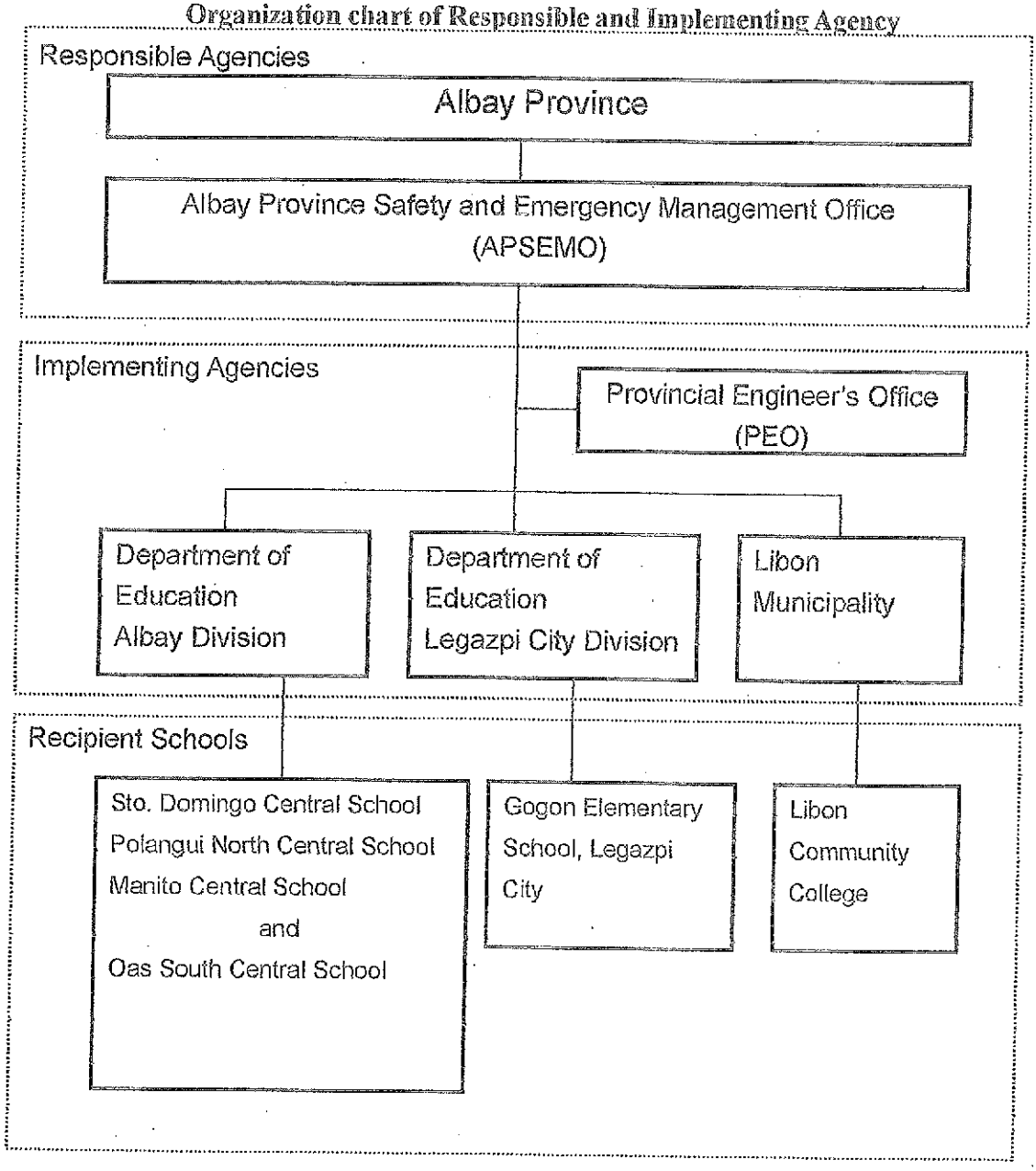
8-5-7 To make arrangements to allow the Team to bring back to Japan any necessary data, maps and materials related to the Survey, subject to approval by the GOP, in order to prepare the reports.

Organization chart of Responsible and Implementing Agency

Under preparing by Philippine side.

Annex- 1

Organization chart of Responsible and Implementing Agency

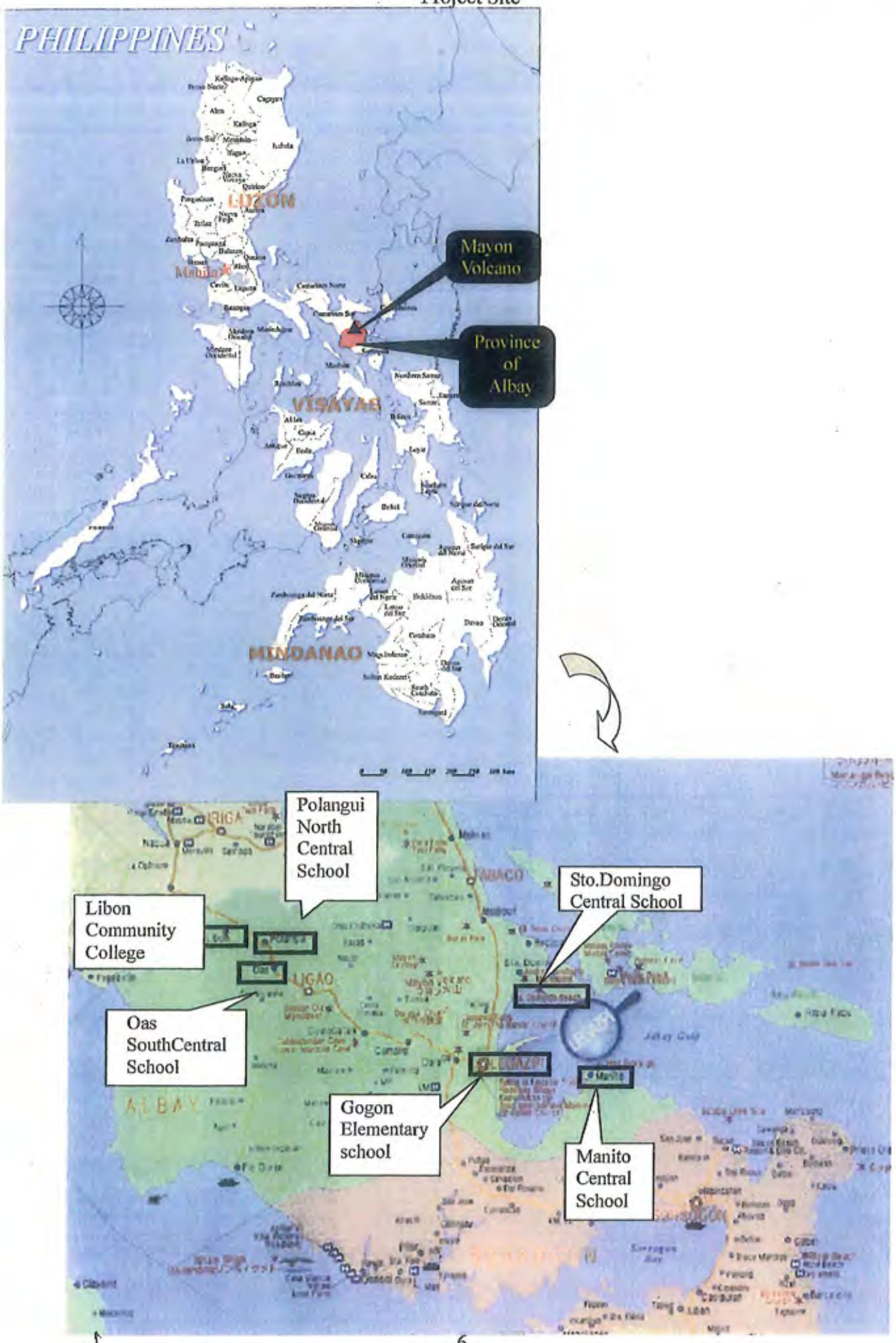


Confirmed by:

Jukes Nuñez (APSEMO)

Chiaki Kobayashi (JICA)

Project Site



JAPAN'S GRANT AID

The Government of Japan (hereinafter referred to as "the 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. 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 (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 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.

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.

(End)

Major Understandings to be taken by Each Government

No	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	to secure of land necessary for the implementation of the Project and to clear the site		○
2	To construct the following facilities		
	1) Evacuation Shelters	○	
	2) The gates and fences in and around the site		○
	3) The access 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		
	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		N/A
	b. The gas supply system within the site	N/A	
	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 (school furniture)		○
	b. Project equipment	○	
4	To ensure prompt unloading and customs clearance of the imported 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) Tax exemption and custom clearance of the Products at the port of disembarkation		○
	3) 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 nationals whose services may be 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)
(*)Payment of Advising and Payment commission are agreed on Exchange of Notes between the GOP and the GOJ

(2) Field Survey II (Minutes of Discussions to be signed in March, 2011)

Minutes of Discussions
on
The Preparatory Survey
on
The Project for Evacuation Shelter Construction in Disaster Vulnerable Areas in Province of Albay, in the Republic of the Philippines
(EXPLANATION ON DRAFT REPORT)

In response to a request from the Government of the Philippines (hereinafter referred to as "the GOP"), the Government of Japan (hereinafter referred to as "the GOJ") decided to conduct a Preparatory Survey on the Project for Evacuation Shelter Construction Project in Mayon Volcano Disaster Areas, Province of Albay (hereinafter referred to as "the Project") in the Republic of the Philippines (hereinafter referred to as "the Philippines") and entrusted the survey to Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to the Philippines the Preparatory Survey Team (hereinafter referred to as "the Team"), which is headed by Mr. Kazuhiko Ueno, Senior Representative, JICA Philippines Office and is scheduled to stay in the Province of Albay from 20th to 25th February 2011.

The Team held discussions with the concerned GOP officials and conducted a field survey at the Project areas. As a result of discussions and field survey, both parties confirmed the main items described in the attached sheets.

Manila, 23rd March, 2011

Mr. Kazuhiko Ueno Leader Preparatory Survey Team Japan International Cooperation Agency	Mr. Joey Salceda Governor Province of Albay Republic of the Philippines

ATTACHMENT

1. Components of the Draft Report

The Philippines side agreed and accepted in principle the components of the Draft Report explained by the Team. The components of the Project are shown in **Annex-1**.

2. Japan's Grant Aid scheme

The Philippines side understood Japan's Grant Aid Scheme and the necessary measures to be taken by the GOP as explained by the Team as per the Minutes of Discussions signed by both sides on 5th August 2010(hereinafter referred to as "the Previous M/D").

3. Schedule of the Survey

JICA will complete the final report in accordance with the confirmed items and send it to the GOP by April 2011.

4. Tentative Schedule of the Project

The Philippines side understood the tentative time schedule of implementation stage of the Project as shown in **Annex-2**. The Philippines side also understood the time schedule is subject to change, depending on the date of Exchange of Notes(hereinafter referred to as "E/N") and Grant Agreement(hereinafter referred to as "G/A").

5. Confidentiality of the Project

5.1 Detailed Specifications

Both sides confirmed all the information related to the Project including detailed specifications of the facilities, equipment and other technical information shall not be released to any other party(ies) before the signing of all contract(s) for the Project.

5.2 Project Cost Estimate

The Team explained to the Philippines side the estimated project cost to be borne by the GOJ as attached in **Annex-3**.

The Philippines side agreed to allocate necessary budget in order to bear requested undertakings as shown in Annex-3. The Team also explained that these cost estimations are subject to change since they are provisional and need to be further examined.

Both sides agreed that the Project Cost Estimate should never be duplicated in any form nor disclosed to any other party(ies) before the signing of all the Contract(s) for the Project. This confidentiality of the estimated project cost is necessary to ensure fairness of the tender procedure.

6. Undertakings of the Philippines side

The Team requested and the GOP agreed on the following undertakings in addition to the major undertakings described in the Previous M/D.

6.1 Tax Exemption

The Philippines side agreed to ensure exemptions of Value Added Tax (VAT), customs duty, all other taxes and fiscal levies in the Philippines which are to be arisen from the Project activities by allocation of the 70% of the Local Disaster Risk Reduction and Management fund.

6.2 Acquisition of building permits

The Provincial Engineering Office has agreed to undertake the application for the building permits including application fees to the respective Local Government Units (hereinafter referred to as "LGUs").

6.3 Demolishing Work and Provision of Disposal Area of Demolished Construction Debris

Both sides confirmed that the demolishing work of the existing school construction and disposal of construction debris shall be undertaken by the Philippines side before commencement of the construction work by the Japanese side. In this relation, the Albay Division Office of the Department of Education (hereinafter referred to as "DepED") should secure permits from the National Historical Commission on the demolition of the existing foundation of the Gabaldon building at Polangui North Central School. Other permits for demolition of existing dilapidated classroom building at Oas South Central School and Gogon Central School should be secured by respective DepED Division Offices.

The Philippines side agreed to provide the disposal area of demolished construction debris of the existing construction at their own expense and take necessary measures according to the related law before commencement of the construction work by the Japanese side.

6.4 Operation and Maintenance of incidental facilities

For the incidental facilities which are not used for educational purposes during normal times, such as machine room with generator, shower rooms, kitchen, and laundry,etc., the respective LGUs shall be responsible for the operation and maintenance of these facilities, including budget allocation under the supervision of the Governor through Albay Public Safety and Emergency Management Office (APSEMO).

6.5 Allocation of additional school personnel and necessary budget

The DepED Albay Division Office, DepED Legazpi City Division Office and the municipality of Libon agreed to undertake the followings, regarding the cost estimation as shown in **Annex-4**:

1) To allocate relevant number of additional school personnel in accordance with the increased number of classrooms provided by the Project.
2) To be responsible for the maintenance of school facilities such as classrooms, offices and toilets, including budget allocation.

7. Other Relevant Issues

7.1 Repair work of Polangui North Central School

The Philippines side explained and the Japanese side confirmed that the repair work of the 29 existing classrooms in Polangui North Central School was temporary measure and not a construction of new classrooms that will meet the criteria of Provincial Disaster Coordinating Council (PDCC) against typhoon and earthquake proof.

Both sides agreed the proposed 11 classrooms will be constructed by the Project.

7.2 Confirmation on the safety of the Project sites

Upon the request by the Team, APSEMO requested and received an official statement from Philippine Institute of Volcanology and Seismology (hereinafter referred to as "PHIVOLCS") Central Office and submitted it to the Team regarding the safety of the Project sites at Gogon Central School and Sto. Domingo Central School which are categorized in low susceptibility area against lahar.

According to the official statement, the sites are adequate as evacuation shelters for moderately explosive eruption with relevant risk prevention measures. In this relation, Albay Province agreed to regularly implement dredging in Basud and Yawa Rivers which will help maintain the river condition in high discharge capacity to prevent or mitigate the possible lahar that may affect the sites.

In addition to the above mentioned measures, APSEMO shall take special measures to

guide evacuees to safer sites other than the above-mentioned sites based on the warnings by PHIVOLCS, in case of highly explosive eruptions.

7.3 Joint-operation

The new facilities at Gogon Central School and Manito Central School have been planned and designed in the Preparatory Survey, based on the joint operation with the adjoining educational institutions, namely Gogon National High School and Manito Community College respectively. The agreement on the joint operation plan shall be concluded amongst the concerned schools, DepED Division Offices, and LGUs.

(End)

Annex -1 : Tentative list of Components of the Project
Annex -2 : Tentative Implementation Schedule
Annex -3 : Project Cost Estimation
Annex -4 : Cost estimation on the increase of school personnel cost and maintenance cost

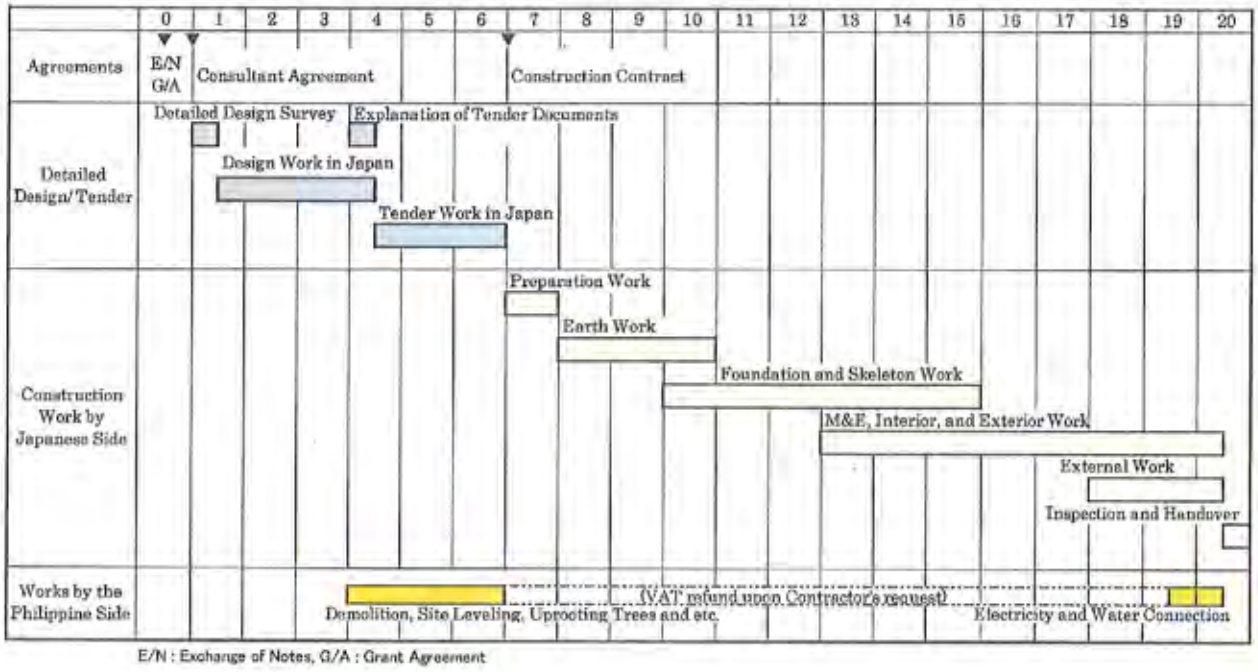
Annex-1

Tentative List of Components of the Project

School	Components to be Covered by the Japan's Grant Aid							Components to be Covered by the Philippine Side	
	Class-room	Office	Toilet	Shower unit	Kitcen	Laundry space	Machine room with generator	Fire extingu-isher	Furniture
LICOM	20	1	46	20	2	2	1	25	Upon necessity
Polangui North C/S	11	1	28	12	1	1	1	14	
Oas South C/S	11	1	28	12	1	1	1	14	
Manito C /S	19	1	46	20	2	2	1	24	
Sto. Domingo C/S	9	1	23	10	1	1	1	12	
Gogon C/S	9	1	23	10	1	1	1	12	
Total	79	6	194	84	8	8	6	101	

Annex-2

Tentative Implementation Schedule



E/N : Exchange of Notes, G/A : Grant Agreement

This Page is closed due to the confidentiality.

Cost estimation on the increase of school personnel cost and maintenance cost

(1) Salaries

Due to the expansion of the facilities, needs for additional personal services arise in 3 sites. The increase of salaries for additional employment is demonstrated below.

Increase in salaries after the Project (PHP)

Site	Employment Type	Intake	Average annual salary	Additional cost (annual)	Covered by
LICOM	Teaching staff	23	61,000	1,403,000	Libon
	Non-teaching staff	4	46,000	184,000	Libon
Manito C/S	Teacher	2	247,000	494,000	DepED
Sto. Domingo C/S	Teacher	6	247,000	1,482,000	DepED
Gogon C/S	Teacher	3	247,000	741,000	DepED
TOTAL		38		4,304,000	

(2) Water and electricity costs

The increases in water and electricity costs for the Project due to the expansion of the facilities are indicated below.

Water and electricity cost for the new facility in normal time

Item	Monthly cost (PHP)	Annual cost (PHP)
Electricity bill	100,000	1,200,000
Water bill	42,000	504,000
TOTAL	142,000	1,704,000

(3) Maintenance cost

The facilities planed in the Project are presumed to require no maintenance for the first several years after the handover. However, repainting costs will be required after several years. The assumed frequency and costs are shown below.

Maintenance cost of the Project sites

Item		Frequency	Annual cost (PHP)
Repainting	Interior/exterior wall, ceiling	Once every 5 years	1,500,000
	Fittings	Once every 5 years	40,000
Removal of sludge in the septic tank		Once every 3 years	10,000
TOTAL			1,550,000

V. References

No.	Title	Format	Original/Copy	Institution of Issuance	Publication Year
1	National Building Code of the Philippines (REPUBLIC ACT NO. 6541)	DATA	COPY	Republic of the Philippines	1972
2	Sanitation Code of the Philippines (PRESIDENTIAL DECREE NO. 856)	DATA	COPY	President of the Philippines (FERDINAND E.	1975
3	Standard Design and Specifications	DATA	COPY	DepED	
4	Manual on School Improvement Planning	PUBLICATION	COPY	DepED	2008
5	Annual Plan	DATA	COPY	DepED Albay Division Office	2011
6	Annual Accomplishment Report	DATA	COPY	DepED Albay Division Office	2009
7	Division Annual Plan	PUBLICATION	COPY	DepED Legazpi City Division Office	2010
8	Division Accomplishment Report	PUBLICATION	ORIGINAL	DepED Legazpi City Division Office	2009
9	2009 Philippine Statistical Yearbook	PUBLICATION	ORIGINAL	National Statistical Coordination Board	2009
10	Economic Indicators	PUBLICATION	ORIGINAL	National Statistical Coordination Board	2010
11	Disaster Risk Reduction Resource Manual	PUBLICATION	ORIGINAL	DepED	2008
12	Risk Map (Municipality of Libon)	PUBLICATION	COPY	APSEMO	1990
13	Risk Map (Municipality of Polangui)	PUBLICATION	COPY	APSEMO	1990
14	Risk Map (Municipality of Oas)	PUBLICATION	COPY	APSEMO	1990
15	Risk Map (Municipality of Manito)	PUBLICATION	COPY	APSEMO	1990
16	Risk Map (Municipality of Sto. Domingo)	PUBLICATION	COPY	APSEMO	1990
17	Risk Map (Legazpi City)	PUBLICATION	COPY	APSEMO	1990
18	Sphere Project Handbook 2004	DATA	COPY	United Nations	2004
19	Building Resilient Communities-Good Practices in Disaster Risk Management in the Philippines	PUBLICATION	ORIGINAL	Oxfam Great Britain	2010

VI. Other Relevant Data

(1) Letter regarding the refund of VAT

Republic of the Philippines
PROVINCE OF ALBAY
Legazpi City

Office of the Governor

JOEY SARTE SALCEDA
Governor

October 25, 2010

Mr. KAZUHIKO UENO
Senior Representative
JICA Philippines
40th Floor, Yuchengco Tower,
RCBC Plaza Avenue
Ayala Ave, Makati City

Dear **Mr. Ueno:**

This pertains to your message, dated October 19, 2010, informing us of the estimated amount of the VAT to be incurred by the Provincial Government and other inquiries regarding the project, "Evacuation Shelter Construction in Disaster Vulnerable Areas in the Province of Albay."

Please be informed that aside from the two options mentioned in our letter to Mr. Norio Matsuda, Chief Representative, JICA Philippines, dated August 13, 2010, copy of which is attached, the Philippine Government, through the newly enacted Republic Act 10121, which is "an act strengthening the Philippine Disaster Risk Reduction and Management System, Providing for the National Disaster Risk Reduction and Management Framework and Institutionalizing the National Disaster Risk Reduction Plan and Appropriating Funds Thereof," or otherwise known as the "Philippine Disaster Risk Reduction and Management Act of 2010," allows the utilization of the Seventy (70) percent of the Five (5) percent local calamity fund for pre-disaster use can be another source of fund to cover the VAT of our proposed project with JICA.

Also, upon coordination with the Department of Education, Albay Division, we were informed that the repair of the 29 existing classrooms in Polangui North Central School is more of a minor one and will not entail construction of new classrooms that will meet PDCC criteria for typhoon and earthquake proof to make it as safe evacuation centers. As experienced during Super Typhoon Reming in 2006, almost 80 percent of public school buildings were destroyed since the design of existing public school classrooms are not typhoon and earthquake proof. May we kindly request for JICA to consider the school as our project site as it is the only public school site in Polangui with space that will accommodate the construction of the facility.

Also, the Municipal Mayor of Libon, Hon. Agnes Dycoco, would like us to convey to you that the Municipal Government of Libon had already relocated the informal settlers in the compound of Libon Community College since August. They will be issuing certification relative to this.

With regards to the Agreement Letter from the DepEd Albay, DepEd Legazpi and the Municipality of Libon, for the budget allocation for the operation and maintenance of the project, they have an existing allocation for these expenses and if their budget will not warrant we are very willing to shoulder the expenses to be charged under RA 10121 which is referred to above.

We hope the foregoing will clarify matters raised in your message.

Thank you.

Very truly yours,

JOEY SARTE SALCEDA

Encl.: a/s

(052) 481-2555 (052) 480-3444 govoffice@albay.gov.ph / albaygovoffice@yahoo.com http://www.albay.gov.ph
MANILA OFFICE (ALBAY EMBASSY)
904-S Tower B. Skyland Plaza, Sen. Gil Puyat Avenue, Makati City 1200 Telefax No. (02) 887-7672 Tel. No. (02) 381-3161

(2) Official statement by PHIVOLCS regarding the safety of the sites ①

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF SCIENCE AND TECHNOLOGY
PHILIPPINE INSTITUTE OF VOLCANOLOGY AND SEISMOLOGY
PHIVOLCS Bldg., C.P. Garcia Ave., University of the Philippines Campus, Diliman, Quezon City
Tels. (+632) 426-1468 to 79 loc 112, 129; (+632) 926-2611, (+632) 920-7058
Fax: (+632) 929-6366; 927-1095

LC-Feb-10-005

26 February 2010

CERTIFICATION

To Whom It May Concern:

This is to certify that the schools listed below and located in the Municipalities of Oas, Legazpi, Polangui, Manito, Sto. Domingo and Libon in Albay Province, as shown in the vicinity map provided, the GPS coordinates supplied by the REDAS Team and the approximated centers of urban areas, are outside the 6-km Permanent Danger Zone (PDZ) for Mayon Volcano and are not within the hazard area for pyroclastic flow and lava flow. However, for lahar hazards, Gogon Elementary School and the approximated location of Sto. Domingo Central School are within areas with low susceptibility to lahars. The four other schools namely Oas Central School, and the approximated locations of Polangui, Manito, and Libon Central Schools are safe from lahars.

List of volcanic hazards assessment for the schools are listed below:

Name of School	Lahar	Lava	Pyroclastic Flow
1. Oas Central School *(with GPS location from REDAS Team)*	Safe	Safe	Safe
2. Gogon Elementary School *(with GPS location from REDAS Team)*	Low Susceptibility	Safe	Safe
3. Polangui Central School *(approximate location / located in the center of urban area)*	Safe	Safe	Safe
4. Manito Central School *(approximate location / located in the center of urban area)*	Safe	Safe	Safe
5. Sto. Domingo Central School *(approximate location / located in the center of urban area)*	Low Susceptibility	Safe	Safe
6. Libon Central School *(approximate location / located in the center of urban area)*	Safe	Safe	Safe

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Furthermore, all the above mentioned schools are not transected by the Lake Bato Lineament (LBL). The LBL is the nearest known active fault in the area, based on the map available at PHIVOLCS. The buffer zone against rupturing recommended by this office is at least 5 meters on both sides of the mapped fault trace or from the edge of the deformation zone. In addition, we would like to emphasize that more detailed geologic assessment needs to be done to validate the extent of the potential earthquake hazards and for proper design and construction of major infrastructures.

This certification is issued upon the request of **Japan International Cooperation Agency (JICA)** for whatever purpose it may serve, and supersedes any previous certification issued by this office regarding the area.

RENATO U. SOLIDUM, JR.
Director

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(3) Official statement by PHIVOLCS regarding the safety of the sites ②

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF SCIENCE AND TECHNOLOGY
PHILIPPINE INSTITUTE OF VOLCANOLOGY AND SEISMOLOGY
PHIVOLCS Bldg., C.P. Garcia Ave., University of the Philippines Campus, Diliman, Quezon City
Tels. 426-1468 to 79; 928-2230; 926-7749; 926-9338
Fax: 929-8961; 926-3225

OGL-Feb-11-017

22 February 2011

The Hon. JOEY SARTE SALCEDA
Governor
The Province of Albay

Dear Gov. Salceda,

Thank you for your letter to us today requesting for a Volcanic Hazards Certification of the Gogon Elementary School and Sto. Domingo Elementary School, as needed by JICA for its project with your kind Office.

Based on the current PHIVOLCS Medium-term Volcanic Hazards Maps, which were devised for small to moderate-sized eruptions, the said schools are both safe from lava and pyroclastic flows and surges but are in the low susceptibility zones for lahars. Low susceptibility to lahars means that typical lahars generated by rains after a moderately explosive eruption (Volcano Explosivity Index, or VEI ≤3, e.g. in 1984, 2000-01) will most likely not affect the area, but those generated by extreme rainfall events (e.g. 2006 Typhoon *Reming*) most likely will, as was a small part of Brgy. Gogon along Yawa River during *Reming*.

In terms of long-term hazards from highly explosive (VEI 4) eruptions such as the 1814 and 1897 eruptions, historical precedents show that Sto. Domingo Elementary School may be at risk to pyroclastic flows and surges. Accounts of the 1987 eruption vividly recount the repeated passage of pyroclastic flows through the town of Sto. Domingo all the way to the sea, scouring a gorge in the crater rim that directed the greater part of Mayon's volcanic flows to this town until 1947. Lahars ensuing from VEI 4 eruptions, and also, those from the 100-year flood rainfall, will most likely impact Sto. Domingo proper as well as Brgy. Gogon, both being in river plains, and put the above schools at risk.

In view of the above, our Institute nonetheless will not discourage the construction of school facilities under the JICA or any other project in the above school sites, because the primary, *long-term* use of these schools is for public education. However, for the alternate purpose of

utilizing the schools as evacuation centers during volcanic activity, there are two scenarios with differing risks to the school sites that need to be considered. In the first and prevailing scenario, which is Mayon behaving within the cycle of moderately-sized eruptions, or in the *medium-term*, the school sites are safe from lava and pyroclastic flows and surges but are at low susceptibilties to lahars. With the construction of adequately strong and elevated school facilities and other mitigating structures to counteract the impacts of lahars, the risks to lahars can be diminished and the schools can be used for evacuation purposes. Only in the second scenario, when a highly explosive eruption similar to the 1814 or 1897 eruption occurs, or in the *long-term*, will these school sites be at risk to pyroclastic flows and surges and lahars and should be disused for evacuation purposes. A VEI 4 eruption will definitely exhibit very clear and strong precursors that can be detected by the current state-of the-art monitoring in Mayon, and therefore timely and appropriate warning can be issued by PHIVOLCS so that the Province's evacuation efforts can be guided accordingly.

The above assessments have already been communicated to JICA representatives and their consultants during a meeting held in PHIVOLCS last February 21, 2011. We hope that this certification further clarifies our position, and that we have addressed all concerns on the volcanic risk to and safety of the said school sites. Should you need any more clarifications, please do not hesitate to contact us for additional details.

Very Truly Yours,

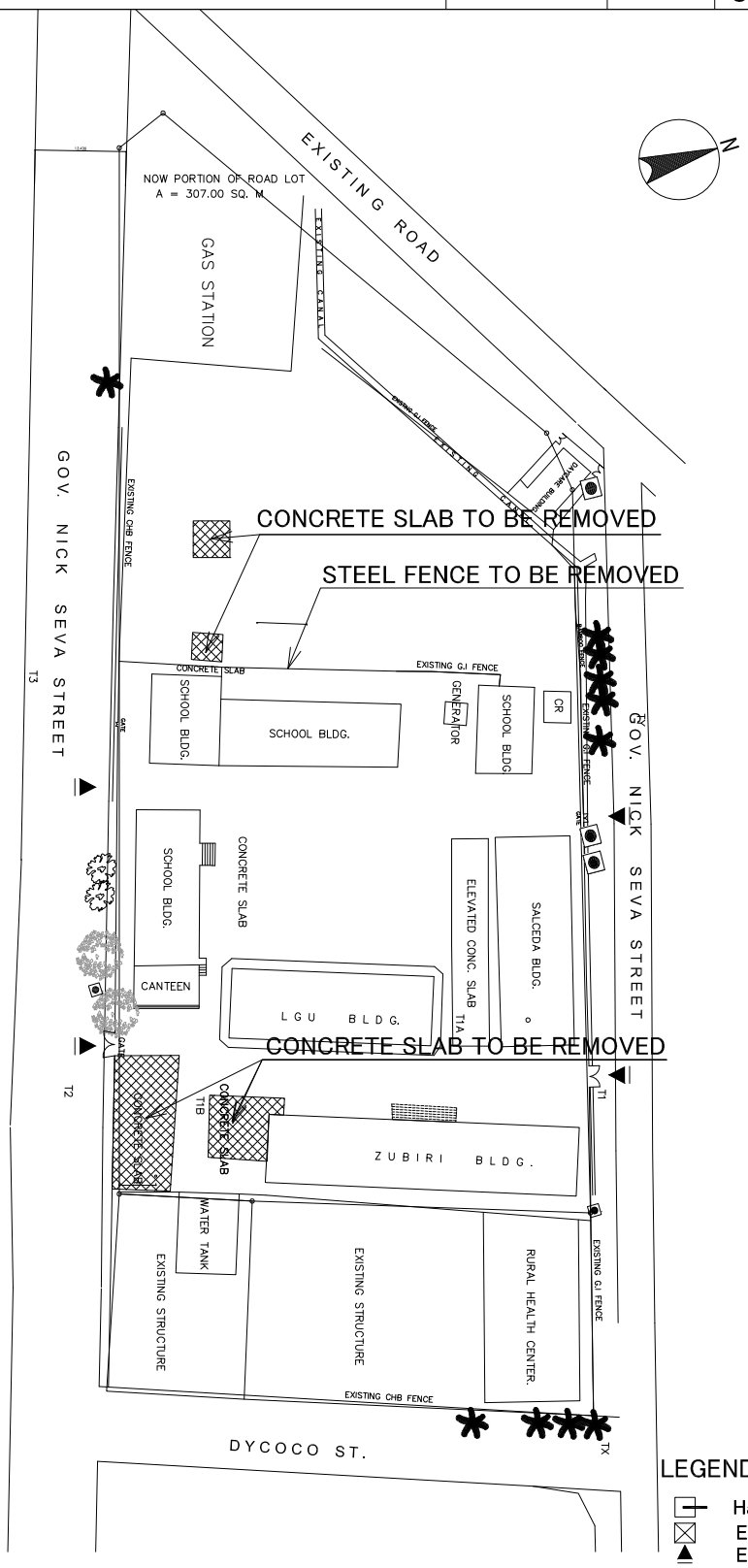
for:

RENATO U.SOLIDUM, JR.
Director

Appendices 2

1. Outline Design Drawing

NAME OF SCHOOL	Libon Community College	BARANGAY	Zone 4	DATE OF SURVEY	2010/8/16



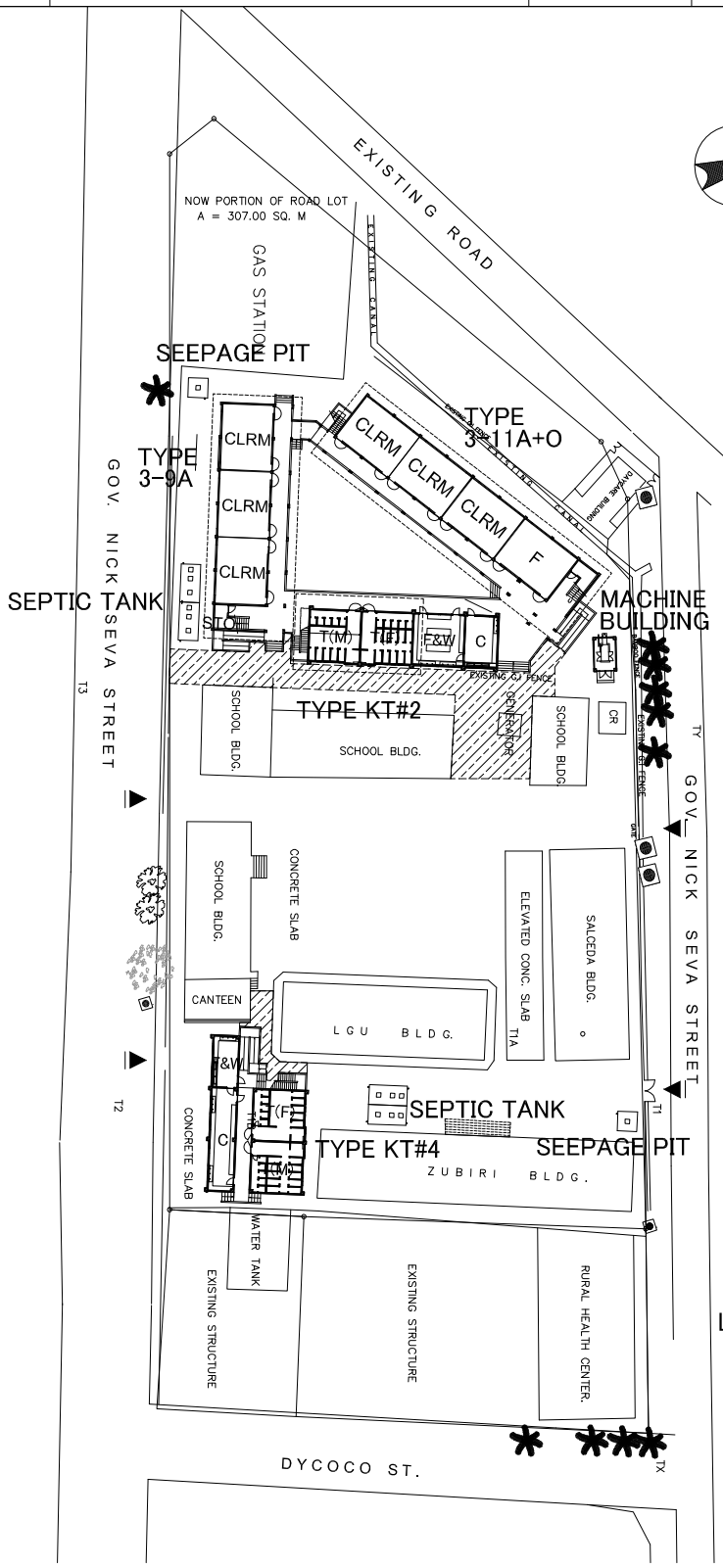
LEGEND:

- Hand Pump
- EWT
- Entrance
- Well
- Electric Post
- Obstruction removal (By Government of the Province of Albay Work)

EXISTING SITE PLAN SCALE 1:1000M

01

NAME OF SCHOOL	Libon Community College	BARANGAY	Zone 4	DATE OF SURVEY	2010/8/16



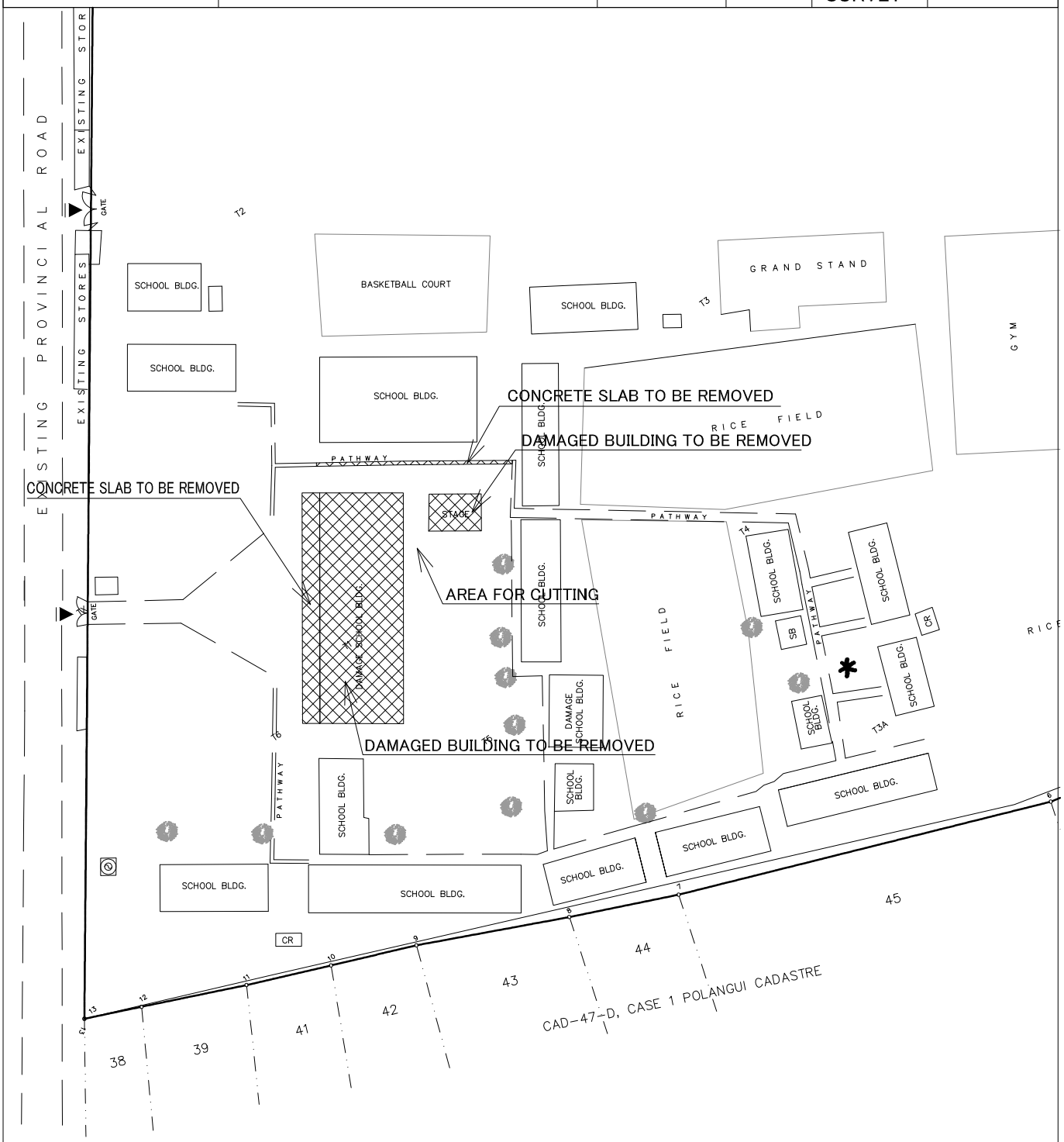
LEGEND:

	Hand Pump
	EWT
	Entrance
	Well
	Electric Post
F	Office
CLRM	Classroom
T(M)	Boys Toilet
T(F)	Girls Toilet
F&W	Food Preparation and Washing
C	Cooking
	Concrete Pavement (By Government of the Province of Albay Work)

PROPOSED SITE PLAN SCALE 1:1000M

02

NAME OF SCHOOL	Polangui North Central School	BARANGAY	Centro Oriental	DATE OF SURVEY	2010/8/22



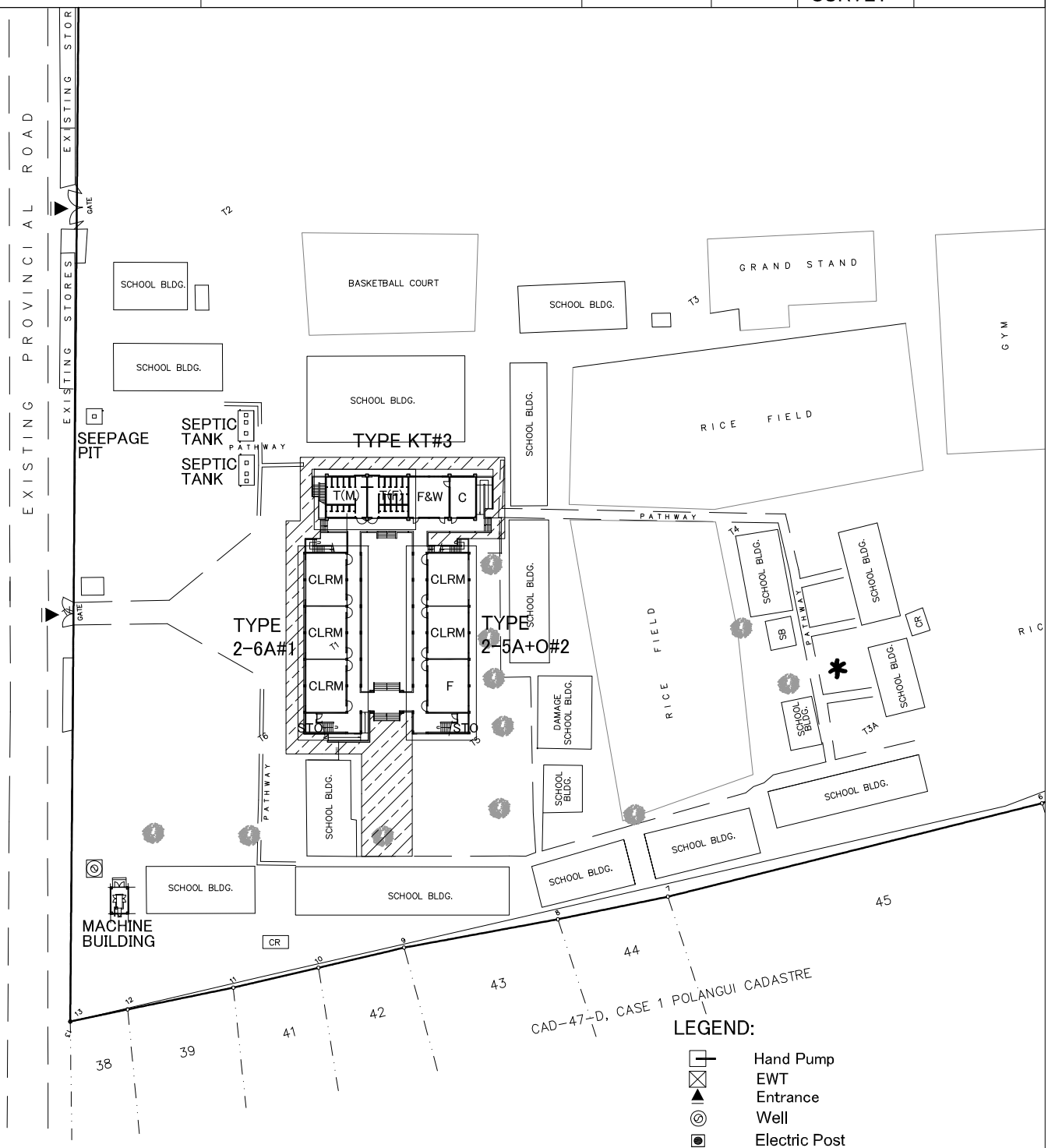
LEGEND:

- Hand Pump
- EWT
- Entrance
- Well
- Electric Post
- Obstruction removal (By Government of the Province of Albay Work)
- Area for Cutting (By Government of the Province of Albay Work)

EXISTING SITE PLAN SCALE 1:1000M

03

NAME OF SCHOOL	Polangui North Central School	BARANGAY	Centro Oriental	DATE OF SURVEY	2010/8/22

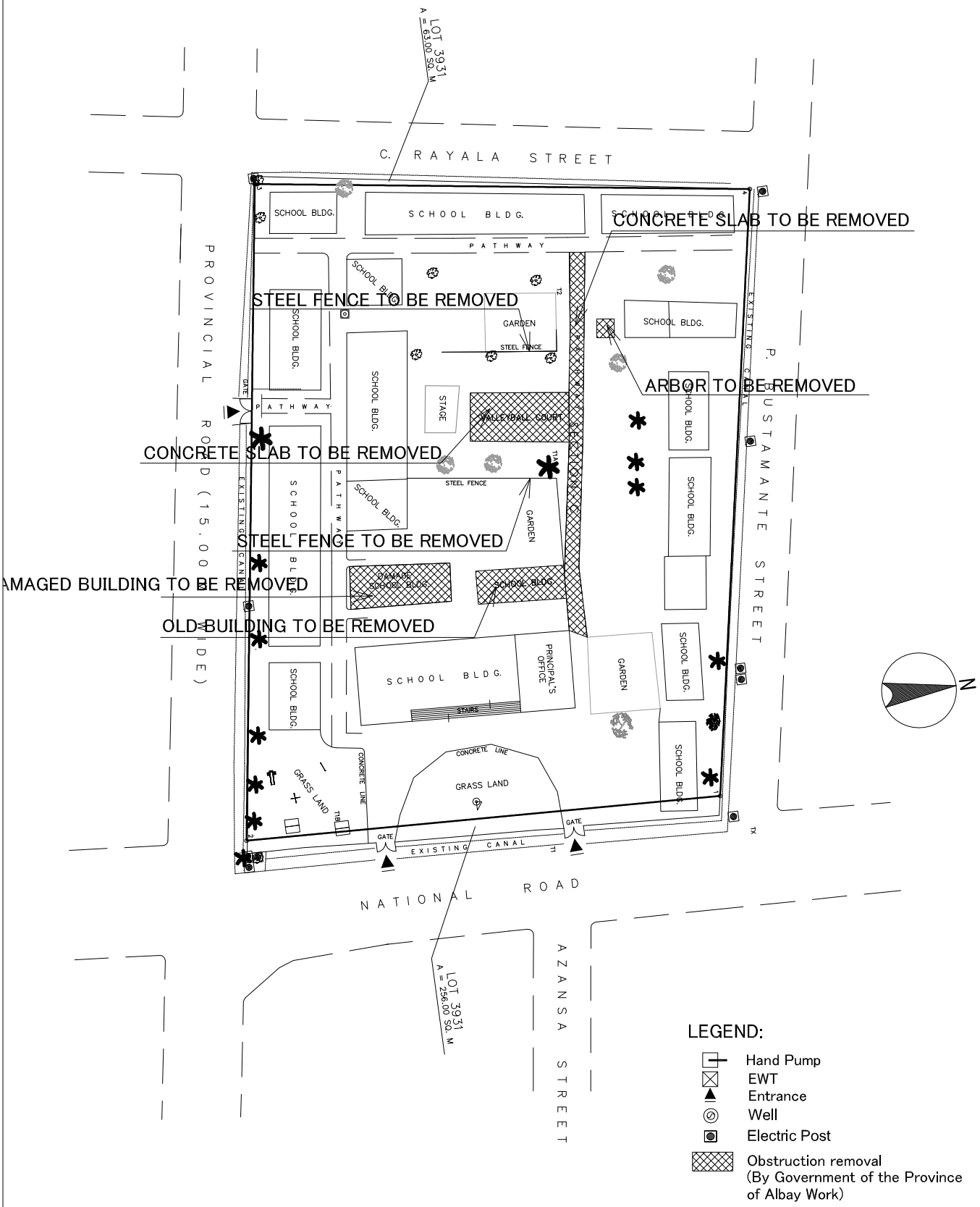


LEGEND:

	Hand Pump
	EWT
	Entrance
	Well
	Electric Post
F	Office
CLRM	Classroom
T(M)	Boys Toilet
T(F)	Girls Toilet
F&W	Food Preparation and Washing
C	Cooking
	Concrete Pavement (By Government of the Province of Albay Work)

PROPOSED SITE PLAN SCALE 1:1000M

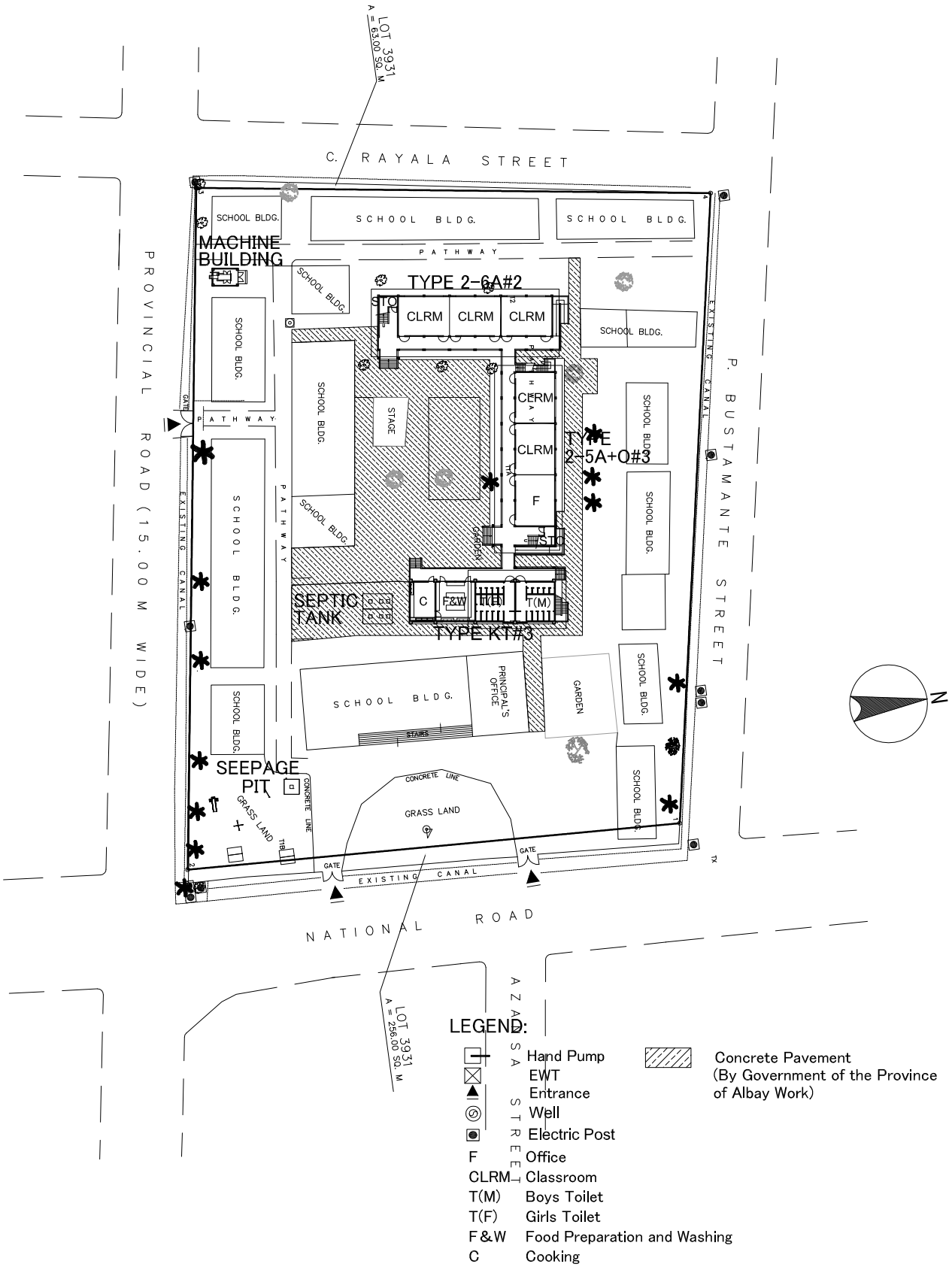
NAME OF SCHOOL	Oas South Central School	BARANGAY	Ilaor Norte	DATE OF SURVEY	2010/8/22



EXISTING SITE PLAN SCALE 1:1000M

05

NAME OF SCHOOL	Oas South Central School	BARANGAY	Ilaor Norte	DATE OF SURVEY	2010/8/22



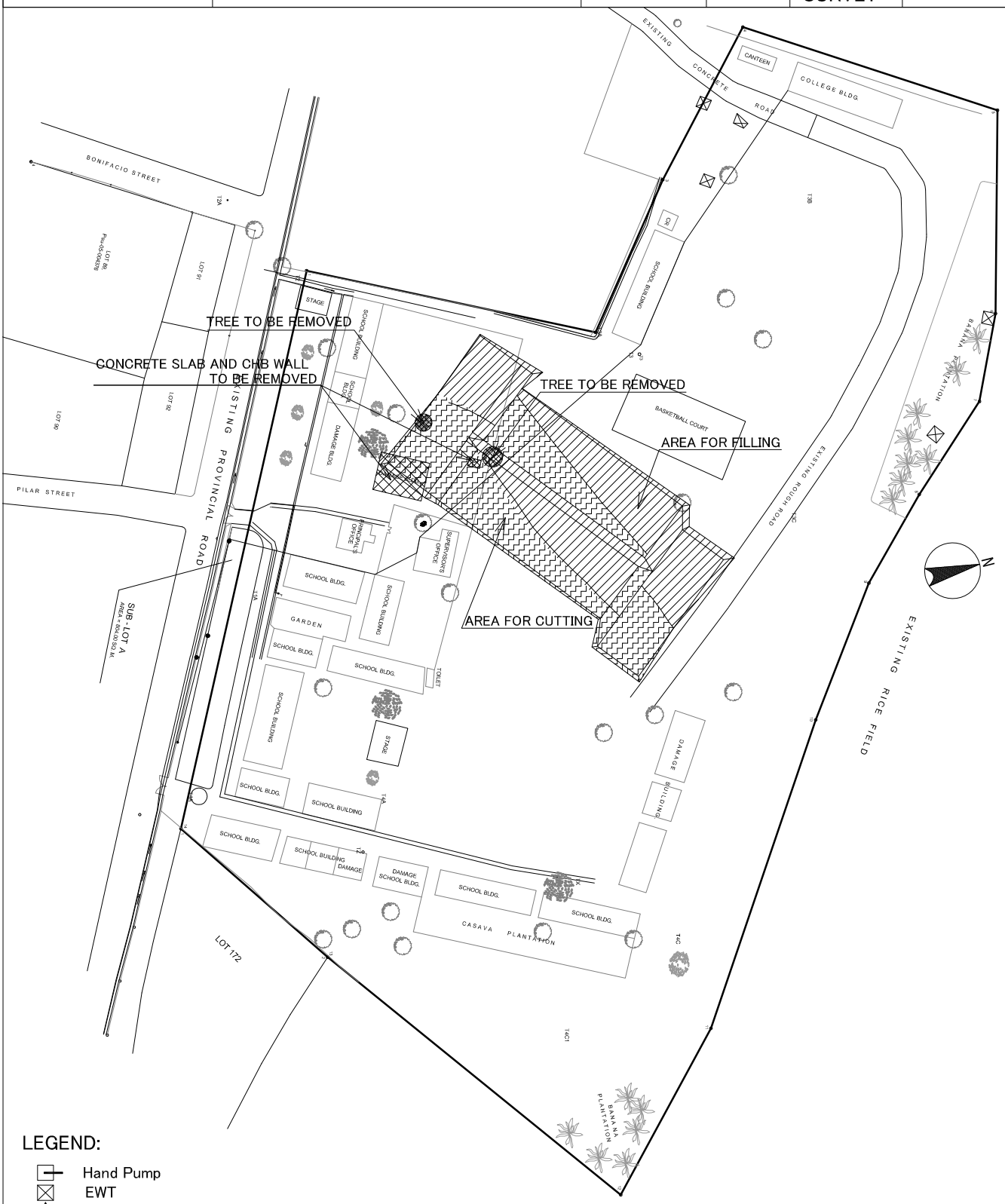
LEGEND:

	Hand Pump		Concrete Pavement (By Government of the Province of Albay Work)
	EWT		
	Entrance		
	Well		
	Electric Post		
F	Office		
CLRM	Classroom		
T(M)	Boys Toilet		
T(F)	Girls Toilet		
F&W	Food Preparation and Washing		
C	Cooking		

PROPOSED SITE PLAN SCALE 1:1000M

06

NAME OF SCHOOL	Manito Central School	BARANGAY	It-ba	DATE OF SURVEY	2010/8/18



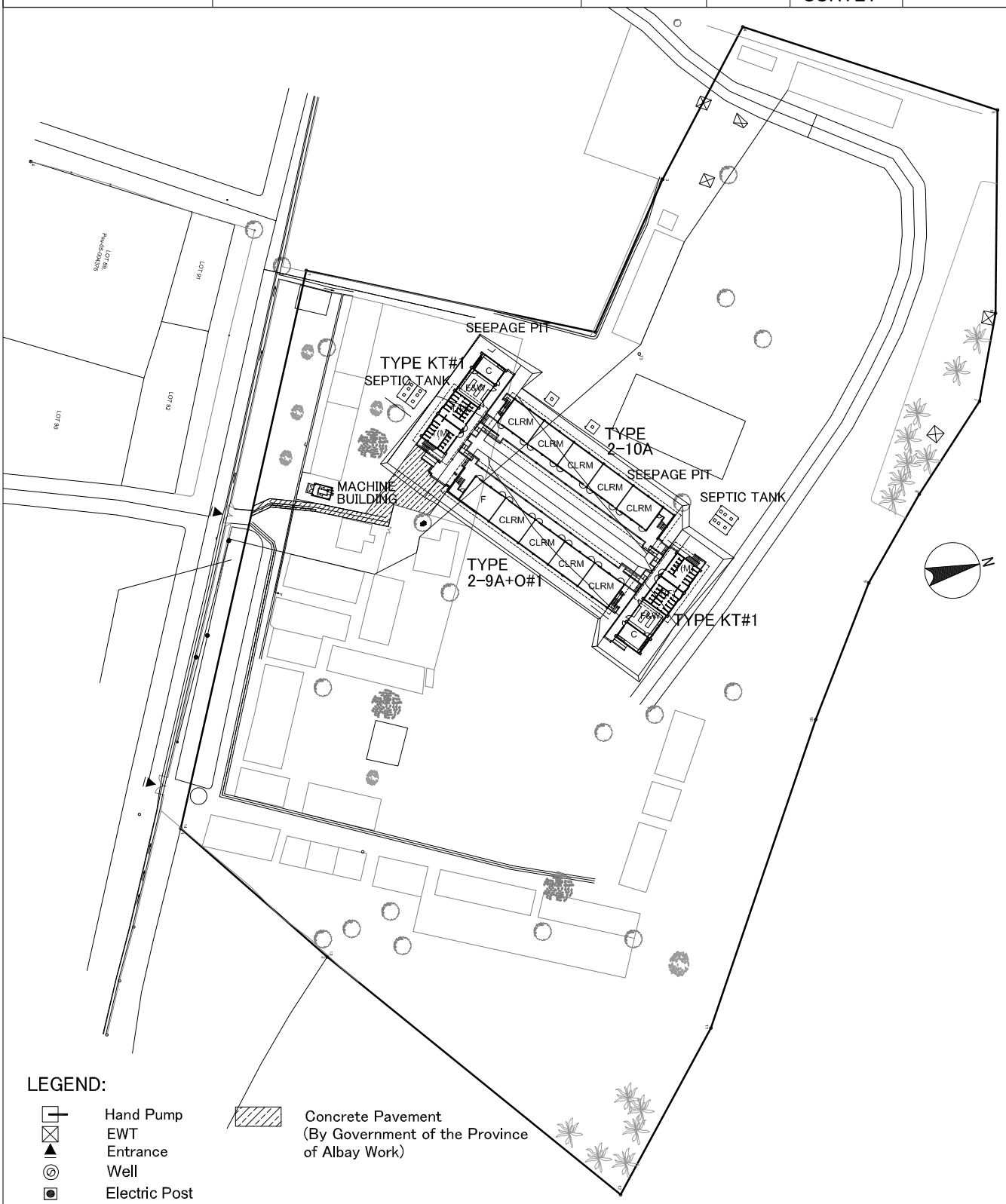
LEGEND:

- Hand Pump
- EWT
- Entrance
- Well
- Electric Post
- Obstruction removal (By Government of the Province of Albay Work)
- Area for Cutting (By Government of the Province of Albay Work)
- Area for Filling (By Government of the Province of Albay Work)

EXISTING SITE PLAN SCALE 1:1400M

07

NAME OF SCHOOL	Manito Central School	BARANGAY	It-ba	DATE OF SURVEY	2010/8/18



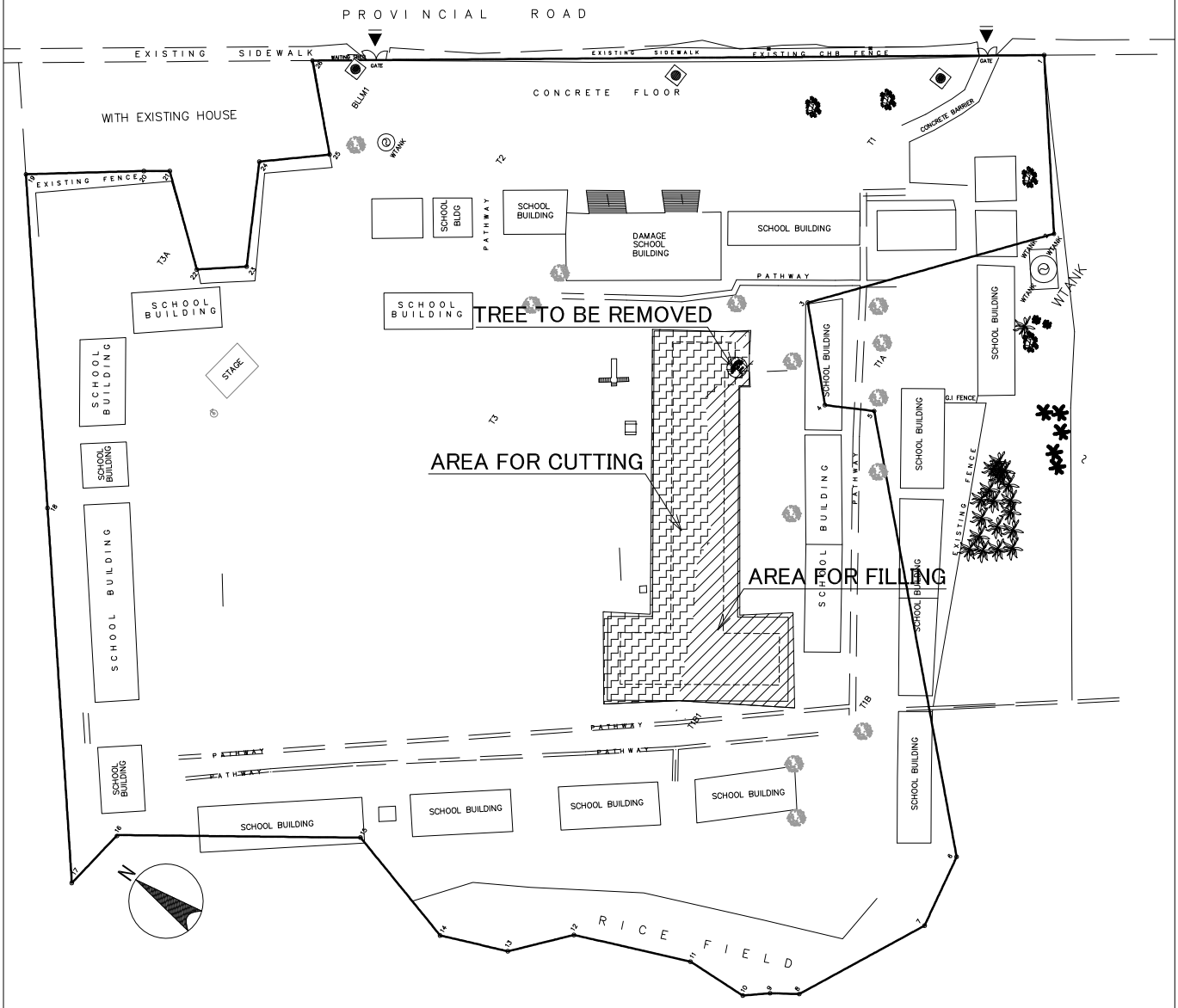
LEGEND:

	Hand Pump		Concrete Pavement (By Government of the Province of Albay Work)
	EWT		
	Entrance		
	Well		
	Electric Post		
F	Office		
CLRM	Classroom		
T(M)	Boys Toilet		
T(F)	Girls Toilet		
F&W	Food Preparation and Washing		
C	Cooking		

PROPOSED SITE PLAN

SCALE 1:1400M

NAME OF SCHOOL	Sto. Domingo Elementary School	BARANGAY	Nagsya	DATE OF SURVEY	2010/8/15-17

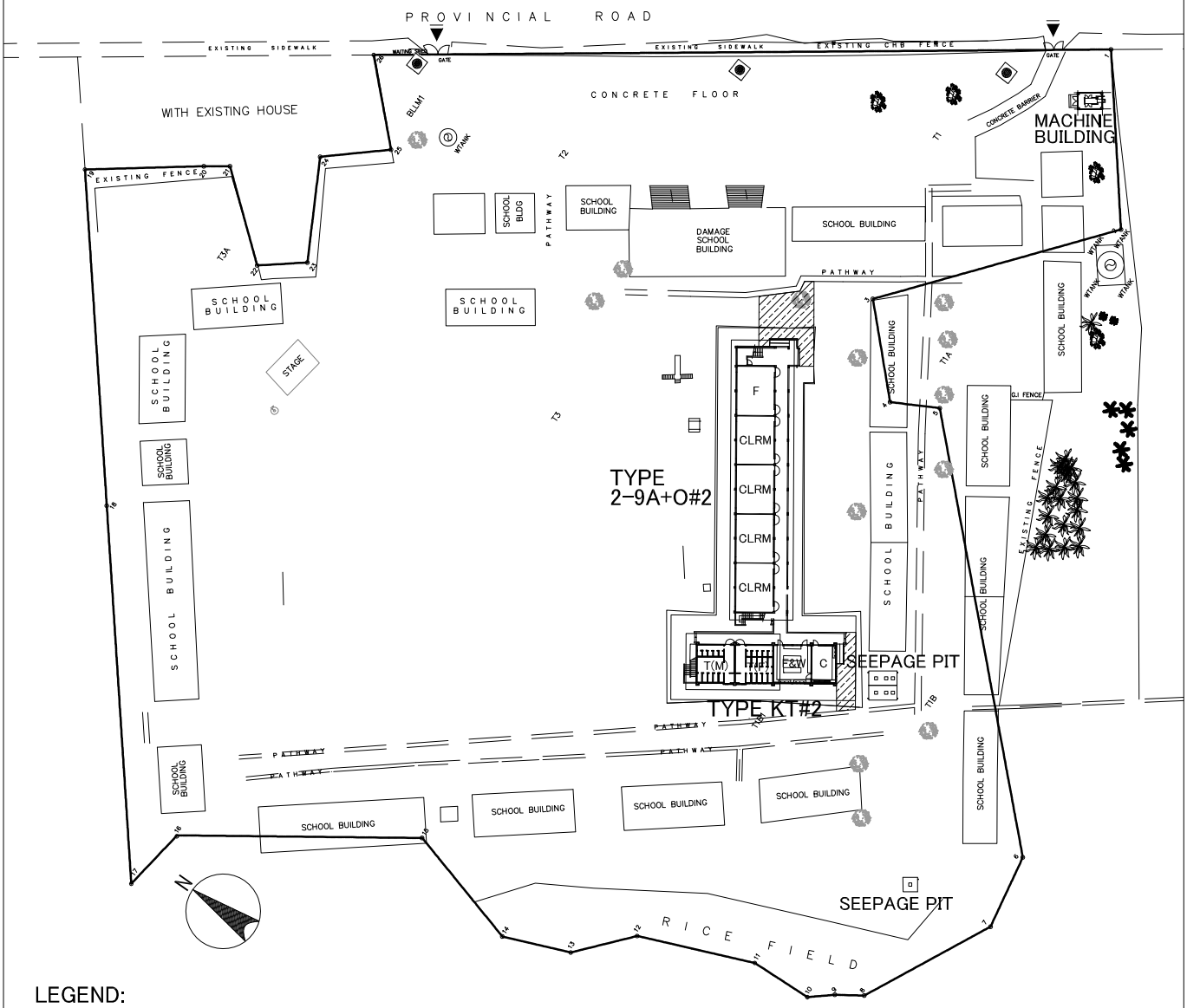


LEGEND:

- Hand Pump
- EWT
- Entrance
- Well
- Electric Post
- Obstruction removal (By Government of the Province of Albay Work)
- Area for Cutting (By Government of the Province of Albay Work)
- Area for Filling (By Government of the Province of Albay Work)

EXISTING SITE PLAN SCALE 1:1200M

NAME OF SCHOOL	Sto. Domingo Elementary School	BARANGAY	Nagsya	DATE OF SURVEY	2010/8/15-17



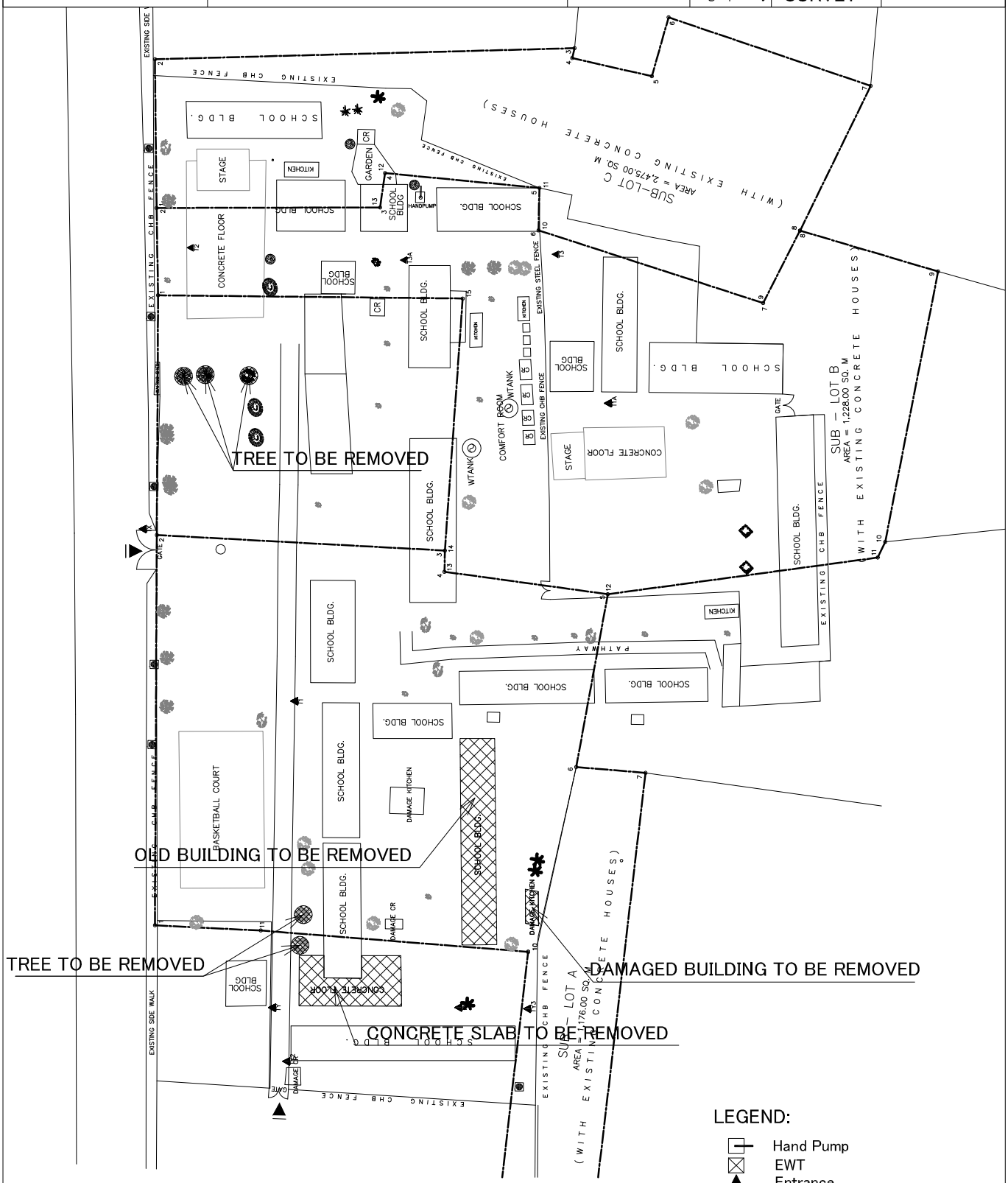
LEGEND:

	Hand Pump		Concrete Pavement (By Government of the Province of Albay Work)
	EWT		
	Entrance		
	Well		
	Electric Post		
F	Office		
CLRM	Classroom		
T(M)	Boys Toilet		
T(F)	Girls Toilet		
F&W	Food Preparation and Washing		
C	Cooking		

PROPOSED SITE PLAN

SCALE 1:1200M

NAME OF SCHOOL	Gogon Elementary School	BARANGAY	Gogon Legazpi City	DATE OF SURVEY	2010/8/15-17

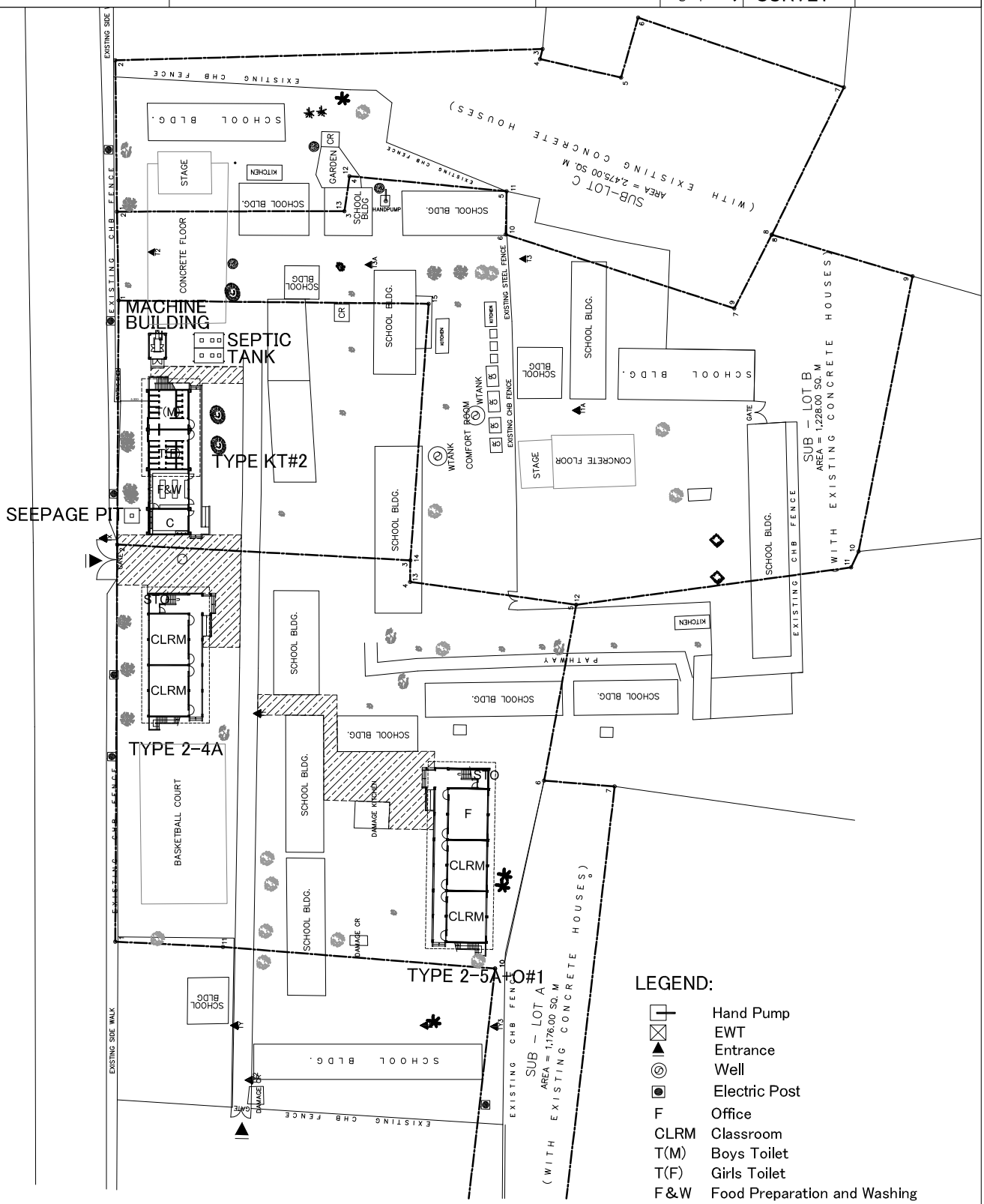


LEGEND:

- Hand Pump
- EWT
- Entrance
- Well
- Electric Post
- Obstruction removal (By Government of the Province of Albay Work)

EXISTING SITE PLAN SCALE 1:1000M

NAME OF SCHOOL	Gogon Elementary School	BARANGAY	Gogon Legazpi City	DATE OF SURVEY	2010/8/15-17



LEGEND:

	Hand Pump
	EWT
	Entrance
	Well
	Electric Post
F	Office
CLRM	Classroom
T(M)	Boys Toilet
T(F)	Girls Toilet
F&W	Food Preparation and Washing
C	Cooking
	Concrete Pavement (By Government of the Province of Albay Work)

PROPOSED SITE PLAN SCALE 1:1000M